

Climate variability across scales – from the butterfly’s wings to the age of the Earth
– an online seminar series from Nov 2020 to March 2021 –

Heatwaves and Cold Spells and Assessing Their Response to Climate Change

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Abstract: Extreme events provide relevant insights on the dynamics of the climate system and their understanding is key to defining useful strategies for mitigating the impact of climate variability and climate change. By applying large deviation theory to the output of a state-of-the-art climate model, Galfi & Lucarini (2021, arXiv:2010.08272) define the climatology of persistent heatwaves and cold spells in some key target regions of the planet by constructing empirically the corresponding rate functions for the surface temperature, and we assess the impact of increasing CO₂ concentration on such persistent anomalies. In particular, we can better understand the increasing hazard associated to heatwaves in a warmer climate. We show that two 2010 high impact events - summer Russian heatwave and winter Dzud in Mongolia - are associated with atmospheric patterns that are exceptional compared to the typical ones, but typical compared to the climatology of extreme events. Finally, we propose an approximate formula for describing large and persistent temperature fluctuations from easily accessible statistical properties.

The speaker: Valerio Lucarini studied Physics, Climate Physics and Chemistry in Pisa/Italy and Cambridge (Mass.), and holds a PhD in Physics from the University of Joensuu in Finland. From 2011 to 2016 he was a professor of Theoretical Meteorology at the University of Hamburg. Since 2017 he holds the professorship of Statistical Mechanics and is the director of the centre for the Mathematics of Planet Earth at the University of Reading.

More information: <https://www.reading.ac.uk/maths-and-stats/about/team/professor-v-lucarini.aspx>

Dates and speakers

1. **Jürg Schmidli** – IAU Frankfurt, Germany “**Variability at sub-daily time scales – from seconds to hours**”. Tuesday **10.11.2020** 16:00-17:00 (*video on youtube, link below*)
2. **Christian Grams** – IMK-TRO/KIT, Germany “**Synoptic to sub-seasonal surface climate variability in the Atlantic-European region: the role of weather regimes.**”. Thursday **26.11.2020** 16:00-17:00 (*video on youtube*)
3. **Tine Nilsen** – UIT, Norway “**Decadal variability and the scaling paradigm**”. **3.12.2020** 16:00-17:00 (*video on youtube*)
4. **Michel Crucifix** – UC Louvain, Belgium “**The challenge of centennial climate variability**”. Friday **18.12.2020** 11:00-12:00 (*video on youtube*)
5. **Heather Andres** – MUN, Canada “**Millennial climate variability and Dansgaard-Oeschger events**”. **21 Jan 2021** 16:00-17:00 (*video on youtube*)
6. **Julie Schindlbeck-Belo** – GEOMAR Kiel, Germany “**The links between volcanism and climate**”. **20.1.2021** 16:00-17:00 (*video available on request*)
7. **Oliver Friedrich** – GEOW HD, Germany “**Glacial/Interglacial climate variability (10⁵-10⁷ years)**”. **27.1.2021** 11:00-12:00
8. **Valerio Lucarini** – Reading, UK “**Heatwaves and Cold Spells and Assessing Their Response to Climate Change**”. **Wednesday 10.2.2021** 11:00-12:00
9. **Mario Trieloff**, GEOW Heidelberg, “**Climate variability on other planets**”. **Friday 5.3.2021** 11:00-12:00 (*title tbc*)
10. **Shaun Lovejoy**, McGill University/Canada – “**Linking Climate Variability Across Scales**” – **17.3.2021** 16:00-17:00 (*date/time tbc*)

All times stated are CET (Berlin). Past lectures are available via the PAGES youtube channel:

https://www.youtube.com/playlist?list=PLSaCdvM4wMLH_QfoKHyc5n4d-0_KBHDL

Registration: The link to the online meeting (Zoom) will be sent a day before the seminar to the first 75 registered participants. For technical questions and registration, please send an email to paleodyn@iup.uni-heidelberg.de with the mail header “CVAS lecture series”. **Contact:** Kira Rehfeld (krehfeld@iup.uni-heidelberg.de)

