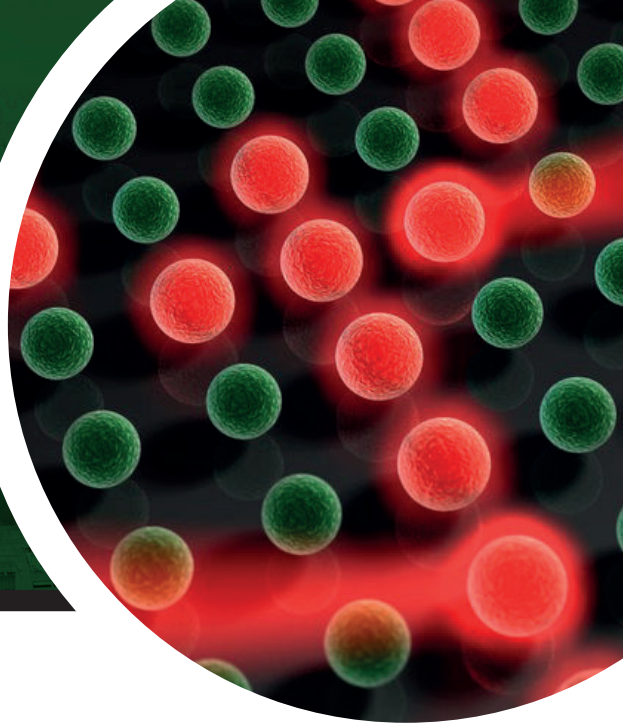
ICTP SAIFR International Centre for Theoretical Physics South American Institute for Fundamental Research

INSTITUTO PRINCIPIA

PROGRAM ON QUANTUM MANY-BODY DYNAMICS: THERMALIZATION AND ITS VIOLATIONS



September 8 – 19, 2025

at Principia Institute, São Paulo, Brazil

INVITED SPEAKERS

First week

Ceren Dag (Harvard University, USA)
Anatoli Polkovnikov (Boston University, USA)
Tobias Micklitz (CBPF, Brazil)
Thomas Iadecola (Iowa State University, USA)
Natalia Chepiga (Delft University of Technology, Netherlands)
Pedram Roushan (Google, USA)
Antonello Scardicchio (ICTP, Italy)
Dries Sels (New York University, USA)
David Logan (Oxford, England)
Ivan Khaymovich (Nordita, Sweden)
Soumya Bera (Indian Institute of Technology Bombay, India)
Yevgeny Bar Lev (Ben Gurion University of the Negev, Israel)
Jean-Yves Desaules (Institute of Science and Technology Austria, Austria)
Piotr Sierant (Barcelona Supercomputing Center, Spain)

Second Week

Lea Santos (University of Connecticut, USA)
Peter Claeys (Max Planck I. for the Physics of Complex Systems, Germany)
Nicolas Regnault (Ecole Normale Superieure Paris, France)
Marcos Rigol (Penn State University, USA)
Thomas Iadecola (Iowa State University, USA)
Natalia Chepiga (Delft University of Technology, Netherlands)
Antonello Scardicchio (ICTP, Italy)
Dries Sels (New York University, USA)
David Logan (Oxford, England)
Ivan Khaymovich (Nordita, Sweden)
Piotr Sierant (Barcelona Supercomputing Center, Spain)
Soumya Bera (Indian Institute of Technology Bombay, India)
Fabian Heidrich-Meisner (Georg-August-Universität Göttingen, Germany)
Yevgeny Bar Lev (Ben Gurion University of the Negev, Israel)
David Weiss (Penn State University, USA)
Ulrich Schneider (Cambridge, England)
Sona Najafi (IBM TJ Watson Research Center, USA)
Jean-Yves Desaules (Institute of Science and Technology Austria, Austria)

How isolated quantum systems thermalize and reach equilibrium constitutes a long-standing question, dating back to the early days of quantum mechanics. During the last 20 years, the celebrated Eigenstate Thermalization Hypothesis has shed light on the mechanism of thermalization, and its predictions have been massively tested, at the theoretical, numerical, and experimental level. Simultaneously, huge efforts have been devoted to find robust mechanisms that quantum systems can exploit to escape thermalization and retain information in their local degrees of freedom. With the advent of the second quantum revolution and quantum technologies, these mechanisms are of uttermost importance, since they can be used to build quantum memory devices. At the same time, recent quantum simulators allow the study of these phenomena at the experimental level, with high precision and in almost perfect isolation.

This program will bring together international experts on these topics, to provide an overview of the most recent results and techniques, spanning the theoretical, computational, and experimental aspects. A lightweight talk schedule will create the perfect atmosphere for discussions and will foster new collaborations among participants. In parallel, there will be pedagogical activities specifically tailored to young scientists, to offer them the possibility of including these developments in their research horizons.

There is no registration fee.

Registration deadline: July 19, 2025

Online application and more information:
ictp-saifr.org/pqmbd2025

ORGANIZERS

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