



Department Seminar

4:00pm, April 1, 2026

Girish Kulkarni (TIFR Mumbai)

From ChatGPT to AI Agents: New Tools for Research, Teaching, and Academic Life

Venue: AB1 Conference Room

Abstract: Recent advances in generative artificial intelligence, especially large language models such as ChatGPT, have sparked both excitement and anxiety within academia. AI has long been used in scientific research through specialised machine-learning methods, but we are now also witnessing a parallel shift: the emergence of AI as a day-to-day cognitive assistant for researchers. At the cutting edge, frontier systems are moving beyond simple chat into multimodal reasoning models and AI agents that can plan, use tools, inspect documents and code, and carry out parts of complex scholarly workflows. In this talk, I will explore the evolving role of generative AI in the working life of a researcher, with examples drawn from research, teaching, and academic administration. I will discuss how systems such as ChatGPT can assist with literature review, conceptual exploration, coding, symbolic manipulation, and scientific writing; how they can support lecture preparation, problem design, explanation, and student engagement; and how emerging agentic tools may increasingly automate or streamline routine academic tasks. The talk will not be a technical survey of AI methods, but a reflective and practical account of what these tools can and cannot do. Drawing on personal experience as an early adopter, I will present concrete use cases, discuss limitations and risks of over-reliance, and invite a broader conversation about how AI may reshape the practice of physics in the coming years.

About the Speaker: Girish Kulkarni is an astrophysicist and Associate Professor at the Tata Institute of Fundamental Research in Mumbai. He works on the first billion years of cosmic history, when the first galaxies formed, the intergalactic medium became reionised, and the earliest supermassive black holes began to grow. His research combines physics, astronomy, and high-performance computing, and engages with data and questions connected to major international facilities and experiments, including JWST, the VLT, REACH, the Square Kilometre Array, and LSST at the Rubin Observatory. He received his PhD from the Harish-Chandra Research Institute under the supervision of Jasjeet Singh Bagla, and has previously held positions in Cambridge and Heidelberg.

