



RESEARCH CENTER

FIELD

**Applied Mathematics, Computation  
and Simulation**

# Activity Report 2017

## Section Dissemination

Edition: 2018-02-19



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## ACUMES Project-Team

## 8. Dissemination

### 8.1. Promoting Scientific Activities

#### 8.1.1. Scientific Events Organisation

##### 8.1.1.1. General Chair, Scientific Chair

- P. Goatin is member of the the scientific committee of the annual seminar CEA-GAMNI “*Numerical fluid-mechanics*”.
- J.-A. Désidéri and A. Habbal had organized and chaired the 27th IFIP TC7 Conference on System Modeling and Optimization (Sophia Antipolis, June 29 - July 3, 2015). As a result, they jointly chaired with L. Bociu (North Carolina University) the reviewing panel that elaborated the book of revised contributions edited by Springer [29].

##### 8.1.1.2. Member of the Organizing Committees

- P. Goatin was member of the organizing committee of the Indam “*Transport Modeling and Management: Vehicles and Crowds*”, Roma (Italy), March 2017.
- R. Duvigneau and A. Habbal organized a minisymposium *PDE-Constrained Optimization, Control and Games: New Models and Methods - Part I and II* at the SIAM Conference on Optimization, May 22-25, Vancouver BC (Canada).

#### 8.1.2. Scientific Events Selection

##### 8.1.2.1. Member of the Conference Program Committees

- A. Habbal is member of the the scientific committee of the 8th Conference on Trends in Applied Mathematics Tunisia-Algeria-Morocco TAMTAM 2017, May 10-13, Hammamet (Tunisia).

#### 8.1.3. Journal

##### 8.1.3.1. Member of the Editorial Boards

- P. Goatin is member of the Editorial Board of *Networks and Heterogeneous Media*.

##### 8.1.3.2. Reviewer - Reviewing Activities

- J.-A. Désidéri has made reviews for the *International Journal of Information Technology & Decision Making*, *Comptes Rendus de l'Académie des Sciences*, and *Algorithms*.
- R. Duvigneau is a reviewer for the following international journals : *Computers & Fluids*, *International Journal for Numerical Methods in Fluids*, *Computer Methods for Applied Mechanical Engineering*, *Computer Aided Geometric Design*, *Applied Mathematics & Mechanics*, *Engineering Optimization*.
- P. Goatin is reviewers for the following international journals: *Acta Applicandæ Mathematicæ* ; *African Journal of Mathematics and Computer Science Research*; *Algorithms*; *Annales de l'Institut Henri Poincaré (C) Analyse Non Linéaire*; *Applied Mathematics and Computation*; *Computer-aided Civil and Infrastructure Engineering*; *Discrete and Continuous Dynamical Systems*; *European Journal of Operational Research*; *IEEE Transactions on Automatic Control*; *IEEE Transactions on Intelligent Transportation Systems*; *International Journal of Dynamical Systems and Differential Equations*; *Journal of Computational Physics*; *Journal of Flow, Turbulence and Combustion*; *Mathematical Models and Methods in Applied Sciences*; *Mathematics of Computation*; *Networks and Heterogeneous Media*; *New Journal of Physics*; *Nonlinear Analysis Ser. B: Real World Applications*; *SIAM Journal of Mathematical Analysis*; *SIAM Journal of Applied Mathematics*; *SIAM Journal of Numerical Analysis*; *SIAM Journal on Scientific Computing*.

- A. Habbal is reviewer for the following international journals: Applied Mathematics (AM), Scientific Research Publishing ; Journal of Structural and Multidisciplinary Optimization ; Journal of Math. Model. Nat. Phenom. ; International Journal of Mechanical Sciences ; Modern Applied Science ; Asian Journal of Control ; Applied Mathematics and Computation ; Computer Methods in Applied Mechanics and Engineering ; Bulletin of Mathematical Biology ; Journal of Pure and Applied Functional Analysis ; Int. Journal of Mathematical Modeling and Numerical Optimization; Numerische Mathematik; Journal of Differential Equations; EMS Surveys; AMS reviews.

#### 8.1.4. Invited Talks

- P. Goatin: Workshop “Current topics in kinetic theory”, Warsaw (Poland), March 2017.  
Invited talk: “*Non-local macroscopic models of traffic flow*”.
- A. Habbal: Univ. Wurzburg Chair of Mathematics (Scientific Computing) Mathematical Colloquium, Wurzburg, April 2017.  
Invited talk: *Modeling avoidance dynamics by FP-constrained Nash games*
- P. Goatin: Barcelona Mathematical Days, Barcelona (Spain), April 2017.  
Session “Progress in Transport Phenomena”.  
Invited talk: “*Non-local conservation laws arising in traffic modeling*”.
- P. Goatin: 2016-17 Warwick EPSRC Symposium, Warwick (UK), May 2017.  
Workshop “Emerging PDE models in Socio-Economic Sciences”.  
Invited talk: “*Moving bottlenecks in traffic flows*”.
- J.-A. Désidéri & A. Dervieux: Journées Scientifiques Inria, Sophia Antipolis, 14-16 June, 2017:  
Invited talk: 50 ans de calcul scientifique: le point de vue de numériciens des fluides (*50 years of scientific computing: the viewpoint from CFD-ers*).
- P. Goatin: ICERM Topical Workshop “Pedestrian Dynamics: Modeling, Validation and Calibration”, Providence, RI (USA), August 2017.  
Invited talk: “*Macroscopic modeling and simulation of crowd dynamics*”.

#### 8.1.5. Research Administration

- P. Goatin is member of BCP (“Bureau du Comité des Projets”) at Inria Sophia Antipolis Méditerranée.
- R. Duvigneau is member of CDT (“Comité Développement Technologique”) at Inria Sophia Antipolis Méditerranée.
- R. Duvigneau is member of CSD (“Comité Suivi Doctoral”) at Inria Sophia Antipolis Méditerranée.
- R. Duvigneau is responsible for the Immersive Space Committee at Inria Sophia Antipolis Méditerranée.

## 8.2. Teaching - Supervision - Juries

### 8.2.1. Teaching

Master: Advanced Optimization, 40.5 hrs, M2, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (J.-A. Désidéri, R. Duvigneau).

Master: Conservation laws and finite volume scheme, 30 hrs, M2, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (P. Goatin).

Master: Multidisciplinary Optimization, 22.5 hrs, joint *Institut Supérieur de l’Aéronautique et de l’Espace* (ISAE Supaéro, “Complex Systems”) and M2 (Mathematics), Toulouse (J.-A. Désidéri).

Licence: Summer Project in Mathematical Modeling, 36 hrs, L3, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

Master: Numerical Methods for Partial Differential Equations, 66 hrs, M1, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal and R. Duvigneau).

Master: Modeling strategies for e-Formula races, M1 Students Project, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

### 8.2.2. Supervision

PhD in progress : Cédric Durantin, *Meta-modelling for the optimization of nanophotonic devices*, October 2014. Supervisors : J.-A. Désidéri and A. Glière (CEA LETI).

PhD in progress : Quentin Mercier, *Multicriterion optimization under uncertainties : the stochastic multiple gradient approach. Application to aerelasticity*, October 2015. Supervisors : J.-A. Désidéri and F. Poirion.

PhD in progress : Sosina Mengistu-Gashaw (EURECOM), *Mobility and connectivity modelling of 2-wheels traffic for ITS applications*, March 2015. Supervisors: P. Goatin and J. Härrä (EURECOM).

PhD in progress: Rabeb Chamekh, *Game strategies for thermo-elasticity*, Jan 2015, Supervisors: A. Habbal, Moez Kallel (LAMSIN, ENIT, Tunis)

PhD in progress: Marwa Ouni, *Solving inverses problems in fluid mechanics with game strategies*, October 2016, Supervisors: A. Habbal, Moez Kallel (LAMSIN, ENIT, Tunis)

PhD in progress: Kelthoum Chahour, *Modeling and optimal design of coronary angioplastic stents*, Nov 2015, Supervisors: A. Habbal, Rajae Aboulaich (LERMA, EMI, Rabat)

PhD in progress: A. Azaouzi, *isogeometric analysis methods for hyperbolic systems*, ENIT (Tunisia) / University of Nice - Sophia Antipolis, Oct. 2013, supervisors: R. Duvigneau and M. Moakher (ENIT).

PhD in progress: M. Sacher, *advanced methods for numerical optimization of yacht performance*, Ecole Navale, Oct. 2014, supervisors: R. Duvigneau, O. Le Maitre (LIMSI), F. Hauville and J.-A. Astolfi (Ecole Navale).

PhD in progress: C. Fiorini, *Sensitivity equation method for hyperbolic systems*, Univ. Versailles, Oct. 2014, supervisors: R. Duvigneau, C. Chalons (Univ. Versailles).

PhD in progress : Nicolas Laurent-Brouty (ENPC), *Macroscopic traffic flow models for pollution estimation and control*, September 2016. Supervisor: P. Goatin.

PhD in progress : Felisia Angela Chiarello (Université de Nice Sophia Antipolis), *Conservation laws with non- local flux*, October 2016. Supervisor: P. Goatin .

PhD in progress : Nikodem Dymski (Maria Curie Skłodowska University & Université de Nice Sophia Antipolis), *Conservation laws in the modeling of collective phenomena*, October 2016. Supervisors: P. Goatin and M.D. Rosini (UMCS).

PhD defended on November 2017: Boutheina Yahyaoui, *Validation of mecano-chemo-biological models for cell sheet wound closure*, Jan 2013, Supervisors: A. Habbal, Mekki Ayadi (LAMSIN, ENIT, Tunis)

### 8.2.3. Juries

- P. Goatin was member of the committee of P. Grandinetti's PhD thesis "*Control of large-scale traffic networks*", Université de Grenoble, September 11th, 2017.
- A. Habbal was member of the committee of F. Kpadonou *Optimisation de forme et anisotropie par une méthode isogéométrique-polaire*, Université de Versailles et Saint-Quentin, August 31, 2017.

## 8.3. Popularization

- J.-M. Loubes and P. Goatin, "*La prédiction dans les transports*", Les Big Data à découvert, CNRS Editions (2017), pp. 124-125.
- Press article: *Les mathématiciennes ont de plus en plus confiance*, La Tribune, May 2017. Portrait of P. Goatin by L.J. Baudu.
- P. Goatin gave the talk "*Le trafic routier en équations*" at Luxembourg University and at Lycée Aline Mayrisch du Luxembourg on October 5, 2017, as part of the conference cycle "*La Recherche au féminin*" organized by the French Institute of Luxembourg.
- Web Press articles : *On a Collision Course with Game Theory* about the Royal Society Proceedings paper [13] in <https://phys.org/news/2017-09-collision-game-theory.html> and in <http://www.sciencenewsline.com/news/2017092714240040.html>

## **CAGIRE Project-Team**

# **10. Dissemination**

## **10.1. Promoting Scientific Activities**

### ***10.1.1. Scientific Events Organisation***

#### *10.1.1.1. Member of the Organizing Committees*

- Member [RM] of the steering committee of the Special Interest Group “Turbulence Modelling” (SIG-15) of ERCOFTAC (European Research COmmittee for Flow, Turbulence and Combustion) that organizes a series of international workshops dedicated to cross-comparisons of the results of turbulence models and experimental/DNS databases.

### ***10.1.2. Scientific Events Selection***

#### *10.1.2.1. Member of the Conference Program Committees*

- Intl Symp. Turbulence, Heat and Mass Transfer [RM]
- Intl. Symp. Engineering Turbulence Modelling and Measurement [RM]
- ASME 2018 Fluids Engineering Division Summer Meeting (FEDSM) [RM]

#### *10.1.2.2. Reviewer*

This year, the team members have reviewed (3) contributions for the following conferences:

- ASME-GT Turbo Expo 2018 (Oslo, Norway) (1) [PB]
- FVCA 2017 (Lille, France) (1) [JJ]
- REEE 2017 (Fez, Morocco) (1) [PB]

### ***10.1.3. Journal***

#### *10.1.3.1. Member of the Editorial Boards*

- Visualization of Mechanical Processes [PB]
- Advisory Board of International Journal of Heat and Fluid Flow [RM]
- Advisory Board of Flow, Turbulence and Combustion [RM]

#### *10.1.3.2. Reviewer - Reviewing Activities*

During 2017, the team members reviewed (13) papers for the following journals:

- Combustion and Flame (3) [PB]
- Compte Rendus Mécanique (1) [PB]
- Energy and Buildings (1) [PB]
- International Journal of Fluid Mechanics Research (1) [PB]
- International Journal of Heat and Fluid Flow (2) [RM]
- Journal of Petroleum Science and Engineering (1) [PB]
- Mathematics and Computers in Simulation (1) [RM]
- Nuclear Eng Design (2) [RM]
- Physics of fluids (1) [RM]



#### 10.1.4. Research Administration

- Co-responsible of seventh day of welcoming new recruits at Institut Henri Poincaré on January [JJ]
- Co-responsible of the organisation of the LMAP seminar <sup>0</sup> [JJ]
- Member of the LMAP council [PB]
- Member of the IPRA scientific council [RM]

### 10.2. Teaching - Supervision - Juries

#### 10.2.1. Teaching

Master : "Maths 2: Data analysis", 68h25, M1 - Génie Pétrolier, Université de Pau et des Pays de l'Adour, Pau, France. [JJ]

Master : "Finite volume for hyperbolic systems and compressible fluid mechanics", 26h25, M2 - MMS, Université de Pau et des Pays de l'Adour, Pau, France. [JJ]

Master : "Finite volume for hyperbolic systems and compressible fluid mechanics", 24h75, M2 - MMS, Université de Pau et des Pays de l'Adour, Pau, France. [VP]

Master : "Turbulence modelling" (in English), 27h30, M2 - International Master program Turbulence, Université de Poitiers/Ecole centrale de Lille, France. [RM]

Eng. 3 : "Industrial codes for CFD" (in English), 12h30, 3rd year of engineering school (M2), ENSMA, Poitiers, France. [RM]

Eng. 3 : "Advanced physics-Turbulence modelling for CFD", 16h, 3rd year of engineering school (M2), ENSGTI, France. [RM]

#### 10.2.2. Supervision

PhD in progress: Gaetan Mangeon, "Modelisation avancée des transferts thermiques pour les configurations industrielles avec et sans prise en compte de la paroi solide", 2017 Supervisor: [RM].

PhD in progress: Saad Jamel, "Modélisation de la turbulence en régimes de convection mixte et naturelle dans un contexte automobile", 2017, Supervisor: [RM].

PhD, in progress: Al Hassan Afailal, "Simulation numérique tridimensionnelle de l'aérodynamique interne non réactive des moteurs à allumage commandé par une méthode hybride RANS/LES", 2017 Supervisor: [RM].

PhD, in progress: Vladimir Duffal, "Hybrid RANS/LES modelling for unsteady loadings in turbulent flows", 2017, Supervisor [RM]

#### 10.2.3. Juries

The participation in the following thesis juries is noted ("referee" in a French doctoral thesis jury is more or less equivalent to an external opponent in an Anglo-Saxon like PhD jury):

PhD: Océane Lambert «Solutions architecturées par fabrication additive pour le refroidissement de parois de chambres de combustion» Communauté Université Grenoble Alpes, France, 17 October 2017. Supervisors: R. Dendeviel - C. Davoine. [PB, referee]

### 10.3. Popularization

- «Forum des Métiers» organized by "Collège Pierre Emmanuel", Pau (64), France, 18 May 2017. A stand was manned during one day with the objective of explaining the activity of researcher to an audience of middle school students. [PB]

<sup>0</sup><http://lma-umr5142.univ-pau.fr/fr/activites-scientifiques/seminaires/seminaires-math-et-applications.html>

## CARDAMOM Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. Member of the Organizing Committees

- M. Colin: Modélisation et Analyse des phénomènes dispersifs, conférence en l'honneur de Jean-Claude Saut, 'ENSEIRB MATMECA, 21-27 November 2107, Bordeaux (<https://jc70.sciencesconf.org>)
- M. Colin : special session "Stability properties for nonlinear dispersive equations" at The Tenth IMACS International Conference, March 2017. (<http://waves2017.uga.edu/index.shtml>)
- M. Ricchiuto: HYWEC17 workshop, April 2017, Bilbao (<http://www.bcamaath.org/en/workshops/hywec2017>)

### 10.1.2. Scientific Events Selection

#### 10.1.2.1. Member of the Conference Program Committees

Mathieu Colin is a member of the scientific committee of The Tenth IMACS International Conference and of the JEF day's.

### 10.1.3. Journal

#### 10.1.3.1. Member of the Editorial Boards

- Mathieu Colin is a member of the board of the journal Applications and Applied Mathematics: An International Journal (AAM)
- P.M. Congedo is Editor of Mathematics and Computers in Simulation, MATCOM (Elsevier)
- Mario Ricchiuto is member of the editorial board of *Computers & Fluids* (Elsevier), and of *GEM - International Journal on Geomathematics* (Springer)
- A special issue of the European Journal of Mechanics / B Fluids will be dedicated to the 2 editions of the international workshop B'Waves on wave breaking, held in 2014 in Bordeaux (M. Colin and M. Ricchiuto as co-organizers), and in 2016 in Bergen (M. Ricchiuto as co-organizer). M. Colin and M. Ricchiuto will be guest editors of this issue

#### 10.1.3.2. Reviewer - Reviewing Activities

We reviewed papers for top international journals in the main scientific themes of the team : journal of Computational Physics, Computer Methods in Applied Mechanics and Engineering, Optimization and Engineering, International Journal of Numerical Methods in Fluids, Physics of Fluids, Journal of Marine Science and Technology, Engineering Applications of Computational Fluid Mechanics, Computers and Fluids, International Journal of Modelling and Simulation in Engineering Aircraft Engineering and Aerospace Technology, International Journal of Computational Fluid Dynamics, Applications and applied mathematics : An international journal, Discrete and Continuous Dynamical Systems - Series A, Electronic Journal of Differential Equations, Calculus of Variations and Partial Differential Equations, Nonlinear Analysis: Modelling and Control, Advanced Nonlinear Studies, Communications on Pure and Applied Analysis, Communications in Computational Physics, Nonlinearity, Applications and Applied Mathematics: An International Journal, Journal of Differential Equations, Analysis and Mathematical Physics.

#### 10.1.4. Invited Talks

- Luc Mieussens has been invited to give a talk [35] in the SIAM Conference on Analysis of Partial Differential Equations, Dec 2017, Baltimore, United States.
- M. Ricchiuto has been plenary speaker at the conferences NUMHYP17 in Switzerland (<http://www.math.uzh.ch/nmhp17/index.php?id=speakers>), and at the conference Numerical Methods for Shallow Water Equations and Related Models, held in Shenzhen in December 2017 (<http://math.sustc.edu.cn/event/10593.html?lang=en>).
- P.M. Congedo has been plenary speaker at the conference SimHydro, in June 2017, Nice.

#### 10.1.5. Research Administration

Luc Mieussens is the new director of the "Mesocentre de Calcul Intensif en Aquitaine", started in September, and he has been scientific Advisor for the French Atomic Energy Agency (CEA) for the third year.

### 10.2. Teaching - Supervision - Juries

#### 10.2.1. Teaching

Doctorat: P.M. Congedo, Introduction to Uncertainty Quantification, 26h, Doctorate School of Politecnico di Milano, Italie.

Master : H  lo  se Beaugendre, Calcul Haute Performance (OpenMP-MPI), 40h, M1, ENSEIRB-MATM  CA et Universit   de Bordeaux, France

Master : H  lo  se Beaugendre, Responsable de fili  re de 3  me ann  e, 15h, M2, ENSEIRB-MATM  CA, France

Master : H  lo  se Beaugendre, Calcul parall  le (MPI), 39h, M2, ENSEIRB-MATM  CA, France

Master : H  lo  se Beaugendre, Encadrement de projets de la fili  re Calcul Haute Performance, 10h, M2, ENSEIRB-MATM  CA, France

Master : H  lo  se Beaugendre, Encadrement de projets sur la mod  lisation de la pyrolyse, 20h, M1, ENSEIRB-MATM  CA, France

Master : H  lo  se Beaugendre, Projet fin d'  tudes, 4h, M2, ENSEIRB-MATM  CA, FRANCE

Master : Mathieu Colin : Integration, M1, 54h, ENSEIRB-MATM  CA, FRANCE

Master : Mathieu Colin : Fortran 90, M1, 44h, ENSEIRB-MATM  CA, FRANCE

Master : Mathieu Colin : PDE, M1, 28h, University of Bordeaux, FRANCE

Master : Mathieu Colin : Analysis, L1, 47h, ENSEIRB-MATM  CA, FRANCE

Master : Mathieu Colin : projet professionnel and internship responsibility : 15 h, ENSEIRB-MATM  CA, FRANCE

Master : Mathieu Colin : Encadrement de projets TER, 20h, ENSEIRB-MATM  CA, FRANCE

Master : C  cile Dobrzynski, Encadrement de projets TER, 20h, ENSEIRB-MATM  CA, FRANCE

#### 10.2.2. Supervision

PhD : Arpaia Luca, Continuous mesh deformation and coupling with uncertainty quantification for coastal inundation problems, defended in September 2017.

PhD: Peluchon Simon, Approximation num  rique et mod  lisation de l'ablation diff  rentielle de deux mat  riaux: application    l'ablation liquide. Advisor: Luc Mieussens. PhD hosted in CEA-CESTA. Defended in November 2017.

PhD in progress : Bosi, Umberto, ALE spectral element Boussinesq modelling of wave energy converters, started in November 2015.

PhD in progress : Cortesi Andrea, Predictive numerical simulation for rebuilding freestream conditions in atmospheric entry flows, started in October 2014.

PhD in progress: Lin Xi, Asymptotic modelling of incompressible reactive flows in self-healing composites, started in October 2014.

PhD in progress: Aurore Fallourd, Modeling and Simulation of inflight de-icing systems, Started in October 2016.

PhD in progress: Guillaume Jeanmasson, Explicit methods with local time stepping for the simulation of unsteady turbulent flows. Started in October 2016. Advisor: Luc Mieussens. Hosted in ONERA Châtillon.

PhD in progress: Francois Sanson, Uncertainty propagation in a system of codes, started in February 2016.

PhD in progress: Nassim Razaaly, Robust optimization of ORC systems, started in February 2016.

PhD in progress: Mickael Rivier, Optimization under uncertainties of complex systems, started in May 2017.

### **10.2.3. Juries**

- Luc Mieussens has been referee and member of a jury for the PhD of M. Abdelmalik, defended in TU Eindhoven (Netherlands) in May 2017;
- Héloïse Beagendre has been referee and member of a jury for the PhD of E. Itam (Montpellier University in November 2017), and referee and member of a jury for the PhD of C. Bayeux (ONERA Toulouse, in December 2017);
- Mathieu Colin has been referee and member of a jury for the PhD of Tianxiang Gou, defended in Université de Franche-Comté in October 2017
- Mario Ricchiuto has been referee and member of the jury of the HDR of J. Harris (U. Paris-Est, November 2017), member of the PhD jury of M. Legal (Paris-Est, February 2017), and president of the juries of J. Deborde (U. de Bordeaux, June 2017), and S. Pelouchon (U. de Bordeaux, November 2017);

## DEFI Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. Member of the Organizing Committees

- G. Allaire is a member of the "comité national" CNRS, section 41 (mathematics). He is a member of the board of the Gaspard Monge program on optimization (PGMO) at the Jacques Hadamard Mathematical Foundation. He is a board member of Institut Henri Poincaré (IHP). He is the chairman of the scientific council of IFPEN (French Petroleum Institute and New Energies).
- L. Chesnel co-organized the Journée de rentrée (2017) of the Centre de Mathématiques Appliquées of École Polytechnique
- L. Chesnel co-organize the seminar of the Centre de Mathématiques Appliquées of École Polytechnique and the joint seminar of the Inria teams Defi-M3DISIM-Poems.
- H. Haddar Co-organized of the third Franco-German Summer School "Inverse Problems and Imaging", University of Bremen, September 18-22, 2017
- DEFI was a sponsor of the conference "Waves diffracted by Patrick Joly", Paris, 2017.
- J.R. Li is organizer of Ecole d'été d'excellence for Chinese Master's students funded by French Embassy in China, 2017.
- J.R. Li is member of Organizing Committee of SIAM Conference on Computational Science and Engineering, 2017

#### 9.1.2. Scientific Events Selection

##### 9.1.2.1. Member of the Conference Program Committees

- J.R. Li is member of the SIAM Committee on Programs and Conferences 2017-2019
- J.R. Li is responsable for the Ecole Polytechnique part of the French-Vietnam Master Program in Applied Mathematics, 2017
- J.R. Li is reviewer for Millennium Science Initiative, a program of the Government of Chile, 2017.
- H. Haddar is member of the scientific committees of the conferences series TAMTAM, Picof and Waves

#### 9.1.3. Journal

##### 9.1.3.1. Member of the Editorial Boards

- G. Allaire is member of the editorial board of
  - book series "Mathématiques et Applications" of SMAI and Springer,
  - ESAIM/COCV, Structural and Multidisciplinary Optimization,
  - Discrete and Continuous Dynamical Systems Series B,
  - Computational and Applied Mathematics,
  - Mathematical Models and Methods in Applied Sciences (M3AS),
  - Annali dell'Università di Ferrara,
  - OGST (Oil and Gas Science and Technology),
  - Journal de l'Ecole Polytechnique - Mathématiques,
  - Journal of Optimization Theory and Applications.

- H. Haddar is
  - member the editorial advisory board of Inverse Problems
  - Associate Editor of the SIAM Journal on Scientific Computing
  - Guest editor of Computers and Mathematics with Applications for a special issue on "Numerical Methods for PDEs and Inverse Problems"

#### 9.1.3.2. Reviewer - Reviewing Activities

The members of the team reviewed numerous papers for numerous international journals. Too many to make a list.

#### 9.1.4. Invited Talks

- G. Allaire
  - "GAMM-Seminar on Microstructures", Dortmund (January 2017).
  - Workshop on "Shape, Images and Optimization", Münster (March 2017).
  - Interaction of Applied Mathematics and Mechanics Conference, IAMMC2017, Paris (May 2017).
  - Congrès CSMA, Giens (May 2017).
  - New trends in shape optimization, Vosges (May 2017).
  - WCSMO, Braunschweig (June 2017).
  - CEDYA, Cartagena (June 2017).
  - Waves diffracted by Patrick Joly, Gif-sur-Yvette (August 2017).
  - SIM-AM ECCOMAS conference, München (October 2017).
- L. Chesnel
  - Workshop Inverse plasmonic problems-Neumann Poincaré operator, Université de Grenoble-Alpes, November 2017.
  - Séminaire EDP, modélisation et calcul scientifique, UMPA, ENS Lyon, November 2017.
  - Séminaire EDP, analyse et applications, Université de Lorraine, Metz, November 2017.
  - Séminaire EDP/Physique mathématique, Université de Bordeaux, September 2017.
  - Waves diffracted by Patrick Joly, Gif-sur-Yvette, August 2017.
- H. Haddar
  - TamTam'17, Hammamet, Tunisia, May 2017, Minisymposium, Inverse and imaging problems for PDE with applications
  - Oberwolfach Workshop Computational Inverse Problems for Partial Differential Equations, Oberwolfach, May 2017.
  - Workshop on the occasion of the 75th birthday of Rainer Kress, Goettingen, May 2017
  - Applied Inverse Problems, Hangzhou, May 2017
    - \* Minisymposium on Inverse Spectral Problems
    - \* Minisymposium on Stability and reconstruction in inverse problems and their applications
    - \* Minisymposium on Recent Developments on Computation of Transmission Eigenvalues with Applications
  - Workshop on nonlinear analysis : Recent advances and new trends, Monastir, July 2017
  - Quantitative Tomographic Imaging : Radon meets Bell and Maxwell, RICAM, Linz, July 2017
  - Waves diffracted by Patrick Joly, Gif-sur-Yvette, August 2017.

- Colloquium of the mathematical department, Mainz University, October 2017.

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Teaching

- Master : Grégoire Allaire, Approximation Numérique et Optimisation, for students in the second year of Ecole Polytechnique curriculum: 8 lessons of 1h30.
- Master : Houssem Haddar, Approximation Numérique et Optimisation, for students in the second year of Ecole Polytechnique curriculum: 8 TDs of 4h.
- Master : Houssem Haddar, Variational analysis of partial differential equations, for students in the second year of Ecole Polytechnique curriculum: 8 TDs of 4h.
- Master : Lucas Chesnel, “Variational analysis for partial differential equations”, 16 equivalent TD hours, second year (2A), École Polytechnique, Palaiseau, France
- Master : Lucas Chesnel, “Numerical approximation and optimisation”, 14 equivalent TD hours, second year (2A), École Polytechnique, Palaiseau, France
- Master : Lucas Chesnel, “Elementary tools of analysis for partial differential equations”, 25 equivalent TD hours, L3, Ensta ParisTech, Palaiseau, France
- Master : Grégoire Allaire, Optimal design of structures, for students in the third year of Ecole Polytechnique curriculum. 9 lessons of 1h30.
- Master : Grégoire Allaire, Theoretical and numerical analysis of hyperbolic systems of conservation laws, Master M2 “mathematical modeling”, 8 lessons of 3h.
- Master : Jing Rebecca Li, Mathematical and numerical foundations of modeling and simulation using partial differential equations. French-Vietnam Master Program in Applied Mathematics.
- Doctorat : Houssem Haddar, Lecturer at the Summer School on Quantitative Tomographic Imaging : Radon meets Bell and Maxwell. (2x1h30) July 10-14, RICAM, Linz, 2017.

### 9.2.2. Supervision

- Ph.D. : M. Lakhal, Méthodes d’inversion pour la reconstruction de mines enfouies à partir de mesures d’antennes radar, June 2017, H. Haddar
- Ph.D. : T.P. Nguyen, Direct and inverse solvers for scattering problems from locally perturbed infinite periodic layers, January 2017, H. Haddar
- Ph.D. : K. Van Nguyen, Modeling, simulation and experimental verification of water diffusion in neuronal network of the Aplysia ganglia, March 2017, J.-R. Li and L. Ciobanu
- Ph.D. in progress: B. Charfi, Identification of the singular support of a GIBC, 2014, H. Haddar and S. Chaabane
- PhD in progress : A. Talpaert, the direct numerical simulation of vapor bubbles at low Mach number with adaptative mesh refinement, 2013, G. Allaire and S. Dellacherie
- PhD in progress : A. Bissuel, linearized Navier Stokes equations for optimization, floating and aeroacoustic, 2014, G. Allaire
- PhD in progress : P. Geoffroy on topology optimization by the homogenization method in the context of additive manufacturing (Safran Tech, to be defended in 2019), G. Allaire.
- PhD in progress : S. Houbar sur la cavitation dans le fluide caloporteur induite par les mouvements des assemblages d’un réacteur (CEA, to be defended in 2020), G. Allaire and G. Campioni
- PhD in progress : M. Boissier sur l’optimisation couplée de la topologie des formes et de la trajectoire de lasage en fabrication additive (to be defended in 2020). G. Allaire and Ch. Tournier.
- PhD in progress : L. Rakotondrainibe sur l’optimisation des liaisons entre pièces dans les systèmes mécaniques (to be defended in 2020), G. Allaire.

- PhD in progress : F. Feppon sur l'optimisation topologique de systèmes couplés fluide-solide-thermique (Safran, to be defended in 2020), G. allaire and Ch. Dapogny.
- PhD in progress : Q. Feng sur les éléments finis multi-échelles pour Navier Stokes incompressible en milieu encombré (CEA, to be defended in 2019), G. Allaire and A. Cartalade.
- PhD in progress : K. Napal, Transmission eigenvalues and non destructive testing of concrete like materials , 2016, L. Chesnel H. Haddar and L. Audibert
- PhD in progress : M. Kchaou, Higher order homogenization tensors for DMRI modeling, 2016, H. Haddar, J.R Li and M. Moakher
- PhD in progress : H. Girardon, Non destructive testing of PWR tubes using eddy current rotating coils, 2017, H. Haddar and L. Audibert
- PhD in progress : J. Hao, Thesis topic: Algorithm and software development for analysis and classification of EEG measurements during administration of neuropsychological tests for AD/HD, 2017, J.R. Li and H. Rahioui.



## ECUADOR Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific events organisation

##### 9.1.1.1. Member of the organizing committees

- Laurent Hascoët was the local organizer, and one of the speakers/teachers during the 2-days training of the Marie Curie FP7 programme “IODA” on Algorithmic Differentiation, <http://ioda.sems.qmul.ac.uk/events/nice2017>, february 13-14.
- Laurent Hascoët is on the organizing committee of the EuroAD Workshops on Algorithmic Differentiation. This year, the team organized the 20th EuroAD workshop at Inria Sophia-Antipolis, <http://www.autodiff.org/?module=Workshops&submenu=EuroAD/20/main>, february 16-17.
- Alain Dervieux organized two workshops for the ANR project MAIDESC, on may 11th and november 16th.

### 9.2. Teaching - Supervision - Juries

#### 9.2.1. Teaching

Master : Laurent Hascoët, Optimisation avancée, 15 h, M2, University of Nice

#### 9.2.2. Supervision

PhD : Ala Taftaf, “Extensions of Algorithmic Differentiation by Source Transformation to meet some needs of Scientific Computing”, defended january 17, advisor L. Hascoët

PhD in progress : Éléonore Gauci, “Norm-oriented criteria for CFD and coupled CSM-CFD systems”, started october 2014, advisor A. Dervieux

PhD : Emmanuelle Itam, “Simulation numérique d’écoulements autour de corps non profilés par des modèles de turbulence hybrides et un schéma multi-rate”, defended november 30, co-advisor A. Dervieux

#### 9.2.3. Juries

- Stephen Wornom, jury, PhD defense of Emmanuelle Itam, Université Montpellier II, november 30.

**GAMMA3 Project-Team (section vide)**

## IPSO Project-Team

## 6. Dissemination

### 6.1. Promoting Scientific Activities

#### 6.1.1. Scientific Events Organisation

##### 6.1.1.1. Member of the Organizing Committees

- F. Castella organized the workshop "Multiscale numerical methods", Saint-Malo, december 13-15 2017. [15 participants]
- N. Crouseilles co-organized the weekly seminar "Mathematic and applications", ENS Rennes.
- N. Crouseilles co-organized the Nantes-Rennes meeting at the university of Nantes, january 19 2017. [50 participants]
- N. Crouseilles organized the IPL FRATRES meeting at Inria Rennes, november 27-28 2017. [30 participants]
- N. Crouseilles and M. Lemou co-organized (with C. Cheverry and K. Pravda-Starov) the international workshop "Analysis of transport equations: Vlasov and related models", Rennes, may 16-19 2017. [50 participants]
- E. Faou organizes a work-group on "Mathematics of deep learning" (Inria, IRMAR and Technicolor), Rennes, France.
- E. Faou organized the mini-symposium "Methods for the nonlinear Schrödinger equations, solitary waves and discrete patterns", with T. Matsuo (University of Tokyo), at the Scicade international conference, Bath (UK), september 11-15 2017.
- E. Faou co-organized the conference ANSIVAL on the occasion of the 60th birthday of M. Dauge (IRMAR), Rennes, France, february 8-10 2017. [70 participants]

#### 6.1.2. Journal

##### 6.1.2.1. Member of the Editorial Boards

- P. Chartier is associate editor of M2AN (2007-).
- A. Debussche is editor in chief of Stochastic Partial Differential Equations: analysis and computations (2013-).
- A. Debussche is associate editor of Differential and Integral Equations (2002-).
- A. Debussche is associate editor of Potential Analysis (2011-).
- A. Debussche is associate editor of ESAIM:PROC (2012-).
- A. Debussche is associate editor of Journal of Evolution Equation (2014-).
- A. Debussche is associate editor of Applied Mathematics & Optimization (2014-).
- A. Debussche is associate editor of SIAM JUQ (2017-).
- A. Debussche is member of the editorial board of the collection "Mathématiques & Applications de la SMAI", Springer.

##### 6.1.2.2. Reviewer - Reviewing Activities

The members of the IPSO team are reviewers for almost all the journals in which they publish.

### 6.1.3. Invited Talks

#### National conferences

- A. Crestetto gave talk at Congrès SMAI 2017, La Tremblade, june 5-9 2017.
- The members of the team gave several seminars in french institutions (Marseille, Cergy, Toulouse, Nancy, CEA Cadarache, ...).

#### International conferences

- P. Chartier was invited speaker at FoCM 2017, workshop on "Geometric Integration and Computational Mechanics" (july 10-12), Barcelona, Spain.
- P. Chartier was invited speaker at "Mathematical and Computational Methods for Quantum and Kinetic Problems", (june 12-14), Beijing, China.
- P. Chartier was invited speaker at "Kinema 2017: Numerical Modelling of Kinetic Magnetized Plasmas", spring school, Institut d'études scientifiques de Cargèse, (april 3-7), Cargèse, France.
- A. Crestetto gave talk at the workshop "NumKin 2017" (october 23-27), IPP Garching, Germany.
- A. Crestetto gave a talk at the Oberseminar (july 11), Würzburg, Germany.
- N. Crouseilles gave a talk at the workshop on "Mathematical and Computational methods for Quantum and Kinetic Problems, (june 12-14), Beijing, China.
- A. Debussche gave a talk at "Stochastic PDEs: Analysis and Computation", (march 27-31), Warwick, England.
- A. Debussche gave a talk at "Probabilistic Perspectives in Nonlinear PDEs", (june 5-9), International Centre for Mathematical Sciences (ICMS), Edinburgh, Scotland.
- A. Debussche gave a talk at FoCM2017, workshop on "Stochastic Computation", (july 10-12), Barcelona, Spain.
- A. Debussche gave a talk at "2017 Fields Medal Symposium", (october 16-19), Toronto, Canada.
- E. Faou gave a talk at the mini-symposium "Modelling, theory and approximation of nonlinear waves", Scicade international conference, (september 11-15), University of Bath, UK.
- E. Faou gave a talk at the conference "Asymptotic analysis of evolution equations", (july 3-7), CIRM, Marseille.
- E. Faou gave a talk at the seminar at the University of Cambridge, (june 2017), UK.
- E. Faou gave a talk at the workshop "Mathematical questions in wave turbulence theory", (may 15-19), San Jose, California.
- E. Faou gave a talk at the workshop "Modern Numerical Methods for Quantum Mechanics", (march 20-22) Polish Academy of sciences, Warsaw, Poland.
- M. Lemou gave a talk at International workshop "Geometric Transport Equations in General Relativity", (february 20-24), ESI, Vienna, Austria.
- M. Lemou gave a course in the summer school "Applied and Stochastic Analysis for Partial Differential Equations". Institute of Natural Science, Shanghai Jiao Tong University, (july 12-22), Shanghai, China.
- M. Lemou gave a talk at WPI workshop on "Quantum Dynamics and Uncertainty Quantification", (june 20-25), Vienna, Austria,
- M. Lemou gave a talk at the workshop on "Mathematical and Computational methods for Quantum and Kinetic Problems, (june 12-14), Beijing, China.
- M. Lemou gave a course at "Kinema 2017: Numerical Modelling of Kinetic Magnetized Plasmas", spring school, Institut d'études scientifiques de Cargèse, (april 3-7), Cargèse, France.
- M. Lemou gave a talk at the workshop on "Kinetic Theory and Fluid Mechanics : theoretical and computational aspects", (november 6-10), Toulouse, France.

- F. Méhats gave a talk at SIAM Conference on "Analysis of Partial Differential Equations", (december 10-12), Baltimore, USA.
- F. Méhats gave a talk at the workshop on "Mathematical and Computational methods for Quantum and Kinetic Problems, (june 12-14), Beijing, China.
- F. Méhats gave a talk at the conference "Advances in Mathematics for Technology", (october 9-11) Catania, Italy.

#### 6.1.4. Scientific Expertise

- P. Chartier is member of the promotion committees DR1 and DR0 Inria.
- N. Crouseilles was reviewer for ANR project.
- A. Debussche participated to the report projet EUR Centre Henri Lebesgue.
- A. Debussche was reviewer for ERC projects, "Philip Leverhulme" (GB) fundation, Austrian Science Foundation.
- A. Debussche was president of the visiting committee HCERES of the Centre d'Analyses et de Mathématique Sociales (Paris, EHESS).

#### 6.1.5. Research Administration

- P. Chartier is scientific vice-deputy of the Inria Rennes center.
- P. Chartier is member of the Inria evaluation committee.
- P. Chartier is member of the Inria Scientific Committee (COSI).
- P. Chartier is member of the Bureau du Comité des Projets (BCP).
- A. Crestetto is member of the mathematic department council of the university of Nantes.
- A. Crestetto is member of the scientific council of "UFR Sciences et Techniques" of the university of Nantes.
- N. Crouseilles is member of the scientific council of ENS Rennes.
- N. Crouseilles is member of the mathematic laboratory (IRMAR) council.
- N. Crouseilles is member of the Fédération de Fusion council (University of Rennes representative).
- A. Debussche is member of the scientific council of the Fédération Denis Poisson.
- A. Debussche is member of the administrative council of ENS Paris-Saclay.
- A. Debussche is scientific vice-deputy and international relations of ENS Rennes.
- A. Debussche is vice-head of the Centre Henri Lebesgue.
- A. Debussche is vice-head of the Lebesgue agency for Mathematic and Innovation.
- E. Faou is member of the scientific council of the Pôle Universitaire Léonard de Vinci.
- E. Faou is member of the CNU section 26.
- E. Faou is head of organization of the semester *scientific computing* sponsored by the Labex Lebesgue (2 international summer schools, 7 workshops and international conferences).
- M. Lemou is member of the scientific council of the Center Henri Lebesgue.
- M. Lemou is member of the scientific council of ENS Rennes.
- M. Lemou is the head of the numerical analysis team of IRMAR laboratory. [46 members].
- F. Méhats was head of the mathematic laboratory IRMAR (2015-2017). [250 members].

## 6.2. Teaching - Supervision - Juries

### 6.2.1. Teaching

- Master : F. Castella, "Equations de transport et Phenomenes de Propagation", 48h, M1, university of Rennes 1, France.

- Master : F. Castella, "Analyse Numerique Generale", 48h, M1, university of Rennes 1, France.
- Master : P. Chartier, "Semi-lagrangian methods for Vlasov-Poisson equations", 18h, M2, university of Rennes 1, France.
- Master : A. Crestetto, "Méthodes numériques pour les fluides incompressibles", 64h, M2, university of Nantes, France.
- Master : A. Crestetto, "Compléments de modélisation pour l'agrégation", 26h, M2, university of Nantes, France.
- Master : N. Crouseilles, "Analyse numérique", 30h, M1, ENS Rennes, France.
- Master : A. Debussche, "Distribution et analyse fonctionnelle", 30h, M1, ENS Rennes, France.
- Master : A. Debussche, "Introduction aux EDP Stochastiques", 48h, M2, university of Rennes 1, France.
- Master : A. Debussche, "Compléments pour l'agrégation", 26h, M2, ENS Rennes, France.
- Master : M. Lemou, "Equations aux dérivées partielles elliptiques", 30h, M1, ENS de Rennes.
- Master : F. Méhats, "Equations hyperboliques", 30h, M2, university of Rennes 1, France.

### 6.2.2. Supervision

- PhD : R. Horsin, Comportement en temps long d'équations de type Vlasov: Etudes mathématiques et numériques, university of Rennes 1, december 1st 2017, E. Faou and F. Rousset (university Paris Sud).
- PhD : V. Doli, Phénomènes de propagation de champignons parasites de plantes, par couplage de diffusion spatiale et de reproduction sexuée, december 23th 2017, F. Castella and F. Hamelin (IGEPP, Agrocampus).
- PhD in progress : M. Malo, Equations cinétiques non collisionnelles : stabilité, oscillations, september 2015, M. Lemou and F. Méhats.
- PhD in progress : J. Bernier, Mathematical and numerical analysis of nonlinear transport equations, (2016-), september 2016, N. Crouseilles and E. Faou.
- PhD in progress : M. Tusseau, Sur l'équation de Schrödinger non linéaire hautement oscillante avec potentiel aléatoire, september 2013, A. Debussche and F. Méhats.
- PhD in progress : M. Jugal Nguepedja Nankep, Modèles spatiaux stochastiques de systèmes multi-échelle de particules en interactions, september 2014, A. Debussche.
- PhD in progress : A. Rosello, Approximation-diffusion pour des équations cinétiques pour les modèles de type "spray", september 2017, A. Debussche.

### 6.2.3. Juries

- A. Crestetto was member of the jury of the thesis of T. Blanc, "Etude mathématique de problèmes paraboliques fortement anisotropes", Marseille, december 4th 2017.
- N. Crouseilles was member of the jury of the thesis of A. Finot, "Analyse mathématique des modèles cinétiques en présence d'un champ magnétique intense", Marseille, january 26th 2017.
- N. Crouseilles was member of the jury of the thesis of T. Hardy, "Traitement des conditions aux limites spéculaires pour l'étude du transfert radiatif dans des matériaux à géométrie complexe", Nantes, january 31th 2017.
- E. Faou was member of the jury of the thesis of S. Dieckmann, "Dynamics of patterns in equivariant Hamiltonian partial differential equations", Bielefeld (Germany), april 2017.
- E. Faou was member of the jury of the thesis of P. Krämer, "Numerical integrators for Maxwell-Klein-Gordon and Maxwell-Dirac systems in highly to slowly oscillatory regimes", Karlsruhe (Germany), august 2017.
- M. Lemou was member of the jury of the thesis of R. Horsin Blanc, "Comportement en temps long d'équations de type Vlasov: Etudes mathématiques et numériques", Rennes, december 1st 2017.
- M. Lemou was member of the jury (reviewer) of the thesis of T. Blanc, "Etude mathématique de problèmes paraboliques fortement anisotropes", Marseille, december 4th 2017.
- F. Méhats was member of the jury of the thesis of A. Finot, "Analyse mathématique des modèles cinétiques en présence d'un champ magnétique intense", Marseille, january 26th 2017.

## MATHERIALS Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

E. Cancès

- is the director of CERMICS, the Applied Mathematics department at École des Ponts,
- is a member of the editorial boards of Mathematical Modelling and Numerical Analysis (2006-), SIAM Journal of Scientific Computing (2008-), Communications in Mathematical Sciences (2011-), SIAM Multiscale Modeling and Simulation (2012-), and the Journal of Computational Mathematics (2017-),
- was a member of the executive committee of the CEA-EDF-Inria schools in applied mathematics and computer science (2010-July 2017),
- is co-organizing the IMA Long Program on Multiscale Mathematics and Computing in Science and Engineering, 2017-2018.

V. Ehrlacher

- is a member of the “Conseil d’Enseignement et de Recherche” of Ecole des Ponts,
- has co-organized the Oberwolfach workshop on “Applications of Optimal Transportation in the Natural Sciences”, January 2017 (with J.-D. Benamou and D. Matthes),
- has co-organized a minisymposium on “Numerical methods for electronic structure calculations” at the SIAM CSE conference, February 2017 (with B. Stamm, L. Lin and C. Yang),
- has co-organized the IPAM workshop on “Uncertainty Quantification for Stochastic Systems and Applications”, November 2017 (with M. Katsoulakis, T. Lelièvre, P. Plechac, A. Stuart and D. Trinkle).

G. Ferré and J. Roussel co-organize the working group J-PSI (Jeunes chercheurs en physique statistique et interactions) at IHP, which aims at stimulating interactions between PhD students and post-docs coming from different institutions in Paris and working on the analysis of models in statistical physics.

C. Le Bris is editor-in-chief of Applied Mathematics Research Express (2003-2017). He is a managing editor of Networks and Heterogeneous Media. He is a member of the editorial boards of Annales mathématiques du Québec (2013-), Archive for Rational Mechanics and Analysis (2004-), COCV (Control, Optimization and Calculus of Variations) (2003-), Mathematics in Action (2008-), Nonlinearity (2005-) and Journal de Mathématiques Pures et Appliquées (2009-).

He is a member of the editorial boards of the monograph series Mathématiques & Applications, Series, Springer (2008-), Modelling, Simulations and Applications, Series, Springer (2009-), Springer Monographs in Mathematics, Springer (2016-).

He is a member of

- the Cabinet of the High Commissioner for Atomic Energy,
- the “Comité d’experts” for the Fondation de Recherche pour l’Aéronautique et l’Espace,
- the “International Scientific Advisory Committee” of the Centre de Recherche Mathématique, Université de Montréal,
- the “Advisory Board” of the DFG Cluster of Excellence Engineering of Advanced Materials, Erlangen,
- the “International Scientific Advisory Board” of the DFG research center Matheon, Berlin,
- the “Conseil scientifique de la SMAI” (Scientific Council of the French Applied Maths Society),
- the International Mathematical Union Circle.

He is the president of the strategic committee of the Institut des Sciences du calcul et des données, Sorbonne Universités.

He has held a regular position of Visiting Professor at the University of Chicago.

F. Legoll is a member of the editorial board of SIAM MMS (2012-) and of ESAIM: Proceedings and Surveys (2012-).

T. Lelièvre

- is editor-in-chief of ESAIM: Proceedings and Surveys (with D. Chafai, C. Imbert and P. Lafitte),
- is a member of the “Conseil d’Administration” of SMAI and École des Ponts,
- has co-organized the Journées EDP-Probab at Institut Henri Poincaré (with F. Malrieu),
- has co-organized the IPAM Long Program on “Complex High-Dimensional Energy Landscapes”, September 11th - December 15th 2017 (with C. Clementi, G. Henkelman, R. Hennig, M. Luskin, N. Marom, P. Plechac and C. Schuette),
- has co-organized the ICTS program on “Large deviation theory in statistical physics: Recent advances and future challenges”, August 14th - October 13th 2017 (with A. Ayyer, F. den Hollander, A. Dhar, J.P. Garrahan, C. Jarzynski, M. Krishnapur, S. Sabhapandit and H. Touchette),
- has co-organized with Florent Malrieu and Pierre-André Zitt the workshop “Piecewise Deterministic Markov Processes and sampling”, January 25-27th, 2017,
- has co-organized with C. Chipot and G. Stoltz the “Rencontre Math-Industrie simulation moléculaire dans l’industrie pharmaceutique”, at IHP on 28th April 2017,
- has co-organized with A. Jentzen the Stochastic Computation Workshop at FoCM 2017, Barcelona, July 10th-12th, 2017.

G. Stoltz

- is a member of the scientific council of UNIT (Université Numérique Ingénierie et Technologie),
- has co-organized the IHP trimester “Stochastic Dynamics Out of Equilibrium”, Spring 2017 (with G. Giacomini, S. Olla, E. Saada and H. Spohn).

## 10.2. Teaching - Supervision - Juries

The members of the project-team have taught the following courses:

- Licence: Outils mathématiques pour l’ingénieur, 15h, L3, École des Ponts (E. Cancès, V. Ehrlacher, M. Josien, F. Legoll, T. Lelièvre),
- Licence: Analyse et calcul scientifique, 30h, L3, École des Ponts (G. Ferré, A. Levitt, M. Josien, G. Stoltz),
- Licence: Projet de 1ère Année, 6h, L3, École des Ponts (J. Roussel, P. Terrier),
- Licence: Mathématiques, 36h, L1, Université Paris Dauphine (G. Ferré, J. Roussel),
- Licence: Optimisation, 15h, L3, École des Ponts (A. Levitt),
- Licence: Équations aux dérivées partielles et éléments finis, 15h, L3, École des Ponts (F. Legoll, A. Levitt),
- Licence: Méthodes numériques pour les problèmes en grande dimension, 17h30, L3, École des Ponts (V. Ehrlacher, S. Boyaval),
- Licence: Maths 1 et 2, 9h, L3, École des Mines (G. Stoltz),
- Licence: méthodes pour la grande dimension, L3, École des Ponts (V. Ehrlacher 10h, S. Boyaval 5h),
- Licence: hydraulique numérique, 15h, L3, École des Ponts (S. Boyaval),
- Master: Modéliser Programmer Simuler, 28 h, M1, École des Ponts (T. Lelièvre),



- Master: Analyse variationnelle des équations aux dérivées partielles, 32h, École Polytechnique (T. Lelièvre),
- Master: Aléatoire, 32h, École Polytechnique (T. Lelièvre),
- Master: Simulation moléculaire, 6h, UVSQ (T. Lelièvre, G. Stoltz),
- Master: Analyse de Fourier, 15h, M1, École des Ponts (V. Ehrlacher, A. Levitt, G. Stoltz),
- Master: Partial differential equations, 21h, M1, École des Ponts (E. Cancès),
- Master: Control of dynamical systems, 16h, M1, École Polytechnique (E. Cancès),
- Master: Projet du département IMI, 12h, M1, École des Ponts (J. Roussel, G. Ferré),
- Master: Analyse spectrale et application aux Équations aux dérivées partielles, 36h, M1, École des Ponts (F. Legoll, V. Ehrlacher),
- Master: Spectral theory and variational methods, 10h, M2, UPMC (E. Cancès),
- Master: Méthodes de quantification des incertitudes en ingénierie, 18h, M2, École des Ponts (V. Ehrlacher),
- Master: Simulation moléculaire en sciences des matériaux, 6h, M1, École des Ponts (V. Ehrlacher),
- Master: Introduction to computational statistical physics, 20h, M2, UPMC (G. Stoltz),
- Master: Méthodes numériques probabilistes, 36 h, M2, UPMC (T. Lelièvre),
- Master: Problèmes multiéchelles, aspects théoriques et numériques, 20h, M2, UPMC (F. Legoll).

The following Habilitation thesis has been defended in the group at École des Ponts:

- Sébastien Boyaval, Topics in the numerical modelling of flows, Université Paris-Est, defended on December 21 2017.

The following PhD theses have been defended in the group at École des Ponts:

- Athmane Bakhta, Modélisation and simulation for photovoltaic applications, Université Paris-Est, École des Ponts, defended on December 19th, 2017, supervised by E. Cancès and T. Lelièvre, co-supervised by V. Ehrlacher,
- G r me Faure, Multiscale methods for the simulation of shock and detonation waves, Universit  Paris-Est,  cole des Ponts and CEA/DAM, defended on November 29th 2017, supervised by G. Stoltz and J.-B. Maillet (CEA/DAM),
- Alessandra Iacobucci, Nonequilibrium steady-states of rotor and oscillator chains, defended on October 20th 2017, University Paris Dauphine, supervised by S. Olla (Dauphine) and G. Stoltz,
- Henri Louvin, Development of adaptive variance reduction methods for Monte Carlo particle transport, Ecole Doctorale PHENIICS, defended on October 12th, supervised by Check Diop (CEA) and T. Leli vre,
- Boris Nectoux, Spectral analysis and semi-classical analysis for metastability in molecular dynamics, Universit  Paris-Est,  cole des Ponts, defended on November 20th, supervised by T. Leli vre and E. Canc s.

The following PhD theses are ongoing in the group at  cole des Ponts:

- Amina Benaceur, Th se CIFRE EDF, started January 1st, 2016, supervised by A. Ern, co-supervised by V. Ehrlacher, in collaboration with G. Blatman (EDF) and S. Meunier (EDF),
- Lingling Cao, Mathematical analysis of models of thermo-electronic transport, Universit  Paris-Est,  cole des Ponts, started November 1st, 2016, supervised by E. Canc s and G. Stoltz,
- Rafa l Coya d, M thodes num riques d terministes et stochastiques pour le transport optimal, Universit  Paris-Est,  cole des Ponts, started October 1st, 2017, supervised by A. Alfonsi and co-supervised by V. Ehrlacher,
- Qiming Du, Mathematical analysis of splitting methods,  cole Doctorale Sciences Math matiques de Paris Centre, started September 1st, 2016, supervised by A. Guyader (UPMC) and T. Leli vre,

- Grégoire Ferré, Efficient sampling methods for nonequilibrium systems, Université Paris-Est, École des Ponts started October 1st, 2016, supervised by G. Stoltz,
- Marc Josien, Multiscale approaches for materials science, started September 1st, 2015, supervised by C. Le Bris,
- Sofiane Martel, Modélisation de la turbulence par mesures invariantes d'EDPS, Université Paris-Est, École des Ponts, started January 1st, 2017, supervised by S. Boyaval and co-supervised by J. Reygner (CERMICS),
- Julien Roussel, Variance reduction techniques for nonequilibrium systems, Université Paris-Est, École des Ponts, started September 1st, 2015, supervised by G. Stoltz,
- Pierre-Loïc Rothé, Numerical methods for the estimation of fluctuations in multi-scale materials and related problems, started October 1st, 2016, supervised by F. Legoll,
- Mouad Ramil, Metastability for interacting particle systems, started October 1st 2017, supervised by T. Lelièvre and J. Reygner (CERMICS),
- Laura Silva Lopes, Rare event simulation and applications to biological systems, started October 1st, 2016, supervised by J. Hénin (IBPC) and T. Lelièvre,
- Sami Siraj-Dine, Modélisation mathématique des matériaux 2D, École des Ponts, started October 2017, supervised by E. Cancès, C. Fermanian and co-supervised by A. Levitt,
- Pierre Terrier, Reduced models for defect migration in metals, Université Paris-Est, École des Ponts and CEA Saclay, started September 1st, 2015, supervised by G. Stoltz and M. Athènes (CEA).

Project-team members have participated in the following PhD juries:

- S. Boyaval, PhD of Riad Sanchez ("Application des techniques de bases réduites à la simulation des écoulements poreux"), defended at IFPEN in December 2017,
- E. Cancès, PhD of Geneviève Dusson, defended at UPMC in October 2017,
- E. Cancès, PhD of Chaoyu Quan, defended at UPMC in November 2017,
- V. Ehrlicher, PhD of Xianglong Duang ("Transport optimal et diffusion de courants"), defended at Université Paris-Saclay in September 2017,
- V. Ehrlicher, PhD of Eleonora Musharbash ("Dynamical Low Rank approximation for PDEs with random parameters"), defended at EPFL in May 2017,
- V. Ehrlicher, PhD of Julien Ricaud ("Symétrie et brisure de symétrie pour certains problèmes non linéaires"), defended at Université de Cergy-Pontoise in June 2017,
- V. Ehrlicher, PhD of Pierre-Éric Allier ("Contrôle d'erreur pour et par les modèles réduits PGD"), defended at ENS Paris-Saclay in November 2017,
- V. Ehrlicher, PhD of Quentin Ayoul-Guilmarde ("Méthodes numériques pour la prise en compte de défauts aléatoires en mise en forme de composites quasi-périodiques"), defended at Ecole Centrale Nantes in December 2017,
- T. Lelièvre, referee for the PhD of Arthur Talpaert ("Simulation numérique directe de bulles sur maillage adaptatif avec algorithmes distribuées"), defended at Ecole Polytechnique in February 2017,
- T. Lelièvre, PhD of Romain Poncet ("Méthodes numériques pour la simulation d'équations aux dérivées partielles stochastiques non-linéaires en condensation de Bose-Einstein"), defended at Ecole Polytechnique in October 2017,
- T. Lelièvre, president of the jury for the PhD of Manon Baudel ("Théorie spectrale pour des applications de Poincaré aléatoires"), defended at Université d'Orléans in December 2017,
- T. Lelièvre, referee for the PhD of Riad Sanchez ("Application des techniques de bases réduites à la simulation des écoulements en milieux poreux"), defended at Université Paris Saclay in December 2017,
- G. Stoltz, referee for the PhD of Romain Poncet ("Méthodes numériques pour la simulation d'équations aux dérivées partielles stochastiques non-linéaires en condensation de Bose-Einstein"), defended at École Polytechnique in October 2017,
- G. Stoltz, referee for the PhD of Viviana Letizia ("Modèles microscopiques pour la loi de Fourier"), defended at Université Paris Dauphine in December 2017.

Project-team members have participated in the following habilitation jury:

- T. Lelièvre, HDR of Fabio Pietrucci (“Inventing general simulation methods to study the transformations of matter”), defended at UPMC on December 1st 2017.

### 10.3. Conference participation

Members of the project-team have delivered lectures in the following seminars, workshops and international conferences:

- S. Boyaval, Finite-Element for Flows, Roma, April 2017,
- S. Boyaval, RWTH AICS colloquim, Aachen, November 2017,
- S. Boyaval, weekly seminar of Collège de France, Paris, December 2017,
- E. Cancès, workshop on New trends in Mathematical Physics at the interface of Analysis and Probability, University College London, England, February 2017,
- E. Cancès, SIAM conference on Scientific Computing, Atlanta, Georgia, February 2017,
- E. Cancès, Mathematical Physics seminar, Université Paris Dauphine, March 2017,
- E. Cancès, weekly seminar of the Mathematics department, University of Metz, March 2017,
- E. Cancès, workshop on Wavelet and Tensor Methods for Partial Differential Equations, Berlin, May 2017,
- E. Cancès, IMA workshop on Mathematical Modeling of 2D Materials, Minneapolis, Minnesota, May 2017,
- E. Cancès, weekly seminar of the Mathematics department, Peking University, Beijing, China, June 2017,
- E. Cancès, workshop on Focus activity on quantum and kinetic problems, Beijing, China, June 2017,
- E. Cancès, BIRS workshop on Mathematical and Numerical Methods for Time-Dependent Quantum Mechanics from Dynamics to Quantum Information, Oaxaca, Mexico, August 2017,
- E. Cancès, workshop on Advances in mathematical modelling and numerical simulation of superfluids, University of Rouen, August 2017,
- E. Cancès, Colloquium lecture, University of Kansas, Lawrence, Kansas, September 2017,
- E. Cancès, workshop on Multiscale Theory and Computation, Minneapolis, Minnesota, September 2017,
- E. Cancès, MOANSI workshop, Aachen, Germany, October 2017,
- V. Ehrlacher, Demi-journée d’échange Labex Bézout/EADS, Marne-la-Vallée, October 2017,
- V. Ehrlacher, Seminar Institut für Numerische Simulation, Bonn, Allemagne, November 2017,
- V. Ehrlacher, IPAM workshop on “Uncertainty Quantification for Stochastic Systems and Applications”, Los Angeles, California, November 2017,
- V. Ehrlacher, MORTECH 2017 (keynote lecture), Sevilla, Spain, November 2017,
- V. Ehrlacher, Oberwolfach workshop on “Multiscale and High-Dimensional Problems“, Oberwolfach, Germany, April 2017,
- V. Ehrlacher, Conference in honor of Y. Maday’s 60th birthday, Roscoff, May 2017,
- V. Ehrlacher, SIAM CSE conference, Atlanta, Georgia, February 2017,
- G. Ferré, Young researchers’ seminar, IHP semester, “Stochastic dynamics out of equilibrium”, Paris, June 2017,
- G. Ferré, Large deviation theory in statistical physics, ICTS, Bangalore, September 2017,
- M. Josien, CAMP Seminar, University of Chicago, April 2017,

- M. Josien, SciCADE Conference, Bath, September 2017,
- M. Josien, Séminaire de Physique Mathématique-EDP, Institut de Mathématiques de Bordeaux, December 2017,
- D. Kazerani, weekly seminar, Orléans, October 2017,
- D. Kazerani, Post-doc days of IHES, Orsay, October 2017,
- D. Kazerani, weekly seminar IRD, Paris, October 2017,
- C. Le Bris, Conference in honor of Yvon Maday's 60th birthday, May 2017,
- C. Le Bris, Conference in honor of Patrick Joly's 60th birthday, August 2017,
- C. Le Bris, Workshop HPC, Institut d'Etudes Scientifiques de Cargèse, September 2017,
- C. Le Bris, Multiscale Modeling, Theory, and Computation, Conference in honor of Mitchell Luskin's 65th birthday, Minneapolis, September 2017,
- C. Le Bris, Homogenization Theory and Applications, Weierstrass Institute Berlin, October 2017,
- C. Le Bris, BIRS Workshop on "Computational Uncertainty Quantification", Banff International Research Station (BIRS), Canada, October 2017,
- C. Le Bris, Séminaire d'Automatique du plateau de Saclay, June 2017,
- C. Le Bris, Forum Teratec, July 2017,
- F. Legoll, Workshop stochastic homogenization, Bonn, February 2017,
- F. Legoll, UNECECOMP Conference, Rhodes, June 2017,
- F. Legoll, ADMOS Conference, Verbania, June 2017,
- F. Legoll, CIMPA Summer school on multiscale methods, Lucknow, India, July 2017,
- F. Legoll, USNCCM Conference, Montreal, July 2017,
- F. Legoll, COMPLAS 2017 Conference, Barcelona, September 2017,
- F. Legoll, Scicade conference, Bath, September 2017,
- F. Legoll, IMA program on multiscale mathematics, Minneapolis, September 2017,
- F. Legoll, séminaire Université de Genève, October 2017,
- F. Legoll, MORTECH 2017 conference, Sevilla, November 2017,
- F. Legoll, IPAM Program, Los Angeles, November, 2017,
- T. Lelièvre, workshop on Multiscale methods for stochastic dynamics, Geneva, February 2017,
- T. Lelièvre, Séminaire du Laboratoire de Chimie Physique, Université Paris-Sud, March 2017,
- T. Lelièvre, CECAM workshop "Exploiting finite-size effects in simulations", UPMC, April 2017,
- T. Lelièvre, CIRM workshop "interactions EDP/probabilités - équations cinétiques, temps long et propagation du chaos", Marseille, April 2017,
- T. Lelièvre, Colloquium Lorrain de Mathématiques, Université de Nancy, April 2017,
- T. Lelièvre, IHP trimester on Stochastic Dynamics Out of Equilibrium, Paris, April 2017,
- T. Lelièvre, CECAM workshop "Beyond Kd's: New computational methods to address challenges in drug discovery", EPFL, Lausanne June 2017,
- T. Lelièvre, Séminaire de probabilités, ENS Lyon, June 2017,
- T. Lelièvre, "Multiscale Theory and Computation Conference", University of Minneapolis, September 2017,
- T. Lelièvre, "Quasistationary Distributions: Analysis and Simulation", University of Paderborn, September 2017,
- T. Lelièvre, Colloquium du laboratoire Dieudonné, Université Nice Sophia Antipolis, October 2017,

- T. Lelièvre, “Workshop Stochastic Sampling and Accelerated Time Dynamics on Multidimensional Surfaces”, IPAM, Los Angeles, October 2017,
- T. Lelièvre, Workshop “Bridging Scales in Molecular Biology”, Mathematics & Physical Sciences conference of the Simons Foundation, New York, November 2017,
- T. Lelièvre, workshop “Mathématiques pour la neutronique”, GDR MANU, Paris, November 2017,
- T. Lelièvre, Mathematisches Kolloquium RWTH Aachen University, Aachen, December 2017,
- A. Levitt, Young researchers working group, UPMC, January 2017,
- A. Levitt, Chemistry colloquium, Cornell, New York, February 2017,
- A. Levitt, THEOS seminar, Cornell, New York, February 2017,
- A. Levitt, SIAM CSE conference, Atlanta, Georgia, February 2017,
- A. Levitt, Conference in honor of Y. Maday’s 60th birthday, Roscoff, May 2017,
- A. Levitt, Scalable solvers group seminar, Lawrence Berkeley National Lab, California, June 2017,
- A. Levitt, CCP17, Paris, July 2017,
- A. Levitt, Density Functional Theory and Beyond, Warwick, July 2017,
- A. Levitt, Mathematical physics summer school, Zurich, July 2017,
- A. Levitt, ICJ seminar, Lyon, November 2017,
- P. Monmarché, Groupe de travail Prob., Théo. Erg. et Systèmes Dynamiques, LMRS, Rouen, January 2017,
- P. Monmarché, Workshop PDMP et sampling, ENPC, Marne-la-Vallée, January 2017,
- P. Monmarché, Conférence PDE/Probability Interactions: Kinetic Equations, CIRM, Marseille, April 2017,
- P. Monmarché, Seminar of the Department of Statistics, University of Oxford, May 2017,
- P. Monmarché, Groupe de travail de probabilités, Université Paris 5, May 2017,
- P. Monmarché, Trimestre IHP dynamiques hors équilibre, Institut Henri Poincaré, Paris, June 2017,
- B. Nectoux, Worskhop “Interactions EDP/probabilités : équations cinétiques, temps long et propagation du chaos”, CIRM, April 2017,
- B. Nectoux, SciCADE, university of Bath, UK, Septembre 11-15, 2017,
- B. Nectoux, Workshop “Quasi-stationary distribution: analysis and simulation”, Paderborn, September 2017,
- P.-L. Rothé, SciCADE 2017 Conference, Bath, UK, September 2017,
- P.-L. Rothé, USNCCM14, 14th U.S. National Congress on Computational Mechanics, Montreal, Canada, July 2017,
- P.-L. Rothé, Congrès SMAI 2017, La Tremblade, June 2017,
- J. Roussel, Young researchers’ seminar, IHP semester “Stochastic dynamics out of equilibrium”, Paris, June 2017,
- J. Roussel, ICL Seminar, London, November 2017,
- L. Silva Lopes, “Hands-on” Workshop on Enhanced Sampling and Free-Energy Calculation, Urbana-Champaign, Illinois, September 2017,
- G. Stoltz, seminar at Army Research Laboratory, Aberdeen Proving Grounds, February 2017,
- G. Stoltz, seminar at University of Massachussetts, February 2017,
- G. Stoltz, seminar at University of Geneva, March 2017,
- S. Siraj-Dine, Density Functional Theory and Beyond, Warwick, July 2017,
- P. Terrier, The MRS Spring Meeting & Exhibit, Phoenix, April 2017,
- P. Terrier, Séminaire des doctorants du LAMFA, Amiens, December 2017.

Members of the project-team have delivered the following series of lectures:

- E. Cancès, The mathematics of quantum chemistry, 9h, GDR CORREL winter school, Paris, January 2017,
- E. Cancès, Density Functional Theory: Models and numerical methods, 4h, Beijing, China, June 2017,
- E. Cancès, Mathematical aspects of electronic structure theory, 3h, Aussois, France, June 2017,
- E. Cancès, Mathematical structure of quantum mechanics, 3h, Heidelberg, Germany, October 2017,
- T. Lelièvre, Lectures on “Algorithms for computational statistical physics”, 3h, ICTS, Bangalore, August 2017,
- T. Lelièvre, Tutorial on “Sampling efficiently metastable dynamics: algorithms and mathematical analysis”, 2h, IPAM, Los Angeles, September 2017,
- A. Levitt, Numerical analysis of periodic quantum systems, 2h, Aalborg, Denmark, June 2017,
- G. Stoltz, From a microscopic description of matter to a macroscopic one on a computer: computational statistical physics, 6h, CIMPA Summer School on Multiscale Computational Methods and Error Control, IIT Kanpur, India, July 2017,
- Random homogenization, theoretical and numerical aspects, 6h, CIMPA Summer School on Multiscale Computational Methods and Error Control, IIT Kanpur, India, July 2017.

Members of the project-team have presented posters in the following seminars, workshops and international conferences:

- G. Ferré, Complex high-dimensional energy landscapes, UCLA, Los Angeles, October 2017,
- G. Ferré, Numerical Aspects of Nonequilibrium dynamics, IHP semester “Stochastic dynamics out of equilibrium”, Paris, April 2017,
- G. Ferré, Trends and Advances in Monte Carlo Sampling Algorithms, Duke University, Durham (North Carolina), December 2017,
- D. Kazerani, colloque EDP Normandie, Caen, October 2017,
- B. Nectoux, Workshop “Dynamiques stochastiques hors d’équilibre”, CIRM, April 2017,
- P.-L. Rothé, colloque EDP Normandie, Caen, October 2017,
- J. Roussel, workshop “Trends and Advances in Monte Carlo Sampling Algorithms”, SAMSI (Duke University), December 2017,
- J. Roussel, Numerical Aspects of Nonequilibrium dynamics, IHP semester “Stochastic dynamics out of equilibrium”, Paris, April 2017,
- L. Silva Lopes, Beyond Kd’s: New computational methods to address challenges in drug discovery, Lausanne, Switzerland, June 2017,
- L. Silva Lopes, CEMRACS 2017: Numerical methods for stochastic models: control, uncertainty quantification, mean-field, Marseille, July, 2017,
- L. Silva Lopes, 11th Triennial Congress of the World Association of Theoretical and Computational Chemistry, Munich, Germany, August 2017,
- L. Silva Lopes, Stochastic Sampling and Accelerated Time Dynamics on Multidimensional Surfaces, Los Angeles, California, October 2017,
- P. Terrier, SMAI 2017, La Tremblade, June 2017.

Pierre Terrier has won the best poster award at SMAI 2017.

Members of the project-team have participated (without giving talks nor presenting posters) in the following seminars, workshops and international conferences:

- M. Josien, colloque EDP Normandie, Caen, October 2017,
- Mouad Ramil, PDE/Probability Interactions: Kinetic Equations, Long time and Propagation of Chaos at CIRM, Marseille, April 2017
- Mouad Ramil, Workshop on Quasi-Stationary distributions, Paderborn, September 2017
- P.-L. Rothé, Winter School on Numerical Analysis of Multiscale Problems, Hausdorff Research Institute for Mathematics, Bonn, Germany, January 2017,
- J. Roussel, CEMRACS, CIRM, July 2017,
- L. Silva Lopes, IPAM Long Program on “Complex High-Dimensional Energy Landscapes”, Los Angeles, California, September-November 2017.

#### 10.4. Software development and contributions

- A. Levitt has added methods for optimization on Riemannian manifolds to the Optim.jl optimization library, see <https://github.com/JuliaNLSolvers/Optim.jl>.
- A. Levitt has published an implementation of the method developed in [16] to construct Wannier functions, see <https://github.com/antoine-levitt/wannier>.
- In the framework of the PhD of Laura Silva Lopes, L. Silva Lopes and T. Lelièvre have implemented a new tutorial on the NAMD code in order to popularize the Adaptive Multilevel Splitting method among the practitioners, see <http://www.ks.uiuc.edu/Training/Tutorials/namd/ams-tutorial/tutorial-AMS.pdf>.
- J. Roussel and G. Stoltz have added new features to the Simol code, in particular concerning the use of control variates.

#### 10.5. Popularization

- G. Ferré gave a talk about statistical physics and its applications to undergraduate students at Lycée Pierre Corneille, Rouen, in November 2017.
- A. Levitt is a member of the editorial board of Interstices, Inria’s popularization website.
- P. Monmarché gave a talk about mathematics and music to high school students at lycée Pablo Picasso, Avion, in May 2017.
- P. Monmarché participated to Les Matinales de la Recherche de l’ENPC and presented a poster about his work to the students of ENPC in April 2017.
- G. Stoltz participated to Les Matinales de la Recherche de l’ENPC and gave a talk about his work to the staff of ENPC in April 2017.
- G. Stoltz, together with Gilles Buisson (Ecole des Ponts), published a contribution to the proceedings of QPES 2017 (Questions de Pédagogie dans l’Enseignement Supérieur), on his teaching experience involving flipped classrooms organized at the level of a complete class of first year students at Ecole des Ponts. See G. Buisson and G. Stoltz, La classe inversée à grande échelle en école d’ingénieur, Actes du colloque QPES 2017, 633-640.

## MEMPHIS Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Selection

#### 10.1.1.1. Member of the Conference Program Committees

Michel Bergman has co-organized the international conference "Interaction fluide-Structure: Analyse et controle", October 2017 (<https://indico.math.cnrs.fr/event/1366/overview>)

### 10.1.2. Journal

#### 10.1.2.1. Member of the Editorial Boards

Angelo Iollo is in the advisory board of Acta Mechanica.

#### 10.1.2.2. Reviewer - Reviewing Activities

Journal of Computational Physics, International Journal of CFD, Journal of Non-linear Analysis B, ASME Journal of Computational and Nonlinear Dynamics, Journal of Fluid Mechanics, Acta Mechanica, AIAA Journal, International Journal Numerical Methods in Fluids, Computers & Fluids, Journal of Engineering Mathematics, European Journal of Mechanics / B Fluids, Journal Européen de Systèmes Automatisés, Applied Mathematics and Computation. Nuclear Science and Engineering, Computer Methods in Applied Mechanics and Engineering, Journal of Theoretical Biology, Computational Optimization and Applications. Applied science, Meccanica.

### 10.1.3. Invited Talks

The invited conferences are [10], [8], [13], [14], [9], [11], [15], [7].

### 10.1.4. Scientific Expertise

Angelo Iollo is reviewer for national and international programs such as H2020 (EU), ANR (France), PRIN (Italy).

2016-2017: Angelo Iollo is expert for the Italian Ministry of Research: quality evaluation of research products. Michel Bergmann: member of the Inria Young Researchers Commission, which allocates PhD and Postdoc grants.

Afaf Bouharguane has participated to the recruitment committee for Associate Professor position in Besancon, May 2017

Angelo Iollo was expert in the Young Investigator Rita Levi Montalcini program, Italy

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

Four members of the team are Professors or Assistant Professors at Bordeaux University and have a teaching duty, which consists in courses and practical exercises in numerical analysis and scientific computing. Michel Bergmann (CR) also teaches around 64 hours per year (practical exercises in programming for scientific computing).



### 10.2.2. Supervision

PhD in progress : Claire Morel, Modélisation aerodynamique 3D d une turbine eolienne, 01/01/2015, M., Bergmann M., Iollo A.

PhD in progress : Federico Tesser, Identification of dense suspensions rheology, 01/11/2014, Bergmann M., Iollo A.

PhD in progress : Baptiste Lambert, modélisation et simulations numériques des contacts dans des écoulements chargés en particules, 01/10/2015, Bergmann M., Weynans L.,

PhD in progress : Emanuela Abbate, Méthodes numériques pour problèmes stiff en mécanique des fluides et élasticité, 01/11/2015, Iollo, A.

PhD in progress : Mathias Braun, Modèles réduits et problèmes inverses pour l étude de la résilience des réseaux d eau potable, 01/10/2015, Iollo A. and Mortazavi I.

PhD in progress : Luis Henrique Benetti Ramo, Aeroelastic instabilities, Bergmann M. and Iollo A.

PhD in progress : Guillaume Ravel, Simulation numérique et modélisation de la nage du poisson zèbre pour l étude de maladies humaines d origine génétique et toxicologique, 01/10/2017, Bouharguane A. and Babin P. (MRGM)

PhD in progress : Sebastien Riffaud, Reduced Order Models, classification and data geometry, 01/10/2017, Iollo A.

2013-2017: Meriem Jedoua, Introduction d une méthode efficace de capture d interface permettant la localisation d un grand nombre d objets immergés dans un fluide. Applications à des solides rigides et des vésicules (membranes élastiques) immergés dans un fluide incompressible, 01/10/2013, Bruneau C.-H. and Maitre E.

2014-2017 : Alice Raeli, Numerical Modelling for Phase Changing Materials, 12/06/2014, Azaiez M., Bergmann M., Iollo A.

### 10.2.3. Juries

Michel Bergmann has participated to the PhD defense of Pierre Costini, Centrale Marseille, 19/05/2017

Michel Bergmann has participated to the PhD defense of Lei Cheng, DELF (pays-bas), 15/12/2017

Angelo Iollo has been reviewer of the PhD defense *Applicabilité de la réduction de modèles à la conception aérothermique collaborative des systèmes d air secondaires des turbomachines*, Pierre Costini, Ecole Doctorale des Sciences pour l Ingénieur, Aix-Marseille, May 2017.

Angelo Iollo has participated to the PhD defense of Manon Deville, *Modélisation de l'électroporation et de la transfection de gènes à l'échelle du tissu. Aspects théorique et numérique.* " Institut de Mathématiques de Bordeaux, université de Bordeaux, novembre 2017.

Angelo Iollo has participated as president to the PhD defense of Agathe Peretti *Quantification de l'hétérogénéité tumorale à partir de l imagerie médicale. Application à la classification de tumeurs rénales.* Institut de Mathématiques de Bordeaux, université de Bordeaux, décembre 2017.

## 10.3. Popularization

Lisl Weynans has co-organized the *Journée Filles et Maths, une équation lumineuse*, April 2017.

Afaf Bouharguane and Lisl Weynans have co-organized the *Journée Emploi Maths de l' Unité de Formation Mathématiques et Interaction*, November 2017.

## MEPHYSTO Project-Team

## 6. Dissemination

### 6.1. Promoting Scientific Activities

#### 6.1.1. Scientific Events Organisation

##### 6.1.1.1. Member of the Organizing Committees

M. Simon was a member of the Organizing Committee for the *Journée de la Fédération de Recherche Mathématique du Nord Pas de Calais 2017* (place: Villeneuve d'Ascq, duration: one day).

M. Simon was a member of the Organizing Committee for the *Semaine d'Études Maths-Entreprises Hauts de France 2018* (place: Villeneuve d'Ascq, duration: one week). For that aim, she got a subvention by Inria.

#### 6.1.2. Journal

##### 6.1.2.1. Member of the Editorial Boards

Antoine Gloria is editor at NWJM.

##### 6.1.2.2. Reviewer - Reviewing Activities

G. Dujardin is reviewer for M2AN.

#### 6.1.3. Invited Talks

M. Simon was an invited speaker at:

- *Collège de France*, for the physics seminar (January 2017).
- the congress *Stochastic Analysis and its Applications*, taking place in Bedlewo Center (Poland) in june 2017.

## 6.2. Teaching - Supervision - Juries

### 6.2.1. Supervision

PhD: M. Duerinckx, PhD at Université Libre de Bruxelles, defended on 19th December 2017 (A. Gloria).

PhD in progress: P. Mennuni, PhD at Université de Lille 1 (S. De Bièvre and G. Dujardin).

## 6.3. Popularization

M. Simon participated in the diffusion program *MathenJeans*, in Lille. She followed a group of 4 children (aged 10–11), who presented a project to the national competition named *CGénial*.

## MOKAPLAN Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. Member of the Organizing Committees

G. Carlier has organized CMO-BIRS 17w5093.

J-D. Benamou has co-organized Brenier 60.

J-D. Benamou has co-organized MFO workshop 1705 (February).

#### 9.1.2. Journal

##### 9.1.2.1. Member of the Editorial Boards

Guillaume Carlier is in the board of Journal de l'école Polytechnique, Applied Mathematics and optimization (since 2016) and Mathematics and financial economics, with Filippo Santambrogio and Thierry Champion he co-edited a special issues of RICAM Series devoted to optimal transport. G. Peyré is editor for SIAM Journal of Imaging Sciences and Springer Journal of Mathematical Imaging and Vision. He co-edited a special issues of RICAM Series devoted to inverse problems.

##### 9.1.2.2. Reviewer - Reviewing Activities

The members of the team are frequently reviewing papers in SIIMS (SIAM Journal on Imaging Sciences), JMAA (Journal of Mathematical Analysis and Applications), IPol (Image Processing Online), JVCi (Journal of Visual Communication and Image Representation), COCV, M2AN ... Discrete and computational geometry, Journal of the London Math Society, JOTA, JCP, "Information and Inference: A Journal of the IMA", JMIV, Optimization Letters, PAMI, SIAM optimization and control, IPMI, MICCAI (leading conferences in medical imaging), IEEE Information Theory, ICLR, NIPS, ICML (important machine learning conferences).

#### 9.1.3. Invited Talks

Y. De Castro gave talks at Séminaire d'Informatique de l'Ecole Normale Supérieure, Lyon, and Séminaire de Probabilités de l'Ecole Normale Supérieure, Lyon, Groupe de Travail "Gaussian Process" Université Jean Monnet, St-Etienne, Séminaire de Probabilités de Lille, Séminaire de Probabilités et Statistique de Liège, Séminaire de Probabilités et Statistique de Versailles, LMV, Séminaire de Statistique de Toulouse, IMT, Groupe de Travail "Sequential Structured Statistical Learning", IHES, Cambridge Statistics Seminar, Cambridge, UK.

G. Carlier gave talks in Banff, Victoria, Naples, Le Teich, Toulouse (conference in honor of P. Cattiaux and C. Léonard), Paris (conference in honor of Y. Brenier, functional analysis seminar at IMJ and Game theory seminar at IHP), PGMO Days Paris Saclay.

J-D. Benamou was invited speaker at FOCM (Barcelona, July), CEMRACS (CIRM, July), Conf. in Honor of P. Joly (Gif, September) SPO (IHP, October) .

I. Waldspurger gave talks at Journées EDP (Roscoff, June), and at workshops on phase retrieval (Minneapolis, August) and on generative models, parameter learning and sparsity (Cambridge, October). She also gave a mini-course at Journées de géométrie algorithmique (Aussois, December).

V. Duval has given talks at the SPOC seminar (Université de Dijon, January) and Statistics seminar (Télécom ParisTech, September).

F-X. Vialard gave talks at MIT, csail, in the medical imaging group, in Chapell Hill University (April), workshop on applied geometric mechanics (Darryl Holm's anniversary) in Madrid (July), Classic and Stochastic Approaches to Mathematical Fluid Dynamics at Imperial College (September), workshop in Cambridge about growth and form (November), and about mathematics for imaging (December), Geometric Functional Data Analysis Workshop in Tallahassee (September), GMO (Paris-Saclay).

T. Gallouët gave a talk at the ANEDP seminar of Paris Sud University (December 2017).

#### 9.1.4. Research Administration

J-D. Benamou is an elected member of the "Conseil Académique" of the PSL COMUE.

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Teaching

Master : V. Duval, Student project supervision, October 2017 to March 2018, M2, INSA Rouen-Normandie

Licence : I. Waldspurger, Analyse 1, Université Paris-Dauphine, 72h.

Master : Y. De Castro, Master 1 course on Statistics at Orsay.

### 9.2.2. Supervision

Internship :

PhD in progress : Miao Yu, *Optimal Transport distances and Geophysical imaging* J-D. Benamou (co-direction J.-P. Vilotte, IPGP).

PhD in progress : Paul Catala, *Low-rank approaches for off-the-grid superresolution*, October 2016, G. Peyré and V. Duval.

PhD in progress : Lucas Martinet *Multi-Marginal OT* Oct. 2017 , J-D. Benamou.

PhD in progress : Aude Genevay, *Optimal Transport for Machine Learning* , october 2015, G. Peyré.

PhD in progress : Quentin Denoyelle, *Off-the-grid super-resolution: theory, algorithms and applications in fluorescence imaging*, October 2014, G. Peyré and V. Duval.

Postdoc completed:

PhD completed: Lenaic Chizat

Postdoc in progress : A. Natale (Inria/Prestige)

Postdoc in progress : J.B. Courbot (PSL IRIS, in collaboration with LMD, ENS).

PhD in progress : Ernesto Araya, *Measures on graphs* , Y. De Castro

### 9.2.3. Juries

J-D. Benamou F-X. Vialard were in the PhD committee of Lenaic Chizat (Paris-Dauphine, November).

J-D. Benamou was in the HDR committee of F-X. Vialard (Paris-Dauphine, December).

G. Carlier and F-X. Vialard were in the PhD committee of Xianglong Duan (École Polytechnique, September).

G. Carlier was in the HDR committee of Francisco Silva (Limoges) and Daniela Tonon (Dauphine), in the PhD committee of Fatima Al Reda (Orsay), Xianglong Duan (Polytechnique), Van-Thanh Nguyen (Limoges) and Luigia Ripani (Lyon). G. Carlier was president of the committee for the PGMO PhD. award.

## NACHOS Project-Team

## 8. Dissemination

### 8.1. Promoting Scientific Activities

#### 8.1.1. Scientific events organisation

##### 8.1.1.1. General chair, scientific chair

The team has organized the first workshop of the CLIPhTON (advanCed numerical modelIng for multiscale and multiphysics nanoPhoTONics) network that took place at the Inria Sophia Antipolis-Méditerranée research center on November 30-December 1st, 2017.

##### 8.1.2. Invited Talks

Claire Scheid, "Numerical contributions in nanophotonics" Women in PDE's @ Karlsruhe, KIT, Karlsruhe, Germany, April 27-28 2017.

Claire scheid, "A structure preserving numerical discretization framework for the Maxwell Klein Gordon equations in 2D", CRC Seminar, KIT, Karlsruhe, 22 June 2017

Stéphane Lanteri, "Méthodes de type élément fini hybride d'ordre élevé et solveurs par décomposition de domaine pour le calcul de DAS et de SER", Journée Electromagnétisme et Guerre Electronique, Toulouse, France, November 23, 2017.

Stéphane Lanteri, "High order hybridized methods for time-domain and frequency-domain electromagnetics", Congrès Mathias 2017, Paris, France, October 25-27, 2017.

Stéphane Lanteri, "High order DG methods for computational electromagnetics", Barcelona Supercomputing Center, Barcelona, Spain, September 15, 2017.

Stéphane Lanteri, "Discontinuous Galerkin method for computational nanophotonics", Institut Fresnel, Marseille, France, June 9, 2017.

##### 8.1.3. Scientific Expertise

Stéphane Lanteri is a member of the Scientific Committee of CERFACS.

##### 8.1.4. Research Administration

Stéphane Descombes is the head of the Center of Modeling, Simulation and Interactions (MSI) of the UCA JEDI Excellence Initiative. See also: <http://univ-cotedazur.fr/en/uca-innovation/msi/home>.

Stéphane Lanteri is a member of the Project-team Committee's Bureau of the Inria Sophia Antipolis-Méditerranée research center.

Stéphane Lanteri is a member of the Sciences Fondamentales et Appliquées Doctoral School Committee.

## 8.2. Teaching - Supervision - Juries

### 8.2.1. Teaching

Stéphane Descombes, *Scientific computing*, M1, 36 h, University Côte d'Azur.

Stéphane Descombes, *Principal components analysis*, M2, 30 h, Université Nice Sophia Antipolis.

Stéphane Lanteri, *High performance scientific computing*, MAM5, 24 h, Polytech Nice Sophia.

Claire Scheid, *Analyse, Lecture and practical works*, Master 2 Agrégation, 27h, University Côte d'Azur.

Claire Scheid, *Analyse Hilbertienne et analyse de Fourier, Practical works*, Master 1 MPA, 36h, University Côte d'Azur.

Claire Scheid, *Méthodes numériques en EDP, Lectures and practical works*, Master 1 MPA and IM, 63h, University Côte d'Azur.

Claire Scheid, *Option Modélisation, Lectures and practical works*, Master 2 Agrégation, 48h, University Côte d'Azur.

### **8.2.2. Supervision**

PhD in progress: Alexis Gobé, *Multiscale hybrid-mixed methods for time-domain nanophotonics*, November 2016, Stéphane Lanteri.

PhD in progress: Nikolai Schmitt, *Numerical modeling of electron beam interaction with nanostructures*, October 2015, Stéphane Lanteri and Claire Scheid.

PhD in progress: Georges Nehmetallah, *Efficient finite element type solvers for the numerical modeling of light transmission in nanostructured waveguides and cavities*, November 2017, Stéphane Descombes and Stéphane Lanteri.

## NANO-D Project-Team

# 7. Dissemination

## 7.1. Promoting Scientific Activities

### 7.1.1. Scientific Events Organisation

#### 7.1.1.1. Schools

- We organized SAMSON School 2017 in Lyon, for users and developers of SAMSON.

#### 7.1.1.2. Member of the Organizing Committees

- Stephane Redon is a member of the steering committee of the Nanosciences Foundation in Grenoble

### 7.1.2. Scientific Events Selection

#### 7.1.2.1. Member of the Conference Program Committees

Sergei Grudinin was an editorial member of the ACM-BCB'17 conference.

#### 7.1.2.2. Reviewer

- Leonard Jaillet was a reviewer for ICRA (International Conference on Robotics and Automation), IROS (International Conference on Intelligent Robots and Systems), ISRR (International Symposium on Robotics Research) and for RA-L (Robotics and Automation Letters).
- Sergei Grudinin served as a reviewer at the ACM-BCB'17 conference.

### 7.1.3. Journal

#### 7.1.3.1. Reviewer - Reviewing Activities

Sergei Grudinin served a reviewer for the following journals, several D3R assessment submissions in Journal of Computer-Aided Molecular Design; Bioinformatics, several CASP12 assessment submissions in PROTEINS: Structure, Function, and Bioinformatics; PLOS Computational Biology; PLoS One; Spectrochimica Acta Part A; Chemical Research in Toxicology; Journal of Computational Chemistry; The Journal of Physical Chemistry; Journal of Chemical Information and Modeling.

### 7.1.4. Invited Talks

- Sergei Grudinin gave an invited talk entitled "On the Nonlinear Normal Mode Analysis and its Applications to Structural Bioinformatics" at the Second International Conference on Computational Genomics and Proteomics, Aug 14 - 18 2017, Playa Blanca, Panama.
- Guillaume Pagès gave an invited talk entitled "Algorithms and Software for Symmetry Detection and Analysis in Large Macromolecular Assemblies" at the Second International Conference on Computational Genomics and Proteomics, Aug 14 - 18 2017, Playa Blanca, Panama.
- Sergei Grudinin gave an invited talk entitled "Some problems in computational electron-cryo microscopy" at the DROITE workshop on tomography: mathematics and applications, on the 27 Jan, 2017 in Grenoble.
- Sergei Grudinin gave an invited talk entitled "On the Nonlinear Normal Mode Analysis and its Applications to Structural Bioinformatics" at the rencontre nationales sur les modes normaux, May 30 2017, Institute Pasteur, Paris, France.
- Sergei Grudinin gave an invited talk entitled "Using machine learning and fast conformational space exploration techniques for some problems in structural bioinformatics" at the SMAI-2017 congress, June 4-9 2017, Azureva Ronce-les-Bains, France.

- Sergei Grudinin gave an invited talk entitled "Using Machine Learning and Integrative Approaches for Current Problems in Structural Biology" at the University Paris 6, Biologie Computationnelle et Quantitative lab on the 29th of May 2017.
- Sergei Grudinin gave an invited talk entitled "Application of machine learning to structural bioinformatics" on the 28th of February 2017 at the Thoth team of Inria Grenoble, France.
- Sergei Grudinin gave an invited talk entitled "Using Machine Learning and Integrative Approaches for Current Problems in Structural Biology" on the 14th of June 2017, at the ABS team of Inria Sophia-Antipolis, France.
- Sergei Grudinin gave an invited talk entitled "Using Machine Learning and Integrative Approaches for Current Problems in Structural Biology" at INRA Toulouse, France.
- Sergei Grudinin gave an invited talk entitled "On the Nonlinear Normal Mode Analysis and its Applications to Structural Biology" at LAAS CNRS, Toulouse, France.
- Sergei Grudinin gave an invited talk entitled "On the Nonlinear Normal Mode Analysis and its Applications to Structural Biology Including SAXS and Cryo-EM Experiments" at IBT Vilnius, Lithuania, on the 15th of September 2017.
- Sergei Grudinin gave an invited talk entitled "On some aspects of computational predictions of protein structure and organization" at the Institute of Bioorganic Chemistry NASB, Minsk, Belarus, on the 19th of September 2017.
- Sergei Grudinin gave an invited talk entitled "On some aspects of computational predictions of protein structure and organization" at the Interdisciplinary Laboratory Of Biological Systems Modelling, Warsaw, Poland, on the 9th of October 2017.
- Sergei Grudinin gave an invited talk entitled "Computational predictions of protein structure and organization" at the Laboratory For Biomolecular Modeling, EPFL, Lausanne, Switzerland, on the 24th of October 2017.
- Sergei Grudinin gave an invited talk entitled "On some methods for structural bioinformatics" at the Methodes Algorithmiques pour les Structures et Interactions des Macromolecules (GT MASIM) meeting on Nov. 16-17, Paris, France.
- Alexandre Hoffmann gave an invited talk entitled "On fast Fourier transform (FFT)-accelerated flexible exhaustive search for cryo-EM fitting" at the CryoEM Structure Challenges Workshop, Oct 6-8, Stanford, USA,

#### **7.1.5. Other Talks, Presentations and Participations in the Scientific Events**

- Sergei Grudinin gave a talk entitled "On the non-linear normal mode analysis and its applications" at the GGMM 2017 conference, May 9-11 2017, Reims, France.
- Guillaume Page`s, Sergei Grudinin, Alexandre Hoffmann, and Maria Kadukova presented 3 posters at the GGMM 2017 conference, May 9-11 2017, Reims, France.
- Sergei Grudinin participated in the Journees Scientifiques Inria 2017, Jun 14-16 2017, Antibes, France.
- Sergei Grudinin and Alexandre Hofmann gave a talk entitled "FFT-accelerated exhaustive flexible docking method" at the Mapping2017 conference, May 21-26 2017, Lyon, France.
- Sergei Grudinin, Guillaume Page`s, Alexandre Hoffmann, and, Maria Kadukova presented two posters at the Mapping2017 conference, May 21-26 2017, Lyon, France.
- Sergei Grudinin and Yassine Naimi gave a talk entitled "On the Small-angle X-ray Scattering modeling in SAMSON" at the SAMSON School 2017, Lyon, France.
- Sergei Grudinin gave a talk entitled "On the development of knowledge-based approaches for structural predictions of macromolecules in Nano-D team" at the seminaire d'evaluation Nano-D, Apr 15-16 2017, Paris, France.



- Sergei Grudinin gave a talk entitled "Using Machine Learning for Protein-Ligand Interactions" at the SBDD2017 conference, Sep 4-8 2017, Lausanne, Switzerland.
- Sergei Grudinin presented a poster entitled "On the Normal Modes, Small-Angle Scattering and Convex Optimization for Protein Structure Prediction" at the Coarse-graining of biomolecules and beyond workshop, on the 7th of October 2017, Warsaw, Poland.

## **7.2. Teaching - Supervision - Juries**

### **7.2.1. Teaching**

- Stephane Redon is teaching INF572 (Introduction to C++) at Ecole polytechnique
- Stephane Redon is teaching INF473S (Computational nanoscience with SAMSON) at Ecole polytechnique

### **7.2.2. Supervision**

- Leonard Jaillet is advising the PhD of Minh Khoa Nguyen
- Sergei Grudinin is advising the PhD of Alexandre Hoffmann
- Sergei Grudinin is advising the PhD of Maria Kadukova
- Sergei Grudinin is advising the PhD of Guillaume Pages
- Stephane Redon was co-advising the PhD of Krishna Kant Singh in collaboration with Jean-Francois Mehaut
- Stephane Redon is advising the PhD of Francois Rousse
- Stephane Redon is advising the PhD of Semehor Edorh

### **7.2.3. Juries**

- Stephane Redon was a member of the PhD committee of Laurent Denarie
- Sergei Grudinin was a member of the "Suivi individuel" PhD committee of Serge Nader

## **7.3. Popularization**

- Sergei Grudinin co-advised the team of high-school student "Cantor se Gauss d'un Poincaré" in the team competitions "Tournoi Français Des Jeunes Mathématiciens" (TFJM).
- NANO-D was involved in several popularization activities, including a participation to Fete de la Science, and a participation to the GameLab project in Grenoble, where SAMSON modules were developed for high school students.
- Leonard Jaillet was involved in the development of a demonstration of SAMSON in the Inria showroom. Several scenarios were proposed where the user can interact with molecular systems and test different possible applications of the SAMSON software platform.

## POEMS Project-Team

## 10. Dissemination

### 10.1. Promoting Scientific Activities

#### 10.1.1. Advisory and management activities

- P. Joly is a member of the scientific committee of CEA-DAM.
- E. Lunéville is the Head of UMA (Unité de Mathématiques Appliquées) at ENSTA ParisTech.

#### 10.1.2. Scientific events organisation and selection

- E. Bécache, A. S. Bonnet-Ben Dhia, M. Bonnet, S. Fliss, C. Hazard, P. Joly and E. Lunéville were members of the scientific committee for the 13rd international conference on mathematical and numerical aspects of wave propagation (WAVES 2017), which took place in Minneapolis in May 2017.
- A. Modave co-organized with B. Thierry (CNRS/UPMC) a Young Researchers' Meeting on "Solving Large-Scale Time-Harmonic Wave Problems", which took place at UPMC on November, 2017. There were 8 talks, 2 tutorials and 20 participants, including young researchers from the Inria teams Magique3D, HiePACS and Alpines. The meeting was funded in part by the SMAI through a BOUM project.

#### 10.1.3. Journal

- A. S. Bonnet-Ben Dhia is associate editor of SINUM (SIAM Journal of Numerical Analysis) and SIAP (SIAM Journal of Applied Mathematics).
- M. Bonnet is associate editor of Engineering Analysis with Boundary Elements
- M. Bonnet is in the editorial board of Inverse Problems.
- M. Bonnet is in the editorial board of Computational Mechanics.
- M. Bonnet is in the editorial board of Journal of Optimization Theory and Application.
- P. Ciarlet is an editor of CAMWA (Computers & Mathematics with Applications).
- P. Ciarlet is an editor of ESAIM:M2AN (Mathematical Modeling and Numerical Analysis).
- P. Joly is an editor of ESAIM:M2AN (Mathematical Modeling and Numerical Analysis).
- P. Joly is a member of the editorial board of AAMM (Advances in Applied Mathematics and Mechanics).
- P. Joly is a member of the Book Series Scientific Computing of Springer Verlag.
- The team members regularly review papers for many international journals.

### 10.2. Teaching - Supervision

#### 10.2.1. Teaching

Eliane Bécache

- *Méthode des éléments finis*, ENSTA ParisTech (2nd year)
- *Compléments sur la méthode des éléments finis*, ENSTA ParisTech, (2nd year)
- *Fonctions d'une variable complexe*, ENSTA ParisTech (1st year)
- *Résolution des problèmes de diffraction par équations intégrales*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Marc Bonnet

- *Problèmes inverses*, Master MS2SC (Centrale Paris and ENS Cachan)
- *Méthodes intégrales*, Master TACS (ENS Cachan)
- *Outils élémentaires d'analyse pour les équations aux dérivées partielles*, ENSTA Paris-Tech (1st year)

Anne-Sophie Bonnet-Ben Dhia

- *Fonctions d'une variable complexe*, ENSTA ParisTech (1st year)
- *Propagation dans les guides d'ondes*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)
- *Non Destructive Testing*, Master "Acoustics" (M2)
- *Théorie spectrale des opérateurs autoadjoints et applications aux guides optiques*, ENSTA ParisTech (2nd year)

Laurent Bourgeois

- *Outils élémentaires pour l'analyse des équations aux dérivées partielles*, ENSTA Paris-Tech (1st year)
- *Fonction d'une variable complexe*, ENSTA ParisTech (1st year)

Stéphanie Chaillat

- *Introduction à la discrétisation des équations aux dérivées partielles*, ENSTA ParisTech (1st year)
- *Fonctions d'une variable complexe*, ENSTA ParisTech (1st year)
- *Equations intégrales et multipôles rapides*, Ecole doctorale MODES (Univ. Paris Est, Marne la Vallée)
- *Résolution des problèmes de diffraction par équations intégrales*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Colin Chambeyron

- *Analyse réelle: optimisation libre et sous contraintes*, Dauphine University (1st year)
- *Outils mathématiques*, Dauphine University (1st year)
- *Algèbre linéaire*, Dauphine University (2nd year)

Patrick Ciarlet

- *Advanced Finite Element Methods*, ENSTA ParisTech (2nd year)
- *Parallel Scientific Computing*, ENSTA ParisTech (3rd year), and Master "Analysis, Modelling, Simulation" (M2)
- *Mathematical Models and their Discretisation in Electromagnetism*, ENSTA ParisTech (3rd year), and Master "Analysis, Modelling, Simulation" (M2)
- *Deputy Head of the Master's Program Analysis, Modelling, Simulation*, Paris-Saclay University

Sonia Fliss

- *Méthode des éléments finis*, ENSTA ParisTech (2nd year)
- *Introduction à la discrétisation des équations aux dérivées partielles*, ENSTA ParisTech (1st year).
- *Propagation des ondes dans les milieux périodiques*, ENSTA ParisTech (3rd year) and Master "Analysing, Modeling and Simulation" (M2)
- *Homogénéisation périodique*, Masters ANEDP, M4S et AMS "Analysing, Modeling and Simulation" (M2)

Christophe Hazard

- *Outils élémentaires d'analyse pour les équations aux dérivées partielles*, ENSTA Paris-Tech (1st year)
- *Théorie spectrale des opérateurs autoadjoints et applications aux guides optiques*, ENSTA ParisTech (2nd year)

Patrick Joly

- *Introduction à la discrétisation des équations aux dérivées partielles*, ENSTA ParisTech (1st year)
- *Propagation des ondes dans les milieux périodiques*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Nicolas Kielbasiewicz

- *Programmation scientifique et simulation numérique*, ENSTA ParisTech (2nd year)
- *Parallélisme et calcul réparti*, ENSTA ParisTech (Master 2)

Marc Lenoir

- *Fonctions d'une variable complexe*, ENSTA ParisTech (2nd year)
- *Equations intégrales*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)
- *Méthodes asymptotiques hautes fréquences pour les équations d'ondes - course notes*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Eric Lunéville

- *Introduction au Calcul Scientifique*, ENSTA ParisTech (2nd year).
- *Programmation scientifique et simulation numérique*, ENSTA ParisTech (2nd year).
- *Propagation dans les guides d'ondes*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Jean-François Mercier

- *Outils élémentaires d'analyse pour les équations aux dérivées partielles*, ENSTA Paris-Tech (1st year)
- *Fonctions d'une variable complexe*, ENSTA ParisTech, ENSTA ParisTech (1st year)
- *Théorie spectrale des opérateurs autoadjoints et application aux guides optiques*, ENSTA ParisTech (2nd year)

Axel Modave

- *Finite Element Methods*, ENSTA ParisTech (2nd year)
- *High Performance Scientific Computing*, ENSTA ParisTech (2nd year)
- *Parallel Scientific Computing*, ENSTA ParisTech (3rd year), and Master "Analysis, Modelling, Simulation" (M2)
- *Mathematical Models and their Discretisation in Electromagnetism*, ENSTA ParisTech (3rd year), and Master "Analysis, Modelling, Simulation" (M2)

### 10.2.2. Supervision

PhD: Luca Desiderio, "H-matrix based Solvers for 3D Elastodynamic Boundary Integral Equations", January 2017, Stéphanie Chaillat and Patrick Ciarlet

PhD: Laure Pesudo, "Modélisation de la réponse ultrasonore de défauts de type fissure par méthode BEM et couplage à un modèle de propagation - Application à la simulation des contrôle non destructifs", October 2017, Marc Bonnet

PhD in progress : Zouhair Adnani, "Modélisation numérique tridimensionnelle des effets de site en interaction sol-structure par une méthode adaptée aux problèmes sismiques de très grande taille", October 2014, Marc Bonnet and Stéphanie Chaillat

PhD in progress : Antoine Bensalah, "Une approche nouvelle de la modélisation mathématique et numérique en aéroacoustique par les équations de Goldstein et applications en aéronautique", October 2014, Patrick Joly and Jean-François Mercier

PhD in progress : Antoine Bera, "Conception de perturbations invisibles pour les ondes électromagnétiques ou acoustiques", October 2016, Anne-Sophie Bonnet-Ben Dhia and Lucas Chesnel

PhD in progress :Léandre Giret, "Development of a domain decomposition method on non-conforming meshes: application to the modeling of a Reactivity-Initiated Accident (RIA) in a Pressurized Water Reactor (PWR)", October 2014, Patrick Ciarlet

PhD in progress :Sandrine Paolantoni, "Analyse spectrale et simulation numérique de la diffraction électromagnétique par des métamatériaux", October 2016, Christophe Hazard and Boris Gralak

PhD in progress : Arnaud Recoquillay, "Identification de défauts dans un guide d'ondes en régime temporel", October 2014, Laurent Bourgeois

PhD in progress : Yohanes Tjandrawidjaja, "Modélisation de la propagation d'ondes guidées et de leur interaction avec des défauts localisés dans une plaque élastique anisotrope pour des applications en SHM", October 2016, Anne-Sophie Bonnet-Ben Dhia and Sonia Fliss

PhD in progress : Emile Parolin, "Non overlapping domain decomposition methods with non local transmission conditions for electromagnetic wave propagation", October 2017, PPatrick Joly and Xavier Claeys

PhD in progress : Clément Beneteau, "Asymptotic analysis of time harmonic Maxwell equations in presence of metamaterials", October 2017, Sonia Fliss and Xavier Claeys

PhD in progress : Hajer Methenni, "Mathematical modelling and numerical method for the simulation of ultrasound structural health monitoring of composite plates ", October 2017, Sonia Fliss and Sébastien Impériale

PhD in progress : Damien Mavaleix, ""Modeling of the fluid-structure interaction resulting from a remote underwater explosion", December 2017, Marc Bonnet and Stéphanie Chaillat

PhD in progress : Yacine Abourrig, "Boundary element method for modeling electromagnetic non-destructive testing: perturbative techniques for efficient and accurate parametric studies involving multiple simulations", October 2017, Marc Bonnet and Edouard Demaldent

## RAPSODI Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. General Chair, Scientific Chair

Claire Chainais-Hillairet was general chair of the organisation committee of FVCA8 held in Lille on June 12-16, 2017. Clément Cancès was general chair for the Journée de la Fédération de Recherche Mathématique du Nord-Pas-de-Calais on October, 4. He also organized the closing day of the ANR Geopor on Nov. 7, 2017.

Emmanuel Creusé is a member of the organizing committee of the Study Week Mathematics-Enterprises, which will take place in Lille from January 2018, 29 to February 2018, 02. (see <https://indico.math.cnrs.fr/event/2413/>).

Thomas Rey was a main organizer of the Microturbu workshop held in Lille on Oct. 19–20, 2017.

##### 9.1.1.2. Member of the Organizing Committees

The whole team RAPSODI was involved in the organization of the FVCA8 conference.

#### 9.1.2. Scientific Events Selection

##### 9.1.2.1. Chair of Conference Program Committees

Clément Cancès edited the proceedings of FVCA8 together with Pascal Omnes (CEA Saclay & Univ. Paris Nord).

##### 9.1.2.2. Reviewer

Several member of the team RAPSODI were deeply involved in the reviewing process for the FVCA8 proceedings.

#### 9.1.3. Journal

##### 9.1.3.1. Member of the Editorial Boards

C. Chainais-Hillairet is a member of the editorial board of the North-Western European Journal of Mathematics (<http://math.univ-lille1.fr/nwejm/>) and of the International Journal on Finite Volumes (<http://www.i2m.univ-amu.fr/IJFV/>).

##### 9.1.3.2. Reviewer - Reviewing Activities

The members of the team RAPSODI reviewed numerous papers for numerous international journals.

#### 9.1.4. Invited Talks

- C. Cancès was an invited speaker at the MAMERN'11 conference organized at Oujda (Morocco) on May 17-20, 2017: <http://mamern11.ump.ma/>. He was invited to give talks in several workshops (Oberwolfach ×2, workshop on Finite Volumes in Nice, minisymposium on porous media flows in ENUMATH). He was also invited to give several seminars in France (Inria Paris-LJLL, ENS Rennes, IFPEN Rueil-Malmaison) or abroad (Bonn).
- C. Chainais-Hillairet was an invited plenary speaker at the SMAI Conference held in Ronce les Bains in June 2017. She gave talks in workshops: workshop on Finite Volumes in Nice and Journées multiphasiques et incertitudes in Nantes in October 2017. She was invited to give lectures in two CIMPA Summer Schools: 10 hours lectures in Ifrane (Summer school on numerical analysis and partial differential equations, May 2017) and 8 hours lectures in Kanpur (Summer school on multiscale computational methods and error control, July 2017).

- E. Creusé was invited to give a seminar at LAMFA in Amiens. He also gave talks in International conferences (NUMELEC, Paris and ACOMEN, Ghent) and workshops (GATIPOR, Paris).
- I. Lacroix-Violet was invited to give a seminar at LAMFA in Amiens.
- T. Rey was invited to give plenary talks in several workshops: Mafran Days in Cambridge, Computational Methods in Kinetic Theory and Related Models in Toulouse, and Mathematical Aspects of Fluids: Kinetic and Dynamics at ENS Paris

### 9.1.5. Scientific Expertise

C. Cancès reported on scientific proposals for the Croatian Science Foundation (HRZZ).

### 9.1.6. Research Administration

C. Cancès is the head of the MaNu Research Group (GdR MaNu, <http://gdr-manu.math.cnrs.fr/>) funded by the Institute for Mathematical Sciences and Interaction (INSMI) of the French National Center for Research (CNRS).

During the training year 2016-2017, E. Creu   got an Inria partial delegation (50%). He had in charge to develop some actions promoted by AMIES (Agency for Mathematics in Interaction with Business and Society). More particularly, his action was devoted to several characteristic points:

Management of some PEPS (First support for exploratory projects). Discussions to initiate collaborations between academic researchers in Mathematics and industrial partners,

Talks and meeting animations to promote mathematical studies to high school pupils and their teachers, as well as to bachelor students (in Lens, Lille, Douai).

Presentation of AMIES to the Mathematical Laboratories of the region Hauts-de-France (Lille, Calais, Lens, Amiens, Valenciennes).

Creation of CIME, a node of the network "MSO" (Modelisation - Simulation - Optimisation) developed by AMIES (<http://cime.math.cnrs.fr/>). CIME is a structure which allows enterprises to find easier mathematician collaborators in the Hauts-de-France, either in the mathematical teams of Inria Lille Nord Europe, or in the mathematical laboratories of the region.

Participation to some national events (RUE (Paris, March 2017) - TERATEC (Palaiseau, June 2017), FEM (Paris, December 2017)).

Participation to the monthly AMIES meeting.

Organisation of the Mathematical Study Week in Mathematics, which will take place in Lille in January 2018.

C. Chainais-Hillairet is head of the Commission Emplois de Recherche of the Lille - Nord Europe Inria research center.

C. Calgaro is a member of the Commission de la Formation et de la Vie Universitaire of the Academic Council of Universit   Lille 1.

I. Lacroix-Violet, B. Merlet and Thomas Rey are members of the Conseil du Laboratoire Paul Painlev  .

C. Canc  s and B. Merlet are members of the commission des th  ses of the Ecole doctorale.

I. Lacroix-Violet was organizing the weekly seminar of the ANEDP team of the Paul Painlev   laboratory until last July. She was substituted by T. Rey in September 2017.

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Teaching

The group is strongly involved in teaching at the Universit   Lille 1. C. Calgaro is in charge respectively of the Master of Mathematical Engineering. C. Chainais-Hillairet was in charge of the Master 2 of Scientific Computing until July 2017. She was substituted by B. Merlet for this task. E. Creus   is responsible of the "Cursus Master Ing  nierie" in Mathematics, Lille 1 University. C. Canc  s gave lectures at Polytech' UPMC.

### 9.2.2. Supervision

HdR: Ingrid Lacroix-Violet defended her habilitation thesis on Nov. 24, 2017. *Comportements asymptotiques, conditions aux limites et analyse numérique pour des modèles fluides*, Univ. Lille 1.

PhD: Ahmed Ait Hammou Oulhaj defended his PhD thesis on Dec. 11, 2017. *Design and analysis of nonlinear numerical schemes for solving parabolic problems: application to porous media flows*, Univ. Lille 1, advisors: C. Cancès & C. Chainais-Hillairet. *Design and analysis of nonlinear numerical schemes for solving parabolic problems: application to porous media flows*, since 01/10/2014, advisors: C. Cancès & C. Chainais-Hillairet.

PhD in progress: Claire Colin, *Analyse numérique et simulations de modèles multifluides*, since 01/10/2015, advisors: C. Calgaro & E. Creusé.

PhD in progress: Luca Ferrari, *Line energies and applications to image reconstruction of partially masked objects*, since 01/09/2015, advisors: A. Chambolle (CNRS & CMAP, École Polytechnique) & B. Merlet.

PhD in progress: Nicolas Peton, *Numerical methods for a stratigraphic model with nonlinear diffusion and moving frontier areas*, 15/10/2015, C. Cancès, Q. H. Tran (IFPEN) & S. Wolf (IFPEN).

PhD in progress: Antoine Zurek, *Numerical and theoretical analysis of models describing the corrosion of materials*, since 01/10/2016, advisors: C. Chainais-Hillairet & B. Merlet.

Master internship: Aymeric Nayet, *Development and parallelization on GPU of a C++ code for the resolution of a  $2D \times 2D$  kinetic equation with BGK relaxation*, supervisor: T. Rey.

Master internship: Anissa El Keurti, *Study of an upwind finite volume scheme for non-local transport equation*, supervisor: T. Rey.

### 9.2.3. Juries

C. Cancès reported on Laurent Quaglia's PhD thesis, defended on Dec. 13, 2017 at Aix-Marseille Univ. Title: *Contribution à l'étude des écoulements diphasiques avec capillarité*.

C. Chainais-Hillairet reported on:

- Clémentine Courtès' PhD thesis, defended on Nov. 23, 2017 at Univ. Paris-Sud (Orsay). Title: *Analyse numérique de systèmes hyperboliques-dispersifs*.
- Laurent Quaglia's PhD thesis, defended on Dec. 13, 2017 at Aix-Marseille Univ. Title: *Contribution à l'étude des écoulements diphasiques avec capillarité*.
- Christophe Le Potier's HdR, defended on Nov. 15, 2017 at Univ. Paris-Est (Marne-la-Vallée). Title: *Construction et développement de nouveaux schémas pour des problèmes elliptiques ou paraboliques*.

E. Creusé reported on:

- Sarah Ali Hassan's PhD thesis, defended on June 26, 2017 at UPMC Paris 6. Title: *Estimations d'erreur a posteriori et critères d'arrêt pour des solveurs par décomposition de domain et avec des pas de temps locaux*.
- Rita Riedlbeck's PhD thesis, defended on November 27, 2017 at Montpellier University. Title: *Algorithmes adaptatifs pour la poro-mécanique et la poro-plasticité*.

B. Merlet reported Sylvain Dotti's PhD thesis, defended on Dec. 4, 2017 at Aix-Marseille Univ. Title: *Numerical approximation of hyperbolic stochastic scalar conservation laws*.

C. Calgaro and E. Creusé were members of the PhD's jury of Abdullatif Ellawy, defended on Dec. 14, 2017, at Lille 1 University. Title : *Propriétés qualitatives de quelques systèmes de la mécanique des fluides incompressibles*.



C. Cancès was a member of the jury of the PhD thesis of Van Thanh Nguyen, defended on Oct. 3, 2017 at the University of Limoges. Title: *Problèmes de transport partiel optimal et d'appariement avec contrainte*.

C. Chainais-Hillairet was a member of the following juries:

- PhD's jury of Maxime Herda defended on September 20, 2017 at the University of Lyon 1. Title: *Analyse asymptotique et numérique de quelques modèles pour le transport de particules chargées*.
- PhD's jury of Sarah Leclavier defended on December 12, 2017 at the University of Rouen. Title: *Volumes finis et solutions renormalisées, application à des systèmes couplés*.
- HdR's jury of Ingrid Lacroix-Violet defended on November 24, 2017 at Lille 1 University. Title: *Comportements asymptotiques, conditions limites et analyse numérique pour des modèles fluides*.

T. Rey was a member of the PhD's jury of Ward Melis, defended in March 2017 at KU Leuven. Title: *Projective integration for hyperbolic conservation laws and multiscale kinetic equations*.

C. Calgaro and C. Cancès are members of the Jury de l'Agrégation de Mathématiques, which is a national hiring committee for the highest level of high-school teachers.

### 9.3. Popularization

C. Calgaro is in charge of the communication of "Laboratoire Paul Painlevé" and she is in charge of the relation between the University of Lille 1 and high schools. Accordingly, she organizes various events which promote mathematics among young peoples like:

Les Mathématiques itinérantes (<http://mathematiques.univ-lille1.fr/Ouvertures/Mathematiques-itinerantes/>)

La semaine des Mathématiques (<http://mathematiques.univ-lille1.fr/Ouvertures/Mathematiques-itinerantes/>)

Stage en sciences pour les élèves de seconde (<http://www.univ-lille1.fr/etudes/stageseconde>)

Members of the team participate regularly in these actions.

## APICS Project-Team

## 8. Dissemination

### 8.1. Promoting Scientific Activities

- L. Baratchart gave a talk at SEAM 2017 <https://www.math.utk.edu/SEAM/> and organized a scientific session at AIP 2017 <http://aip2017.csp.escience.cn/dct/page/1>.
- J. Leblond presented oral communications at the Conference “Cerveau.at.UCA”, <http://cauca2017.sciencesconf.org/>, Fréjus, France, Jun., at the Workshop ERNSI 2017, <http://ernsi2017.sciencesconf.org/>, Lyon, France Sept. and a poster at the Conference BACI 2017, <http://www.baci-conference.com/>, Bern, Switzerland, Aug.
- J.-P. Marmorat presented a poster at the 18th International Symposium on Applied Electromagnetic and Mechanics (ISEM), <http://www.isem2017.org/>, Chamonix, France, Sep.
- K. Mavreas presented oral communications at the Conference Tendances des Applications Mathématiques en Tunisie, Algérie, Maroc (TAMTAM), <http://indico.math.cnrs.fr/event/1335/overview>, Hammamet, Tunisia, May [13], at the 18th ISEM, <http://www.isem2017.org/>, Chamonix, France, Sep. [25], and at the PhD Seminar of the Research Center, Jun.
- C. Papageorgakis gave an oral communication at the Conference TAMTAM, <http://indico.math.cnrs.fr/event/1335/overview>, Hammamet, Tunisia, May [14], and at the Conference GRETSI 2017, <http://gretsi.fr/colloque2017/>, Juan-Les-Pins, France, Sep. [17].
- D. Martinez presented a poster at the International Microwave Symposium 2017 <https://ims2017.org/>, Hawaii, USA.
- G. Bose gave a talk at the International Conference on Electromagnetics in Advanced Applications <http://www.iceaa.net/j3/>, Verona, Italy, [15].
- A. Cooman presented a poster at the Workshop ERNSI 2017, <http://ernsi2017.sciencesconf.org/>, Lyon, France.
- M. Olivi gave a seminar at ONERA, Toulouse, January 12. She presented a poster at the Workshop ERNSI 2017, <http://ernsi2017.sciencesconf.org/>, Lyon, France.

#### 8.1.1. Scientific Events Organisation

##### 8.1.1.1. General Chair, Scientific Chair

- J. Leblond was the scientific chair of a mini-symposium at the Conference TAMTAM, <http://indico.math.cnrs.fr/event/1335/overview>, Hammamet, Tunisia, May.

##### 8.1.1.2. Member of the Organizing Committees

- K. Mavreas was one of the organizers of the PhD seminar of the Research Center, until Oct.

#### 8.1.2. Scientific Events Selection

##### 8.1.2.1. Member of the Conference Program Committees

L. Baratchart was a member of the program committee of “Control and Distributed Parameter Systems”, Bordeaux, 2017.

#### 8.1.3. Journal

##### 8.1.3.1. Member of the Editorial Boards

L. Baratchart is an editor for “Complex Analysis and Operator Theory” (CAOT) and “Constructive Methods and Function Theory” (CMFT).

### 8.1.3.2. Reviewer - Reviewing Activities

S. Chevillard was a reviewer for the journal *Transactions on Computers*.

J. Leblond was a reviewer for the journals *Czechoslovak Mathematical Journal*, *Annals of West University of Timisoara - Mathematics and Computer Science*, *ESAIM: Control, Optimisation and Calculus of Variations*, *Adv. in App. Clifford Algebras*, *ARIMA*, *Numerical Algorithms*.

F. Seyfert was a reviewer for the journal *IEEE Microwave Theory and Techniques*.

M. Olivi was a reviewer for the journal *Automatica*.

### 8.1.4. Invited Talks

L. Baratchart was an invited speaker at the conference “Complex and Functional Analysis and their interactions with Harmonic Analysis”, Bedlewo, Poland (June) <https://plas.mat.umk.pl/etcafa/cfaha.html> and at the “Harmonic Analysis and Inverse Problems” session of the Mathematical Congress of the Americas, Montreal, Canada (Jul.) <https://mca2017.org/prog/sessions/scientific>. He was a plenary speaker at the conference “Complex and Harmonic Analysis”, Holon, Israel (June) <http://www.hit.ac.il/acc/golberga/CHA17/CHA17.html> and an invited speaker at the “Mid-western Workshop on Asymptotic Analysis”, Indianapolis, USA (October) <http://mwaa.math.iupui.edu/>, as well as an invited speaker at the conference “Mathematics, Signal Processing and Linear Systems: New Problems and Directions”, <http://www1.chapman.edu/~mbvajiac/conferences/2017Conference.html>, Chapman University, Orange, CA, USA, Nov.

J. Leblond was an invited speaker at the 17ème Journée Calcul Scientifique et Modélisation Mathématique d’Amiens, <http://www.lamfa.u-picardie.fr/desveaux/JCS17/journeeCS16.html>, June, at the Conference on Control of Distributed Parameter Systems (CDPS 2017), <http://indico.math.cnrs.fr/event/1363/>, Bordeaux, July, at the annual days of GdR AFHP, <http://www.math.u-bordeaux.fr/~sgolenia/GDR/>, Bordeaux, Oct., and at the Conference Mathematics, Signal Processing and Linear Systems: New Problems and Directions, <http://www1.chapman.edu/~mbvajiac/conferences/2017Conference.html>, Chapman University, Orange, CA, USA, Nov.

M. Olivi was invited to give a communication at the symposium “Mathematics in Knowledge Engineering and Data Science - Identifying Connections”, June 30, in Maastricht, the Netherlands.

### 8.1.5. Scientific Expertise

F. Seyfert is a member of the IEEE MTT-8 Technical Committee on Filters and Passive Components

### 8.1.6. Research Administration

L. Baratchart sits on the committee “Mathématiques et Informatique” of the French Agency for research (ANR).

J. Leblond is an elected member of the “Conseil Scientifique” and of the “Commission Administrative Paritaire” of Inria. Until April, she was a member of the “Conseil Académique” of the Univ. Côte d’Azur (UCA).

## 8.2. Teaching - Supervision - Juries

### 8.2.1. Teaching

**Graduate course:** L. Baratchart gave a graduate course titled “Introduction to Inverse Problems” (40 hours) at Vanderbilt University, Nashville, Tennessee.

**Colles:** S. Chevillard is giving “Colles” at Centre International de Valbonne (CIV) (2 hours per week).

**Summer School:** M. Olivi gave two lectures at the 38-th summer school of automatic control, Grenoble, September 11-15: “Optimization-based model reduction” with P. Vuillemin (Onera) and “Applications in electronics: design of frequency filters and stability analysis of amplifiers”.

### 8.2.2. Supervision

PhD: C. Papageorgakis, *Conductivity model estimation*, since October 2014 (advisors: J. Leblond, M. Clerc, M. Rusiniak), defended Dec. 15th [10].

PhD in progress: K. Mavreas, *Inverse source problems in planetary sciences: dipole localization in Moon rocks from sparse magnetic data*, since October 2015 (advisors: S. Chevillard, J. Leblond).

PhD in progress: D. Martinez Martinez, *Méthodologie et Outils de Synthèse pour des Fonctions de Filtrage Chargées par des Impédances complexes*, since October 2015, advisors: L. Baratchart and F. Seyfert.

PhD in progress: G. Bose, *Filter Design to Match Antennas*, since December 2016, advisors: F. Ferrero and F. Seyfert.

PhD in progress: S. Fueyo, *Cycles limites et stabilité dans les circuits*, since October 2016, advisors: L. Baratchart and J.-B. Pomet.

### 8.2.3. Juries

L. Baratchart was a referee of the “Mémoire d’habilitation” by Nicolas Brisebarre (ENS de Lyon).

J. Leblond was a member of the “Jury d’admissibilité du concours CR2” of the Inria Research Center Nancy Grand Ouest and of the “Comité de Sélection” for professors at UNSA (Polytech Nice), in March. She was a member of the PhD thesis defense committee of Lobna Merghmi, Aix-Marseille Université, Institut de Math. de Marseille (I2M), Jan.

M. Olivi was a reviewer for the PhD document of Igor Pontes-Duff-Pereira, université de Toulouse, January 11. She was a member of the PhD thesis defense committees of Afrooz Ebadat, KTH, Stockholm, September 8, and Yusuf Bhujwalla, université de Lorraine, Nancy, December 5. She was a member of the “jury d’admission du concours CR” of Inria.

## 8.3. Popularization

- M. Olivi is responsible for Scientific Mediation and president of the Committee MASTIC (Commission d’Animation et de Médiation Scientifique) <https://project.inria.fr/mastic/>. Her main contributions related with this mission were:
  - management of the contract “région PACA: Science Culture Lycée” and organization of about thirty conferences in the high schools of the region (100 students per conference),
  - co-organization of 10 robotics sessions for 2 classes of middle school students (device “MEDITES” <http://medites.fr>, founded by ANRU, the “Agence Nationale de Renovation Urbaine”),
  - co-organization of the “stage MathC2+”, a four-day internship for 50 high school students (“secondes”, about 16 years old) organized by the Committee MASTIC and its partners (June 14-17),
  - co-organization of Inria participation to the event “Le Village des Sciences et de l’Innovation” in Antibes (October 7 & 8, 10000 people),
  - co-organization of about 10 “cafés scientifiques” (c@fé-in’s and cafés Techno, 30 to 80 participants each),
  - supervision of a (2 months) internship, done by Sabrina Ballauris, for the realization of objects to manipulate, in view of illustrating some mathematical results and scientific principles (Pythagora’s puzzles, Galton’s board, Galileo’s experiment, the fastest toboggan, ...)

She was a member of the scientific committee of the “Forum Mathématiques Vivantes”, a national event (initiated by CFEM, the French Commission for Mathematics Education, <http://forum-maths-vivantes.fr/>) organized in Lille, Lyon, Rennes, Toulouse during the Mathematics Week. She participated into the reviewing process for the book “Panorama Mathématiques et Langages” published in this occasion by CFEM.

- M. Olivi animated two half-day workshop sessions “activités débranchées” at “l’ESPE de Nice” for primary school students (March 16 & 24), 200 students each session). She gave three presentations for high school students in Gap and Marseille. With K. Mavreas, she participates to the event “Le Village des Sciences et de l’Innovation” in Antibes (October 7 & 8, 10000 people).
- A. Cooman gave a presentation at the “stage MathC2+”, a four-day internship for high-school students organized by the Committee MASTIC and its partners (June 14-17).

## **BIPOP Project-Team**

# **10. Dissemination**

## **10.1. Promoting Scientific Activities**

### **10.1.1. Scientific Events Organisation**

#### *10.1.1.1. Member of the Conference Program Committees*

- Pierre-Brice Wieber, Associate Editor for Humanoids 2017 and ICRA 2018.
- Florence Bertails-Descoubes, Program Committee member for ACM Siggraph 2018, Eurographics 2018, and ACM-EG Symposium on Computer Animation 2017.
- Vincent Acary, Program Committee member for 9th European Nonlinear Dynamics Conference (ENOC 2017) in Budapest, Hungary.

### **10.1.2. Journal**

#### *10.1.2.1. Member of the Editorial Boards*

- Bernard Brogliato is Associate Editor for ASME Journal of Nonlinear and Computational Dynamics.
- Bernard Brogliato is Associate Editor for Nonlinear Analysis: Hybrid Systems.
- Pierre-Brice Wiever is Associate Editor for IEEE Transactions on Robotics.

#### *10.1.2.2. Reviewer - Reviewing Activities*

- Arnaud Tonnelier is reviewer for Physical Review E and Journal of Computational and Nonlinear Dynamics
- Vincent Acary, reviewer for Computer Methods in Applied Mechanics and Engineering (CMAME), Engineering Structures, IEEE Transactions on Haptics, International Journal for Numerical Methods in Engineering, Journal Sound and Vibrations, International Journal of Geological Engineering, Comptes Rendus de l'Académie des sciences, ASME Journal of Computational and Nonlinear Dynamics, Multibody systems Dynamics
- Bernard Brogliato, reviewer for IEEE Transactions on Automatic Control, Optimization Letters, Multibody System Dynamics, SIAM journal on Optimization and Control, Automatica, Journal of Optimization Theory and Applications, SIAM Journal of Applied Dynamical Systems, etc.

### **10.1.3. Invited Talks**

- Bernard Brogliato was invited speaker at the Sliding Mode Control summer school in Graz (September 2017).
- Florence Bertails-Descoubes was invited talk at the Institut Jean le Rond d'Alembert seminar in Paris (September 2017).

### **10.1.4. Research Administration**

- Bernard Brogliato was member of the Commission d'Orientation Scientifique (COS) of Inria Grenoble until June 2017.

## **10.2. Teaching - Supervision - Juries**

### **10.2.1. Teaching**

Master : Florence Bertails-Descoubes, module IRL (Introduction à la Recherche), 1.5 éq TD, ENSIMAG 2A.

Master : Vincent Acary, 17H éq TD Systèmes dynamiques, ENSIMAG 2A.

### 10.2.2. Supervision

HdR : Florence Bertails-Descoubes, Numerical Modeling of elastic slender structures subject to contact and friction: From dynamic simulation to inverse static design, Grenoble Universités. Defended the 30th of May, 2017.

PhD : Alejandro Blumentals, Numerical modelling of thin elastic solids in contact. Defended the 3rd of July, 2017. Supervised by B. Brogliato and F. Bertails-Descoubes.

Alexandre Vieira, Optimal Control of Linear Complementarity Systems, October 2015, B. Brogliato and C. Prieur.

Nestor Bohorquez, October 2015, P.-B. Wieber.

Nahuel Villa, October 2016, P.-B. Wieber.

Matteo Ciocca, March 2017, P.-B. Wieber and T. Fraichard (Inria team Pervasive Interaction).

### 10.2.3. Juries

- Bernard Brogliato was member of the HdR jury of Laurentiu Hetel (CR CNRS, LAGIS Ecole Centrale de Lille), 14 juin 2017.
- Guillaume James was a referee for the PhD thesis of Huong Le Thi, Université de Nice (16 June, 2017).
- Bernard Brogliato was member of the HdR jury of Alexandre Kruszewski (MdC Ecole Centrale de Lille), 12 décembre 2017.
- Bernard Brogliato was member of the PhD thesis jury of Maxime Feigensicht (11 décembre 2017), Inria Lille.
- Bernard Brogliato was member of the PhD thesis jury of Sébastien Crozet (08 décembre 2017) , CEA LIST.
- Florence Bertails-Descoubes was member (examiner) of the PhD thesis jury of Vincent Barrielle (24 novembre 2017), CentraleSupélec, Rennes.
- Vincent Acary, member of Ph.D. Thesis committee of Clara Issanchou (25 September 2017), Université Pierre et Marie Curie .

## 10.3. Popularization

Alejandro Blumentals and Florence Bertails-Descoubes have participated in the new showroom “login”, by setting up a fiber demo. The demo allows a user to manipulate a real fiber by moving and twisting the ends, creating self-coiling structures called plectonema. In parallel to real manipulations, a simulation reproduces in real-time the deformations of a rod undergoing the same constraints, which reveals similar patterns compared to the real experiment. The simulation relies upon the optimal control framework set up by Alejandro Blumentals in his PhD thesis, which allows to simulate the quasistatic deformation of a thin elastic rod in the presence of self-contact.

## COMMANDS Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Selection

#### 10.1.1.1. Member of the Conference Program Committees

- F. Bonnans: PGMO Days 2017.

### 10.1.2. Journal

#### 10.1.2.1. Member of the Editorial Boards

- F. Bonnans: Associate Editor of “Applied Mathematics and Optimization” and of “Series on Mathematics and its Applications, Annals of The Academy of Romanian Scientists”.

#### 10.1.2.2. Reviewer - Reviewing Activities

Reviews in 2017 for major journals in the field: Applied Mathematics and Optimization, Automatica, Int. J. of Control, Inverse problems, J. Convex Analysis, J. Diff. Equations, J. of Optimization Theory and Applications, Optimization Set Valued and Variational Analysis, SIAM J. Optimization, SIAM J. Control and Optimization, several conference proceedings.

### 10.1.3. Invited Talks

- F. Bonnans: Forecasting and risk management for renewable energy, June 7-9, Paris; Numoc, June 19-23, Roma; NHOC2017, July 3-5, Porto; Optimal Control of Partial Differential Equations, Sept, Castro Urdiales.

### 10.1.4. Leadership within the Scientific Community

- F. Bonnans: French representative to the IFIP-TC7 committee (International Federation of Information Processing; TC7 devoted to System Modeling and Optimization).
- F. Bonnans: member of the PGMO board and Steering Committee (Gaspard Monge Program for Optimization and Operations Research, EDF-FMJH).

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

Master :

F. Bonnans: *Numerical analysis of partial differential equations arising in finance and stochastic control*, 24h, M2, Ecole Polytechnique and U. Paris 6, France.

F. Bonnans: *Optimal control*, 15h, M2, Optimization master (U. Paris-Saclay) and Ensta, France.

F. Bonnans: *Stochastic optimization*, 15h, M2, Optimization master (U. Paris-Saclay), France.

A. Kröner : *Optimal control of partial differential equations*, 20h, M2, Optimization master (U. Paris-Saclay), France.

### 10.2.2. Supervision

PhD in progress : Cédric Rommel, Data exploration for the optimization of aircraft trajectories. Started November 2015 (CIFRE fellowship with Safety Line), F. Bonnans and P. Martinon.

PhD in progress : Arthur Le Rhun, Optimal and robust control of hybrid vehicles. Started September 2016 (IFPEN fellowship), F. Bonnans and P. Martinon.

## 10.3. Popularization

The collaboration with startup Safety Line was presented at events “Vivatech” (17/06/2017, <https://vivatechnology.com/>) and “Rencontre Inria Industrie” (17/10/2017) in Paris.



## DISCO Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. Member of the Organizing Committees

- Frederic Mazenc has organized with Pablo Monzon, Alvaro Castaneda and Gonzalo Robledo the "Workshop and Spring School on Stability and Dichotomies on Differential and Delay Equations" of the Universidad de Chile, Facultad de Ciencias, October 17-26, 2017.

#### 10.1.2. Scientific Events Selection

- Frederic Mazenc and Ali Zemouche were Associate Editor for the conferences 2018 American Control Conference, Milwaukee, USA, and the 56th IEEE Conference on Decision and Control, Melbourne, USA, (2017).
- Frederic Mazenc was Associate Editor for the European Control Conference, Limassol, Cyprus (2018).
- Ali Zemouche has co-organized three invited sessions in international conferences (*IEEE-ACC 2018*, *Workshop on Advanced Control and Diagnosis*, *ACD 2017*, *International Conference on Systems and Control*, *ICSC 2017*).

#### 10.1.2.1. Chair of Conference Program Committees

- Ali Zemouche was an invited session chair of the "14th International Workshop on Advanced Control and Diagnosis, ACD 2017", which was held at Politehnica University of Bucharest, Romania, from 16 to 17 November 2017.
- International Society of Difference Equations (ISDE) Board of Directors has favorably voted for the proposal submitted by Sorin Olaru to organize the International Conference on Difference Equations and Applications (ICDEA) in 2021 in Paris Saclay.
- Guillaume Sandou is a member of the Program Committee of the IEEE Symposium on Computational Intelligence in Production and Logistics Systems, 2017, Hawaii, USA

#### 10.1.2.2. Member of the Conference Program Committees

- Catherine Bonnet was a member of the *Comité International Scientifique* de MADEV17, Rabat, Morocco.
- Frederic Mazenc is member (Associate Editor) of the *Control Editorial Board - IEEE - CSS*.
- Ali Zemouche is member (Associate Editor) of the *Control Editorial Board - IEEE - CSS*.
- Ali Zemouche was involved in the Technical Program Committee and International Program Committee of the following international conferences:
  - IEEE American Control Conference, ACC 2017;
  - Workshop on Advanced Control and Diagnosis, ACD 2017;
  - International Conference on Systems and Control, ICSC 2017;
  - Australian and New Zealand Control Conference, ANZCC 2017;
  - International Conference on Electrical Engineering and Control Applications, ICEECA 2017.

#### 10.1.2.3. Reviewer

The team reviewed papers for several international conferences including IEEE Conference on Decision and Control, IEEE American Control Conference, European Control Conference, IFAC World Congress.

### 10.1.3. Journal

#### 10.1.3.1. Member of the Editorial Boards

Frederic Mazenc is member of the editorial boards (Associate Editor) of the following journals:

- IEEE Transactions on Automatic Control;
- European Journal of Control;
- Journal of Control and Decision.

Sorin Olaru is member of the editorial boards (Associate Editor) of the following journals:

- IMA Journal of Mathematical Control and Information;
- IEEE CSS-Letters.

Ali Zemouche is member of the editorial boards (Associate Editor) of the following journals:

- SIAM Journal on Control and Optimization;
- European Journal of Control;
- Cogent Engineering.
- Managing Guest Editor for a **Special Issue** in European Journal of Control
  - Title: Advanced Control and Observers for Complex Systems via LMIs
  - Organizers: Ali Zemouche et al.
  - url: <https://www.journals.elsevier.com/european-journal-of-control/call-for-papers/special-issue-on-advanced-control-and-observer-design-for-no>

#### 10.1.3.2. Reviewer - Reviewing Activities

The team reviewed papers for several journals including SIAM Journal on Control and Optimization, Automatica, IEEE Transactions on Automatic Control, IEEE Control Systems Magazine, Systems and Control Letters.

### 10.1.4. Invited Talks

Stefanella Boatto gave a talk entitled '*Modeling epidemics dynamics due to Aedes mosquitoes : the example of Rio de Janeiro and how to approximate an epidemic attractor*', Université de Bordeaux, 22 Dec 2017, a talk entitled '*The N-body problem on surfaces, Maxwell laws and the axioms of Mechanics*', Fluid mechanics seminar, Dept. Mechanical Engineering, Universitat Rovira i Virgili, Tarragona, Spain, 30 June 2017, a talk entitled '*SIR-Network model : epidemics dynamics in a city & climate variations*', Seminar of Analysis and Differential Equations, Dept. of Mathematics, University of Lisbon, Portugal, 20 June 2018, a talk entitled '*The N-body problem on surfaces, Maxwell laws and the axioms of Mechanics*', IA Seminar, Physics Dept., University of Lisbon, Portugal 22 June 2017, Vortex Dynamics Group, a talk entitled '*N-body on surfaces of revolution: the rôle played by curvature and topology*', School of Mathematics and Statistics, University of St. Andrews, UK, February 2017.

Catherine Bonnet and Frédéric Mazenc gave a talk entitled '*Modeling and Analysis of Cell Dynamics in Acute Myeloid Leukemia*', Institute of Disease Modeling, Seattle, USA, 30 May 2017.

Ali Zemouche gave a talk entitled '*Nonlinear observer design for Lipschitz systems*', University of Toulon (IUT de Toulon, France).

Ali Zemouche gave a talk entitled '*Observer-based stabilization of uncertain nonlinear systems via LMIs*', Deakin University (Geelong, Australia).

Frédéric Mazenc gave a talk entitled '*Model reduction and predictor control*', the Departamento de Ingeniería de Control y Robotica of the Universidad Nacional Autónoma de México, Mexico-city, August 2017.

Frédéric Mazenc gave several talks and lectures to the "Workshop and Spring School on Stability and Dichotomies on Differential and Delay Equations" of the Universidad de Chile, Facultad de Ciencias, Santiago de Chile, October 17-26, 2017.

Frédéric Mazenc was one of the speakers of the tutorial session entitled "Tutorial on time-delay and sampled-data systems" organized by Alexandre Seuret and Emilia Fridman in the IFAC World Congress of Toulouse, 9-14 July 2017. The title of his talk was *Model reduction and predictor control*.

#### 10.1.5. Leadership within the Scientific Community

Catherine Bonnet is a member of the IFAC Technical Committees *Distributed Parameter Systems* and *Biological and Medical Systems*. She is a member of the SIAG/CST (SIAM Activity group Control System Theory) steering committee (2015-2017) and a member of the management committee of the COST Action FRACTAL (2016-2020).

Sorin Olaru is a member of the IFAC Technical Committees *Robust Control* and the IFAC CSS TC on *hybrid systems*.

Ali Zemouche is member of the IFAC Technical Committee *Non-Linear Control Systems*.

#### 10.1.6. Scientific Expertise

Catherine Bonnet is a member of the Evaluation Committee of Inria since September 2015.

Since 2014, Frédéric Mazenc is an expert for the FNRS (Belgium). His mission consists in evaluating research projects funded by this institution.

Since 2012, Frédéric Mazenc is a, expert for the ANVUR (National Agency for the Evaluation of Universities and Research Institutes, Italy). His mission consists in evaluating the contribution of Italian scientists.

Since 2011, Frédéric Mazenc is a, expert for the Romanian National Council for Development and Innovation (Romania). His mission consists in evaluating research projects funded by the this institution.

#### 10.1.7. Research Administration

Catherine Bonnet is a member of the administration council of the association *Femmes et Mathématiques*, of the Parity Committee of Inria and of the *Cellule veille et prospective* of Inria (both created in 2015).

In 2017, Frédéric Mazenc was president of the commission scientifique du CRI Saclay-Ile-de-France. In 2017, Frédéric Mazenc was member of the Bureau du Comité des Projets du CRI Saclay-Ile-de-France. Since October 2017, he is Correspondant Inria Saclay A.M.I.E.S., <http://www.agence-maths-entreprises.fr/>

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

Master : Stefanella Boatto, Challenges in Biomathematical Modelling, 3h, M1, CentraleSupélec

Licence : Walid Djema, Computer Architecture and Assembly Programming, 40h, L1, University Paris-Saclay

Licence : Walid Djema, Computer Sciences project, 24h, L1, University Paris-Saclay

Master : Dina Irofti, Industrial IT services, Java, Networks, 64h, M1 and M2 University Paris-Sud

Master : Dina Irofti, Control Theory, Mathematics and Numerical Analysis, M1, 54h, ESIEE

Doctorat : Frederic Mazenc, introduction to the ordinary differential equations, Lypunov design, control and observation of nonlinear dynamical systems, 21h, PhD, International Graduate School on Control of the EECI, CentraleSupélec

Doctorat : Frederic Mazenc, Stability and Dichotomies on Differential and Delay Equations, 3 h, PhD, Universidad de Chile, Facultad de Ciencias

Licence : Sorin Olaru, Automatic Control, 8h , M1, SUPELEC, France

Licence : Sorin Olaru, Signals and systems, 8h , L3, SUPELEC, France

Licence : Sorin Olaru, Embedded systems, 8h , M1, Centrale Paris, France

Licence : Sorin Olaru, Numerical methods and Optimization, 24h, niveau M1, SUPELEC, France

Licence : Sorin Olaru, Hybrid systems, 16h, M2, SUPELEC, France  
 Licence : Guillaume Sandou, Signals and Systems, 87h, L3, CentraleSupélec  
 Licence : Guillaume Sandou, Mathematics and programming, 18h, L3, CentraleSupélec  
 Master : Guillaume Sandou, Automatic Control, 8h, M1, CentraleSupélec  
 Master : Guillaume Sandou, Numerical methods and optimization, 28h, M1 and M2, Centrale-Supélec  
 Master : Guillaume Sandou, Modelling and system stability analysis, 21h, M2, CentraleSupélec  
 Master : Guillaume Sandou, Control of energy systems, 22h, M2, CentraleSupélec  
 Master : Guillaume Sandou, Robust control and  $\mu$ -analysis, 9h, M2, CentraleSupélec  
 Master : Guillaume Sandou, Systems identification, 32h, M2, ENSTA  
 Master : Guillaume Sandou, System Analysis, 22h, M2, Ecole des Mines de Nantes  
 DUT : Ali Zemouche, Java Programing, 24 HTD, 2<sup>ème</sup> année DUT (Bac + 2), University of Lorraine, France

### 10.2.2. Supervision

PhD in progress : Saeed Ahmed, Bilkent University, Stability analysis and control of switched systems with time-delay. Supervisor : Hitay Ozbay. Co-supervisor : Frédéric Mazenc.  
 PhD in progress : Nadine Aoun, Modélisation de réseaux de chaleur et gestion avancée multi-échelles de la production, de la distribution et de la demande. Modeling and multi-scale advanced management of production, distribution and demand in district heating networks. Supervisor: Guillaume Sandou.  
 PhD in progress : Caetano Cardeliquio, Stability and stabilization of (possibly fractional) systems with delays. French Supervisor : Catherine Bonnet, Brazilian Supervisor : André Fioravanti.  
 PhD : Walid Djema, Understanding Cell Dynamics in Cancer from Control and Mathematical biology Standpoints - Particular Insights in the Modeling and Analysis Aspects in Hematopoietic Systems and Leukemia, Université Paris-Saclay, 21 November 2017. Supervisor : Catherine Bonnet. Co-supervisors : Jean Clairambault and Frédéric Mazenc.  
 PhD : Dina Irofti, Delay effects: a journey from multi-agent systems to genetic networks, Université Paris-Saclay, 18 July 2017. Supervisor : Silviu Niculescu. Co-supervisor : Islam Boussaada.  
 PhD in progress : Mohamed Lotfi Derouiche, Sur l'optimisation par métaheuristiques avancées de lois de commande prédictive non linéaire. On the optimization of nonlinear predictive control laws using advanced metaheuristics algorithms. Supervisor: Soufienne Bouallegue, Joseph Haggège et Guillaume Sandou.  
 PhD in progress : Nicolo Gionfra, Optimisation du pilotage d'un parc d'énergies renouvelables avec stockage et du réseau de distribution sous-jacent. Optimization of the control of a park of renewable sources considering storage means and distribution network. Supervisors: Houria Siguerdidjane et Guillaume Sandou.  
 PhD in progress : Juliette Pochet, Analyse de performance et de résilience d'une ligne de type RER équipée d'un automatisme CBTC. Analysis of the performance of a RER line with CBTC trains. Supervisor: Guillaume Sandou.  
 PhD in progress : Jean Mercat, Modele predictif des objets d'une scene routiere ; application à la sélection robuste des cibles pour les ADAS. Supervisor: Guillaume Sandou.  
 PhD in progress : Maxime Pouilly-Cathelain, Commande adaptative temps réel vis-a-vis de critères multiples de haut niveau. Supervisor : Guillaume Sandou.

### 10.2.3. Juries

Catherine Bonnet was a member of several recruiting committees: Junior Researcher competition in Inria Grenoble - Rhône-Alpes and Bordeaux - Sud-Ouest and Professor competition at Université de Nancy.

Catherine Bonnet was the President of the PhD Defense juries of Yacine Boukal '*Observation et commande des systèmes dynamiques d'ordre non entier*', 16 October 2017, Université de Nancy and of Jin Chi '*Stability analysis of systems with delay-dependant coefficients*', L2S, CentraleSupélec, 21 November 2017.

Sorin Olaru was a reviewer for the PhD thesis of JULIAN BARREIRO GOMEZ at Universiy of Catalunya in Barcelona.

Sorin Olaru was a reviewer of the HDR thesis of Christophe Louembet.

Guillaume Sandou was a reviewer of Khaleb Laib PhD, Analyse hierarchisee de a robustesse des systemes incertains de grade dimension.

Guillaume Sandou was a reviewer of Damien Casetta PhD, Modele d'aide à la conduite de réseaux de froid.

Frederic Mazenc was a reviewer of the PhD thesis of Mohamed Maghenem, '*Commande en formation de véhicules autonomes*' 05 July 2017, L2S, Centralesupelec.

Frederic Mazenc was a reviewer of the PhD thesis of Luis Borja Rosales, '*Stabilization of a class of nonlinear systems with passivity properties*', 06 July 2017, L2S, Centralesupelec.

Frederic Mazenc was a reviewer of the PhD thesis of first half of the Phd ("suivi mi-parcours") of Mohamed Kahelras, '*Observation Problem for Different Classes of Nonlinear Delayed Systems*', 9 October 2017, L2S, Centralesupelec.

### 10.3. Popularization

Catherine Bonnet gave a talk in the *Promenades Mathématiques* series of the event *Femmes en maths : une équation lumineuse* for female high school students, IHP, Paris, 19 december 2017. She met several groups of female high school students at the event *Femmes en maths : une équation lumineuse* IHP, Paris, january 2017. She met several groups of high school students at the event *Forum des métiers* in Lycée Hoche, Versailles, February 2017.

## GECO Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. General Chair, Scientific Chair

Ugo Boscain was organizer of the conference “Mathematical Control Theory, with a special session in honor of Gianna Stefani”, Porquerolles, 27–30 June.

#### 9.1.2. Journal

##### 9.1.2.1. Member of the Editorial Boards

- Ugo Boscain is Associate Editor of SIAM Journal of Control and Optimization
- Ugo Boscain is Managing Editor of Journal of Dynamical and Control Systems
- Mario Sigalotti is Associate Editor of Journal of Dynamical and Control Systems
- Mario Sigalotti is Associate Editor of ESAIM Control, Optimisation and Calculus of Variations
- Ugo Boscain is Associate Editor of Mathematical Control and Related Fields
- Ugo Boscain is Associate editor of Analysis and Geometry in Metric Spaces

#### 9.1.3. Invited Talks

- Mario Sigalotti gave an invited talk at the conference “Mathematical Control Theory, with a special session in honor of Gianna Stefani”, Porquerolles, France, June 2017.
- Mario Sigalotti gave an invited talk at groupe de travail “Contrôle”, Laboratoire Jacques-Louis Lions, Paris, France, January 2017.

#### 9.1.4. Research Administration

- Mario Sigalotti is member of the IFAC technical committee “Distributed Parameter Systems”.
- Mario Sigalotti was member of the steering committee of the *Institut pour le Contrôle et la Décision* of the Idex Paris-Saclay up to June 2017.

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Supervision

- PhD in progress: Ludovic Sacchelli, “Sub-Riemannian geometry, hypoelliptic operators, geometry of vision”, started in September 2015, supervisors: Ugo Boscain, Mario Sigalotti.
- PhD in progress: Nicolas Augier, “Contrôle adiabatique des systèmes quantiques”, started in September 2016, supervisors: Ugo Boscain, Mario Sigalotti.
- PhD in progress: Mathieu Kohli, “Volume and curvature in sub-Riemannian geometry”, started in September 2016, supervisors: Davide Barilari, Ugo Boscain.
- PhD in progress: Jakub Orłowski, “Modeling and steering brain oscillations based on in vivo optogenetics data”, started in September 2016, supervisors: Antoine Chaillet, Alain Destexhe, and Mario Sigalotti.

## I4S Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Selection

#### 10.1.1.1. Member of the Conference Program Committees

J. Dumoulin is

- member of the scientific committee of the GI Division (Geosciences Instrumentation and Data Systems) of EGU (European Geosciences Union) for infrastructure instrumentation and monitoring since April 2013. (<http://www.egu.eu/gi/structure/>)
- member of the scientific committee of QIRT (quantitative Infrared Thermography) since February 2014 (<http://www.qirt.org/>)
- organizer and chair of a session at EGU 2017 (<http://www.egu2017.eu/>).

Q. Zhang is

- member of the international program committee of the 18th IFAC Symposium SYSID that will take place in Stockholm, Sweden, July 9-11, 2018.
- member of the international program committee of the 10th IFAC Symposium SAFEPROCESS that will take place in Warsaw, Poland, 29-31 August 2018.
- member of IFAC Technical Committee on Modelling, Identification and Signal Processing.
- member of IFAC Technical Committee on Fault Detection, Supervision and Safety of Technical Processes.
- member of IFAC Technical Committee on Adaptive and Learning Systems.

L. Mevel is

- member of the EWSHM scientific committee.
- member of the IOMAC scientific committee.

V. Le Cam is

- member of the IWSHM scientific committee.
- head and general secretary of the EWSHM scientific committee.

M. Doehler is member of IFAC Technical Committee on Modelling, Identification, and Signal Processing.

#### 10.1.1.2. Reviewer

V. Le Cam was session chairman for IWSHM 2017 in Stanford

L. Mevel was session chairman for IWSHM 2017 in Stanford

Q. Zhang was reviewer for CDC 2017, ACC 2018.

M. Doehler was session organizer at a COST workshop (<http://www.cost-tu1402.eu/>), session chairman at IOMAC 2017, and reviewer for ACC 2018.

J. Dumoulin was reviewer for QIRT ASIA 2017 and session chairman at EGU 2017 in GI division

### 10.1.2. Journal

#### 10.1.2.1. Member of the Editorial Boards

L. Mevel is member of the editorial board of the journal Mathematical Problems in Engineering, and of the journal Shock and Vibration.

Q. Zhang is member of the editorial board of the journal of Intelligent Industrial Systems.

J. Dumoulin is member of the editorial board of the journal Quantitative Infrared Thermography, and of the journal Geoscientific Instrumentation and Data Systems.

#### 10.1.2.2. Reviewer - Reviewing Activities

L. Mevel was reviewer for Mechanical Systems and Signal Processing, journal of Sound And Vibration, Sensors, Advanced Engineering Informatics, Structural Control and Health Monitoring, Advances in Structural Engineering

M. Doehler was reviewer for Automatica, Mechanical Systems and Signal Processing, Journal of Sound and Vibration, Journal of Testing and Evaluation

J. Dumoulin was reviewer for Quantitative Infrared Thermography Journal, GI Journal (EGU), SFT conference, ASME New NDE Journal

F. Gillot was reviewer for Structural and Multidisciplinary Optimization, Applied Mathematical Modelling, Shock and Vibration, Applied Sciences

#### 10.1.3. Invited Talks

M. Doehler and L. Mevel, "Méthodes statistiques pour l'analyse vibratoire des structures," Journée scientifique Évaluation non destructive dans le génie civil de l'énergie, Nantes, France

M. Doehler, "Subspace-based methods for damage assessment," Wölfel Engineering, Würzburg, Germany

J. Dumoulin, "Infrared thermography in civil engineering: from non destructive testing in laboratory to outdoor thermal monitoring", QIRT ASIA 2017, Daejeon, South Korea

N. Le Touz, J. Dumoulin and J-M. Piau, " Etude et développement d'un modèle EF de transfert de chaleur multi-physique : application à l'étude de routes solaires hybrides", Journée thématique du groupe rayonnement de la société Française de Thermique sur "Méthodes numériques pour la résolution de l'équation de transfert radiatif : développements récents, modèles, et objectifs", Paris, France

V. Le Cam, "Internet of Things and new challenges for Transportation and Structural Monitoring", plenary talk given to Committee of Transport Ministry, on 25 January 2017, to CEA List, on 16th March 2017, and to assembly of COFREND (500 people) on 30th May 2017

#### 10.1.4. Research Administration

V. Le Cam is member of the scientific council of WEN (West Electronic Network) since 2014, which is a cluster of about 200 companies, academics and research laboratories active in electronics. During 2017, he has been involved amongst others in meetings and selection of R&D projects, PhD and post-doc funding, international mobility.

M. Doehler was reviewer of a research proposal submitted to the Polish National Science Centre (national research agency).

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

J. Dumoulin

- Licence Professionnelle TAM : thermographie infrarouge active, 16h, Université Paris-Est, France
- Master 2 MMMRI (Maintenance et Maîtrise des Risques Industriels), contrôle non destructif par thermographie infrarouge active, 12h, Université Paris-Est, France
- Master 2 ITII, BTP, module Maintenance et réhabilitation des ouvrages, Transferts thermiques dans les Structures : Des principes physiques à l'application sur site réel, 12 h, Ecole Centrale de Nantes(ECN), France.
- Conference course, 2h, IR inspection of infrastructures: Scope of application, technical solutions and analysis methods, QIRT ASIA 2017, Daejeon, South Korea



## V. Le Cam

- Master 2 Civil engineering, Structural Monitoring, 4h, Université de Nantes, France
- Licence 3 Professional SEICOM, 3h of theoretical lessons and 20H of practical lessons on Embedded and Smart Systems, Université de Nantes, France
- ESEO, 16h, practical lessons on embedded and smart systems under Linux, France
- Master 2 Electrical Engineering (GEII), 4h on electronic systems and Structural Monitoring, Université Bretagne Sud, France

## M. Doehler

- Master 1 informatique, 24 TD projet recherche, Université de Rennes 1 & ENS Rennes, France
- Cycle préparatoire intégré, STPI, mathématiques, 96h TD, INSA Rennes, France
- Conference course, 2h, Advanced Operational Modal Analysis using Stochastic Subspace Identification and its Applications, IOMAC 2017, Ingolstadt, Germany

## X. Chapeleau

- Licence Pro Mesures physiques, Mesures optiques, 15h, IUT de St Nazaire, Université de Nantes, France

## T. Toullier

- Master 1, TP Capteurs (12h), contrôle, commandes, École Centrale de Nantes, France
- Foundation Master, TD Programming and Data Analysis (14h), École Centrale de Nantes, France

## F. Gillot

- Master 1, Conception optimale robuste de systèmes mécaniques (10h), École Centrale de Lyon, France
- Master 1, Dynamique des systèmes biologiques humains (4h), École Centrale de Lyon, France
- Formation initiale des ingénieurs de l'École Centrale de Lyon, TP, TD, BE, niveau L3, (50h), France

**10.2.2. Supervision**

PhD : Antoine Bassil, *Fibre-optic sensor for fatigue monitoring*, D. Leduc, O. Abraham and X. Chapeleau. Ecole doctorale SPIGA, Université de Nantes, since November 2016.

PhD : Delwar Hossain Bhuyan, *Damage localisation for civil structures*, L. Mevel, F. Schoefs, Y. Lecieux and M. Doehler. Ecole doctorale MathSTIC, Université de Rennes 1, defended in 2017.

Guillaume Gautier's post-doctoral project on morphosense sensors, L. Mevel, 2015-2017.

Shubamoy Sen's post-doctoral project on seismic event monitoring, L. Mevel, 2016-2017.

Guillaume Gautier's post-doctoral project on seismic event monitoring, L. Mevel, 2017-2018.

Ludovic Gavérina post-doctoral project on in-situ measurement of thermal resistance of building envelopes, J. Dumoulin, march 2017- february 2019.

PhD : Nassif Berrabah, *Electrical cable ageing monitoring*, Q. Zhang, Ecole doctorale MathSTIC, Université de Rennes 1, defended in 2017.

PhD : Nicolas Le Touz, *Design and study of positive energy transport infrastructures: from thermo-mechanical modeling to the optimization of such energy systems* J. Dumoulin. Ecole Centrale Nantes (ECN) since december 2015.

PhD : Thibault Toullier, *Simultaneous characterization of the radiative properties and temperatures of envelopes of structures in natural environment by multispectral infrared thermography* L. Mevel, J. Dumoulin and M. Doehler. Ecole doctorale MathSTIC, Université de Rennes 1, since November 2016.

PhD : Saeid Allahdadian, *Methods for vibration-based damage assessment*, M. Doehler and C. Ventura. University of British Columbia, Canada, defended in 2017.

PhD : Eva Viefhues, *Statistical damage localization for civil structures*, L. Mevel and M. Doehler. Ecole doctorale MathSTIC, Université de Rennes 1, since November 2016.

PhD : Francesco Giordano, *Value of information for strain monitoring of infrastructure*, M. Doehler and MP. Limongelli and F. Bourquin. Politecnico Milano, Italy, since November 2017.

PhD : David Pallier, *Sensor Enhancement to Augmented Usage and Reliability*, S. Pillement, IETR, V. Le Cam, Ecole doctorale MathSTIC

J. Dumoulin is associate professor at Laval University, Canada.

M. Doehler is associate researcher at BAM, Germany.

### **10.2.3. Juries**

Jean Dumoulin was invited jury member for the PhD defense of Yingying YANG at I2M in Bordeaux.

## **10.3. Popularization**

The Hybrid solar road Mock-up (presented at the French Pavillon during COP21) has been invited and presented at:

- Forum National des Travaux Publics, Carroussel du Louvre (Paris), February 2017
- Innovation day des Travaux Publics, Casino du Lyon Vert (Lyon), December 2017
- Fête de la science, Ecole d'architecture de Nantes, October 2017

## MCTAO Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. General Chair, Scientific Chair

- J.-B. Caillau was member of the 2017 PGMO days scientific committee.

##### 9.1.1.2. Member of the Organizing Committees

- 09/2017: Mini-symposium "Geometric control & applications", 18th French-German-Italian conference on optimization, Paderborn (J.-B. Caillau)
- 11/2017: Mini-symposium "Optimal control & applications to biology", PGMO days 2017, Paris Saclay (J.-B. Caillau)
- 12/2017 (Dijon): **Journées McTAO**: event organized by the team with three invited speakers and two from the team.

##### 9.1.2. Scientific Events Selection

- J.-B. Caillau is member of the program committee of the **Séminaire de géométrie hamiltonienne** of Paris VI - UPMC.

##### 9.1.3. Books

- B. Bonnard and J. Rouot, together with M. Chyba, have written the series of notes [17], soon to appear as Springer briefs Publications. They were the basis of courses at the Phd level given at the University of Burgundy and at the institute of Mathematics for industry at Fukuoka (Japan).
- J.-B. Caillau, together with M. Bergounioux, G. Peyré, C. Schnörr and T. Haberkorn, served as an editor for the volume [11]. With a focus on the interplay between mathematics and applications of imaging, the first part covers topics from optimization, inverse problems and shape spaces to computer vision and computational anatomy. The second part is geared towards geometric control and related topics, including Riemannian geometry, celestial mechanics and quantum control.

##### 9.1.4. Journals

B. Bonnard is a member of the editorial board of the *Pacific Journal of Mathematics for Industry*.

##### 9.1.5. Invited Talks

Jean-Baptiste Caillau:

02/2017: Séminaire ENAC, Toulouse

06/2017: Mathematical Control Theory, Porquerolles

07/2017: New Horizons on Optimal Control, Porto

11/2017: PGMO Days 2017, Paris Saclay (with Barlaud, M.; Gilet, C.)

Laetitia Giraldi:

03/2017: Seminar at University Paris Dauphine

05/2017: Speaker at a meeting of the IPL Algae in Silico

09/2017: Seminar at Gibbs-lab, *Grenoble*

10/2017: Speaker at **Interaction Fluide-Structure: Analyse et Contrôle**

11/2017: Seminar at Institut de Recherche Mathématiques Avancée, *Strasbourg*

Michaël Orieux:

09/2017: Workshop on Classical Integrability and Perturbations, *Paris*

Jean-Baptiste Pomet:

09/2017: **Séminaire de géométrie hamiltonienne** of Paris VI - UPMC.

Ludovic Rifford:

07/2017: Plenary speaker at the Pan African Congress of Mathematics, *Rabat (Morocco)*

07/2017: Plenary speaker at the conference New Trends in Control Theory and PDEs, *INdAM, Rome (Italy)*

09/2017: Plenary speaker at the Conférence à la mémoire d'Ahmad El Soufi, *Université François Rabelais, Tours (France)*

### 9.1.6. Research Administration

Jean-Baptiste Caillaud has been the joint head of the CNRS team Statistique, Probabilités, Optimisation & Contrôle at Institut math. Bourgogne. He is member of the Scientific Committee of the GdR Calcul, of the Institut de Mécanique Céleste et de Calcul des Éphémérides (Observatoire de Paris), and of the Programme Gaspard Monge pour l'Optimisation et la recherche opérationnelle de la Fondation Mathématique Jacques Hadamard.

From 2017 Laetitia Giraldu is member of CSD *Comité du suivi Doctoral* at Sophia-Antipolis.

Jean-Baptiste Pomet is a member of the steering committee of the Center for Planetary Origin (C4PO) and of the scientific council of Académie 2 "Complex system", both for Université Côte d'Azur (UCA). He is an elected member of Commission d'évaluation (Inria permanent evaluation committee).

Ludovic Rifford has been Executive Director of the CIMPA (Centre International de Mathématiques Pures et Appliquées) since September 2016.

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Teaching

Licence : Laetitia Giraldu, Colles de Mathématiques en MPSI et MP, 110heures en équivalent TD, niveau (L1, L2, L3), Lycée internationale de Valbonne, France. J.-B. Caillaud, Processus Stochastiques, 50 H ETD, Polytech Nice-Sophia.

Master : Laetitia Giraldu, Théorie du Contrôle appliquée à des problèmes de micro-natation, 4 heures en équivalent TD, niveau M2, université de Strasbourg, France. J.-B. Caillaud, Commande optimale, 50 H ETD, Polytech Nice-Sophia ; Optimisation, 30 H ETD, Univ. Côte d'Azur.

Doctorat : Laetitia Giraldu, Controlled propulsion of elastico-magnetic micro-swimmer, 4 heures en équivalent TD, université de Padoue, Italie

### 9.2.2. Supervision

M2: Yacine El Alaoui-Faris: "Machine Learning for Biology", supervised by J.-B. Caillaud, April to September.

PhD: Zeinab Badreddine, "Mass transportation in sub-Riemannian structures admitting singular minimizing geodesics", defended December 4, 2017, co-supervised by B. Bonnard and L. Rifford. See bibliography.

PhD in progress : Michaël Orioux, "Minimum time control and applications", started September, 2015, co-supervised by J.-B. Caillaud and J. Féjoz (Univ. Paris Dauphine).

PhD in progress : Alice Nolot, "Sub-Riemannian geometry and optimal swimming at low Reynolds, started October, 2016, supervised by B. Bonnard.

PhD in progress : Sébastien Fueyo, "Testing stability of nonlinear amplifier by frequency-domain methods", started October, 2016, co-supervised by J.-B. Pomet and L. Baratchart (APICS team).

PhD in progress : Yacine El alaoui-faris, "modeling magnetico-elastic micro-robot from theory to experiment", started October, 2017, co-supervised by L. Giraldu, J.-B. Pomet and Stéphane Régnier (Univ. Paris Sorbonne).

PhD in progress : Clément Moreau, “Contrôlabilité de systèmes en dimension finie ou infinie issus du vivant”, started September, 2017, co-supervised by L. Giraldi, Pierre Lissy and J.-B. Pomet.

PhD in progress : Karine Sérrier, “Micro-natation et invariants de la géométrie sous-Riemannienne”, started September, 2017, supervised by B. Bonnard.

### **9.2.3. *Juries***

J.-B. Caillau has been reviewer for the Habilitation of Aude Rondepierre (Toulouse), and for the PhD's of Cécile Carrere (Marseille), Clément Gazzino (Toulouse), and Ouazna Ouchaka (Toulon). He has also been member of the Habilitation jury of Marco Caponigro (Paris).

J.-B. Caillau and L. Giraldi are members of the jury of Agrégation de mathématiques.

Ludovic Rifford has been reviewer for the PhD of Sebastiano Nicolussi Golo (University of Jyväskylä, Finland).

## **9.3. Popularization**

J.-B. Caillau participates in the MASTIC initiative at Inria and has given conferences at the high school level in Sophia (MathC2+ event, June 2017) and Grasse (Lycée Amiral, Sep. 2017).

## NECS Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. General Chair, Scientific Chair

C. Canudas de Wit has been appointed General Chair of the 58th IEEE Conference on Decision and Control, 2019.

##### 9.1.1.2. Member of the Organizing Committees

The team organized the international ERC Scale-free Back workshop on “Modelling reduction tools for large-scale complex networks”, Grenoble, September 2017.

P. Frasca organized an open Invited session on “Dynamics and control in social networks”, IFAC World Congress, July 2017 (with G. Como) .

#### 9.1.2. Scientific Events Selection

##### 9.1.2.1. Member of the Conference Program Committees

Paolo Frasca has served as Associate Editor in the IEEE Robotics and Automation Society CASE Conference Editorial Board for the 13th IEEE International Conference on Automation Science and Engineering, 2017 .

Federica Garin is Associate Editor in the IEEE Control System Society Conference Editorial Board (this year, she served for CDC 2017, ACC 2018)., and Associate Editor in the European Control Association (EUCA) Conference Editorial Board (this year, she served for ECC 2018).

Hassen Fourati was a member of the International and Scientific Program Committees of the International Conference on Control, Automation and Diagnosis (ICCAD'17), 2017, and the International Conference on Sciences and Techniques of Automatic Control and Computer Engineering STA2017, 2017.

##### 9.1.2.2. Reviewer

Team members, and in particular faculty, have been reviewers for several conferences (including the most prestigious ones in their research area): IEEE Conference on Decision and Control CDC, European Control Conference ECC, American Control Conference ACC, European Signal Processing Conference, IEEE International Conference on Robotics and Automation ICRA, IEEE/RSJ International Conference on Intelligent Robots and Systems IROS, IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys), Indian Control Conference, IFAC World Congress, IFAC Workshop on Control for Transportation Systems (CTS).

#### 9.1.3. Journal

##### 9.1.3.1. Member of the Editorial Boards

Carlos Canudas de Wit is Associate Editor of IEEE Transactions on Control of Networks Systems IEEE-TCNS (since June 2013), Associate Editor of IEEE Transactions on Control System Technology IEEE-TCST (since January 2013), and Editor of the Asian Journal of Control AJC (since 2010).

Hassen Fourati is guest editor of the special issue titled “Multi-sensor Integrated Navigation and Location based services applications” for International Journal of Distributed Sensor Networks (IJDSN), 2017 and Associate Editor of the Asian Journal of Control AJC (since January 2016). Paolo Frasca is Subject Editor of the International Journal of Robust and Nonlinear Control (Wiley) (since February 2014), Associate Editor of IEEE Control System Letters (from February 2017) and Associate Editor of the Asian Journal of Control (Wiley) (since January 2017).

#### 9.1.3.2. Reviewer - Reviewing Activities

Team members, and in particular faculty, have been reviewers for several journals (including the most prestigious ones in their research area): IEEE Trans. on Automatic Control, IEEE Trans. on Control of Network Systems, IEEE Trans. on Signal Processing, Automatica, IEEE Signal Processing Letters, Systems and Control Letters, IEEE Transactions on Information Theory, Elsevier Signal Processing, Int. Journal of Robust and Nonlinear Control, IET Communications, IET Wireless Sensor Networks. IEEE/ASME Trans. on Mechatronics, IEEE Trans. on Instrumentations and Measurements, IEEE Sensors journal, IEEE Trans. on Robotics, AIMS Networks and Heterogeneous Network (NHM), Wiley Mathematical Methods in the Applied Sciences (MMAS), Journal of Mathematical Analysis and Applications (JMMA), Journal of Nonlinear Science and Applications (JNSA), Journal of the Franklin Institute, AMS Mathematical Reviews, IEEE Journal of Intelligent Transportation Systems, Asian Journal of Control, IEEE Transaction on Intelligent Transportation Systems, Elsevier Transportation Research Part B.

#### 9.1.4. Invited Talks

- M. L. Delle Monache, “Traffic regulation via controlled speed limit”, SIAM Conference on Optimization, Vancouver, Canada, May 22, 2017.
- M. L. Delle Monache, “Control of traffic flow via ramp metering and automated vehicles”, France Berkeley Fund Symposium, Collège de France, Paris, France, June 7, 2017.
- M. L. Delle Monache, “Coupled PDE-ODE systems: applications to traffic flow modeling and control”, Institute de Mathematiques de Marseille, Marseille, France, November 14, 2017.
- M. L. Delle Monache, “Control of Traffic: from ramp metering to autonomous vehicles”, The Finite volume schemes and traffic modeling workshop, Besançon, France, November 23, 2017.
- P. Frasca, “Message-passing computation of the harmonic influence in social networks”, L2S, Paris-Saclay, November 21, 2017.
- P. Frasca, “Harmonic influence in social networks and identification of influencers by message passing”, WUDS’17 workshop, Banyuls-sur-mer, July 6, 2017.
- P. Frasca, “Non-smooth dynamical systems in opinion dynamics”, University of Twente, Enschede, NL, June 15, 2017.
- P. Frasca, “The observability radius of network systems”, University of Cagliari, Cagliari, Italy, May 4, 2017.
- F. Garin, “Input-and-state observability of structured network systems”, LCCC Focus Period on Large-Scale and Distributed Optimization, Lund, Sweden, June 2017.

#### 9.1.5. Leadership within the Scientific Community

C. Canudas de Wit has been president of the European Control Association (EUCA) until June 2015, and is now (until 2017) Past-president and member of the EUCA Council.

#### 9.1.6. Scientific Expertise

Team members participate to the following technical committees of IEEE Control Systems Society and of the International Federation of Automatic Control:

CSS Technical Committee “Networks and Communications Systems” (P. Frasca and F. Garin);

IFAC Technical Committee 1.5 on Networked Systems (P. Frasca and C. Canudas de Wit);

IFAC Technical Committee 2.5 on Robust Control (P. Frasca);

IFAC-TC7.1 Automotive Control (C. Canudas de Wit);

IFAC-TC7.4 Transportation systems (C. Canudas de Wit).

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Teaching

Master: F. Garin, Distributed Algorithms and Network Systems, 13.5h, M2, Univ. Grenoble Alpes, France.

Licence: H. Fourati, Informatique Industrielle, 105h, L1, IUT 1 (GEII), Univ. Grenoble Alpes, France;

Licence: H. Fourati, Réseaux locaux industriels, 30h, L2, IUT1 (GEII), Univ. Grenoble Alpes, France.

Licence: H. Fourati, Automatique, 38h, L3, UFR physique, Univ. Grenoble Alpes, France.

Licence: H. Fourati, Automatique échantillonnée, 15h, L2, IUT 1 (GEII), Univ. Grenoble Alpes, France.

Licence: H. Fourati, Automatique complément, 12h, L2, IUT 1 (GEII), Univ. Grenoble Alpes, France.

Licence: H. Fourati, Mathématiques, 18h, L2, IUT1 (GEII1), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Automatique, 52h, L2, IUT1(GEII1), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Mathématiques, 33h, L2, IUT1 (GEII1), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Mathématiques, 44h, L1, IUT1 (GEII1), Univ. Grenoble Alpes, France.

Licence: A.Kibangou, Automatique, 16h, L3, IUT1 (GEII1), Univ. Grenoble Alpes, France.

### 9.2.2. Supervision

PhD: Pietro Grandinetti, Control of large-scale traffic networks, Sept. 2017, co-advised by C. Canudas de Wit and F. Garin.

PhD: Thibaud Michel, Mobile Augmented Reality Applications for Smart Cities, Nov. 2017, co-advised by N. Layaïda, H. Fourati and P. Geneves.

PhD in progress: Andrés Alberto Ladino Lopez, Robust estimation and prediction in large scale traffic networks, from Oct. 2014, co-advised by C. Canudas de Wit, A. Kibangou and H. Fourati.

PhD in progress: Sebing Gracy, Cyber-physical systems: a control-theoretic approach to privacy and security, from Oct. 2015, co-advised by A. Kibangou and F. Garin.

PhD in progress: Stéphane Durand, Coupling distributed control and game theory: application to self-optimizing systems, from Oct. 2015, co-advised by B. Gaujal and F. Garin.

PhD in progress: Stéphane Mollier, Aggregated Scale-Free Models for 2-D Large-scale Traffic Systems, from Oct. 2016, co-advised by C. Canudas de Wit, M. L. Delle Monache and B. Seibold.

PhD in progress: Nicolas Martin, On-line partitioning algorithms for evolutionary scale-free networks, from Dec. 2016, co-advised by C. Canudas de Wit and P. Frasca.

PhD in progress: Martin Rodriguez-Vega, Traffic density, traveling time and vehicle emission estimation in large - scale traffic networks, from Oct. 2017, co-advised by C. Canudas de Wit and H. Fourati.

PhD in progress: Muhammad Umar B Niazi, State-state estimation design and optimal sensor placement algorithms for large-scale evolutionary dynamical networks, from Dec. 2017, co-advised by C. Canudas de Wit and A. Kibangou.

### 9.2.3. Juries

- P. Frasca was committee member of the PhD defence of Florian Dietrich. Analyse et controle de systemes de dynamiques d'opinions. CRAN, Université de Lorraine, Nancy, France. Ph.D. advisors: Marc Jungers and Samuel Martin, November 22, 2017
- H. Fourati was committee member of the PhD defense of Alexis Nez, Univ. Poitiers, July 2017



- F. Garin was member of the recruiting committee, held in March-May 2017, for two Researcher ('CR2') positions at Inria Grenoble-Rhône Alpes.
- F. Garin was Member of the recruiting committee, held in April-May 2017, for an Associate Professor position ('poste de Maître de Conférences, section 61') at Univ. Grenoble Alpes and the Automatic Control Departement of GIPSA-lab.
- F. Garin was opponent for the licentiate thesis of Riccardo Lucchese, Luleå University of Technology, Luleå, Sweden, May 2017.
- P. Frasca was member of the recruiting committee, held in March-May 2017, for two Researcher ('CR2') positions at Inria Saclay.

### 9.3. Popularization

The GTL webpage (<http://gtl.inrialpes.fr/status>) is public in November: more generally the traffic activities have been popularized via the following public talk.

- G. Casadei, V. Bertrand, DEMO on the GTL at the "Rencontres Inria Industrie", Inria, Paris, Oct. 2017

## NON-A Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. General Chair, Scientific Chair

- W. Perruquetti is the chairman of the IFAC Technical Committee “Social Impact of Automation”, International Federation of Automatic Control, TC 9.2, and a member of the IFAC Technical Committees “Nonlinear Control Systems”, TC 2.3, and “Discrete Event and Hybrid Systems”, TC 1.3.
- A. Quadrat is a member of the IFAC Technical Committee “Linear Control Systems”, International Federation of Automatic Control, TC2.2
- J.-P. Richard is a member of the IFAC Technical Committee “Linear Control Systems”, International Federation of Automatic Control, TC2.2
- G. Zheng is a member of the IFAC Technical Committee “Social Impact of Automation”, International Federation of Automatic Control, TC9.2
- G. Zheng is co-chair of the working group “Commande et pilotage en environnement incertain” of GRAISYHM

#### 10.1.1.2. Member of the Organizing Committees

A. Quadrat is a member of the organization committee of the Journées Nationales de Calcul Formel (JNCF), Luminy, France, 22–26/01/2018.

J.-P. Richard is associate editor of the conferences EUCA-IEEE ECC 2018, Limassol, Cyprus (16th European Control Conference), 12–15/06/2018, IFAC TDS 2018, Budapest, Hungary (14th IFAC Workshop on Time Delay Systems), 28–30/06/2018, and IEEE MED 2017, Valletta, Malta (25th IEEE Mediterranean Conference on Control and Automation), 3–6/06/2017.

### 10.1.2. Scientific Events Selection

J.-P. Richard was the coordinator of the Inria Evaluation Seminar of the theme “Optimization and control of dynamical systems” à Rungis, 13–17/03/2017.

#### 10.1.2.1. Member of the Conference Program Committees

A. Quadrat was a member of the Program Committee of the 10th International Workshop on Multidimensional (nD) Systems (nDS 2017), University of Zielona Góra, Poland, 13–15/09/2017.

J.-P. Richard was a member of the Program Committee of the conference IARA VEHICULAR 2017, Nice, France (6th Int. Conf. on Advances in Vehicular Systems, Technol. & Appl.), 23–27/06/2017. He will also be a member of the Program Committee of IARA VEHICULAR 2018, Venice, Italy (7th Int. Conf. on Advances in Vehicular Systems, Technol. & Appl.), 24–28/06/2018.

#### 10.1.2.2. Reviewer

The members of NON-A team are reviewers and contributors of all top-ranked conferences in the field of automatic control (IEEE Conference on Decision and Control, IFAC World Congress, European Control Conference, American Control Conference, etc.).

### 10.1.3. Journal

#### 10.1.3.1. Member of the Editorial Boards

D. Efimov is associate editor of:

- Associate editor, IFAC Journal on Nonlinear Analysis: Hybrid Systems
- Associate editor, Asian Journal of Control

He was also guest editor of two special issues on differentiators and on interval and set-membership estimation for International Journal of Control.

A. Polyakov is associate editor of:

- International Journal of Robust and Nonlinear Control
- Journal of Optimization Theory and Applications
- Automation and Remote Control

A. Quadrat is associate editor of Multidimensional Systems and Signal Processing.

#### 10.1.3.2. Reviewer - Reviewing Activities

The members of NON-A team are reviewers and contributors of all top-ranked conferences in the field of automatic control (IEEE Conference on Decision and Control, IFAC World Congress, European Control Conference, American Control Conference, etc.).

### 10.1.4. Invited Talks

A. Quadrat was invited to give a talk at the conference “Questions algorithmiques en algèbre, analyse, géométrie et topologie”, I.H.E.T, Tunis, Tunisia, 24–26/10/2017, and at the “1st DECOD Workshop – Delays and Constraints on Distributed Parameter Systems”, CentraleSupélec, Gif-sur-Yvette, France, 22–24/11/2017.

### 10.1.5. Leadership within the Scientific Community

The NON-A team is the leader in the field of non-asymptotic control and estimation using homogeneity framework.

Moreover, the NON-A team is also leader in algebraic systems theory. In particular, two invited sessions “Algebraic Methods and Symbolic-Numeric Computation in Systems Theory” and “New Results in Multidimensional Systems Theory” were organized at the IFAC 2017 World Congress, Toulouse (France), 09–14/07/2017. Finally, the book “Algebraic and Symbolic Computation Methods in Dynamical Systems” was edited by A. Quadrat and E. Zerz (RWTH Aachen, Germany) for the collection “Advances in Delays and Dynamics” (ADD), volume 9, Springer, and will appear in 2018.

### 10.1.6. Scientific Expertise

Since 2016, R. Ushirobira and D. Efimov have been working with the start-up Neotrope (Tourcoing). Following a first contract (2016) on the treatment of electro-dermal signals from their connected bracelet, a second part of the collaboration is underway for the filtering of the heart rate signal (HR). A second contract should be implemented in the coming months.

### 10.1.7. Research Administration

- W. Perruquetti is Vice-deputy of INS2I CNRS.
- J.-P. Richard is an Expert for the French Ministry of Research, MENESR/MEIRIES.
- A. Quadrat is a member of the “Bureau du Comité des Equipes-Projets” (BCEP) and of the “Commission des Emplois de Recherche”, Inria Lille.
- R. Ushirobira continues to participate in our local commissions: technological development (CDT, since January 2012); IT users (CUMI, since March 2016); sustainable development (CLDD since September 2016). Since 2013, she has been leading the “30 minutes of science” cycle (monthly seminar for the center’s scientific staff).

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

From September 2016 to June 2017, Y. Bouzidi was ATER at Ecole Centrale de Lille. He completed 192 hours of computer science courses/TD, as well as algorithmic courses, for students in L3 and M1.

Since February 2017, R. Ushirobira has completed 24 hours of Linear Algebra course / TD at Polytech'Lille, 8 h of Automatic TP in L3 at the University of Lille1 and 38 h TD of Mathematics in Mathematics. 1st year at Centrale Lille. She supervises this year students in 4th and 3rd grades of Arthur Rimbaud College Villeneuve d'Ascq, as part of 'Math in Jeans'.

### 10.2.2. Supervision

PhD: Maxime Feingesicht, "Dynamic Observers for Control of Separated Flows", Ecole Centrale de Lille, 11/12/2017, supervisors: J.-P. Richard, F. Kerherve, A. Polyakov

PhD in progress: Haik Jan Davtjan, "Estimation in complex systems", EC Lille, 2016, UCoCoS EU project, supervisors: D. Efimov, J.-P. Richard

PhD in progress: Nadhynee Martinez Fonseca, "Non-asymptotic control and estimation problems in robotic system designed for manipulation of micro-organisms", National Polytechnic Institute of Mexico, 2015, supervisors: I. Chairez-Oria, A. Polyakov

PhD in progress: Tatiana Kharkovskaya, "Interval Observers for Distributed Parametr Systems", ITMO University-EC Lille, 2015, supervisors: D. Efimov, J.-P. Richard and A. Kremlev

PhD in progress: Langueh Désiré Kokou, "Inversion à gauche, singularités d'inversion, immersion et formes normales pour les systèmes dynamiques", 2015, supervisors: Thierry Floquet, Gang Zheng

PhD in progress: Gabriele Perozzi, "Save exploration of aerodynamic field by microdrone", Onera-Region, 2015, supervisors: D. Efimov, J.-M. Biannic and L. Planckaert

PhD in progress: Francisco Lopez-Ramirez, "Control and estimation via implicit homogeneous Lyapunov function", Inria, 2015, supervisors: D. Efimov, W. Perruquetti and A. Polyakov

PhD in progress: Guillaume Rance, "Asservissement paramétrique de systèmes flexibles à retard et application aux viseurs", CIFRE Safran Electronics & Defense, 2014, supervisors: A. Quadrat, A. Quadrat, H. Mounier

PhD in progress: Haik-Jan Silm, "Estimation in complex systems", 2016, supervisors: D. Efimov, R. Ushirobira, W. Michels, J.-P. Richard

PhD in progress: Yue Wang, "Development of a blimp robot for indoor operation", 2016, supervisors: Wilfrid Perruquetti, Denis Efimov, Gang Zheng

PhD in progress: Siyuan Wang, "Robust control of quadrotors", 2017, supervisors: Andrey Polyakov, Gang Zheng

### 10.2.3. Juries

- A. Quadrat was member of a selection committee for a MCF position (CNU 15-17), University of Limoges.
- R. Ushirobira was a jury member of the CR2 Inria 2017 competition for the Lille - Nord Europe center. She was also invited to participate in 3 selection committees for MCF positions (CNU 61, ENSEA and CNAM in May, Ecole Centrale de Nantes in September).

## QUANTIC Project-Team

## 8. Dissemination

### 8.1. Promoting Scientific Activities

#### 8.1.1. Journal

##### 8.1.1.1. Member of the Editorial Boards

Pierre Rouchon is member of the editorial board of Annual Reviews in Control (since 2016).

Mazyar Mirrahimi was a guest editor for the journal "Quantum Science and Technology" (Institute Of Physics, 2016-2017), Special issue on "Quantum coherent feedback and quantum reservoir engineering".

##### 8.1.1.2. Reviewer - Reviewing Activities

Zaki Leghtas served as a referee for Physical Review Journals.

Mazyar Mirrahimi served as a referee for Physical Review Journals.

Pierre Rouchon has been a reviewer for several automatic control and dynamical systems journals and conferences.

Alain Sarlette has been a reviewer for several automatic control and dynamical systems journals and conferences.

#### 8.1.2. Invited Talks

Mazyar Mirrahimi, July 2017, ICTS (Workshop Open Quantum Systems), Bangalore, India.

Mazyar Mirrahimi, June 2017, 22ème conférence Claude Itzykson, CEA Saclay, France.

Mazyar Mirrahimi, June 2017, CIFAR Workshop on Quantum Cavities, Jouvence, Quebec, Canada.

Mazyar Mirrahimi, May 2017, L2S, Supelec, France.

Mazyar Mirrahimi, April 2017, Conference of Optical Society of America, Quantum Information and Measurement, Paris, France.

Mazyar Mirrahimi, March 2017, CMAP, Ecole Polytechnique, France.

Mazyar Mirrahimi, February 2017, UVSQ, France.

Pierre Rouchon, November 2017, Control and Optimization Conference on the occasion of Frédéric Bonnans 60th birthday, Palaiseau, France.

Pierre Rouchon, June 2017, 22ème conférence Claude Itzykson, CEA Saclay, France.

Pierre Rouchon, April 2017, workshop on Quantum Control Theory: Mathematical Aspects and Physical Applications, TUM-IAS, Garching, Germany.

Pierre Rouchon, April 2017, 4th Workshop on Quantum Non-Equilibrium Dynamics, University of Nottingham, UK.

Alain Sarlette, July 2017, Praeqsys: Principles and Applications of Control in Quantum Systems, Seattle, USA.

Alain Sarlette, June 2017, L2S, Supelec, France.

Rémi Azouit, February 2017, Sherebrooke University, Canada.

### 8.1.3. Scientific Expertise

Mazyar Mirrahimi is a member of the Technical Committee on "Distributed Parameter Systems" in IFAC (International Federation of Automatic Control).

Pierre Rouchon is a member of the scientific committee of LAGEP (Laboratoire d'Automatique et de Génie des Procédés) since 2017

Pierre Rouchon is a membre of the "Conseil Scientifique du DIM Math Innov" since 2017.

Pierre Rouchon is a member of the "Conseil de la recherche de PSL " since 2016.

Pierre Rouchon is a member of the "Conseil Scientifique du Conservatoire National des Arts et Metiers" since 2014.

Pierre Rouchon was a member of the scientific committee of PRACQSYS 2017

## 8.2. Teaching - Supervision - Juries

### 8.2.1. Teaching

Zaki Leghtas taught a course on Quantum Mechanics at Paris Sciences et Lettres (40 hours).

Zaki Leghtas taught a course on Quantum Mechanics and Statistical Physics at Mines ParisTech (12 hours).

Zaki Leghtas taught a course on Complex Analysis at Mines ParisTech (10 hours).

Mazyar Mirrahimi and Pierre Rouchon have given a course (20 hours) entitled "UE : Analyse et contrôle de systèmes quantiques " in the "Master de sciences et technologies, mention mathématiques et applications, Université Pierre et Marie Curie".

Mazyar Mirrahimi is hired as a professeur chargé de cours à temps partiel of Applied Mathematics at Ecole Polytechnique. His teaching will start during winter 2018.

Mazyar Mirrahimi has given TDs of the courses on Probabilities and on Stochastic Processes at Ecole des Mines de Paris.

Pierre Rouchon gave a course on "Cryptographie, théorie des nombres et information quantique" at Mines ParisTech (24 hours).

Pierre Rouchon gave a course on "Modelling, simulation and feedback of open quantum systems" in the PSL-Master, PSL-IT, IQ Ingénierie Quantique (12 hours).

Alain Sarlette has given a master course on "Probabilistic robotics" at Ghent University (30 hours) and has given TDs of the courses on Probabilities and on Stochastic Processes at Ecole des Mines de Paris.

Alain Sarlette has given a quantum-related lecture in the course on Stochastic Processes (5 hours), Ecole des Mines de Paris.

### 8.2.2. Supervision

PhD in progress: Raphael Lescanne. ENS. "Engineering Multi-Photon Dissipation In Superconducting Circuits For Quantum Error Correction". September 2016. (advisors: Zaki Leghtas and Benjamin Huard).

PhD: Rémi Azouit. Mines Paristech. "Adiabatic elimination for open quantum systems". 2014-2017. (advisors: Pierre Rouchon and Alain Sarlette), Defended on Oct 2017.

PhD in progress: Gerardo Cardona. Mines ParisTech. "Beyond static gains in analog quantum feedback control". Nov 2016 (advisors: Pierre Rouchon and Alain Sarlette).

PhD in progress: Alain Sarlette is co-supervising 3 PhD students with his former institution UGent (Simon Apers, Zhifei Zhang, Arash Farnam). Simon Apers is working on (quantum) network algorithms accelerations and intends to address other quantum control questions.

PhD: Joachim Cohen. ENS. “Autonomous quantum error correction with superconducting circuits”. 2013-2017 (advisor: Mazyar Mirrahimi), Defended on Feb 2017.

PhD in progress: Lucas Verney. ENS. “Robust quantum information processing with superconducting circuits”. Sept 2016. (advisors: Zaki Leghtas and Mazyar Mirrahimi).

PhD in progress: Jérémie Guillaud. ENS. “Modular architecture for quantum information processing”. Sept 2017. (advisors: Mazyar Mirrahimi and Pierre Rouchon).

### 8.2.3. *Juries*

Mazyar Mirrahimi was a member the PhD defense committees of Serguei Fedortchenko (Jury president, University Paris Diderot).

Pierre Rouchon was a referee for the PhD thesis of Muhammad Emzi, Australian National University, and for the Habilitation thesis of Marco Caponigro, UMPC.

Alain Sarlette was a jury member for the PhD of Stavros Lopatzidis (UGent, Belgium) and of Bram Vervisch (UGent, Belgium).

## 8.3. Popularization

Mazyar Mirrahimi has been interviewed by Le Monde for a dossier on quantum information.

Mazyar Mirrahimi gave an invited talk on “Quantum computing” at the CRiP’s ITES Innovation Summit at Deauville, France in Mars 2017.

Mazyar Mirrahimi gave an invited talk on “Quantum computing” at X-Creation (X-Drahi) in May 2017.

Pierre Rouchon was invited to give a talk "Contrôle des systèmes: du classique au quantique", Journée d'inauguration du programme PSL-maths, 19 October 2017 at ENS-Paris.

Alain Sarlette has been speaking at inria-organized dissemination events:

- 03/07 "fresh from the labs" talk about quantum technology hardware (at Boston Consulting Group, Paris – team gamma)
- 06-08/06 Keynote speech at Journées DGGT
- 10/07 presentation at inria-Paris-labs visit by high-level managers and stakeholders

Alain Sarlette is answering questions about quantum control and quantum computing on the website "ik-heb-een-vraag.be" where Flemish layman can ask questions to scientific experts.

## SPHINX Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. Member of the Organizing Committees

K. Ramdani was member of the Organizing Committee of the Conference “Accès ouvert : rêve ou réalité ?” (CIRM, October 2017) organized by the RNBM (Réseau National des Bibliothèques de Mathématiques). During this conference, two days were more especially scientists-oriented and devoted to new models of publication, and more especially open access journals (for more details, see: <http://www.rnbm.org/cirm-2017>).

#### 10.1.1.2. General chair, Scientific chair

T. Takahashi co-organized a conference, in the framework of the ANR’s project IFSMACS, at the Institut de Mathématiques de Bordeaux from the 2nd to the 5th of October 2017 (see <https://indico.math.cnrs.fr/event/1367/>).

### 10.1.2. Journal

#### 10.1.2.1. Member of the Editorial Boards

J.-C. Vivalda is a member of the editorial board of the “Journal of Dynamical and Control Systems”. David Dos Santos Ferreira is member of the editorial board of “Mathematical Control and Related Fields”.

#### 10.1.2.2. Reviewer - Reviewing Activities

J.-F. Scheid is reviewer for the “Applied Mathematics and Optimization” journal.

J.-C. Vivalda is reviewer for the “Mathematical reviews”.

### 10.1.3. Invited Talks

- T. Chambrion has been invited to the “Recife Workshop on Control and Stabilization of PDEs” held from 13 to 17 February 2017 in Recife (Brasil). See <https://sites.google.com/site/recontrolpde/>.
- T. Chambrion has been invited to the seminar of Université de Nice (analysis) in November 2017 and Strasbourg (December 2017).
- T. Takahashi was an invited speaker at the conference CDPS 2017 in Bordeaux (see <https://indico.math.cnrs.fr/event/1363/>).

### 10.1.4. Leadership within the Scientific Community

T. Chambrion has been a co-animator (with F. Di Meglio) of the GT EDP in GDR MACS until the redesign of the working groups in November 2017.

D. Dos Santos Ferreira is one of the coordinators of the GDR “Analyse des EDP”.

### 10.1.5. Research Administration

- Karim Ramdani was deputy delegate for scientific affairs of the Inria Nancy research center until August 31, 2017.
- Karim Ramdani is member of the board of the RNBM (Réseau National des Bibliothèques de Mathématiques) and is in charge with Benoît Kloeckner of Open Access issues.

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

With the exception of K. Ramdani, T. Takahashi and J.-C. Vivalda, SPHINX members have teaching obligations at “Université de Lorraine” and are teaching at least 192 hours each year. They teach mathematics at different level (Licence, Master, Engineering school). Many of them have pedagogical responsibilities.



### **10.2.2. Supervision**

PhD in progress: Mohamed ID SAID, Embedded automatic control with limited computational resources, from October 2017, supervisors: T. Chambrion and G. Millerioux;

PhD in progress: Meriem BOUGUEZZI, Reaction-diffusion system for the modeling of a corrosion phenomena, from november 2017, J.-F. Scheid (co-supervisor);

PhD in progress: Imem JBIL, Myocardial infarction as a fluid-structure system : modeling and simulations, from mars 2017, J.-F. Scheid (co-supervisor);

PhD in progress: Imene DJEBOUR, Control and inverse problems on fluid-structure interaction systems, from November 2017, supervisor : Takahashi

PhD in progress: Benjamin Obando, Mathematical study of the dynamics of heterogeneous granular flows, from August 2015, supervisors : Takahashi and San Martín (Universidad de Chile)

### **10.2.3. Juries**

David Dos Santos Ferreira reviewed the application of Joonas Ilmavirta for position of “docent” at Helsinki University. He was also a member of the HDR (Accreditation to Supervise Research) thesis jury of Yavar Kian (defended in November 2017).

## TROPICAL Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. General Chair, Scientific Chair

- Stéphane Gaubert is the coordinator of the Gaspard Monge Program for Optimization and Operations Research, a corporate sponsorship program, operated by Fondation Mathématique Jacques Hadamard, supported by EDF, Orange and Thales, see <https://www.fondation-hadamard.fr/fr/pgmo/>

#### 10.1.1.2. Member of the Organizing Committees

- S. Gaubert co-organizes the “Séminaire Parisien d’Optimisation”.

### 10.1.2. Scientific Events Selection

#### 10.1.2.1. Chair of Conference Program Committees

- S. Gaubert, Chair of the PGMO days, EDF Labs Paris Saclay, Nov 13-14, 2017. <https://www.fondation-hadamard.fr/fr/pgmo/pgmodays>

### 10.1.3. Journal

#### 10.1.3.1. Member of the Editorial Boards

- S. Gaubert is member of the editorial committee of the collection Mathématiques et Applications, SMAI and Springer.
- S. Gaubert is associate editor of Linear and Multilinear Algebra.
- S. Gaubert is associate editor of RAIRO Operations research.

### 10.1.4. Invited Talks

- S. Gaubert
  - Noncommutative geometry: number theory, celebration of Alain Connes’ 70th birthday, Shanghai, March 23 - April 7, 2017. Tropical modules, zero-sum games and non-archimedean optimization.
  - Mathematical morphology and its applications to image and signal processing Fontainebleau, Fontainebleau, May 15 – May 17, 2017. Tropical and non-linear Perron-Frobenius methods for optimal control and zero-sum games

### 10.1.5. Research Administration

- M. Akian :
  - Member of the “comité de liaison SMAI-MODE” since June 2015.
  - Member of the laboratory council of CMAP.
- S. Gaubert :
  - Member of the scientific council of CMAP.
- X. Allamigeon:
  - Member of the scientific committee of Inria Saclay – Ile-de-France.
  - Member of the Applied Mathematics Department committee at Ecole Polytechnique.

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

- M. Akian
  - Course “Markov decision processes: dynamic programming and applications” joint between (3rd year of) ENSTA and M2 “Mathématiques et Applications”, U. Paris Saclay, “Optimization”, and shared with Jean-Philippe Chancelier (ENPC), 15 hours each.
- X. Allamigeon
  - Petites classes et encadrement d’enseignements d’approfondissement de Recherche Opérationnelle en troisième année à l’École Polytechnique (programme d’approfondissement de Mathématiques Appliquées) (niveau M1).
  - Cours du M2 “Optimisation” de l’Université Paris Saclay, cours partagé avec Manuel Ruiz (RTE) et Dominique Quadri (LRI, Université Paris Sud).
  - Co-responsabilité du programme d’approfondissement en mathématiques appliquées (troisième année) à l’École Polytechnique.
- V. Boeuf
  - Petite classe du cours de tronc commun de 1ere année “Introduction à l’optimisation” de l’École des ponts (ENPC), niveau L3.
- J.B. Eytard
  - Cours de niveau L1-L2 à l’IUT d’Informatique d’Orsay (Univ. Paris-Sud), dans le cadre d’un monitorat (64h) (théorie des graphes, recherche opérationnelle, modélisation mathématique).
- S. Gaubert
  - Course “Systèmes à Événements Discrets”, option MAREVA, ENSMP.
  - Course “Algèbre max-plus pour le contrôle optimal et les jeux” of “Parcours Optimisation, Jeux et Dynamique” (ODJ) of M2 “Mathématiques et Applications” of Paris 6 University and École Polytechnique.
  - Lecture of Operations Research, third year of École Polytechnique. The lectures notes were published as a book [63].
- M. Skomra
  - TD de mathématiques à l’UPMC.
- N. Stott
  - Cours et TD “Introduction à la programmation graphique en C++”, option MAREVA et semaine Athens à l’ENSMP (École des Mines de Paris), niveau M1.

### 10.2.2. Supervision

- PhD in progress : Eric Fodjo, registered at École Polytechnique, since October 2013, thesis supervisor: Marianne Akian.
- PhD : Nikolas Stott, registered at École Polytechnique, since October 2014, thesis supervisor: Stéphane Gaubert, cosupervision: Xavier Allamigeon, Éric Goubault, Sylvie Putot, defended on 23 Nov 2017.
- PhD : Vianney Boeuf, registered at École Polytechnique, since October 2014, thesis supervisor: Stéphane Gaubert, cosupervision: Stéphane Raclot (BSPP), Marianne Akian, Xavier Allamigeon, defended on 18 Dec 2017.
- PhD in progress : Mateusz Skomra, registered at Univ. Paris Saclay since October 2015, thesis supervisor: Stéphane Gaubert, cosupervision: Xavier Allamigeon.

- PhD in progress : Jean-Bernard Eytard, registered at Univ. Paris Saclay since October 2015, thesis supervisor: Stéphane Gaubert, cosupervision: Marianne Akian, Mustapha Bouhtou.
- PhD in progress: Paulin Jacquot, registered at Univ. Paris Saclay since November 2016, thesis supervisor: Stéphane Gaubert, cosupervision: Nadia Oujdane, Olivier Beaude (EDF).
- PhD in progress: Benoît Tran, registered at Univ Paris-Est Marne La Vallée, since September 2017, thesis supervisor: Jean-Philippe Chancelier (ENPC), cosupervision: Marianne Akian.

### 10.2.3. Juries

- X. Allamigeon
  - Jury of the PhD thesis of N. Stott (Ecole Polytechnique, examiner, November 2017).
  - Jury of the PhD thesis of V. Bœuf (Ecole Polytechnique, examiner, December 2017).
- S. Gaubert
  - Member of hiring committee (Professor position) at Paris 6 University.
  - Jury of the PhD thesis of A. Sagnier (Paris 7, examiner, 2017).
  - Jury of the PhD thesis of G. Loho (TU-Berlin, reviewer, 2017).
  - Jury of the PhD thesis of R. Hess (LAAS, 2017).
  - Jury of the PhD thesis of N. Stott (Ecole Polytechnique, examiner, November 2017).
  - Jury of the PhD thesis of V. Bœuf (Ecole Polytechnique, examiner, December 2017).

## 10.3. Conferences, Seminars

- M. Akian
  - Workshop "Numerical methods for optimal control problems: algorithms, analysis and applications" at INdAM, Roma, Italy, June, 19-23, 2017. Title of the talk: "Probabilistic max-plus schemes for solving Hamilton–Jacobi–Bellman equations".
  - Atelier "Jeux dynamiques à somme nulle: temps discret, temps continu", Fréjus, from 17 to 19 oct 2017. Title of the talk: "Érgodicité des jeux à somme nulle".
- X. Allamigeon
  - "Tropical Mathematics and its Applications" seminar, Warwick University, February 15, 2017. Title of the talk: "Tropicalization of spectrahedra".
  - "Optimisation and Numerical Analysis" seminar, Birmingham University, February 16, 2017. Title of the talk: "Log-barrier interior-point methods are not strongly polynomial".
  - "Computing in Tropical Geometry" workshop, Zuse Institut Berlin, May 11-12, 2017. Title of the talk: "Tropical linear optimization".
  - 8th International Conference on Interactive Theorem Proving, Brasília, September 26-29, 2017. Title of the talk: "A Formalization of Convex Polyhedra based on the Simplex Method".
  - "Computations and Proofs" SpecFun seminar, Saclay, October 16, 2017. Title of the talk: "Log-barrier interior-point methods are not strongly polynomial".
- V. Boeuf
  - INFORMS APS 2017, Applied Probability Society Conference. Chicago, IL, USA, July 10-12, 2017. "An Asymptotic Analysis of Blocking in a Finite Capacity Network with Two Levels."
- J.B. Eytard
  - Congrès annuel de la société française de Recherche Opérationnelle (ROADEF), Feb. 22-24, 2017, Metz. Title of the talk: "Une approche tropicale de la programmation bi-niveau".

- 15th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WIOPT) , May. 15-17, 2017, Paris. Title of the talk: "A bilevel optimization model for load balancing in mobile networks through price incentives".
- Séminaire des doctorants du CMAP, Jun. 23, Palaiseau. Title of the talk: "A tropical approach to bilevel programming applied to a price incentives model in mobile data networks".
- SIAM Applied Algebraic Geometry (SIAMAG), Jul. 31 - Aug. 4, Atlanta. Title of the talk: "A tropical approach to bilevel programming: application to a price incentives model in mobile data networks".
- PGMO Days, Nov. 13-14, 2016, Palaiseau. Title of the talk: "Price incentives in mobile data networks: bilevel programming, competitive equilibria and discrete convexity".
- S. Gaubert
  - STACS, Hannover, March 2017, The operator approach to entropy games.
  - Noncommutative geometry: number theory, celebration of Alain Connes' 70th birthday, Shanghai, March 23 - April 7, 2017. Tropical modules, zero-sum games and non-archimedean optimization.
  - Mathematical morphology and its applications to image and signal processing Fontainebleau, Fontainebleau, May 15 – May 17, 2017. Tropical and non-linear Perron-Frobenius methods for optimal control and zero-sum games
  - INDAM Workshop, Roma, June 19–23, 2017. Noncommutative aspects of dynamic programming.
  - Stony Brook Game Theory Conference, July 17-21, 2017. Nonarchimedean convexity and stochastic mean payoff games.
  - OR Berlin, Sep. 5-8, 2017. Tropical spectrahedra and stochastic mean payoff games.
  - Control and Optimization Conference On the occasion of Frédéric Bonnans 60th birthday, EDF Labs Saclay, 15-17 Nov, 2017. Dynamic programming over noncommutative spaces
- D. Jones
  - Tropical Mathematics & its Applications, Birmingham, Nov 15 2017. "A discrete geometry model of fire propagation in urban areas".
- M. Skomra
  - Séminaire de Géométrie Tropicale, UPMC, Paris, April 26, 2017. Title of the talk: "Tropical spectrahedra".
  - Computing in Tropical Geometry, Zuse Institute Berlin, May 11–12, 2017. Title of the talk: "Tropical spectrahedra".
  - SIAM Conference on Optimization, Vancouver, May 22–25, 2017. Title of the talk: "Solving Generic Nonarchimedean Semidefinite Programs using Stochastic Game Algorithms".
  - International Conference on Effective Methods in Algebraic Geometry (MEGA), Nice, June 12–16, 2017. Title of the talk: "The tropical analogue of the Helton–Nie conjecture is true".
  - SIAM Conference on Applied Algebraic Geometry, Atlanta, GA, Jul. 31 – Aug. 04, 2017. Title of the talk: "Tropical spectrahedra".
- C. Walsh
  - Workshop "Compactifications of buildings and symmetric spaces", Heidelberg, May 16–17, 2017. Title of the talk: "The horofunction compactification of symmetric cones".
  - Workshop "Order Structures, Jordan Algebras, and Geometry", Leiden, May 29–June 2, 2017. Title of the talk: "Antitone maps and Euclidean Jordan algebras".
  - Seminar, Ecole Polytechnique, Palaiseau, June 7, 2017. Title of the talk: "Approximability of convex bodies and volume growth in Hilbert geometries".
  - Conference "Géométrie métrique, géométrie de Finsler", Marseille, June 26–29, 2017. Title of the talk: "Approximability of convex bodies and volume growth in Hilbert geometries".

## DOLPHIN Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. General Chair, Scientific Chair

- E-G. Talbi (steering committee): PDCO'2017 7th IEEE Workshop Parallel Distributed Computing and Optimization, Orlando, USA, May 2017
- N. Melab: Chair of 5 simulation and HPC-related seminars at Lille 1 oct-dec. 2017 (CENAERO, Intel, e-xstream, CRISTAL, Labs of mechanics at Lille)
- L. Jourdan et al.: Summer school ATOM 2017, June 2017, Lille, France

### 10.1.2. Scientific Events Selection

#### 10.1.2.1. Chair of Conference Program Committees

- E-G. Talbi: Track chair "Metaheuristics and machine learning", MIC'2017 Metaheuristics International Conference, Barcelona, Spain, July 2017

#### 10.1.2.2. Member of the Conference Program Committees

- IEEE Congress on Evolutionary Computation (CEC), San Sebastián, Spain, June 5-8, 2017
- The ACM Genetic and Evolutionary Computation Conference (GECCO), Berlin, Germany, July 15-19, 2017
- 12th Metaheuristics International Conference (MIC), Barcelona, Spain, July 4-7, 2017
- The 2017 International Conference on High Performance Computing & Simulation (HPCS), Genoa, Italy, July 17-21, 2017
- IEEE Intl. Workshop on Parallel/Distributed Computing and Optimization (IPDPS/PDCO), Orlando, Florida, USA, May 23-27, 2017
- 9th Intl. Conf. on Intelligent Networking and Collaborative Systems (INCoS), Track: Nature-inspired parallel collaborative systems, Ryerson University, Canada, August 24-26, 2017
- Colloque sur l'Optimisation et les Systèmes d'information (COSI), Bouira, Algérie, May 14-16, 2017
- The 3rd Intl. Conf. on Cloud Computing Technologies and Applications (CloudTech), Rabah, Morocco, Oct 24-26, 2017
- 6th Int. Conf. on Advances in Computing Communication and Informatics ICACCI'17, Manipal, India, Sept 2017
- ROADEF'2017 18ème Conférence de la Société Française de Recherche Opérationnelle et Aide à la Décision, Metz, France, Fev 2017
- EvoCOP'2017, European Conference on Evolutionary Computation in Combinatorial Optimization, Amsterdam, Netherlands, Apr 2017
- ACM GECCO'2017 (Genetic and Evolutionary Computation Conference), Berlin, Germany, July 2017
- IEEE PDCO Parallel and Distributed Computing and Optimization in IPDPS'2017, Orlando, USA, May 2017
- MIC'2017, Metaheuristics International Conference, Barcelona, Spain, July 2017

- IJCCI'2017 8th International Joint Conference on Computational Intelligence, Madeira, Portugal, Nov 2017
- EvoCOP'2017, European Conference on Evolutionary Computation in Combinatorial Optimization, Amsterdam, Netherlands, Apr 2017
- ACM Student Workshop in GECCO'2017 (Genetic and Evolutionary Computation Conference), Berlin, Germany, July 2017
- IESM'2017 Int. Conf. on Industrial Engineering and Systems Management, Saarbrücken, Germany, Sept 2017
- EA'2017 Int. Conference on Artificial Evolution, Paris, France, Nov 2017
- MOPGP'2017 Int. Conference on Multiple objective Programming and Goal Programming, Metz, France, 2017
- IEEE CEC 2017

### **10.1.3. Journal**

#### *10.1.3.1. Member of the Editorial Boards*

- E-G. Talbi : Editor of the Journal « Computers and Industrial Engineering (CAIE, Elsevier)» Area «Computational Intelligence»
- N. Melab: Guest and Managing Editor (in collaboration with A. Zomaya and I. Chakroun) of a special on Parallel Optimization using/for Multi and Many-core High Performance Computing in Journal of Parallel and Distributed Computing (JPDC), 2016-2017
- L. Jourdan: Review Editor Frontiers in Big Data

#### *10.1.3.2. Reviewer - Reviewing Activities*

- IEEE Transactions on Evolutionary Computation, Evolutionary Computation, Journal of Heuristics, Artificial Intelligence Journal
- Applied Soft Computing
- Computers in Biology and Medicine
- Computers & Industrial Engineering
- Computers & Operations Research
- EJOR European Journal of Operational Research
- IEEE Transaction on Evolutionary Computation
- International Journal of Metaheuristics
- International Journal of Molecular Sciences
- International Journal of Production research
- International Transactions in Operational
- JOH Journal of Heuristics
- JOCO Journal of Combinatorial Optimization
- JPDC Journal of Parallel and Distributed Computing
- Nature Scientific Report
- Soft Computing (SOCO)
- Transactions on Computational Biology and Bioinformatics
- ACM Computing Surveys
- Computation and Concurrency: Practice and Experience (CCPE)
- Parallel Processing Letters
- Parallel Computing

- Journal of Parallel and Distributed Computing (JPDC)
- 4OR: A Quarterly Journal of Operations Research (Springer)
- ASOC: Applied Soft Computing (Elsevier)
- CAIE: Computers & Industrial Engineering (Elsevier)
- ITOR: International Transactions in Operational Research (Wiley)
- NEUCOM: Neurocomputing (Elsevier)
- Discrete Optimization
- Annals of Operations Research
- RAIRO - Operations Research

#### **10.1.4. Invited Talks**

- E-G. Talbi: Multi-objective optimization under uncertainty, Keynote presentation, Business Clouds'2017, Luxembourg, Jan 2017.
- E-G. Talbi: Matheuristics, Invited presentation, Universidad Elche, Spain, April 2017
- E-G. Talbi: Multi-objective metaheuristics, Invited presentation, University of Catania, Catania, Italy, April 2017
- E-G. Talbi: Optimization of smart grids: opportunities and directions, Keynote speaker ICOA'2017, International Workshop on Optimization and Applications, Kenitra, Morocco, April 2017
- E-G. Talbi: Parallel and distributed metaheuristics, Invited tutorial, IEEE CEC Congress on Evolutionary Computation, San Sebastian, Spain, June 2017
- E-G. Talbi: Evolutionary multi-objective algorithms under uncertainty, Invited seminar, Jozef Stefan Institute, Ljubljana, Slovenia, Oct 2017
- E-G. Talbi: Smart grids: challenges and opportunities, Invited seminar, Ecole Centrale de Casablanca, Casablanca, Morocco, Nov 2017
- E-G. Talbi: Complex optimization problems in smart grids, Keynote speaker, Workshop MOSSYS'2017 Modélisation, Optimisation et Simulation des Systèmes, Rabat, Morocco, Oct 2017
- E-G. Talbi: Optimization of smart grids, Invited seminar, Jozef Stefan Institute, Ljubljana, Slovenia, Nov 2017

#### **10.1.5. Leadership within the Scientific Community**

- L. Jourdan : Co-president of the working group “ATOM: Multi-objective optimization”, GDR RO
- L. Jourdan, A. Liefooghe : Secretary of the association “Artificial Evolution” (EA)
- L. Jourdan: nominated member of CNU 27
- C. Dhaenens: member of the scientific council of GDR RO (Operations research)
- C. Dhaenens: nominated member at Co-NRS, section 6 (National committee of CNRS)
- N. Melab: scientific leader of Grid'5000 (<https://www.grid5000.fr>) at Lille, since 2004
- N. Melab: Chargé de Mission of High Performance Computing and Simulation at Université Lille 1, since 2010
- E-G. Talbi : Co-president of the working group “META: Metaheuristics - Theory and applications”, GDR RO and GDR MACS
- E-G. Talbi : Co-Chair of the IEEE Task force on Cloud Computing within the IEEE Computational Intelligence Society

#### **10.1.6. Scientific Expertise**

- E-G. Talbi: QS respondents (Novosibirsk State University, Russia, 2014-2017)



- E-G. Talbi: Reviewer de projets de recherche, National Science Center, Pologne (2017)
- E-G. Talbi: Dutch NOW council (Innovative Research Incentive Scheme) project, Netherlands, 2017
- E-G. Talbi: Reviewer de dossiers de qualification de Professeurs, University of Portsmouth, UK, 2017
- E-G. Talbi: Expertise projets ERC Consolidator Grant (2017)
- E-G. Talbi: Expertise projets STIC/Math Amérique du Sud – Chili et Argentine (2017)
- E-G. Talbi: Expertise projets COFECUB - Brésil (2017)
- N. Melab: Member of the advisory committee for the IT and management engineer training at Faculté Polytechnique de Mons
- N. Melab: Reviewer for the COFECUB scientific evaluation committee (Comité Français d’Evaluation de la Coopération Universitaire et scientifique avec le Brésil), 2017
- N. Melab: Expert for two government research agencies: CONICYT (Chile) and NCN (Poland), 2017

### **10.1.7. Research Administration**

- C. Dhaenens: Vice-head of CRISAL laboratory (Centre de Recherche en Informatique, Signal et Automatique de Lille), common to CNRS, University of Lille and Ecole Centrale de Lille, 430 people
- L. Jourdan: member of the Bureau du Département de domaine Informatique pour l’école doctorale SPI, University of Lille
- N. Melab: Member of the steering committee of “Maison de la Simulation” at Université Lille 1
- E-G. Talbi, Coordinator of the International Relationships of Inria Lille Nord Europe

## **10.2. Teaching - Supervision - Juries**

### **10.2.1. Teaching**

- Master: Laetitia Jourdan, Business Intelligence, 30h, M1, University of Lille 1, France
- Master : Laetitia Jourdan, Datamining, 60h , M1, University of Lille 1, France
- Master: Laetitia Jourdan, Datawarehouse, 30h, M1, University of Lille 1, France
- Licence: Laetitia Jourdan, Informatique, 48h, L1 University of Lille 1, France
- Master: Laetitia Jourdan, Responsible of Master MIAGE Formation en Alternance, University of Lille 1, France
- Licence: Laetitia Jourdan, Co-responsible of Licence 1 Computer Science, University of Lille 1, France
- Engineering school: Clarisse Dhaenens, Graphs and Combinatorics, 80 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school: Clarisse Dhaenens, Operations Research, 70 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school: Clarisse Dhaenens, Algorithmics and programming, 45 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school: Clarisse Dhaenens, responsible of the 5th year of statistics and computer science department.
- Engineering school: Marie-Eléonore Kessaci, Graphs and Combinatorics, 44 HeqTD, Polytech Lille, University Lille 1, France

- Engineering school: Marie-Eléonore Kessaci, Algorithmics and programming, 51 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school: Marie-Eléonore Kessaci, Databases, 71 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school: Marie-Eléonore Kessaci, Mathematics, 20 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school: Marie-Eléonore Kessaci, responsible of the 3th year of statistics and computer science department
- Master lecture: N. Melab, Supercomputing, 24h, Master 2, University Lille 1, France
- Master lecture: N. Melab, Operations Research, 78h, Master 1, University Lille 1, France
- Master leading: N. Melab, Co-head (with B. Merlet) of the Master 2 of advanced scientific computing, U. Lille 1
- Licence: A. Liefoghe, Algorithmic and Data structure, 36h ETD, L2, Université de Lille 1, France
- Licence: A. Liefoghe, Algorithmic for Operations Research, 36h ETD, L3, Université de Lille 1, France
- Master: A. Liefoghe, Databases, 30h ETD, M1, University Lille 1, France
- Master: A. Liefoghe, Advanced Object-oriented Programming, 53h ETD, M2, University Lille 1, France
- Master: A. Liefoghe, Combinatorial Optimization, 10h ETD, M2, University Lille 1, France
- Master: A. Liefoghe, Multi-criteria Decision Aid and Optimization, 25h ETD, M2, University Lille 1, France
- A. Liefoghe is supervising the Master 2 MIAGE IPI-NT
- Master: Bilel Derbel, Combinatorial Optimization, 35h, M2, University Lille 1, France
- Master: Bilel Derbel, Grid Computing, 16h, M2, University Lille 1, France
- Master: Bilel Derbel, Parallel and Distributed Programming, 35h, M1, University Lille 1, France
- Master: Bilel Derbel, Algorithms and Applications, 28h, M1, University Lille 1, France
- Engineering school: El-Ghazali Talbi, Advanced optimization, 36h, Polytech'Lille, University Lille 1, France
- Engineering school: El-Ghazali Talbi, Data mining, 36h, Polytech'Lille, University Lille 1, France
- Engineering school: El-Ghazali Talbi, Operations research, 60h, Polytech'Lille, University Lille 1, France
- Engineering school: El-Ghazali Talbi, Graphs, 25h, Polytech'Lille, University Lille 1, France

### 10.2.2. Supervision

- PhD in progress: Maxence Vandromme, Datamining et optimisation combinatoire adaptés à la prévention et à l'orientation de patients, starting: 1/06/2014, CIFRE with Alicante co-supervision: Clarisse Dhaenens and Laetitia Jourdan
- PhD in progress: Aymeric Blot, Réagir et s'adapter à son environnement : Concevoir des méthodes autonomes pour l'optimisation combinatoire à plusieurs objectifs, September 2015, co-directed Laetitia Jourdan and Marie-Eléonore Marmion
- PhD in progress : Lucien Mousin, Exploiter la connaissance pour mieux optimiser, October 2015, co-directed Clarisse Dhaenens and Marie-Eléonore Marmion
- PhD in progress: AnneLise Bedenel, Classification supervisée et non supervisée en présence de descripteurs évoluant dans le temps. Application à la comparaison d'assurances en ligne, co-directed Laetitia Jourdan and Christophe Biernacki (Modal Inria Team)

- PhD defense: Sylvain Dufourny, Optimisation de décisions économiques concurrentielles dans un simulateur de gestion d'entreprise, Clarisse Dhaenens - Defended in October 2017
- PhD defense: Jan Gmys, Parallel Branch-and-Bound for solving permutation problems on multi- and many-core clusters, Nouredine Melab and Daniel Tuytens (UMONS, Belgium), 12/2017
- PhD in progress: Sohrab Faramarzi, Optimization of medical laboratories, 02/2016, El-Ghazali Talbi
- PhD in progress: Z. Garroussi, Demand side management in smart grids: Multi-objective models, El-Ghazali Talbi and Rachid Ellaia (EMI, Morocco)
- PhD in progress: J. Pelamatti, Multi-disciplinary design of aerospace vehicles, Jan 2017, El-Ghazali Talbi
- PhD in progress: Ali Hebbal, Surrogate-assisted multi-objective evolutionary algorithms, Oct 2017, El-Ghazali Talbi and Nouredine Melab.
- PhD defense: A. Q. Nguyen, Cloud broker optimization for energy-aware in multi-clouds system, 01/2017, El-Ghazali Talbi and Pascal Bouvry (Univ. Luxembourg)
- PhD defense: Oumayma Bahri, Fuzzy multi-objective optimization, 05/2017, El-Ghazali Talbi and Nahla Ben-Omar (Univ. Tunis, Tunisia)

### 10.2.3. *Juries*

- E-G. Talbi: Phd Thesis: Urrego Agudelo Lilliam, A novel method for the approximation of risk of blackout in operational conditions, Université Paris-Est, Créteil, France, Jan 2017
- E-G. Talbi: Phd Thesis: Jonathan Oesterle, Holistic approach to designing hybrid assembly lines, Université de Technologie de Troyes, France, Apr 2017
- E-G. Talbi: Phd Thesis: Birsan Irem Selamoglu, The plant propagation algorithm for discrete optimization, University of Essex, Colchester, UK, June 2017
- E-G. Talbi: Phd Thesis: Omer Yusuf Adam Mohamed, Resource allocation for improved performance and resource efficiency in cloud computing, University of Sydney, Australia, July 2017
- E-G. Talbi: Phd Thesis: Nhan Quy Nguyen, Electric vehicle charging scheduling optimization, UTT Troyes, France, Sept 2017
- E-G. Talbi: Phd Thesis: Mohamed Afilal, Optimisation de la prévision et de la planification des activités d'un centre d'urgence hospitalier, UTT Troyes, France, Dec 2017
- E-G. Talbi: Phd Thesis: Sara Tfaily, Contribution aux graphes creux pour le problème de tournées sur arcs déterministe et robustes: théorie et algorithmes, Normandie Université, Havre, France, Dec 2017
- N. Melab: PhD thesis: Escobar Fernando, Vers une nouvelle génération d'outils d'aide à la décision s'appliquant à la prévention des risques lors de la prescription des antibiotiques : Combinaison des technologies Web sémantique et de l'aide multicritère à la décision, University of Mons, October 13th, 2017
- N. Melab: PhD thesis, GPU-based backtracking strategies for solving permutation combinatorial problems, Federal University of Cerea, Brazil, December 5th, 2017
- C. Dhaenens: PhD Thesis: Nawal Benabbou, Procédures de décision par élicitation incrémentale de préférences en optimisation multicritère, multi-agents et dans l'incertain, Université Paris 6, May 2017
- L. Jourdan: PhD Thesis: Pauline Wauquiez, Task driven representation learning, Université de Lille - May 29th 2017 (Présidente de Jury)
- L. Jourdan: PhD Thesis: Labib Yousef, Contribution à la résolution des problèmes de placement en trois dimensions, Université Picardie Jules Verne, June 29th 2017

- L. Jourdan: HDR: Karine Deschinkel, Nouveaux modèles de programmation linéaire et de flots pour la résolution de problèmes d'optimisation difficiles, Université de Belfort Franche Comté - June 6th 2017

### **10.3. Popularization**

- E-G. Talbi: Organization of a R&D day for all students and lecturers of Polytech'Lille engineering school on "Big data and machine learning" (22/03/2018).

## GEOSTAT Project-Team

## 10. Dissemination

### 10.1. Promoting Scientific Activities

#### 10.1.1. Scientific Events Organisation

##### 10.1.1.1. Member of the Organizing Committees

- H. Yahia with S. Bontemps (Bordeaux Astrophysics Laboratory) and N. Schneider (Cologne University): GENESIS/MOBS kick-off meeting 28. and 29.9.2017 in Bordeaux, <https://hera.ph1.uni-koeln.de/~nschneid/genesis-meeting-sep2017.html>.

#### 10.1.2. Journal

##### 10.1.2.1. Member of the Editorial Boards

H. Yahia is a review editor of *Frontiers in Fractal Physiology*.

##### 10.1.2.2. Reviewer - Reviewing Activities

H. Yahia: *Frontiers in Physiology*.

#### 10.1.3. Invited Talks

- N. Brodu: Presentation given to the 8<sup>th</sup> *École Interdisciplinaire sur les Systèmes Complexes : « Extraction de données et information: applications à l'imagerie, à l'environnement et à la physique »*. 11-13 october 2016, Rennes.
- K. Daoudi has been invited to the Wolrd Voice Consortium 2017 to present the project on differential diagnosis in Parkinsonism.
- H. Yahia: presentation given to the Laboratoire d'Astrophysique de Bordeaux on March 8, 2017.
- H. Yahia is invited to the TOSCA (<http://www.tosca2017.fr/>) group in march 2017.
- A. Tamim is invited in June 2017 for the reception of his PHC Hubert Curien PhD gold medal.
- K. Minaoui is invited in GEOSTAT in July 2017.
- Visit of D. Singh in GEOSTAT in August 2017 on the co-supervision of G. Singh PhD thesis.
- Invitation of H. Badri in the framework of I2S kickoff meeting, on Inria funding.

#### 10.1.4. Research Administration

- H. Yahia participated in the first scientific meeting of "Centre d'Excellence sur les Maladies Neurodégénératives", projet « Bordeaux Initiative for Neurodegenerative Disorders », May 11 2017, Bordeaux (NEUROCAMPUS auditorium building).
- Participation of H. Yahia, H. Badri, K. Daoudi and N. Brodu to the I2S-GEOSTAT kickoff meeting in September 2017.
- Participation of K. Daoudi to the SABOR project organization.

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Supervision

PhD in progress : B. Das, supervised of H. Yahia in the framework of the Toubkal project (starts 01/01/18).

PhD in progress : A. El Aouni, co-supervised by K. Daoudi, H. Yahia and K. Minaoui in the framework of the Toubkal project.

PhD in progress : G. Singh, co-supervised by N. Brodu in the framework of OPTIC assoicated team anf IFCAM collaboration.

PhD in progress : C. Artana, co-supervised by H. Yahia in a collaboration with LOCEAN team (Univ. Paris 6).

### **10.3. Popularization**

Diffusion of the GENESIS project in the magazine Inria PLUGIN (published beginnig 2018) and in the Inria website (national and INRIS BSO), see <https://www.inria.fr/centre/bordeaux/actualites/lancement-du-projet-genesis>.

## INOCS Team

## 10. Dissemination

### 10.1. Promoting Scientific Activities

#### 10.1.1. Scientific Events Organisation

##### 10.1.1.1. Member of the Organizing Committees

6th Winter School on Network Optimization, Estoril, Portugal, January 2017: Bernard Fortz.

Meeting of the EURO Working group on Pricing and Revenue Management, Amsterdam, Netherlands, June 2017: Luce Brotcorne.

#### 10.1.2. Scientific Events Selection

##### 10.1.2.1. Member of the Conference Program Committees

ORBEL 2017, Brussels, Belgium, February 2017: Bernard Fortz.

ROADEF2017 - 18ème Conférence de la Société Française de Recherche Opérationnelle et d'Aide à la Décision, Metz, France, February 2017: Luce Brotcorne, Bernard Fortz, Frédéric Semet.

International Network Optimization Conference (INOC) 2017, Lisbon, Portugal, March 2017: Bernard Fortz.

International Conference on Design of Reliable Communication Networks 2017 (DRCN 2017), Munich, March 2017: Martine Labbé.

Conference of the International Federation of Operational Research Societies, Quebec, Canada, July 2017: Luce Brotcorne, Bernard Fortz.

International Symposium on Locational Decisions (ISOLDE 2017), Toronto, July 2017 Martine Labbé.

INFORMS TSL Conference, Chicago, July 2017: Martine Labbé.

XLIX Brazilian Symposium on Operational Research (XLIX SBPO), Blumenau, Brazil, August 2017: Martine Labbé.

Computer Science Discovery 8 (CSD8), Mons, Belgium, August 2017: Martine Labbé.

#### 10.1.3. Journal

##### 10.1.3.1. Member of the Editorial Boards

EURO Journal on Computational Optimization: Martine Labbé - Editor in chief.

Computers and Operations Research: Luce Brotcorne - Associate editor.

INFORMS Journal on Computing: Bernard Fortz - Associate editor.

International Transactions in Operations Research: Bernard Fortz, Martine Labbé - Associate editors.

Transportation Science: Martine Labbé - Member of the Advisory Board.

##### 10.1.3.2. Reviewer - Reviewing Activities

Annals of Operations Research, Applied Computing and Informatics, Central European Journal of Operations Research, Computers & Operations Research, Computational Optimization and Applications, Discrete Applied Mathematics, EURO Journal on Transportation and Logistics, European Journal of Operational Research, IIE Transactions, INFORMS Journal on Computing, International Journal of Management Science and Engineering Management, Mathematical Programming Computation, Networks, Omega, Operations Research, Optimization and Engineering, RAIRO - Operations Research, Transportation Science: Luce Brotcorne, Diego Cattaruzza, Bernard Fortz, Martine Labbé, Maxime Ogier, Frédéric Semet, Markus Sinnl.

#### **10.1.4. Invited Talks**

Conference of the International Federation of Operational Research Societies, Quebec, Canada, July 2017: Martine Labbé, EURO plenary lecturer [42].

Optimization 2017, Lisbon, Portugal, September 2017: Martine Labbé, plenary speaker [43].

Conférence ROAD 2017, Esatic, Abidjan, March 2017: Luce Brotcorne, plenary speaker [37].

Network Optimization Workshop 2017, Viterbo, June 2017: Luce Brotcorne, Frédéric Semet, invited speaker [38], [61].

#### **10.1.5. Leadership within the Scientific Community**

EURO Working Group "Pricing and Revenue Management": Luce Brotcorne - coordinator.

EURO Working Group "European Network Optimization Group (ENOG)": Bernard Fortz - coordinator.

EURO Working Group "Vehicle routing and logistics optimization (VEROLOG)": Frédéric Semet - Member of the board.

SIAG/Optimization Prize committee: Martine Labbé - Chair.

ORBEL (Belgian Operations Research Society): Bernard Fortz - Member of the board of administration and treasurer.

ORBEL representative for EURO and IFORS: Bernard Fortz

CNRS GdR 3002 : Operations Research: Frédéric Semet - Member of the steering committee

#### **10.1.6. Scientific Expertise**

Scientific orientation committee of the Interuniversity Centre on Enterprise Networks, Transportation and Logistics (CIRRELT), Canada: Bernard Fortz, Frédéric Semet - Members.

Scientific Advisory Board of IWR and its Graduate school HGS MathComp, Heidelberg University: Martine Labbé - Member.

Centro de Matemática, Aplicações Fundamentais e Investigação Operacional, University of Lisbon: Martine Labbé - Member.

Scientific committee of France-Netherlands Exchange Program: Luce Brotcorne - Member.

Evaluation committee for Inria/MITACS Exchange Program: Luce Brotcorne - Member.

Evaluation committee COST GTRI: Luce Brotcorne - Member.

President of the FRIA PE1 - jury 1: Bernard Fortz - Chair.

Scientific board of PICOM competitiveness cluster: Frédéric Semet - Member.

Agence Nationale de la Recherche (ANR): Luce Brotcorne, Frédéric Semet - Reviewer.

Fond de Recherche Nature et Technologie du Québec: Frédéric Semet - Reviewer.

Research Council of Norway: Frederic Semet - Reviewer.

#### **10.1.7. Research Administration**

Committee for the Technological Development (CDT): Luce Brotcorne - Member.

CRIStAL: Frédéric Semet - Deputy-director.

Scientific council of Centrale Lille: Frédéric Semet - Elected member.

### **10.2. Teaching - Supervision - Juries**

#### **10.2.1. Teaching**

Master: Bernard Fortz, Recherche Opérationnelle et Applications, 30hrs, M1, Université de Mons (campus Charleroi), Belgique.



Master: Bernard Fortz, Continuous Optimization, 24hrs, M1 & M2, Université libre de Bruxelles, Belgique.

Master: Martine Labbé, Computer science seminar, 12hrs, M2, Université libre de Bruxelles, Belgique.

Master: Frédéric Semet, Non-linear Optimization, 30hrs, M2, Centrale Lille.

Master: Frédéric Semet, Operations Research, 28hrs, M2, Centrale Lille.

Master: Luce Brotcorne, Optimisation, 14hrs, M1, Polytech Lille.

Master: Luce Brotcorne, Recherche opérationnelle, 16hrs, M1 apprentissage, Polytech Lille.

Master: Luce Brotcorne, Diego Cattaruzza, Maxime Ogier, Frédéric Semet, Numerical Analysis and Optimization, 132hrs, M1, Centrale Lille.

Master: Diego Cattaruzza, Maxime Ogier, Object-Oriented Programming, 48hrs, M1, Centrale Lille.

Master: Diego Cattaruzza, Maxime Ogier, Operations Research, 16hrs, M1, Centrale Lille.

Master: Frédéric Semet, Large-scale optimization methods, 24hrs, M1, Centrale Lille.

Licence: Diego Cattaruzza, Maxime Ogier, Object-Oriented Programming, 36hrs, L3, Centrale Lille.

Licence: Frédéric Semet, Advanced programming and Complexity, 24hrs, L3, Centrale Lille.

Licence: Diego Cattaruzza, Maxime Ogier, Object-Oriented Programming, 40hrs, L2, Centrale Lille.

Licence: Diego Cattaruzza, Web Technologies and Multimedia, 32hrs, L2, Centrale Lille.

Licence: Bernard Fortz, Algorithmique 1, 12hrs, L1, Université libre de Bruxelles, Belgique.

Licence: Bernard Fortz, Algorithmique 2, 24hrs, L1, Université libre de Bruxelles, Belgique.

Licence: Martine Labbé, Projets d'informatique 3 transdisciplinaire, 12hrs, L3, Université libre de Bruxelles, Belgique.

### 10.2.2. Supervision

PhD: Carlos Casorrán Amilburu, Models and algorithms for Solving Bimatrix Stackelberg games, Université libre de Bruxelles, October 2017, Martine Labbé [11].

PhD in progress: Jérôme De Boeck, Optimization problems in energy, from October 2015, Bernard Fortz.

PhD in progress: Burak Celik, Models and methods for Stackelberg games using bilevel optimization and mixed integer linear programming, from Nov 2016, Luce Brotcorne, Martine Labbé.

PhD in progress: Yaheng Cui, Models and methods for decentralized decision in logistics networks, from Oct 2016, Luce Brotcorne, Eric Ballot.

PhD in progress: Concepción Domínguez Sánchez, Mixed Integer Linear Models and Algorithms for Pricing Problems, from October 2017, Martine Labbé.

PhD in progress: Wenjuan Gu, Location routing for short and local fresh food supply chain, from Oct 2016, Maxime Ogier, Frédéric Semet.

PhD in progress: Léonard Von Niederhausen, Design and pricing of new services in energy in a competitive environment, from Oct 2015, Luce Brotcorne, Didier Aussel.

PhD in progress: Fränk Plein, Models and methods for the robust verification of booked capacities in gas networks in a decentralized setting, from October 2017, Martine Labbé.

PhD in progress: Luciano Porretta, Models and methods for the study of genetic associations, from May 2011, Bernard Fortz.

PhD in progress: Fabio Sciamannini, Column generation approaches for solving variants of node coloring problems, from October 2014, Bernard Fortz, Martine Labbé.

PhD in progress: Yuan Yuan, Vehicle Routing Problems with Synchronization for City Logistics, from Oct 2016, Diego Cattaruzza, Frédéric Semet.

### 10.2.3. *Juries*

PhD: "Quelques Algorithmes de Planification Ferroviaire sur Voie Unique", Laurent Daudet, Université de Paris Est. Frédéric Meunier. Luce Brotcorne - Reviewer.

PhD: "Formulations and algorithms for general and security Sackelberg games", Carlos Casorrán Amilburu, Université libre de Bruxelles. Martine Labbé et Fernando Ordóñez. Bernard Fortz - Examiner and Committee Secretary.

PhD: "The multi-terminal vertex separator problem: Complexity, Polyhedra and Algorithms", Youcef Magnouche, Université Paris Dauphine. Ridha Mahjoub. Frederic Semet - Committee Chair.

PhD: "Vehicle routing problems with road-network information", Ramza Ben Ticha, Université Clermont-Auvergne. Nabil Absi and Alain Quillot. Frédéric Semet - Reviewer and Committee Chair.

PhD: "Problèmes de tournées avec gestion de stock et prise en compte explicite de la consommation d'énergie", Yun He, Université Fédérale de Toulouse-Midi Pyrénées. Cyril Briant and Nicolas Jozefowiez. Frédéric Semet - Reviewer.

PhD: "Conception et optimisation d'un réseau de transport multimodal pour desservir des ports maritimes et leur hinterland", Yulong Zhao, Université de Nantes. N. Bostel and Pierre Dejax. Frédéric Semet - Examiner.

PhD: "Heterogeneous cluster computing for many-task exact optimization - Application to permutation problems", Jan Gmys, Université de Mons. Nouredine Melab and Daniel Tuytens. Frederic Semet - Committee Secretary.

PhD: "Mathematical optimization for the visualization of complex datasets", Vanesa Guerrero Lozano, Universidad de Sevilla. Emilio Carrizosa Priego and Dolores Romero Morales. Martine Labbé - Examiner.

PhD: "Automatic algorithm configuration", Leslie Angélica Pérez Cáceres, Université Libre de Bruxelles. Thomas Stuetzle. Martine Labbé - Examiner.

Habilitation: "Reformulations and decompositions of mixed integer linear and nonlinear programs", Fabio Furini, Université Paris-Dauphine. Ridha Mahjoub. Martine Labbé- Reviewer.

## 10.3. Popularization

L. Brotcorne, Club Logistique et Transport, Lille, September 2017.

## MISTIS Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. Member of the Organizing Committees

- Stéphane Girard was a member of the organization committee of the international conference “Mathematical Methods in Reliability”, Grenoble, [MMR2017](#). He also organized a session on Extremes, safety and reliability.
- Stéphane Girard and Julyan Arbel co-organized the one week 2017 school of statistics for astrophysics on Bayesian methodology, Autrans, [Stat4Astro 2017](#).
- F. Forbes co-organized the Multiplanet 2 day [workshop](#) in November 2017 in Grenoble, on the analysis of multimodal data for planets observation and exploration.
- J.-B. Durand co-organized the [CFIES](#) conference in September 2017 in Grenoble, on teaching statistics.

#### 10.1.2. Journal

##### 10.1.2.1. Member of the Editorial Boards

- Stéphane Girard is Associate Editor of the *Statistics and Computing* journal since 2012 and Associate Editor of the *Journal of Multivariate Analysis* since 2016. He is also member of the Advisory Board of the *Dependence Modelling* journal since December 2014.
- F. Forbes is Associate Editor of the journal *Frontiers in ICT: Computer Image Analysis* since its creation in Sept. 2014. Computer Image Analysis is a new specialty section in the community-run openaccess journal *Frontiers in ICT*. This section is led by Specialty Chief Editors Drs Christian Barillot and Patrick Bouthemy.
- In 2017, J.-B. Durand has been a guest Associate Editor of the *PLOS Computational Biology* journal.

##### 10.1.2.2. Reviewer - Reviewing Activities

In 2017, S. Girard has been a reviewer for *Statistics and Risk Modeling*, *Extremes* and *Electronic Journal of Statistics*.

In 2017, F. Forbes has been a reviewer for *Journal of Multivariate Analysis*, *Computational Statistics and Data Analysis*, *Journal of graphical and computational statistics*, *Statistical analysis and data mining*.

In 2017, Julyan Arbel has been reviewer for *the Annals of Statistics*, *Bayesian Analysis*, *Biometrics*, *the Canadian Journal of Statistics*, *Statistics and Computing*, *Statistics and Probability Letters*, *the Journal of Non-parametric Statistics*, *the Scandinavian Journal of Statistics*, as well as for Machine Learning Conferences: *the Conference On Learning Theory (COLT)*, *the AAAI Conference on Artificial Intelligence (AAAI)*, *the International Conference on Learning Representations (ICLR)*. He is also writing Mathematical Reviews for MathSciNet.

#### 10.1.3. Invited Talks

**Stéphane Girard** has been invited to give a talk to the following conferences:

- 10th International Conference of the ERCIM WG on Computing and Statistics [\[31\]](#), London, UK.
- 10th International Conference on Extreme Value Analysis [\[32\]](#), Delft, Netherlands.
- 27th Annual Conference of the International Environmetrics Society [\[33\]](#), Bergamo, Italy.

- Laboratoire de Statistique Théorique et Appliquée (LSTA), Univ Paris 6. Estimation de mesures de risques à partir des Lp-quantiles extrêmes, mai 2017.
- Laboratoire des Écoulements Géophysiques et Industriels (LEGI), Univ Grenoble-Alpes, Introduction à la statistique des valeurs extrêmes, novembre 2017.

**Florence Forbes** has been invited to give talks at :

- University of Queensland, Brisbane, Australia, April 2017 on *Student Sliced Inverse Regression*.
- University of La Trobe, Melbourne, Australia, April 2017 on *inverse regression approach to robust non-linear high-to-low dimensional mapping*.
- The American Statistical Association Joint Statistical meeting 2017 in Baltimore, USA - for a special session entitled "*New Dimension Reduction Methods with Applications to Biomedical Studies*", [35].

**Julyan Arbel** has been invited to give talks at the following seminars and conferences:

- Statistics Seminar, University of Kent, Canterbury, Kent, England, November 2. Talk: Approximating predictive probabilities of Gibbs-type priors.
- Workshop 'New challenges in statistics for social sciences', Ca' Foscari University of Venice, Italy, October 16-17. Invited tutorial: Bayesian nonparametric mixture models and clustering.
- School of Statistics for Astrophysics: Bayesian methodology, Autrans, France, October 9-13. Tutorial: Bayesian nonparametric clustering.
- Journées Scientifiques d'Inria, Sophia Antipolis, France, June 14-16. Invited talk: Probabilités de découverte d'espèces: Bayes à la rescousse de Good & Turing.
- Statistics Seminar, Université du Québec à Montréal, May 25. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- Statistics Seminar, Université de Sherbrooke, Canada, May 23. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- Statistical Science Seminar Series, Duke University, Durham, April 14. Invited talk: Bayesian nonparametric inference for discovery probabilities.

Julyan Arbel gave also the following contributed talks:

- 10th International Conference of Computational and Methodological Statistics (ERCIM), University of London, UK, December 16-18. Invited talk: Approximating predictive probabilities of Gibbs-type priors.
- Bayes in Grenoble reading group, Grenoble, France, November 15. Talk: Approximate Bayesian computation.
- Mathematical Methods of Modern Statistics, CIRM, Luminy, France, July 10-14. Talk: Investigating predictive probabilities of Gibbs-type priors. Poster: On the sub-Gaussianity of the Beta and Dirichlet distributions.
- 11th Conference on Bayesian Nonparametrics, Paris, France, June 26-30. Poster: Sequential Quasi Monte Carlo for Dirichlet Process Mixture Models.
- Workshop YES VIII, Eindhoven, Netherlands, January 23-25. Talk: Bayesian nonparametric inference for discovery probabilities.

**Jean-Baptiste Durand** has been invited to give a talk:

- at the seminar of probability and statistics at Laboratoire J. A. Dieudonné, in Nice, February 2017.

**Alexis Arnaud** gave a talk at:

- Congrès National d'Imagerie du Vivant, in Paris, November 2017, on *Suivi de l'hétérogénéité de la croissance de 4 modèles de gliomes par IRM multiparamétrique analysée par clustering*, [48].

**Pierre-Antoine Rodesch** gave a talk at:

- GDR ISIS, in Paris, March 2017, *Un algorithme one-step de reconstruction tomographique en Imagerie X spectrale*.

#### 10.1.4. Seminars organization

- MISTIS participates in the weekly statistical seminar of Grenoble. Jean-Baptiste Durand is in charge of the organization and several lecturers have been invited in this context.
- F. Forbes and J. Arbel are co-organizing a monthly **reading group** on Bayesian statistics.

#### 10.1.5. Leadership within the Scientific Community

Stéphane Girard is at the head of the associated team SIMERGE (*Statistical Inference for the Management of Extreme Risks and Global Epidemiology*) created in 2015 between MISTIS and LERSTAD (Université Gaston Berger, Saint-Louis, Sénégal). The team is part of the LIRIMA (Laboratoire International de Recherche en Informatique et Mathématiques Appliquées), <http://mistis.inrialpes.fr/simerge>.

#### 10.1.6. Scientific Expertise

Stéphane Girard was a member of the HCERES committee for the evaluation of the SAMM laboratory, Université Paris 1. He also was a referee for the NWO, Netherlands Organisation for Scientific Research.

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

Master : Stéphane Girard, *Statistique Inférentielle Avancée*, 18 ETD, M1 level, Ensimag. Grenoble-INP, France.

Master: Jean-Baptiste Durand, *Statistics and probability*, 192 ETD, M1 and M2 levels, Ensimag Grenoble INP, France. Head of the MSIAM M2 program, in charge of the statistics and data science tracks ([64]).

J.-B. Durand is a faculty member at Ensimag, Grenoble-INP.

Master and PhD course: Julyan Arbel gave a course on *Bayesian nonparametric statistics*, 25 ETD, Inria Montbonnot, France.

J.-M. Bécu, C. Albert are teaching at UGA.

Licence : Alexis Arnaud, *Modélisations mathématiques*, 48 ETD, L2 level, IUT2 Grenoble. Université Grenoble Alpes, France.

Licence : Alexis Arnaud, *Analyse pour l'ingénieur*, 33 ETD, L3 level, Ensimag. Grenoble-INP, France.

Licence : Alexis Arnaud, *Soutien en Analyse pour l'ingénieur*, 39 ETD, L3 level, Ensimag. Grenoble-INP, France.

Licence: Brice Olivier, *Probabilités pour l'informatique*, 27 ETD, M1 level, Ensimag. Grenoble-INP, France.

Licence: Brice Olivier, *Principes et méthodes statistiques*, 36 ETD, L3 level, Ensimag. Grenoble-INP, France.

Licencel: Brice Olivier, *Retours d'expériences (ReX)*, 2 ETD, M2 level, Ensimag. Grenoble-INP, France.

### 10.2.2. Supervision

PhD: Maïlys Lopes, “*Suivi écologique des prairies semi-naturelles : analyse statistique de séries temporelles denses d’images satellite à haute résolution spatiale*”, defended November 2017, Stéphane Girard and Mathieu Fauvel (INRA Toulouse).

PhD in progress: "A new location-scale model for heavy-tailed distributions", started on September 2016, Séphane Girard and Alio Diop (Université Gaston Berger, Sénégal).

PhD in progress: Thibaud Rahier, "Data-mining pour la fusion de données structurées et non-structurées", started on November 2015, Florence Forbes and Stéphane Girard.

PhD in progress: Clément Albert, "Limites de crédibilité d'extrapolation des lois de valeurs extrêmes", started on January 2016, Stéphane Girard.

PhD in progress: Alexis Arnaud "Multiparametric MRI statistical analysis for the identification and follow-up of brain tumors ", October 2014, Florence Forbes, Benjamin Lemasson and Emmanuel Barbier (GIN).

PhD in progress: Pierre-Antoine Rodesch, "Spectral tomography and tomographic reconstruction algorithms", October 2015, Florence Forbes, Clarisse Fournier and Veronique Rebuffel (CEA Leti Grenoble).

PhD in progress: Brice Olivier, "Joint analysis of eye-movements and EEGs using coupled hidden Markov and topic models", October 2015, Jean-Baptiste Durand, Marianne Clausel and Anne Guérin-Dugué (Université Grenoble Alpes).

PhD in progress: Karina Ashurbekova, "Robust Graphical models", October 2016, Florence Forbes and Sophie Achard (Gipsa-lab, Grenoble).

PhD in progress: Veronica Munoz Ramirez, "Extraction de signatures dans les données IRM de patients parkinsoniens de novo", October 2017, Florence Forbes, Julyan Arbel and Michel Dojat (GIN).

PhD in progress: Fabien Boux, "Développement de méthodes statistiques pour l'imagerie IRM fingerprinting ", September 2017, Florence Forbes, Julyan Arbel and Emmanuel Barbier (GIN).

### 10.2.3. Juries

- S. Girard was a member of 3 PhD committees in 2017:
  - Mohamed Néjib Dalhoumi, *Sur l'estimation de probabilités de queues multivariées*, Univ. Montpellier, September 2017.
  - Achmad Choiruddin, *Sélection de variables pour des processus ponctuels spatiaux*, Univ. Grenoble, September 2017.
  - Patricia Tencaliec, *Development in statistics applied to hydrometeorology: imputation of stream-flow data and semiparametric precipitation modeling*, Univ. Grenoble, February 2017.
- Florence Forbes has been reviewer of 2 PhD thesis in 2017:
  - Julie Aubert, *Analyse statistique de données biologiques à haut débit*, AgroParisTech, January 2017.
  - Adrien Faivre, *Analyse d'images hyperspectrales*, University of Besançon Franche-Comté, December 14, 2017.
- F. Forbes was a member of 3 PhD committees in 2017:
  - Clément Elvira, *Modèles bayésiens pour l'identification de représentations antiparcimonieuses et l'analyse en composantes principales bayésienne non paramétrique*, November 10, 2017, Centrale Lille
  - Melanie Bernard, *Système modulaire de traitement pour la tomographie d'émission à partir de détecteurs CdZnTe*, November 6, 2017, CEA-Leti, Grenoble.
  - Vincent Drouard, , *Localisation et suivi de visages à partir d'images et de sons*, December 18, 2017, Inria Grenoble.
- Julyan Arbel acted as a reviewer for the PhD thesis of Ilaria Bianchini, *Modeling and computational aspects of dependent completely random measures in Bayesian nonparametric statistics*, December 2017, Politecnico di Milano, Italy.

#### 10.2.3.1. Other committees

- Grenoble Pole Cognition. F. Forbes is representing Inria and LJK in the pole.
- PRIMES Labex, Lyon. F. Forbes is a member of the strategic committee. F. Forbes is representing Inria since 2016.
- F. Forbes is a member of the executive committee of the Idex CDP Grenoble Data institute.
- F. Forbes is a member of the Committee for technological project and engineer candidate selection at Inria Grenoble Rhône-Alpes ("Commission du développement technologique ") since 2015.
- F. Forbes is a member of the " Comité d'Organisation Stratégique" (COS) since September 2017.
- F. Forbes has been a member of 3 selection committees, 2 for Professors at Centrale Lille and at Paris-Descartes 5, and 1 for assistant professors at University of Lille.
- F. Forbes has been a member of the committee awarding *Grand prix Inria de l'académie des sciences*, June 2017.
- Since 2015, S. Girard is a member of the INRA committee (CSS MBIA) in charge of evaluating INRA researchers once a year in the MBIA dept of INRA.
- S. Girard is a member of the "Comité des Emplois Scientifiques" at Inria Grenoble Rhône-Alpes since 2015.

## MODAL Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

Sophie Dabo-Niang has organized a session “Spatial econometrics” of the conference” at the *1st International Conference on Econometrics and Statistics*, June 15-16, 2017, Hong-Kong, China.

Sophie Dabo-Niang co-organises a session “Regression models under non i.i.d. settings” of the 10th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2017)

(<http://www.cmstatistics.org/CMStatistics2017/>), December 16-18, 2017, London.

Vincent Vandewalle organizes a session “Model-based clustering” of the conference” at the 10th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2017)”

(<http://www.cmstatistics.org/CMStatistics2017/>), December 16-18, 2017, London.

#### 10.1.1.1. General Chair, Scientific Chair

Benjamin Guedj, Pascal Germain (both at Modal) and Francis Bach (SIERRA, Inria Paris) co-organize a NIPS 2017 workshop, called “(Almost) 50 shades of Bayesian learning: PAC-Bayesian trends and insights”. A large audience is expected, and the workshop has a series of prestigious international speakers. See the [website](#).

Benjamin Guedj is the organizer of the [Modal team scientific seminar](#).

#### 10.1.1.2. Member of the Organizing Committees

Alain Celisse was the co-head of the organizing committee of the *Journée Statistique Mathématique*, January the 8th 2017 at IHP.

Guillemette Marot was the co-head of the organizing committee of JOBIM 2017 (<https://project.inria.fr/jobim2017/fr/>).

Sophie Dabo-Niang was:

Member of the scientific committee of “*LICMA'17*”, May 16-19, 2017, Beyrouth, Lebanon (<http://www.licma.net/>)

Member of the international organizing committee of AMU Commission on Women in Mathematics in Africa-African Women Mathematicians Association 2017 AMUCWMA - AWMA Workshop, July 7-8, 2017, Rabat, Morocco (<http://fsr.um5.ac.ma/PACOM2017/WPACOM2017.php>)

Vincent Vandewalle is member of the scientific animation cell of the bilille platform which has organized two thematic days in 2017:

Omics-driven genome annotation, Lille, March 31st 2017 ([https://wikis.univ-lille1.fr/bilille/omics\\_annotation\\_2017](https://wikis.univ-lille1.fr/bilille/omics_annotation_2017))

Working with networks and pathways in molecular biology, Lille, November 20th 2017 ([https://wikis.univ-lille1.fr/bilille/networks\\_2017](https://wikis.univ-lille1.fr/bilille/networks_2017))



### 10.1.2. Scientific Events Selection

#### 10.1.2.1. Member of the Conference Program Committees

Sophie Dabo-Niang was member of the local committee program of ISI (61st World Statistics Congress), 16-21, July, 2017, Marrakech, Morocco (<http://payment.isi2017.org/committees/local-programme-committee-lpc/>).

Vincent Vandewalle was member of the committee program of JOBIM 2017 (<https://project.inria.fr/jobim2017/fr/>).

#### 10.1.2.2. Reviewer

Benjamin Guedj is a reviewer for NIPS 2017, AISTATS 2018, ALT 2018 and ICLR 2018, ICML 2018.

Pascal Germain: 6th International Conference on Learning Representations (ICLR 2018).

### 10.1.3. Journal

#### 10.1.3.1. Member of the Editorial Boards

Sophie Dabo-Niang is member of *Revista Colombiana de Estadística*, 2015- —.

Christophe Biernacki is an Associate Editor of the North-Western European Journal of Mathematics (NWEJM).

#### 10.1.3.2. Reviewer - Reviewing Activities

Benjamin Guedj acted as a reviewer for the following journal papers: Math Reviews, and the Annals of the Institute of Statistical Mathematics, Electronic Journal of Statistics.

Sophie Dabo acted as a reviewer for the following journal papers: Statistical Inference for Stochastic Processes, Computational Statistics and Data Analysis, Statistics, ESAIM: Probability and Statistics, Journal of Multivariate Analysis, Journal of Nonparametric statistics, Statistics and Probability Letters, Electronic journal of statistics, Metrika, Annals of Applied Statistics, Statistical Methods and Applications, ...

Christophe Biernacki acted as a reviewer for the following journal papers: Statistics and Computing (STCO), Psychometrika (PMET), Test, Knowledge and Information Systems (KAIS), Journal of Machine Learning Research (JMLR), Journal of Statistical Software (JSS), Neurocomputing (NEUCOM), Computational Statistics and Data Analysis (CSDA).

Alain Celisse acted as a reviewer for the following journal papers: Annals of Statistics, Bernoulli, JMLR.

Serge Iovleff acted as a reviewer for the following journal papers: Statistics and Computing and Neural Processing Letters.

Vincent Vandewalle acted as a reviewer for the following journal papers: Statistics in Medicine, Expert Systems With Applications, Computational Statistics, Journal de la SFdS.

### 10.1.4. Invited Talks

Sophie Dabo:

*LICMA'17, Lebanese International Conference on Mathematics and Applications*, Beyrouth, 16-19 May 2017. Nonparametric regression models for spatial data.

*JEF 2017 4th Days of Econometrics for Finance*, Rabat, 15-16 July, 2017.

<https://sites.google.com/site/jefconference/home>. Functional autoregressive spatial models.

*Pan African Congress of Mathematicians 2017*, Rabat, 3-7 July, 2017.

<http://fsr.um5.ac.ma/PACOM2017/>. Spatial prediction over spatio-functional data.

*SIS 2017 Statistics and Data Science: New Challenges, New generations*, Florence, 28-30 June 2017,

[http://www.fupress.com/archivio/pdf/3407\\_11724.pdf](http://www.fupress.com/archivio/pdf/3407_11724.pdf). Quasi-Maximum Likelihood Estimators For Functional Spatial Autoregressive Models.

Christophe Biernacki gave several invited talks in 2017:

61st World Statistics Congress, Marrakech (Morocco), 16-21 July 2017, <http://payment.isi2017.org/> [30]

Classification Society Conference, Santa Clara (USA), 21-24 June 2017, <https://academicaaffairs.ucsc.edu/classification-society-conference/> [27]

XXIVèmes Rencontres de la Société Francophone de Classification, Lyon (France), 28-30 June 2017, <http://polytech-sfc2017.univ-lyon1.fr/> [28]

StatLearn, Lyon (France), 7th April 2017, <http://www.univ-lyon2.fr/culture-savoirs/podcasts/statlearn-2017-727260.kjsp?RH=podcasts>, [20]

Talk to the seminar of the INRA of Jouy-en-Josas, June 12th 2017

Alain Celisse:

New assessment of the cross-validation performance, Montpellier, 24th November, 2017.

Change-point detection with kernels, IHP, 3rd October, 2017.

Cristian Preda:

C. Preda, P. Bastien (2017), Functional models applied to data from image analysis, 61st World Statistics Congress - ISI2017, Marrakech, Morocco, 16-21 July, 2017

A. Amarioarei, C. Preda, Scan statistics for some dependent models and applications, 17th Conference of the ASMDA, London, 6-9 June, 2017.

C. Preda, Gilbert Saporta's contributions to functional data analysis, 17th Conference of the ASMDA, London, UK, 6-9 June, 2017.

A. Amarioarei, C. Preda, Approximation for the scan statistics distribution of a three dimensional Poisson process, IMS China 2017, Nanning, China, June 28 - July 3, 2017.

Vincent Vandewalle gave several invited talks in 2017:

V. Vandewalle, C. Preda, Clustering categorical functional data. Application to medical discharge letters, 20th conference of the society of probability and statistics of Roumania, Brasov (Roumania), April 28, 2017.

V. Vandewalle, C. Biernacki, Dealing with missing data through mixture models, 154th ICB Seminar on "Statistics and clinical practice" Warsaw May 11, 2017.

V. Vandewalle, C. Biernacki, Survival analysis with complex covariates: a model-based clustering preprocessing step, IEEE PHM Dallas June 19th, 2017.

V. Vandewalle, Simultaneous dimension reduction and multi-objective clustering, IFCS Meeting Tokyo August 8th, 2017.

Benjamin Guedj gave several invited talks in 2017:

University College London (3/2017)

Université Paris 5 (3/2017)

Hélioparc (Pau, 3/2017)

Inria SequeL seminar (3/2017)

KU Leuven (5/2017)

Institut de Recherche en Informatique de Toulouse (9/2017)

Inria TAU seminar (10/2017)

Machine Learning in the Real world workshop at Criteo (11/2017).

### 10.1.5. Leadership within the Scientific Community

Benjamin Guedj is an elected member of the board of the **French Statistical Society** (SFdS). He is also deputy general secretary since June 2017.

Benjamin Guedj is a member of the board of **AMIES**, the French Agency fostering collaborations between mathematicians and the private sector.

Guillemette Marot is responsible of bilille, the bioinformatics and bioanalysis platform of Lille. More information about the platform is available at <https://wikis.univ-lille1.fr/bilille/>.

Christophe Biernacki is the president (since 1012) of the data mining and learning group of the French statistical association (SFdS, <http://www.sfds.asso.fr/>).

### 10.1.6. Scientific Expertise

Sophie Dabo-Niang is expert for the l'Oréal "Women in Science" award since 2014.

Christophe Biernacki acted as a President of a HCERES committee for research evaluation. He was also an elected member to the "Conseil National des Universités" (CNU) from October 2015 to September 2017. From October 2017, he is member of the "Commission d'Evaluation" (CE) of Inria.

Alain Celisse is reviewer for the annual Research Fellowship Competition of Cambridge.

Guillemette Marot reviewed one project as expert for the ANR.

### 10.1.7. Research Administration

Benjamin Guedj is a member of the scientific Council of the **Laboratoire Paul Painlevé** (Maths Department of the University of Lille).

Benjamin Guedj is an elected member of **Inria's Evaluation Committee** (CE).

Sophie Dabo is the head of the MeQAME research team of Laboratory LEM-CNRS 9221.

Christophe Biernacki is "Délégué Scientifique" of the Inria Lille center from June 2017.

Guillemette Marot was member of the Research Commission of the University of Lille 2 until December 2017.

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

Benjamin Guedj is teaching

Master: Machine learning, Theory and Algorithms, 10h, Université du Maine, Le Mans, France

Master: Machine learning, Theory and Algorithms, 30h, ISUP, Paris, France

Master: Machine learning, Theory and Algorithms, 20h, Université Pierre et Marie Curie, Paris, France

Guillemette Marot is teaching:

Licence: Biostatistics, 9h, L1, U. Lille Droit et Santé, France

Licence: Health care Informatics, 6h, L1, U. Lille Droit et Santé, France

Master: Biostatistics, 45h, M1, U. Lille Droit et Santé, France

Master: Supervised classification, 22h, M1, Polytech Lille, France

Master: Statistics for Human Genetics, 1h, U. Lille Droit et Santé, France

Doctorat: Data analysis with R, 14h, U. Lille Droit et Santé, France

Doctorat: Data analysis with R, 7h, COMUE Lille Nord de France, France

Doctorat: RNA-Seq analysis, 6h, U. Lille Droit et Santé, France

Sophie Dabo is teaching:

Licence: Probability, 24h, U. Lille 3, France

Master: Advanced Statistics, 24h, U. Lille 3, France

Master: Biostatistics Statistics, 40h, U. Lille 1, France

Master: Non-parametric Statistics, 24h, UGB, Senegal

Master: Sophie Dabo: Spatial Statistics, 24h, U. Lille 3, France

Christophe Biernacki is head of the M2 “Ingénierie Statistique et Numérique” (<http://mathematiques.univ-lille1.fr/Formation/>) at University Lille 1. He has also the following teaching activities at the same University:

Master: Coaching project, 10h, M1

Master: Data analysis, 97.5h, M2

Master: Coaching internship, 20h, M2

From September 2017, he is on secondment at Inria, without any teaching duty.

Cristian Preda is teaching:

L1: Probability, 40h, Polytech Lille

L1: Inferential Statistics, 50h, Polytech Lille

M1: Data Analysis, 40h, Polytech Lille

M2: Biostatistics, 12h, Polytech Lille

M2: Functional data analysis, 12h, U. Lille 1

Serge Iovleff is teaching:

DUT-S1: Mathématiques discrètes, TD, 68h

DUT-S1: Algèbre linéaire, TD, 32h

DUT-S2: Analyse et méthodes numériques, TD/TP, 56h

DUT-S3: Modélisation Mathématiques, TD, 24h

DUT-S4: R.O. et aide à la décision, TD, 32h

Master Mathématiques Appliquées, Statistique - Ingénierie Mathématique: Object Oriented programming, CTD, M1, U. Lille 1, 20h

Master Mathématiques Fondamentales: Statistics, CTD, M2, U. Lille 1, 24h

Vincent Vandewalle was in CRCT last year without any teaching.

### 10.2.2. Supervision

PhD: Jérémie Kellner, Gaussian processes and reproducing kernels, Université Lille 1, 11/12/2016, supervision: C. Biernacki, A. Celisse.

PhD: Emad Drwesh, Spatial Statistics in Discrete-Choice Models, University Lille 3, december, 11th, 2017, supervision: Sophie Dabo-Niang, Jérôme Foncel.

PhD: Mohamed Salem Ahmed, Contribution to spatial statistics and functional data analysis, University Lille 3, december, 12th, 2017, Sophie Dabo-Niang, Mohamed Attouch.

PhD in progress: Zied Gharbi (Contribution to Spatial autoregressive models), 2014, supervision: Sophie Dabo-Niang, Laurence Broze.

PhD in progress: Dang Khoi Pham (Planning and re-planning of nurses in an oncology department using a multi-objective and interdisciplinary approach), 2016, supervision: Alejandra Duenas, Christine Di Martinelli, Sophie Dabo-Niang. item PhD in progress: H. Sarter, Outils statistiques pour la sélection de variables et l'intégration de données "cliniques" et "omiques" : développement et application au registre EPIMAD, December 1st, 2016, supervision: C. Gower, G. Marot.

PhD in progress: Le Li, "PAC-Bayesian Online Clustering: theory and algorithms", iAdvize & Université d'Angers, since 11/2014, Benjamin Guedj, Sébastien Loustau.

PhD in progress: Arthur Leroy, "Machine learning algorithms to improve athletes' performance", INSEP, since 10/2017, supervision: Benjamin Guedj, Servane Gey, Jean-François Toussaint.

PhD in progress: Maxime Brunin, Etude du compromis entre précision statistique et temps de calcul, 1/10/2014, supervision: C. Biernacki, A. Celisse.

PhD in progress: Yaroslav Averyanov, New early stopping times and reproducing kernels, 1/10/2017, supervision: C. Preda, A. Celisse.

PhD in progress: Anne-Lise Bedenel, June 2015, supervision: Christophe Biernacki, Laetitia Jourdan.

PhD in progress: Adrien Ehrhardt, June 2016, supervision: Christophe Biernacki, Philippe Heinrich and Vincent Vandewalle.

PhD in progress: Margot Seloise, October 2017, Christophe Biernacki and Julien Jacques.

Serge Iovleff supervises dYawo Mamoua Kobara's Master thesis "*Estimation of a hierarchical Bayesian model for penalized regression*" at African Institute for Mathematical Sciences (AIMS), Senegal, 2017.

### 10.2.3. Juries

Guillemette Marot was examiner at the PhD defense of M. Canouil, Univ. Lille, September 29, 2017.

Sophie Dabo-Niang was member of the jury of the thesis of Hiba Alawieh, University of Lille 1, March 13th, 2017.

Sophie Dabo-Niang was referee and member of the thesis jury of Rim Ben Elouefi, INSA Rennes, September 5th, 2017.

Sophie Dabo-Niang was president of the thesis jury of Alban Mbinan Mbina, University of Franceville (Gabon) and University of Lille 1, October 28th, Gabon (Franceville).

Christophe Biernacki participated as a reviewer to 4 PhD theses and as an examiner to 1 PhD thesis. He was president of a recruitment committee for an assistant professor position.

## 10.3. Popularization

Pascal Germain gave a short talk vulgarizing a research topic for first year university students. Part of the presentation of the Painlevé Mathematic Laboratory (University of Lille), December, 1st 2017.

Christophe Biernacki has given about 10 talks during 2017 for institutions (Inria, universities...), companies and other related events. He organized also a first short meeting in February 2017 in Lille for obtaining a feedback from company and academic users about the MASSICCC platform developed by the Modal and Select teams (<https://massiccc.lille.inria.fr/#/>).

Alain Celisse gave a talk at the Meetup in Pau in January, 23rd 2017: Change-point detection with structured objects.

Benjamin Guedj gave a Meetup talk in Pau (3/2017) on quasi-Bayesian learning and an application to digits recognition.

## RANDOPT Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. General Chair, Scientific Chair

- A. Auger, program chair of the PPSN 2018 conference Coimbra, Portugal

##### 9.1.1.2. Member of the Organizing Committees

- Anne Auger, Dimo Brockhoff, Nikolaus Hansen, and Dejan Tušar, co-organizer of the ACM-GECCO-2017 workshop on Black Box Optimization Benchmarking, together with Tea Tušar
- Anne Auger, Dimo Brockhoff and Nikolaus Hansen, co-organizer of the ACM-GECCO-2018 workshop on Black Box Optimization Benchmarking, together with Julien Bect, Rodolphe Le Riche, Victor Picheny, and Tea Tušar

#### 9.1.2. Scientific Events Selection

##### 9.1.2.1. Chair of Conference Program Committees

- Anne Auger: theory track chair for the ACM-GECCO conference 2018, Kyoto, Japan
- Nikolaus Hansen: co-track chair at ACM-GECCO-2018 for the “Evolutionary Numerical Optimization” track, Kyoto, Japan
- Nikolaus Hansen: co-track chair at ACM-GECCO-2017 for the “Evolutionary Numerical Optimization” track, Berlin, Germany

##### 9.1.2.2. Member of the Conference Program Committees or Reviewer

- Dimo Brockhoff reviewed for ACM-GECCO
- Anne Auger is reviewer for ACM-GECCO, ACM-FOGA, NIPS, ICML

#### 9.1.3. Journal

##### 9.1.3.1. Member of the Editorial Boards

- Anne Auger and Nikolaus Hansen, members of the editorial board of the Evolutionary Computation Journal
- Dimo Brockhoff, co-guest editor of a special issue on Evolutionary Multiobjective Optimization in the Computers & Operations Research journal (issue 79), together with Joshua Knowles, Boris Naujoks, and Karthik Sindhya

##### 9.1.3.2. Reviewer - Reviewing Activities

- Dimo Brockhoff reviewed in 2017 for IEEE Transactions on Evolutionary Computation, the Evolutionary Computation Journal, Natural Computing, PLoS One, Algorithmica, and Optimal Control, Applications and Methods
- Anne Auger reviewed in 2017 for IEEE Transactions on Evolutionary Computation, the Evolutionary Computation Journal, Algorithmica, SIAM Journal on Optimization

#### 9.1.4. Invited Talks and Tutorials

- Dimo Brockhoff: invited tutorial on benchmarking (multiobjective) optimizers at the Symposium on Search-based Software Engineering (SSBSE’2017) in September 2017 in Paderborn, Germany
- Dimo Brockhoff: two invited talks (one on Evolutionary Multiobjective Optimization, one on Benchmarking) at the Mascot-Num conference in March 2017 in Paris, France

- Anne Auger and Nikolaus Hansen, tutorial on *Introduction to randomized continuous optimization* at the ACM-GECCO conference, Berlin, Germany
- Dima Brockhoff: introductory tutorial on Evolutionary Multiobjective Optimization at the ACM-GECCO conference, Berlin, Germany
- Nikolaus Hansen: tutorial “A Practical Guide to Benchmarking and Experimentation” at the ACM-GECCO conference, Berlin, Germany
- Nikolaus Hansen: tutorial “CMA-ES and Advanced Adaptation Mechanisms” at the ACM-GECCO conference, Berlin, Germany, together with Youhei Akimoto

### 9.1.5. Leadership within the Scientific Community

- Since 2011, Anne Auger **Elected** member of the **ACM-SIGEVO executive board**, re-elected in 2017.

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Teaching

Master: Dima Brockhoff, “Introduction to Optimization”, 31.5h ETD, M2, Université Paris-Sud, France

Master: Anne Auger and Dima Brockhoff, “Advanced Optimization”, 31.5h ETD, M2, Université Paris-Sud, France

Master: Anne Auger, “Derivative-free Optimization”, Paris-Saclay, Optimization Master

Master: Anne Auger : Anne Auger (Introduction to Machine Learning, Advanced Machine Learning), Ecole Polytechnique, c.a. 50h

Summer school: Anne Auger and Dima Brockhoff, July 3-7, 2017. CEA-EDF-Inria **summer school** on *Design and optimization under uncertainty of large-scale numerical models*. Course on *Introduction to Randomized Black-Box Numerical Optimization and CMA-ES*, Paris.

### 9.2.2. Supervision

PhD in progress: Cheikh Touré, topic: multiobjective optimization, started in October 2017, supervised by Anne Auger and Dima Brockhoff

PhD in progress: Konstantinos Varelas, topic: constrained and expensive optimization, started in December 2017, supervised by Anne Auger and Dima Brockhoff

### 9.2.3. Juries

- A. Auger in the PhD jury of Paul Feliot (defense July 2017)

## REALOPT Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. Member of the Organizing Committees

- Arnaud Pêcher, François Clautiaux and Pierre Pesneau have organized "Journées Graphes et Algorithmes", Bordeaux, Novembre 15-17, 2017

### 10.1.2. Scientific Events Selection

#### 10.1.2.1. Chair of Conference Program Committees

- Olivier Beaumont is the Chair of the Algorithm Track of Super Computing 2017 (November, Denver, USA); "The International Conference for High Performance Computing, Networking, Storage and Analysis" <https://sc17.supercomputing.org>
- Olivier Beaumont is the Chair of the Algorithm Track of HIPC 2017 (December, Jaipur, India); "24th Ieee International Conference On High Performance Computing, Data, And Analytics" <http://hipc.org>
- Lionel Eyraud-Dubois is Chair of the "Cloud Computing and Data Center Management" track of I-SPAN 2017; the 14th International Symposium on Pervasive Systems, Algorithms, and Networks

#### 10.1.2.2. Member of the Conference Program Committees

The team members are members of the following program committees:

- Francois Clautiaux, Arnaud Pecher, and Francois Vanderbeck: ROADEF 2017: French Operational Research Society Conference.
- Lionel Eyraud-Dubois and Olivier Beaumont: HiPC 2017: 24th IEEE International Conference on High Performance Computing, Data, and Analytics
- Lionel Eyraud-Dubois: REPPAR 2017: 4th International Workshop on Reproducibility in Parallel Computing
- Olivier Beaumont: Primary PC Member, IPDPS 2017, 31st IEEE International Parallel & Distributed Processing Symposium May 29 – June 2, 2017, Orlando, Florida USA <http://www.ipdps.org/ipdps2017/index.html>
- Olivier Beaumont: HeteroPar 2017 (a EuroPar workshop), Fifteenth International Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms, August 28th, 2017, Santiago de Compostela, Spain <https://web.fe.up.pt/~heteropar2017/index.php?pane=home>
- Olivier Beaumont: IPDPSW 2017, IPDPS 2017, 31st IEEE International Parallel & Distributed Processing Symposium May 29 – June 2, 2017, Orlando, Florida USA, PC member [http://www.ipdps.org/ipdps2017/2017\\_call\\_for\\_workshops.html](http://www.ipdps.org/ipdps2017/2017_call_for_workshops.html)

### 10.1.3. Journal

#### 10.1.3.1. Member of the Editorial Boards

- Olivier Beaumont is editor for IEEE Transactions on Parallel and Distributed Systems (TPDS)
- Francois Vanderbeck is Associate Editor for the EURO Journal on Computational Optimization
- Francois Clautiaux is Associate Editor for Mathematical Programming and Exact Methods in the journal ISTE "Recherche Opérationnelle"

#### 10.1.3.2. Reviewer - Reviewing Activities

The team members are regular referees for the best journals of the field.



#### **10.1.4. Invited Talks**

Arnaud Pêcher: *Lovasz's theta function and perfect graphs*, “The beauty of discrete mathematics” workshop, Montréal, Canada, October 2017.

François Vanderbeck: *Revisiting Benders Decomposition*, Combinatorial Optimization and Applications Workshop, Edinburgh, Scotland, February 2017.

#### **10.1.5. Leadership within the Scientific Community**

Our group is actively preparing the triennial symposium of the international mathematical optimization society. We organize it in Bordeaux in July 2018. 2000 attendees are expected.

#### **10.1.6. Scientific Expertise**

- Olivier Beaumont is a member of the **INCITE (math-comp track) panel**
- Olivier Beaumont is an expert for the H2020-FET-OPEN-2016 projects

#### **10.1.7. Research Administration**

- Olivier Beaumont is the scientific deputy of Inria Bordeaux Sud-Ouest and a member of the Evaluation Committee of Inria *Verify it!!*.
- François Vanderbeck is taking care of the team OptimAI (“Optimisation Mathématique Modèle Aléatoire et Statistique”) at the Mathematics Institute of Bordeaux.
- Arnaud Pêcher is the head of the Computer Science Department, IUT of Bordeaux.

### **10.2. Teaching - Supervision - Juries**

#### **10.2.1. Teaching**

Licence : A. Pêcher, Programmation Impérative, 10h, DUT, Université de Bordeaux, France

Licence : A. Pêcher, Conception Objet, 42h, DUT, Université de Bordeaux, France

Licence : A. Pêcher, Programmation objet en Java, 44h, DUT, Université de Bordeaux, France

Licence : A. Pêcher, Algorithmique Avancée, 32h, DUT, Université de Bordeaux, France

Licence : A. Pêcher, Assembleur, 24h, DUT, Université de Bordeaux, France

Licence : A. Pêcher, Programmation Mobile, 24h, DUT, Université de Bordeaux, France

Master : F. Clautiaux, Gestion des Opérations et Planification de la Production, 20h, M2, Université de Bordeaux, France

Master : F. Clautiaux, Flot et Combinatoire, 10h, M2, Institut Polytechniques de Bordeaux, France

Master : F. Clautiaux, Introduction à la Programmation en Variables Entières, 20h, M1, Université de Bordeaux, France

Master : F. Clautiaux, Projet d'optimisation pour l'insertion professionnelle, M2, Université de Bordeaux, France

Master : L. Eyraud-Dubois, Optimisation en Cloud Computing et Big Data, 15h, M2, Université de Bordeaux, France

Licence : Licence : P. Pesneau, Optimisation, 37h, L2, Université de Bordeaux, France

Licence : Licence : P. Pesneau, Programmation pour le calcul scientifique, 24h, L2, Université de Bordeaux, France

Licence : Licence : P. Pesneau, Recherche Opérationnelle, 24h, DUT, Université de Bordeaux, France

Licence : Master : P. Pesneau, Algorithmique et Programmation 1, 28h, M1, Université de Bordeaux, France

Licence : Master : P. Pesneau, Programmation linéaire, 29h, M1, Université de Bordeaux, France

Licence : Master : P. Pesneau, Optimisation dans les graphes (partie flots), 15h, M1, Université de Bordeaux, France

Master : O. Beaumont, Approximation et Big Data, 15h, M2, Université de Bordeaux, France

Master : O. Beaumont, Distributed Computing and Data Mining, 4h, M2, Institut National Polytechnique de Bordeaux, France

Licence : B. Detienne, Initiation à l'ingénierie en optimisation, 12h, L1, Université de Bordeaux, France

Licence : B. Detienne, Modèles et Méthodes d'Optimisation, 21h, L2, Université de Bordeaux, France

Licence : B. Detienne, Groupe de travail applicatif, 12h, L3, Université de Bordeaux, France

Master : B. Detienne, Optimisation continue, 43h, M1, Université de Bordeaux, France

Master : B. Detienne, Problèmes combinatoires et routage, 14h, M1, Université de Bordeaux, France

Master : B. Detienne, Problèmes combinatoires et routage, 14h, M1, Institut National Polytechnique de Bordeaux, France

Master : B. Detienne, Optimisation dans l'incertain, 58h, M2, Université de Bordeaux, France

Master : R. Sadykov, Introduction à la Programmation par Contraintes, 30h, M1, Université de Bordeaux, France

Master : I. Tahiri, Recherche Opérationnelle, 16h, M1, Institut National Polytechnique de Bordeaux, France

Master : F. Vanderbeck, Recherche Opérationnelle, 15h, M1, Institut National Polytechnique de Bordeaux, France

Master : F. Vanderbeck, Programmation Entière, 58h, M2, Université de Bordeaux, France

### **10.2.2. Supervision**

PhD : Suraj Kumar, Scheduling of Dense Linear Algebra Kernels on Heterogeneous Resources [10], Université de Bordeaux, 12/04/2017, Olivier Beaumont (dir) and Lionel Eyraud-Dubois (co-dir)

PhD: Thomas Lambert, Placement de tâches et réplique de fichiers sur plates-formes parallèles [11], Université de Bordeaux, 8/09/2017, Olivier Beaumont (dir) and Lionel Eyraud-Dubois (co-dir)

PhD in progress : Jérémy Guillot, Optimisation de problèmes de partitionnement, from September 2014, François Clautiaux (dir) and Pierre Pesneau (dir).

PhD in progress : Quentin Viaud, Méthodes de programmation mathématiques pour des problèmes complexes de découpe, from January 2015, François Clautiaux (dir), Ruslan Sadykov (dir), and François Vanderbeck (co-dir).

PhD in progress : Rodolphe Griset, Robust planning in Electricity production, from November 2015, Boris Detienne (dir) and François Vanderbeck (dir).

PhD in progress : Imen Ben Mohamed, Location routing problems, from October 2015, Walid Klibi (dir) and François Vanderbeck (dir).

PhD in progress : Thomas Bellitto, Infinite graphs, from September 2015, Arnaud Pêcher (dir) and Christine Bachoc (dir).

PhD in progress : Guillaume Marques, Planification de tournées de véhicules avec transbordement en logistique urbaine : approches basées sur les méthodes exactes de l'optimisation mathématique, from September 2017, François Vanderbeck (dir) and Ruslan Sadykov (co-dir).

PhD in progress : Gaël Guillot, Aggregation and disaggregation methods for hard combinatorial problems, from November 2017, François Clautiaux (dir) and Boris Detienne (dir).

### **10.2.3. Juries**

- Lionel Eyraud-Dubois participated in the jury of Raphaël Bleuse, who defended on October 11, 2017, at Université de Grenoble Alpes.
- Olivier Beaumont: Evaluation (rapporteur) and President of the PhD thesis committee of Aymen Jlassi (University of Tours, France)
- Olivier Beaumont: Evaluation (rapporteur) of the PhD thesis committee of Orcun Yildiz (Ecole Normale Supérieure de Rennes, France)
- Olivier Beaumont: Member of the PhD thesis committee of Alexandre Perrot (University of Bordeaux, France)
- Olivier Beaumont: Member of the PhD thesis committee of Noel Gillet (University of Bordeaux, France)
- Francois Vanderbeck: Member of the PhD thesis committee of Nicolas HUIN (Inria Sophia)

### **10.3. Popularization**

- François Clautiaux is a member of the board of AMIES, the French Agency for Interaction in Mathematics with Business and Society. AMIES is a national organization that aims to develop relations between academic research teams in mathematics and business, especially SMEs.
- Olivier Beaumont participated to “Unithé ou Café” (May 19, 2017), a local event dedicated to popular science on the topic of online algorithms.
- Olivier Beaumont participated to “La Fête de la Science” (October 3 and 4, 2017) on the computation of PageRank.

## SELECT Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. General Chair, Scientific Chair

Sylvain Arlot organized (with Guillaume Charpiat) the Workshop Statistics/Learning at Paris-Saclay (2nd edition), at IHES (Bures-sur-Yvette).

##### 9.1.1.2. Member of the Organizing Committees

- Gilles Celeux is one of the co-organizers of the international working group on model-based clustering. This year the workshop took place in Perugia, Italy.
- Sylvain Arlot is one of the co-organizers of the Junior Conference on Data Science and Engineering at Paris-Saclay (2nd edition in 2017).
- Jean-Michel Poggi was president of the Scientific Program Committee, ENBIS 2017, Naples, 10-14 June 2017.
- Jean-Michel Poggi was member of the Conference Scientific Board of IES 2017, Naples, Italy, 6-8 September 2017.

#### 9.1.2. Journal

##### 9.1.2.1. Member of the Editorial Boards

Gilles Celeux is Editor-in-Chief of the *Journal de la SFdS*. He is Associate Editor of *Statistics and Computing*, *CSBIGS*.

Pascal Massart is Associate Editor of *Annals of Statistics*, *Confluentes Mathematici*, and *Foundations and Trends in Machine Learning*.

Jean-Michel Poggi is Associate Editor of *Journal of Statistical Software*, *Journal de la SFdS* and *CSBIGS*.

##### 9.1.2.2. Reviewer - Reviewing Activities

The members of the team have reviewed numerous papers for numerous international journals.

#### 9.1.3. Invited Talks

The members of the team have given many invited talks on their research in the course of 2016.

#### 9.1.4. Leadership within the Scientific Community

Jean-Michel Poggi is:

- Vice-President ENBIS (European Network for Business and Industrial Statistics), 2015-18
- Vice-President FENStatS (Federation of European National Statistical Societies) since 2012
- Council Member of the ISI (2015-19)
- Member of the Board of Directors of the ERS of IASC (since 2014)

#### 9.1.5. Scientific Expertise

Jean-Michel Poggi is member of the EMS Committee for Applied Mathematics (since 2014).

#### 9.1.6. Research Administration

Jean-Michel Poggi is the president of ECAS (European Courses in Advanced Statistics) since 2015.

Sylvain Arlot coordinates (jointly with Marc Schoenauer, Inria Saclay) the math-STIC program of the Labex Mathématique Hadamard.

Christine Keribin is treasurer of the Société Française de Statistique (SFdS).

## **9.2. Teaching - Supervision - Juries**

### **9.2.1. Teaching**

SELECT members teach various courses at several different universities, and in particular the Master 2 “Mathématique de l’aléatoire” of Université Paris-Saclay.

### **9.2.2. Supervision**

PhD: Valérie Robert, 2013, Gilles Celeux and Christine Keribin. Defended in June 2017

PhD : Yann Vasseur, 2013, Gilles Celeux and Marie-Laure Martin-Magniette (URGV). Defended in December 2017

PhD in progress: Neska El Haouij, 2014, Jean-Michel Poggi and Meriem Jaïdane, Raja Ghozi (ENIT Tunisie) and Sylvie Sevestre-Ghalila (CEA LinkLab), Thesis ENITUPS

PhD in progress: Florence Ducros, 2015, Gilles Celeux and Patrick Pamphile

PhD in progress: Claire Brécheteau, 2015, Pascal Massart

PhD in progress: Hedi Hadiji, 2017, Pascal Massart

PhD in progress: Eddie Aamari, 2015, Pascal Massart and Frédéric Chazal

PhD: Damien Garreau, 2013, Sylvain Arlot and Gérard Biau (UPMPC). Defended in October 2017

PhD in progress: Guillaume Maillard, 2016, Sylvain Arlot and Matthieu Lerasle

PhD in progress: Jeanne Nguyen, 2015, Claire Lacour and Vincent Rivoirard (Univ Paris Dauphine)

PhD in progress: Benjamin Goehry, 2015, Pascal Massart and Jean-Michel Poggi

Masters internship: Thomas Prochwicz. Christine Keribin conducted a preliminary study on expert aggregation by supervising this three month internship.

### **9.2.3. Juries**

S. Arlot was a member of the Ph.D. jury of Jilai Mei (Université Paris-Sud).

## SEQUEL Project-Team

## 10. Dissemination

### 10.1. Promoting Scientific Activities

#### 10.1.1. Scientific Events Organisation

- *Visually grounded interaction and language*, workshop at NIPS 2017, organized by Florian Strub, Harm de Vries, Abhishek Das, Satwik Kottur, Stefan Lee, Mateusz Malinowski, Olivier Pietquin, Devi Parikh, Dhruv Batra, Aaron C Courville, Jérémie Mary. URL: <https://nips.cc/Conferences/2017/Schedule?showEvent=8766>
- O. Maillard: Workshop of the working group *Sequential Structured Statistical Learning*, May 17 2017 at Institut des Hautes Etudes Scientifiques (Bures-sur-Yvette). URL: <https://sites.google.com/site/groupedetravailsssl>

##### 10.1.1.1. Member of the Conference Program Committees

Members of SEQUEL have been involved in the following program committees in 2017:

- Senior PC for International Joint Conference on Artificial Intelligence (IJCAI 2017)
- Senior PC for ACM KDD 2017
- International Conference on Artificial Intelligence and Statistics (AI & STATS 2017)
- PC member for the international Conference On Learning Theory (COLT 2017)
- European Conference on Machine Learning (ECML 2017)
- 1st Workshop on Transfer in Reinforcement Learning (TiRL) 2017
- The Third International Conference on Machine Learning, Optimization and Big Data (MOD 2017)
- French conferences:
  - Extraction et Gestion de Connaissances (EGC),
  - Journées Francophones de Planification, Décision, Apprentissage (JFPDA)
  - Journées de la Société Francophone de Classification (SFC)
  - Conférence francophone sur l'Apprentissage Automatique (CAp)

##### 10.1.1.2. Reviewer

Édouard Oyallon receives a “best NIPS reviewer award”.

Members of SEQUEL have reviewed papers for the following conferences:

- AI&Stats, COLT, ECML, ICML, IJCAI, NIPS, ALT.

#### 10.1.2. Journal

##### 10.1.2.1. Reviewer - Reviewing Activities

- Automatica
- IEEE Transactions on Pattern Analysis and Machine Intelligence - Journal Reviewer
- IEEE transaction on Software Engineering
- International Federation of Automatic Control
- Bernoulli Journal
- Journal of Machine Learning Research
- IEEE Transaction on Signal Processing

##### 10.1.3. Invited Talks

- R. Gaudel, *Recommendation as a Sequential Process*, Presented on February 1st, 2017, at Séminaire CMLA, Paris, France (CMLA 2017)
- R. Gaudel, *Recommendation as a Sequential Process*, Presented on January 10th, 2017, at Séminaire ENSAI, Rennes (Bruz), France (ENSAI 2017)
- A. Lazaric, *Spectral Methods for Reinforcement Learning*, Presented on April 10, 2017, at Amazon, Berlin, Germany
- M. Valko, *SequeL, graphs in ML, and online recommender systems*, Presented on November 9th, 2017 at Plateau Inria Euratechnologies in Lille, France (Euratechnologies 2017)
- M. Valko, *Sequential sampling for kernel matrix approximation and online learning* Presented on September 19th, DeepMind, London, UK (DeepMind 2017)
- M. Valko, *Active learning on networks and online influence maximization*, Presented on September 18th, 2017, Decision Theory and Network Science: Methods and Applications, Lancaster, UK (STOR-i 2017)
- M. Valko, *Side observation in graph bandits*, Presented on July 11th, 2017, ICML 2017 workshop on Picky Learners, Sydney, Australia (ICML 2017)
- M. Valko, *Distributed sequential sampling for kernel matrix approximation*, Presented on June 28th, 2017, L'Institut de Mathématiques de Toulouse, France (IMT 2017)
- M. Valko, *Online sequential solutions for recommender systems*, Presented on June 14th, 2017 at Journées Scientifiques Inria 2017 in Nice, France (JS 2017)
- M. Valko, *Where is Justin Bieber?*, Presented on March 30th, 2017 at Dating day in Lille, France (Dating 2017)
- M. Valko, *Distributed sequential sampling for kernel matrix approximation*, Presented on March 22nd, 2017, for Universität Potsdam at Amazon (Berlin 2017)

#### 10.1.4. Scientific Expertise

- É. Kaufmann was a member of the committee of Experts for Hiring junior faculty in the maths department of Université of Lille 1
- J.Mary was a member of the industrial transfer commission of Inria Lille
- Alessandro Lazaric was reviewer for NSFC-ISF Research Grant
- Philippe Preux is a member of the evaluation committee and participates in the hiring, promotion, and evaluation juries of Inria:
  - Inria CR1 hiring committee
  - Inria Lille CR2 hiring committee
  - Inria committee for researcher promotion
  - Inria committee for PEDR
- Philippe Preux was a member of the hiring committees for 1 professor and 2 associate professors at the Université de Lille 3
- Philippe Preux was a member of the committee for PhD grant of the “Pôle Métropolitain de la Côte d’Opale”
- Philippe Preux reviewed a proposal for ANRT (and declined invitation from ANR)
- M. Valko is an elected member of the evaluation committee and participates in the hiring, promotion, and evaluation juries of Inria, notably
  - Hiring committee for junior researchers at Inria Saclay (2017)
  - Inria work group for deontological ethics (2017)
  - Selection committee for Inria award for scientific excellence of junior and confirmed researchers (2017)

- M. Valko was a member national Inria acceptance committee for hiring junior researchers
- M. Valko was a member of the committee of Experts for Hiring junior faculty at CMLA, ENS Paris-Saclay

### 10.1.5. Research Administration

- M. Gaudel was member of the Board of CRISAL.
- Philippe Preux is:
  - “délégué scientifique adjoint” of the Inria center in Lille
  - member of the Inria evaluation committee (CE)
  - member of the Inria internal scientific committee (COSI)
  - member of the scientific committee of CRISAL
  - the head of the “Data Intelligence” thematic group at CRISAL

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

Master: É. Kaufmann, 2017/2018 Fall: Machine Learning, 18h eq TD, M2 Maths/Finances, Université de Lille 1

Master: É. Kaufmann, 2016/2017 Spring: Data Mining, 36h eq TD, M1 Maths/Finances, Université de Lille 1

Master: A. Lazaric, 2017/2018 Fall: Reinforcement Learning, 36h eqTD, M2, ENS Cachan

Master: M. Valko, 2017/2018 Fall: Graphs in Machine Learning, 36h eqTD, M2, ENS Cachan

### 10.2.2. Supervision

PhD in progress: Marc Abeille, Exploration-exploitation in reinforcement learning, started Sept. 2014, advisor: Remi Munos, Alessandro Lazaric

PhD in progress: Merwan Barlier, Human-in-the loop reinforcement learning for dialogue systems, started Oct. 2014, advisor: Olivier Pietquin

PhD in progress: Alexandre Bérard, Deep learning for post-editing and automatic translation, started Oct. 2014, advisor: Olivier Pietquin

PhD in progress: Lilian Besson, Bandit approach to improve Internet Of Things Communications, started Oct. 2016, advisor: Émilie Kaufmann, Christophe Moy (CentraleSupélec Rennes)

PhD in progress: Daniele Calandriello, Efficient Sequential Learning in Structured and Constrained Environment, Inria, started Oct. 2014, advisor: Michal Valko, Alessandro Lazaric

PhD in progress: Ronan Fruit, Exploration-exploitation in hierarchical reinforcement learning, Inria, started Dec. 2015, advisor: Daniil Ryabko, Alessandro Lazaric

PhD in progress: Pratik Gajane, Multi-armed bandits with unconventional feedback, started Oct. 2014, defended Nov. 14th 2017, advisor: Philippe Preux

PhD in progress: Guillaume Gautier, DPPs in ML, started Oct. 2016, advisor: Michal Valko; Rémi Bardenet

PhD in progress: Jean-Bastien Grill, Création et analyse d’algorithmes efficaces pour la prise de décision dans un environnement inconnu et incertain, Inria/ENS Paris/Lille 1, started Oct. 2014, advisor: Rémi Munos, Michal Valko

PhD in progress: Édouard Leurent, Autonomous vehicle control: application of machine learning to contextualized path planning, started Oct. 2017, advisor: Odalric Maillard, Philippe Preux, Denis Effimov (NON-A), Wilfrid Perruquetti (NON-A)



PhD in progress: Sheikh Waqas Akhtar, Bandits for non-stationarity and structure, started Oct. 2017, advisor: Odalric Maillard, Daniil Ryabko.

PhD in progress: Julien Perolat, Reinforcement learning: the multi-player case, started Oct. 2014, advisor: Olivier Pietquin

PhD in progress: Pierre Perrault, Online Learning on Streaming Graphs, started Sep. 2017, advisor: Michal Valko; Vianney Perchet

PhD in progress: Mathieu Seurin, Multi-scale rewards in reinforcement learning, started Oct. 2017, advisor: Olivier Pietquin, Philippe Preux

PhD in progress: Julien Seznec, Sequential Learning for Educational Systems, started Mar. 2017, advisor: Michal Valko; Alessandro Lazaric, Jonathan Banon

PhD in progress: Xuedong Shang, Adaptive methods for optimization in stochastic environments, started Oct. 2017, advisor: Émilie Kaufmann, Michal Valko

PhD in progress: Florian Strub, Reinforcement Learning for visually grounded interaction, started Jan. 2016, advisors: Olivier Pietquin and Jeremie Mary

PhD in progress: Kiewan Villatel, Deep Learning for Conversion Rate Prediction in Online Advertising, started Oct. 2017, advisor: Philippe Preux

### 10.2.3. *Juries*

PhD and HDR juries:

- É. Kaufmann, *Navikumar Modi*, CentraleSupélec Rennes, May 2017
- A. Lazaric:
  - *Stefano Paladino*, Politecnico di Milano, Dec 2017
  - *Micheal Castronovo*, Université de Liege, March 2017
  - *Raffaello Camoriano*, Università di Genova, April 2017
  - *Claire Vernade*, TelecomParis Tech, October 2017
- Ph. Preux:
  - Cricia Zilda Felicio Paixao, Uniervity Uberlandia, Brasil
  - Thibault Gisselbrecht, LIP 6, UPMC, Paris
  - Pratik Gajane, CRISAL, Lille
- M. Valko: *Clément Bouttier*, Université Toulouse 3 Paul Sabatier, June 2017

PhD mid-term evaluation:

- M. Valko: *Thibault Liétard*, Université Lille, September 2017

## 10.3. Popularization

- CNRS publishes an article about zonotope sampling presented at ICML (see <http://www.cnrs.fr/ins2i/spip.php?article2633>).
- Julien Seznec publishes an article in *Les Echos* that discusses ML for education (November 2017).
- Émilie Kaufmann gave a popularization talk about bandit algorithms aimed at high school/prepa students at the MathPark seminar, organized at IHP in Paris (April 2017).
- *Avec GuessWhat?! quand l'humain joue, l'ordinateur s'initie au langage*, <https://www.inria.fr/centre/lille/actualites/avec-guesswhat-!-quand-l-humain-joue-l-ordinateur-s-initie-au-langage>
- Florian Strub and Mathieu Seurin demonstrated guesswhat?! during the celebrations of Inria 50th anniversary (November 2017).
- Philippe Preux:

- interviewed for an article on *L'intelligence artificielle, est-ce vraiment de l'intelligence ?* in *BioTech.info*, Jan. 2017.
- participates to a debate about Artificial Intelligence, as part of the franceIA tour (Euratechnologies, Lille).
- interview by AFP in relation to alphaGo.
- interviewed for an article on AI and games, published in *Le figaro*.
- an interview that led to a publication in ATOS Connexion, the ATOS internal journal.
- a video has been made with him being interviewed on Artificial Intelligence by NordEka (to be available on youtube).
- has been selected to be portrayed at the “Soirée partenaires de l’université de Lille”, Nov.
- was a member of the organization committee of the celebrations of the 50th Inria anniversary in Lille.
- co-organizes a meet-up on big data and machine learning at Inria.
- M. Valko, *Comment maximiser la détection des influenceurs sur les réseaux sociaux ?*, popularization talk, Presented on May 30th, 2017 at 13 France (*Inria 13:45 2017*)

## SIERRA Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

- P. Germain and F. Bach: co-organization of NIPS workshop: "(Almost) 50 Shades of Bayesian Learning: PAC-Bayesian trends and insights" <https://bguedj.github.io/nips2017/50shadesbayesian.html>
- A. d'Aspremont: co-organization of the workshop: "Optimization and Statistical Learning", Les Houches, France

##### 9.1.1.1. Member of the Organizing Committees

- F. Bach: Senior Area chair for NIPS 2017

#### 9.1.2. Journal

##### 9.1.2.1. Member of the Editorial Boards

- F. Bach: Action Editor, Journal of Machine Learning Research.
- F. Bach: Information and Inference, Associate Editor.
- F. Bach: Electronic Journal of Statistics, Associate Editor.
- F. Bach: Mathematical Programming, Associate Editor.
- F. Bach: Foundations of Computational Mathematics, Associate Editor.
- A. d'Aspremont: SIAM Journal on Optimization, Associate Editor.

#### 9.1.3. Invited Talks

- F. Bach: Workshop on Shape, Images and Optimization, Muenster, Germany invited talk, February 2017
- F. Bach: SIAM conference on Optimization, Vancouver, Canada, invited tutorial, May 2017
- F. Bach: LCCC workshop on Large-Scale and Distributed Optimization, Lund, Sweden, invited talk, June 2017
- F. Bach: Summer school on Structured Regularization for High-Dimensional Data Analysis, Paris, invited talk, June 2017
- F. Bach: FOCM Barcelona, two invited talks in special sessions, July 2017
- F. Bach: European Signal Processing conference (EUSIPCO), Kos, Greece, keynote speaker, August 2017
- F. Bach: StatMathAppli 2017, Frejus, mini-course on optimization, September 2017
- F. Bach: 2017 ERNSI Workshop on System Identification, Lyon, invited plenary talk, September 2017
- F. Bach: New-York University, Data science seminar, October 2017
- F. Bach: Workshop on Generative models, parameter learning and sparsity, Cambridge, UK, invited talk, November 2017
- F. Bach: NIPS workshops, two invited talks, Long Beach, CA, December 2017
- A. d'Aspremont: "Regularized Nonlinear Acceleration"
  - GdR MOA, Bordeaux.
  - GdR MEGA, Paris.

- SIAM OPTimization conference
- Oxford computational math seminar
- Alan Turing institute
- A. d’Aspremont: “Sharpness, Restart and Acceleration”. Foundations of Computational Mathematics, Barcelona.
- P. Germain: “Generalization of the PAC-Bayesian Theory, and Applications to Semi-Supervised Learning”, Modal Seminars, Lille, France, January 2017
- P. Germain: “Theory Driven Domain Adaptation Algorithm”, Google Brain TechTalk, Mountain View (CA), USA, April 2017
- P. Gaillard: “Sparse acceleration of exponential weights”
  - Seminar of the SEQUEL project team, Lilles, February 2017
  - 49e Journées Françaises de Statistique, Avignon, Juin 2017
- P. Gaillard: “Obtaining sparse and fast convergence rates online under Bernstein condition”, CWI-Inria Workshop, September 2017
- P. Gaillard: “Online nonparametric learning”
  - Cambridge Statistics Seminar, October 2017
  - Statistics Seminar of the University Aix-Marseille, December 2017

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Teaching

Master: A. d’Aspremont, “Optimization”, 21h, M1, Ecole Normale Supérieure, France

Master: A. d’Aspremont, “Optimization”, 21h, M2 (MVA), ENS Cachan, France

Master: F. Bach and P. Gaillard, “Apprentissage statistique”, 35h, M1, Ecole Normale Supérieure, France.

Master: F. Bach (together with G. Obozinski), “Graphical models”, 30h, M2 (MVA), ENS Cachan, France.

Master: F. Bach, “Optimisation et apprentissage statistique”, 20h, M2 (Mathématiques de l’aléatoire), Université Paris-Sud, France.

Master: F. Pedregosa (together with Fajwel Fogel), “Introduction to scikit-learn”, M2 (MASH), Université Paris-Dauphine, France.

### 9.2.2. Supervision

- PhD: Nicolas Flammarion, July 2017, co-directed by Alexandre d’Aspremont and Francis Bach.
- PhD: Aymeric Dieuleveut, September 2017, directed by Francis Bach.
- PhD: Christophe Dupuy, June 2017, directed by Francis Bach.
- PhD: Rafael Rezende, December 2017, Francis Bach, co-advised with Jean Ponce.
- PhD: Vincent Roulet, December 2017, directed by Alexandre d’Aspremont.
- PhD in progress: Damien Scieur, started September 2015, co-directed with Alexandre d’Aspremont and Francis Bach
- PhD in progress: Antoine Recanati, started September 2015, directed by Alexandre d’Aspremont
- PhD in progress: Anaël Bonneton, started December 2014, co-advised by Francis Bach, located in Agence nationale de la sécurité des systèmes d’information (ANSSI).
- PhD in progress: Dmitry Babichev, started September 2015, co-advised by Francis Bach and Anatoly Judistky (Univ. Grenoble).

- PhD in progress: Tatiana Shpakova, started September 2015, advised by Francis Bach.
- PhD in progress: Loucas Pillaud-Vivie, started September 2017, co-directed by Alessandro Rudi and Francis Bach
- PhD in progress: Margaux Brégère, started September 2017, co-advised by Pierre Gaillard, Gilles Stoltz and Yannig Goude (EDF R&D)

### **9.3. Popularization**

- A. d'Aspremont: Paris Science et Data, PSL & Inria.
- A. d'Aspremont: Journée innovation défense
- P. Gaillard: testimony for EDF fellows day

## TAU Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. General Chair, Scientific Chair

- Guillaume Charpiat, Workshop Statistics/Learning at Paris-Saclay 2017 and 2018
- Isabelle Guyon, General Chair, NIPS 2017
- Flora Jay, Junior Conference on Data Science and Engineering Paris-Saclay (JDSE 2017)
- Paola Tubaro, Recent Ethical Challenges in Social Network Analysis (RECSNA 2017)

#### 10.1.1.2. Member of the Organizing Committees

- Cecile Germain, co-organizer of DataScience@HEP 2017; Hammers and Nails Weizmann Workshop.
- Isabelle Guyon, co-organizer BayLearn, NIPS workshops Challenges in Machine Learning, AutoML workshop at ICML, LAP challenge workshops (ICCV, ICPR).
- Marc Schoenauer, Steering Committee, Parallel Problem Solving from Nature (PPSN); Steering Committee, Learning and Intelligent Optimization (LION).
- Michele Sebag, President of Steering Committee, Eur. Conf. on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD).

#### 10.1.1.3. Member of Conference Program Committees

All TAO members are members of the Program Committees of the main conferences in the fields of Machine Learning, Evolutionary Computation, and Information Processing.

#### 10.1.1.4. Reviewer

All TAO member review papers for the most prestigious conferences in the fields of Machine Learning and Evolutionary Computation.

### 10.1.2. Journal

#### 10.1.2.1. Member of the Editorial Boards

- Isabelle Guyon, action editor, *Journal of Machine Learning Research* (JMLR); series editor, *Springer series Challenges in Machine Learning* (CiML).
- Marc Schoenauer, member of Advisory Board, *Evolutionary Computation Journal*, MIT Press, and *Genetic Programming and Evolutionary Machines*, Springer Verlag; action editor, *Journal of Machine Learning Research* (JMLR).
- Michèle Sebag, Editorial Board, *Machine Learning*, Springer Verlag.
- Paola Tubaro, Associate Editorial Board, *Sociology*, Sage; member of Editorial Board, *Revue Française de Sociologie*, Presses de Sciences Po.

#### 10.1.2.2. Reviewer - Reviewing Activities

All members of the team reviewed numerous articles for the most prestigious journals in the fields of Machine Learning and Evolutionary Computation.

### 10.1.3. Invited Talks

- Philippe Caillou, 7 march 2017, *Simulation analysis with charts in GAMA*, Gama Training session, TU Delft, Delft.
- Guillaume Charpiat, 9 May 2017, *Introduction to Neural Networks*, Mathematical coffees, Huawei.
- Guillaume Charpiat, 30 November 2017, *Apprentissage profond pour la segmentation d'images satellite haute résolution*, Workshop Deep Learning - Télédétection - Temps, Issy-les-Moulineaux.
- Aurélien Decelle, 24 March 2017, *Ising inverse problem : recovering the topology of the network*, International workshop on numerical methods and simulations for materials design and strongly correlated quantum matters
- Isabelle Guyon, 19 Jan 2017, *Causal graph reconstruction*, ENS Ulm, Paris.
- Flora Jay, 7 April 2017, *Reconstructing past history from whole-genomes: an ABC approach handling recombining data*, European Mathematical Genetics Meeting, Estonia.
- Cecile Germain, 9 May 2017, *Review on Anomaly/Outlier detection*, DataScience@HEP, Fermilab.
- Marc Schoenauer, 23 Feb. 2017, *Adaptation and self-adaptation in Evolutionary Computation and in scientific careers*, School of Computer Science, University of Adelaide; 7 Sep. 2017, *l'Intelligence Artificielle dans le domaine scientifique*, Open Laboratories, IMRA, Sophia Antipolis; 21 Sep. 2017, *Getting hints from random walks in Optimization and Deep Learning*, CSAIL Seminar, MIT, Boston; 31 Oct. 2017, *Adaptation in Artificial Systems: lessons from Evolution Strategies applied to Deep Learning*, XIII Brazilian Congress on Computational Intelligence, Rio de Janeiro.
- Michèle Sebag, July 2017, *AI without hot air / Le vent de l'IA*, Académie des Technologies; July 2017, *IA et Intelligence Service*, DGA Ecole Militaire; Sept. 2017, *Causal Generative Neural Networks*, Lorentz center, Leiden; Sept. 2017, *Stochastic Gradient Descent: Going as fast as possible but not faster*; Sept. 2017, *AutoML@ECMLPKDD*, Skopje; Sept. 2017, *Algorithm Recommender System*, keynote speech JST CREST Program on Big Data Applications, Tokyo.
- Paola Tubaro, 11 May 2017, *Mapping the collaborative economy: social networks, status and norms*, RITM Seminar, Université Paris Sud, Sceaux.

### 10.1.4. Leadership within the Scientific Community

- Isabelle Guyon, President and co-founder of **ChaLearn**, a non-for-profit organization dedicated to the organization of challenge.
- Marc Schoenauer, Chair of ACM-SIGEVO (Special Interest Group on Evolutionary Computation), re-elected July 2017 (2-years term).
- Marc Schoenauer, founding President of SPECIES (Society for the Promotion of Evolutionary Computation In Europe and Surroundings), that organizes the yearly series of conferences *EvoStar*.
- Michèle Sebag, elected Chair of Steering Committee, ECML-PKDD; head of the Research Programme, Institut de Convergence DataIA
- Paola Tubaro, convenor of the Social Network Analysis Group of British Sociological Association; co-founder of European Network on Digital Labor

### 10.1.5. Scientific Expertise

- Cécile Germain, evaluator for the H2020-ICT-2017-1 Big Data PPP call.
- Marc Schoenauer, mission Villani pour l'Intelligence Artificielle

### 10.1.6. Research Administration

- Cécile Germain, University officer for scientific computing; deputy head of the computer science departement, in charge of research; member of the scientific council of faculty of Science (UPsud) and of its board; member of the Board of the Lidex *Center for Data Science*; member of the scientific council of faculty of Medicine (UPsud).

- Isabelle Guyon, representative of UPSud in the DataIA *Institut de Convergence* Program Committee, University of Paris-Saclay.
- Marc Schoenauer, co-chair (with Sylvain Arlot) of the *Maths-STIC* program of the Labex of Mathematics Hadamard (LMH).
- Michele Sebag, deputy director of LRI, CNRS UMR 8623; elected member of the Research Council of Univ. Paris-Saclay; member of the STIC department council of Univ. Paris-Saclay; member of the Scientific Council of Labex AMIES, Applications des Mathématiques ds l'Industrie, l'Entreprise et la Société; member of the Scientific Council of IRT System'X; member of the CSFRS (Conseil supérieur de la formation et de la recherche stratégique).
- Paola Tubaro, representative of CNRS in the DataIA *Institut de Convergence* Program Committee, University of Paris-Saclay.

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

Licence : Philippe Caillou, Computer Science for students in Accounting and Management, 192h, L1, IUT Sceaux, Univ. Paris Sud.

Licence : Aurélien Decelle, Computer Architecture, 28h, L2, Univ. Paris-Sud.

Licence : Aurélien Decelle, Machine Learning and Artificial Life, 55h, L2, Univ. Paris-Sud.

Licence : Aurélien Decelle, Object-oriented programming , 26h, L2, Univ. Paris-Sud.

Licence : Aurélien Decelle, Computer Architecture, 26h, L3, Univ. Paris-Sud.

Licence and Polytech : Cécile Germain, Computer Architecture

Licence : Isabelle Guyon, Project: Creation of mini-challenges, M2, Univ. Paris-Sud.

Master : Guillaume Charpiat and Corentin Tallec, Advanced Machine Learning, 34h, M2 Recherche, Centrale-Supélec.

Master : Aurélien Decelle, Machine Learning, 26h, M1, Univ. Paris-Sud.

Master : Aurélien Decelle, Probability and statistics, 26h, M1, Univ. Paris-Sud.

Master : Cécile Germain, Parallel Programming

Master : Isabelle Guyon, Project: Resolution of mini-challenges (created by M2 students), L2, Univ. Paris-Sud.

Master : Yann Ollivier, Deep learning, 4h, M2 Recherche, Telecom/Polytech.

Master : Michèle Sebag, Machine Learning, 12h; Deep Learning, 6h; Reinforcement Learning, 6h; M2 Recherche, U. Paris-sud.

Master : Paola Tubaro, Sociology of social networks, 24h, M2, EHESS/ENS.

Master : Flora Jay, Population Genetics, 10h, M2, Univ. Paris-Sud.

Doctorate: Paola Tubaro, Research Methods, 12h, University of Insubria, Italy.

### 10.2.2. Supervision

PhD: Vincent Berthier, *Studies on stochastic optimisation and applications to the real world*, Univ. Paris-Saclay, 29/9/2017, Olivier Teytaud.

PhD: Nacim BELKHIR, *On-line parameter tuning*, Univ. Paris-Saclay, 30/11/2017, Marc Schoenauer and Johann Dréo (Thalès), CIFRE Thalès.

PhD: Pierre-Yves MASSÉ, *Gradient Methods for Statistical Learning*, Univ. Paris-Saclay, 15/12/2017, Yann Ollivier

PhD: Emmanuel MAGGIORI, *Large-Scale Remote Sensing Image Classification*, 22/06/2017, Univ. Nice-Sophia-Antipolis, Yuliya Tarabalka, Pierre Alliez and Guillaume Charpiat



PhD: Yasaman SARABI, *Network Analysis of Private Water Companies, Challenges Collaboration and Competition*, 15/12/2017, Paola Tubaro (at the University of Greenwich, London, UK).

PhD in progress: Mehdi CHERTI *Learning to discover: supervised discrimination and unsupervised representation learning with applications in particle physics*. 01/10/2014, Balazs Kegli.

PhD in progress: Benjamin DONNOT, *Optimisation et méthodes d'apprentissage pour une conduite robuste et efficace du réseau électrique par anticipation sur base de parades topologiques.*, 1/09/2015, Isabelle Guyon and Marc Schoenauer

PhD in progress: Guillaume DOQUET, *ML Algorithm Selection and Domain Adaptation*, 1/09/2015, Michele Sebag

PhD in progress: Victor ESTRADE *Robust domain-adversarial learning, with applications to High Energy Physics*, 01/10/2016, Cécile Germain and Isabelle Guyon.

PhD in progress: François GONARD, *Automatic optimization algorithm selection and configuration*, 1/10/2014, Marc Schoenauer and Michèle Sebag, thèse IRT SystemX.

PhD in progress : Hoang M. LUONG, *Squaring the Circle in Modelling Corporate Governance, Market Structure and Innovation: A Tobin's Q Approach to R&D Investment when Network Effects Are Present*, 01/09/2014, (with M. Ugur and S. Gorgoni, at the University of Greenwich, London, UK).

PhD in progress: Anna PIAZZA, *Inter-Organisational Relationships and Organisational Performance: Network Analysis Applications to a Health Care System*, 01/09/2014, Paola Tubaro (with F. Pallotti and A. Lomi, at the University of Greenwich, London, UK).

PhD in progress: Adrian POL *Machine Learning Anomaly Detection, with application to CMS Data Quality Monitoring*, 01/10/2016, Cécile Germain.

PhD in progress: Thomas SCHMITT, *A Collaborative Filtering Approach to Matching Job Openings and Job Seekers*, 1/11/2014, Philippe Caillou and Michèle Sebag and Jean-Pierre Nadal (EHESS)

PhD in progress: Lisheng SUN, *Apprentissage Automatique: Vers une analyse de données automatisé*, 1/10/2016, Isabelle Guyon and Michèle Sebag

PhD in progress: Corentin TALLEC, *Reinforcement Learning and Recurrent Neural Networks: Dynamical approaches*, 1/10/2016, Yann Ollivier

PhD in progress: Pierre WOLINSKI, *Learning the Architecture of Neural Networks*, 1/9/2016, Guillaume Charpiat and Yann Ollivier

PhD in progress: Victor BERGER, *Variational Anytime Simulator*, 1/10/2017, Michèle Sebag and Marc Schoenauer

PhD in progress: Giancarlo FISSORE, *Statistical physics analysis of generative models*, 1/10/2017, Aurélien Decelle and Cyril Furtlehner

PhD in progress: Diviyan KALAINATHAN, *Causal models and quality of life at work*, 1/10/2017, Michèle Sebag and Isabelle Guyon

PhD in progress: Zhengying LIU, *Automation du design des reseaux de neurones profonds*, 1/10/2017, Isabelle Guyon

PhD in progress: Herilalaina RAKOTOARISON, *Automatic Algorithm Configuration for Power Grid Optimization*, 1/10/2017, Marc Schoenauer and Michèle Sebag

PhD in progress: Théophile SANCHEZ, *Reconstructing the past: deep learning for population genetics*, 1/10/2017, Guillaume Charpiat and Flora Jay

PhD in progress: Aris TRITAS, *Modélisation causale des relations entre alimentation et santé*, 1/10/2017, Michèle Sebag and Philippe Caillou

### 10.2.3. Juries

Guillaume Charpiat, jury of the 2017 Gilles Kahn PhD prize (SIF); jury of a MdC hiring committee at Univ. Paris-Sud.

Cecile Germain, jury of the Telecom PhD prize; half-way jury of Jacob Montiel (Telecom)

Isabelle Guyon, PhD jury Mathieu Bouyrie (Univ. Paris-Saclay, 11/1/2017) HDR jury Alexandre Gramfort (Univ. Paris-Saclay, 6/11/2017)

Flora Jay, half-way juries of Bérénice Alard (MNHN), Arnaud Becheler (EGCE), Cyriel Paris (INRA Toulouse)

Marc Schoenauer, PhD jury of Mathieu Carriere (Univ. Paris-Saclay, 21/11/2017), Elvis Dohmatob (Univ. Paris-Saclay, 29/9/2017) ; PhD committee and half-way jury of Arthur Mensch (Univ. Paris-Saclay, 3/7/2017), Julio Navarro Lara (Univ. Strasbourg, 25/7/2017), Jean Marçais (Univ. Rennes, 10/2017).

Michèle Sebag, Research Quality Assessment Panel for the Department of Computer Science, U. Copenhagen; Hiring Jury, Professor U. Nice Cote d'Azur; Hiring Jury, Professor U. Dortmund, Germany; Hiring Jury, MdC UPSud; Reviewer PhD Audrey Durand, U. Laval Québec; Reviewer PhD Antonio Vergari, U. Bari, Italie; Jury Member: Gisselbrecht, UPMC; Renyu Xury, UPSud.

### 10.3. Popularization

Philippe Caillou, talk on quality of life at work, AFRAME association for ethic management, Paris, 28/11/2017

Isabelle Guyon: press release at NIPS conference (5/12/2015); interview l'Usine Nouvelle (12/12/2017).

Michèle Sebag: interview France 2; interview l'Usine Nouvelle; 2 articles The Conversation France.

Paola Tubaro: interview Pourquoi Docteur (online health magazine, 01/01/2017); article in Journal du CNRS (02/02/2017); op-ed Libération (02/02/2017); interview Le Devoir (daily newspaper, Canada, 29/04/2017); interview Les Echos (19/09/2017); interview Le Monde (09/11/2017); 1 article OuiShare magazine (13/07/2017); 1 article The Conversation France (French version 02/11/2017, English version 11/12/2017); round table on Open data at "Science and You" conference, Montréal (05/05/2017); round table "Cuisine and Performance" at Centre Pompidou, Paris (18/11/2017).

## ASPI Team

## 8. Dissemination

### 8.1. Promoting scientific activities

#### 8.1.1. Scientific events organisation

Valérie Monbet has co-organized the workshop and summer school on **Data Science and Environment**, held in Brest in July 2017. The conference gathered researchers that have an expertise in one of the two areas (data science, environmental data) and some interest for the other. Its main goal was to explore the fruitful interplay between the two areas, and ultimately to help create new connections and collaborations between the scientific communities involved. Another objective was to propose some high level courses and practices at the interaction of these two areas.

#### 8.1.2. Participation in workshops, seminars, lectures, etc.

In addition to presentations with a publication in the proceedings, which are listed at the end of the document, members of ASPI have also given the following presentations.

Frédéric Cérou has given an invited talk on the convergence of adaptive multilevel splitting at the workshop **Quasistationary Distributions: Analysis and Simulation** held in Paderborn in September 2017.

Patrick Héas has presented his joint work with Mamadou Lamarana Diallo and Cédric Herzet (EPI FLUMINANCE, Inria Rennes–Bretagne Atlantique) on model reduction with “multi-space” prior information, at the **European Conference on Numerical Mathematics and Advanced Applications** (ENUMATH), held in Voss, Norway, in September 2017.

Thi Tuyet Trang Chau has presented her work on non parametric state–space model for missing–data imputation, at the workshop on **Data Science and Environment**, held in Brest in July 2017.

#### 8.1.3. Research administration

François Le Gland is a member of the *conseil d’UFR* of the department of mathematics of université de Rennes 1. He is also a member of the *conseil scientifique* for the EDF/Inria scientific partnership.

Valérie Monbet is a member of both the *comité de direction* and the *conseil* of IRMAR (institut de recherche mathématiques de Rennes, UMR 6625). She is also the deputy head of the department of mathematics of université de Rennes 1, where she is a member of both the *conseil scientifique* and the *conseil d’UFR*.

### 8.2. Teaching, supervision, thesis committees

#### 8.2.1. Teaching

Patrick Héas gives a course on **Monte Carlo simulation methods in image analysis**, at université de Rennes 1, within the SISEA (signal, image, systèmes embarqués, automatique) track of the master in electronical engineering and telecommunications.

François Le Gland gives

- a 2nd year course on **introduction to stochastic differential equations**, at INSA (institut national des sciences appliquées) Rennes, within the GM/AROM (risk analysis, optimization and modeling) major in mathematical engineering,
- a 3rd year course on **Bayesian filtering and particle approximation**, at ENSTA (école nationale supérieure de techniques avancées), Palaiseau, within the statistics and control module,
- a 3rd year course on **linear and nonlinear filtering**, at ENSAI (école nationale de la statistique et de l’analyse de l’information), Ker Lann, within the statistical engineering track,
- a course on **Kalman filtering and hidden Markov models**, at université de Rennes 1, within the SISEA (signal, image, systèmes embarqués, automatique, école doctorale MATISSE) track of the master in electronical engineering and telecommunications,
- and a 3rd year course on **hidden Markov models**, at Télécom Bretagne, Brest.

Valérie Monbet gives

- a course on machine learning for biology at université de Rennes 1, within
  - the G2B (genetics, genomics, biochemistry) track of the master in molecular and cellular biology,
  - the MODE (modélisation en écologie) track of the master in biodiversity, ecology, evolution
  - and the master in scientific computing and modelling,
- a course on machine learning for environmental data, at the summer school on **Data Science and Environment**, held in Brest in July 2017,
- a course on graphical models at université de Rennes 1, within the master on applied mathematics and statistics,
- a course on MATLAB at université de Rennes 1, within the master in economics and financial engineering.

### 8.2.2. Supervision

François Le Gland and Valérie Monbet are jointly supervising one PhD student

- Thi Tuyet Trang Chau, provisional title: *Non parametric filtering for Metocean multi-source data fusion*, université de Rennes 1, started in October 2015, expected defense in October 2018, funding: Labex Lebesgue grant and Brittany council grant, co-direction: Pierre Ailliot (université de Bretagne Occidentale, Brest).

François Le Gland is supervising three other PhD students

- Kersane Zoubert-Ousseni, provisional title: *Particle filters for hybrid indoor navigation with smart-phones*, université de Rennes 1, started in December 2014, expected defense in 2017, funding: CEA grant, co-direction: Christophe Villien (CEA LETI, Grenoble),
- Audrey Cuillery, provisional title: *Bayesian tracking from raw data*, université du Sud Toulon Var, started in April 2016, expected defense in 2019, funding: CIFRE grant with DCNS, co-direction: Claude Jauffret (université du Sud Toulon Var) and Dann Laneuville (DCNS, Nantes).
- Ramatoulaye Dabo, provisional title: *Rare event simulation in epidemiology*, université Assane Seck de Ziguinchor (Senegal) and université de Rennes 1, started in September 2015, expected defense in 2018, co-direction: Alassane Diedhiou (université Assane Seck de Ziguinchor).

Valérie Monbet is supervising two other PhD students

- Audrey Poterie, provisional title: *Régression d'une variable ordinale par des données longitudinales de grande dimension : application à la modélisation des effets secondaires suite à un traitement par radiothérapie*, université de Rennes 1, started in October 2015, expected defense in 2018, funding: INSA grant, co-direction: Jean-François Dupuy (INSA Rennes) and Laurent Rouvière (université de Haute Bretagne, Rennes).
- Marie Morvan, provisional title: *Modèles de régression pour données fonctionnelles. Application à la modélisation de données de spectrométrie dans le proche infra rouge*, université de Rennes 1, started in October 2016, expected defense in 2019, funding: MESR grant, co-direction: Joyce Giacomci (université de Haute Bretagne, Rennes) and Olivier Sire (université de Bretagne Sud, Vannes).

Mathias Rousset is supervising one PhD student

- Yushun Xu, provisional title: *Variance reduction of overdamped Langevin dynamics simulation*, université Paris-Est, started in October 2015, expected defense in 2018, co-direction: Pierre-André Zitt (université Paris-Est).

Patrick Héas has been supervising two post-doctoral fellows

- Hassan Maatouk, title: *Compressing the model by exploiting observations*, EPI ASPI, Inria Rennes–Bretagne Atlantique, started in September 2016, ended in September 2017, funding: ANR GERONIMO, co-supervision: Cédric Herzet (EPI FLUMINANCE, Inria Rennes–Bretagne Atlantique).
- Mamadou Lamarana Diallo, title: *Model reduction with “multi-space” prior information*, EPI FLUMINANCE, Inria Rennes–Bretagne Atlantique, started in October 2016, ended in October 2017, funding: ANR GERONIMO, co-supervision: Cédric Herzet (EPI FLUMINANCE, Inria Rennes–Bretagne Atlantique).

### **8.2.3. Thesis committees**

François Le Gland has been a member of the committee for the HDR of Christian Musso (université du Sud, Toulon).

Mathias Rousset has been a member of the committee for the PhD thesis of G r me Faure (CERMICS Ecole des Ponts Paris-Tech and CEA DAM, advisor: Gabriel Stoltz and Jean–Bernard Maillet).

## CQFD Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Scientific Events Organisation

#### 10.1.1.1. Member of the Organizing Committees

P. Legrand was co-organizer of EA 2017.

F. Dufour has been a member of the Organizing Committee of the SIAM Conference on Control and Its Applications (CT17) in Pittsburgh, USA, 2017.

### 10.1.2. Scientific Events Selection

#### 10.1.2.1. Chair of Conference Program Committees

P. Legrand was chair for EA 2017.

#### 10.1.2.2. Member of the Conference Program Committees

J. Anselmi has been a member of the TPC of the following international conferences: VALUETOOLS-2017, ASMTA-2017 and IFIP Performance 2017.

P. Legrand has been a member of the PC of the following international conferences: EA 2017.

### 10.1.3. Journal

#### 10.1.3.1. Member of the Editorial Boards

P. Del Moral is an associate editor for the journal Stochastic Analysis and Applications since 2001.

P. Del Moral is an associate editor for the journal Revista de Matematica: Teoria y aplicaciones since 2009.

P. Del Moral is an associate editor for the journal Applied Mathematics and Optimization since 2009.

F. Dufour is associate editor of the journal: SIAM Journal of Control and Optimization since 2009.

F. Dufour is the representative of the SIAM activity group in control and system theory for the journal SIAM News since 2014.

J. Saracco is an associate editor of the journal Case Studies in Business, Industry and Government Statistics (CSBIGS) since 2006.

#### 10.1.3.2. Reviewer - Reviewing Activities

All the members of CQFD are regular reviewers for several international journals and conferences in applied probability, statistics and operations research.

### 10.1.4. Invited Talks

Pierrick Legrand was invited to give a talk on IA in Thales center in october.

Pierre del Moral gave several invited talks listed at the following address: <http://people.bordeaux.inria.fr/pierre.delmoral/conf.html>

### 10.1.5. Leadership within the Scientific Community

P. Legrand was the scientific leader of the programs HUMO 3 (with UBX and IMS) and MICRO-DOPPLER (with Thales and IMS) in the context of the GIS ALBATROS.

### 10.1.6. Scientific Expertise

Pierrick Legrand has been reviewer for the ANR generics projects in 2017.

J. Saracco is elected member of the council of the *Société Française de Statistique* (SFdS, French Statistical Society).

J. Saracco was vice president of SFdS from 2014 to 2016.

### 10.1.7. Research Administration

J. Saracco is deputy director of IMB (Institut de Mathématiques de Bordeaux, UMR CNRS 5251) since 2015.

M. Chavent is member of the national evaluation committee of Inria.

M. Chavent and Pierrick Legrand are members of the council of the Institut de Mathématique de Bordeaux.

Pierrick Legrand was the director of the Ressources Center Victoire of the UF Mathematics and interactions until may 2017.

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

- Licence : J. Anselmi, Probabilités et statistiques, 20 heures, L3, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, fili re T l communications, France.
- Licence : J. Anselmi, Probabilit s et statistiques, 16 heures, L3, Institut Polytechnique de Bordeaux,  cole ENSEIRB-MATMECA, fili re Electronique, France.
- Licence : J. Anselmi, Probabilit s et statistiques, 48 heures, niveau L3, Institut Polytechnique de Bordeaux,  cole ENSEIRB-MATMECA, fili re Math matique et M canique, France.
- Licence: M. Chavent, Analyse des donn es, 15 ETD, L3, Bordeaux university, France
- License: M. Chavent, Mod lisation statistique, 15 ETD, niveau L3, Bordeaux university, France
- Master : M. Chavent, Apprentissage automatique, 50 ETD, niveau M2, Bordeaux university, France
- Licence : F. Dufour, Probabilit s et statistiques, 70h, first year of  cole ENSEIRB-MATMECA, Institut Polytechnique de Bordeaux, France.
- Master : F. Dufour, M thodes num riques pour la fiabilit , 36h, third year of  cole ENSEIRB-MATMECA, Institut Polytechnique de Bordeaux, France.
- P. Legrand, Alg bre (responsable de l'UE), Licence 1 SCIMS (108 heures)
- P. Legrand, Informatique pour les math matiques (responsable de l'UE), Licence 1 et Licence 2 (36 heures)
- P. Legrand, Espaces Euclidiens. (responsable de l'UE), Licence 2 SCIMS (54 heures)
- Licence: J. Saracco, Probability and Descriptive statistics, 27h, L3, First year of ENSC - Bordeaux INP, France
- Licence: J. Saracco, Mathematical statistics, 20h, L3, First year of ENSC - Bordeaux INP, France
- Licence: J. Saracco, Data analysis (multidimensional statistics), 20h, L3, First year of ENSC - Bordeaux INP, France
- Master: J. Saracco, Statistical modeling, 27h, M1, Second year of ENSC - Bordeaux INP, France
- Master: J. Saracco, Applied probability and Statistics, 40h, M1, Second year of ENSCBP - Bordeaux INP, France
- Master: J. Saracco, Probability and Statistics, 12h, M2, Science Po Bordeaux, France
- A. Genadot, Probabilit s de bases (18h), Licence MIASHS premi re ann e, Universit  de Bordeaux.
- A. Genadot, Statistiques de bases (18h), Licence MIASHS premi re ann e, Universit  de Bordeaux.
- A. Genadot, Probabilit s (36h), Licence MIASHS deuxi me ann e, Universit  de Bordeaux.

- A. Genadot, Processus (18h), Licence MIASHS troisi  me ann  e, Universit   de Bordeaux.
- A. Genadot, Mod  lisation statistique (18h), Licence MIASHS troisi  me ann  e, Universit   de Bordeaux.
- A. Genadot, Martingales (25h), Master MIMSE premi  re ann  e, Universit   de Bordeaux.
- A. Genadot, Probabilit  s (20h), Master MEEF premi  re ann  e, Universit   de Bordeaux.

### 10.2.2. Supervision

- PhD completed : Aliz   Geeraert, Contr  le optimal des processus Markoviens d  terministes par morceaux et application    la maintenance, University of Bordeaux, supervised by B. de Saporta and F. Dufour (defense in June 2017).
- PhD in progress : Ines Jlassi, Contributions    la r  gression inverse par tranches et    l'estimation non para m  trique des quantiles conditionnels, University of Monastir (Tunisia), September 2013, supervised by J. Saracco and L. Ben Abdelghani Bouraoui.
- PhD in progress : Hadrien Lorenzo, Analyses de donn  es longitudinales de grandes dimensions appliqu  es aux essais vaccinaux contre le VIH et Ebola, University of Bordeaux, September 2016, supervised by J. Saracco and R. Thiebaut.
- PhD in progress : Tiffany Cherchi, "Automated optimal fleet management policy for airborne equipment", Montpellier University, since 2017, supervised by B. De Saporta and F. Dufour.
- PhD in progress : Chlo   Pasin, "Modelisation et optimisation de la r  ponse vaccinale. Application au VIH et Ebola", Bordeaux University, since 2015, supervised by F. Dufour and R. Thiebaut.
- PhD in progress : Maud Joubaud, "Branching piecewise deterministic Markov processes, applications to cell biology", Montpellier University, since 2016, supervised by B. De Saporta and B. Cloez.
- PhD completed : Emigdio Z. Flores, Human mental states classification using EEG by means of Genetic Programming, ITT Tijuana, supervised by L. Trujillo and P. Legrand (defense in July 2017).

### 10.2.3. Juries

J. Saracco is vice president of the french statistical society (SFdS).



## MATHRISK Project-Team

## 9. Dissemination

### 9.1. Promoting Scientific Activities

#### 9.1.1. Scientific Events Organisation

##### 9.1.1.1. Member of the Organizing Committees

- A. Alfonsi:
  - Co-organizer of the conference "Advances in Financial Mathematics", 10-13 January 2017, <https://fin-risks2017.sciencesconf.org/>.
  - Co-organizer of the working group seminar of MathRisk "Méthodes stochastiques et finance".
- J. Lelong :
  - Member of the organizing committee of Les journées de Probabilités, 2017, France, Aussois.
  - Member of the organizing committee of CEMRACS, 2017, Marseille.
  - Member of the organizing committee of Les journées SMAI MODE 2018, Grenoble.
- A. Sulem
  - Co-organizer of the seminar Inria-MathRisk /Université Paris 7 LPMA "Numerical probability and mathematical finance". <https://www.lpma-paris.fr/mathfipronum/gt>

#### 9.1.2. Scientific Events Selection

##### 9.1.2.1. Member of the Conference Program Committees

B. Jourdain: Member of the scientific committee of the congrès SMAI 2017

##### 9.1.2.2. Reviewer

A. Sulem: Reviewer for *Mathematical Reviews*

#### 9.1.3. Journal

##### 9.1.3.1. Member of the Editorial Boards

- D. Lamberton
  - Associate editor of
    - Mathematical Finance,
    - Associate editor of ESAIM Probability & Statistics
- A. Sulem
  - Associate editor of
    - 2011- Present: *Journal of Mathematical Analysis and Applications (JMAA)*
    - 2009- Present: *International Journal of Stochastic Analysis (IJSa)*
    - 2008- Present: *SIAM Journal on Financial Mathematics (SIFIN)*

##### 9.1.3.2. Reviewer - Reviewing Activities

The members of the team reviewed numerous papers for many journals in probability, finance, stochastic control, applied mathematics, ...

#### 9.1.4. Invited Talks

- A. Alfonsi
  - "Maximum Likelihood Estimation for Wishart processes", conference on "Mathematics of Quantitative Finance", Oberwolfach, March 1.
  - "Optimal Execution in a Hawkes Price Model and Calibration", Market Microstructure and High Frequency Data June 1-3, The University of Chicago, June 2.
  - "Maximum Likelihood Estimation for Wishart processes", Recent Developments in Numerical Methods with Applications in Statistics and Finance Mannheim, Germany, June 9.
  - "Sampling of probability measures in the convex order and approximation of Martingale Optimal Transport problems." New York, conference in honour of Jim Gatheral, NYU, October 15.
  - "Sampling of probability measures in the convex order and approximation of Martingale Optimal Transport problems." GT CMAP-ENSTA-ENSAE, November 27.
- V. Bally
  - LMS-EPSRC Durham Symposium 10-20 July. Regularity for the solution of jump equations using an interpolation method.
  - Conference of Stochastic Processes and their Applications (SPA2017) 24-28 July. Regularity for the solution of jump equations using an interpolation method.
  - Workshop on Piecewise Deterministic Markov Processes, 29.05-2.06 Gaussian noise versus Poisson Point Measures in PDMP's.
- B. Jourdain:
  - Workshop Stochastic Sampling and Accelerated Time Dynamics on Multidimensional Surfaces, IPAM, Los Angeles, 16-20 October : Convergence and efficiency of adaptive importance sampling techniques with partial biasing
  - Workshop Singular McKean-Vlasov dynamics, Sophia-Antipolis, 14-15 September : Existence to calibrated regime-switching local volatility model
  - Summer school CEMRACS, Marseille, 17-21 July : The Metropolis-Hastings algorithm, introduction and optimal scaling of the transient phase
  - Workshop Stochastic Computation, FOCM 2017, Barcelona, 10-12 July : Strong convergence properties of the Ninomiya-Victoir scheme and applications to multilevel Monte Carlo methods
  - Workshop BSDEs SPDEs, Edinburgh, 3-7 July : Existence to calibrated regime-switching local volatility model
  - Conference PDE/Probability Interactions : Kinetic Equations, Large Time and Propagation of Chaos, Marseille, 18-22 April : On a stochastic particle approximation of the Keller-Segel equation
  - Conference PDE and probability methods for interaction, Sophia-Antipolis, 30-31 March : Evolution of the Wasserstein distance between the marginals of two Markov processes
  - Applied Mathematics seminar of the Collège de France, February 24 : Multitype sticky particles and diagonal hyperbolic systems
  - Conference Advances in Financial Mathematics, Paris, 10-13 January : Existence to a calibrated regime-switching local volatility model
- J. Lelong
  - High Performance Computing session during CEMRACS: 4 hours of lectures and 6 hours of hands-on sessions, Marseille.
- A. Sulem
  - Plenary talk at the Congrès SMAI 2017, 8ème biennale française des Mathématiques Appliquées et Industrielles, Ronce-les-bains, June 2017, <http://smai.emath.fr/smai2017/index.php>

- "Recent advances in financial mathematics", conference organised by "Financial Risks Chair", Paris, Janvier 2017. <https://fin-risks2017.sciencesconf.org/program>
- Workshop on *Optimal Stopping in Complex environments*, Bielefeld University, December 18-20 2017, <https://sites.google.com/view/imwworkshop17/>
- Workshop on "Asymptotics of Stochastic Dynamics", University of Swansea, August, 29-21, 2017
- Simulation of Stochastic graphs and applications symposium, International Conference on Monte Carlo techniques, Paris, July 5-8, 2017 <https://montecarlo16.sciencesconf.org>

### 9.1.5. Scientific Expertise

B. Jourdain: Member of the Scientific Advisory Board of the Center for interdisciplinary Research in Biology, Collège de France : March 1st and 2nd 2017

### 9.1.6. Research Administration

- A. Alfonsi
  - Deputy director of the CERMICS since April 2017.
  - In charge of the Master "Finance and Application" at the Ecole des Ponts.
- D. Lamberton
  - Vice-president for research at Université Paris-Est Marne-la-Vallée
- B. Jourdain
  - Head of the doctoral school MSTIC, University Paris-Est
- A. Sulem
  - Member of the Committee for technology development, Inria Paris
  - Corresponding member of the comité opérationnel d'évaluation des risques légaux et éthiques (COERLE) at Inria Paris research center
  - Member of the Committee for Inria international Chairs

## 9.2. Teaching - Supervision - Juries

### 9.2.1. Teaching

Licence :

- A. Alfonsi
  - 'Probabilités', first year course at the Ecole des Ponts.
- B. Jourdain
  - "Introduction to probability theory", 1st year, Ecole Polytechnique
  - "Mathematical finance", 2nd year ENPC
- V. Bally
  - Hilbertien Analysis L3 (36h)

Master

- A. Alfonsi:
  - "Traitement des données de marché : aspects statistiques et calibration", lecture for the Master at UPEMLV.
  - "Mesures de risque", Master course of UPEMLV and Paris VI.
  - Professeur chargé de cours at Ecole Polytechnique.

- V. Bally
  - Interest rates (20h) M2 filière finance
  - Malliavin calculus and applications in finance (30h) M2 filière finance
  - "Risk analysis " M2 filière actuariat (45h)
- B. Jourdain, B. Lapeyre ; course "Monte-Carlo methods", 3rd year ENPC and Master Recherche Mathématiques et Application, University of Marne-la-Vallée
- J.-F. Delmas, B. Jourdain : course "Jump processes with applications to energy markets", 3rd year ENPC and Master Recherche Mathématiques et Application, University of Marne-la-Vallée
- B. Lapeyre: Monte-Carlo methods in quantitative finance, Master of Mathematics, University of Luxembourg,
- D. Lamberton: Calcul stochastique pour la finance, master 1 course, Université Paris-Est Marne-la-Vallée
- A. Sulem :
  - "Finite difference for PDEs in Finance", Master 2 MASEF, Université Paris IX-Dauphine, Département Mathématiques et Informatique de la Décision et des Organisations (MIDO), 27 h.
  - "PDE methods in Finance", Master of Mathematics, University of Luxembourg, 22 h lectures and responsible of the module "Numerical Methods in Finance".

Doctorat :

A. Sulem : "Stochastic Control with Applications to Mathematical Finance", International summer school in "Financial Mathematics and Actuarial Science", **Doctoral lectures**, (30 heures), Atlantic Association for Research in the Mathematical Sciences, University of Prince Edward Island (UPEI), Canada, July <https://aarms.math.ca/summer-school>

### 9.2.2. Supervision

HdR : J. Lelong, Quelques contributions aux méthodes numériques probabilistes et à la modélisation stochastique, Université Grenoble-Alpes, September 2017.

- PhD in progress :
  - Adel Cherchali, "Numerical methods for the ALM", funded by Fondation AXA, starting from September 2017, Supervisor: A. Alfonsi
  - Rafaël Coyaude, "Deterministic and stochastic numerical methods for multimarginal and martingale constraint optimal transport problems", starting from October 2017, Supervisor: A. Alfonsi
  - Rui Chen (Fondation Sciences Mathématiques de Paris grant), "Stochastic Control of mean field systems and applications to systemic risk, from September 2014, Université Paris-Dauphine, Supervisor: A. Sulem.
  - Marouen Iben Taarit , " On CVA and XVA computations ", CIFRE Natixis/ENPC, Supervisor: Bernard Lapeyre
  - Giulia Terenzi , "American options in complex financial models", Université Paris-Est Marne-la-Vallée, Supervisors: Damien Lamberton and Lucia Caramellino, from University Tor Vergata, Rome
  - Alexandre Zhou (started November 2015) "Analysis of stochastic particle methods applied to finance", Supervisor: B. Jourdain
  - Oumaima Bencheikh (started November 2017) "Acceleration of probabilistic particle methods", Supervisor: B. Jourdain

### 9.2.3. Juries

- Damien Lamberton  
"Opponent" for the PhD thesis defense of Hannah Dyrssen (student of Erik Ekstrom) at Uppsala University (Sweden), May 2017.
- Benjamin Jourdain  
Referee for the PhD thesis and participation to the jury for the defense of the PhD thesis of
  - Victor Reutenauer, defended on March 22, University Côte d'Azur
  - Daphné Giorgy, defended on June 2, University Pierre and Marie Curie
  - Radu Maftei, defended on December 14, University Côte d'Azur
- Agnès Sulem
  - Participation to the committee for the recruitment of a Professeur in "applied mathematics, finance and numerical probability", Laboratoire de probabilités (LPMA), Université Paris VI, 2017
  - Participation to the committee for the recruitment of a Assistant professor in "économie, finance et game theory", Université Paris-Dauphine, 2017.
  - Participation to the jury (Chair) for the defense of the PhD thesis of Amine Ismail, *Robust modeling of volatility and application to derivatives pricing and portfolio optimization*, December 15 2017, Université Paris-Diderot - Paris 7.
  - Participation to the jury (Chair) for the defense of the PhD thesis of Jiang Pu, *Contrôle optimal et applications en finance: exécution optimale, couverture d'options et choix de portefeuille*, September 25 2017, Université Paris-Diderot - Paris 7.

## TOSCA Project-Team

# 10. Dissemination

## 10.1. Promoting Scientific Activities

### 10.1.1. Promotion of Mathematics in the industry

- M. Deaconu is involved in the Fédération Charles Hermite Forum which will be held in Nancy in January 2018.
- A. Lejay has been appointed as representative of the Agence Mathématiques et Entreprise (AMIES) for the Grand-Est Region.
- D. Talay continued to serve as a member of the Scientific Committee of the AMIES National Agency aimed to promote interactions between Mathematics and Industry.
- D. Talay continued to serve as the Vice-President of the Fondation d'Entreprise Natixis which aims to contribute to develop research in quantitative finance. He also serves as a member of the Scientific Committee of the Foundation.

### 10.1.2. Scientific Events Organisation

- M. Bossy co-organized the Closing workshop of the project MECASIF On reduced order methods for wind and marine current power held at Inria Sophia Antipolis, February 20-22, 2017.
- M. Bossy co-organized the Workshop EDF-UCA : HPC and fluid flow held at Inria Sophia Antipolis, November 23 - 24, 2017.
- N. Champagnat co-organizes with Marianne Clausel (Univ. de Lorraine) the weekly Seminar of Probability and Statistics of IECL, Nancy.
- D. Talay and N. Touzi (Ecole Polytechnique) organized and chaired the conference 'PDE and Probability Methods for Interactions', Inria Sophia Antipolis, March 30-31, 2017 (<https://project.inria.fr/pde2017/>).
- D. Talay organized the workshop 'Singular McKean-Vlasov Dynamics', Inria Sophia Antipolis, September 14-15, 2017.
- D. Villemonais and M. Kolb organized (Univ. of Paderborn) a workshop entitled "Quasistationary Distributions: Analysis and Simulation" at Paderborn in September 2017 (<http://math.uni-paderborn.de/ag/arbeitsgruppe-wahrscheinlichkeitstheorie/forschung/konferenzen/>).

### 10.1.3. Scientific Events Selection

#### 10.1.3.1. Member of the Conference Program Committees

- A. Lejay is member of the conference program committees of *Journées de Probabilités 2017* (Aussois, France) and of CEMRACS 2017.
- D. Talay is serving as a member of the ICMNS 2018 Conference Program Committee.

### 10.1.4. Journal

#### 10.1.4.1. Member of the Editorial Boards

- N. Champagnat serves as an Associate Editor of *Stochastic Models* and of *ESAIM: Probability & Statistics* until June.
- N. Champagnat was co-editor-in-chief with Béatrice Laurent-Bonneau (IMT Toulouse) of *ESAIM: Probability & Statistics* since June.
- A. Lejay is one of the three editors of the *Séminaire de Probabilités* and *Mathematics and Computers in Simulation* (MATCOM).

- D. Talay serves as an Associate Editor of *Stochastic Processes and their Applications*, *Probability, Uncertainty and Quantitative Risk*, *ESAIM Probability and Statistics*, *Stochastics and Dynamics*, *Journal of Scientific Computing*, *Monte Carlo Methods and Applications*, *Oxford IMA Journal of Numerical Analysis*, *SIAM Journal on Scientific Computing*, *Communications in Applied Mathematics and Computational Science*, *Éditions de l'École Polytechnique*. He also serves as Co-editor in chief of *MathematicS in Action*.

#### 10.1.4.2. Reviewer - Reviewing Activities

- M. Deaconu wrote reviews for manuscripts submitted to *Proceedings of the London Mathematical Society*, *Journal of Computational and Applied Mathematics* and *Mathematics and Computers in Simulation*.
- C. Fritsch wrote reviews for manuscripts submitted to *Journal of Biological Systems* and *Chaos, Solitons & Fractals*.
- A. Lejay wrote reviews for *Stochastic Processes and Their Applications*, *Séminaire de probabilités*, *Annals of Applied Probability*, *Physical Review E*, *Mathematical Methods of Operations Research*, *Bulletin des Sciences Mathématiques*, *Boundary Value Problems*, *Journal of Hydrology*, *Electronic Journal of Probability*, *Quantitative Finance and Economics* and *Journal of Theoretical Probability*.
- D. Talay reported on applications to the Swiss National Science Foundation (SNSF).
- D. Talay reported on an application to the FONDECYT Program, Chile.
- D. Talay reported on applications to the Research Grants Council (RGC) of Hong Kong.
- D. Talay reported on manuscripts submitted to *Electronic. J. of Probability*, *SINUM*, *Annals Applied Probab.*, *J. Mathématiques Pures et Appliquées*.
- E. Tanré wrote reviews for manuscripts submitted to *European Journal of Applied Mathematics*.
- E. Tanré serves as a permanent reviewer of *Mathematical Reviews of the American Mathematical Society (MathSciNet)*.
- D. Villemonais wrote reviews for *Mathematical Reviews of the American Mathematical Society (MathSciNet)* and for manuscripts submitted to *Complexity*, *Journal of Mathematical Biology* and *Annals of Applied Probability*.

#### 10.1.5. Invited Talks

- M. Bossy has been invited to give a talk at the Forecasting and Risk Management for Renewable Energy conference in Paris June 7-9, 2017.
- M. Bossy has been invited to give a lecture talk at the CEMRACS in Marseille July 2017.
- M. Bossy has been invited to give a seminar talk at CMA MinesParisTech, in Sophia Antipolis November 2017.
- M. Bossy gave a talk at the International Workshop on BSDEs, SPDEs, Edinburgh 2017, at the MECASIF workshop, at the workshop on PDE and Probability Methods for Interactions, at the Workshop on singular McKean Vlasov in Sophia Antipolis.
- N. Champagnat has been invited to give talks at the conference on *Ecology and evolutionary biology, deterministic and stochastic models* in Toulouse in October, at the Conference on *Quasistationary Distributions: Analysis and Simulation* in Paderborn, Germany in September, at the Workshop on *Singular McKean-Vlasov equations and their applications* in Sophia Antipolis in September, at the *Journées Scientifiques Inria 2017* at Sophia Antipolis in June, at the *Workshop on Multi-Scale Features of Selection in Population Genetics*, Eurandom in Eindhoven, The Netherlands in March and at the *Journées EDP pour la biologie évolutives* in Avignon in March.
- N. Champagnat has been invited to give seminar talks at the *Séminaire Modélisation Mathématiques et Calcul Scientifique de l'Institut Camille Jordan* in Lyon in November, at the *Séminaire du LPMA* in Paris 6 (UPMC) in February, at the *Séminaire de statistique* in Avignon in January, at the *Séminaire de probabilités et statistique du LMV* in Versailles in January and at the *Séminaire Calcul Stochastique de l'IRMA* in Strasbourg in January.

- N. Champagnat gave a colloquium talk at the *Colloquium of the Mathematical Institute* in Mainz, Germany in February.
- N. Champagnat has been invited to give lectures at the *Workshop/School on Stochastic PDEs, Mean Field Games and Biology* (4h) at the Gran Sasso Science Institute (GSSI) in L'Aquila, Italy in September and at the *Doctoral School "New Trends in Markov Processes"* (6h) in Les Diablerets, Switzerland in March.
- M. Deaconu has been invited to give a talk at the *SIAM Conference on Control and its Applications*, 10-12 July 2017, Pittsburgh, USA.
- M. Deaconu has been invited to give a plenary talk at the *Forum des Jeunes Mathématicien-ne-s*, 22-24 November 2017, Nancy.
- M. Deaconu has been invited to give a seminar talk at the *Probability and Statistic Seminar* at the Institut de Mathématiques in Marseille, in November.
- C. Fritsch has been invited to give seminar talks in February at the probability seminars of Paul Painlevé laboratory in Lille and of Fourier Institute in Grenoble, at the meeting of the Chair *Modélisation Mathématique et Biodiversité* in the VEOLIA head office in Aubervilliers and in *MaLAGE seminar* of INRA in Jouy-en-Josas. She has also been invited to give talk at the annual *ModStatSAP* day in Paris in March and at the *HELENA seminar* of the Institute of Groundwater Ecology in Munich and at the *IRMAR probability seminar* in Rennes in June.
- C. Fritsch gave a talk at the conference *Mathematical Models in Ecology and Evolution* in London in July.
- P. Helson gave a talk at the workshop *Computational Neuroscience and Optical Dynamics* in Sophia-Antipolis in May.
- P. Helson presented a poster at the conference *International Conference on Mathematical Neuroscience* in Boulder (US) in June.
- A. Lejay gave a seminar talk at the *Séminaire EDP de l'Institut Élie Cartan de Lorraine* (Metz, France) in April 2017.
- A. Lejay gave talks at the national conference *Brownian motion in cones: algebraic and analytic approaches* at Toulouse in November and at the national conference *Journées de Probabilités 2017* at Aussois in June.
- A. Lejay gave a talk at the international conference *PDE & Probability Methods for Interactions* at Sophia-Antipolis, February 2013; *Monte Carlo Methods and Applications (MCM 2017)* at Montréal in July 2017; *Scicade 2017* at Bath in September 2017; *Rough Paths in Toulouse* at Toulouse in October 2017.
- P. Pigato has been invited to give seminar talks in January, at the Probability and Statistics Seminar of Laboratoire Jean Kuntzmann (Grenoble) and at the Seminar Modern Methods in Applied Stochastics and Nonparametric Statistics of WIAS Berlin.
- In January, Paolo Pigato has given a seminar talk at the Probability and Statistic Seminar of Institut Elie Cartan (Nancy).
- P. Pigato was invited to participate, from February 26th to March 4th, to the meeting "Mathematics of Quantitative Finance" in Oberwolfach, Germany.
- D. Talay gave a lecture at the workshop *Stochastic Differential Equations: Regularity and Numerical Analysis in Finite and Infinite Dimensions*, Mathematisches Forschungsinstitut Oberwolfach, February 5-11.
- D. Talay gave an invited conference at the Moscow National Research University Higher School of Economics, Laboratory of Stochastic Analysis winter meeting, December 4-7.
- D. Talay gave a seminar at Ecole Polytechnique on October 17th.
- E. Tanré gave talks at Université du Maine and Université de Savoie.



- E. Tanré was invited in Edinburg to give a talk at the International Workshop on BSDEs, SPDEs and their Applications in the McKean-Vlasov special session (July).
- E. Tanré was invited to give a talk at the workshop PDE/Probability Interactions: Kinetic Equations, Long time and Propagation of Chaos (Luminy, September).
- D. Villemonais has been invited to give seminar talks at the Stochastic Analysis Seminar of Imperial College (London, UK), at the Séminaire de probabilités of Université de Lille, at the Séminaire de probabilités of Université de Rennes and at the Probability laboratory of the Univeristy of Bath (UK).

#### **10.1.6. Leadership within the Scientific Community**

- M. Bossy is serving as a vice president of the Inria Evaluation Committee.
- A. Lejay is the head of the Probability and Statistics team of the Institut Élie Cartan since September 2016.
- A. Lejay is member of the Conseil de Perfectionnement of the Master of Mathematics of the Université de Lorraine.
- D. Talay continued to chair the Scientific Council of the French Applied Math. Society SMAI.
- D. Talay served as a member of the scientific council of the Complex System academy of the UCA Idex.
- D. Talay is serving as a member of the committee in charge of preparing the application of Paris to the International Congress of Mathematicians 2022.
- D. Talay is serving as a member of the CMUP Advisory Commission (University of Porto).
- D. Talay is a member of the Comité National Français de Mathématiciens.

#### **10.1.7. Scientific Expertise**

- M. Bossy reported for the Paul Caseau Prize.
- M. Bossy participated in a Associated Professor position recruitment committee at CMA Mines-ParisTech.
- N. Champagnat reported on an research project submitted to the Natural Sciences and Engineering Research Council (NSERC) of Canada.
- M. Deaconu has been a member of the *Committee for junior permanent research positions* of Inria Nancy - Grand Est.
- A. Lejay participated in a Professor position recruitment committee at Université de Lorraine.
- E. Tanré was member of the hiring committee 26 MCF at the 'Ecole Centrale de Paris'.
- E. Tanré reported on an application submitted to CONICYT (Chilean Funding Agency).
- D. Talay served as a member of the committee for positions in Applied Mathematics at the Ecole Polytechnique.
- D. Talay served as a member of the committee for a professor position at UCA University (Nice, France).
- D. Talay served as a member of the committee for an assistant professor position at Lille University.
- D. Talay is chairing the 2019 Pioneer ICIAM prize committee.

#### **10.1.8. Research Administration**

- M. Bossy has been a member of the DTK-Committee.
- N. Champagnat is a member of the *Comité de Centre*, the *COMIPERS* and the *Commission Information Scientifique et Technique* of Inria Nancy - Grand Est, *Responsable Scientifique* for the library of Mathematics of the IECL, member of the *Conseil du laboratoire* of IECL (as *responsable scientifique* of the library). He is local correspondent of the COERLE (*Comité Opérationnel d'Évaluation des Risques Légaux et Éthiques*) for the Inria Research Center of Nancy - Grand Est. He is also local responsible of GdR MAMQVI for Univ. Lorraine.

- M. Deaconu is a member of the *Bureau du Comité de Projets* of Inria Nancy - Grand Est, and of the *Comité de Projet* of Inria Nancy - Grand Est.
- A. Lejay is member of the Pôle AM2I of the Université de Lorraine since 2017.
- A. Lejay is member of the theses committee of the Institut Élie Cartan de Lorraine.

## 10.2. Teaching - Supervision - Juries

### 10.2.1. Teaching

Master : M. Bossy, *Risk on energetic financial markets*, 27h, Master Spécialisé, Ingénierie et Gestion de l'Énergie, Mine ParisTech, France.

Master : M. Bossy *Stochastic Particle Methods for PDEs*, 18h, M2 Probabilité et Applications, Université Pierre et Marie Curie, France.

Master: N. Champagnat, *Introduction to Quantitative Finance*, 18h, M1, École des Mines de Nancy, France.

Master: N. Champagnat, *Introduction to Quantitative Finance*, 13.5h, M2, École des Mines de Nancy, France.

PhD-level lecture: N. Champagnat, *Large population scalings of stochastic population dynamics in ecology and evolution*, Workshop/School on Stochastic PDEs, Mean Field Games and Biology, 6h, at the Gran Sasso Science Institute (GSSI) in L'Aquila (Italy).

PhD-level lecture: N. Champagnat, *Quasi-Stationary Distributions for absorbed Markov processes*, Doctoral School on *New trends in Markov Processes*, 9h, Les Diablerets (Switzerland).

Master: M. Deaconu, *Équations différentielles stochastiques : résolution numérique et applications*, 21h, M2, École des Mines de Nancy, France.

Master: M. Deaconu, *Modélisation stochastique*, 30h, M2, Université de Lorraine, France.

Master: M. Deaconu, *Simulation Monte Carlo*, 24h, M1, Faculté de Droit, Sciences Economiques et Gestion, Université de Lorraine, France.

Master : C. Fritsch, supervision of a research project on the *approximation of birth-death processes by stochastic differential equations*, 6h, M2, École des Mines de Nancy, France.

Master: A. Lejay, *Simulation des marchés financiers*, 28.5h, M2, Université de Lorraine (Metz), France.

Master: K. Salhi, *Statistiques et analyse de données*, 48h, M1, Télécom Nancy, France.

Master: K. Salhi, *Probabilité et Statistiques*, 48h, M1, ENSEM Nancy, France.

Licence: K. Salhi, *Probabilité et mathématiques financières*, 40h, L1, IUT Charlemagne, France.

Master: D. Talay *Invariant measures of diffusion processes*, 18h, M2 Probabilité et Applications, Université Paris 6, France.

Master: E. Tanré (courses) and M. Tomasevic (exercices), *Advanced Numerics for Computational Finance*, 30h (20h + 10h), M2, UCA (Mathmods Erasmus Mundus), France.

Master: E. Tanré, *Mathematical Methods for Neurosciences*, 37h, M2, ENS - Master MVA / Paris 6 - Master Maths-Bio, France.

Master: E. Tanré (courses) and M. Tomasevic (practical classes) *Numerical probability for mathematical finance*, 20h (8h + 12h), M2, EPU (Master IMAFA), France.

### 10.2.2. Supervision

PhD in progress: Antoine Brault, *Non-Linear Sewing Lemma*, Université Toulouse 3, October 2015, L. Coutin (U. Toulouse 3), A. Lejay.

PhD in progress: Lorenzo Campana, *Stochastic modeling of non-spherical particle transport and deposition by turbulent flows*, December 2017, M. Bossy.

PhD in progress: Quentin Cormier, *Biological Networks of Spiking Neurons*, September 2017, E. Tanré and R. Veltz (MATHNEURO Inria team).

PhD in progress: Pascal Helson, *Plasticity in networks of spiking neurons in interaction*, October 2016, E. Tanré and R. Veltz (MATHNEURO Inria team).

PhD: Radu Maftci, *Stochastic Analysis of Lagrangian Particle Simulation Application to colloidal particle collision*, Univ. Nice Sophia Antipolis, December 2017, M. Bossy.

PhD: Hernan Mardones, *Numerical solutions of stochastic differential equations with multiplicative noise*, Université de Concepción (Chile), June 2017, C. Mora (U. Concepción), A. Lejay.

PhD in progress: Milica Tomašević, *On a stochastic interpretation of parabolic-parabolic Keller-Segel systems*, October 2016, D. Talay.

### 10.2.3. Juries

- M. Bossy served as a referee for the Ph.D. theses of Gerome Faure *Stochastic Lagrangian models to better estimate energy production variability*.
- M. Bossy served as an examiner for the HDR of Ahmed Kebaier *Methodes Multilevel Monte Carlo et Statistiques des Processus en Finance*, Université Paris 13, December 2017.
- N. Champagnat served as a referee for the Ph.D. theses of Brice Samegni-Kepgnou, *Grandes Déviations de systèmes stochastiques modélisant des épidémies*, Aix-Marseille Univ., July 13, 2017, and of Nils Caillerie, *Équations cinétiques stochastiques et déterministes dans le contexte des mathématiques appliquées à la biologie*, Univ. Lyon 1, July 5, 2017.
- N. Champagnat served as an examiner for the Ph.D. thesis of Manon Baudel, *Théorie spectrale pour des applications de Poincaré aléatoires*, Univ. Orléans, December 1, 2017.
- M. Deaconu served as a referee for the Ph.D. thesis of Alizée Geeraert, *Contrôle optimal stochastique des processus de Markov déterministes par morceaux et application à l'optimisation de maintenance*, Université de Bordeaux, June 6, 2017.
- A. Lejay served as referee for the Ph.D. thesis of Yi Lu, *Calcul fonctionnel non-anticipatif et applications aux processus stochastiques*, Université Paris 6, December 2017.
- A. Lejay served as an examiner for the jury of Hernan Mardones, *Numerical solutions of stochastic differential equations with multiplicative noise*, Université de Concepción (Chile) in June 2017.
- A. Lejay served as a referee for the Habilitation thesis of Ahmed Kebaier, *Méthodes Multilevel Monte Carlo et Statistiques des Processus en Finance*, Université Paris 13, December 2017.
- D. Talay served as a referee for the Ph.D. thesis of Liping Xu, *Contribution à l'étude de l'équation de Boltzmann homogène*, Université Pierre et Marie Curie, June 2017.
- D. Talay served as a referee for the Habilitation thesis of Jérôme Lelong, *Quelques contributions aux méthodes numériques probabilistes et à la modélisation stochastique*, Université Grenoble Alpes, September 2017.
- D. Talay served as a referee for the Habilitation thesis of Noufel Frikha, *Stochastic approximation, Markovian perturbation of stochastic processes and their applications*, University Paris-Diderot, November 2017.
- D. Talay served as an examiner for the Habilitation thesis of Xialou Tan, *Martingale optimal transport, non Markovian stochastic control and branching diffusion processes*, December 2017.
- D. Talay served as a referee for the Ph.D. thesis of Guillaume Sall, *Quelques algorithmes rapides pour la finance quantitative*, Sorbonne Universités, December 2017.