Charles University
Faculty of Mathematics and Physics

Cordially invites you to

28th Strouhal's Lecture

EXACT SPACETIMES IN EINSTEIN'S GRAVITY AND ITS GENERALIZATIONS

Given by

prof. RNDr. Jiří Podolský, CSc., DSc.
(Institute of Theoretical Physics,
Faculty of Mathematics and Physics,
Charles University)

On Wednesday, 12 March 2025 at 2 p.m.

The lecture will be held in
the Strouhal´s auditorium (F1),
Prague 2, Ke Karlovu 5

The lecture will be also streamed at:

Zoom Meeting ID: 968 6686 1200

click here

prof. RNDr. Jiří Podolský, CSc., DSc. (*1963) is a Full Professor at the Institute of Theoretical Physics, MFF UK, where he obtained his degrees. In 1990–91 he studied at the University of New Mexico (USA), and collaborated with colleagues around the world (UK, Austria, Italy, Japan, Canada, Spain). His research concentrates on exact cosmological gravitational waves and black holes in Einstein's General Relativity, and its extensions. He published about 120 papers, and with Jerry Griffiths a monograph Exact Space-Times in Einstein's General Relativity (Cambridge, 2009). He participated in many Czech and British grants (also as the PI). He is a member of IAU, ISGRG, LISA and ET. In 2022 he obtained the Werner von Siemens and the František Nušl awards. He is active in outreach activities (translation of 21 books, public lectures).

Abstract
General Relativity, Einstein's gravity theory born a century ago, predicted many surprising objects and effects, such as black holes, gravitational waves, or expansion of the Universe from the Big Bang. Such predictions have been confirmed observationally, sometimes with a great precision. Key to their understanding is finding the relevant exact solutions of Einstein's equations (model spacetimes), their mathematical investigation, and physical interpretation. We will review their main classes and outline their properties. This will include our recent results on rotating and accelerating black holes, gravitational radiation generated by them, the Penrose method of obtaining impulsive waves, or effect on test particles (can be chaotic). We will also mention their counterparts in D=3 and D>4 dimensions, and generalizations beyond Einstein's gravity to Quadratic Gravity.