UNIVERSITÀ DI PADOVA
Dipartimento
di Scienze Chimiche - DiSC

DiSC

24 November 2026 at **14:30** in room E of DiSC

Prof. Giovanni Volpe

Department of Physics
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will give the talk entitled:

What Are We to Do in the Age of AI?

La presenza della S. V. sarà molto gradita

Organizzatore
Prof. Vincenzo Amendola

Il Direttore del Dipartimento
Prof. Stefano Mammi

What Are We to Do in the Age of AI?

Giovanni Volpe
Department of Physics
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Sweden

Artificial intelligence is rapidly transforming how we do science, from analyzing experimental data to discovering new materials and understanding complex physical and biological systems. But as AI becomes increasingly capable, what remains for scientists to do?
In this talk, I will explore this question through examples from soft and active matter, microscopy, and biophysics, showing how deep learning can help us tackle problems that are difficult to address with traditional approaches. I will discuss both the opportunities and limitations of current AI methods, and how physical knowledge, creativity, and human intuition remain essential for scientific discovery. Finally, drawing on my experience in translating academic research into practical applications and startups, I will reflect on how AI is changing not only the way we conduct research, but also how we bring scientific discoveries into the real world.

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2. Pineda, J., Midtvedt, B., Bachimanchi, H. et al. Geometric deep learning reveals the spatiotemporal features of microscopic motion. Nature Machine Intelligence 5, 71–82 (2023). https://doi.org/10.1038/s42256-022-00595-0
3. Midtvedt, B. et al. Single-shot self-supervised object detection in microscopy. Nature Communications 13, 7492 (2022). https://doi.org/10.1038/s41467-022-35004-y
4. Selin, M., Ciarlo, A. et al. SmartTrap: automated precision experiments with optical tweezers. Nature Methods 23, 1368-1378(2026). https://doi.org/10.1038/s41592-026-03129-3
5. Volpe, G. et al. Deep Learning Crash Course. No Starch Press (2026). https://github.com/DeepTrackAI/DeepLearningCrashCourse

Short bio

Giovanni Volpe is a Professor of Physics at the University of Gothenburg, Sweden, and a leading researcher in soft matter and complex systems, with a strong focus on the intersection of physics, neuroscience, and artificial intelligence. His work spans topics such as active matter, biophysics, and the development of AI-driven methodologies for scientific discovery. He is the Principal Investigator at DiSTAP (Disruptive & Sustainable Technologies for Agricultural Precision) and has pioneered the application of deep learning to microscopy, biological imaging, and data-driven modeling in the natural sciences. He is also the co-founder of startups leveraging AI for biotechnology and advanced analytics, and an active contributor to discussions on ethical and trustworthy AI. He is the lead author of the book Deep Learning Crash Course (No Starch Press, 2026), which aims to make modern AI accessible to scientists and engineers across disciplines.