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



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 one: 02–06 November 2026)

Monday, 02 November 2026		
Time	**Title**	**Speaker**
0930–1030	Arrival, Registration and Networking	
1030–1100	Opening Ceremony	
1100–1200	Global Warming & Global Weirding: A Nonautonomous Dynamical Systems Perspective	Michael Ghil *UCLA, USA*
1200–1400	Lunch Break	
1400–1500	Critical Transitions in Complex Dynamical Systems: Theory and Applications to Ecosystems and Climate	Ulrike Feudel *University of Oldenburg, Germany*
1500–1515	Tea Break	
1515–1615	Analysis of a Two-Layer Diffusive Energy Balance Model	Cristina Urbani *Universitas Mercatorum, Italy*

Tuesday, 03 November 2026		
Time	**Title**	**Speaker**
0915–0930	Registration	
0930–1030	Fireside Chat with Simon See	Simon See *NVIDIA AI Technology Center, Singapore*
1030–1110	Group Photo & Tea Break	
1110–1140	Learning a Recurrence-based Latent Space of North Atlantic-European Weather Regimes with Joint Embedding Predictive Architectures	Marco Zanchi *CNRS, France*
1140–1210	Predictability Hierarchies of Extreme Events Revealed by AI Model	Yuxuan Yang *NUS, Singapore*
1210–1400	Lunch Break	
1400–1500	Statistics of Open Systems and Metastability	Sandro Vaienti *Université de Toulon et Centre de Physique Théorique, Marseille, France*

Wednesday, 04 November 2026		
Time	**Title**	**Speaker**
0915–0930	Registration	
0930–1030	Preparations for Next-Generational AI- and Physical Model-Based Regional Weather Prediction and Climate Projections at CCRS	Dale Barker *Centre for Climate Research Singapore, Singapore*
1030–1100	Tea Break	
1100–1130	S2S-JEPA: Predicting the Predictable at Subseasonal-to-Seasonal Timescales	Chenyu Dong *NUS, Singapore*
1130–1200	ATEMPO (Amortized Transfer Entropy Model Per-lag Over-time)	Emma Andrews *NUS, Singapore*
1200–1400	Lunch Break	
1400–1500	Complexity science and AI Methods for Earth System Tipping Points	Jingfang Fan *Beijing Normal University, China*
1500–1515	Tea Break	
1515–1615	From Trajectories to Climate Learning and Forecasting with Reservoir Computing	Juan-Pablo Ortega *NTU, Singapore*

Thursday, 05 November 2026		
Time	**Title**	**Speaker**
0915–0930	Registration	
0930–1030	Understanding Predictability, Physical and Dynamical Processes to inform Data-driven Weather and Climate Prediction Models R&D	Gilbert Brunet *ECCC, Canada*
1030–1100	Tea Break	
1100–1200	Thermodynamically Consistent Modeling of Geophysical Fluids: A Variational Perspective	François Gay-Balmaz *NTU, Singapore*
1200–1400	Lunch Break	
1400–1500	In-Context Operator Networks (ICON): A Research Program for Numerical Intelligence	Yang Liu *NUS, Singapore*
1500–1515	Tea Break	
1515–1615	Learning Macroscopic and Mesoscopic Dynamics	Qianxiao Li *NUS, Singapore*
1615–1630	Tea Break	
1630–1730	Persistent Anticyclones, AI and Quantum Computing: Why We Need a 'CERN for Climate Change' *Talk is delivered virtually.*	Tim Palmer *University of Oxford, UK*

Friday, 06 November 2026		
Time	**Title**	**Speaker**
0915–0930	Registration	
0930–1030	From Physics to AI and back	Gianmarco Mengaldo *NUS, Singapore*
1030–1100	Tea Break	
1100–1200	Tracing Uncertainties of Extreme El Niño Prediction to Mesoscale Ocean Currents	Bo Qin *Tongji University, China*

This schedule is accurate as of 06 Nov 2026 and is subjected to changes.