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Fractional Calculus, Probability and NonLocal Operators

16-20 FEB 2026

BOOKLET

Event Schedule and Presentation Abstracts

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09:30	Anomalous Diffusion on Irregular Media	Capitanelli
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12:40	Closing	

ABSTRACTS

GIACOMO ASCIONE

KILLING ME SOFTLY WITH HIS TIME-CHANGE: TIME-NONLOCAL SCHRODINGER EQUATIONS AND TIME-CHANGED KILLED PROCESSES.

Abstract

In this talk we will describe a toy model of a time-changed sofly killed process. Precisely, we will consider a time-changed softly killed Brownian motion with a quadratic potential.

While the relation between time-changed softly killed processes and time-changed Feynman-Kac semigroups can be stated in almost full generality, in this specific model we are able to provide a closed form for the transition density of the process. This is done by exploiting an intertwining relation, based on Doob's h-transform, between the Hamiltonian with quadratic potential and the generator of an Ornstein-Uhlenbeck process, together with a full characterization in suitable fractional (Hermite-)Sobolev spaces of strong solutions of related time-nonlocal abstract Cauchy problems.This is a joint work with Nikolai Leonenko.

IVAN BIOČIĆ

SPACE AND TIME NON-LOCAL PARABOLIC EQUATIONS: BEYOND FRACTIONAL SETTING AND SOME KNOWN THEOREMS REVISITED

Abstract

In this talk, space and time non-local parabolic equations of the following type are studied:

$$\phi(\partial_t)\, q(x,t) = -\psi(-\Delta)\, q(x,t)$$

in a domain $D \subset \mathbf{R}^d$, where $\psi$and $\psi$are rather general Bernstein functions.

A main topic is a method for solving these equations pointwise under initial conditions that fall outside the domain of the spatial operator $-\psi(-\Delta)$, unlike the classical results. Illustrative examples demonstrate the technique's advantages and underline its significance in modeling. The findings are compared to prior approaches, including those of B. Toaldo (Potential Anal., 2015) and Z. Q. Chen (Chaos Solit. Fractals, 2017), with further insights inspired by recent works of Armstrong et al. (Math. Ann., 2025) and Chan et al. (Rev. R. Acad. Cienc. Exactas Fís. Nat. Ser. A Mat., 2022; Nonlinear Differ. Equ. Appl., 2024).

WOLFGANG BOCK

FROM GREY TO GAUSSIAN AND BACK: A UNIFIED FRAMEWORK FOR FRACTIONAL PROCESSES

Abstract:

In recent years, a wide variety of stochastic processes have been introduced to model anomalous diffusion, long-range dependence, and non-Markovian effects arising in physics, biology, and complex systems. These constructions draw on tools from both Gaussian and non-Gaussian analysis and include, among others, fractional Brownian motion, Bernstein fractional Brownian motion, generalized grey Brownian motion, and the class of

g-Wright processes. While these processes originate from different motivations and analytical frameworks, they often display strikingly similar structural features.

In this talk, we present a unified framework that captures a large class of such processes through a minimal set of assumptions formulated at the level of their covariance structure. Rather than relying on specific constructions via stochastic integrals, subordination, or fractional calculus, we show that many key properties, such as self-similarity, stationarity of increments, and scaling behaviour, can be derived directly from covariance considerations alone.

A central result of the talk is that, under mild and natural conditions, the processes under consideration admit a representation of their finite-dimensional distributions as time-changed fractional Brownian motion. This perspective provides a transparent structural explanation for the emergence of non-Gaussian behaviour and anomalous diffusion while preserving the geometric intuition associated with fractional Brownian motion. In particular, the randomness of the time change encodes deviations from Gaussianity and leads to a rich family of models interpolating between classical Gaussian and heavy-tailed regimes.

The unified viewpoint developed here not only clarifies the relationships between several well-known models but also offers a systematic way to construct new processes with prescribed covariance and scaling properties.

STEFANO BONACCORSI

LIMIT THEOREMS FOR STOCHASTIC VOLTERRA PROCESSES VIA MARKOVIAN LIFTS

Abstract:

Stochastic Volterra equations model dynamics with memory but are typically non-Markovian, making their long-time analysis challenging. In this talk, we introduce a Markovian lift that embeds such equations into an infinite-dimensional state space.

Under weak kernel singularity and polynomial memory decay, we establish polynomial ergodicity and a law of large numbers with explicit rates, and we derive a central limit theorem under additional mixing conditions. Several examples illustrate the results. This is joint work with L. A. Bianchi, O. Canadas, and M. Friesen.

RAFFAELA CAPITANELLI

ANOMALOUS DIFFUSION ON IRREGULAR MEDIA

Abstract:

This talk presents recent results concerning fractional equations on irregular media. By merging the theory of time-changed processes with fractal analysis, we provide a deeper insight into the interplay between temporal memory and spatial irregularity in governing transport dynamics within irregular structures.

FABRIZIO CINQUE

FRACTIONAL SKELLAM-TYPE PROCESSES AND INTERACTING POINT PROCESSES

Abstract:

We study Bernstein-space-fractional versions of non-homogeneous generalized Skellam processes, which preserve the independence of the increments. In the homogeneous case we prove a compound Poisson approximation and that the fractionality induces a time-changing in the underlying Poisson processes by means of Bernstein subordinators.

Then, we introduce two different interacting (two dimensional) point processes: a Skellam-type version and the so-called death-migration process. The former can be expressed in terms of independent Skellam processes and the latter one, for fixed time $t > 0$, as the sum of two independent Multinomial random variables.

Finally, we prove that the replacement of the time derivative with the convolution-type derivative in the differential equation governing the state probability of an interacting point process leads to a time-change with the inverse of a Bernstein subordinator.

FAUSTO COLANTONI

RANDOM JUMPS FROM THE BOUNDARY, NON-LOCAL OPERATORS AND STOCHASTIC RESETTING

Abstract:

In this talk we analyse a Brownian motion that is either reflected at the boundary or restarts inside the domain after a jump. We study the SDE on smooth bounded domains and the associated PDE. On the positive half-line we introduce a non-local boundary value problem where non-local operators act as boundary conditions for the heat equation, and we show its connection with Brownian motion with Poissonian resetting. Finally, we discuss possible applications to search problems and statistical mechanics.

Based on joint works with S. Bonaccorsi, M. D'Ovidio and G. Pagnini.

LORENZO CRISTOFARO

FRACTIONAL CALCULUS AND GAUSSIAN PROCESSES: EXTENSIONS AND ALTERNATIVES TO FRACTIONAL BROWNIAN MOTION

Abstract:

We introduce new classes of Gaussian processes exhibiting distinct memory characteristics, namely Bernstein processes and Hadamard fractional Brownian motion. By applying fractional operators within a white noise framework, we model a variety of memory behaviors. On the one hand, these constructions yield Gaussian processes with explicit Wiener integral representations; on the other hand, the choice of fractional operators determines specific forms of the integrand functions.

GIUSEPPE D'ONOFRIO

ADDITIVE SUBORDINATION OF MULTIPARAMETER MARKOV PROCESSES

Abstract:

In this talk, we consider multiparameter multidimensional Markov processes that are time-changed by an independent additive subordinator, obtained from a Lévy process by relaxing the condition of stationary increments. By extending Phillips theorem, we show that the resulting process is a Feller evolution and we characterize its generator. We further derive its pseudo-differential representation and show that its symbol admits a Lévy-Khintchine representation. As an application, we consider a factor-based specification for the Ornstein-Uhlenbeck process subordinated by a Sato process. The constructive nature of this process is inspired by applications in finance which will be briefly discussed.

CHRISTIAN ENGSTRÖM

RESOLVENT ANALYSIS OF TIME-FRACTIONAL EQUATIONS WITH NONLOCAL MEMORY EFFECTS

Abstract:

We investigate a class of multiterm time-fractional diffusion equations incorporating additional nonlocal memory kernels in time. The problem is reformulated as a perturbed parabolic Volterra equation, allowing the use of Laplace-transform techniques and resolvent estimates. Within this framework, we establish existence, uniqueness, and regularity results under minimal structural assumptions on the underlying operators and memory kernels.

The approach is flexible and covers a wide range of anomalous diffusion models with combined fractional and classical memory effects. We also discuss implications for the design and analysis of numerical schemes for such equations.

LORENZO FACCIARONI

A CLASS OF NON-MARKOVIAN PROCESSES WITH LONG RANGE DEPENDENCE

Abstract:

There is a well-established theory linking certain semi-Markov chains and continuous-time random walks to time-fractional equations and anomalous diffusion. In this work, we go beyond the semi-Markov framework by introducing a class of non-Markovian processes, referred to as para-Markov chains, which exhibit long-memory behaviour.

Although their waiting times share the same marginal distributions as those of the above mentioned semi-Markov processes, they are assumed here to be stochastically dependent. Their joint distribution is of Schur-constant type and is closely related to complete Bernstein functions and De Finetti's theorems.

We further extend this setting by embedding para-Markov chains into a more general theory of random time changes of Markov processes. Particular attention is devoted to the special case where the random time is given by the inverse of an increasing stable process. This framework generalizes several models available in the literature, which typically focus solely on Lévy stable subordinators.

SERGEI FEDOTOV

NONLINEAR FRACTIONAL PDES AND APPLICATIONS

Abstract:

The aim of this talk is to show how nonlinear effects can be incorporated into in-time fractional partial differential equations. Both nonlinear transport and reaction terms will be discussed. I show how these nonlinearities lead to tempered fractional derivatives with nonlinear tempering of long-range dependencies. Applications from physics, chemistry, and hydrology will be presented.

ROBERTO GARRAPPA

VARIABLE-ORDER FRACTIONAL CALCULUS WITH PIECEWISE-REGULAR ORDER TRANSITION: NUMERICAL CHALLENGES

Abstract:

In this talk, we address the numerical solution of fractional differential equations of variable order.

Several approaches to extending constant-order fractional operators to the variable-order setting have been proposed in the literature. Among them, a formulation based on generalization in the Laplace transform domain, rather than directly in the time domain, has recently attracted significant interest.

Within this framework, the numerical inversion of the Laplace transform plays a central role, and the regularity of the function describing the variable order becomes a crucial factor in the design and performance of numerical algorithms.

We focus on the case of variable-order functions with only piecewise regularity, modeling an order that is constant at early and late times, undergoing a linear transition over a finite time interval. Unlike the case of smooth transitions, standard numerical methods for Laplace transform inversion are unreliable in this setting, and more sophisticated strategies are required. We discuss the origin of these difficulties and outline suitable numerical approaches to overcome them.

NICOS GEORGIOU

THE RESTLESS MULTICLASS MITTAG-LEFFLER QUEUE

Abstract:

In this talk I will present a single-server priority queue with a finite number of classes, in which the arrivals follow a fractional Poisson process and the service

completions are triggered by an independent fractional Poisson process of not necessarily the same power index. Each of the customers arriving is assigned at random to one of the priority classes. This assignment is independent of the rest of the system and follows a fixed probability distribution.

Using a time-change representation of a fractional Poisson process, we first give a multinomial thinning decomposition: the total number of arrivals in each class are independent standard Poisson processes of appropriate intensities, time-changed by a common independent random clock that is the inverse of a stable subordinator. This yields a process-level law of large numbers and a functional central limit theorem for the process of arrivals.

For the queueing system itself, we identify process-level scaling limits for the cumulative and individual queue lengths of the classes. We also prove that the queue gets empty infinitely often in the critical regime, irrespective of the time dilation.

This is joint work with Enrico Scalas and Vladislav Vysotsky.

MARTIN GROTHAUS

MITTAG-LEFFLER ANALYSIS: CONSTRUCTION AND APPLICATIONS

Abstract:

Motivated by the results of infinite dimensional Gaussian analysis and especially white noise analysis, we construct a Mittag--Leffler analysis. This is an infinite dimensional analysis with respect to non-Gaussian measures of Mittag--Leffler type which we call Mittag--Leffler measures.

Our results indicate that the Wick ordered polynomials, which play a key role in Gaussian analysis, cannot be generalized to this non-Gaussian case. We provide evidence that a system of biorthogonal polynomials, called

generalized Appell system, is applicable to the Mittag--Leffler measures, instead of using Wick ordered polynomials. With the help of an

Appell system, we introduce a test function and a distribution space. Furthermore we give characterizations of the distribution space and we characterize the weakly integrable functions and the convergent sequences within the distribution space. We construct Donsker's delta in a non-Gaussian setting as an application. In the second part, we develop a grey noise analysis. This is a special application of the Mittag--Leffler analysis. In this framework, we introduce generalized grey Brownian motion and prove differentiability in a distributional sense and the existence of generalized grey Brownian motion local times.

Grey noise analysis is then applied to the time-fractional heat equation and the time-fractional Schrödinger equation. We prove a generalization of the fractional Feynman--Kac formula for distributional initial values. In this way, we find a Green's function for the time-fractional heat equation, which coincides with the one given in the literature.

ÁGOTA G. HORVÁTH

FRACTIONAL BESSEL OPERATORS, BESSEL-SOBOLEV AND BESSEL B-POTENTIAL SPACES

Abstract:

Examination of fractional Bessel operators of elliptic type leads to the study of the corresponding function spaces.

The generalized or Bessel translation implies the notion of different Bessel moduli of smoothness. The equivalence of modulus of smoothness and the appropriate K-functional allows to define a Gagliardo-type seminorm and fractional Bessel-Sobolev spaces as well. We also define the Bessel B-potential spaces, and give imbedding theorems.

As an application, a potential theoretic characterization of removable sets with respect to certain fractional partial differential operators is given.

This is a joint work with Mouna Chegaar.

FRANCESCO IAFRATE

TIME CHANGES IN RANDOM EVOLUTIONS AND ANALYTIC CONNECTIONS

Abstract:

Random evolutions model dynamical systems in random environments, where a control mechanism switches at random times among finitely many modes of evolution, typically semigroups on a Banach space.

Finite-speed transport models provide a motivating class of regime-switching dynamics: a particle moves with finite velocity and changes direction at Poissonian times. In one dimension this yields the telegraph process, whose mean dynamics is governed by the telegraph equation.

In this work we extend random evolutions to an anomalous-time setting by introducing time-changed random evolutions, obtained by replacing deterministic time with an inverse subordinator clock. This produces regime-switching evolutions with trapping effects and non-Markovian features, encompassing a time-changed version of the telegraph dynamics. We construct the associated expectation operators and study their analytical counterparts in a general abstract setting.

In particular, we link these expectation operators to non-local abstract Cauchy problems driven by convolution-type fractional derivatives, which include the Caputo derivative as a special case. In the commuting case we recover generalized time-fractional telegraph-type equations. This enables us to derive Kac-style stochastic representations involving a random time-change.

Finally, we hint at our current investigation about the connection between time-changed random evolutions and the usual properties of a one-parameter family of operators, such as continuity and semigroup-like properties.

ATSUHIDE ISHIDA

STUMMEL-TYPE PERTURBATIONS FOR FRACTIONAL AND RELATIVISTIC SCHR\"ODINGER OPERATORS

Abstract:

In this talk, we propose new classes of potential functions as perturbations of fractional and relativistic Schrodinger operators. Specifically, we define four types of fractional Stummel classes that ensure infinitesimal relative boundedness and relative compactness, based on the Stummel conditions for the standard Schrodinger operator.

KEI KOBAYASHI

EFFECT OF RANDOM TIME CHANGES ON LOEWNER HULLS

Abstract:

Loewner hulls are determined by their real-valued driving functions. We study the geometric effect on the Loewner hulls when the driving function is composed with an inverse subordinator. In contrast to the classical SLE (Schramm-Loewner evolution), the time-changed Brownian motion never generates a simple curve. Furthermore, we develop criteria that can be applied in many situations to determine whether the Loewner hull generated by a time-changed driving function is simple or non-simple.

NIKOLAI LEONENKO

STRETCHED NON-LOCAL PEARSON DIFFUSIONS

Abstract:

This talk presents a new class of stochastic processes called stretched non-local Pearson diffusions. These models extend the well-known Pearson diffusions by introducing a flexible time-change mechanism driven by the Kilbas–Saigo function, allowing for non-local and stretched-time dynamics. We show how this construction leads to new types of fractional Cauchy problems and discuss their analytical and probabilistic solutions. The framework unifies and generalizes (fractional) Pearson family of diffusions, including Ornstein–Uhlenbeck, Cox–Ingersoll–Ross, and Jacobi processes, while offering greater modelling versatility for systems with memory and anomalous diffusion effects.

The talk based on joint results with Luisa Beghin, Ivan Papic and Jayme Vaz[1] [1] Beghin, L., Leonenko, N., Papic, I. and Vaz, J. (2026) Stretched non-local Pearson diffusions, Stochastic Processes and Applications, published on line 30/12/2025, https://authors.elsevier.com/c/1mMJO15DqVU1Ze

JÓZSEF LŐRINCZI

A FABER-KRAHN INEQUALITY FOR BERNSTEIN FUNCTIONS OF THE LAPLACIAN IN BOUNDED DOMAINS

Abstract:

The Faber-Krahn inequality is an example of an isoperimetric property in the spectral theory of the Laplacian and related operators in bounded domains. In this talk I will consider a non-local counterpart of the classic result on the minimiser of the principal Dirichlet eigenvalue for convex bounded Euclidean domains.

The framework of Bernstein functions of the Laplacian will be used, i.e., that of Markov generators of subordinate Brownian motion. Contrary to rearrangement techniques used for the classical case of the Laplacian, I will explain how to obtain a Faber-Krahn inequality for this family of non-local operators by a different approach.

SONIA MAZZUCCHI

PROBABILISTIC REPRESENTATION FORMULA FOR THE SOLUTION OF FRACTIONAL HIGH-ORDER HEAT-TYPE EQUATIONS

Abstract:

We propose a probabilistic construction for the solution of a general class of fractional high-order heat-type equations in the one-dimensional case, by using a sequence of random walks in the complex plane with a suitable scaling.

A time change governed by a class of subordinated processes allows to handle the fractional part of the derivative in space. We first consider evolution equations with space fractional derivatives of any order, and later we show the extension to equations with time fractional derivative (in the sense of Caputo derivative) of order $\alpha \in (0, 1)$.

ALESSANDRA MEOLI

NONLOCAL SIZE-BIASING OF ORDER A

Abstract:

We introduce a nonlocal size-biasing of order $\alpha \in (0,1)$ for nonnegative random variables, defined via a nonlocal operator of Riemann–Liouville type. This construction extends classical size-biasing and reduces to it in the limit $\alpha \uparrow 1$. We study its main structural features, including closure properties across various classes of distributions. We then develop a Stein equation adapted to the nonlocal size-biasing of order α and use it to derive a one-sided concentration inequality. Finally, we illustrate the resulting bound on a representative example.

ALEKSANDAR MIJATOVIC

CENTRAL LIMIT THEOREM FOR ERGODIC AVERAGES OF MARKOV CHAINS AND APPLICATIONS TO SAMPLING ALGORITHMS

Abstract:

Establishing central limit theorems (CLTs) for ergodic averages of Markov chains is a fundamental problem in probability and its applications. Since the seminal work Kipnis and Varadhan (1986), a vast literature has emerged on the sufficient conditions for such CLTs. To counterbalance this, the present work provides verifiable necessary conditions for CLTs of ergodic averages of Markov chains on general state spaces. Our theory is based on drift conditions, which also yield lower bounds on the rates of convergence to stationarity in the Wasserstein distance and total variation.

The validity of the ergodic CLT is of particular importance for sampling algorithms, where it underpins the error analysis of estimators in Bayesian statistics and machine learning. Although heavy-tailed sampling is of central importance in applications, the characterisation of the CLT and the convergence rates are theoretically poorly understood for almost all practically-used Markov chain Monte Carlo (MCMC) algorithms. In this setting our results provide sharp conditions on the validity of the ergodic CLT and establish convergence rates for large families of MCMC sampling algorithms for heavy-tailed targets.

Our study includes a rather complete analyses for random walk Metropolis samplers (with finite- and infinite-variance proposals), Metropolis-adjusted and unadjusted Langevin algorithms and the stereographic projection sampler (as well as the independence sampler). By providing these sharp results via our practical drift conditions, our theory offers significant insights into the problems of algorithm selection and comparison for sampling heavy-tailed distributions.

This is joint work with M. Bresar and G. Roberts.

YULIYA MISHURA

TEMPERED FRACTIONAL RIEMANN-LIOUVILLE PROCESSES AND THEIR MAIN PROPERTIES

Abstract:

We consider tempering of the fractional Riemann-Liouville processes. Despite their apparent simplicity, these processes have many unexpected properties, one of which is the sudden independence of increments, a change in the sign of the correlation of increments, and some other effects.

GIANNI PAGNINI

MASTER EQUATIONS FOR CONTINUOUS-TIME RANDOM WALKS WITH STOCHASTIC RESETTING

Abstract:

We study a general continuous-time random walk (CTRW), by including non-Markovian cases and Lévy flights, under complete stochastic resetting to the initial position with an arbitrary law, which can be power-lawed as well as Poissonian. We provide three linked results. First, we show that the random walk under stochastic resetting is a CTRW with the same jump-size distribution of the non-reset original CTRW but with a different counting process.

Later, we derive the condition for a CTRW with stochastic resetting to be a meaningful displacement process at large elapsed times, i.e. the probability to jump to any site is higher than the probability to be reset to the initial position, and we call this condition the zero-law for stochastic resetting. This law joins with the other two laws for reset random walks concerning the existence and the non-existence of a non-equilibrium stationary state (NESS). Finally, we derive master equations for CTRWs when the resetting law is a completely monotone function.

The talk is based on:

Colantoni F. and Pagnini G., Proc. R. Soc. A 481: 20250641 (2025)

FEDERICO POLITO

DISCRETE-TIME RESETTING VIA RENEWAL THEORY

Abstract:

We develop a discrete-time framework for stochastic resetting based on renewal processes, showing that the backward recurrence time controls propagators and first-passage related quantities on lattices and more general graphs.

A key dichotomy is finite-mean versus infinite-mean reset-time distributions: the former yields a universal non-equilibrium steady state (NESS), while the latter leads to slow, non-stationary relaxation.

MLADEN SAVOV

EXCHANGEABLE MEASURE-VALUED PÓLYA SEQUENCES

Abstract:

Measure-valued Pólya sequences (MVPS) are stochastic processes whose dynamics are governed by generalized Pólya urn schemes with infinitely many colors. Assuming a general reinforcement rule, MVPSs can be viewed as extensions of Blackwell and MacQueen's Pólya sequence, which characterizes an exchangeable sequence with a Dirichlet process (DP) prior distribution.

In this talk, we give a complete account of the class of exchangeable MVPSs in terms of their prior distributions. First, we show that under exchangeability, an MVPS is necessarily balanced and its reinforcement kernel is, after normalization, a regular conditional distribution.

As a result, its prior distribution is that of a DP mixture with respect to a latent parameter, which is associated with the conditioning sigma-algebra. Furthermore, we examine the effects of relaxing exchangeability to conditional identity in distribution and find that the two are equivalent for balanced MVPSs.

In the second part of the talk, we study Hoeffding decomposability under exchangeability and provide a complete characterization of class of exchangeable Hoeffding-decomposable sequences. In particular, we show that there exists a random parameter, conditional on which an exchangeable Hoeffding-decomposable sequence is an MVPS.

joint work with Chorbadzhiyska, Y., Sariev, H. and Gerdjikov, S.

ANNA PAOLA TODINO

NEW CHAOS DECOMPOSITION FOR NODAL VOLUMES OF GAUSSIAN RANDOM FIELDS

Abstract:

In this talk, we attempt to provide an overview of the statistical properties of the nodal volume of random spherical eigenfunctions. We begin by examining the two-dimensional case (the nodal length) and then we extend our analysis to higher dimensions. A key tool in this investigation is the Wiener chaos expansion, which allows us to analyze the fluctuations and limiting distributions of this geometric functional. However, the application of this technique, in its standard formulation, presents technical obstacles and limitations. After discussing these constraints, we will introduce a new version of the chaos expansion that overcomes some of these difficulties.

Crucially, this new framework is not limited to the spherical context or the eigenfunctions of the Laplacian. Instead, it applies to a more general class of Gaussian random fields on a general Riemannian manifold.

ANNA VIDOTTO

FRACTIONAL COINTEGRATION OF GEOMETRIC FUNCTIONALS

Abstract:

In this talk, we show that geometric functionals (e.g., excursion area, boundary length) evaluated on excursion sets of sphere-cross-time long memory random fields can exhibit fractional cointegration, meaning that some of their linear combinations have shorter memory than the original vector.

With these results we prove the existence of long-run equilibrium relationships between functionals evaluated at different threshold values; as a statistical application, we discuss a frequency-domain estimator for the Adler-Taylor metric factor, i.e., the variance of the field's gradient. We illustrate our results also by Monte Carlo simulations. The talk is based on a joint work with A. Caponera e D. Marinucci.

VANJA WAGNER

NONHOMOGENEOUS BOUNDARY CONDITION FOR SPECTRAL NON-LOCAL OPERATORS

Abstract:

We study (semil)inear non-local elliptic problems driven by spectral-type operators of the form

$$\psi(-L_{|D})$$

in a bounded $C^{1,1}$ domain $D \subset \mathbb{R}^d$, with a non-homogeneous boundary condition. Here ψ is a Bernstein function satisfying a weak scaling condition at infinity, and $L_{|D}$ is the generator of a killed Lévy process.

This general framework covers and extends the theory of the interpolated fractional Laplacian. A key novelty in this setting is the analysis of the non-homogeneous boundary condition formulated in terms of the Poisson potential with respect to the $d-1$ Hausdorff measure on ∂D.

Thanks for your participation

Speakers

Giacomo Ascione, Scuola Superiore Meridionale
Lehel Banjai, Heriot-Watt University
Ivan Biočić, University of Zagreb
Wolfgang Bock, Linnaeus University
Stefano Bonaccorsi, University of Trento
Fausto Colantoni, Sapienza University of Rome
Lorenzo Cristofaro, University of Luxembourg
Giuseppe D'Onofrio, Politecnico di Torino
Christian Engström, Linnaeus University
Sergei Fedotov, University of Manchester
Roberto Garrappa, University of Bari
Nicos Georgiou, University of Sussex
Martin Grothaus, RPTU, Kaiserslauten
Agota Horváth, Technical University of Budapest
Francesco Iafrate, University of Hamburg
Atsuhide Ishida, Tokyo University of Science
Kei Kobayashi, Fordham University
Nikolai Leonenko, Cardiff University
József Lőrinczi, Rényi Institute of Mathematics
Sonia Mazzucchi, University of Trento
Alessandra Meoli, Università degli Studi di Salerno
Aleksandar Mijatovic, University of Warwick
Yuliya Mishura, Taras Shevchenko National University of Kyiv
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Enrica Pirozzi, Università degli Studi della Campania
Federico Polito, University of Turin
Mladen Savov, Sofia University
Anna Paola Todino, University of Eastern Piedmont
Anna Vidotto, Sapienza University of Rome
Vanja Wagner, University of Zagreb

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