WAVES TO WEATHER

6th Annual Meeting of W2W

November 16th - 18th 2020

online

Program

(last update: Nov. 9th 2020)

Monday 16th November 2020

12:00-12:50 Overview of W2W (Chairs: Eisenstein, I. Chen) *(Main room)*

12:00-12:05 Welcome and general overview (Craig)
12:05-12:20 Overview Research Area C (Fink)
12:20-12:35 Overview Research Area B (Mayer)
12:35-12:50 Overview Research Area A (Riemer)

12:50-13:15 *Break (Coffee Break)*

13:15-18:00 Research Area C: Predictability of local weather (Chairs: Hirt, Teubler)

13:15-14:00 Using "ecPoint" to improve forecasts worldwide and to understand model biases (Tim Hewson, ECMWF, SAB) *(Main room)*
14:00-14:05 *Break (Coffee Break)*
14:05-14:35 Short poster presentations by the Early Career Scientists (ECS) in RA-C (1 slide per poster) *(Main room)*
14:35-14:50 *Break (Coffee Break)*
14:50-15:50 Poster session RA-C *(Poster X)*
15:20-15:50 Conversation between the ECS in RA-A and D. Domeisen *(Meet the Speaker (RA-A))*
15:50-18:00 *Ice breaker #1 (Ice Breaker – Group X)*

Tuesday 17th November 2020

09:00-11:35 Research Area B “Cloud-scale uncertainties” (Chairs: Löffel, Schulz)

09:00-09:45 Current challenges in convective-scale and storm-scale numerical weather prediction (Axel Seifert, DWD) *(Main room)*
09:45-09:50 *Break (Coffee Break)*
09:50-10:20 Short poster presentations by the ECS in RA-B (1 slide per poster) *(Main room)*
10:20-10:35 *Break (Coffee Break)*
10:35-11:35 Poster session RA-B

11:05-11:35 Conversation between the ECS in RA-C and T. Hewson *(Meet the Speaker (RA-C))*

11:35-12:30 *Lunch (Coffee Break)*

12:30-18:00 Central activities (Chairs: Beckert, Fischer) *(Main room)*

12:30-12:45 WWRP Joint Project (Riemer)
12:45-13:00 Report on ECS activities (de Heuvel, Hauser, Tempest)
13:00-13:15 Report on Z2 activities (Redl)
13:15-13:30 Report on Z1 activities (Laurian)
13:30-13:45 Report on outreach and dissemination activities (Knippertz)
13:45-14:00 Report on equal opportunity activities (Hoose)
14:00-14:15 Another perspective on EO issues (S. van den Heever)

14:15-14:30 *Break (Coffee Break)*

14:30-16:00 General Assembly (see separate agenda) – **all PIs and W2W members** (chair: Craig; minutes: Laurian) *(General Assembly)*
14:30-16:00 Early Career Scientists meeting – **all ECS** *(Early Career Scientists meeting)*

16:00-18:00 *Ice breaker #2*

Wednesday 18th November 2020

09:00-12:30 Research Area A "Upscale error growth" (Chairs: Oertel, Keshtgar) *(Main room)*

09:00-09:45 Progress and challenges in sub-seasonal weather prediction (Daniela Domeisen, ETH Zurich)
09:45-09:50 *Break (Coffee Break)*
09:50-10:20 Short poster presentations by the ECS in RA-A (1 slide per poster)
10:20-10:35 *Coffee break (Coffee Break)*
10:35-11:35 Poster session RA-A
11:05-11:35 Conversation between the ECS in RA-B and A. Seifert *(Meet the Speaker (RA-B))*

11:35-12:30 *Lunch (Coffee Break)*

12:30-12:45 Report on discussion on mathematics (Janjic-Pfander) *(Main room)*
12:45-14:45 Breakout group discussions (see page 3) *(Breakout group discussions (RA-X))*
14:45-15:00 *Break (Coffee Break)*
15:00-16:15 Report on breakout group discussions (RA coordinators), on ECS meeting (de Heuvel), and on SAB (McTaggart-Cowan) *(Main room)*
16:15-16:30 Final discussion *(Main room)*
16:30-17:30 *Ice Breaker #3*
17:30 *End of the meeting*

Breakout group discussion

Topic: Research Areas

(Wednesday 18th, 12:45-14:45)

Research Area A: Upscale Error Growth *chair: Michael Riemer*	**Research Area B: Cloud-scale Uncertainties** *chair: Bernhard Mayer*	**Research Area C: Predictability of local Weather** *chair: Peter Knippertz*
Chen Ihan Craig George (PI) *Domeisen Daniela* Farokhmanesh Fatemeh Grams Christian (PI) Groot Edward Hauser Seraphine de Heuvel Jorge Hirt Mirjam Keil Christian (PI) Krüger Konstantin Lukacova Maria (PI) Polster Christopher Puh Matjaž Rautenhaus Marc (PI) Rosemeier Juliane Sadlo Filip (PI) Schäfler Andreas (PI) Schindler Matthias Schömer Elmar (PI) Sdeo Kai Selz Tobias Spichtinger Peter (PI) Tempest Kirsten Teubler Franziska Tost Holger (PI) Weissmann Martin Werth Kai Wiebe Bettina	Barthlott Christian (PI) Baumgartner Manuel Borne Maurus Brinkmann Andre (PI) Frey Lena Hieronymus Maicon Höhlein Kevin Hoose Corinna (PI) Janjic-Pfander Tijana (PI) Jung Hyunju Keshtgar Behrooz Kuntze Patrick Kunz Michael (PI) Maier Richard Manev Mihail Matsunobu Takumi Miltenberger Annette (PI) Oertel Annika Porz Nikolas Ruckstuhl Yvonne *Seifert Axel* *Van den Heever Sue* Voigt Aiko (PI) Westermann Rüdiger (PI) Zarboo Amirmahdi	Birner Thomas (PI) Beckert Andreas Chen Xiaoyang Eisenstein Lea Fischer Christoph Fragkoulidis Georgios Garny Hella (PI) Gneiting Tilmann (PI) Grazzini Federico *Hewson Tim* Kiefer Selina Lemburg Alexander Lerch Sebastian (PI) Löffel Sheena Maier-Gerber Michael Pinto Joaquim (PI) Rasheeda Sateesh Athul Rupp Philip Schulz Benedikt Späth Jonas Walz Eva-Maria Wirth Volkmar (PI)
→ Breakout group discussions (RA-A #1, #2, #3)	*→ Breakout group discussions (RA-B #1, #2, #3)*	*→ Breakout group discussions (RA-C #1, #2, #3)*

If your name doesn't appear in the lists, please feel free to join the group of your choice.

Keynote presentations

Tim Hewson (ECMWF, UK) *Monday 16th, 13:15-14:00*

Title: Using "ecPoint" to improve forecasts worldwide and to understand model biases

Abstract:

In April 2019 ECMWF operations introduced a new, experimental, “point rainfall” forecast product. This is based on the post-processing package “ecPoint” applied to ensemble output and gives site-specific forecasts for everywhere in the world up to day 10. ecPoint aims to incorporate probabilistically the expected sub-grid variability, and simultaneously apply gridscale bias corrections. Both these adjustments depend critically on the local “gridbox-weather-type”. This presentation will describe the novel, non-local, meteorology-based calibration rationale that underpins ecPoint, and how it can also be applied to other surface variables such as 2m temperature. With an open-source GUI, called "ecPoint-calibrate", and a 1-year calibration dataset, users can easily and interactively create the ecPoint decision trees used for post-processing. This tool will be briefly illustrated.

The conditional verification concepts underpinning the calibration allow one to identify weather-situation-dependent gridscale biases. Three examples will illustrate the diagnostic power of this approach, showing meteorological scenarios in which rainfall is typically under- and over-forecast by ECMWF, providing also pointers for future model improvements. The aforementioned GUI can also be used with other ensembles, to allow for intercomparison of their performance in different weather situations, and potentially creation of a post-processed blended multi-model global product.

Forecast improvements that arise operationally using ECMWF output will be discussed, using both long term global verification up to day 10, and illustrative case studies, with a focus on how extreme localized rainfall, that might lead to flash floods, is better handled. It will be shown how the post-processing can usefully shift the emphasis for warning issue from one region (as highlighted in raw model output) to another.

There will be brief reference, from collaborative work, to how ecPoint output compares favorably with the post-processed output of convection-resolving limited area ensembles, and also to ongoing work where ecPoint is being applied to the ERA5 reanalysis and extended range forecasts.

Some weaker points of the method and avenues for improvement and collaboration will also be discussed.

Axel Seifert (DWD, Germany) *Tuesday 17th, 09:00-09:45*

Title: Current challenges in convective-scale and storm-scale numerical weather prediction

Abstract:

Forecasting convective storms is a challenging endeavour. In my talk I will give an overview of current efforts at Deutscher Wetterdienst (DWD) to improve high-resolution numerical weather prediction. Technically DWD is moving from the COSMO model to ICON for the convective-scale forecasts. Hence, COSMO-D2 will be replaced by ICON-D2 early next year. I will present some recent results comparing ICON-D2 and COSMO-D2 that pose, in my opinion, interesting questions regarding the predictability convective storms. On a somewhat more long-term perspective, DWD is aiming at the prediction of individual convective storms, which I would call storm-scale NWP in contrast to convective-scale NWP. I will try to highlight the differences between the two regimes or applications and how this has already transformed the model development at DWD. Last but not least, I will present some results on improvements of a cloud microphysical

parameterization in ICON using radar observations and detailed process-oriented modeling to remove some biases and compensating errors in the representation of clouds. If time allows, I can provide a perspective on the use of machine learning methods for the development of microphysical parameterizations for atmospheric models.

Daniela Domeisen (ETH Zürich, Switzerland) *Wednesday 18th, 09:00-09:45*
Title: Progress and challenges in sub-seasonal weather prediction
Abstract:
Weather prediction on timescales of weeks to months has seen significant progress over the past years. On these timescales, there is a wide range of users and stakeholders interested in the forecasts. While these forecasts are already in use for assessing impacts, there remain many challenges, especially in the prediction of extreme events, their drivers and impacts. This contribution will focus on the potential for the prediction of extreme temperature events, i.e. heatwaves and cold air outbreaks, on sub-seasonal timescales with a focus on remote drivers of these extremes.