

Friday, Dec 14

- 09:00–09:45 | **Geisendorf:**
Internal selection and market selection in economic Genetic Algorithms
Presenter: Ricarda Winkelmann
- 09:45–10:30 | **Neubersch et al.:**
Operationalizing climate targets under learning: An application of cost-risk analysis
Presenter: Cécile Stehrenberger
- 10:30–11:00 | **Discussion**
- 11:00–11:15 | **Coffee break**
- 11:15–12:00 | **Verburg et al.:**
Methods and approaches to modelling the Anthropocene
Presenter: Hirokazu Takizawa
- 12:00–12:30 | **Discussion**
- 12:30–13:30 | **Lunch**
- 13:30–15:00 | **Synthesizing key concepts and challenges**

Organized by Carsten Herrmann-Pillath
(Max-Weber-Kolleg, Erfurt) und Axel Kleidon
(Max-Planck-Institut für Biogeochemie, Jena)

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Workshop

Cross-disciplinary perspectives on Anthropocene Studies: Human Agency in the Evolution of the Technosphere

December 13–14, 2018 | Seminary of the Archdiocese, Holzheienstrasse 15, 99094 Erfurt



The notion of the 'Anthropocene' has been introduced in the geosciences, but also gained much traction in the humanities as well (for a recent survey, see Malhi 2017). There are many initiatives in the arts and literature that aim at coping with this seismic shift in the perception of how humanity interacts with the Earth System. Our workshop aims at exploring the potential for cross-disciplinary cooperation to understand some of the central questions in approaching the Anthropocene. We recognize a deep gap between the debates in the different fields. In the sciences and economics, the discussion proceeds on a highly aggregate level of model-building, whereas in the humanities and the social sciences human agency in political, social and cultural contexts comes into focus, with a rich conceptualization of human interests, motivations, and conflicts (Bonneuil and Fressoz 2015).

The proposed workshop focuses on the question how technology and human agency interact under the conditions of the Anthropocene. In Anthropocene research, the concept of the technosphere has been suggested, in analogy to the well-established notion of 'biosphere' (overview in Donges et al. 2017). The technosphere is the entire complex system of human artefacts in the Earth system that enable the specific performances of human niche construction in the biosphere, and is the origin of dysfunctional effects, such as global warming (Zalasiewicz et al. 2017). Some researchers raise the question whether the technosphere has begun to manifest autonomous evolutionary dynamics which would eventually also shape and contain human agency in dealing with those challenges (Haff 2016). Can humans control and design technosphere evolution? Or, do we need to acknowledge that the technosphere obeys to its own laws and evolutionary mechanisms? Evidently, an answer to these most general questions would also impact on our understanding on specific feedback loops between technology, human agency and Earth system dynamics.

The question of the relationship between technology and human agency has been debated in the philosophy of technology for decades, with no clear result. Yet, there are important strands of thought even in economics that would approach technological change as an evolutionary process partly beyond human design and control (Arthur 2009). In the context of Science and Technology Studies, pertinent research has resulted in new approaches to human agency that highlight the mutually constitutive role of human actors and artefacts, with Actor Network Theory leading (Latour 2005). These intellectual developments have resulted in a wave of scholarship that discusses a wide range of variants of 'New Materialism' (such as Bennett 2010).

The workshop gathers participants from the sciences, philosophy, economics and sociology to explore the potential of cross-disciplinary approaches in research on human agency in the Anthropocene. A central question is how certain analytical frameworks in the sciences, such as feed-back loops in complex systems, can be related to corresponding concepts in economics, such as rebound effects, and in sociology, such as process analysis and social mechanism, in order to construct unified conceptual approaches to human agency. One core concern is to reflect upon the relevance of anthropocentric notions of valuation and action analysis that clearly dominate in economics, thus also impacting climate change models and resulting policy design.

The workshop adopts a specific format to enable cross-disciplinary and innovative dialogue, as well as including young researchers. Invited speakers submit existing papers that are accessible to a broader audience. These papers are presented by colleagues from other disciplines, with comments added (30 minutes). Chairpersons of sessions will be mostly young researchers from the applying institutions. With 20 participants, everybody assumes an active role. The speakers respond (15 minutes). Open discussion follows (45 minutes).

Thursday, Dec 13

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| 10:00–10:30 | Welcome |
| 10:30–11:15 | Donges et al.: The Technosphere in Earth system analysis: A coevolutionary perspective
Presenter: Urs Lindner |
| 11:15–12:00 | Kleidon: Thermodynamic foundations of the Earth system: Human activity
Presenter: Andreas Folkers |
| 12:00–12:30 | Discussion |
| 12:30–13:30 | Lunch |
| 13:30–14:15 | Jarvis et al.: Resource acquisition, distribution and end-use efficiencies and the growth of industrial society
Presenter: Sisi Sung |
| 14:15–15:00 | Herrmann-Pillath: The Case for a New Discipline: Technosphere Science
Presenter: Jörg Oberthür |
| 15:00–15:30 | Discussion |
| 15:30–16:00 | Coffee-Break |
| 16:00–16:45 | Szerszynski: Viewing the Technosphere in an interplanetary light
Presenter: Georg Kobiela |
| 16:45–17:30 | Weisz: The probability of the improbable: Society–nature coevolution
Presenter: Petra Gümplová |
| 17:30–18:00 | Discussion |
| 19:00–22:00 | Dinner (downtown) |