**ECMWF**

# Workshop on Diagnostics for Global Weather Prediction

## Programme

# Monday
# Agenda

Agenda time displays according to the selected time zone.

**The selected timezone is Europe/London**

| 12:00 to 14:00 | **Registration and lunch**<br>Registration in the Weather Room | |
|---|---|---|
| | **Workshop opening** | |
| 14:00 to 14:10 | **Welcome and introduction**<br>Video recording | Matthieu Chevallier (ECMWF) |
| 14:10 to 14:15 | **Logistical arrangements** | Mark Rodwell (ECMWF) |
| | **Predictability**<br>Chair: Sarah-Jane Lock, Rapporteur: Inna Polichtchouk | |
| 14:15 to 14:45 | **Diagnostics for investigating the representation of synoptic-scale processes in models and their benefit for medium- to extended-range prediction**<br>Presentation slides<br>Video recording | Christian M. Grams (MeteoSwiss) |
| 14:45 to 15:05 | **Diabatic heating as a diagnostic for predictability on weather to intra-seasonal time scales**<br>Presentation slides<br>Video recording | David Straus (George Mason University) |
| 15:05 to 15:25 | **'Forecast busts' over Europe in ERA5 reforecasts: Characteristics and predictions using neural networks**<br>Presentation slides<br>Video recording | Seraphine Hauser (University of Oklahoma) |
| 15:25 to 15:55 | **Coffee break** | |
| 15:55 to 16:15 | **The transition from practical to intrinsic predictability and how to diagnose it**<br>Presentation slides<br>Video recording | Tobias Selz (Karlsruhe Institute for Technology (KIT)) |

| 16:15 to 16:45 | **Discussion 1**<br>What is ultimate predictability, and what is holding NWP back?<br><br>[Video recording](#) |
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| 16:45 to 17:45 | **Icebreaker reception**<br>Weather Room |

# Tuesday
# Agenda

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| | Processes 1<br>Chair: Richard Forbes, Rapporteur: Luise Schulte | |
|---|---|---|
| 09:30 to 10:00 | **Diagnosing Mesoscale Convective Systems in DYAMOND Models: A Feature Tracking Intercomparison**<br>Presentation slides<br>Video recording | Zhe Feng (Pacific Northwest National Laboratory) |
| 10:00 to 10:20 | **Evaluation and Error Analysis of the July 2021 Extremely Severe Rainstorm in Henan Province Simulated by CMA-MESO Model**<br>Presentation slides<br>Video recording | Ziwei Wan (CMA Earth System Modeling and Prediction Centre) |
| 10:20 to 10:40 | **The Challenge of Representing Extreme Rainfall Events in Global Models**<br>Presentation slides<br>Video recording | David B. Parsons (University of Oklahoma) |
| 10:40 to 11:00 | **The role of eddy momentum flux on the organisation of shallow convection**<br>Presentation slides<br>Video recording | Alessandro Savazzi (TuDelft) |
| 11:00 to 11:30 | **Coffee break** | |
| 11:30 to 11:50 | **Model Uncertainty – MIP**<br>Presentation slides<br>Video recording | Hannah Christensen (University of Oxford) |
| 11:50 to 12:10 | **ICECAP - A tool to analyse multi-centre sea-ice forecasts from days to seasons**<br>Presentation slides<br>Video recording | Steffen Tietsche (ECMWF) |

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| 12:10 to 12:30 | **Process-based diagnostics using atmosphere budget analysis and nudging technique to identify sources of model systematic errors in global MetUM**<br>Presentation slides<br>Video recording | Chihiro Matsukawa (Japan Meteorological Agency, Met Office) |
| 12:30 to 12:50 | **Process-based diagnostics of the impact of new observing systems: a case study of the Aeolus wind satellite**<br>Presentation slides<br>Video recording | Robin Pilch Kedzierski (University of Hamburg) |
| 12:50 to 13:50 | **Lunch break** | |
| 13:50 to 14:20 | **Research on Error Traceability Technology Based on Scale Analysis**<br>Presentation slides<br>Video recording | Bin Zhao (CMA Earth System Modeling and Prediction Centre, China Meteorological Administration) |
| 14:20 to 14:50 | **Discussion 2**<br>What are the key model process errors and uncertainties?<br><br>Video recording | |
| | **Posters** | |
| 14:50 to 15:30 | **Poster introductions**<br>Chair: David Lavers<br><br>Video recording | |
| 15:30 to 17:00 | **Poster session** | |

# Wednesday Agenda

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| | Machine learning Chair: Michael Maier-Gerber, Rapporteur: Linus Magnusson | |
|---|---|---|
| 09:30 to 09:50 | **Do AI models produce better weather forecasts than physics-based models? A quantitative evaluation case study of Storm Ciarán** Presentation slides Video recording | Simon Driscoll (University of Reading) |
| 09:50 to 10:10 | **Global deep-learning weather prediction model evaluation and error diagnostics** Presentation slides Video recording | Uroš Perkan (University of Ljubljana) |
| 10:10 to 10:30 | **Can ML help end users increase forecast successes and highlight potential busts** Presentation slides Video recording | Isla Finney (Lake Street Consulting Ltd) |
| 10:30 to 11:00 | **Discussion 3 - Why are AI models so competitive, and are they physically consistent?** Rapporteur: Linus Magnusson Video recording | |
| 11:00 to 11:30 | **Coffee break and group photo** | |
| | **Host talk** | |
| 11:30 to 11:50 | **Scale-dependent evaluation and fair comparison of ensemble systems** Presentation slides Video recording | Mark Rodwell (ECMWF) |
| | **Processes 2** Chair: Frederic Vitart, Rapporteur: Rebecca Emerton | |

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| 11:50 to 12:20 | **Diagnosing tropical waves**<br>Presentation slides<br>Video recording | Peter Knippertz (Institute for Meteorology and Climate Research, Karlsruhe Institute for Technology) |
| 12:20 to 12:40 | **Tropical Wave Diagnostics and Their Applications to Numerical Weather Models**<br>Presentation slides<br>Video recording | Quinton Lawton (University of Miami) |
| 12:40 to 13:00 | **The Maritime Continent barrier effect on MJO predictability**<br>Presentation slides<br>Video recording | Hyemi Kim (Ewha Womans University) |
| 13:00 to 14:00 | **Lunch break** | |
| 14:00 to 14:30 | **Diagnostics for Tropical cyclone prediction : from the S2S scale to the mesoscale**<br>Presentation slides<br>Video recording | Philippe Peyrillé (Météo-France) |
| 14:30 to 15:00 | **Discussion 4**<br>The tropical elephant in the forecasting room?<br><br>Video recording | |
| 15:00 to 15:30 | **Coffee break** | |
| | **Community data and tools**<br>Chair: Linus Magnusson, Rapporteur: Alison Cobb | |
| 15:30 to 15:50 | **Diagnostics Package for MJO-Teleconnections**<br>Presentation slides<br>Video recording | Chaim Garfinkel (Hebrew University) |
| 15:50 to 16:10 | **The Ensemble Museums – a diagnostic tool of weather forecasting-**<br>Presentation slides<br>Video recording | Mio Matsueda (Univesity of the Ryukyus/University of Tsukuba) |
| 16:10 to 16:30 | **The development and implementation of diagnostics for ERA5 and ERA6**<br>Presentation slides<br>Video recording | Alison Cobb (ECMWF) |

| 16:30 to 17:00 | **Discussion 5**<br>The importance of community datasets and intercomparison<br><br>[Video recording](Video recording) |
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| 18:30 to 21:00 | **Dinner in Reading town centre** |

# Thursday Agenda

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|  | **Resolution and scale interactions**<br>Chair: Inna Polichtchouk, Rapporteur: Richard Forbes |  |
|---|---|---|
| 09:30 to 10:00 | **Diagnostic approaches for the GLObal-to-Regional ICON (GLORI) Digital Twin**<br>Presentation slides<br>Video recording | Chiara Marsigli (DWD) |
| 10:00 to 10:20 | **Flow dependence of error growth: Potential-vorticity diagnostics and feature tracking**<br>Presentation slides<br>Video recording | Michael Riemer |
| 10:20 to 10:40 | **Case study of error-growth from mesoscale convection near the intrinsic limit: combining potential vorticity error growth tendencies with ensemble sensitivity analysis**<br>Presentation slides<br>Video recording | Edward Groot (AOPP, University of Oxford) |
| 10:40 to 11:00 | **Inspecting high-resolution coupled models in a scale-aware way**<br>Presentation slides<br>Video recording | Matthias Aengenheyster (ECMWF) |
| 11:00 to 11:30 | **Coffee break** |  |
| 11:30 to 12:00 | **Challenges in the evaluation of the K-Scale hierarchy**<br>Presentation slides<br>Video recording | Claudio Sanchez (Met Office) |
| 12:00 to 12:30 | **Discussion 6**<br>Does resolution matter in global NWP?<br><br>Video recording |  |
|  | **Close of workshop**<br>Chair: Mark Rodwell, Rapporteur: Sarah-Jane Lock |  |

12:30 to 13:00    **Plenary discussion**
What have we learnt? Diagnostic success stories?
Diagnostic priorities? The ingredients of the perfect
diagnostic?

[Video recording](Video recording)