ARNOLD SOMMERFELD

CENTER FOR THEORETICAL PHYSICS

LUDWIG-
MAXIMILIANS-
UNIVERSITÄT
MÜNCHEN

Sommerfeld Theory Colloquium

Prof. Raul Jimenez

Barcelona University

The Denario Project: Deep knowledge AI agents for scientific discovery

We present Denario, an AI multi-agent system designed to be a scientific research assistant. Denario can perform many different tasks, such as generating ideas, checking the literature, developing research plans, writing and executing code, making plots, and writing a scientific paper. Denario is built as a modular system, and therefore, can perform either very specific tasks, such as generating an idea, or carrying out end-to-end scientific analysis using cmbagent as a deep-research backend. In this talk, we describe Denario and its modules in detail and illustrate its capabilities by presenting multiple AI-generated papers generated by it. These papers cover many scientific disciplines, such as astrophysics, biology, biophysics, biomedical informatics, chemistry, material science, mathematical physics, medicine, and planetary science. Denario can also perform research combining ideas from different disciplines, and we illustrate it by showing a paper that applies methods from quantum physics and machine learning with astrophysical data. We publicly release the code at https://github.com/AstroPilot-AI/Denario. A Denario demo can also be run directly on the web at https://huggingface.co/spaces/astropilot-ai/Denario, and the full app is deployed on the cloud.

Wednesday, 4 February 2026, 16:15h, Room A348, Theresienstr. 37/III

Prof. Gia Dvali