Seminar: “Measuring, reconstructing and modelling Earth's climate variability across spatial and temporal scales”

**Module**: Bachelor (PSEM) / Master (MVSem)

**Language**: English (German optionally, tbd in first meeting)

**Credit points**: 3 / 6 ECTS for Bachelor / Master

**Content**: Student talks on the topic of climate variability on different time scales with joint discussions afterwards.

**Time**: Tuesdays, 16:15-18:00, exact dates below

**Scope**: The seminar includes the preparation of a talk for one of the topics listed below. Besides the oral presentation (30min), a hand out (max. 1 page) in case of Bachelor students or a written report (5 pages) for Master students should be provided. The seminar requires active participation in all sessions. Grades will be assigned according to the evaluation of the talk and, in case of MVSem, the written report.

**Number of Participants**: 12

**Registration**: is closed

**Contact**: beatrice.ellerhoff@iup.uni-heidelberg.de

**Lecturers**: Dr. Kira Rehfeld & Beatrice Ellerhoff

**The seminar will be held online**: [https://heiconf.uni-heidelberg.de/cyfa-uvwf-dkx9-c7mh](https://heiconf.uni-heidelberg.de/cyfa-uvwf-dkx9-c7mh)
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<tr>
<th>Date</th>
<th>Topic</th>
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<tr>
<td>03.11.2020</td>
<td>Introduction to climate variability across scales, discussion of seminar organization</td>
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<tr>
<td>10.11.2020</td>
<td>1. Climate variability - Mechanisms and Reconstruction</td>
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<tr>
<td>17.11.2020</td>
<td>2. Centennial to millennial variability</td>
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<td>24.11.2020</td>
<td>3. Glacial-Interglacial changes</td>
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<td>01.12.2020</td>
<td>4. Dansgaard-Oeschger events</td>
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<td>08.12.2020</td>
<td>5. Human evolution and climate variability</td>
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<td>15.12.2020</td>
<td>6. Climate variability in the Common Era from models and proxies</td>
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<td>12.01.2021</td>
<td>7. Synoptic changes/ storm tracks</td>
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<td>19.01.2021</td>
<td>8. Impact of climate variability on near-term policy choices and the value of information on the example of wind energy production</td>
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<td>26.01.2021</td>
<td>9. The Concept of equilibrium climate sensitivity and its relevance to future climate</td>
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<td>02.02.2021</td>
<td>10. Extreme events in a changing climate: Variability is more important than averages</td>
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<td>09.02.2021</td>
<td>11. Global heating and its attribution</td>
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<td>16.02.2021</td>
<td>12. tba</td>
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If you have problems accessing the literature via the university network (e.g. VPN), please contact beatrice.ellerhoff@iup.uni-heidelberg.de

In the scope of this seminar, it is important to focus on the main findings of the provided literature (often contained in the figures). An explanation of these main findings forms the basis for our discussions throughout the seminar. Questions can be additionally clarified in the personal meetings before the talk.

A short guide towards paper reading can be found here: https://towardsdatascience.com/how-to-read-scientific-papers-df3afd454179. It could be worthwhile developing your own strategy (e.g. marking with different colors, summarizing the key points in tables or mind maps) not only for this seminar but also for a Bachelor/Master thesis.

Background knowledge on paleoclimate science and environmental physics:
- Bradley, Raymond S.: Paleoclimatology: reconstructing climates of the Quaternary
- Roedel, Walter: Physik unserer Umwelt: die Atmosphäre

Seminar topics (please pick one):

1. Climate variability - Mechanisms and Reconstruction

2. Centennial to millennial variability

3. Glacial-Interglacial changes


4. Dansgaard–Oeschger events


5. Human evolution and climate variability

- **Miikka Tallavaara, Miska Luoto, Natalia Korhonen, Heikki Järvinen, Heikki Seppä:** Human population dynamics in Europe over the LGM, *Proceedings of the National Academy of Sciences* Jun 2015, 201503784; DOI: 10.1073/pnas.1503784112


6. Climate variability in the Common Era from models and proxies

7. Synoptic changes/ storm tracks

8. Impact of climate variability on near-term policy choices and the value of information on the example of wind energy production

9. The Concept of equilibrium climate sensitivity and its relevance to future climate

10. Extreme events in a changing climate: Variability is more important than averages
11. Global heating and its attribution

