

Recent Breakthroughs in Singular Stochastic PDEs

Bicocca Winter School (Milan, 2-6 February 2015)

[Overview](#) • [Registration](#) • [Program](#) • [Practical Info](#) • [Contacts](#)

Overview

The aim of this school is to present some recent breakthroughs in the theory of non-linear stochastic PDEs, that allow to give a rigorous meaning to some important *singular equations* for which classical methods fail, due to the irregularity of the noise. Examples include the *Kardar-Parisi-Zhang (KPZ) equation* in 1d, the equation of *stochastic quantization* in 3d, the *parabolic Anderson model* in 2d.

The school is mainly targeted at PhD students and young researchers. There will be two mini-courses by [Massimiliano Gubinelli](#) (Université Paris Dauphine) and [Lorenzo Zambotti](#) (Université Pierre et Marie Curie), presenting different approaches but discussing analogous examples.



Massimiliano Gubinelli

Paracontrolled distributions and SPDEs

I will explain how ideas from the theory of non-linear waves, namely the paradifferential calculus of Bony, can be used to tackle problems in SPDEs and, more generally, problems involving non-linear operations on distributions. The aim of the mini-course is to develop the ideas and framework necessary to understand and give a meaning to singular (random) PDEs. We will also lay out links with the recent theory of regularity structures by Martin Hairer.



Lorenzo Zambotti

Introduction to the theory of Regularity Structures

In this course we want to present the main ideas of this recent theory due to Martin Hairer. The motivation is given by a class of singular stochastic PDEs and their renormalization, but the scope of the theory is larger: I plan to emphasize how this formalism can be used to construct a pathwise stochastic integration with respect to multi-parameter (Gaussian) noises, thus generalizing the classical Ito versus Stratonovic integration to a filtration-free setting.

Registration

Participation to the school is free, but **registration is mandatory**: please [email us](#), specifying the arrival/departure dates.

Program

The school starts on *Monday 2 February 2015 (afternoon)* and finishes on *Friday 6 February 2015 (morning)*. Each course consists in 4 lectures of 2 hours each, with the following tentative schedule:

	Mon 2	Tue 3	Wed 4	Thu 5	Fri 6
10:00-12:00	-	Zambotti	Gubinelli	Gubinelli	Zambotti
14:00-16:00	Zambotti	Gubinelli	Gubinelli	Zambotti	-

Practical Info

Venue

The school is hosted by the [Department of Mathematics and Applications](#) of the [University of Milano-Bicocca](#). The lectures will be given in the **U5 building** (via Roberto Cozzi 55, [map](#)) in **room 3014** (3rd floor).

How to get here

See the [dedicated page](#).

Accommodation

There is limited availability of accommodation on campus at [Residenza delle Fontane \(map\)](#), which is good value for money (60-70 euros/night, depending on the room). Reservations must be made [contacting us](#).

For accommodation outside campus, participants are invited to make reservations on their own. Feel free to [contact us](#) for advice.

Financial support

We might be able to provide financial support to young participants. Interested people are invited to [contact us](#).

Lunch meals will be provided to participants at discounted price (5.50 euros/meal).

Contacts

Organizing Committee: [Francesco Caravenna](#), [Federica Masiero](#), [Gianmario Tessitore](#)



Last modified: 18 Nov 2014.