



Ramamohan Paturi

Eduard Čech



Institute of Mathematics
Czech Academy of Sciences
cordially invites you
to the lecture

Introduction to Fine-grained Complexity

given by

Ramamohan Paturi

University of California, San Diego

on Monday May 16, 2022
at 10 a.m.

in the blue lecture room
of the Institute of Mathematics CAS,
Žitná 25, Praha 1.

The lecture will also be streamed live via
[Zoom](#) and [YouTube](#).



It is the eighteenth lecture in the cycle of
representative talks organized to honour

Professor Eduard Čech,

one of the most renowned Czech
mathematicians of modern history and
founder of the
Institute of Mathematics, Czech Academy
of Sciences.

Tomáš Vejchodský, director

<http://www.math.cas.cz>

Introduction to Fine-grained Complexity

The field of computational complexity studies the resource (time, space, etc.) requirements for computing problems.

While the question of proving lower bounds on such resources for computing concrete problems has turned to be notoriously difficult, progress has been made in a number of directions. In the present talk, we introduce the fine-grained complexity approach to reason about the exact worst-case time complexities of algorithms. We discuss the genesis of the well-known complexity hypotheses, Exponential Time Hypothesis (ETH) and Strong Exponential Time Hypothesis (SETH) as they are a starting point for fine-grained complexity. We will also contrast the fine-grained complexity theory with the classical NP-theory.

We will illustrate the fine-grained complexity techniques by showing how the exact complexities of various problems (in classes P and NP) can be explained. Finally, we will discuss obstructions to fine-grained relationships among problems.

