Doctorate School PLUS

uni-salzburg.at/doktorat

PARIS LODRON UNIVERSITÄT SALZBURG

MARS

Models, Algorithms, Computers and Systems

Series of Talks
SS 2026

Start: 3 pm

Location: Lecture room 414, 1st floor
Hellbrunner Straße 34

A cooperation with SMC

Department of Mathematics
Department of Computer Science

Contact

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PARIS LODRON UNIVERSITÄT SALZBURG | Mathematics

PARIS LODRON UNIVERSITÄT SALZBURG | Computer Science

MARS – Models, Algorithms, Computers, and Systems

Modern high tech research in science and technology requires to a great extent an interdisciplinary approach. This applies particularly to wide areas of the methodological sciences mathematics and computer science, where generally one or more aspects of a chain of consecutive closely interlocked fields of research are considered. These start with a mathematical model, continue with algorithmic problems and finally cover aspects of the implementation on computers or high performance computing environments and therefore also issues on the efficiency of computer systems.

MARS is a doctoral programme at the Doctorate School PLUS (DSP Programme), which is organized by the departments of mathematics and computer sciences of the Paris Lodron University Salzburg. Its objective is to educate doctoral students in the research fields models, algorithms, computers, and systems and also to achieve new insights and research findings especially with regard to the inter-dependency of these fields of research. The focus will be on important topics relevant for the Salzburg research site. MARS fields of research form particularly from a methodological point a cohesive and closely linked line of research and cover a wide spectrum of scientific interests.

Joint activities constitute the structured doctoral program in MARS. These include seminars with external guest speakers, one day workshops with external guests and multi day retreats away from the university, as well as summer schools on the topics of MARS.

Program

Mai 21, 2026
Thursday, 15:00-15:45
Lecture room 414, 1st floor

Low regularity time integration of dispersive problems
Alexander Ostermann (University of Innsbruck)

Standard numerical integrators, such as Lie splitting, Strang splitting, and exponential integrators, experience order reduction when applied to semilinear dispersive problems with non-smooth initial data.

To address this issue, a recent development introduces a new class of integrators known as low-regularity integrators. These integrators use the variation-of-constants formula and employ resonance-based approximations in Fourier space, demonstrating improved convergence rates at low regularity. However, the estimation of nonlinear terms in the global error still relies on classical bilinear estimates derived from Sobolev embeddings.

At very low regularity, traditional error analysis in Sobolev spaces is hampered by the lack of suitable embeddings. A novel framework, inspired by Bourgain's techniques, has been developed that allows the analysis of methods applicable to very low regularity initial data. This approach has been applied to various problems, including the nonlinear Schrödinger equation.

Coming...

Artin's Conjecture on primitive roots
Antonella Perucca (University of Luxembourg)
Mai 28, 2024