Call for Audience

AIRO
APU Integrated Research Organization

# RICE BALL SEMINAR

## Learning to Discover: From Abstraction and Reasoning Corpus to Artificial Intelligence for Science

Recent advances in AI are producing breakthroughs across mathematics, science, and increasingly agentic forms of work. Yet current systems stillstruggle when the relevant categories, goals, affordances, or causal structures are not given in advance. Scientific discovery and situated problemsolving require more than pattern recognition: they require exploration, intervention, surprise, and rule formation.

Drawing on embodied cognitive science, this talk develops a foundation for nature-inspired AI as situated, action-oriented, and relational. We use ARC-AGI-3, an interactive benchmark in which agents must discover how unfamiliar environments work through action, as a simplified laboratory forembodied rule discovery. By comparing children, adults, and artificial agents, we examine how perception, action, surprise, and rule formation becomecoupled through semiotic compression: the reorganization of complex experience around a small number of action-relevant cues.

Although ARC-style environments are simple, they isolate capacities central to scientific discovery: identifying what matters, designing informativeinterventions, revising expectations, and forming transferable rules. We argue that AI for science should move beyond memorizing patterns towarddiscovering embodied, communicable rules that can transfer from constrained micro-worlds to open-ended scientific inquiry.

**November 3, 2026**
**TUE**

**Building J, 3rd floor**
**J308**

**5th period**
**16:10-17:50**

**ENGLISH**

**IN PERSO**

## Speakers



**Sahar Vahdati**
Leibniz University of Hannover
Professor of AI for Science
Head of the AI for Scholarly Communications Research Group



**Andrei Aioanei**
Leibniz Information Centre for Science and Technology
Research Scientist

## Organizer



**ALIN OLTEANU**
APS
Associate Professor