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Researching and Shaping Climate Futures

J. Baehr, J. Behrens, L. Borchert, M. Brüggemann, L. Kutzbach, K. Linscott, A. Oberg

3rd course day – April 23rd, 2026

Moderator: Lars Kutzbach

Course coordination: Michael Brüggemann, Lars Kutzbach, Kat Linscott
Contact: Kat Linscott (katherine.linscott@studium.uni-hamburg.de)

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Today's Schedule

- Introduction to poster task and grading criteria, and poster session task (L. Kutzbach), 20 min
- Input(s) and plenary discussion: *Epistemic pluralism and climate science* (K. Linscott, G. Thway, M. Militzer), 30 min
- Input(s) and plenary discussion: *Transformative Science: What is it, how does it challenge traditional roles in science, and what could it mean for us (ICSS/CLICCS)?* (M. Brüggemann), 40 min
- Homework #3 (L. Kutzbach), 2 min

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Introduction to poster tasks and grading criteria; poster session task

Lars Kutzbach

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What is the task?

- Each student prepares her/his own poster (individually graded), but accompanied by group work / peer feedback / lecturer feedback.
- The group of students will organize two poster sessions on July 2nd and July 9th, 2026, where posters will be exhibited and presented.
- Students will work in groups on specific tasks needed for poster sessions.
- Best three posters will be presented by authors at CLICCS retreat on September 30th to October 2nd, 2026.

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Why a poster?

AGU Fall Meeting Dezember 2018, ©Jörn Behrens

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Why a poster?

- Important form of communicating research results in the natural (and social) sciences.
- Presents complex information as simple as possible.
- Is a communicative device / conversation starter.
- Supported by much more information than can be presented on the printed poster itself.

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What should the poster be about?

- Address the course question:

How can we research and shape the complex web of natural and societal dynamics constituting climate futures?

- Your poster: select **one** specific strategy of adapting to or of mitigating climate change (e.g., strategies of city governments, of companies, of environmental or science activists, of the oil industry, of media, …)

- The poster should deal with
  1) knowledge and research on dynamics supporting or hindering this strategy and
  2) an effective way to communicate/implement this strategy.

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What to think about before designing a poster?

Audience

- What is the target group? (in our case: the extended CLICCS/SICSS community)
- Which knowledge can be assumed?
- Which language will be used?

Core message

- Which message do I want to convey?
- What should be the main takeaway?

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What to think about before designing a poster?

Balancing act

- Poster must stand on its own (but will also be presented)
- Textual information ↔ visual information
- Scientifically sound ↔ attention-grabbing

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What to think about before designing a poster?

Preparation

- What do I want to say (1 sentence)
- Thinking, material collection
- Sorting (5-step procedure):

Talk

Plan

1. **Topic,** relevance for audience (motivation)
2. **Starting point**, current situation, the problem/knowledge gap
3. **Description of improvement** – where do I want to go?
4. **Path to solution**, methods, tools, strategies
5. **Generalization**

    What does this mean for audience?
    What is the take-home message?
    Summary

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What does a good poster involve?

- Tells a story (textually/visually);
- Clearly points to the key information;
- Is well-designed,

incl. legible, efficient use of space, not too much text, good combination of visual/textual information, clear structure and sequence

(→ separate input on April 30th by Kat)

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What does a good poster involve?

Introduction

- Motivation, overview
- Mental road map
- Raise interest
- Clear description of problem/knowledge gap
- Clear statement on objectives/research questions/hypotheses

Sections

- Structure
- Create re-entry points

Closing

- Repeat core message
- Find good closing sentence

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What does a good poster involve?

- Can be read from top left to lower right. Stress positions: top left and lower right, here you find the core information.
- Balance visuals and text - 50:50, but better 60:40 (start with key visuals; do they cover the main point?).
- Can be understood from far/ on an A4 print-out.
- Use headers to structure your poster.
- Start with figures and adapt text accordingly. (NOT the other way around!)

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Convincing poster presentation

- Clear and confident presentation to poster visitors.
- Key messages & highlights are made clear during presentation.
- Answers to questions are knowledgeable and clear.
- Find different ways through the poster
  - for your own little presentation speech,
  - for your answer to a specific question.

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Poster grading criteria

- Design (30 %)
- Content (50 %)
- Poster presentation to poster visitors (20%)

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Poster Grading Scheme

Design (30 %)

- Follows format guidelines (A0, portrait orientation)
- Visual appeal
- Clear and organized layout
- Logical flow of information
- Text and graphics readable from 1-2 m
- Efficient use of space
- Correct formatting and orthography

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Poster Grading Scheme

Content (50 %)

- Relevant and appropriate content:
  - ✓ Poster contributes to answering the overarching course question
  - ✓ Poster addresses one specific strategy of adapting to or of mitigating global change
  - ✓ Poster deals with both: 1) knowledge/research on dynamics supporting or hindering this strategy and 2) an effective way to communicate/implement this strategy. Both aspects do not need to be addressed equally.
- Clear structure of poster content: clear objectives, clear take-home messages

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Poster Grading Scheme

Content (50 %)

- Good depth of coverage
- Correctness regarding content
- Usage of relevant literature
- Useful images/figures
- Figures intuitively comprehensible
- Appropriate references of sources
- Precise language

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Poster Grading Scheme

Poster presentation to poster visitors (20%)

- Precise, concise and clear oral presentation (2-3 min)
- Convincing and comprehensible “guided tour” through poster
- Able to competently answer questions

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Poster: Updated Timeline

Task	until
Class: Introduction to poster tasks and grading (Lars)	23.04.26
Homework: Post first ideas for a poster on the blog (100-200 words)	30.04.26
Class: Input on poster design (Kat); Starting organisation of self-organized poster session (Kat)	30.04.26
Homework: Post proposal for poster topic including references on the blog (200-400 words)	21.05.26
Class: Poster session organization (Kat)	21.05.26
Homework: Comment on one poster idea: 50-100 words	04.06.26
Q&A poster task	04.06.26
Homework: prepare first version of poster (digital and A4 printout)	11.06.26
Class: Poster drafts feedback - speed dating	11.06.26
Time for students to prepare poster session	18.06.26
Poster clinic; Time for students to prepare poster session	25.06.26
Poster Session events I and II	02.07.26, 09.07.26
CLICCS Retreat: Presentation of awarded posters	30.09.-02.10.26

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Updated preliminary session plan

09.04.	Introduction to the course (L. Kutzbach); Introduction to the course blog (J. Behrens); Introduction to *Climate Futures* (L. Kutzbach)
16.04.	Mapping natural and societal dynamics constituting climate futures (A. Oberg);
23.04.	Introduction to poster task and grading criteria; poster session task (L. Kutzbach); Input on *Epistemic Pluralism in Climate Science* (K. Linscott et al.); Input on *Transformative Science* (M. Brüggemann)
30.04.	*Mathematical perspectives on climate futures* (J. Behrens); Introduction to poster design and starting organisation of poster session task (K. Linscott); Introduction to roles and role-playing (M. Brüggemann)
07.05.	*Can we predict climate?* (Johanna Baehr); 1st role-play on *epistemic plurality and transformative science in CLICSS* (students)
21.05.	*The changing Arctic in a warmer world - combining observations, experiments and modelling* (L. Kutzbach); Poster session organization (K. Linscott)
28.05.	*Communicating climate futures* (Michael Brüggemann); 2nd role-play (students)
04.06.	*Narrative-based near-term prediction of climate futures* (Leo Borchert); Q&A poster task
11.06.	Poster drafts feedback - speed dating
18.06.	Organisation of poster session
25.06.	Poster clinic; preparation of poster session
02.07.	Poster Session event I
09.07.	Poster Session event II
16.07.	Feedback and Conclusions (students and lecturers)

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What does it mean to be a "good" scientist?

Two debates:

1. **The truth question: Is science about truth? Are scientific knowledge claims superior to … ?**
2. **The value question: Is science value-neutral? Should scientists engage for value...?**

Ad. 1: Epistemic Plurality

Ad. 2: Transformative Science

As Concepts and Challenges to the orthodoxy of what science is about and what scientists should do

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Epistemic pluralism and climate science

Kat Linscott, Garmani Thway and Mats Militzer

What is science?

What is science?

Is science “the truth”?

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What is science?

- A method of gaining valid and reliable knowledge, based on testing theories against collective evidence (Giddens and Sutton, 2017)
- Relies on specific methods and representations (the scientific method, written & numerical representations, etc.) (Renn, 2020)
- Constructed through a continually evolving social process
- Subject to the *myth of neutrality*
  - Held as empirical/rational and free from emotions/values, but research questions are inherently shaped by the values of the researchers, funding bodies, and wider public (van Eck, 2024)

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Science and “the truth”?

- We often position science as superior to other knowledges
- Science is not the wholly encompassing truth of reality
- Decontextualized knowledge can be counterproductive in climate science

e.g., Climate Models

"no one experiences global mean temperature" (Hulme, 2010)

Is science the only way of knowing?

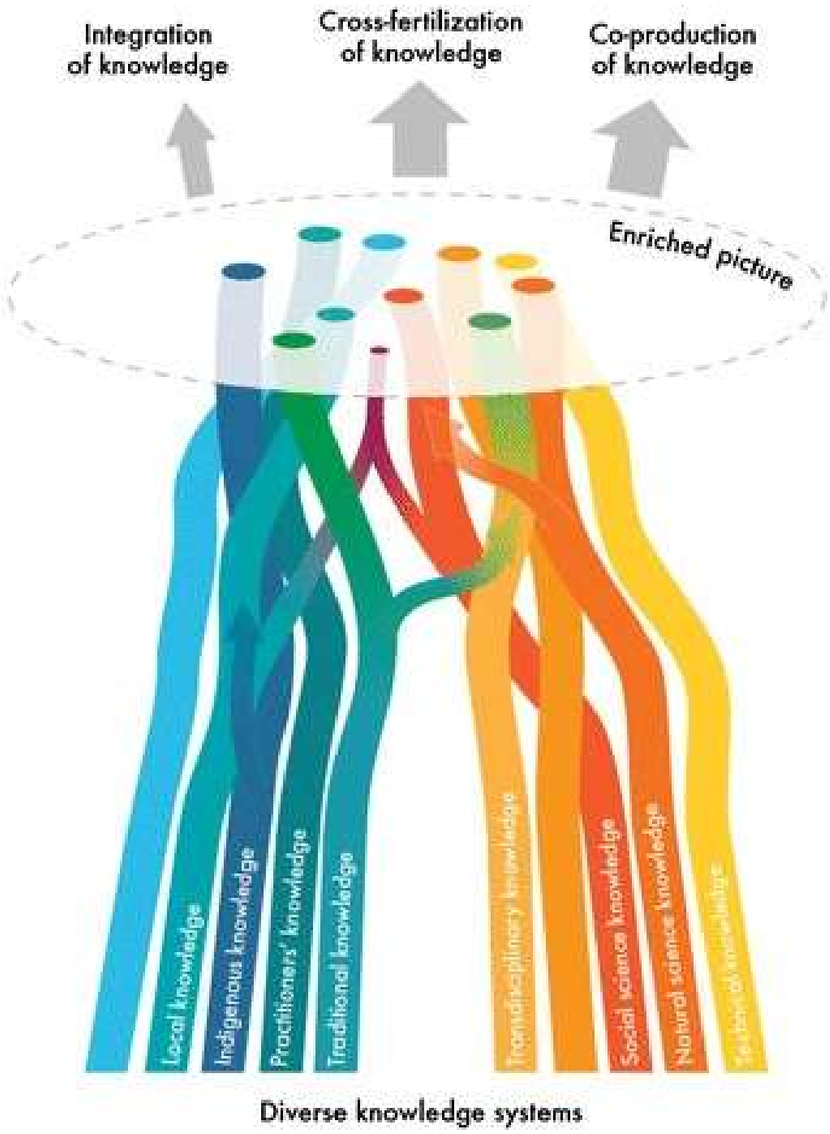
Is science the only way of knowing?

There are many ways of knowing

And they can all influence each other and be part of several knowledge systems (that can overlap), e.g. :

- Local knowledge
- Indigenous knowledge
- Practitioners' knowledge
- Traditional knowledge
- Transdisciplinary knowledge
- Social sciences knowledge
- Natural science knowledge
- Technical knowledge

(Tengö et al. 2014)



Tengö et al. 2014

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What is epistemic plurality/diverse ways of knowing?

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What is epistemic plurality & diverse ways of knowing?

Epistemic Plurality

- The notion that there are many types of knowledge/knowledge systems, and that we can include different ways of thinking and knowing.
- Provides critical reflexivity on the ways that we make and use knowledge within climate science.
- Diverse ways of knowing is one approach

*__Epistemic:__ of or relating to knowledge or knowing.

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Can (climate) science practices cause harm?

Based on the readings and your own experience, consider how ignoring diverse ways of knowing within climate science can create negative outcomes.

Consider also how diverse ways of knowing can improve the impact of climate science.

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How can climate science cause harm?

The dominance of science suppresses other ways of knowing.

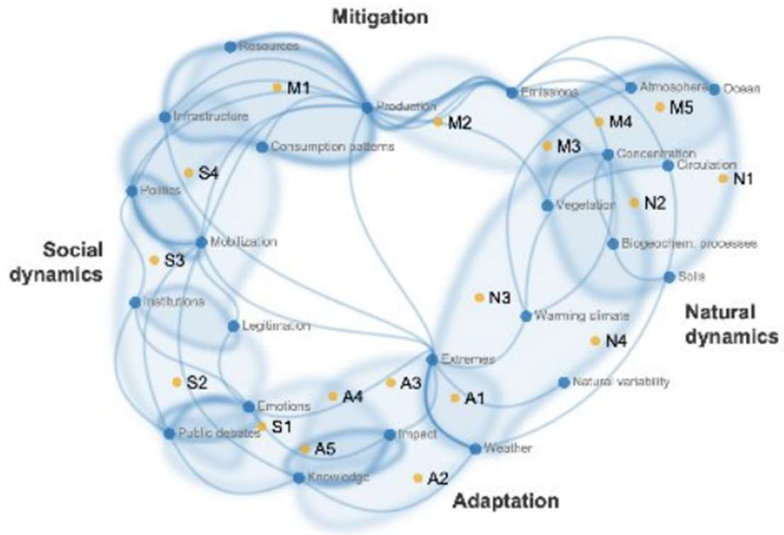
- Results in the reproduction of injustices & coloniality in climate science and governance
- De-legitimizing other knowledge systems & creates knowledge extractivism
  - ➢ Excluding other knowledges **harms communities, decreases adapt./mitig. success**, **reduces scientific understanding** & **constrains future visionings**

Therefore, incorporating concepts from diverse ways of knowing is fundamental for **successful** and **equitable climate science.**

Relevance of Epistemic Plurality for this course

Epistemic Plurality is important for:

- Reflecting on our **role as scientists**
- Developing **relevant understandings** of the link between societal & natural systems
- Researching/shaping climate futures: addressing the question “Which **climate futures** are **plausible**, and **how** can **desired** climate futures be realized?”



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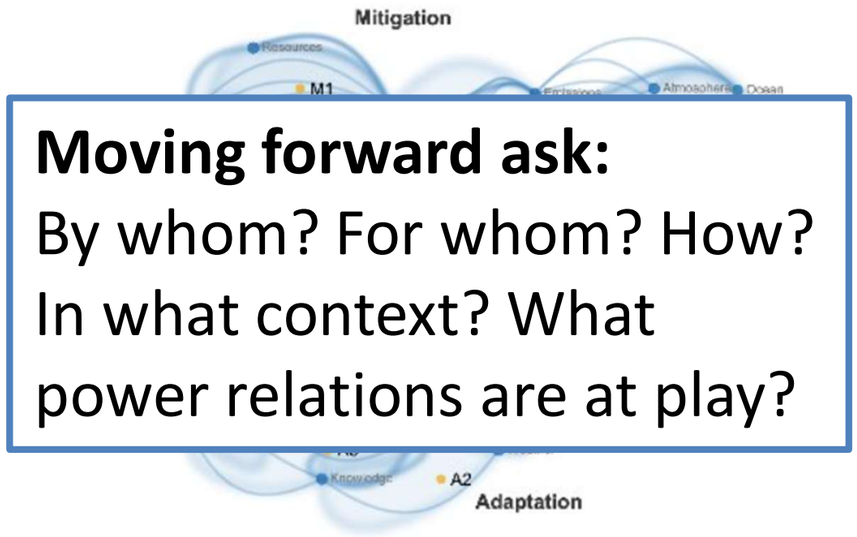

Moving forward ask:
By whom? For whom? How? In what context? What power relations are at play?

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Transformative Science: What is it, how does it challenge traditional roles in science, and what could it mean for us (ICSS/CLICCS)?

Michael Brüggemann

Back to the roots

Max Weber:

Distinction between world of values and world of facts (domain of science)

No conclusion possible from factual findings to values

Scientific practice should be value-free ("Wertfreiheit")

<- Which statements (by Max Weber) above are scientific according to Max Weber?

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Roles of scientists in society

Pielke's 4 Types of scientists – and how they should interact with politics

- The pure scientist
- The science arbiter
- The advocate
- The broker

How/Should they engage with politics?

What if scientists are faced with threats to core shared values in democratic societies?

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Transformative Science as a concept

What is the main idea of transformative science?

What does transformation (transformative) mean in this context? Any type of change?

More concretely, what does transformative science entail according to the texts?

What does reflexivity mean?

Should stake holders determine our research questions and interpet our data for us?

Is transformative research the same as partisan research or pursuing personal interests?

Does the call for transformative research imply replacing basic research?

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What turns research into transformative research?

What other things besides research should transformative academics worry about?

Decide the public scholar you want to be!

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Group discussions

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Discussion Questions

In groups of 4 students:

- What would change in CLICCS or ICSS if we want(ed) to do transformative research/teaching and take into account epistemic diversity?
- Are we already transformative?
- What are the (potential) benefits and risks associated with transformative science and taking epistemic diversity seriously?

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Homework # 3

Lars Kutzbach

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Homework # 3a

Write and post a 100–200 words blog post that outlines your first idea for your poster.

- Please consider the criteria on expected content given on slide 7.
- Search for 2-3 scientific articles that relate to your poster topic as your poster should include references to the existing literature.
- Don’t forget to add the category “Blog Posts 2026” while making your posts.
- Submission deadline: 30 April, 2026

If you run into any problems, please contact Kat (katherine.linscott@studium.uni-hamburg.de)

Homework # 3b

a) Make notes on the discussions on epistemic plurality and transformative science on today´s course day (23.04.26).

b) Think about what would change in CLICCS and/or MICSS if we want(ed) to do transformative research/teaching and take into account epistemic plurality? Note one idea.

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Bonus Material