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WTMC SERIES

ON TEACHING &
LEARNING STS

Infrastructures Across Borders

(online workshop)

Workshop

2024(3)



WTMC

of Science, Technology and Modern Culture

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Directions

Instead of a map of how to get to Soeterbeeck, we provide a map of how to get to our chosen platform and an introduction of our guide for this journey...

As the infrastructural backbone for this online workshop, we will be using Zoom in connection with a shared google document. You find all links at several places in the program below. What can you expect? During most of the day we will make use of Zoom, sometimes we'll also use the shared google document to give you the chance to make collaborative notes and prepare questions for the presenters, or to simply exchange ideas and thoughts among each other.

On the second day of the workshop, you will be meeting up in small in person to work on two assignments. We will make sure that you have the contact details of your group, as well as instructions of what to work on, and leave it to you to arrange the rest.

We recommend that you otherwise join the workshop from a room that you have to yourself, with a strong internet connection, as we may at times make use of break-out sessions: experience shows that it can be tricky to have people who are in the same physical space spread out over different break-out rooms. So please make sure that you are in a physical space where you can individually join a break-out room for most of the workshop. If you are in a location close to other WTMCers, we do of course encourage you to meet up with others for a shared lunch or after-workshop drink!

Before the workshop starts, we will also provide you with links to watch the pre-recorded video lectures.

Practical notes

To do before the Workshop

Allow about two weeks for preparation of this workshop. The compulsory literature consists of roughly 270 pages. At 8 pages per hour, this takes about 34 hours. We expect you to spend about 6 more hours on reading the recommended literature, preparing the skills session, and pondering the connections between different parts of the programme. This amounts to 40 hours, which is the standard amount of preparation time for a workshop. In preparation, proceed as follows:

1. Read the detailed programme and pay special attention to the activities so that you know in advance what you need to prepare and think about – there is also a short survey we ask you to respond to before the workshop.
2. Read all the assigned literature before the start of the workshop. There is no time to read during the workshop. Make notes about what you don't understand, questions you would like to ask, things you want to discuss.
3. Watch the pre-recorded lectures, which are circulated before the start of the workshop. Perhaps some of the questions you noted down based on the readings are answered by the lectures; and almost certainly, new questions will arise. Make sure to keep track of your thoughts, comments and questions, so that we can draw upon them during the workshop. N.B. the time to watch the lectures was not counted as part of your 40 ours preparation time, but as time you would normally spend at the workshop (you will see that our online days are short to reduce the number of hours spent behind the screen per day).
4. Check the programme to see if you are a discussant for one of the PhD presentations. Look at the instructions towards the end of this programme which contains guidelines for presenters, discussants and all others!
5. All mentioned time-slots are expressed in **Central European Time (CET)**. In case you are in a different time zone, please use websites such as <https://www.timeanddate.com> to convert these times to your own time zone.
6. We will meet on ZOOM, using the same link for all three days that have online meetings.
7. For some activities, we will ask you to upload your work onto surfdrive or put notes into google drive. In principle, we use the surfdrive for uploading files which has been shared with you in the e-mail. However, for quicker notes (and if the surfdrive is causing technical problems), you can upload onto a google drive folder.

Attendance and cancellation

- *The workshop will be a mediated, largely synchronous event with asynchronous elements (e.g. pre-recorded lectures).* In the context of this workshop, attendance means being logged on with your camera on during synchronous events (e.g. Q&As, PhD presentations, exercises), as much as bandwidth allows. In order to prevent connection problems, we recommend to use a wired internet connection. Almost all modern routers allow for connections with a network cable. It also means participating in the asynchronous activities that we have included in the programme in order to limit screen fatigue.
- In order to receive credit for attending the workshop, *you are required to be present throughout the entire event.* Only calamities are grounds to depart from this rule. If this creates problems, then please contact the coordinators beforehand and as soon as possible.!
- If, for any reason, you are unable to attend the workshop, please inform the WTMC secretariat (wtmc@utwente.nl) as soon as you can, putting the training coordinators Alexandra and Evelien in CC. We may be able to offer your place to someone on the waiting list if we know soon enough. If notice of cancellation is received more than 10 working days prior to the start of the workshop, you will receive a refund for all of the fees, minus €150 to cover the costs of administration and course materials. In the case of cancellations received less than 10 working days before the start of the workshop, fees and any other costs that have been incurred by WTMC will not be refunded.

Programme (in CET)

Monday, 4 November: Infrastructures All Below		
12:45 – 13:45	1.1	Logging in & welcome
13:45 – 14:00		Brief coffee break
14:00 – 14:30	1.2	Introducing group work & formulating questions
14:30 – 15:00		Coffee break
15:00 – 15:45	1.3	Q&A with Geoffrey Bowker, <i>Infrastructures Must Die</i>
15:45 – 16:15		Coffee Break
16:15 – 16:45	1.4	PhD Presentations
16:45 – 17:00		Reflections on Day 1
Tuesday, 5 November: Group Activities		
TBD by you	2.1	Skills 1 – Supervision Issues
	2.2	Core Reading 1 – Mind-mapping
Wednesday, 6 November: Urban Infrastructures		
10:00 – 10:15		Checking In: What Kept You Awake?
10:15 – 11:00	3.1	Q&A with Sulfikar Amir, <i>Techno-Nationalist Urbanism and the Making of Indonesia's New Capital</i>
11:00 – 11:30		Coffee break
11:30 – 12:30	3.2	Core Reading 2: reporting back
12:30 – 13:30		Lunch break
13:30 – 14:30	3.3	Skills 2: reporting back
14:30 – 15:00		Coffee break
15:00 – 15:45	3.4	Q&A with Anique Hommels, <i>Infrastructural Breakdown</i>
15:45 – 16:00		Reflections on Day 2
Thursday, 7 November: Transnational Infrastructures		
10:00 – 10:15		Checking In: What Kept You Awake?
10:15 – 11:00	4.1	Q&A with Nina Klimburg-Witjes, <i>Infrastructures of Earth-Space Relations: Following a Rocket Around</i>
11:00 – 11:30		Coffee break
11.30 – 12:15	4.2	Q&A with Francesca Musiani, <i>Infrastructuring Digital Sovereignty: Digital Self-determination as a Set of Infrastructure-embedded Practices</i>
12.15 – 13.30		Lunch break
13:30 – 14:15	4.3	Q&A with Huub Dijkstra, <i>Bordering the Earth: Infrastructures, Geopolitics and the Emergence of Permacrisis</i>
14.15 – 14:30		Coffee break
14:30 – 15:30	4.4	Closing discussion, farewell & virtual group picture

Introduction to the Workshop

Welcome to the Workshop. Together with our guest speakers, we will be probing into the topic of infrastructure over the coming weeks. The exploration starts here, well before you arrive at the online event. This programme, together with some texts, provides the luggage for your journey. Travel well prepared!

It is advisable that you first carefully study the whole programme, before embarking on the actual reading. This should help you get a sense of the themes and how they connect, and how specific texts fit in those themes. Also, some assignments require preparation, others require you to bring certain things. And finally, we will have a number of participant presentations. Take care to know whether you are scheduled as a discussant for one of them.

For each of you, the ideas and concepts discussed during the workshop will have different kinds of relevance. This depends on your research topic and method, the phase you are currently in, and your personal interest. The workshop is not a “one size fits nobody” event, and getting the most out of it does require some work. Make sure that you have in mind what you would like to learn, and how that can be achieved.

We will work with a variety of different formats and assignments throughout the workshop. The lectures have been pre-recorded, allowing you to prepare by watching them in the lead-up to the workshop itself, and allowing us to focus our valuable time that we have together in the synchronous setting of a Zoom environment on dynamic and interactive discussions with the speakers. Most of the discussions will take place online; however, on the second day of the workshop, we invite you to convene in small groups at a location of your choice (or online if meeting up in person is not possible).

In general, it is good practice to prepare one or more written questions about the reading material and about the pre-recorded lectures for each session. This helps focus your attention during the workshop, and it ensures that you have something to contribute to the discussion. Of course, going with the flow and welcoming things the way they happen to come to you, is also an important mode of learning. We will provide ample check-in moments to share what we are taking away from the experience throughout the workshop. So let's get started!

Infrastructures Across Borders

Infrastructures are all around, or perhaps rather ‘all below’: the word literally means ‘those structures that are below’. Often, they are understood as “big, durable, well-functioning systems and services” that have important consequences for social organization (Edwards et al. 2009) – i.e. roads and railways, power lines, communication networks or water management systems are key examples. But of course, infrastructures also include our knowledge production and transfer systems (of which WTMC itself is one), financial systems, worldwide markets, and, arguably, our cultures and their very norms and standards by which we interact. This autumn workshop delves into the making, maintenance and destruction of infrastructures as well as their performativity, which has been a vital topic in STS research for decades. We will pay particular attention towards the spatiality of infrastructures: think of their participation in border-making (and thereby governing over life and death) and/or border-crossing, their varied materializations in different localities across the globe and even in outer space.

Together with colleagues who have developed different takes on the issue, we will take stock of rich past and ongoing research in the field. Moreover, we will use the workshop as a platform to engage participants and lecturers in a critical discussion on how STS scholarship on ‘infrastructures’ can function as a productive intermediary or means of intervention in a geographically heterogeneous world full of tensions.

On Monday, we begin our journey with an introductory session. Geoffrey Bowker as our guest speaker helps us to set some foundations for STS approaches to the study of infrastructures – while also provoking us to wish for their (un)timely death.

On Tuesday, we invite you to meet up in small groups, making use of urban or digital infrastructures of your choice, to work on the skills assignment and core reading assignment for this workshop. These encompass a combination of navigating supervision challenges, critical reading and connecting theory to your own work.

On Wednesday, we explore the creation and breakdown of urban infrastructures in different geographical contexts together with Sulfikar Amir and Anique Hommels.

On Thursday, we cross international borders together with our final set of guest speakers, Nina Klimburg-Witjes, Francesca Musiani and Huub Dijkstra.

We hope you will enjoy preparing for this workshop and look forward to meeting you (again) in a few weeks!

Evelien de Hoop and Alexandra Supper

Detailed overview

Monday, 4 November: Infrastructures All Below

1.1 Welcome

We will kick off our workshop with a short opening session to get to know each other and discuss the programme of the coming days.

1.2 Introducing group work & formulating questions

This short session serves two main purposes:

- The groups who will be meeting up on Tuesday will each pick one or two of the ‘supervision issues’ (see session 2.1 below) and discuss this with the other groups to ensure that not all groups will be dealing with the same supervision issue.
- You get a chance to briefly pre-discuss, in small break-out groups, some questions that you would like to raise during the Q&A with our first speaker, Geoffrey Bowker.

1.3 Q&A with Geoffrey Bowker, Infrastructures Must Die

In a classic manifesto, Stephen Cairns and Jane M. Jacobs made the impassioned plea: Buildings Must Die. In this talk I take seriously the concept that Infrastructures Must Die. Many of our infrastructures have roots in the period from say 1880 to 1960; periods when, as Timothy Mitchell describes, there was a prevailing assumption that our world was eternally one of growth, continuity and surplus (excess). I examine the death of infrastructure from a material; an economic; and a social point of view. I argue that this death, perhaps unlike our own, is frequently: “a consummation devoutly to be wished” (Hamlet).

Required Reading:

- Appel, H., Anand, N., and Gupta, A. (2018). Introduction: Temporality, Politics and the Promise of Infrastructure. In: Anand, N., Gupta, A., Appel, H. (Eds) *The Promise of Infrastructure*. Duke University Press. The entire book may be downloaded here: <https://read.dukeupress.edu/books/book/2493/The-Promise-of-Infrastructure>.

1.4 PhD presentations

1. Presenter: Marcus van Toor, Discussant: Joe Litobarski

Important: See the guidelines for presenters and discussants at the end of this reader.

Tuesday, 5 November:

On Tuesday, you will be meeting up in small groups of around four participants to do some group work. We leave it to you to arrange the finer details of this, in terms of the time and location of your meeting, though we have already identified a city in which you could meet up, taking into account the answers you've provided in the registration form.

We strongly recommend that you contact each other within your subgroup via e-mail to discuss when and where you will be meeting several weeks before the workshop. Do make sure that you set aside at least 90 minutes for each of the two agenda points, and that you take a proper break in-between.

The group composition will be as follows:

Group	City	Name	
1	Nijmegen	Wytske	Hepkema
1	Nijmegen	Ching-Han	Kuo
1	Nijmegen	Maaike	Pierik
1	Nijmegen	Ilse	Dijkstra
2	Utrecht	Jonathan	Arentoft
2	Utrecht	Renate	Reitsma
2	Utrecht	Marcus	van Toor
2	Utrecht	Joe	Litobarski
2	Utrecht	Amna	Pottarath
3	Amsterdam	Jessica	Coetzer
3	Amsterdam	Hanneke	de Boer
3	Amsterdam	Ena	Vojvodic
3	Amsterdam	José Bernardo	Pedroso Couto Soafres
4	Rotterdam	Fenna	Nijboer
4	Rotterdam	Shachi	Mokashi
4	Rotterdam	Sevgi	Fruytier
4	Rotterdam	Aisha	So

2.1 Skills session 1: Supervision Issues

This activity deals with (potential) issues concerning the supervision of your PhD work. Although many of you will hopefully be very happy with your supervisors, most of you will also have encountered (or can imagine) problems. To mention just a few common examples, this might include your two or three supervisors disagreeing with each other about your work, wanting you to go in directions that you dislike, or not reading your work properly.

Before the workshop, think about the issue that you would like to see discussed, and submit it via an anonymous survey, at the latest at 10:00 on Friday, November 1st.

We will collect all responses anonymously before the workshop. During the workshop, each group picks one of the issues to ‘adopt’. Our recommendation is that you pick an issue that none of the group members submitted yourself, but of course (also considering the anonymous submission), this is not a hard rule that we plan to enforce in any way. Within your group, discuss possible solutions or ways out of this dilemma, and prepare a short role-play in which you sketch out a possible solution. Please create a video of maximum 5 minutes (or some other form of documentation that can be experienced in 5 minutes or less) of this role-play and submit it to our shared Surfdrive or google drive by 6pm on Tuesday. We recommend the Surfdrive option if you can make it work, and the google drive only as a back-up if the Surfdrive is causing technical difficulties (see p. 6 of document for details).

We will watch the output together during Wednesday’s skills session and delete it after the end of the workshop. Please do not create local back-ups of the work of other groups, and keep back-ups of your own group work only if everyone within the group agrees to it!

2.2 Core reading

In this first core reading session, we approach the theme of the workshop by with two complementary texts. The Handbook chapter by Stephen Slota and Geoffrey Bowker sets out the very many ways in which (some of) STS has engaged with infrastructure as an analytical concept. While reflecting on the use of this concept in knowledge production, it is in itself rooted in specific knowledge infrastructures with a strong geographical footing in predominantly Europe and North America. The text by Leandro Medina takes the latter observation as its starting point, and explores alternatives informed by ideas around epistemic decentring.

When discussing these texts in your group, we would like to ask you to produce a mind map based on these two texts, consisting of three elements:

- Some kind of mapping of core ideas from the texts themselves.
- Your own take on these texts: what do you find interesting/inspiring/problematic/different from literature you read earlier/... etc.?
- Relations between these texts and your own work: how might you use and/or contribute to some of the texts’ sensitivities through your own research?

There are, of course, very many ways to produce a mindmap. We suggest you make one single mindmap as a group, and you are free to choose how you do so. Please upload your mindmap in to our shared Surfdrive or google drive by 6pm on Tuesday. We will discuss the mind maps together during Wednesday’s skills session, and delete it again after the end of the workshop. Please do not create local back-ups of the work of other groups, and keep back-ups of your own group work only if everyone within the group agrees to it!

Required Reading:

- Slota, S.C., and Bowker, G. (2017). 18: How Infrastructures Matter. In: Felt, U., Fouché, R., Miller, C.A., and Smith-Doerr, L. (Eds). *The Handbook of Science and Technology Studies*. Cambridge, MA: The MIT Press, pp. 529-554.
- Medina, L. 2024. On Epistemic Decentralising: Infrastructuring Knowledge beyond Global North. *Globalisation, Societies and Education*.

Wednesday, 6 November: Urban Infrastructures

3.1 Q&A with Sulfikar Amir, *Techno-Nationalist Urbanism and the Making of Indonesia's New Capital*

This lecture critically examines the construction of Indonesia's new capital, a project rushed to commence in the mid of 2022 despite financial constraints and a lack of proper planning. Called "Nusantara", the new capital is a pet project of President Joko Widodo whose ambition is not only to relocate the capital from Jakarta to East Kalimantan within two years, but also to build a new modern city as his political legacy that fuses Indonesian nationalism and technological prowess in urban space. Using a critical framework of techno-nationalist urbanism, this paper unpacks the core assumptions underpinning Widodo's adamant decision to undertake a large-scale urban project of his dream. It interrogates two logical fallacies upon which the Nusantara project is grounded, and exposes how techno-nationalist rhetoric is mobilized to vindicate the project. Furthermore, the framework is used to foray into the techno-political imaginaries embodied in the technical and symbolic configurations of Nusantara's urban landscape. Lastly, the paper addresses the political repercussions the Nusantara project has on democratic regression in Indonesia due to Widodo's desire to pursue the new capital at all cost.

Required Reading:

- Amir, S., *Techno-Nationalist Urbanism in the Making of Indonesia's New Capital* (unpublished draft)
- Amir, S. (2007), Nationalist rhetoric and technological development: The Indonesian aircraft industry in the New Order regime, *Technology in Society* 29, p. 283–293.

3.3 Core reading session, part 2: reporting back on your mindmaps

During this session, each subgroup has five minutes to present their mindmaps. This is not a lot of time to present an entire mindmap – so we suggest you focus on the following:

- What happened when you started putting everything from the two readings into some sort of "coherent whole" (i.e. the mindmap)?
- Were there any frictions within the group with regards to your own take on the readings and/or their relation to your own work? And were there points you agreed upon or felt strongly about?

We will then discuss the points raised in plenary.

3.3 Skills Session, part 2: reporting back about supervision issues

During this session, each subgroup has five minutes to share with the rest of the workshop participants what they have produced yesterday in response to the supervision issue they have 'adopted'. We will then discuss these responses in plenary.

3.4 Q&A with Anique Hommels, *Infrastructural Breakdown*

This lecture focuses on how cities respond to the breakdown of infrastructure, as well as the various implications of urban responses to breakdowns for innovation and change in infrastructure systems. It distinguishes three approaches in the overlapping and interdisciplinary field of LTS,

STS and infrastructure studies focusing on “vulnerability”, “disaster” and “crisis” respectively. Analysing a number of empirical examples, this lecture explores articulations of urban responses to breakdown in these academic fields, by looking at the underlying theoretical assumptions about infrastructure and technology, the different conceptualisations of vulnerability, disaster and crisis, as well as the various implications for innovation and transformation. The first approach draws on historical LTS work that studies the vulnerability of critical infrastructure in cities and system interdependencies. The second approach, largely stemming from other strands of sociological and historical STS work, looks at urban sociotechnical responses to disaster. The third approach focuses on how users of infrastructure respond to conditions of infrastructural precariousness. The lecture compares and contrasts all three perspectives, and uses the analysis to propose some avenues for further interdisciplinary research in the area.

Required Reading:

- Fortun, K., Knowles, Scott G., Choi, V., Jobin, P., Matsumoto, M., de la Torre, P., Liboiron, M. and Murillo, L. (2017) ‘Research Disaster from an STS perspective’ in U. Felt, R. Fouche, C. A. Miller, and L. Smith-Doerr (eds.) *The Handbook of Science and Technology Studies*. Cambridge, MA: MIT Press, pp. 1003-1028.
- Millington, N., and Scheba, S. (2021) ‘Day Zero and The Infrastructures of Climate Change: Water Governance, Inequality, and Infrastructural Politics in Cape Town’s Water Crisis’, *International Journal of Urban and Regional Research*, 45(1), pp. 116–132. <https://doi.org/10.1111/1468-2427.12899>

Optional further reading:

- Williams, R. (2021). Crisis: The Emergence of Another Hazardous Concept. *Technology and Culture* 62(2), 521-546. <https://dx.doi.org/10.1353/tech.2021.0062>.

Thursday, 7 November: Transnational Infrastructures

4.1 Q&A with Nina Klimburg-Witjes, Infrastructures of Earth-Space Relations: Following a Rocket Around

How do future visions of space shape forms of European integration in the present, and how, conversely, do geopolitical relations on Earth shape how and by whom these futures are imagined and inscribed in infrastructural processes? My talk explores how large-scale technological infrastructures are shaped by how the future of space is envisioned and vice versa. These concerns speak to longstanding methodological questions in infrastructure studies: How can the different dimensions of infrastructural projects be connected and their complex relations described? In short, how to locate where the action is? But what changes when such questions are extended to infrastructures beyond Earth? Taking Ariane as a case study, I will show how ideas of collectivity and connectivity have come under scrutiny in building and maintaining the Ariane and how it displays multiple and competing forms of infrastructural dis/integration. ‘Following the rocket around’ to production sites, policy conferences, and foresight departments, this infrastructural ethnography traces how political, spatial, social, and economic futures are occupied in the present through large-scale technological projects.

Link to the ERC-funded research project FutureSpace: <https://futurespace-project.eu>

Required Reading:

- Klimburg-Witjes, N., & Trauttmansdorff, P. (Eds.). (2023). *Technopolitics and the Making of Europe: Infrastructures of Security*. Routledge. DOI: 10.4324/9781003267409 (Read the Introduction chapter)
- Redfield, P. (1996). Beneath a Modern Sky: Space Technology and Its Place on the Ground. *Science, Technology, & Human Values*, 21(3), 251–274.

Optional further reading:

- Opitz, S., & Tellmann, U. (2015). Europe as Infrastructure: Networking the Operative Community. *South Atlantic Quarterly*, 114(1), Article 1. <https://doi.org/10.1215/00382876-2831356>

4.2 *Q&A with Francesca Musiani*, Infrastructuring Digital Sovereignty: Digital Self-determination as a Set of Infrastructure-embedded Practices

This talk takes stock of recent research conducted through the theoretical lens, grounded in science and technology studies (STS) and more specifically infrastructure studies, that I have previously defined as “infrastructuring digital sovereignty” (Musiani, 2022).

With this concept, I address “digital sovereignty” beyond its strictly legal interpretations and its rhetorical uses in political discourses, by understanding it “from within” as an ongoing series of negotiations, practices, struggles and controversies embedded in infrastructures, their creation, their development and their maintenance. The talk will discuss how we can provide better empirical and theoretical understanding, informed by the social sciences, of digital sovereignty as a set of process and co-constructed techniques, practices and norms “in the making”. I will focus in particular on the study of practices related to the governance of/by infrastructure, e.g. modifications made to, and co-optations of, digital infrastructures for political objectives related to self-determination and digital sovereignty. I will specifically examine how technical development is enacted at different infrastructural levels, how it intersects with industrial/economic (as well as regulatory) practices, and how it is affected by them. I will discuss how an increasingly pertinent contribution to the study of digital sovereignty today is providing in-depth accounts of concrete practices and arrangements related to the processes of “infrastructuring” digital sovereignty, with the objective of explaining (a) how technical infrastructures and architectures are developed and deployed, and (b) how economic and industrial policies are drafted, implemented and adapted to politico-economic realities. I will draw on my most recent completed research project, focused on Russia, to illustrate these points.

Required Reading:

- Musiani, F. (2022). Infrastructuring digital sovereignty: a research agenda for an infrastructure-based sociology of digital self-determination practices. *Information, Communication & Society*, 25(6), 785–800. <https://doi.org/10.1080/1369118X.2022.2049850> Full text available on [Hal](#)
- Ksenia Ermoshina, Benjamin Loveluck, Francesca Musiani, 2021, “A market of black boxes: The political economy of Internet surveillance and censorship in Russia”, *Journal of Information Technology & Politics*, published online: 01 Apr 2021, DOI: [10.1080/19331681.2021.1905972](https://doi.org/10.1080/19331681.2021.1905972). Full text available on [Hal](#)

4.3 Q&A with Huub Dijstelbloem, *Bordering the Earth: Infrastructures, Geopolitics and the Emergence of Permacrises*

In 2022, permacrisis - a word that describes the feeling of living through a period of war, inflation and political instability - was chosen as Collins Dictionary's word of the year. Although the accuracy and performative power of the term 'permacrisis' is questionable, a situation of 'permacrisis' is recognisable when we analyse the introduction, development, transformation, collapse and revival of infrastructures across borders in the military, energy, climate and migration fields. In the name of crisis, infrastructures become sites of massive expansion, adaptation and political struggles, many of which become permanent or intertwined. In this lecture, Huub Dijstelbloem will explore the relationship between infrastructures, geopolitics and crises of a supposedly permanent nature. Drawing on an analysis of how state borders have been geopolitically redefined in response to international human mobility (see Dijstelbloem 2021, ch. 2), he will examine how infrastructures draw all kinds of borders, materially but also discursively, in different debates and in relation to different issues such as climate change and global health (see Dijstelbloem 2020). Drawing on STS literatures, philosophy of technology, international relations and political theory, the lecture aims to contribute to the reconceptualisation of infrastructures and borders, and a different understanding of the relationship between human and non-human mobility and the understudied notion of 'immobility' (see Boas et al. 2024) under conditions of proclaimed geopolitical crises.

Required Reading:

- Dijstelbloem, H. (2020). Bordering a Hybrid World: Infrastructural Isolation and the Governance of Human and Nonhuman Mobility. *Global Perspectives*, 1, Article 12789. <https://doi.org/10.1525/gp.2020.12789>
- Dijstelbloem, H. (2021). 'The Rise of Europe's Border Infrastructures', Chapter 2 in *Borders as Infrastructure: The technopolitics of border control*. The MIT Press. <https://doi.org/10.7551/mitpress/11926.001.0001>

Optional Further Reading:

- Boas, I., Farbotko, C., & Bukari, K. N. (2023). The bordering and rebordering of climate mobilities: towards a plurality of relations. *Mobilities*, 19(3), 521–536. <https://doi.org/10.1080/17450101.2023.2279095>

4.4 Closing discussion, farewell & virtual group picture

We will wrap our online workshop with some final reflections, a farewell session and a virtual group picture.

About the speakers

Geoffrey C. Bowker is Professor at the School of Information and Computer Science, University of California at Irvine, where he directs a laboratory for Values in the Design of Information Systems and Technology. Recent positions include Professor of and Senior Scholar in Cyberscholarship at the University of Pittsburgh iSchool and Executive Director, Center for Science, Technology and Society, Santa Clara. He also acted as the anchor teacher of the WTMC summer school in 2011. Together with Leigh Star he wrote *Sorting Things Out: Classification and its Consequences*; his most recent book is *Memory Practices in the Sciences*. In 2024, he received the Bernal Prize of the Society for Social Studies of Science in recognition of his distinguished contributions to the field of STS.

Sulfikar Amir is an Associate Professor of Science, Technology, and Society (STS) and a faculty member in Sociology Programme at the School of Social Sciences NTU Singapore. His research interests primarily focus on examining institutional, political, and epistemological dimensions of scientific knowledge and technological systems. He has conducted research on technological nationalism, development and globalisation, nuclear politics, risk and disaster, design studies, city and infrastructure, and resilience. He is the author of *The Technological State in Indonesia: the Constitution of High Technology and Authoritarian Politics* (Routledge, 2012), and the editor of *The Sociotechnical Constitution of Resilience: A New Perspective on Governing Risk and Disaster* (Palgrave, 2018).

Anique Hommels holds a Special Chair in Sociohistorical Technology Studies, supported by the Foundation of the History of Technology (SHT). She works at the Faculty of Arts and Social Sciences at Maastricht University, where she is a member of the Science, Technology and Society (MUSTS) research group. She has an interdisciplinary profile, combining historical and sociological studies of technology in society. Her research focuses on STS and the city, urban sociotechnical change, sustainability and obduracy. She is also interested in the dynamics of urban vulnerability and resilience, the governance of critical infrastructure, and urban responses to disasters. At the moment, she is involved in a JPI-Urban Europe project on urban transformation through co-creation in Living Labs.

Nina Klimburg-Witjes holds a TT-Professorship on “Infrastructures, Innovation and Global Politics” at the STS Department of the University of Vienna and is the Principal Investigator of the ERC-funded research project FutureSpace. Nina’s work centers on the dynamic relationships between infrastructures, innovation, and shifting geopolitical landscapes. Her research employs qualitative methods to develop a grounded understanding of the interplay between global politics and technological transformations, especially in relation to outer space governance. Nina’s work has been published amongst others in *Science, Technology and Human Values*, *Science as Culture*, *Science and Public Policy*, *Geopolitics and European Security*. She has published three edited volumes: *Border Politics*, with C. Günay (2016); *Sensing In/security*, with N. Pöchhacker and G.C. Bowker (2021); and most recently, *Technopolitics and the Making of Europe*, with P. Trauttmansdorff (2023). She received her PhD in Science and Technology Studies (STS) from the Technical University of Munich in 2017 and was co-leader of the research group “Science, Technology and

Security” of the Engineering Responsibility Lab. She previously held positions as a visiting researcher at the European Space Policy Institute in Vienna, and as a research fellow at the Austrian Research Foundation for International Development, the Austrian Institute for International Affairs and the Institute of Sociology at the Albert Ludwig University Freiburg.

Francesca Musiani is Research Professor at the French National Center for Scientific Research (CNRS). She holds a PhD in socio-economics of innovation (MINES ParisTech, 2012) and received her Habilitation to supervise doctoral research in sociology from Sciences Po Paris in 2022. She is Deputy Director of the Center for Internet and Society of CNRS, which she co-founded with Mélanie Dulong de Rosnay in 2019. Her research explores Internet infrastructures as tools of governance and power. Her home on the Web is here: https://cis.cnrs.fr/en/francesca_musiani/

Huub Dijkstra is Professor of Philosophy of Science, Technology and Politics and Scientific Director of the Institute for Advanced Study of the University of Amsterdam. Building bridges between science, research, society and policy-making, and methodological and conceptual innovation is central to his work. Previously, he was affiliated to the Netherlands Scientific Council for Government Policy (WRR) and the Rathenau Institute. At the WRR, he worked on food policy, international security, European cooperation, climate justice and long-term climate policy. At the Rathenau Institute, he advised the government and stimulated public debate on emerging technologies, privacy and information technologies, and biomedical developments.

About the coordinators

Evelien de Hoop is an assistant professor at the Athena Institute, Vrije Universiteit Amsterdam. Her research interests span across a variety of themes including but not limited to practices and politics of agriculture, landscape change, (digital) knowledge politics, health and healthcare, etc.. Evelien holds an MPhil degree in Geography and the Environment from Oxford University, and did her PhD at the Technology, Innovation and Society group at Eindhoven University of Technology. Her transdisciplinary research and education are rooted in STS, critical geography, post- and decolonial studies and (connected) history. She also coordinates the CLUE+ interfaculty research institute's Inclusive Landscape Transformations programme.

Alexandra Supper is an assistant professor at the Faculty of Arts and Social Sciences, Maastricht University. Her research interests include the role of role of sensory skills in scientific practice, the construction of scientific authority, the dynamics of (inter)disciplinary communities, as well as the role of sound technologies in popular music. She serves as (associate) editor of the journals *Science and Technology Studies* and *Journal of Sonic Studies*. Alexandra holds an MA degree in sociology from the University of Vienna (2007) and a PhD in science and technology studies, which includes WTMC training, from Maastricht University (2012).

List of Participants

First name	Surname	University	What is the topic of your research?
Jessica	Coetzer	VU Amsterdam	Digital Health Equity in the Netherlands.
Hanneke	de Boer	University of Groningen	I study the historically developed socio-cultural attitudes towards the menopause and how these attitudes shape women's experience of the perimenopause. My project is an interdisciplinary project, connecting the fields of history and psychology.
Sevgi	Fruytier	VU Amsterdam	My work focuses on the involvement of patients and publics in health research decision-making. I am interested in how people give meaning to these collaborations and what underlying assumptions and systemic structures hinder them from realizing their expectations. Moreover, I am curious to explore the various roles actors fulfill in such collaborations and their networks.
Aisha	So	Utrecht University	My research is about co-creation of knowledge in transdisciplinary agriculture projects. We are interested in how specific characteristics of knowledge-production spaces or disciplines affect the types of co-creation that are enabled or constrained. We are planning to investigate empirical contexts in which knowledge about plants is co-created with the goal of making agriculture more "resilient".
Ilse	Dijkstra	Maastricht University	The construction of the 'low socioeconomic status' as category in health inequality research and in health promotion. Currently, I am working on a paper based on the work of Bowker and Star. I study the infrastructure of the categorization of socioeconomic status in the Netherlands.
Wytske	Hepkema	Radboud University	Error correction in the nanosciences. One of my projects focuses on argumentation in scientific papers, how this changes over time, and the influence of new terms and categorization in argumentation (changes). In another project I conceptualize errors as a part of knowledge production, and using a case study aim to find out how nanoscientists construct something as an error.
Marcus	van Toor	University of Amsterdam	My PhD-project aims to study under which conditions (e.g. social, political, epistemological) scientific research takes place that substantiates government policy. The PhD-project aims to study three interconnected problems: (1) how science can find its way into policies in the Anthropocene, and how to cope with the dangers of (2) technocracy on the one hand and (3) relativism on the other.

Jonathan	Arentoft	Utrecht University	Crop genome editing offers potential for improving smallholders livelihoods through creation of improved crops. However gene editing also comes with several power and distributional risks detrimental to smallholders. Democratisation of the governance of crop genome editing, through the inclusion of needs and concerns of affected smallholders offer potential solutions. The research seeks to investigate such democratic ordering.
Ching-Han	Kuo	Radboud University	I am a PhD student working on a project called 'DISAPEER', which aims to investigate the recent editorial developments in journals and changes in peer review through content and social network analyses, ethnographic studies of editorial processes, and qualitative interviews with actors involved in reviewing.
Shachi	Mokashi	VU Amsterdam	In my PhD research, I follow people who engage in constructing and maintaining environmental (pollution) monitoring infrastructures. I study what kinds of claims various actors (technical experts, scientific experts, bureaucrats, residents) make using these monitoring infrastructures to work towards decontamination.
Maaïke	Pierik	Radboud University	This research aims to study which dilemma's emerge for astronomers between doing 'good science' and being responsive to societal needs and values, specifically during the development and operation of telescope facilities. This will be done by focusing on a real-time, longitudinal study of developments around the Africa Millimetre Telescope, which is a radio telescope that is currently being designed to be built in Namibia.
Joe	Litobarski	Maastricht University	I am a PhD candidate in the history of public cybernetics at the History Department and the Science, Technology, and Society Studies Research Programme of Maastricht University's Faculty of Arts and Social Sciences. I'm currently researching the transnational history of electronic democracy from the 1960s to the 1990s. I'm also interested in the history of cybernetics, information theory, neoliberalism, cyberspace and virtual public space, as well as in contemporary public debate around the future of digital democracy, social media and AI.
Renate	Reitsma	Leiden University	I am looking into the controversies on Deep Seabed Mining research that particularly focuses on the knowledge production on the environmental risks of DSM. Knowledge production happens through close interactions between science, industry and governments who all have a different interest. An important issue is the scientific credibility that is questioned in

			these interactions when either industrial actors or scientists present research on the impacts of mining.
Fenna	Nijboer	Erasmus University Rotterdam	In my research project, the rather new phenomenon of assetization of care, in which health services are turned into assets to generate revenues for a wide range of actors, is studied. Even though private organizations have always been central to the Dutch healthcare system, the recent entrance of for-profit actors and internationally operating enterprises (“private equity”) introduces alternative ordering logics, valuation instruments and value regimes that are hardly understood in the healthcare context. This assetization of care may have far-reaching consequences for quality of care, working conditions and access to care. This PhD project focuses on the financial, technical, and social infrastructures underpinning the assetization of care on the accompanying changing political economy of healthcare.
Ena	Vojvodic	RUG	My research explores the role of science in energy projects, focusing on Groningen's gas extraction and the transition to renewables. I compare trust relationships in Groningen, Netherlands, and Stavanger, Norway, regarding fossil fuels and renewable energy. I also investigate public needs and expectations from science in these projects using mixed methods, including questionnaires and interviews.
José Bernardo	Pedroso Couto Soafres	Wageningen University & Research	The theme is about water and pollution. The project is a partnership between Wageningen and WETSUS which develops wastewater technologies. Infrastructure as a concept will be crucial for thinking about sanitation and water cleaning practices.
Amna	Pottarath	Radboud University	Part of the project Disapeer: The reconfiguration of peers in editorial review

PhD Presentation guidelines

For presenters

- Send the title & summary of your presentation to the discussant assigned to you at least 1 week before the workshop.
- Have your presentation ready on your computer. As soon it is your turn, we will give you the opportunity to share your screen.
- The duration of your presentation should be **15 minutes**. Then there is another 15 minutes for the discussant and plenary discussion. We keep time very strictly.
- Try to make a sophisticated choice on what you want to present. One typical pitfall is wanting to give an overview of your whole PhD project, which leads to an unfocused and overloaded presentation. Rather select an interesting aspect of your research and discuss it in-depth.

For discussants

- Make sure you receive the title & summary of the presentation at least 1 week before the workshop. Contact the presenter if needed.
- After the presentation: we will give the word to the discussant
- Present your comments in **5 minutes** max.
- Mind that being a discussant is not about pointing out all the flaws in the presenter's argument, but about setting the stage for a constructive discussion. Offering critique is good, but also try to bring out what the potentials of the argument are for improvement, and to identify some questions for the speaker or the group as a whole.
- You may want to get in touch with the presenter to prepare some comments. Feedback should address the quality of the presentation itself (slides, clarity, focus) as well as its content.

All others

- Listen carefully and attentively to the presentation.
- Please add your comments to the shared googledoc. Your feedback will be collected and sent to the presenter in a separate word file.
- Join the discussion after the discussant has given their feedback.
- Chances are that there is not enough time to discuss all questions from the audience. Please write them down in the shared googledoc. Even without discussion, your questions might be very valuable for the presenter!

Feedback on Presentations

This is to help you give feedback to your fellow participants, some of whom will be presenting their research during this event. Feedback will be shared in a joint google document. We will distribute the link when we meet. Write your comments during or immediately after the presentation. Don't forget to sign your name. This gives the presenter the opportunity to get in touch with you, if there are follow-up questions.

Points to consider when preparing feedback (you don't need to cover everything):

- Attractiveness of title and opening
- Clarity and significance of problem definition, research questions and aims (refinement of, addition to, clarification or rejection of an existing thesis)
- Use of theory and/or historiography (concepts, interpretations, etc.)
- Embeddedness in fields relevant to WTMC
- Clarity of structure
- Presentation of the method(s) employed
- Validity and reliability of the method(s) employed
- Accessibility of the research data to the audience
- Use of (intriguing and relevant) details and examples
- Clarity of argument
- Relation to the nature and level of expertise of audience
- Use of PowerPoint and other audio-visual resources
- Contact with audience and audibility of speech
- Clarity and significance of conclusions
- Response to questions and comments
- Time management

Regardless of what aspects you decide to focus on in your feedback, make sure to keep the tone of your feedback constructive and supportive!

