

SEMINAR ON MAGNETISM AND SUPERCONDUCTIVITY

We kindly inform You that on **Friday (NON-STANDARD DATE)**

December 15th at 10:00

there will be a **seminar in room 203, building I**

where

Prof. dr hab. Maciej Maśka

*(Wrocław University of Science and Technology; Faculty of Fundamental Problems of Technology;
Institute of Theoretical Physics)*

will deliver a lecture on:

“Monte Carlo methods in physics”

There are some problems in physics and, in general, in science that are so complicated that they just cannot be analyzed using formulas that you can write down on a piece of paper. Then, the solution may be a statistical technique initially developed by Stanisław Ulam, who worked on the Manhattan Project. A family of these techniques, known as Monte Carlo methods in reference to Ulam's uncle who loved playing the odds at the Monte Carlo casino, is used to model probabilistic (or "stochastic") systems and establish the odds for a variety of outcomes.

The lecture will be a pedagogical introduction to these techniques. It will begin with historical examples followed by a discussion of the elements of statistics that are used in Monte Carlo simulations, such as importance sampling. Next, the Metropolis or Metropolis-Hastings algorithm, recognized as one of the ten most pivotal algorithms in history, will be discussed. The main part of the lecture will be devoted to the application of this algorithm to simulations of classical systems. In the concluding part the problems that arise when applying Monte Carlo techniques to quantum systems and how to (try to) solve them will be discussed.

The seminar will be given in Polish on-site in room 203, slides will be in English. The ZOOM transmission will also be available - link is provided on the IP PAS website.

We sincerely invite You

**Roman Puźniak
Andrzej Szewczyk
Henryk Szymczak**