Mathematics and Artificial Intelligence for Weather and Climate

(02 Nov 2026–13 Nov 2026)



ORGANIZING COMMITTEE

Gianpaolo Balsamo
European Centre for Medium-Range Weather Forecasts (ECMWF)

Chen Chen
Center for Climate Research Singapore

Davide Faranda
CNRS/IPSL, France

Adriano Gualandi
University of Cambridge

Gianmarco Mengaldo
National University of Singapore

Stephane Vannistem
Nanyang Technological University



9 November 2026 (Monday) is a public holiday in Singapore and the Institute will be closed.

Venue

IMS Executive Seminar Room
Bock S17, Level 3
10 Lower Kent Ridge Rd Singapore 119076

For more information: https://ims.nus.edu.sg/events/mathaiweather

Mathematics and Artificial Intelligence for Weather and Climate

(Week two: 09–13 November 2026)

Monday, 09 November 2026		
Time	**Title**	**Speaker**
Free Day to Explore and Enjoy Singapore! **https://www.visitsingapore.com/**		

Tuesday, 10 November 2026		
Time	**Title**	**Speaker**
0915–0930	Registration	
0930–1030	How Surprising are Rare Climate Extremes?	Melinda Galfi *VU Amsterdam, Netherlands*
1030–1110	Group Photo & Tea Break	
1110–1200	Challenges and Strategies for Data-driven Modeling of Multiscale Turbulent Systems: Focus on Climate Modeling, Forced Responses and Causality	Fabrizio Falasca *New York University, USA*
1200–1400	Lunch Break	
1400–1500	Detecting Transient Metastability and Optimising System Perturbations from Observations	Gary Froyland *UNSW Sydney, Australia*
1500–1515	Tea Break	
1515–1615	Climate Dynamics: from AI to Topology and Back	Denise Sciamarella *CNRS, France*
1615–1630	Tea Break	
1630–1730	Clustering Profiles of Extremes in Dynamical Models	Jorge Freitas *University of Porto, Portugal*

Wednesday, 11 November 2026		
Time	**Title**	**Speaker**
0915–0930	Registration	
0930–1030	Beyond Extremes: a Few Thoughts on Black Swans and Aliens, where Statistics and Physics Meet	Pascal Yiou *LSCE, France*
1030–1100	Tea Break	

Wednesday, 11 November 2026		
Time	**Title**	**Speaker**
1100–1200	Climate Downscaling in Southeast Asia Using Generative AI Methods	Xiaoling Zhou *CCRS, Singapore*
1200–1400	Lunch Break	
1400–1500	Merging Data Assimilation and Machine Learning at Various Degrees: Examples from Arctic Sea Ice and Radiative Transfer	Alberto Carrassi *University of Bologna, Italy*
1500–1515	Tea Break	
1515–1615	Multivariate Extremes in Dynamical Systems	Ana Cristina Moreira Freitas *University of Porto, Portugal*
1615–1630	Tea Break	
1630–1730	Machine Learning–driven Advances in Geophysical Data Assimilation	Marc Bocquet *CEREA, ENPC, EDF R&D, Institut Polytechnique de Paris, Île-de-France, France*

Thursday, 12 November 2026		
Time	**Title**	**Speaker**
0915–0930	Registration	
0930–1030	Data-driven Meteorological Forecasts of Extremes in a Changing Climate	Gabriele Messori *Uppsala University, Sweden*
1030–1100	Tea Break	
1100–1200	Downscaling Regional Forecasts to Operational Decisions: Weather Impact Analysis for Infrastructure Resilience	Ronald Chan *A*STAR, Singapore*
1200–1400	Lunch Break	
1400–1500	AI for Actionable Convective Weather Nowcasting	Shili Xiang *A*STAR, Singapore*
1500–1515	Tea Break	
1515–1615	Turning Weather Uncertainty into Better Airport and Airspace Decisions	Paul Tan *ICAI, Singapore*
1615–1630	Tea Break	
1630–1700	Topological Autoencoders for Nonlinear Dynamics: A Templex-Based Approach	Gisela D. Charó *Ctr for Marine & Atmospheric Research, Argentina*

Friday, 13 November 2026		
Time	**Title**	**Speaker**
0915–0930	Registration	
0930–1030	Multimodal Spatiotemporal Atmospheric Data Assimilation with Latent Video Flow-matching	Romit Maulik *Purdue University, USA*
1030–1100	Tea Break	
1100–1200	Attribution Science in the AI Era	Davide Faranda *CNRS, France*

This schedule is accurate as of 10 Nov 2026 and is subjected to changes.