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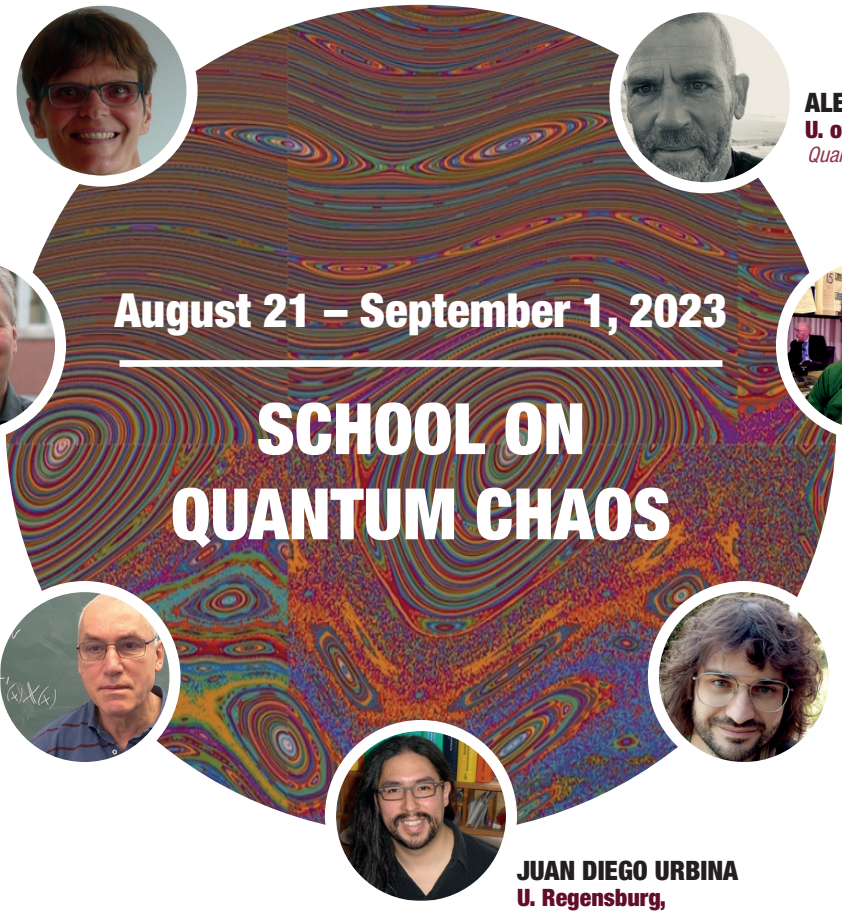
South American Institute for Fundamental Research

Campus of IFT-UNESP - São Paulo, Brasil



August 21 – September 1, 2023

SCHOOL ON QUANTUM CHAOS

BARBARA DIETZ
I. for Basic Science (IBS), Republic of Korea
Non-Relativistic and Relativistic Quantum Chaos

ALEXANDER ALTLAND
U. of Cologne, Germany
Quantum Chaos in the SYK model

THOMAS GUHR
U. of Duisburg-Essen, Germany
Random Matrix Theory Applications from Single to Many-Body Quantum Chaos

HORACIO PASTAWSKI
U. Nacional de Córdoba-CONICET, Argentina
Dynamical Quantum Chaos in Many-Body Systems: An experimental quest for the origin of irreversibility from Loschmidt Echoes to Out of Time Order Correlators

MARTIN SIEBER
U. of Bristol, UK
Semiclassical Theory Approach in Quantum Chaos

DARIO ROSA
I. for Basic Science (IBS), Republic of Korea
Aspects of Many-Body Quantum Chaos

JUAN DIEGO URBINA
U. Regensburg, Germany
The Semiclassical Approach to Discrete Quantum Fields and Many-Body Interference in Fock Space

Quantum chaos focuses on the quantum manifestations of classical chaos. A characteristic of classical chaos is the exponential sensitivity of the dynamics with respect to infinitesimal changes in the initial conditions. Thus, to classify classical dynamics it is sufficient to follow phase space trajectories starting infinitesimally close to each other and to determine the evolution of their distances with respect to each other with time. Because of the uncertainty relation, this is no longer possible in the corresponding quantum system.

The focus of research within the field of quantum chaos has been extended to relativistic quantum systems and to many-body quantum systems with focus on random matrix theory and the semiclassical approach. In distinction to single-particle systems, many-body systems like atomic nuclei do not have a classical analogue. In recent years different measures of chaos and models have been developed. Here, a prominent model is the Sachdev-Ye-Kitaev model which serves as a paradigm for the study of quantum chaos in strongly interacting many-body systems.

The school is aimed at PhD students, post-docs and outstanding master students and the first part will provide a survey of single- and many-body quantum chaos and applications based on random-matrix theory and the semiclassical approach. The second part of the school will focus on current aspects of research in the context of many-body quantum chaos.

There is no registration fee and limited funds are available for travel and local expenses.

Application deadline: June 11, 2023

Online application and more information:

www.ictp-saifr.org/qc2023/

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