Ecodep Conference 2021, Networks Reconstruction
June 22-24, 2022

http://doukhan.u-cergy.fr/ecodep.html

Paul Doukhan

Paris Seine University, AGM UMR 8088, CYU site Saint-Martin, 95000 Cergy-Pontoise, France
http://doukhan.u-cergy.fr/conference2022.html

The conference will be totally free but **registration** is mandatory. Please register as soon as possible, other informations about AGM may be consulted online https://cyagm.cyu.fr/ecodep-activities.

The conference is essentially face to face so we suggest the link https://www.traveldoc.aero/ to determine wether you are allowed to travel to the conference place.

After/During all this pandemic time our idea was to propose a real physical conference so that the organisation committee will do his very best to welcome you in the best conditions if your institution allows for it.

Six sessions of around 3 hours will aim at organising adequate orientations of the reconstruction networks part of the project ECODEP. One of the session will be include posters, each poster may be presented with a few slides in the conference room.

The conference will be online and physical: one may attend the talk through a link to be found on the ecodep calendar in the homepage https://doukhan.u-cergy.fr/conference2022.html of the conference.

Contents

1 Schedule

Paris Time is indicated and the duration of talks does include questions.
The online abstracts book version will be updated and will include the correct information.
Small changes in the schedule are always possible.

- June 22
  - Morning
    - 10:00-10:40 **Camille Coron** (University Paris-Saclay, Orsay)
    - 10:40-11:20 **Marie-Pierre Etienne** (Agroparitech, Rennes)
    - 11:20-12:00 **Coffee**.
    - 12:00-12:40 **Guillaume Franchi** (ENSAI, Rennes)
  - Afternoon
    - 14:40-15:30 **Pablo Marquet** (Catholic University, Santiago)
    - 15:30-16:10 **Daniel Valencia** (Catholic University, Las Cruces, Chile)
    - 16:10-16:50 **Mara Freilich** (Scripps Institution of Oceanography, University of California San Diego)
    - 16:50-17:30 **Posters**
    - 17:30-20:15 **Welcome cocktail**
- June 23
  - Morning
    - 10:00-10:40 **Pierre Jacob** (ESSEC, Cergy)
    - 10:40-11:20 **Pierre Alquier** (Riken AIP, Tokyo)
    - 11:20-12:00 **Coffee**
    - 12:00-12:40 **Catherine Aaron** (University Clermont-Auvergne)
  - Afternoon
    - 14:40-15:30 **Frederico Maddanu** (CY University)
    - 15:30-16:10 **Anton Klimovsky** (University of Stuttgart)
    - 16:10-16:40 **Coffee**.
    - 16:40-17:20 **Julien Randon Furling** (University Panthéon Sorbonne, Paris)
    - 17:20-18:00 **Roundtable**
    - 20:00 **Conference dinner** l'Entracte des Gobelins (please register)
- June 24
  - Morning
    - 10:00-10:40 **Lionel Truquet** (ENSAI, Rennes)
    - 10:40-11:20 **Denys Pommeret** (Marseille University and ISFA Lyon)
    - 11:20-12:00 **Coffee**
    - 12:00-12:40 **Laurence Reboul** (Aix-Marseille and Cergy Universities)
  - Afternoon
    - 14:40-15:30 **Natalia Bahamonde** (PUCV, Valparaiso)
    - 15:30-16:10 **Jean-Marc Bardet** (Paris-Panthéon Sorbonne)
    - 16:10-16:40 **Coffee**.
    - 16:40-17:20 **Felix Cheysson** (LPSM, Paris, France)
    - 17:20-18:00 **Arnaud Dragicevic** (INRAE, Aubière and CIRANO, Montréal)

2 Abstracts

- **Catherine Aaron** (University of Clermont Auvergne)
  Local Convex Hull density, support and level set estimation

  In "A local nearest-neighbor convex-hull construction of home ranges and utilization distribution", Getz and Wilmer proposed an algorithm for home range and utilization distribution (core area) estimation. We aim to theoretically study this method. With Olivier Bodart, in 2016 we proved that the home range (support) estimator is consistent (and minimax when regularity conditions are satisfied). More recently, we proved, with Ricardo Fraiman, that the core area (level set) estimator has to be slightly modified to achieve minimax rates. In the talk we will present the initial algorithm, the proposed modifications, why they are expected to improve the initial method and the associated asymptotic results.

- **Pierre Alquier** (Riken AIP, Tokyo)
  Robust estimation via minimum distance estimation

  Under misspecification, the maximum likelihood estimator is often not consistent. Similarly, the posterior distribution in Bayesian statistics also often leads to inconsistent estimation. To fix this issue, it has been suggested to replace the likelihood by other measure of distances between probability distributions. This leads to estimation methods known as "minimum distance estimation" (MDE). In this talk, I will focus on MDE when the metric is chosen in the Integral Probability Metric family (IMP). IPM include the Kolmogorov distance, the MMD and the Wasserstein distance. I will study the consistency of these estimators. The estimator based on the MMD criterion, in particular, enjoys very strong robustness properties to all kind of misspecification and contamination of the data. The talk will cover both frequentist and Bayesian methods. While the models covered in the talk will be elementary, there is a huge potential for more complex models. In particular, the MMD and Wasserstein methods were already successfully used to train deep generative networks.

- **Natalia Bahamonde** (PUCV, Valparaiso)
  On the Consistency of Least Squares Estimator in Models Sampled at Random Times Driven by Long Memory Noise: The Jittered Case

  In numerous applications data are observed at random times. Our main purpose is to study a model observed at random times incorporating a long memory noise process with a fractional Brownian Hurst exponent H. In this work, we propose a least squares estimator in a linear regression model with long memory noise and a random sampling time called “jittered sampling”. Specifically, there is a fixed sampling rate $1/N$ but contaminated by an additive noise (the jitter) and governed by a probability density function supported in $[0, 1/N]$. The strong consistency of the estimator is established, with a convergence rate depending on N and Hurst exponent. A Monte Carlo analysis supports the relevance of the theory and produces additional insights, with several levels of long-range dependence (varying the Hurst index) and two different jitter densities.
  Reference: to appear in Statistica Sinica, paper in collaboration with Héctor Araya, Lisandro Fermín, Tania Roa and Soledad Torres.

- **Jean-Marc Bardet** (University Paris 1, Panthéon-Sorbonne)
  Efficient and consistent model selection procedures for time series

  This talk deals with the problem of model selection in a large class of causal time series models that includes ARMA or AR(∞) processes as well as GARCH or ARCH(∞), APARCH, ARMA-GARCH - and many other processes. First, we study the asymptotic behavior of the ideal penalty that minimizes the risk defined from a quasi-likelihood estimation among a finite family of models containing the true model. We then establish general conditions on the penalty term to obtain properties of consistency and efficiency. In particular, we prove

that consistent model selection criteria outperform the classical AIC criterion in terms of efficiency. Finally, we derive the usual BIC criterion from a Bayesian approach and, retaining all second-order terms of the Laplace approximation, a data-driven criterion, which we call KC'. Monte Carlo experiments illustrate the asymptotic results obtained and show that the KC' criterion performs better than the AIC and BIC criteria in terms of consistency and efficiency.

- **Felix Cheysson** (LPSM, Paris, France)
  Comparing CART trees by subsampling

  CART trees are appealing non parametric methods for classification and regression problems, as they can often model complex covariate-outcome relationships without prior knowledge, and the decision process is akin to how humans make decisions. However, they are highly sensitive to the learning set, and established theoretical properties for CART are few and far between, which may cause some issues when trying to compare the trees built from two different samples. We propose a test for the comparison of CART trees, based on a U-statistic framework, where the critical threshold of the hypothesis test is estimated via subsampling without replacement. Notably, we prove a central limit theorem for this estimator. A short simulation study and an application to Covid-19 data illustrate the performances of the proposed method.

- **Camille Coron** (University Paris Saclay)
  Biodiversity monitoring using citizen data

  This presentation based on Giraud et al (2016) and Coron et al (2018) aims at estimating relative abundances of common bird species by combining datasets with different protocoles. The first dataset, provided by Vigie-Nature, is composed of all observations made by scientists at a precise location and for a fixed amount of time. The second dataset, provided by the Ligue pour la Protection des Oiseaux, is composed of some observations made by citizens, whose location and observation duration are unknown. The second dataset is much larger than the first one, but provides few associated information concerning the observation protocole. Our work consists in introducing a probabilistic modeling of these two datasets, that allows to benefit both from the information brought by the first dataset, and the abundance of the second one, and thus improving estimations made using only the first dataset.
  References
  C. Coron, C. Calenge, C. Giraud, R. Julliard (2018) Estimation of species relative abundances and habitat preferences using opportunistic data. Env. and Ecol. Stat. 25, 71–93.
  C. Giraud, C. Calenge, C. Coron, R. Julliard (2016) Capitalizing on opportunistic data for monitoring species relative abundances. Biometrics 72 (2), 649-58.

- **Arnaud Dragicevic** (INRAE, Aubière and CIRANO, Montréal)
  Stochastic Control of Ecological Networks

  The paper models the maintenance of ecological networks in forest environments, built from bioreserves, patches and corridors, when these grids are subject to random processes such as extreme natural events. It also outlines a management plan to support the optimized results. After presenting the random graph-theoretic framework, we apply the stochastic optimal control to the graph dynamics. Our results show that the preservation of the network architecture cannot be achieved, under stochastic control, over the entire duration. It can only be accomplished, at the cost of sacrificing the links between the patches, by increasing the usage of the control devices. This would have a negative effect on the species migration by causing congestion among the channels left at their disposal. The optimal scenario, in which the shadow price is at its lowest and all connections are well-preserved, occurs at half of the course, be it the only optimal stopping moment found on the stochastic optimal trajectories. In such a scenario, the optimal forestry management policy has to integrate agility, integrated response, and quicker response time.

- **Marie-Pierre Etienne** (AgroParisTech, Rennes)

- **Guillaume Franchi** (ENSAI, Rennes)
  Modelling of abundances through a GLM model

- **Mara Freilich** (Scripps Institution of Oceanography, University of California San Diego)
  Inferring ecological networks using spatiotemporal data: Insights from intertidal observations and a stochastic model

  Ecosystems functioning is based on an intricate web of interactions among living entities. Most of these interactions are difficult to observe, especially when the diversity of interacting entities is large and they are of small size and abundance. To sidestep this limitation, it has become common to infer the network structure of ecosystems from co-occurrence of species in space and time, but it is not clear how well networks can be reconstructed, especially in the presence of environmental and demographic variability that propagates through ecological networks. We first test the efficacy of statistical methods for network reconstruction by comparing an inferred network constructed using spatially intensive co-occurrence data from the rocky intertidal zone in central Chile to a well-resolved, empirically based, species interaction network from the same region. We find that co-occurrence networks do not represent classical ecological networks in which edges indicate a pairwise interaction. Co-occurrence networks most likely provide information about the joint spatial effects of environmental conditions, recruitment, and, to some extent, biotic interactions, and among the latter, they tend to better detect niche-expanding positive non-trophic interactions. We then evaluate the effects of intrinsic noise and network topology on the performance of different methods of inferring network structure from time-series data, demonstrating the co-occurrence networks are non-random, but do not necessarily correspond to the known interaction network. Patterns of interactions in co-occurrence networks must be interpreted with caution, especially when extending interaction-based ecological theory to interpret network variability and stability.

- **Pierre Jacob** (ESSEC, Cergy-Pontoise)
  Bayesian inference with models made of modules

  In many cases, models employed in statistics are made of different "modules" that relate to specific parts of the analysis, or specific sources of data. For example, there might be a primary module with the parameters of interest, but also: a module for the imputation of missing data, a module for the estimation of propensity scores, a module that estimates unobserved covariates using external data, a module that handles some pre-processing step, a module that captures measurement error, etc. An appeal of the standard Bayesian approach is the ability to perform inference on all unknown quantities jointly, leading to a coherent treatment of uncertainty across all modules. However, misspecification of any module can motivate departures from the standard joint inference approach and has led practitioners to employ "modularized" strategies, designed to "cut the feedback" from some modules onto others, leading to "cut distributions" instead of standard posterior distributions. This talk reviews the arguments proposed to defend and to condemn modularization in Bayesian analysis, describes some statistical properties of the "cut distributions" and presents algorithms to approximate them.

- **Anton Klimovsky** (University of Stuttgart)
  Stochastic modelling of evolving networks using graph limits

  Majority of complex networks change over time. We report on some recent results on the probabilistic fundamentals of evolving networks. We focus discuss notions of convergence of graph sequences and their limiting objects.

- **Federico Maddanu** (CY University)
Time trends in atmospheric ethane

  Understanding the dynamics underlying ethane (C2H6) trends is of uttermost importance in the context of climate change. We focus on time series of ethane abundance in the atmosphere recorded at 15 ground-stations located in both the Northern and Southern Hemispheres. The trend component is hidden by both a strong persistent annual cycle and the large amount of missing data (about 70%). Our approach proposes a novel structural model where both the cycle and trend evolve stochastically and can be estimated via the Kalman filter methodology. The results suggest a global pattern in the dynamics of ethane trends in both the Northern and Southern Hemispheres. With Tommaso Proietti (Roma Torre Vergata).

- **Denys Pommeret** (Aix Marseille University & ISFA Lyon)
Mixed Deep Gaussian Mixture Models

  Recently, Viroli & McLachlan (2019) proposed a generalization of the well-known Gaussian Mixture Models (GMM) which they called Deep Gaussian Mixture Models (DGMM).

  Roughly speaking, DGMMs are mixtures of GMM. The architecture of a DGMM is that of a neural network: each mixture can be seen as a layer and its components are the neurons. DGMMs only work for continuous variables. Fuchs et al. (2021) proposed an extension to the mixed case (continuous and non continuous) which they call Mixed DMGG (MDGMM). The idea of a MDGMM is first to link the mixed data to a continuous latent space. Then a DGMM is applied. The latent space contains information on the dependence structure of the mixed data. MDGMMs can be used for clustering.

  Another important use is data augmentation. Indeed we can modify a MDGGM to generate mixed variables. We call this algorithm MIAMI (for MIxed data Augmentation MIxture).

  In this talk we show the principle of MDGMMs and we compare the MIAMI algorithm to competitors (k-modes, k-Prototypes, Hierarchical Clustering, Self-Organising Maps, DBSCAN, CTGAN, CART, Random Forest, $k-$Nearest Neighbour).

  We also show an application of the MDGMM in oceanography.

- **Julien Randon Furling** (University Paris 1, Panthéon-Sorbonne)
On a first hit distribution of the running maximum of Brownian motion

  Let $(S_t)_{t\geq 0}$ be the running maximum of a standard Brownian motion $(B_t)_{t\geq 0}$ and $T_m = \inf\{t,\, mS_t \leq t\}$ for $m \geq 0$. In this note we calculate the joint distribution of T_m and B_{T_m}. We also present results for Brownian motion with drift.
  A part of the motivation behind the study presented here stems from a toy-model designed by Paul Krapivsky for animal foraging (2017). Among many applications, stochastic processes have indeed often been used to model the paths traced by animals searching for food, shelter or other necessities.

- **Laurence Reboul** (Marseille and Cergy Universities)
Estimation of Pickands dependence function of bivariate extremes under mixing conditions

  Modeling dependence structures of multivariate extremes is of great interest in many application fields . A well known way to model these structures is to use Pickands dependence function (Pickands, 1981). If $X = (X_1, X_2)$ is a bivariate vector of extremes with margins F_1 and F_2, Pickands dependence function A is defined via the extreme-value copula's type representation:

$$C(u,v) = \mathbb{P}(F_1(X_1) \leq u, F_2(X_2) \leq v) = \exp\left\{\log(uv) A\left(\frac{\log(u)}{\log(uv)}\right)\right\},\ 0 \leq u, v \leq 1,$$

and totally characterizes the joint distribution $F(x_1, x_2) = C(F_1(x_1), F_2(x_2))$ of (X_1, X_2) of X knowing its marginal laws. It may be shown that $A : [0, 1] \to [1/2, 1]$ is a convex function such that $A(0) = A(1) = 1$ and $\max(t, 1 - t) \leq A(t) \leq 1$.

The problem of estimating Pickands dependence function by nonparametric methods has been extensively studied in the literature (see Zang et al., 2008). The underlying sequence of extremes observations is always assumed to be i.i.d., which excludes a possible serial correlation. This bias is to a certain extent supported by theoretical results on maxima of strictly stationary sequences (see e.g. Hsing, 1989). In practical situation however, the temporal independence of extremes is usually an unrealistic assumption. In the sequel, we propose to revisit the properties of the so called CFG estimator, a classical estimator of A (see Capéràa et al., 1997), when it is based on some kind of weakly dependent strictly stationary sequence of extremes, then to use these properties to build a test of independence of X's margins.

- **Lionel Truquet** (ENSAI, Rennes)
  Nonparametric inference for general categorical time series with time-varying parameters

  The first motivation of this paper is to construct a general framework for modeling non-stationary categorical time series with time-varying analogues of logistic, multiple choice or ordinal time series models and for which some kind of non-stationary exogenous regressors can be included in the dynamic. To this end, we develop two locally stationary notions for autoregressive categorical processes. The first one, which is adapted to strictly exogenous covariates, is based on the theory of Markov chains in random environments and the second one, which is adapted to sequentially exogenous covariates, on iterated random maps systems. In both cases, our results allow to derive asymptotic properties of localized partial sums and consistency properties of local likelihood estimators for time-varying parameters. For strictly exogenous regressors, we also develop a notion of derivative processes which is useful to control the bias of localized partial sums.

- **Daniel Valencia** (Catholic University, Las Cruces, Chile)

3 Social Program

Beginning such a program let us realise two things,

- first I should apologise because it is so restrictive but it is necessarily biased;
- the second point it to think about the importance of keeping all those incredibly beautiful places which justify thousands times the existence of projects in analogous lines.

The forthcoming text is full of links: click on locations to safely travel during this complicate period.

The social program ([1]) will be free:

- Brazil: Iguazu falls, Rio-Corcovado, Amazonia Forests,
- Chile: Patagonia, Paranal, Atacama desert, Valparaiso, Caleta Portales,
- China: The great wall, Peking-Forbidden city, Hong-Kong,
- France: Lyon ([2]), Nantes-Machines de l'Ile, Paris-Plage, Paris-Tara Expedition, Vannes, Luminy,
- Germany: Aachen, Berlin, Heidelberg, Munich-Hofbraeuhaus, Oberwolfach,
- Mexico: Mexico-Frida Khalo Museum, Mexico-Coyoacan,
- New Caledonia: Nouméa,
- Poland: Torun, Varsaw-Jewish Museum,
- Spain: Barcelona-La Pedrera, Figueras-Dali Museum, Granada,
- USA : Colorado, New York City,
- Venezuela: Delta del Orinoco, Salto Angel.
- Fortunately you are welcome face to face to the conference and taste our beautiful city of Paris which you may see from the conference room at the top of Tolbiac University main building.
- Fooding is due to the reinsertion central kitchen Label Gamelle,
- The conference dinner will be at L'entracte des Gobelins, Paris 13.

[1] Don't hesitate to help for improving this important feature of the conference.

[2] Sorry for reducing the attraction of this beautiful city to food but a social program should include a conference dinner and Lyon is the capital of Gastronomy...
Let us hope that we can meet physically in this city for a physical event!

4 Participants

Participants come from all over the world and to turn this conference in a link between researcher we thought that an easy access to all of them may be a successful tool for further contacts; people attending this conference are located in Belgium, Brazil, Canada, Chile, China, Cyprus, Denmark, Germany, France, Hong-Kong, Hungary, Indonesia, Ivory Coast, Japan, Mauritius, New Caledonia, Pakistan, Peru, Poland, Portugal, Russia, Singapore, South Korea, Spain, Switzerland, Ukraine, United Kingdom, United States of America, Uruguay and Vietnam.

Alphabetical list of participants integrate universities and email links:

- Aaron, Catherine
  UCA, Clermont, France
  catherine.aaron@uca.fr
- Alain, Mathieu
  Université Laval, Canada
  mathieu.alain.2@ulaval.ca
- Albrecher, Hansjoerg
  University of Lausanne, Switzerland
  hansjoerg.albrecher@unil.ch
- Alimoradian, Behzad
  ISFA, Lyon, France
  behzad.alimoradian@gmail.com
- Alquier, Pierre
  Riken AIP, Tokyo, Japan
  pierrealain.alquier@riken.jp
- Aries, Nawel
  Université des Sciences et de la Technologie Houari Boumediene (USTHB), Algeria
  aries.nawel@hotmail.com
- Avila, Isidora
  Advanced Conservation Strategies, Santiago, Chile
  isidora.avila.thieme@gmail.com
- Bahamonde, Natalia
  PUCV, Valparaiso, Chile
  nataliabde@gmail.com
- Barczy, Matyas
  Simon Bolyai Institute, Szeged, Hungary
  barczy@math.u-szeged.hu
- Baydil, Banu
  Columbia University, New-York, USA
  bb2717@columbia.edu
- Bernard, Hugo
  ENSAI, Rennes, France
  hugo.bernard@eleve.ensai.fr

- Boly, Ousmane
  CY University, Cergy, France
  boly1ousmane@gmail.com

- Cabana, Alejandra
  UAB, Barcelona, Spain
  AnaAlejandra.Cabana@uab.cat

- Cabana, Enrique
  IMERL, Universidad de la República, Montevideo,Uruguay
  emcabana@gmail.com

- Cheysson, Felix
  Sorbonne Université, Paris,France
  felix@cheysson.fr

- Cohen, Joel E
  Rockefeller University & Columbia University, USA
  cohen@rockefeller.edu

- Curato, Imma Valentina
  Ulm University, Germany
  imma.curato@uni-ulm.de

- Cotil, Adrien
  INRAE, Paris, France
  adrien.cotil@inrae.fr

  06/05/2022 10:21:04 camille.coron@math.u-psud.fr Coron Camille Université Paris Saclay June 22 No

- Coron, Camille
  University Paris Saclay,Orsay, France
  camille.coron@math.u-psud.fr

- de la Pena, Victor
  Columbia University, USA
  victordelapena2@gmail.com

- De Lima Medina, Francyelle
  Federal University of Pernambuco, Recife, Brazil
  francy@de.ufpe.br

- Dion-Blanc, Charlotte
  LPSM Sorbonne Université, Paris, France
  charlotte.dion_blanc@sorbonne-universite.fr

- Derquenne, Christian
  EDF R&D, Paris, France
  christian.derquenne@edf.fr

- Doukhan, Paul
  CY University, Cergy, France
  doukhan@cyu.fr

- Durot, Cécile
  Universite Paris Nanterre, France
  cdurot@parisnanterre.fr

- Durrieu, Gilles
  South Brittany University, Vannes, France
  gilles.durrieu@univ-ubs.fr
- Essel, Lawrenceline Agartha
  University of Ghana , Accra, Ghana
  mial37218@gmail.com
- Fallet, Sara
  South Brittany University, Rennes and ENSAI, Rennes, France
  sara.fallet@laposte.net

  sara.fallet@laposte.net
- Fan, Xiequan
  Tianjin University, China
  fanxiequan@hotmail.com
- Fetiveau, Arthur
  South Brittany University, Vannes, France
  arthur.fetiveau@univ-ubs.fr
- Feugeas, Jean-Paul
  University of Besançon INSERM, France
  jean-paul.feugeas@inserm.fr
- Fokianos, Konstantinos
  University of Cyprus. Cyprus
  fokianos@ucy.ac.cy
- Fouché, Edouard
  Karlsruhe Institute of Technology, Germany
  edouard.fouche@kit.edu
- Fourest, Cécile,
  CNES, Kourou, Guyane.
  cecile.Dechoz@gmail.com
- Franchi, Guillaume
  ENSAI, Rennes, France
  guillaume.franchi@eleve.ensai.fr
- Freilich, Mara
  Scripps Institution of Oceanography, University of California San Diego, USA
  mfreilich@ucsd.edu
- Gandica Yérali
  CY University, Cergy, France
  ygandica@gmail.com
- Garnier, Rémy
  CDiscount & CY University, Cergy, France
  Remy.Garnier@ext.cdiscount.com
- Ghanavi Rozhin
  Cohere ai, Toronto, Canada
  rghanavi@gmail.com

- Gomez Garcia, José
  AgroParistech Paris, France
  jose3g@gmail.com
- Goncalves, Branda
  CY University, Cergy, France
  branda.goncalves@outlook.fr
- Guillaume, Tristan
  CY University, Cergy, France
  tristan.guillaume@cyu.fr
- Hervé, Vincent
  INRAE, Paris, France
  vincent.herve@inrae.fr
- Hoang, Van Ha
  University of Science, Ho Chi Minh, Viet Nam
  hvha@hcmus.edu.vn
- Hodara, Pierre
  ICM, Paris, France
  pierre.hodara@icm-institute.org
- Huillet, Thierry
  CY University, Cergy, France
  thierry.huillet@cyu.fr
- Hwang, Eunju
  Gachon University, Seongnam, South Korea
  ehwang@gachon.ac.kr
- Jakubowski, Adam
  Nicholas Copernic University, Torun, Poland
  adjakubo@mat.umk.pl
- Kengne, William
  CY University, Cergy, France
  william.kengne@cyu.fr
- Klesov, Oleg
  National Technical University of Ukraine, Kiev, Ukraine
  Klesov@matan.kpi.ua
- Koukiou, Flora
  CY University, Cergy, France
  Flora.KOUKIOU@cyu.fr
- Kühnert Sebastian
  University of Rostock, Germany
  s.kuehnert_math@gmx.de
- Laib, Naamane
  CY University, Cergy, France
  naamane.laib@cyu.fr

- Lang, Gabriel
  AgroParisTech, Paris, France
  gabriel.lang@agroparistech.fr
- Langhendries, Raphael
  SAMM, Paris, France
  r.langhendries@gmail.com
- Laverny, Oskar
  University Lyon 1, France
  olaverny@scor.com
- Lbath, Hana
  INRIA, France
  hana.lbath@inria.fr
- Lebecq, Louis
  South Brittany University, Vannes, France
  lebecq.e1901798@etud.univ-ubs.fr
- Le Bras, Yves
  Biotope, Mèze, France
  ylebras@biotope.fr
- Lember, Jüri
  University of Tartu, Estonia
  jyril@ut.ee
- Leucht, Anne
  University of Bamberg, Germany
  anne.leucht@uni-bamberg.de
- Li, Xiaoyin
  St. Cloud State University, USA
  lixiaoyin0925@gmail.com
- Loisel, Stéphane
  ISFA, Lyon, France
  stephane.loisel@univ-lyon1.fr
- Lopes, Silvia Regina Costa
  UFRGS, Porto Alegre, Brasil
  silviarc.lopes@gmail.com
- Lmakri, Aziz
  Faculty of Sciences and Techniques of Tangier, Morocco
  lmakriaziz@gmail.com
- Maddanu, Federico
  CY Tech, CY University, Cergy, France
  federico.maddanu@gmail.com
- Mamode Khan, Naushad
  University of Mauritius, Mauritius
  n.mamodekhan@uom.ac.mu

- Mathieu, Jerome
  Sorbonne Université, Paris
  nemail.jussieu@gmail.com

- Marquet, Pablo
  PUC, Santiago, Chile
  pmarquet@bio.puc.cl

- Medina Garay, Aldo William
  Federal University of Pernambuco, Recife, Brazil
  agaray@de.ufpe.br

- Navarrete, Sergio
  PUC-ECIM, Las Cruces, Chile
  snavarrete@bio.puc.cl

- Neumann, Michael H
  Friedrich Schiller University, Jena, Germany
  michael.neumann@uni-jena.de

- Nguyen, Thi Hien
  CY Tech, CY University, Cergy, France
  nguyen.thi.hien.k5@gmail.com

- Nolberto Sifuentes, Violeta Alicia
  UNMSM: Universidad Nacional Mayor de San Marcos, Lima, Peru
  vnolbertos@unmsm.edu.pe

- Pasemann, Gregor
  TU Berlin, Germany
  pasemann@math.tu-berlin.de

- Pere, Christophe
  La Capitale, Montréal, Canada
  pere.christophe1@gmail.com

- Pereira, Isabel
  University of Aveiro, Aveiro, Portugal
  isabel.pereira@ua.pt

- Philippe, Anne
  LMJL, Nantes, France.
  Anne.Philippe@univ-nantes.fr

- Poignard, Benjamin
  Osaka University and RIKEN AIP, Osaka, Japan
  bpoignard@gmail.com

- Pommeret, Denys
  Aix-Marseille University, I2M and laboratory SAF, ISFA, France.
  denys.pommeret@univ-amu.fr

- Prigent, Jean-Luc
  CY University, Cergy, France
  Prigent@cyu.fr

- Rebolledo, Rolando
  UV, Valparaiso, Chile
  rolando.rebolledo@uv.cl

- Renault, Eric
  University of Warwick, United Kingdom
  Eric.Renault@warwick.ac.uk

- Randon Furling, Julien
  Panthéon-Sorbonne University, Paris, France
  j.randon.furling@gmail.com

- Reboul, Laurence
  Aix-Marseille University, France
  laurence.reboul@univ-amu.fr

- Roux, Jean-Baptiste Roux
  South Brittany University, Vannes, France
  roux.e1901747@etud.univ-ubs.fr

- Rynkiewicz, Joseph
  Panthéon-Sorbonne University, Paris, France
  Joseph.Rynkiewicz@univ-paris1.fr

- Safikhani, Abolfazl
  University of Florida, Gainesville, USA
  abolfazl.safikhani@gmail.com

- Salhi, Yahia
  ISFA, Lyon, France
  yahia.salhi@gmail.com

- Sajjad, Irsa
  The University of Lahore, Islamabad, Pakistan
  Isra.sajjad@lbs.uol.edu.pk

- Samorodnitsky, Gennady
  Cornell University, Ithaca, USA
  gs18@cornell.edu

- Signor, Juliette
  France Energies Marines, France
  juliette.signor@france-energies-marines.org

- Surgailis, Donatas
  Vilnius university, Lithuania
  donatas.surgailis@mif.vu.lt

- Tran, Chi
  Gustave Eiffel University, Marne-la-Vallée, France
  chi.tran@u-pem.fr

- Tran, Diu
  Ho Chi Minh, Vietnam
  ttdiu.tran@gmail.com

- Truquet, Lionel
  ENSAI, Rennes, France
  Lionel.TRUQUET@ensai.fr

- Valencia, Daniel
  PUC, Santiago, Chile
  dgvalencia@uc.cl

- Veraart, Almut
  Imperial College London, UK
  a.veraart@imperial.ac.uk

- Videla, Leonardo
  Instituto de Ingeniería Matemática, Universidad de Valparaíso, Chile
  leonardo.videla@uv.cl

- Watkins, Chris
  Royal Holloway, University of London, UK
  C.J.Watkins@rhul.ac.uk

- Zhu, Ke
  University of Hong Kong, Hong Kong
  mazhuke@hku.hk