Atanasoff Memorial Lecture Series

In Topological, Computational & Algebraic Aspects of Complex Systems and Machine Learning

Hosted by the Bulgarian Academy of Sciences

Inaugural Event — November 10, 2025

Invited Lecturers

- **Amaury Hayat**, French mathematician and applied scientist, Professor at École des Ponts – Institut Polytechnique de Paris, working on control and stabilization of PDEs and on applications of artificial intelligence to mathematics.
- **Dr. Raphaël Douady**, French mathematician and economist. PhD (1982, Paris VII) in Hamiltonian dynamics, former Frey Chair of Quantitative Finance at Stony Brook (SUNY) and Academic Director at LabEx ReFi. Co-founder and Research Director of Riskdata, with decades of work in chaos theory, systemic-risk modelling, polymodel theory and machine-learning methods in finance.
- **Prof. Carlos Simpson**, American algebraic geometer. PhD Harvard (1987) under Wilfried Schmid on Systems of Hodge Bundles and Uniformization. Research Director at CNRS, Université Côte d'Azur. Work includes non-abelian Hodge theory, higher categories, moduli spaces and computer-aided proof verification.
- **Prof. Yuri Tschinkel**, Russian-German-American algebraic geometer; PhD MIT (1992), Junior Fellow Harvard Society of Fellows, Gauss Chair at Göttingen, Chair at Courant (NYU), and Director at the Simons Foundation. Research on rational points, birational geometry and the arithmetic of high-dimensional varieties.
- **Prof. Ernesto Lupercio**, Mexican mathematician. PhD (1998, Stanford) in Geometry and Topology. Professor at CINVESTAV and ICMS Sofia, leading the group on Topological, Computational & Algebraic Aspects of Complex Systems. His work spans Hodge theory, non-Kähler geometry, mirror symmetry and mathematical structures underlying data and complexity.
- **Prof. Phillip A. Griffiths**, American mathematician, Institute for Advanced Study (IAS Princeton). Renowned for foundational work in Hodge theory, algebraic geometry and differential geometry, as well as for his leadership in shaping modern mathematical institutions and research communities.

Programme Schedule

10:00–10:50	Lecture 1 — Public Lecture by Prof. Ernesto Lupercio
13:00–13:50	Lecture 2 — Dr. Raphaël Douady
14:00–14:50	Lecture 3 — Prof. Carlos Simpson
15:00–15:50	Lecture 4 — **Atanasoff Keynote Lecture (50 min)** by **Amaury Hayat**
16:00–16:50	Lecture 5 — Prof. Yuri Tschinkel
17:00–17:50	Lecture 6 — Prof. Phillip Griffiths
19:00–19:45	Reception

Intersectional Themes

At the nexus of machine learning, probability, geometry and topology: exploring complex systems through data-driven inference, structural randomness and the interaction between learning and geometric structure.

Series Legacy & Organization

The Atanasoff Memorial Lecture Series honours **John Vincent Atanasoff**, regarded in Bulgaria as the pioneer of electronic computing. It bridges national scientific heritage and global mathematical research frontiers, linking foundational theory with modern computational innovation.

Organised by the Bulgarian Academy of Sciences and ICMS Sofia, under the leadership of Prof. Ernesto Lupercio and the Research Group in Complex Systems.

Venue & Logistics

Location: ICMS Sofia, Acad. G. Bonchev St. Bl. 8, Sofia
Admission: Free (registration suggested; limited capacity)