

Division of Theoretical Physics IPPAS

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Introduction to the Theory of Open Quantum Systems

- **Time & Location:** Wednesdays at 10:00, room D, Institute of Physics PAS (al. Lotników 32/46).
- **Online access:** Live Zoom meetings and VoD recordings of lectures
- **Duration:** 15 sessions, each 2 hours (30 hours in total)
- **First Lecture:** **March 26th.**
- **Website:** <http://www.theory.ifpan.edu.pl?class=24/2/opensys/pszan>
- **Lecturer:** Dr Piotr Szańkowski (piotr.szankowski@ifpan.edu.pl)
- **Reading Materials:** Available on the course website.
- **Language:** English

COURSE OBJECTIVES:

This course provides a comprehensive introduction to the theory of open quantum systems. By the end of the lecture series, participants will have the necessary knowledge and experience to solve basic problems in the field and engage with more advanced literature.

ADMISSION REQUIREMENTS

Basic knowledge of quantum mechanics is expected.

TEACHING METHODS

The course consists of fifteen two-hour lectures (30 hours total). To reinforce the material, participants will receive weekly home assignments providing hands-on experience.

COURSE STRUCTURE

1. Dynamics of closed quantum systems
2. Stochastic dynamics of quantum systems
3. Dynamics of open quantum systems
4. Master equation
5. Dynamics of thermalization
6. Multi-time correlations in open quantum systems
7. The origin of external fields in quantum mechanics