

# AI AND MATH

# FOR METEOROLOGY AND CLIMATOLOGY

## CONFERENCES

**5 MAY | 9H00 > 17H30**

Collège de France  
11 place Marcelin Berthelot - 75005 Paris

free to enter, depending on availability

Recent advances in artificial intelligence (AI) have produced unexpected and impressive results for weather forecasting, despite the complexity of these multi-scale phenomena. AI is also playing an increasingly important role in climatology. These results raise profound questions about modelling. On the one hand, we know the physics equations that have so far been used in large-scale numerical models. On the other hand, many physical parameters are unknown, for example at interfaces, which motivates a learning approach based on past data. We can also learn the evolution equations indirectly, eliminating the need for physical modelling. The approaches developed in AI in recent years oscillate between these two strategies.

**9H > 9H10 : Stéphane Mallat, Collège de France**  
*Introduction*

**9H10 > 10H10: Michael Brenner, Harvard University**  
*The neural GCM, and other remarks*

**10H10 > 11H10: Thomas Dubos, École Polytechnique**  
*Hamiltonian insights and the challenge of unresolved processes in geophysical models*

**11H30 > 12H30: Laure Zanna, New York University**  
*Reshaping climate modelling with AI*

**14H00 > 15H00: Remi Lam, Massachusetts Institute of Technology**  
*Learning global weather forecasting from data*

**15H00 > 16H00: Claire Monteleoni, INRIA Paris**  
*Confronting climate change with generative and self-supervised machine learning*

**16H20 > 17h20: Marc Bocquet, CERE**  
*Artificial intelligence for geophysical data assimilation*

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