4th Summer school on Lévy processes

Université de Lille 1 July 18-22, 2016

Scientific program

Dedicated to the memory of Ante Mimica (1981-2016).

Schedule of the lectures

All lectures are given in the Salle de réunion, Bâtiment M2.

Monday, July 18th

8h30 - 9h00 *Welcome*

9h00 - 10h30 **Nathalie Eisenbaum**
Alpha-permanental processes I.

11h00 - 12h30 **Igor Kortchemski**
Lévy processes and large random discrete structures I.

14h00 - 15h30 **Alexey Kuznetsov**
Complex analytic methods in the theory of Lévy processes I.

16h00 - 17h30 **Leonid Mytnik**
Super-Brownian motions with stable branching mechanisms and their regularity properties I.

Tuesday, July 19th

8h30 - 10h00 **Igor Kortchemski**
Lévy processes and large random discrete structures II.

10h30 - 12h00 **Alexey Kuznetsov**
Complex analytic methods in the theory of Lévy processes II.

14h00 - 15h30 **Leonid Mytnik**
Super-Brownian motions with stable branching mechanisms and their regularity properties II.

16h00 - 17h30 **Nathalie Eisenbaum**
Alpha-permanental processes II.

Wednesday, July 20th

8h30 - 10h00 **Leonid Mytnik**
Super-Brownian motions with stable branching mechanisms and their regularity properties III.

10h30 - 12h00 **Nathalie Eisenbaum**
Alpha-permanental processes III.

Thursday, July 21st

8h30 - 10h00	**Igor Kortchemski** *Lévy processes and large random discrete structures III.*
10h30 - 12h00	**Alexey Kuznetsov** *Complex analytic methods in the theory of Lévy processes III.*
14h00 - 15h30	**Leonid Mytnik** *Super-Brownian motions with stable branching mechanisms and their regularity properties IV.*
16h00 - 17h30	**Nathalie Eisenbaum** *Alpha-permanental processes IV.*
19h30	*Summer school dinner*

Friday, July 22nd

9h00 - 10h30	**Igor Kortchemski** *Lévy processes and large random discrete structures IV.*
11h00 - 12h30	**Alexey Kuznetsov** *Complex analytic methods in the theory of Lévy processes IV.*

Schedule of the contributed talks

Wednesday, July 20th - Session one (Salle de réunion, Bâtiment M2)

14h00 - 14h25 **Stavros Vakeroudis** (Nicosia)
Windings of planar processes.

14h30 - 14h55 **Grégoire Véchambre** (Orléans)
Exponential functionals of spectrally one-sided Lévy processes conditioned to stay positive.

15h00 - 15h25 **Ehyter Martín-Gonzalez** (Guanajuato)
The negative Wiener-Hopf factor and the Generalized Gerber-Shiu function for a class of two-sided jumps Lévy risk processes.

15h30 - 15h55 **Kei Noba** (Kyôto)
Generalization of refracted Lévy processes and its application to exit problems.

16h30 - 16h55 **Vanja Wagner** (Zagreb)
Censored Lévy processes.

17h00 - 17h25 **Weerapat Satitknatitkul** (Bath)
Conditioned self-similar Markov processes.

17h30 - 17h55 **Salem Lamine** (Angers)
$\mathbb{R}^d$*-valued multi-self-similar Markov processes as time-changed Markov additive processes.*

Wednesday, July 20th - Session two (Salle Kampé de Fériet, Bâtiment M2)

14h00 - 14h25 **Chang-Han Rhee** (Amsterdam)
Sample path large deviations for heavy-tailed Lévy processes.

14h30 - 14h55 **Dirk Brandes** (Ulm)
On CARMA *processes with Lévy autoregressive coefficients.*

15h00 - 15h25 **Julien Hamonier** (Lille 2)
Critical Hölder regularity of linear multifractional stable motion.

15h30 - 15h55 **Vitalii Makogin** (Ulm)
Covariance function and maximal probabilities of Gaussian self-similar random fields with stationary rectangular increments.

16h30 - 16h55 **Mateusz Majka** (Bonn)
Coupling and exponential ergodicity for Lévy-driven SDEs.

17h00 - 17h25 **Eugenio Guerrero-Ruiz** (Guanajuato)
A functional of Brownian motion and an application to the explosion time problem of a system of SPDEs.

17h30 - 17h55 **Van Bien Bui** (Nice)
The stability of non-linear filter in continuous time.

Friday, July 22nd - Session one (Salle de réunion, Bâtiment M2)

14h00 - 14h25 **Sandra Palau** (Guanajuato)
Branching processes in a Lévy random environment.

14h30 - 14h55 **Sudipta Bera** (Kolkata)
Time domain and frequency domain analysis of free and confined, pure and anomalous Brownian motion.

15h00 - 15h25 **Anna Kharcheva** (Nizhny Novgorod)
Lifetime of metastable states with Lévy noise.

16h00 - 16h25 **Oana Lupascu** (Bucarest)
Measure-valued branching processes and applications.

16h30 - 16h55 **Michael Nicholson** (Edinburgh)
Universal asymptotic of clone size distribution for arbitrary population growth.

July 22nd - Session two (Salle Kampé de Fériet, Bâtiment M2)

14h00 - 14h25 **Ioulian Cimpean** (Bucarest)
Semimartingale functionals of Markov processes: a semigroup approach.

14h30 - 14h55 **Hiroshi Tsukada** (Osaka)
A potential theoretic approach to Tanaka formula for asymmetric Lévy processes.

15h00 - 15h25 **Mariusz Olszewski** (Wrocław)
Reflected Brownian motion on nested fractals.

16h00 - 16h25 **Idir Arab** (Béjaia)
Asymptotic results for certain weak dependent random variables.

16h30 - 16h55 **Kuldeep Kumar Kataria** (Bombay)
On densities of stable and inverse stable subordinators.

Abstracts of the lectures

N. Eisenbaum. *Alpha-permanental processes.*

We will introduce the class of α-permanental point processes, also called α-determinantal point processes. This class contains the determinantal point processes, the Poisson point processes and the permanental point processes. We will analyse this class from the point of view of infinite divisibility. We will then concentrate on the intersection of the class of α-permanental processes and the class of Cox processes. Each element of this intersection is connected to an α-permanental real process which represents its intensity. α-permanental real processes are characterized by the fact that their joint moments are given by α-permanents of matrices. The most known and used α-permanental real processes are the squared Gaussian processes (i.e. $(\eta_x^2, x \in I)$ for $(\eta_x, x \in I)$ centered Gaussian process). The law of the configurations of bosons in standard conditions belongs to this intersection. A sufficient condition for a Cox process to be infinitely divisible is the infinite divisibility of its intensity. We will characterize the infinitely divisible α-permanental real processes. Each infinitely divisible α-permanental real process can be associated to a transient Markov process. This connection will be exploited to construct extensions of Dynkins isomorphism Theorem. We will then detail some applications of these identities to Lévy processes.

I. Kortchemski. *Lévy processes and large random discrete structures.*

We will be interested in large random discrete structures which exhibit heavy-tail phenomena and which are, roughly speaking, asymptotically described by Lévy processes. We will focus on Bienaymé-Galton-Watson random trees and on random planar maps, and we will see how properties of the limiting Lévy processes give information on the combinatorial structure of these models.

A. Kuznetsov. *Complex analytic methods in the theory of Lévy processes.*

Complex analysis provides powerful tools for studying Lévy processes. These tools can be used to solve many diverse problems, such as: finding the distribution of extrema, establishing the asymptotic behavior of the density of the overshoot, and computing the price of an Asian option in a Lévy-driven model. In these lectures I will give a short introduction to Complex Analytical tools and then I will present a number of case-studies of how these tools can be applied to studying Lévy processes. These are some of the topics that we will discuss:

1) Analytic and meromorphic functions, analytic continuation, residues and Cauchy theorem, Laplace and Mellin transforms;

2) Finding the distribution of extrema for hyperexponential, meromorphic and stable Lévy processes;

3) Computing the scale function for processes with completely monotone jumps;

4) Finding the distribution of the exponential functional.

If time permits, we will also talk about applications of these results in Mathematical Finance and Actuarial Mathematics.

L. Mytnik. *Super-Brownian motions with stable branching mechanisms and their regularity properties.*

Super-Brownian motions are measure-valued processes that arise as limits of branching particle systems undergoing Brownian migration and critical, or asymptotically critical, branching. In low dimensions these processes could be described as solutions to stochastic partial differential equations. We would like to describe the construction of the super-Brownian motion with stable branching mechanism and to give an overview of results on its regularity properties. In particular, we will show that the density at fixed times of the super-Brownian motion with stable branching is continuous in dimension $d = 1$, and locally unbounded in all higher dimensions where it exists. Also in dimension $d = 1$ we determine pointwise and local Hölder exponents of the density, and discuss the multifractal spectrum corresponding to pointwise Hölder exponents.

Abstracts of the contributed talks

I. Arab. *Asymptotic results for certain weak dependent random variables.*

In this talk, we consider a special class of weak dependent random variables with control on covariances of Lipschitz transformations. This class includes positively, negatively associated variables and a few other classes of weakly dependent structures. We prove a Strong Law of Large Numbers with a characterization of convergence rates which is almost optimal, in the sense that it is arbitrarily close to the optimal rate for independent variables. Moreover, we prove an inequality comparing the joint distributions with the product distributions of the margins, similar to the well-known Newman inequality for characteristic functions of associated variables. As a consequence, we prove a Central Limit Theorem.

S. Bera. *Time domain and frequency domain analysis of free and confined, pure and anomalous Brownian motion.*

The conventional way of analyzing stochastic processes following the Wiener process and governed by the Langevin equation is by power spectral density (PSD) computed by Fast Fourier Transform (FFT), but this typically requires a large number of data points. We have developed two processes for analyzing Brownian motion data in the time domain: a) by an exact Bayesian inference, and b) by an auto-regressive (AR) model, and in the frequency domain by computing the PSD by using an AR process. The main advantage of these processes is the requirement of less number of data points. We perform exhaustive theoretical simulations to validate our techniques and show that all parameters estimated by these processes match very close to input parameters compared to conventional techniques. We have also developed a technique to analyze anomalous Brownian motion by PSD computed by FFT in presence of external noise. The validity of these models is performed by analyzing the trajectory of Brownian motion of an optically trapped micron-sized particle in water, and yield values with higher accuracy. These models will thus be useful analyzing various types of diffusive motion, and even can be applied economics where stochastic processes play an important role.

D. Brandes. *On CARMA processes with Lévy autoregressive coefficients.*

Autoregressive moving average processes in continuous time (CARMA (p, q)), where $q < p$ are integers, have been point of focus for researchers in applied stochastic over the last fifteen years. As a continuous time analogue of ARMA processes they have a wide field of applications in physics, biology and finance. Using recent results by Behme and Lindner on multivariate generalized Ornstein-Uhlenbeck processes (MGOU), we are going to define random coefficient CARMA processes (RC-CARMA (p, q)) as a special case. The latter generalizes CARMA processes by adding randomness to the coefficients of the autoregressive part, namely by choosing not necessarily independent or uncorrelated Lévy processes. Sufficient conditions for the existence of strictly stationary solutions and the existence of moments are obtained. We also investigate second order properties and give a connection to CARMA processes.

V.-B. Bui. *The stability of non-linear filter in continuous time.*

The filtering problem consists of estimating the state of a dynamic, called signal which is often a Markov process, from the noisy observation of the past states. In this thesis, we consider a filtering model in continuous time for the diffusion process. The aim is to study the stability of the optimal filter with respect to its initial condition beyond the mixing (or quasi-mixing) hypothesis for the transition kernel ignoring the ergodicity of the signal.

I. Cimpean. *Semimartingale functionals of Markov processes: a semigroup approach.*

We aim to present a study of those functions u with the property that $u(X)$ is a semimartingale, where X is a given right Markov process. This problem has already been investigated from a general theory of Markov processes perspective by Cinlar, Jacod, Protter, Sharpe, and in terms of symmetric Dirichlet forms by Fukushima. We propose a new approach to the subject based on the quasimartingale structure of such functionals expressed in terms of the associated semigroup, with applications to lower bounded semi-Dirichlet forms.

E. Guerrero-Ruiz. *A functional of Brownian motion and an application to the explosion time problem of a system of SPDEs*

We investigate an upper bound for the blow-up time of a system of semilinear stochastic partial differential equations (SPDEs). From that bound we obtain a lower bound for the probability of explosion in finite time of the system. The lower bound is obtained from a related system of random partial differential equations. This lower bound is given in terms of the distribution of a perpetual integral functional of Brownian motion.

J. Hamonier. Critical Hölder regularity of linear multifractional stable motion

The study of path behaviour of stochastic processes is a classical topic in probability theory and related areas. In this framework, a natural question is whether the sample paths belong to a critical Hölder space. The answer to this question is negative in the case of Brownian motion and many other stochastic processes: it is well-known that despite the fact that Brownian paths satisfy a Hölder condition of any order strictly less than $\frac{1}{2}$, they fail to belong to the critical Hölder space $\mathcal{C}^{\frac{1}{2}}$. We show that a different phenomenon happens in the case of linear multifractional stable motion: one can find a critical Hölder space to which sample paths belong. Among other things, this result improves an upper estimate, recently derived by Biermé and Lacaux (2013). Joint work with Antoine Ayache.

K.-K. Kataria. *On densities of stable and inverse stable subordinators.*

A stable subordinator is a one dimensional stable Lévy process with non-decreasing sample paths. We obtain the closed form expression for the density of a stable subordinator. The advantage of such a representation is that there exist results which immediately give the density of the random variable defined as the product, quotient, power or scalar multiple of independent stable subordinators. Some known results such as the self-similarity property, non-existence of finite moments etc. of a stable subordinator is evident from such closed form. Similar representations for the densities of the tempered stable subor-

dinator and the first-exit time of a stable subordinator, also known as the inverse stable subordinator, are obtained.

A. Kharcheva. *Lifetime of metastable states with Lévy noise.*

The barrier crossing event for superdiffusion in the form of symmetric Lévy flights is investigated. We derive from the fractional Fokker-Planck equation a general differential equation with the corresponding conditions useful to calculate the mean residence time of a particle in fixed interval for arbitrary smooth metastable potential profile. A closed expression in quadrature of the nonlinear relaxation time for Lévy flights with the index $\alpha = 1$ (Cauchy case) in cubic metastable potential is obtained. Enhancement of lifetime of the metastable state as a function of the noise intensity is found.

S. Lamine $\mathbb{R}^d$*-valued multi-self-similar Markov processes as time changed Markov additive processes.*

An $\mathbb{R}^d$-valued Markov process $X_t^{(x)} = (X_t^{1,x_1}, \ldots, X_t^{d,x_d})$, $t \geq 0, x \in \mathbb{R}^d$ is said to be multi-self-similar with index $\alpha \geq 0$ if the identity in law

$$(c_i X_t^{i,x_i/c_i}, t \geq 0) \stackrel{d}{=} (X_{ct}^{(x)}, t \geq 0)\,,$$

where $c = \prod_{i=1}^d c_i$, is satisfied for all $c_1, \ldots, c_d > 0$ and all starting point x. Multi-self-similar Markov processes were introduced by Jacobsen and Yor in 2003 in order to extend the Lamperti transformation of positive self-similar processes to $\mathbb{R}_+^d$-valued processes. In this paper, we show that a Lamperti-type represention is also valid for $\mathbb{R}^d$-valued multi-self-similar Markov processes. In particular, we obtain a one-to-one relationship between this set of processes and the set of Markov additive processes with values in $\{-1, 1\}^d \times \mathbb{R}^d$. We also show that those processes statisfies the Feller property in the set $\mathbb{R}^d \setminus E$, where $E = \{x \in \mathbb{R}^d : \prod_{i=1}^d x_i = 0\}$ and that there cannot exist any entrance law in the set E. Then we compare this representation with the representation of $\mathbb{R}^d \setminus \{0\}$-valued self-similar Markov processes obtained in a recent work by Alili, Chaumont, Graczyk and Zak.

O. Lupascu. *Measure-valued branching processes and applications.*

We construct fragmentation and measure-valued branching processes, leading to a a stochastic model for the fragmentation phase of an avalanche. A fractal property of the process is emphasized. We establish a specific stochastic differential equation of fragmentation. The results are obtained by combining analytic and probabilistic potential theoretical tools. Based on joint works with Lucian Beznea.

M. Majka. *Coupling and exponential ergodicity for Lévy-driven SDEs.*

We explain how to use the coupling technique in order to investigate convergence rates to equilibrium of Markov processes. As an example, we mention the application of the coupling by reflection for diffusions to investigate ergodicity of some SDEs driven by Brownian Motion. Then we present a novel idea of a coupling of solutions of stochastic differential equations driven by pure jump Lévy processes. We apply this coupling to show that the semigroups associated with the solutions of a wide class of such equations are

exponentially contractive with respect to an appropriately chosen Kantorovich distance. As a corollary, we obtain exponential convergence rates to equilibrium in both the total variation and the standard L^1-Wasserstein distances.

V. Makogin. *Covariance function and maximal probabilities of Gaussian self-similar random fields with stationary rectangular increments.*

Self-similar random fields that are an extension of self-similar stochastic processes are considered. Fractional Brownian sheets are one example of such Gaussian anisotropic self-similar random fields. It is well known that the fractional Brownian motion is a unique Gaussian self-similar process with stationary increments. In this talk the existence of Gaussian self-similar random fields with stationary rectangular increments, that are not fractional Brownian sheets, is presented. In order to establish the main result, some properties of covariance function for self-similar fields with rectangular increments have been proved and the class of covariance functions with specific properties were constructed. For the Gaussian self-similar random fields with stationary rectangular increments the upper maximal probabilities were constructed and the upper bounds for such probabilities for the normalized fields defined on $\mathbb{R}^2_+$ have been derived.

E. Martín-Gonzalez. *The negative Wiener-Hopf factor and the Generalized Gerber-Shiu function for a class of two-sided jumps Lévy risk processes.*

We study the negative Wiener-Hopf factor of a class of Levy processes with positive and negative jumps, such that the positive jumps have a rational Laplace transform. This processes have applications in insurance risk theory and have already been studied by many different authors. We obtain an expression for the probability density function of their negativeWiener-Hopf factor, which is in terms of an infinite sum of convolution of functions depending on the parameters of the process and the measure of the associated negative jumps. Then we apply this result to obtain an expression for the Generalized Expected Discounted Penalty Function (Generalized Gerber-Shiu Penalty Function), which was studied in Biffis and Morales [2010] and Biffis and Kyprianou [2009] for the case of Lévy risk processes with only negative jumps.

M. Nicholson. *Universal asymptotic of clone size distribution for arbitrary population growth.*

Deterministically growing (wild-type) populations which seed stochastically developing mutant clones have found an expanding number of applications from microbial populations to cancer. The special case of exponential wild-type population growth, usually termed as Luria-Delbruck or Lea-Coulson model, is often assumed but seldom realistic. In this work we generalize the model to different types of wild-type population growth, while the mutants evolve as a birth-death branching process. Our focus is on the size distribution of clones after some time, which can be mapped to the total number of mutants. Exact expressions are derived for exponential, power-law and logistic population growth. We prove that the large time limit of the clone size distribution has a general one-parameter form for any population growth. The clone size distribution always has a power law tail, and for subexponential wild-type growth the probability of a give clone size is inversely proportional to the clone size. We support our findings by analyzing a dataset on tumor metastasis sizes, and we find that a power-law tail is more likely than an exponential one.

K. Noba. *Generalization of refracted Lévy processes and its application to exit problems.*

Kyprianou–Loeffen have introduced refracted Lévy processes and studied their exit problems. They are defined via stochastic differential equations as a Markov process which behaves as a spectrally negative Lévy process with different drifts above and below a fixed level. In this talk we generalize Kyprianou–Loeffen's refracted Lévy processes. Our process behaves as spectrally negative Lévy processes with different drifts and different Lévy measures above and below a fixed level. We construct our process based on the excursion theory. This talk is based on a joint work with Kouji Yano.

M. Olszewski. *Reflected Brownian motion on nested fractals.*

Dealing with several problems of quantum physics related to the potential theory leads to analyzing Brownian motion on unbounded nested fractals and bringing the case to the process on a compact set by particular reflection. We examine in which cases the reflected Brownian motion on nested fractals can be constructed as a strong Markov process and show steps of this construction. Joint work with K. Kaleta and K. Pietruska-Pałuba.

S. Palau. *Branching processes in a Lévy random environment.*

In this talk, we analyze the strong solution of a particular family of stochastic differential equations. This result allows us to introduce continuous state branching process (CSBP) in a Lévy random environment. When the underlying CSBP is stable, we study the asymptotic behavior of the explosion and extinction probabilities. These probabilities are related with the exponential functional of a Lévy process.

C.-H. Rhee. *Sample path large deviations for heavy-tailed Lévy processes.*

Let X be a Lévy process with regularly varying Lévy measure ν. The existing theories developed in the heavy-tailed setting are mostly restricted to model-specific results as well as results pertaining to events that are caused by a single big jump. We obtain sample-path large deviations of scaled processes $\bar{X}_n(t) \triangleq X(nt)/n$ and obtain a similar result for random walks. Our results yield detailed asymptotic estimates in scenarios where multiple big jumps in the increment are required to make a rare event happen. In addition, we investigate connections with the classical large-deviations framework. In that setting, we show that a weak large deviations principle (with logarithmic speed) holds, but a full large-deviations principle does not hold.

W. Satitknatitkul. *Conditioned self-similar Markov processes.*

Previously, it has been proven that, under appropriate assumptions, we can condition a positive-valued self-similar Markov processes that is naturally absorbed at 0 to avoid zero and vice versa. Recently, we have been able to extend the conditioning to the case of real-valued self-similar processes (rssMp). In my recent paper, there were two ways of conditioning presented which gives the same result. Both of the methods consider the Lamperti-Kiu representation of the rssMp.

H. Tsukada. *A potential theoretic approach to Tanaka formula for asymmetric Lévy processes.*

The Tanaka formula for Brownian motions is an important expression to understand the local time and the reflection problem for Brownian motions. Thus, in the case of Lévy processes we expect that the Tanaka formula may be a useful tool to consider these problems. In this talk, we shall introduce the Tanaka formula from viewpoint of the Doob–Meyer decomposition for local times. For symmetric Lévy processes, if the local time exists, Salminen–Yor (2007) obtained the formula via the potential theoretic approach. On the other hand, the formula for asymmetric α-stable processes with index $1 < \alpha < 2$ was obtained by using the Itô calculus and the Fourier analysis. We shall focus on the Tanaka formula for asymmetric Lévy processes via the potential theoretic approach in the talk.

S. Vakeroudis. *Windings of planar processes.*

Two-dimensional (planar) processes attract the interest of many researchers. This happens both because of their richness from a theoretical point of view and because their study turns out to be very fruitful in terms of applications (e.g. in Finance, in Biology etc.). This talk focuses on the fine study of trajectories of planar processes, and in particular on their windings. We will survey several results concerning windings of two-dimensional processes, including planar Brownian motion (BM), complex-valued Ornstein-Uhlenbeck (OU) processes and planar stable processes. We will also present Spitzer's asymptotic Theorem for each case. Our starting point will be the skew-product representation. Then, we will introduce Bougerol's celebrated identity in law which is very useful for the study of the windings of planar BM and of complex-valued OU processes. However, this method cannot be applied for the case of planar stable processes, where we will use a new method invoking the continuity of the composition function.

G. Véchambre. *Exponential functionals of spectrally one-sided Lévy processes conditioned to stay positive.*

Exponential functionals of Lévy processes have been widely studied over the past years and have multiple applications, among which the study of diffusions in random environment, the study of self-similar Markov processes or mathematical finance. We are interested in functionals of spectrally one-sided Lévy processes conditioned to stay positive and establish some of their properties : finiteness, distribution tails, self-decomposability, smoothness of the density. We then give some applications of our study to exponential functionals of non-conditoned Lévy processes and to the asymptotic behavior of the local time of a diffusion in a spectrally negative Lévy environment.

V. Wagner. *Censored Lévy processes.*

In this talk, we examine three equivalent constructions of a censored rotationally symmetric Lévy process on an open set D in $\mathbb{R}^n$. We analyze the behaviour of this strong Markov process when the underlying process is a subordinate Brownian motion whose characteristic exponent satisfies certain scaling conditions. Furthermore, we show several potential-theoretical properties of the censored process.

List of participants

Idir Arab	Université de Béjaia	idir.bhh@gmail.com
Antoine Ayache	Université de Lille 1	ayache@math.univ-lille1.fr
Adam Barker	University of Reading	adam.barker@pgr.reading.ac.uk
Youssef Bendraou	Université du Littoral Côte d'Opale	Youssef.Bendraou@lmpa.univ-littoral.fr
Sudipta Bera	IISER, Kolkata	sudiptabera08@gmail.com
Lena-Susanne Boltz	Universität Jena	lena-susanne.boltz@uni-jena.de
Dirk Brandes	Universität Ulm	dirk.brandes@uni-ulm.de
Van Bien Bui	Université de Nice	bienmaths@gmail.com
Loïc Chaumont	Université d'Angers	loic.chaumont@univ-angers.fr
Iulian Cimpean	Institute of Mathematics, Bucarest	iulian.cimpean@imar.ro
Tran Thi Thanh Diu	Université du Luxembourg	thanhdiu1989@gmail.com
Nathalie Eisenbaum	Université Paris 6	nathalie.eisenbaum@upmc.fr
Gustave Emprin	ENPC, Paris	gustave.emprin@gmail.com
Céline Esser	Université de Liège	Celine.esser@ulg.ac.be
Hugo Falconet	ENS, Paris	hugo.falconet@ens.fr
Djiby Fall	New York University, Abu Dhabi	dfall@nyu.edu
Dorottya Fekete	The University of Bath	d.fekete@bath.ac.uk
Rodrigo Gachuz	CIMAT, Guanajuato	rodrigo.gachuz@cimat.mx
Thorbjørn Grønbæk	Aarhus University	thorbjoern@math.au.dk
Eugenio Guerrero	CIMAT, Guanajuato	eguerrero@cimat.mx
Julien Hamonier	Université de Lille 2	julien.hamonier@univ-lille2.fr
Takoua Jendoubi	Imperial College, London	t.jendoubi14@imperial.ac.uk
Tomasz Juszczyszyn	Wrocław University of Technology	tomasz.juszczyszyn@pwr.edu.pl
Kumar Kuldeep Kataria	Indian Institute of Technology, Bombay	kulkat@math.iitb.ac.in
Anna Kharcheva	LSU, Nizhny Novgorod	anya-kharcheva@yandex.ru
Igor Kortchemski	Ecole Polytechnique, Paris	igor.kortchemski@normalesup.org
Anna Kozhina	Higher School of Economics, Moscow	annaakozhina@gmail.com
Alexey Kuznetsov	York University, Toronto	kuznetsov@mathstat.yorku.ca
Salem Lamine	Université d'Angers	salem.lamine@hotmail.fr
Chergui Lassaad	Université de Tunis El Manar	chergui.lassaad@yahoo.fr
Oana Lupascu	Institute of Mathematics, Bucarest	oana.lupascu@yahoo.com
Mateusz Majka	Universität Bonn	majka@uni-bonn.de
Vitalii Makogin	Universität Ulm	vitalii.makogin@uni-ulm.de
Anna Markova	Higher School of Economics, Moscow	anna.r.markova@gmail.com
Ehyter Martín	CIMAT, Guanajuato	8ermartin@cimat.mx
Kevin Musielak	Universität Siegen	musielak@mathematik.uni-siegen.de
Leonid Mytnik	Technion, Haifa	leonid@ie.technion.ac.il
Michael Nicholson	University of Edinburgh	Michael.Nicholson@ed.ac.uk
Mikkel Nielsen	Aarhus University	mikkel@math.au.dk
Kei Noba	Kyoto University	knoba@math.kyoto-u.ac.jp
Mariusz Olszewski	Wrocław University of Technology	mariusz.olszewski@pwr.edu.pl
Sandra Palau	CIMAT, Guanajuato	sandra.palau@cimat.mx
Chang-Han Rhee	CWI, Amsterdam	rhee@cwi.nl
Victor Rohde	Aarhus University	victor@math.au.dk
Weerapat Satitknatitkul	The University of Bath	ws250@bath.ac.uk
Emeline Schmisser	Université de Lille 1	emeline.schmisser@math.univ-lille1.fr
Daniel Schulte	Universität Siegen	schulte1@mathematik.uni-siegen.de
Marion Sciauveau	ENPC, Paris	marion.sciauveau@enpc.fr
Stjepan Šebek	University of Zagreb	stjepan.sebek@gmail.com
Thomas Simon	Université de Lille 1	simon@math.univ-lille1.fr
Hiroshi Tsukada	Osaka City University	d15sac0p04@st.osaka-cu.ac.jp
Stavros Vakeroudis	University of Cyprus	stavros.vakeroudis@gmail.com
Grégoire Véchambre	Université d'Orléans	gregoire.vechambre@ens-rennes.fr
Vanja Wagner	University of Zagreb	wagner@math.hr
Min Wang	Université de Lille 1	minwang8633@gmail.com
Sheng-Jhih Wu	Soochow University	szwu@suda.edu.cn
Samia Zermani	Faculté des Sciences de Tunis	zermani.samia@yahoo.fr

Obituary of Ante Mimica

Ante Mimica passed away on June 9, 2016, after a two-year courageous battle against a malignant brain tumor during which he produced some of his best mathematical work, and served as an inspiration for all who knew him.

Ante was born on January 20, 1981, in Split, Croatia. After finishing high school in Split, he studied mathematics at the University of Zagreb from 1999 to 2003. He completed his doctoral thesis entitled *Harnack inequalities for some Lévy processes* in 2009. Ante was a postdoc at the University of Bielefeld from summer 2010 until winter 2012 when he returned to Zagreb. Since 2013 he was an assistant professor at the Department of Mathematics, University of Zagreb. Ante's mathematical work was mostly in probabilistic potential theory. He studied Harnack inequalities and regularities of harmonic functions for jump processes, and their heat kernel estimates. His main contributions were for the class of processes whose index of stability is either below any $\alpha \in (0, 2)$ or above any $\alpha \in (0, 2)$ (but smaller than 2).

Ante was a wonderful human being, happy to talk about anything, and always willing to help. Besides his math, he loved music - he sang in choirs and played piano. He was also a marathon runner - he ran seriously and with great passion. Ante's passing away is a great loss to the mathematical community. We will all remember him and miss him.

Zoran Vondraček