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Editorial

POSTSCRIPT: When finalising this EASST Review which looks back on the Madrid EASST Conference, we received the very sad news of Bruno Latour's passing. Our colleagues and friends from École des Mines in Paris have written an *In Memoriam* for this issue. We thank them for this collective contribution and welcome any other memories and contributions to honour his life and work for the next edition which will appear in December. Chapeau, Professeur Latour! Vous resterez dans nos pensées, dans notre enseignement, nos écrits et nos discussions, en Europe et dans le reste du monde.

EASST 2022: LOOKING FORWARD FROM YESTERDAY

Vincenzo Pavone

Yesterday, just two months after our Madrid conference, I finally made it to the storage room. I actually just landed back in Madrid… two months after I left my city, the day after the end of the conference. But, somehow, I was too busy settling and, in a way, I was also unprepared to take a look back. In that storage room, dozens of conference bags, a few t-shirts and some lanyards: all of them with the logo of EASST 2022.

As I entered the room, I realized that, indeed, it had happened. We did meet, hundreds of us, in Madrid at the beginning of this now fading summer. We met again; we hugged each other, sat down, looked at each other, frowned upon the nerves of standing up and present our papers in a packed room. We marveled at this opportunity, we complained about the heat and the costs, we raised our full glasses, we stormed the city at night, and we danced together. But most importantly, we shared our knowledge, our doubts, our aspirations, our questions and, why not, our hopes that we would make it forward. We inspired each other, got feedbacks, pushed forward our boundaries and our epistemic communities, small and big ones alike.

It was like before but, at the same time, it was not. Something had changed: we were immensely happy to be back together face to face, but we learned a lesson that made us realize that things could no longer be exactly the same. And this change requires now more than just our acknowledgement. The planet is burning fast, and this has been the driest summer in the past 500 years. We did not know it yet in Madrid, but we feared it could be… and it was. A wider reflection on how we should rethink our conferences in this new scenario was always behind the curtains, and often on the front stage. The pandemic is not over, as it is still harvesting thousands of deaths across the world. The war is still going on, forcing thousands of people in Ukraine to live under permanent threat, facing violence and horror every day, but also leaving shocked and outraged thousands of silent and scared Russians, who disagree with the way the situation has been handled and has evolved. People in Europe are also increasingly vulnerable and poor, with several countries marching fast towards a new economic crisis.

These concerns, along with other important ones on artificial intelligence, biomedical data, political participation and science communication, were all discussed at length in a wide variety of panels or semi-plenary sessions throughout the three days of the conference. Some of these concerns are now discussed at length by contributions in this issue. The future of techno-politics, interspecies cohabitation, the role of STS in the study of democracy and the trajectory of STS studies in science communication are but some of them. Though very different in their focus, approach and topic, all these contributions share a concern for what we live and act today as "politics", for the complex interplay between science and democracy, and for what all these dynamics of change imply for the future of our planet, including our species. They hint at the need to rethink collectively our studies, our tools, our participation in society and, last but not least, our responsibility towards the planet which we inhabit and the political system in which we live and operate.

The last plenary in the conference was quite explicit about this, and it gave voice to a general discomfort with current participation dynamics in our democratic life, as you may also read in the contribution by Sarah Rose Bieszczad and James Besse on the Early Career Researchers meeting. It encouraged us not only to

Pictures of the last plenary conference at the EASST 2022

include these as central topics in our studies but also to take a more active stance in our social engagement and to rethink collectively how to make existing institutions less hostile and more welcoming to the variety of voices and proposals that are blossoming outside the palaces of power. We collectively agreed, or so it seemed, that STS also holds a potential to contribute to the study, maintenance and care of the political institutions that do not seem to work as effectively as they were used to, often high-jacked by powerful minorities who have no interest in the common good.

Yet, we seemed also to agree that Madrid has been the first face-to-face conference post-pandemic (if we can say that), but possibly also the last one. Surely, nobody argued that we should not meet again face-to-face, as it was widely recognized that it is crucial for junior and senior scholars alike to have this opportunity. Whilst it was clear that the traditional model of conference is no longer sustainable, not only for the costs, but also for the significant CO2 impact, it was also clear that existing alternatives, ranging from on-line conference to hybrid events, are also plagued with their own difficulties. In a lunch session organized by the local committee a small but motivated group had a chance to discuss these issues at length, setting the basis for a debate that is likely to last, within and outside the EASST community, for the years to come. You will indeed find more refreshing insights on this topic written by council member Richard Tutton and colleagues in this EASST Review issue.

New forms of meeting each other in order to still have a chance to share time, space, knowledge, doubts and fun together, have become necessary. It is still unclear how they will emerge and consolidate, but it is clear that our scholarly community is actively looking into this. We are honored to have had a chance to give these reflections space and support in Madrid and we are very much looking forward to the next EASST conference for novelties and surprises!

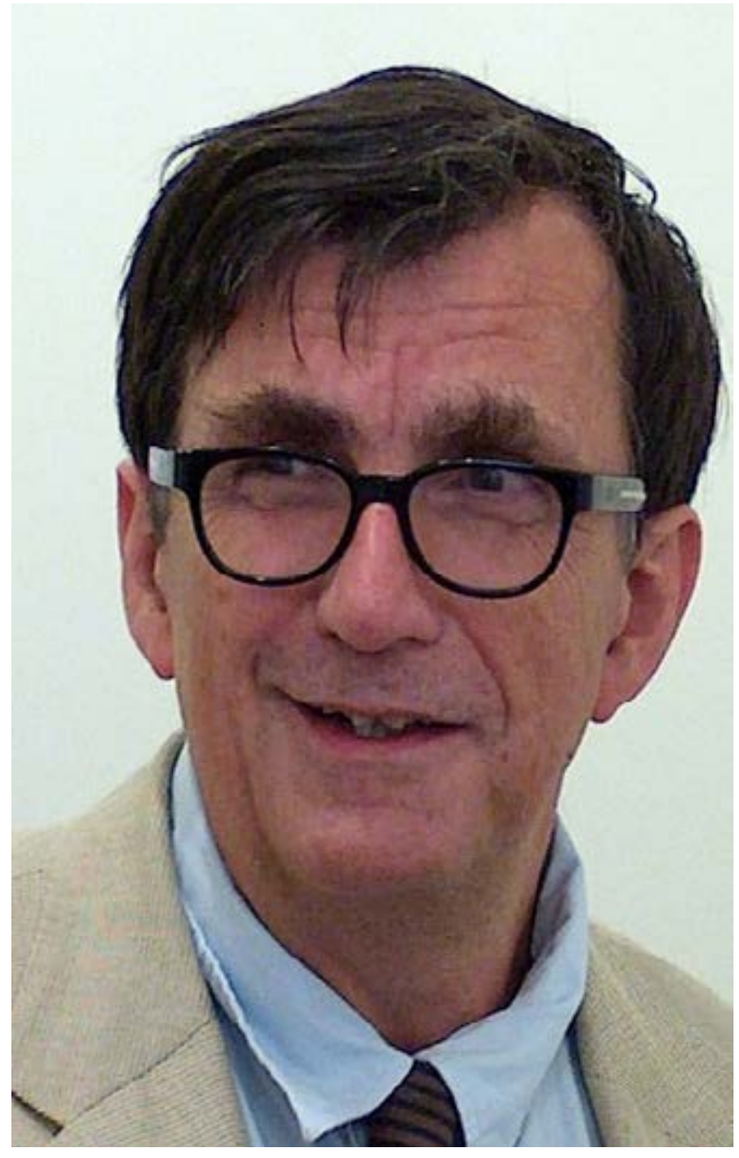
Surely, conference memories should not remain a mere nostalgic exercise. EASST 2022 was a forward-looking conference, which encouraged all of us to think the interplay of science, politics and technology not only as future-generating combination but often also a powerful conservative device that tends to uphold dominant arrangements of our political present, sidelining or obscuring even alternative visions and processes of future generation. After this summer break, the return to our academic life and jobs bears an additional responsibility, which compels us to keep this in mind as we move forward.

Faithful to this spirit, it is also time for the somewhat fragmented STS community in the Spanish state to gather and mobilize once again. The organization of EASST 2022 has been a marvelous, though no doubt demanding, opportunity for many of us to gather and work side by side again. Our hope is that what we shared along the road that took us to IFEMA last July would become a source of energy for a new journey as a thriving STS association.

Vincenzo Pavone
On behalf of the editorial team

Remembering

Bruno Latour, 1947-2022



It is with great sadness that the Center for the Sociology of Innovation has learned of the death of Bruno Latour, who was one of the pillars of our research center for 25 years. He developed his research and teaching activities at the École des Mines from 1982 to 2006, carrying out a large part of the work for which he is best known. The Center for the Sociology of Innovation remembers him as a particularly creative, original, inspiring but also witty colleague. Early on, at a time when French social sciences were rather inward-looking, Latour organized workshops that brought together researchers not only from different geographical areas but also from a wide range of disciplines including anthropology, art history, philosophy, history of technology, semiotics, ethology, mathematics, archaeology, and ethnology. He always encouraged freedom and creativity within and across intellectual domains and disciplines.

With Michel Callon and John Law, and later Madeleine Akrich and many other researchers, he led a radical renewal of the sociology of science and technology, through what was first called the sociology of translation, and then *Actor-Network Theory* – a theory soon to become internationally renowned. From his early research days onwards, Latour had used what Callon and Law had called the generalized principle of symmetry, which was as revolutionary in the eyes of anthropologists as it was in the eyes of epistemologists, in order to analyze the production of knowledge in Côte d'Ivoire with the tools of science, and the work of researchers in a Californian laboratory with the tools of anthropology. His stance: the universal is a particular like any other, it is the result of the meticulous production of inscriptions, not the discovery of a Nature already there.

His research in history, sociology and philosophy initially focused on scientific activity (*Laboratory Life: The Social Construction of Scientific Facts* [1979, with Steve Woolgar]; *Science in Action*, *How to Follow Scientists and Engineers through Society* [1987]; *The Pasteurization of France* [1988]) and technical innovation (*Aramis or the Love of Technology* [1996]). His work found a favorable resonance within an engineering school, whilst science and technology were relatively ignored by the French social sciences. Already, however, the political philosophy reflection was present in these early works, and it became an increasingly explicit focus of the approach he developed from the 1990s onwards (*We Have Never Been Modern* [1993]; *The Making of Law: An Ethnography of the Conseil d'Etat* [2009]). It problematizes our relationship to nature (*Politics of Nature. How to bring the sciences into democracy* [2001] 2004; *Pandora's Hope* [1999]), a theme that would drive him until the end of his career.

Starting from Charles Péguy, to whom his doctoral thesis was dedicated, and from religion to literature and painting (especially on the relationship between the earthly and the divine), from law to politics, from economics to organization: Bruno Latour was interested in the variety of these realities, at once distinct and closely related. From one field to another, he worked to meticulously describe the unique ways each of these realities is shaped, and his exploration culminated in his extensive *Inquiry Into Modes of Existence* [2012].

With a growing sense of urgency, he devoted his energy to politicizing the Anthropocene in a way that only a few have done, anchoring ecological problems to their earthly manifestations and clearly identifying the enemies of those he called "Earthlings" (*Facing Gaia: Eight Lectures on the New Climate Regime* [2017]).

In doing so, he transformed the notion of network into an instrument to describe and question the conditions of life on earth, without ever abandoning his commitment to inquiry, inviting us to collectively ask: "What are we holding onto, where can we land, where are we?" (*Down to Earth: Politics in the New Climatic Regime* [2018]; *After Lockdown: A Metamorphosis* [2021]).

So many questions that, thanks to his latest body of work, seem a little less dizzying.

Latour has been a key figure for the STS community. He gave a talk at the very first 4S conference held in 1976 in Ithaca, New York. And like Donna Haraway, with whom he debated on several occasions, he had an eloquence and a sense for catchphrases that made the public flock to the sessions in which he spoke

The CSI dinner in 2006, just before Bruno left for Sciences Po. From left to right: Florence Paterson, Cécile Méadel, Antoine Hennion, Catherine Lucas, Fabian Muniesa, Michel Callon, Philippe Mustar, Frédéric Vergnaud, Madeleine Akrich, Bruno Latour, Vololona Rabeharisoa, Yannick Barthe (Dominique Linhardt took the picture).

Madeleine Akrich, Bruno Latour (consulting the wine list), Vololona Rabeharisoa, and Yannick Barthe

at 4S and EASST conferences or elsewhere. Over the years, he has coined and redefined many of the concepts that STS scholars are familiar with: from black boxes to matters of concern, from immutable mobiles to the parliament of things. The common language that the STS community speaks today bears many traces of his intellectual craftsmanship. For his contribution to STS he received the John Desmond Bernal Prize in 1992. He served as the 4S president from 2004 to 2005. Several years later the importance of his work for the social sciences more generally was recognised by the Holberg Prize in 2013 and the Kyoto Prize in 2021.

An outstanding educator, he devised collective experiments such as a teaching module on the study of controversies, which is still taught today at the École des Mines, and which has spread to other higher education institutions in

France (Sciences Po Paris, École des Télécommunications, École des Ponts et Chaussées, AgroParisTech, etc.) and abroad (University of Manchester, MIT, École Polytechnique Fédérale de Lausanne, etc.). His classes were witty, unpredictable, and memorable - he would, for instance, bring his collection of stolen hotel keys to showcase sociotechnical scripts in the flesh, so to speak. His students might be puzzled at first, but most walked out with a new attention to objects and a healthy suspicion of traditional dichotomies. One of his many memorable quotes in class: "You have to take the term information absolutely literally. The word cheese [*fromage*] is the word fourme, and fourme is where you put the whey. Information, infourmation: Information is cheese!".

The research training workshops he led at the CSI, putting doctoral students at the center of the discussion and drawing on inventive writing exercises, illustrate the spirit in which he approached intellectual debates. He would for example make students rewrite each other's PhD outlines, which yielded astonishing results, with new ideas emerging and analytical angles opening up. Or, in a more radical kind of challenge, he would ask them to perform a breaching experiment, and then to report on it. Through all these exercises, writing - as much as reading - ceased to be lonely and terrifying, but became a collective and joyful activity. In doing so, the aim was not so much for Latour to 'disseminate' his way of thinking, but really to push students (as well as colleagues) to think for themselves. Still today, doctoral students at the CSI do many of these exercises and Latour's inventiveness continues to affect our 'laboratory life'.

The researchers of the CSI express their gratitude to him.

Reflections on the EASST Conference

Science-in-society communication(s): reflections on the pasts, presents, futures of a thematic stream

Melpomeni Antonakaki

This review reflects my participation, as presenter and discussant, on Panel 062 'Making science in public: studying science communication and public engagement' at EASST 2022. The piece first situates my perspective as someone engaging with the closing remarks of the convenors, Sarah R. Davies and Maja Horst (in absentia, Noriko Hara) during the last day, last slot for the overall conference, and then embarks on a review of the 'biography' of this thematic stream spanning almost a decade. In the end, the achievements of individual papers from 062 are highlighted against the backdrop of a rich theoretical tradition and the communal values and spaces sustained by this long-term collaboration.

The following reflections stem from the so-called graveyard shift at EASST 2022, i.e., the penultimate talk of the last session on the last day of the conference, in Panel 062 'Making science in public: Studying science communication and public engagement'. When the program was published, I realised my talk was so near the end of the conference and reluctantly faced the prospect of a receding audience participation. Heeding the advice of a colleague– "whoever is there, they are game [for a great Q&A]. This is your community" –, I felt motivated to place all my energy and hopes toward the few enduring colleagues. And what a session it proved. Room 115 filled up to the brim – tables full, people sitting on the floor, and an utterly satisfying discussion.

Writing this review, I found myself revisiting the closing remarks of convenors Sarah R. Davies and Maja Horst (in absentia Noriko Hara). They offered an account of continuity and longevity of their thematic stream on science communication spanning almost ten years –a feature both rare and noteworthy, considering how tactically and of-the-moment conference encounters often are. The convenors also extended an invitation toward the assembled community, especially early career scholars (ECRs), to join the convening labours and shape the future of the stream. In the weeks following Madrid, these remarks provided me with structure for processing my thoughts and feelings regarding the overall conference experience of EASST 2022. In particular, I found myself rethinking the terms of a widespread, albeit mostly informal, conversation in Madrid on generating and practicing sustainable ways of getting together as EASST members. I remember vividly how Maja Horst delivered more or less the same invitation to ECRs to get involved in shaping the future of the association twice – once in her capacity as president of EASST during the 2nd plenary, and once in her capacity as convenor of panel 062 during closing remarks. I personally felt much more compelled to do so, in the latter occasion. In developing the concept for this review, I sought to recover elements of what makes an interpellation like that effective and landed on the conclusion that forward looking statements by themselves will not necessarily bring us toward EASST future(s) without reflecting on, effectively sharing and flattening ownership of, the 'biographies' of EASST – perspectival and incomplete stories about the vehicles of EASST which have sustained themselves over years, meetings, and council' tenures. I elaborate on this point here via offering the 'biography' of the stream on science communication.

Methodologically, I followed the convenors' instances of collaboration via an archive comprising stream-related information across Nomadit collections, EASST meetings' webpages, formal literature, and some personal communications. The stream's early foci and concepts originated in the context of EASST 2014 (Torun), and subsequently shaped further within joint EASST/4S meetings, such as 2016 (Barcelona) and 2020 (Virtual/Prague) and 4S meetings, specifically 2019 (New Orleans) and 2021 (Virtual/Toronto). Madrid (2022) was the first solo EASST conference for this thematic stream in eight years. In what follows, I first recover and review the 'biography' of the thematic stream as shaped by the archival sources and my own involvement. Toward the epilogue, I reflect how preoccupations about the futures of both stream and EASST come to interact and inform one another.

The first two iterations of the stream's call for contributions, for Torun & Barcelona, are all but identical. They both call for empirical and theoretical work onto an "often overlooked area of (what [the convenors] might call) 'straight' science communication - that which does not claim to formally influence policy or scientific research, and which may at first glance feature one-way communication" (Situating Solidarities, 2014). An earlier formulation of this proposition by Davies et al. casts how

> [d]ialogue events that do not seek to influence policy are spaces enabling individuals from potentially diverse cultures to come together, articulate positions and views, and interact in a context of genuine equality. It could even be argued that this could—theoretically—be a far more effective way of affecting the culture of science to become more personally relevant and democratically accountable than through public participation in policy. (2009: 345)

This once tentative assessment was properly explored through the selection of panel participants' papers and thematic foci of the stream between 2014 and 2019. To better showcase the significance, for STS as a whole, of consistently attending to this overlooked area, one needs only to remember how prominently another program for research featured at the time – one foregrounding a 'normative commitment' to the ideal of public engagement in and for science policy (Stilgoe et al., 2014: 4). Recently Davies directly addressed the limited horizon of such proclamations, pointing out how "[STS] work on participatory and dialogic forms of science communication has, therefore, taken for granted that this is valuable to society because it contributes to democracy (specifically, democratic science policy)", leaving much else outside the scope (2021: 119). The convenors' efforts have systematically catered to the study of science communication as generative of accounts "about democracy as much as it is about pleasure, spaces, visions, organisations, identities, professions, stories and cultures." (Davies and Horst, 2016: 31).

With public engagement temporarily side-lined, the study of science communication from STS perspectives could then pursue problematics such as "reflections on the role science communication may play in the democratisation of science, analyses of the constitution of publics and knowledges within particular science communication activities, or accounts of experimental practice" (Situating Solidarities, 2014). Early fruits of this strategic move comprise not only novel "explor[ations of] the boundaries of STS scholarship on science communication" (Science and technology by other means, 2016), but the overall reframing of the relation between STS and science communication (Horst et al., 2017). Observing powerful interlinkages between scientific work and the un/makings of civic life beyond conventional spaces of modern democratic politics, Horst et al. claim that:

> […] research in science communication draws attention to the role that informal engagement with science can play in scientific citizenship. In that way it enables STS scholars to observe how lay citizens use museums, popular science, or the Internet as parts of their civic lives. Equally, the foregrounding by science communication research of emotional and aesthetic responses to science—such as pleasure, excitement, entertainment, wonder, and fear—brings a new dimension to the still largely epistemic orientation of STS. (2017: 897)

In 2020, a focus on public engagement would be included within the stream's overarching preoccupation with the dynamics of 'making science in public'. The inclusion owes much to conceptual innovations, which had in the meantime informed the placement of research on public engagement within an ecosystem of activities, comprising all kinds of "organised actions aiming to communicate scientific knowledge, methodology, processes or practices in settings where non-scientists are a recognised part of the audience." (Davies and Horst, 2016: 12). It was in the context of joint projects and meetings bridging EASST and 4S that the stream would re-articulate its focus on casting both science communication and public engagement as

> [k]ey mechanisms by which scientific knowledge is mediated, negotiated, and transformed. Over the past decades, STS research has outlined the ways in which science and society are co-produced through public communication activities and catalysed a shift towards dialogue and engagement in science communication practice. (Locating and Timing Matters, 2020)

This is by far the most authoritative proposition to be found in the stream's biography, prefacing each call published ever since 2019. It claims space for STS research to function as catalytic both in and for science communication practice, while at the same time placing its thematic foci as central in and for STS scholarship. Going into the future I think it is worth reflecting further on the ethos of catalytic work – a metaphor not so preoccupied with preservation or transgression of boundaries, but with how to account for the transformative epistemic effects our engagement accelerates or precipitates. In that sense my call, during my presentation at panel 062, for the study of 'science-in-society communication(s)' stands for an empirical and theoretical re-orientation toward the diverging ways science media and/or science communication workers reflect on their role and participation in legitimizing or contesting emerging "knowledge-control regime[s]." (Hilgartner, 2017: 9) In the next paragraphs I use this lens and offer my own impressions from synergies among the papers presented in Madrid.

Focusing on this year's selection of papers, I particularly enjoyed contributions that painted rich empirical stories of how established (research or technology development) oversight mechanisms open up to public contestation. Stelmach and Smith's paper (co-authored with Hartley) discussed gene drive as an emerging 'global' technology. They show how upcoming and almost certainly uncontainable field experiments with gene drive have demanded preparedness policies and have elicited promises for engaging publics in their risk assessment. Their study of how stakeholders in different countries envisage public engagement thus "contributes to the politics of opening up the under-researched and highly technical space of risk assessment" (Politics of Technoscientific Futures, 2022: 369). Crudgington's video essay further contributed to the opening up of processes of (animal) research oversight governed by secrecy, confidentiality and technical specialization. In this case, it was done "[u]sing the scenario of an imaginary ethical review board tasked with future proofing vaccine productions during global pandemics, [in the context of which] participants explore more complex, nuanced, and empowering conversations in which they learn about their own views and the views of others." (Politics of Technoscientific Futures, 2022: 402) Refracting the perspectives of researcher and advocate, Kashouris presented anti-microbial resistance (AMR) as an epistemic object assembled at the asymmetrical encounter between 'unambitious' state (UK) interventions and their public contestation by chronic sufferers of UTIs, expanding "[Catherine] Will's argument that public health approaches to AMR so far reflect loss of confidence in the public." (Politics of Technoscientific Futures, 2022: 435)

Another thematic spanning 062 explored technologically mediated investments in 'dialogue' or dialogical format(s) under accelerated circumstance (practice-, media- and place- specific). Such investments often seek to reinvent the values underpinning the terms and conditions for legitimate participation. As Rohden argued, a good case in point pertains to the "development of moderation and posting

rules on several coronavirus-related subreddits. Deciding what kind of content would be allowed to be posted where and by whom, and negotiating what counted as 'scientific', 'reliable', or 'expert' sources of information, effectively shaped the way that knowledge about the pandemic was made visible on Reddit." (Politics of Technoscientific Futures, 2022: 370) Breuer and Penkler expanded on recent concerns of professional moderators to go 'more dynamic' with their practice, "[analysing] 'opinion' as an emergent object and category [which] was imagined and produced in a series of German public engagement events called "Genome Editing in Dialogue." (Politics of Technoscientific Futures, 2022: 370) Dolan and Riesch not only reported from their (co-authored with Mihai and Carraro) study of "how scientists and science communicators from four [science improvisation] groups have deployed improvised comedy as a form of science communication", but also engaged in a round of "that's right!" (a medium rooted in dialogical principles of interpersonal interaction) to showcase how experienced performers can better safeguard scientific authority against the deconstructive aspects of comedy (Politics of Technoscientific Futures, 2022: 402).

The final trio of papers approached exemplary places of scientific and/or epistemic authority, i.e. the stem cell laboratory, the oncology clinic, the biotope, but from the perspectives of those who sit very low in the respective "economies of credibility" (Shapin, 1995: 268). Aarden, rendered the in-situ observation of avian wild life into a strategic multispecies alliance. His talk explored how STS can viably extend "an invitation to different kinds of 'publics' to visually capture and reflect on their encounters with climate change, biodiversity, etc. [as a means for providing] insight into publics' perceptions of environmental issues that explicitly draw on their emotional, aesthetic and experiential dimensions." (Politics of Technoscientific Futures, 2022: 403) Van der Kamp's paper (co-authored with Betten and Krabbenborg) presented us with a hashtag used by women living with incurable cancer, which openly challenges established codes of propriety in constructing credibility and communicating biomedical knowledge on Instagram. "[The authors] argue that the next step for science communicators is to explore to what extent these stories can and should become part of the biomedical discourse in order to enrich deliberation and decision making processes on the development and implementation of new technologies." (Politics of Technoscientific Futures, 2022: 434)

My own contribution discussed the role of investigative journalism during one of the most tumultuous and consequential episodes of research misconduct investigation of the 21st century, the so-called STAP cell case at the prestigious Japanese research organization RIKEN (2014-2017). I was taken by the effectiveness of one such investigative reportage in particular, which questioned the credibility of the official RIKEN investigation and argued for the epistemic significance of previously unadmitted evidence of misconduct. The reactions forced the hand of RIKEN in reopening the case under a new committee. The reportage also directly attacked the legitimacy of replication experiments on the STAP cell technique, casting them as sites for contesting in the public eye the boundaries of in/acceptable scientific conduct as much as problematizing notions of the "public's right to know(ledge)" – a co-production I analysed using the concept of scientific citizenship (Irwin, 2001: 4) and the lens of science-in-society communication.

To conclude, in recovering the 'biography' of this thematic stream I came to recognize it as a network of researchers, theoretical orientations, distributed practical and intellectual resources, mentoring, sense of belonging, publication plans, etc. Against this backdrop, my proposal for the EASST community would be a shift of perspective: instead of using convening work as the machinery for gathering a distributed network in one place at one time, what about using the geographically and even temporally distributed network as machinery for reimagining the labours and values of convening work? I hope this review starts a conversation, which situates the imaginations and attempts for new conference formats within experience stemming from already existing sustainable collaborations, like, but not be limited to, panel 062.

Acknowledgment: Participating at EASST 2022 would have been impossible without the generous offer of a conference fee waiver (EASST Grant), so thanks go out to the scientific committee for their support. I want to acknowledge the role of specific individuals in further facilitating good conditions of participation for me. Special thanks go to B. Kasparek, Z. Vasilyeva, C. Cuevas Garcia and S. Pfotenhauer. I am grateful to A. Maibaum for a good piece of advice. Two colleagues read and commented on early drafts of the review, and for this thank you, C. Mendes and F. Rohden.

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I am a doctoral candidate at the Department of Science, Technology and Society, Technical University of Munich. My doctorate comprises extensive empirical research into how visions and applications of 'regenerative biomedicine,' the clinical translation of stem cell research, obtain credibility in different political cultures. I focus on public knowledge controversies, episodes of credibility damage and the practical management of their aftermath. My interests include, the relation between research laboratory and public order; the material politics of research misconduct investigation; and the dynamics of science-in-society communication. Address: melina@antonakaki.eu; @Mel_Antonakaki

Experience of a PhD student from an in-person conference in the era of covid-19.

Konstantinos Konstantis

As a PhD student during the covid-19 era, EASST 2022 conference in Madrid was a great experience for me. Since 2020, most of the conferences worldwide are held online, due to covid-19 restrictions. Here, I will present my view of an in-person conference, both as a presenter and as an attendant. I conclude that in-person conferences are essential in the life of PhD students.

Before covid-19, almost all the conferences were held in person with very few exceptions which were held online. During the first months of pandemic, many conferences were cancelled and other were postponed. Scientific community started to held conferences online in its try to keep organizing conferences during pandemic. In 2022, countries started to lift restrictions that were imposed due to covid-19 and some scientific communities started to organize in-person conferences again.

As a student who started my PhD during pandemic, I have participated in many online conferences and meetings. For example, I participated in the joint meeting of the Society for Social Studies of Science (4S) and the European Association for the Study of Science and Technology (EASST) which was held online in 2020. Presenting a paper at the first year of my PhD was absolutely a remarkable experience. Although, after the presentation, I felt that I hadn't lived this experience on the highest level. This feeling changed directly when I participated in an in-person conference.

One could claim that with online conferences people could benefit from the advantages that may provide this form of events. One of the advantages is inclusivity. Online conferences are more inclusive than in-person conferences. People from all over the world can participate in online conferences and they don't have to worry about many issues that they would have to deal with, if these conferences were held in person. They don't have to pay for flight tickets, for their accommodation and for their meals during the conferences. So, one could say that participants could have many reasons to support that online conferences increase inclusivity. My intention is not weighing up in general pros and cons of the two forms of events. My intention is to focus on the claim that attending in-person conferences provide PhD students with experiences that cannot be lived in online conferences. The feelings that has a PhD student presenting their research in front of other PhD students, professors, and researchers and become aware of their reactions and their emotions are unique.

Being part of an enormous conference like EASST 2022 "Politics of technoscientific futures" is a unique experience for a PhD student. My research focuses on the ethics of engineering (and more specifically of artificial intelligence), so I was happy to find that many sessions and presentations were related to this topic. During all days of the conference, one could easily find panels dealing with subjects in areas related to AI, big data, and digitalization, from STS perspectives. In this review, I provide, first, my perspective as a presenter, and then, as an attendant.

Presenting a paper at an in-person conference is a totally different experience than presenting at an online conference. First, you meet in person with the other panelists of the same session. This is a fruitful experience for a PhD student. Meeting other scholars from all over the world who work on similar topics to yours makes you understand that you belong to a scientific community that shares mutual concerns. In this way, one feels that their work could have a contribution that is useful and interesting for many other academics. Discussions with the rest of the presenters start even before the beginning of the sessions. And then, when the time for the presentation comes, presenters are overwhelmed by satisfaction because finally they have the chance to present their work in front of professors, PhD students, researchers, and many others, from all over the world. This is a feeling that is almost impossible to be felt in online conferences. Questions, comments, and a constructive discussion follow the presentation. All these that seem common for a conference, are a whole new experience for a PhD student during the covid-19 era. Even once the time of the session is over, attendees and presenters have the time to discuss about their concerns during coffee breaks, lunch time, and so forth. I had the chance to exchange opinions with other PhD students and professors during breaks in between other sessions, something that I would not have the chance to do in an online conference.

My presentation was part of the panel entitled "AI, digitalization, and algorithms". On this panel, I had the chance to meet in person and speak with scholars who focus on the same research area as mine. Apart from this panel, EASST had numerous panels and sessions focused on the broad field of AI and big data. As a result, I had the chance to attend many other presentations relevant to my research interests. Also, this conference gave me the opportunity to attend many sessions relevant with a variety of STS issues. Examples are the panels entitled "Conflict, contradiction, and crisis in data-intensive health innovation" and "Energy futures from the past".

Figure 1: Konstantinos Konstantis in his presentation with the title "The birth of (AI) ethics and its discontents". (Source: Konstantinos Konstantis)

PhD students have some professors that inspire them. Some professors that play crucial role during their PhD studies. In-person conferences give PhD students the chance to attend the sessions of distinguished professors from all over the world. Meeting in person, asking questions, and discussing with professors and scholars from all over the world that share the same passions is a remarkable experience for PhD students. Personally, I enjoyed Plenary 1 of the first day. Annalisa Pelizza, a distinguished STS professor, and Amade M'Charek, a distinguished professor of anthropology of science, provided excellent presentations in a crowded auditorium. The presentations of these two professors were relevant, among other issues, with the question "What kind of STS do we need", which was part of the title of this Plenary. For an STS community and for PhD students of STS this is one of the most interesting questions. Presenters approached this question by concrete examples relevant to migration and borders, having a sociotechnical approach. Questions, comments and a fruitful discussion followed the presentations. For a PhD student, being in an auditorium full of professors, researchers, and other PhD students, who make a discussion about the role of their scientific field is an incredibly constructive process. At an in-person conference, someone could perceive much better the arguments, the concerns, the aspect, and the reactions of a speaker, than at an online conference. So, in-person conferences offer a much more fertile ground for discussions like these.

I conclude this reflection by highlighting that EASST 2022 in-person conference was a brilliant experience for me as a PhD student. In-person conferences offer a more holistic experience for attendees than online events. Complying with all the restrictions for covid-19, EASST 2022 was a safe and at the same time exciting conference. Presenting your work, discussing, and socializing is much more efficient when it happens in person.

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Fieldnotes on FlyingLess Conferencing

Vanessa Ashall, Tobias Held, Stefan Laser, Julie Sascia Mewes, Mace Ojala, Nona Schulte-Roemer, Robert Smith, Richard Tutton, Sine Zambach

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The train at platform 22 is for your conference...

Assemblies of STS associations and other academic conferences went online for two years, but with the lifting of public health restrictions, we have seen the return of in-person conferences. Scholars are travelling again. And so the discussion about how to travel has resurfaced, with a focus on carbon emissions and the broader environmental impacts of travel. This also has to do with the experience of digital conferences, which, despite their practical limitations, have indeed facilitated exchange with significantly lower emissions. For example, the European Astronomical Society (Burtscher et al. 2020) estimates that the carbon footprint of its 2020 annual meeting was 3,000 times lower than at previous meetings due to the digital format. So how to learn from this via the railway? The arguments for train transport are straightforward: steel on steel rolls efficiently and can be powered by green electricity; emissions are virtually always lower compared to aeroplanes, cars, buses or ships. The actual numbers are difficult to calculate and vary by route, yet it is a matter of significant orders of magnitude. This is why, for example, the 2022 IPCC Mitigation report (Jaramillo et al. 2022) concludes that rail is an alternative form of transit and can enable decarbonisation, even if a train did not use green electricity or if a carriage only occupied a small proportion of its available seats. Plus, trains offer a more conscious use of space and time and therefore give the opportunity to combine conscious resource use with social concerns, as we will emphasize in this text. As STS scholars, we know that technology use is socially embedded and can take different forms.

Initiatives such as Flying Less and podcasts by the Oxford University Flyingless Group provide information, discussion and practical suggestions on how we as individual academics can alter our practices, but also how to challenge our institutions and professional associations. There are also discussions on how to organise conferences in hybrid or hub-like formats to reduce travel activities. For the recently held EASST 2022 conference in July, some delegates decided to journey by long-distance train across Europe to reach Madrid. As one would expect from a group of STS scholars, this was not done without some appreciation of the sociotechnical challenges involved and of course with that long standing commitment of our field that 'things could be otherwise'.

In this article, we collect and reflect on the experiences of some of those who travelled this way. We hope others will learn about the pleasures and pitfalls of doing so, and maybe even try it for themselves when we meet in 2024.

Many rails lead to Madrid - How our contributors travelled....

Below you can see the different journeys that contributors took to Madrid for the 2022 EASST Conference.

Map illustration © amykendall.com 2022

Why did you choose the train over the plane?

Julie: I prefer to support an infrastructure less harmful to the environment, in alignment with my sense of pace, and much more comfortable in terms of space and air. Besides its comfort, this is a political issue. Employment at academic institutions in the Global North often comes with the privileged position of being able to support alternative modes of CO2-friendlier conferencing. This includes seeking institutional support and using funding infrastructures to avoid flying.

Mace: Environmental concerns of course do matter, but I take the train for æsthetic reasons – airports and all the hassle of getting into and out of, and being funnelled through the travel-industrial "factories" is quite simply insulting to me. I enjoy flying itself, but not the ugliness, anxiety related to security screenings, and the institutionalised pick-pocketing of airports. While I am drawn to liminality, the capitalist realist (Fisher 2009) version offered by the air travel industry is repellant. Instead, travelling by train speaks to my romantic (Kraftwerk 1977; Schütte 2021) and hedonist sides. The train is a convenient, non-exhausting and inspiring choice for a flâneur lifestyle - trains, stations, the views, co-passengers and the infrastructure are interesting and beautiful.

Vanessa and Richard: For various reasons: we wanted to travel in a more environmentally sound way with lower carbon emissions, we wanted a memorable adventure for Vanessa's first ever STS conference, and we wanted to spend some productive time together to work on our common projects and interests, which we thought the train would afford more easily than travelling by plane. We also wanted to show that it could be done and that we might encourage others to consider travelling this way to conferences and other events as well.

Tobi: Three reasons: A, as the pandemic served as a catalyst for a transition to a more sustainable way of travelling due to cash-stricken airlines, I wanted to pioneer ways of travelling in the field of academia. Conversations with colleagues in my department showed me that time constraint, and a need for convenience, have been bold arguments for preferring the plane over the train. I wished to test an alternative way of travelling that contested both perceived time constraints and a lack of convenience. Also, taking long-distance trains has been a tranquillising, concentration-fostering and socialising activity for many years to me.

Rob: I generally try to choose trains over flying. Obviously, we need to fly less – most people in the world do not fly (Gosling and Humpe 2020) – but it's also a more humane form of mobility. This time, though, I took the train because my university instigated a 'Sustainable Travel Policy'. Because my work examines research and funding cultures, often in an interventionist way, I am particularly drawn to the idea of treating this as an experiment that asks what it means to really practice things differently in accelerated academic cultures with a view to reconfiguring them. I wanted to see what it would be like to take at face value the invitation to emit ~85% less carbon on my journey within a web of bureaucracy.

Nona: My decision to take the train was a three-step process involving a sense of adventure and a constant feeling of 'flight shame', economic considerations, and social 'windfall profits' on the way. For a start, a colleague told me that she would travel to Madrid by train using an interrail ticket. "What a brave and intriguing idea," I thought, but still hesitated. Then, my adventurous spirit was spurred by the surprising fact that for the first time, it did not cost more to take the train! A four-day interrail pass for Europe (€250) was even cheaper than a reasonable flight route Berlin-Madrid (€550). The decisive moment came when two dear colleagues - one in Barcelona and one in Montpellier - signalled that they would have time to meet me on my passage.

Sine: I am quite afraid of flying. I keep thinking of all the things that can go wrong, and I have a strong irrational feeling that I will die. But I also wanted to see if I could travel more sustainably in the future.

Stefan: When a conference is used to justify flying, we are spinning in circles, with no way off the hamster wheel! But I must add that travelling across Europe is complicated to organise. I also used the conference as a test, proof-of-concept and even for research purposes, because at that time I was employed at the University of Siegen in a research project on rail infrastructure and its role in a potential socio-ecological transition. Travelling with a 3-month-old child added a little extra challenge – reconciling family and career. It works great as long as certain maximum travel times and rest days are respected. The advantage of the car and the plane is that the child can sleep well in peace, but on the train you can get up without danger, keep yourself busy, and even have a snack.

'For the planet, we will always do less: travel faster by polluting less'. Photo credit: Richard Tutton.

Photo credit: Stefan Laser

Did you have to overcome any obstacles to travel this way?

Vanessa and Richard: We had to commit more time to attend the conference as travelling by train took longer than flying. We therefore had to spend longer away from our families, but they were supportive of us choosing this mode of transport. Other obstacles we faced arose from not being able to book European continental rail travel through our University's travel system, so we had to pay upfront and use commercial platforms such as Trainline. The cost of course is also higher than flying, but our Department was very supportive of our approach and agreed to fund our trip without lots of questions.

Nona: Several obstacles … I've already mentioned the inevitable four days of travel and sorting out reservations for French and Spanish trains, and choosing the best routes cost me a lot of time (most discounted tickets for interrailers were already sold out. Lesson learnt: Book early!). Another important obstacle was that our panel was scheduled for Saturday and it was clear that I would not make it back to Berlin in time to teach my two courses on Monday. Luckily (or sadly), the pandemic has turned our students into remote learning experts, allowing me to interrupt my journey in the South of France to meet them on Zoom.

Tobi: The most striking obstacle was the actual booking. I had never done such a trip before, so I didn´t know that an interrail ticket was the best choice to travel from Germany to Spain. Firstly, the website of Deutsche Bahn served as the point of departure for booking tickets, but I had no success, so I went in person to the train station in Karlsruhe. The customer service agent there gently asked me whether I was crazy! She could not help with making connections or seat reservations, so I ended up at the interrail website (although I still couldn't book seat reservations for the Barcelona Sants – Madrid Atocha leg). In my opinion, the booking procedure for international train connections in Europe needs to be as easy as it is for booking a flight.

Rob: Really, the only obstacle was navigating our university travel agent. Our travel policy means that everything has to be booked through the agent and this pushes you towards flights as the form of mobility for international travel. To book things myself through their portal would mean putting together an itinerary on a different website, clicking the 'flights' tab of their portal, and then intricately entering each station name of each leg into janky browser boxes in the hope this would find the train. To book things by email required months of exchanges, one of which involved being told that I should fly by Ryanair instead. The other potential obstacle is cost – not of the trains but of the hotels and subsistence that come with adding an extra two nights onto a trip. I was lucky to have a grant that could absorb these.

Mace: I did not encounter any obstacles worth mentioning.

Sine: It was annoying that I had to use several different train apps to arrange the trip, as some of the apps did not recognize the night trains, and with others, I had problems with seat reservations, etc. And the night train I took from Copenhagen to Hamburg was terrible, as there were no sleeping options.

Stefan: There are multiple obstacles: getting our belongings onto trains and moving around with a baby, facing the risk of Covid (although this is also true of flying), finding a website to book the tickets, getting a fair price, and getting the institution to pay for all of this. Let me pick the most important ones from our perspective. Comfort: Not all services make it easy to board with a stroller, stow luggage, and take a seat without any problems. The French TGV stands out as a negative example. We have always managed, but with some effort. TGVs have curved staircases, so sometimes you have to lift heavy things around the corner under time pressure. Sometimes, this even needs help from fellow passengers. Regarding accounting: My institution asked questions about the trip afterwards, and people

Photo credit: Mace Ojala

wondered about the necessity of stopovers. Then I showed them the more «direct» route, which is in fact not that much different than the trip we actually took. Regarding the price, due to the high occupancy of air traffic, the cost of the flight one month before the event would actually have been higher than the cost of our train journey (minus the hotels on the stopovers, which were paid for privately).

How would you sum up the experience?

Vanessa and Richard: It was noticeably less tiring arriving at the conference by train. We also felt mentally better prepared, having spent time working and thinking about the conference on the way there. We felt more aware of our geographical location, the distance we had travelled, and the route we had taken to get there. Eating well was difficult during the long journey - especially if you have specific requirements - and also sometimes the food on the trains ran out!

Julie: The level of comfort of the trains I took from Berlin to Madrid proved to be very high. I had a stable Wi-Fi connection most of the time, and trains were never overcrowded, late, or dirty. Though slightly more expensive than flying, the final difference was less than € 20 between a one-way flight and train ticket to Madrid.

Tobi: In short – rewarding, mentally supporting, geographically enriching. Especially currently, when airports in Europe are struggling with personnel, I surely chose the more relaxing and more comfortable option. The Paris – Barcelona Sants trip was geographically marvellous. Being that close to the Mediterranean is not possible when taking a plane. I definitely will do it again, and I´m looking forward to integrating a sleeper train in the next long-distance train journey.

Mace: I'm quite familiar with city-hopping by train or bicycle across Europe with minimal luggage, and in fact, it's my favourite pastime. Taking the train to EASST 2022 was rather a familiar than an unfamiliar experience. I will do it again, for work and for pleasure.

Rob: I enjoyed it and would do it again! I wish that universities and conference organisers would actually incentivise it, though. As far as I know, I was the only person from Edinburgh that didn't fly to Madrid.

Sine: I really liked the experience of meeting so many different people on the way. I talked with a young woman studying programming, a guy working with Google in Zürich, and another one moving from Perpignan to New York. And on the way from Hamburg to Copenhagen, I met another data scientist who was also afraid of flying. Well, knowing statistics does not help against anxiety!

Exhausted bird on a train platform at the French-Spanish border. Photo credit: Nona Schulte-Roemer

Nona: I very much enjoyed this journey as an i*nfrastructural experience* of different sociotechnical mobility systems. The most memorable moment was getting off the train in Cerbère to cross the gap between the incompatible Spanish and French rail tracks by foot. In this place between two systems, I met an exhausted, injured bird in the burning sun on the rail track and we shared a bottle of water before I moved on.

Stefan: This was a splendid experience. I learnt a lot about European cities, modes of transportation, and how climates and landscapes slowly change. Yet I also realized that this is not the standard mode of travelling for business trips of any kind, be it academic or non-academic.

What would be your top tips for anyone thinking of doing the same?

Vanessa and Richard: Take lots of food and drinks and don't rely on the Wi-Fi. Go with the flow - sometimes trains run late, but the operators will put you on the next one, so best not to be stressed by delays. The good thing is that if you are delayed, you're more likely to be sat on a train and so can just carry on with what you are doing rather than prowling around a departure lounge! Practically, we also recommend that you use the The Man in Seat 61 website as this provides lots of helpful information about transfer times and hotels to stay at when on route.

Julie: Consider combining conference travels with holidays or attending other events close to the conference venue or on your way. If you are on a budget, book the train tickets and accommodation as early as possible but during the morning or early afternoon on weekdays. Prices tend to go up in the evening and during the weekend. Use night liners for longer distances, and generally avoid rush hours and routes to or from bigger sports/music/whatnot events.

Mace: My number one tip is simply to break up the travel across multiple days. I think the trick is to very concretely materialise to yourself the idea that the journey too matters, not only the destination; if we reject the slave-morality (Nietzsche, 1886) of suffering for the climate and spend some time critically deconstructing the peculiar achievement of air travel as the norm, it takes very little mental gymnastics to experience a train trip as a quest, an adventure … or simply a pleasant day like any other. Reading the Wikipedia articles of the cities you pass through is respectful and educating. Reach out to colleagues, friends and contacts along the way to catch a drink, dinner or a walk with them.

Tobi and Nona: Don´t forget to make seat bookings in advance. Booking seat reservations at a station during the journey may cause trouble and interruptions, at least in France and Spain. Having tasks to do during the journey that do not rely on Wi-Fi is advisable (especially when using German ICE trains). As mentioned earlier, taking the train can be a great pre-conference event. Making a planned journey public on social media, inviting colleagues at the department and beyond, or visiting colleagues on the way will make it even more memorable.

Rob: First, buy interrail tickets! They seem to be cheaper than booking long routes in Europe, even with the reservation fees for TGVs and Eurostar. Second, if you're taking the Paris metro, have faith that there'll be another ticket machine if you walk past the horde at that first one. Third: Try to use the cities you go through as an actual opportunity to stop and see your friends, do something work-related or both. Fourth: Take a backpack so you don't have to drag wheeled suitcases up and down cobbled streets, train steps and escalators.

Sine: Use different apps and try to go for night trains. You might need to find the night train separately by searching for them. For instance, I could have taken a night train (with couchettes!) from Høje Tåstrup to Hamburg, but it did not show up in any of the apps.

Stefan: If you do not fancy planning for half a week, consider using a travel agency that specialises in railways. They know the tricks of the trade to hack the system,

and it's helpful for the accounting apartment to have one coherent bill. In general, I recommend thinking about the possibility of taking a train when travelling with a family. My partner was still on parental leave at the time, and in retrospect, the time we spent together was a socially, economically and ecologically wise investment.

Photo credit: Richard Tutton

Photo credit: Robert Smith

Final reflections

As many of us travelled to Madrid and tweeted photos and updates on our journeys, it became clear that other STS scholars were also on the same rails we rode along, or even on the same train! At that moment, it showed how a conference might begin on the journey there and not only in its formal venue. Had we known, we could have stopped by each other's seats, caught up over coffee, with the makings of a more humane academic mobile sociality. With this piece, we would also like to encourage you to connect on Twitter next time you travel #flyingless to an STS conference.

Beyond our individual experiences reported here, the STS community needs to engage with how academic conferences are organised in future (e.g. hybrid, or on various continents simultaneously as in the case of this year's International Sustainability Transition conference). We encourage organising committees of academic conferences and the broader community to advocate for, support and make visible alternative ways of travelling. Many of us travelled to Madrid in an experimental mode or spirit, to test alternative ways of conferencing. Let's share our experiences and the 'results' of this experiment with our institutions.

Useful resources to arrange long distance rail travel in Europe:

The Man in Seat Sixty-One, seat61.com

https://www.thetrainline.com/

https://www.raileurope.com/

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Futures and encounters, beyond IFEMA.

Joan Moyà-Köhler

IFEMA was one of the symbols of the health crisis that Spain faced due to the outbreak of COVID-19, a pandemic that forced us to rethink conferences and to look for alternative ways of meeting. During these two years, meeting modalities have been characterised by "onlineisation", a virtualisation that mediated the format of such meetings. This has meant spaces in which it is difficult to sustain attention; meetings in which it is necessary to deal with the distractions of a mundane space; spaces in which the importance of gestures in communication has been partly lost; spaces where talking and who can speak has been reconfigured; and meetings where open debate, or small talk, has been made difficult. In such meetings it has been impossible to find space apart to go deeper, in the congress itself or during coffee breaks.

At IFEMA, the congress once again allowed us to be physically present. In my case, the "Care as a high-tension zone" panel not only allowed me to enjoy interesting presentations and quiet spaces to ask questions, but also favoured debates and opened up continuities between the work of panellists and audience members. Being physically present in a conference venue made it possible to attend unexpected panels, and to find ways of engaging by other means with different ways of thinking. The meeting also allowed for the emergence of ideas—often wildly inventive or even impractical ones—during coffee breaks. The four days of intense meeting, thinking, talking, disconnecting and reconnecting proved to be a refreshing experience. The meeting was a blessing, a shared joy for the work of the academy, which often is extremely individual and solitary.

IFEMA was also a venue carefully chosen by an organisation that worked to ensure the best possible functioning for the congress and to ensure the restrictions still in place under COVID. A space for thousands of people had to be found in a vibrant city like Madrid. But at the same time, this space of virtue that IFEMA became was also the space that materialised my ambivalence about this year's EASST conference.

IFEMA is not a neutral space. It was not so during the outbreak of the pandemic, as I mentioned at the beginning, since it was functioning from 22 March 2020 until 1 May 2020 as a field hospital—informally named "Noah's ark"—due to the health crisis caused by the COVID-19 pandemic. This health centre was promoted by the government of the Madrid region, but not without controversy. The regional government, which presented the hospital as a success, has been accused of wastefulness for the cost that its opening and maintenance entailed in terms of public money, for taking advantage of the pandemic crisis to take another step in the privatisation of health care in Madrid, and for hiding behind this mega-project the shortcomings of primary-care health centres that were left without resources to cope with the situation, while large amounts of money were granted to private companies to support this "Noah's ark". In addition, and just a week before our meeting, IFEMA was also the venue for a NATO meeting which has involved countries' commitment to increase their military spending in the coming years—doubling it by 2030 in the case of Spain.

But this was not the only thing that grieved me about IFEMA, because it also wasn't an ordinary place for the STS community to meet. It was a megalomaniacal non-place, empty despite our presence; an infrastructure that embodies the problem of these forms of meeting that imply unsustainable journeys of

Photo by Miguel Larrea Schindler, Madrid-IFEMA, July 2022

thousands of people, with an environmental impact due to the displacements or the use of plastics to support logistics. It was a problematic space in itself, as the photo at the end is that of a swift—Apus apus in its scientific name, which paradoxically means "without feet" in reference to the fact that it is a species that never touches the ground while it lives—lying on the floor, dead from the impact with a glass window in the hot cement desert.

Perhaps because I write these lines from a small room in Barcelona where, even with a fan, it is difficult to stay, IFEMA emerges even more as a problem. It represents the materialisation of an obsolete infrastructure that stands like ruins in catastrophic times, as Stengers would put it. We have seen how climate change and its manifestations have revealed a rupture with imaginaries or practices of infinite progress, and our obligation is to seek more sustainable modes of encountering.

IFEMA has been the scenario in which the importance of presence has emerged after more than two years, but it has also made it clear that our ways of relating to the world are problematic, that we need an inflection point to deal with this tension between the encounter and our way of relating to the world. We urgently need to find ways and spaces allowing for more debates, more time, more encounters in the informality of the formal. But above all we must find ways that are compatible with life: fewer meetings, but perhaps longer ones, meetings that facilitate mobility without the need for wasteful air transport, meetings that are more situated in the communities where they take place, prioritising elements such as mobility, accessibility and minimising the use of resources (e.g. by revising schedules and taking advantage of better seasonal periods). Such meetings could be less normative, humbler, and more situated in their own fragility.

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EASST 2022 Madrid: An argument for smaller, slower, and more diverse future conferences

Lenka Veselá

In this event report, I share my memories of the recent EASST 2022 Madrid conference. Writing from a perspective of an art-based researcher, I point out the interest in and engagement with speculative, poetic, literary, and artistic approaches demonstrated in numerous individual presentations and harnessed by a science fiction sub-plenary—indicating the potential of the knowledge and expertise exchange between artistic and STS researchers. I praise the exciting program, with fascinating and daring presentations of researchers working reflexively, collaboratively, affectively, and in a socially aware and engaged manner, but also offer critical comments, calling attention to a lack of diversity among the conference participants and identifying some problematic aspects of the massive scale of the event, boasting more than 800 papers presented in less than four full days.

I am an art-based researcher but have attended numerous STS conferences since starting my practice-based PhD, feeling welcome and very much at home at these events. The EASST 2022 meeting in Madrid has been by far the biggest—and most expensive—out of them. I wouldn`t have been able to attend, had I not been granted a fee waiver to participate. I had never been to Spain before and was truly grateful for the opportunity—looking forward to coming and learning more about Madrid and the work of Spanish STS researchers. Here are some of my memories of the conference that I would like to share.

Attending STS conferences is for me not only an opportunity to share my research with like-minded researchers but also an important part of my research practice examining the potential of artistic research to decolonize academic knowledge production (see Veselá 2021). Learning from STS researchers and initiating and facilitating collaborations and partnerships between STS and art-based researchers is a crucial part of my activities seeking to examine and engage practices to counter colonial and/or uncaring practices in academia and beyond. With regard to my research interest in the knowledge and expertise exchange between art-based and STS researchers, the EASST conference in Madrid did not disappoint. I was excited to find out that a number of the conference participants were art-based researchers or STS researchers who either collaborated with artists or developed artistic practice of their own as part of their research work. Moreover, I was happy to learn that in both the panel "Making Livable Worlds Through Reflexive Methods: Care and Intervention in STS Research," in which I presented, and in other panels, participants were interested in situated and reflexive approaches, as well as working collaboratively, affectively, and in a socially aware and engaged fashion. And finally, the well-attended and truly fascinating science-fiction sub-plenary session "Techno-Science-Fictional Futures: Methods, Forms, Norms," which closed the second day of the conference, reminded everyone of the importance to think and imagine beyond the present-day status quo. Stimulating our collective imagination through the engagement with speculative, poetic, literary, and artistic visions of the future, the sub-plenary showed, is a vital tool helping us to devise and consider alternative modes of resistance and world-making for/in troubled times.

All in all, I am pleased to report that all the presentations and panels that I attended during my three days at the conference were, without exception, incredibly captivating. I was in awe of the speakers` expertise and passion, yearning to know more about them and the work they presented. Which brings me to more critical comments on the conference and the experience it offered. With more than 800 papers squeezed into three and a half days, the packed schedule didn`t allow for more than one or two "quick questions" after each of the presentations. Panel after panel was brought to an abrupt end, leaving presenters without proper feedback and disappointing those participants who, like me, were saddened that the panel discussion had to end before it could have properly started. A broader debate about the smaller and slower alternatives to a massive conference model adopted by the conference in Madrid, with more in-depth and valuable experience offered to its participants, is therefore truly necessary.

The immense size of the conference also meant that it couldn`t be hosted by any of the universities in Madrid but was instead held at IFEMA, one of the most important centers in Europe within the international circuit of the fair and congress industry. Hosting a conference in a commercial space designated for organizing large-scale events was reflected not only in a rather cold and businesslike character of the venue but also in the increased registration fees and the higher costs of lunches offered to attendees. The IFEMA convention center was close to the Madrid-Barajas Adolfo Suárez airport but almost 10 kilometers away from the city center where I was accommodated in a small hostel located in one of the old but charming apartment buildings, just a stone`s throw from the Plazza Major. In the evenings, I was wandering around the streets of central Madrid, absorbing its energy. The conference dates coincided with MADO *Madrid Orgullo 2022—Madrid Pride Festival—which brought an extra portion of vibrancy to the city.* After two years of Covid-related restrictions, more than half a million participants flooded the Spanish capital, marching, singing, and dancing in protest and celebration. The ecstatic energy of boiling-hot Madrid during those days stood in stark contrast *to the impersonal, heavily air-conditioned conference rooms of the IFEMA. Moreover, the diversity of the people* of all ages and various backgrounds enjoying the festivities contrasted with the lack of diversity among the almost 1000 participants gathered at the conference, bringing even more of my attention to this regrettable oversight.

MADRID ES EL REFUGIO DE LAS OVEJAS NEGRAS / EL ARTE ES UNA RESPUESTA, a view of the wall in Madrid at the time of the conference. Photo courtesy of the author.

I was not the only one who noticed this lack of diversity which included a low participation of local STS researchers. Shouldn`t a conference hosted by a discipline committed to critical examination of the practices and consequences of science and technology in its historical, cultural, and social contexts pay more critical attention to its own inner workings? Shouldn`t it be a priority for such a discipline to be mindful to include participants from diverse and marginalized communities at its meetings? And shouldn't be one of the primary goals of an STS event hosted in Madrid to celebrate the work of Spanish researchers and to strengthen and broaden their research networks?

In the near absence of local members of the STS community (aside from the Local committee of EASST 2022 Madrid), the choice of conference venue in Madrid raised questions, not least because of the carbon dioxide emissions from air travel undertaken by most of its attendees. In the context of the current climate crisis, indeed, questions arise of whether the large-scale international meetings should be held at all. A profound, systemic shift to more sustainable conference ecologies is, in my opinion, inevitable. And while I feel it is important to stay in touch and engage in broader debate with researchers working in different regions of the world, learning to mitigate climate impacts of coming together should be a priority. Making use of hybrid formats combining face-to-face communication with digital networking or building regional networks and convening smaller regional meetings that allow for more peer interaction, discussion, and learning, for example, can facilitate rewarding conference experience without large emissions.[1]

I would like to conclude my argument for smaller and cheaper, more regional and sustainable conferences run at a ***slower and more attentive*** pace, by sharing some thoughts brought about by a health struggle I encountered during my time at the conference. For some ten years, I have been living with migraines. During this time, I have learned to live better with them—by maintaining a healthier lifestyle and avoiding potential triggers. Heavily air-conditioned rooms were problematic in this regard and, indeed, caused a mild headache which kept growing stronger each day. Worried that the headache could have developed into a full-blown migraine, I decided to skip the last day of the conference. Still, I suffered a migraine-related seizure on my way home which left me incapacitated and scared in the middle of the crowd, unable to see or hear for a couple of long minutes. I am not sharing this to blame the conference organizers for a personal health scare the conference environment might have contributed to, but because it made me think about the size of the conference in relation to health and well-being of its participants. A smaller conference, perhaps, would not have required so much air conditioning to keep attendees alert and to prevent the growth and development of germs and bacteria spreading easily in crowded enclosed spaces. Even more crucially, a smaller conference would have made it possible to slow down a bit, ask participants how they were feeling, and make arrangements to keep everyone happy. In this way, smaller conferences are more likely to be considerate not only of the health of the planet but also of its very participants.

1 Recent workshop "Science and technology studies in context: Provincialising STS from Central Europe" held at Vienna reviewed in the next issue can be named as an inspiring example.

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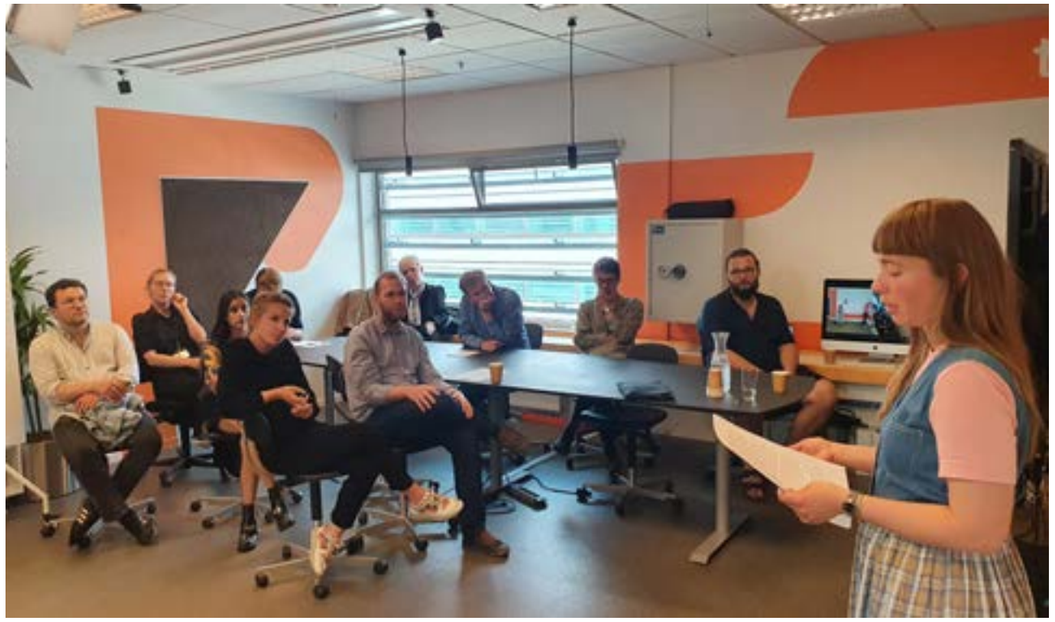
EASST Conference: Reports

Democratic Situations event(s) report: An intervention by Anders Blok

Andreas Birkbak, Anders Blok, Irina Papazu



Democratic Situations is the name of an edited volume published by Mattering Press in May 2022. As the editors of the book, we (Irina and Andreas) would like to take this opportunity to report on two events associated with its publication: An open panel at EASST 2022 in Madrid in July and a book launch event at the TANTLab in Copenhagen in June.

The panel at EASST was entitled "Situating Democratic Futures". The organization of the panel and the formulation of the call for papers was a collective endeavor that we shared with David Moats (Helsinki) and Laurie Waller (Manchester), both contributors to the book. Organizing such a panel in Madrid was a good opportunity to build on and extend existing conversations, given that the 2017 workshop from which the book project arose was co-sponsored by EASST.

The EASST 2022 panel served to open new conversations with the recent book in mind. We received 15 abstracts, out of which 10 papers were presented at the conference. All abstracts were from researchers who had not been involved in the original book project – or rather all but one, since Endre Dányi, our Mattering Press editor, participated with a paper in collaboration with Amade M'charek. Some presentations tackled themes at the heart of the study of democracy, such as 'innovation parliaments' (Stefan Böschen) and EU politics (Tessa Dunlop), while others examined space technologies (Zinaida Vasilyeva), big tech (Ivan Veul), and technodemocratic imaginaries of solar power (Monamie Haines). We take this as a welcome indication of how the book may help carve out a research agenda for researchers interested in pushing STS' democratic imagination further and critically examining the big societal questions of our time.

Another recent event marking the publication of Democratic Situations was a book launch at the TANTLab in Copenhagen. Aside from toasting and celebrating with local colleagues, we were also fortunate that Anders Blok (Uni. of Copenhagen) agreed to make an intervention based on his reading of the freshly published book. Several people joined us online for this part, including a handful of chapter authors. With Anders' permission we would like to share a lightly edited version of his comments here, since we believe they deserve a broad STS audience, and since they serve as a fantastic introduction to – and celebration of – the new book.

What follows from here on are Anders Blok's words, originally spoken in front of a live audience in the TANTLab on the afternoon of 8th June 2022.

"What I would like to do is to give you three reasons for why you ought to read this book, and why you ought to read it in full. And one reason why I think the book calls out for a follow-up volume, casting the net even more widely."

The first reason you should read this book is the core argument clearly spelled out by the editors in their introduction, and then echoed as a refrain throughout – showing, by the way, the value, I think, of having actually had shared conversations among contributors. The argument, in brief, that STS is not only important for elucidating the politics of techno-science but also, more generally, has the conceptual tools and methodological sensibilities to contribute valuably to the wider, if also more mundane, study of democracy in practice. That is to say, what the editors nicely and innovatively dub 'democratic situations'.

It is important here, I think, that this argument cuts both ways, so to speak. On the one hand, it implies an expansionary move on the part of STS. No longer content to hang around laboratories, innovation labs and offices of regulatory science, STS scholars now seek out new fertile empirical grounds in newspaper debating rooms, in the corridors of EU bureaucracy, and in the halls of municipal administrations.

Conversely, however, this move also implies, as Helen Pallett and Jason Chilvers (2022: 119) write in their contribution: "humility and reflexivity on the part of STS scholars." This is so, they continue, because we are forced "to acknowledge both the deep influence of democratic practices and systems on our knowledge-making, but also to recognize the role played by STS theories and knowledges in the empirical sites and contexts we study" (ibid.). As shown and discussed in several chapters in the book, this is true not least for participatory and deliberative models of democracy – models that, in practice, turn out to have quite divergent effects.

In short, by displaying this particular combination of expansionism and humility, this book successfully opens up new and important conversations in STS – conversations about how to study, compare, and intervene in democratic situations, and conversations on how the field as a whole has tended to think about its own commitments to democracy and democratization in some rather than other ways.

The second and related reason you should read this book, and read it in its entirety, is for the somewhat disjunctive but in the end productive sense this provides of being led across sites and settings that all have some recognizable relation to what we call 'democracy', but which are otherwise far apart. This is true geographically – although we tend to stay in the Euro-American realm at large – and it is true for the kinds of 'zones of democratic tension' to which the chapters attune.

I think there is the inkling here of an interesting proto-comparative imagination that the volume invites its reader to engage with – even as only one chapter, the one by Soneryd and Sundqvist, might be called comparative in the standard sense. So, for instance, whereas some chapters take us to the heartland of age-old democratic institutions – partly to show us their incremental forms of change – other chapters chart much more recent and still somewhat unsettled institutional terrains, from stem cell research oversight committees to participation in digital diplomacy.

Similarly, while some chapters attend to fast-paced dynamics tied to specific events – such as how campaigning technology was used and justified in the UK's EU referendum leading to Brexit – other chapters document the slow-paced institutional accretions happening over decades whereby things like a European carbon trading market, in Véra Ehrenstein's case, is build, upheld, and cautiously critiqued by technocratic activists. Activists who, on their part, are constantly on the brink of giving in.

Fittingly for such diversity, one finds across the chapters of this book a quite varied cast of intellectual interlocutors, whose proclamations and theorizations of politics and democracy are brought to bear on the situations at hand. Making no claim to exhaustiveness, and beyond the most canonical STS ensemble, I counted close-at-hand figures and concepts such as Isabelle Stengers on 'hesitation' and Maria Puig de la Bellacasa on 'care', but also farther-flung connections to Chantal Mouffe on 'radical democracy' and Hal Koch on 'deliberation' the Danish way.

In short, when taken and read together, this volume quite helpfully expands the frame on our established STS imaginations of politics and democracy, inviting in the process, I think, more comparative work on democratic situations.

The third reason you should read this book is a more idiosyncratic one, perhaps. But it ties into what the editors note astutely in their introduction, when they reference Latour to the effect that 'ecological mutation' is deeply entangled with current-day changes to democracy. Given my own interest in what I have acquired the habit of calling 'the sustainable state' – a speculative notion meant to signal the work ahead of re-aligning democracy to planetary ecological boundaries – I could not help but pay particular attention to the three chapters specifically on this task.

At the risk of extrapolating a bit too much, it is fair to say, I think, that the cross-cutting picture looks rather bleak. For sure, one cannot but admire the tenacity and skills of the technocratic activists in Brussels trying hard amidst persistent failures to 'civilize markets', as Callon would have it. And one may almost come to care for the farmer who courageously shouldered techno-financial risks during Samsoe's renewable energy transition, only to be written out of the story. Yet, I find it hard not to take the story of Swedish water management as emblematic: here, the authors show, "local actors get engaged and try to do most of the work themselves in the absence of governing bodies handling the overflows." (Soneryd and Sundqvist 2022: 115). Is this not the experience we all share these days in the face of climate change and biodiversity crises?

And so, it is tempting for me, of course, to point out that, while the present volume takes important first steps, more steps lie ahead if we want to re-deploy STS in the service not only of diagnosing, but of attempting to bring about something like a sustainable state, capable of integrating ecology and democracy. And thus also tempting to conclude that this is where a follow-up volume is called for. However, to do so would perhaps be to confuse my own preoccupations a bit too much with the collective project of this volume – or, put differently, I can in fact promise that more work will happen along these lines, but such a proposition is so far mostly of my own making, the specificities of which I invite others to help me negotiate.

Where I would claim the book already calls out for a follow-up volume, in the sense of an immanent overflow collectively registered but not fully attended to so far, is rather when it comes to the project of putting STS' democratic imagination more firmly into dialogue with that of other fields and (inter-)disciplines. Rachel Douglas-Jones (2022: 178) puts it well, I think, when writing in her conclusion that "turning the analytic eye of STS towards democracy as practice […] means meeting the gaze of researchers in other disciplines". She enlists empirical political scientists, ethnographers of democracy, bioethicists, and historians; to which I might want to add in the political theorists, including those attuned to democratic situations beyond Euro-America.

As someone who has long taken an interest in how Bruno Latour, in particular, has long since enlisted a whole range of canonical political theorists in his STS project – sometimes, I think, to less-than-fully-coherent effects, full of interesting gaps – I cannot help thinking that the time would be ripe for a more explicit, more concerted, more self-conscious encounter. Beyond STS expansionism and humility, is it not the case that STS deserves credit for having renewed versions of political theory in interesting ways? Conversely, might STS not stand to learn from having its democratic imaginations more fully compared and contrasted to a broader set of such imaginations already at work out there – as a form of empirical political philosophy?

The release of this book is an occasion that opens up to, affords and invites such further reflections on important matters lying ahead. Such is the sense, I guess, in which a book release is also a democratic situation of sorts. Let us hope that others in STS and beyond will pick up the mantle and extend this situation further. Congratulations on the book!"

At this point we exit Anders Blok's words, spoken on a summer afternoon in Copenhagen. We would like to end this report by thanking him for making such a productive intervention at the book launch – and for agreeing to let us publish his comments in this format. We hope that his comments and the publication of our book may indeed be an occasion for STS researchers to take on a new commitment to an empirical *political* philosophy fit for charting the unsettled terrains we currently find ourselves in.

We hope you as a reader feel inspired to explore the Democratic Situations book, which is available open access via Mattering Press. The book is very much a product of the EASST community of which the book's authors, publishers, editors, and reviewers are members. Let the final words here be a resounding thank you to all the people that contributed to the volume and made the book possible.

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Reflections and suggestions for the future of European STS: an early career workshop report

Sarah Rose Bieszczad

Many STS communities across Europe and around the globe are now looking towards an uncertain future and how STS can aid in addressing the pressing issues of our time whose solutions or lack thereof will have concrete consequences for the future. On the 40th anniversary of EASST and with the theme of this year's conference being *Politics of Technoscientific Futures*, many discussions in the conference were centered around the future, future making, and our vulnerable world. The plenary, *The Futures and Politics of STS in Europe*, aimed to create space for collective sense-making around the identity and future of the field of STS as it is conducted in Europe. As part of the plenary, I was tasked with speaking for Early Career Researchers (ECRs) and what we, as collective, want from the STS community in terms of our education and socialization. As well as how ECRs envision the future of STS and our place within it, as those of us at the start of our researcher careers will become the future researchers of STS.

Speaking for the ECR's of EASST was a large task indeed, as I am only one person. So, to facilitate a collective ECR contribution to the plenary, I, along with my co-organizer James Besse, held a workshop for ECRs at this year's conference in Madrid. In addition to the direct objective of informing the plenary, we wanted to create space to collectively reflect on concerns for ECRs: what does STS mean for us as researchers working in and around the discipline; what does it mean to do STS; what can STS do for us and our research; what motivates us to do STS research; and how we can use our expertise from STS to address our world in crisis?

The workshop had around 40 participants from all around Europe, with backgrounds from all over the world, coming from as far as Australia. We opened the workshop with an exercise looking at how we, as ECRs, place ourselves and our research in relation to the field of STS. Participants placed themselves on a graph (see picture below). On the x axis was how they identify themselves in relation to STS and on the y axis the methods they employ. This exercise was first done in December 2021, at the Netherlands Graduate School for Science, Technology, and Modern Culture (WTMC) 2021 annual meeting's PhD panel entitled *(in)between: perspectives on doing a PhD in and around STS*, that I helped to organized along with my WTMC colleagues Jackie Ashkin, Anneke Boersma, Mike Grijseels, Joyce Hoek, and Nina Schwarzbach. Through this first exercise discussions arose around questions like what defines STS, what does it mean to do STS and what is in store for STS's future? One participant even described STS as a donut, i.e., a circular community with no real core. This fruitful experience led to the decision to try the same exercise for the EASST workshop and, as intended, the exercise led to similar discussions from the perspective of ECRs.

From this intial discussion, we arrived at multiple of topics and destilled them down into four main topics we as a group found most pertinent for further discussion. The topics were decolonizing STS, politics and futures in STS, mentorship and education, and careers. The collective came up with some more concrete suggestions and more broad ones. We found that questions of what we need in terms of our continuing education and mentorship in STS are inextricably linked to many other pressing concerns and discussion for all of us in and around STS.

Questions of education in STS quickly led to questions of what STS is and how you can have an education in something so diverse and distributed, not only

intellectually but also geographically. We find this multiple-ness to be a strength of STS, but we still need more explicit, less tacit ways of being introduced to the field (in all its forms). One suggestion would be a part of the EASST website for ECRs with things that introduce us to the many ways to engage with STS and the varieties of career paths in which STS knowledge can be employed. For instance, one suggestion would be to create a video archive of STS people from various backgrounds and life paths in order to show the diversity of possible application of STS knowledge.

In terms of concrete suggestions for education and mentorship in STS, we would like to find better ways to formally appreciate that mentorship and supervision are like anything a *skill*, requiring effort, learning, and time. We hope to find ways to reward the people that do this well, while creating institutional structures to allow space for other forms of mentorship outside formal academic structure—these informal relationships have often proved most fruitful from our experiences, but often go unrewarded and unrecognized.

Lastly, the future as well as the theme of this conference, we think fits very well with the spirit of our generation of researchers and those to come: we grew up in a world unlike our predecessors in many ways. Many of us feel a dire need for action to be taken and to find ways to make our research and ours privileged positions more meaningful—to do some good in aiding the current crises affecting the world. We want to be taught how to do an STS that makes space for activism and for differences in ways of being an academic. We look to find answers to questions like: If not just engaging with policy how to incorporate activism in our research lives? Is this combination possible? And how do we make STS more accessible to anyone interested in engaging with the field? These questions are deeply intertwined with de-colonization of STS. Looking to more political communities, like those in Latin America, may help provide creative solutions and ways to find answer to our questions.

These concerns were brought to the table in the plenary and a lively discussion around activism in STS ensued. The discussion brought forth many different viewpoints and nuances around activism in STS. Many researchers who have been in the field longer made it clear that these calls for both activisms and clearer understandings of European STS and what it can do for researchers wanting to engage with wider audiences have happened before. While others discussed feeling a similar urgency and the ways they themselves try to act, from teaching to doing radical environmental activism in their personal time. One main point that I feel warrants further clarification is that activism, as we see it and as it was shown in the discussion, can take on many forms, not just 'taking to the streets' as it is often envisioned. Activism can take on many forms, for example taking positions of power or advisory role in institutional settings, teaching, recognizing privilege and using it to empower others, actively situating oneself more politically within their research contexts, or more traditional engagements with activism communities.

I view this discussion that took place at this year's EASST plenary as only a starting point for further discussion and viewpoints around activism in European STS and the plurality of ways to be involved, as STS scholars, in addressing the current crises occurring in our vulnerable world. I hope to collect various viewpoints and stories of how scholars in our community engage with the themes discussed here, i.e., mentorship, educations, careers, activism in STS and the roles STS can play in addressing current crises. If you would like to contribute, please contact me. We hope to collect as many perspectives from as many people in and around STS (at any career stage), to both showcase the diversity of European STS and continue the discussions begun during the workshop and plenary. If you like to be involved, please reach out to the author. We look forward to hearing your perspectives!

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The History of Technoscientific Promises and the Promises of Technoscientific History

Susannah Glickman

Summary of article: What are the politics of technoscientific futures? How do you build and maintain institutions around a technology which does not yet exist? How do you craft a credible technoscientific future? This paper examines the relationships between histories of science, scientists, futures, and STS, through a panel on as well as the author's fieldwork in the emerging field of quantum computing and information. History writing, the author finds, is at the heart of projecting credible technoscientific futures which garner funding and prestige. What does this mean for the fields of history of science and STS?

Futures take the form of a promise. Technoscientific futures even more so—they project a future built around a specific technological object. The "Making Media Futures" panel offered an example of this practice with four talks focused around four different promises: (imagining) the perfect girlfriend, the merging of minds and machines, airports before the existence of airports, and technoscientific imaginations of the nation-state Turkey. How are these technoscientific promises articulated? What forms do they take? Our EASST panel, titled "The power of technological promises: quantum technologies as an emerging field", explored the power of these visions through quantum computing and information (QC). We argued that QC offers a useful example, particularly because the field has yet to deliver on any of its promises. Therefore, it offers social scientists a window into how actors construct institutions, narratives and ideologies in real time, as well as how these narratives shift according to the needs of an audience, field, or other factor. The emerging quantum sciences are, thus, an area of contestation for shifting techno-economic relations on the international level. No quantum computers fulfilling the promises made by the field exist, nor will likely exist in the next decade or so. The same is true of concepts like the quantum internet and fully-secure quantum communication.

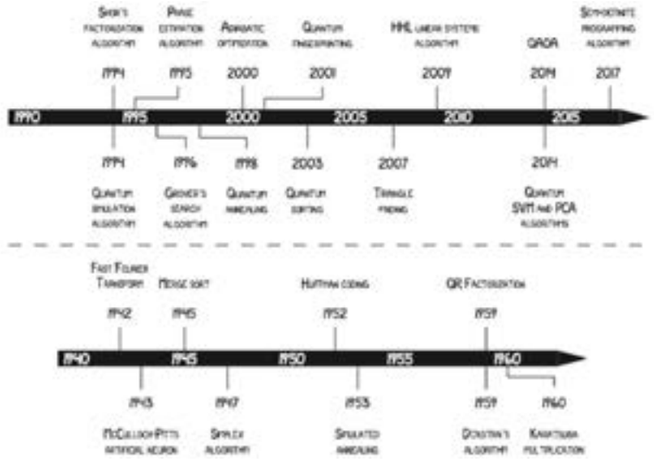

Figure 1: From Seskir's presentation

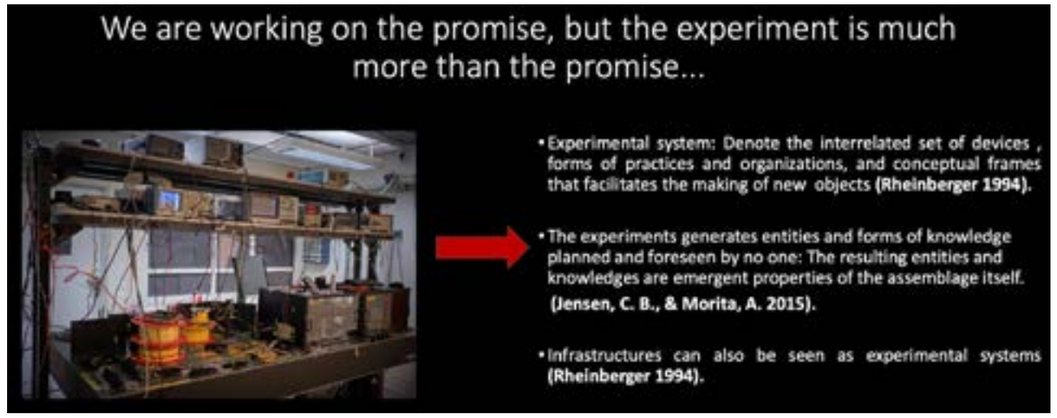

Figure 2: From Alarcón and Castillo's presentation

The paper by Zeki Seskir on post-quantum cryptography offered an account of this landscape. His paper explores post-quantum cryptography and the claim that quantum computers will be able to break the Rivest–Shamir–Adleman algorithm (RSA), the means through which internet communications are encrypted. He touches on the extensive work of the US National Institute of Standards and Technology (NIST) in planning for this future. This promise of encryption-breaking has spawned not only the new field of post-quantum cryptography, which Seskir discussed but moreover a class of consultants to prepare companies to adapt to quantum computing. This class of consultants is not Seskir's focus per se, but their emergence demonstrates how seriously industry takes the promises of QC, and how complex the institutions built around it have become.

Another paper presented at our panel, coauthored by STS scholar Camilo Castillo and electrical engineer Alvaro Alarcón Cuevas, examined the relationship between the promise and products of quantum communication, where Alvaro himself is an active researcher. The authors asked how scholars and broader society do and should evaluate the field's successes, or lack thereof. Their paper offers a tactic for handling the overwhelming power of technological promises: to shift focus away from them. They argued that "the experiment is much more than the promise" and that "we miss things when we are only fixated on the promise," (Alracón and Castillo, 2022). They cite Jensen and Morita's 2015 paper, "Infrastructures as Ontological Experiments," which argues "experiments generate entities and forms of knowledge planned and foreseen by no one: The resulting entities and knowledges are emergent properties of the assemblage itself" (Jenson and Morita 2015). Alracón and Castillo frame tacit knowledge as an example of the products of experimental research which are not outlined in the explicit promises of the field. This is also the stance of some of the scientists I have interviewed in the field of QC who stress that no one knows exactly what technologies may emerge from QC research. Perhaps this approach offers an alternative to the historical reasoning on display more publicly in the field. Many actors in the quantum computing world try to have it both ways; by invoking Castillo and Alarcón's argument that the field is valuable outside of its explicit promises for certain audiences, and permitting or encouraging others to equate quantum computing's future and classical computing's past at the same time.

How do you fund a promise? How do you build and maintain institutions around a technology which does not yet exist? How do you craft a credible technoscientific future? This was the central question of the papers on our panel. My paper touched on the role of history-writing in technoscientific infrastructure. As a historian, in the course of my fieldwork with QC practitioners, I was struck by how much time the scientists spent telling histories to each other and to general audiences.[1] I was further struck by how much importance they placed on the disciplinary practice of

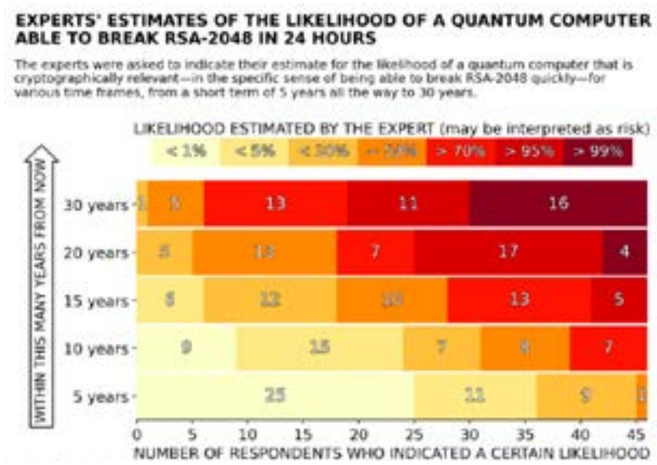

Figure 3: History relayed as promise. From a presentation by Joe Fitzsimons.

history. They wanted me to write their histories the right way, by which they meant in a way that corresponds to their experience. The scientists were very well-read and opinionated about the history of science literature written about their disciplinary backgrounds. They felt compelled to write their own histories to some extent because they had experiences that caused them to believe historians of science had talked only to self-promoters and had thus inscribed the history of the field—and therefore the field itself—incorrectly.

When examining US and EU government documents on QC, I found they were filled with histories; histories of science, of the US state, of technology, and of thought. Often, they were filled with histories relayed by scientists and engineers. Our panel had an example of this as well in Alarcón's participation, though unlike the scientists and engineers in my paper, he worked closely with Castillo, a social scientist. In his essay "Society in the Making," Michel Callon famously argues that the engineers he studies are, in fact, sociologists. They act as sociologists in their work designing and getting buy-in for the technological assemblages that they build (Callon 1987). Callon, furthermore, argues that disciplinary sociologists ought to learn from engineer-sociologists (Callon 1987). In the same year, Bruno Latour wrote an account of how scientists make and remake the grounds of politics in his book The Pasteurization of France (Latour 1987). What should we, as social scientists, make of this usurpation? Perhaps disciplinary categories are aspirational, creating distinct cultures within those boundaries, but not actually cordoning off practice.

Callon and Latour, taken together, can offer an explanation of how scientists make credible technoscientific promises. They do so by taking on the role of social scientists in order to make and remake the grounds of politics. My paper looked at how a network of international, mixed industrial, and academic scientists made the promise of quantum computing credible, into an overdetermined future, and how they convinced US government and industry actors to fund and build institutions for the field. I found through my research that the structure of the promises made by QC relies on scientists' ability to integrate the field into other histories of science and technology—for example, into the histories of computing. Being integrated into the history of computing allowed QC practitioners to use preexisting infrastructures built by and for classical computing practitioners. Scientists in this context act as historians whose histories have great impacts, guide policy and practice, create and recreate a number of scientific fields. The histories they recount enlist other figures (e.g., government bureaucrats, scientists from other disciplines, or industry figures) into their network and make claims about the stakes of their project. Through this practice, they make and remake the grounds of politics.

1 They even introduced me to one practitioner as the 'family historian' of the field.

Not incidentally, these scientists (especially early practitioners in the field) are acutely interested in pedagogy and re-making the general public's understanding of the world. By making insistent claims about the nature of reality—for example, the assertion that 'the physical world is quantum mechanical'--they attempt to re-engineer nature and the human subject—explicitly writing and rewriting the past, future, reality, and the subjects who experience it as such (Feynman 1982, 467-71).

Whether or not historians of science want it—Daston claims that, unlike STS practitioners, historians of science would rather not—histories of science act on the world and guide policy (Daston 2009). One of my central arguments is that these scientist-histories are important to institution-building and planning, as well as anticipating the future. By anticipating the future, I mean preparing the ground for it, using Michelle Murphy's definition of anticipation (Adams and Murphy 2009). In this case, historical reasoning is the epistemology of futures in the sense that quantum scientists apply these histories in order to excavate institutional and imagined space for their project; scientists present these histories as means through which society can anticipate the future.

The kind of historical reasoning on display by scientists relies on a crucial slippage between description and prediction. Take, for example, a central narrative of 'tech', Moore's Law; the belief that devices will keep getting steadily smaller, cheaper, and faster (Fuchs 2015). Many see this as a quasi-law of technological development. It is not true that every actor takes Moore's Law to be predictive. However, the narrative that filters into mainstream culture is that the law is almost a law of nature. Regardless of actors' belief in the status of the law, many use it to make predictions for a variety of reasons. Moreover, progressivist histories like Moore's Law often do not feel they have to offer an explanation of this historical trend, leading later readers or consumers to see them as laws of history. Historians of science may think we are writing descriptions of the world, but others will always use it as prediction.

Actors are primed for these progressivist histories because, as Daston shows in her article "The History of Science & the History of Knowledge," historians of science and others tie histories of science to progressivist histories of civilization in order to explain the difference between 'western civilization' and the rest of humanity and thereby to justify western domination (Daston 2017). Progressive histories were adapted in the post-Cold War to account for lingering inequalities by asserting a relationship between 'technology' and economic difference: technological development became what distinguished the good outcomes of the economies of wealthy countries from the poor outcomes of the economies of the rest (Latham 2000). These techno-economic narratives account for our societal obsession with histories of technology and produce the substrate from which these histories of science and technology, told by scientists, wield such power. They likewise encourage the slippage between description and prediction. In themselves, these histories of science, and technology have become a form of reasoning-- a predictive epistemology whose product is credible futures.

During the Q&A, we fielded many questions about when QC will replace computing and what stage in the historical development of classical computing QC had reached; for example, audience members asked if QC was still at the pre-silicon transistor phase or if we were closer to seeing computers which would replace classical computers (quantum computers will likely never replace classical computers).

These questions recall an oft-repeated narrative about how QC is the second coming of computing; that it represents a recapitulation of the information technology revolution which brought consumers personal computers, the internet, and more. In the course of my research, I have found that narrative is so powerful that managers in the US government and computing industry[2] believe the field will precisely reenact major computing milestones in a similar if not the same

timeframe as classical computing. Likewise, as for example Seskir's presentation demonstrated[3], actors believe it will even have same constituent parts (transistors, repeaters, internet etc). Actors anticipate quantum as computing 2.0 or information technologies 2.0 to the extent that US intelligence agency reports worry that the technology is so overdetermined it may deter progress. Once again, description has become prediction and history has become the future. There is a good reason that this is the case; Histories justify funding, industrial planning (by entities like the US national security state) and eventually lay the groundwork for industry involvement. QC practitioners, in particular by suggesting their project is an extension of the larger project of computing, are able to overcome barriers to their projects' realization through this mechanism.

One question raised by all of this discussion is: what is the proper relationship between STS, history of science and the sciences? What promises do we make to each other and to the public? Castillo and Alarcón's presentation offers a potential model. They had a close relationship and collaboration predating this paper and because of that were able to synthesize a valuable and interesting answer to the problem of how to deal with technological promises in practice: to spend more effort elaborating the societal benefits of these fields outside the technoscientific, product-focused, promises they make to potential funders. Perhaps scientists, historians and STS practitioners should reimagine the boundaries of our fields and collaborate on writing the kinds of histories that matter—the kinds of histories that acknowledge they act on the world as well as describing it.

2 This probably extends beyond the US but most of my research has been with US sources.

3 This way of thinking about quantum technologies is pretty ubiquitous. Seskir's presentation offered some interesting examples of this tendency.

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Has crisis 'run out of steam'? Exploring the affective and temporal qualities of 'crisis talk'

Roosa Rytkönen

Talk about 'crisis' has proliferated in contemporary societies. What does this mean for the analytical usefulness of the concept and our interlocutors' reactions to 'crisis talk'? Paying attention to affective and temporal qualities of crisis talk can provide useful insights for examining whether certain kind of information comes or fails to matter – including providing understanding to what is at stake when claims of crisis are contested.

The concept of 'crisis' has become a central interpretative frame for explaining social changes in contemporary societies, which is also visible in the proliferation of "crisis talk". The omnipresence of the concept has also provoked critical commentaries from scholars, who have contested its usefulness as an analytical concept (e.g. Roitman 2014). For the EASST 2022 Conference, my colleague Alexandra Ciocanel and I proposed a panel asking whether "crisis has run out of steam", seeking to explore temporal and affective qualities of "crisis talk". A central idea behind the panel was that paying attention to such qualities of crisis talk might help us better understand why certain kind of information comes or fails "to matter" (Latour 2004), shedding light to the stakes of contestations.

The presentations in the panel explored crises of various kinds – environmental, political and economic – through different qualitative methodological approaches. One of the central themes of the panel was climate change skepticism. In her presentation, Alexandra Ciocanel pointed to the importance to paying attention to affect and emotions when examining whether climate change comes to matter by discussing optimism and pessimism as affective dispositions. In so doing, she argued that scientific debates about "matters of fact" concerning climate change are also debates "about meaning, ethics, and morality". Monica Marin's presentation about climate change media discourses built on similar insights, pointing to the intertwined nature of temporal and affective work in semiotic struggles. Marin compared media content of two US publications, one considered liberal and the other conservative. She found out that "time work" and "temporal manipulations" played a central role in both, contrasting the urgency of the supporters of climate change, manifest in shorter time frames, with the geological and industrial temporalities of the denialist discourses.

Similarly to Ciocanel, Marin showed how temporal and affective dimensions were intertwined; for example, one idea advanced by the conservative publication was the optimistic assertion that technological advancement would enable humans to tackle environmental challenges. In their focus on time and affect – including pessimism and optimism – these two presentations evoked interesting questions about the ways in which the ongoing climate crisis challenges the idea of progress, which is central for both modern science and state, and transcends the liberal-conservative divide. By challenging the linear narrative of progress – or at least central components of what it involves – climate change strongly connects to what some scholars have termed the ongoing crisis of political imagination in late liberalism (Razsa 2015). If it's easier to imagine the destruction of the earth than the end of capitalism, as Jameson has suggested (1994, xii), are optimism and long-term timeframes really a privilege of denialist discourses?

Optimism and pessimism are both future-oriented orientations, which relate to expectations. However, Rebecca Bryant (2016) has argued that "a particular sense of present-ness produced by futures that cannot be anticipated" (2016, 19) is exactly what defines a time of crisis among our interlocutors. Théo Régniez's presentation addressed this uncertainty about the future from the perspective of knowledge producers, more specifically, economic forecasters in France. Régniez elaborated how his interlocutors were well aware of the inherent uncertainties and high probability of failure in economic forecasting in the midst of a financial crisis. Consequently, Régniez elaborated on an ethnographic distinction his interlocutors made between "understanding" and "explaining": during financial crisis, they were unable to "understand" the situation but still able to "explain" it. Thus, Régniez argued that during the crisis, the story-telling aspect of forecasting, which was also present during "regular" times, took on a new dimension.

In my presentation, I dealt with a similar tension concerning temporal aspects of discerning "truth". I showed how my scientist-interlocutors in Western Siberia manifested a general skepticism towards claims of "global crisis", manifest in their doubts concerning the seriousness of anthropogenic climate change and Covid-19 pandemic. I suggested that in their doubts, my interlocutors were drawing from a culturally specific epistemology of truth, according to which scientists were understood to be dealing with the eternal, metaphysical truths of nature, independent of human cognition. In expressing their doubts, I argued, they presented a critique of the politico-economy of knowledge production in both media and academia, which they viewed was susceptible to political and economic manipulations. They considered that truth was often impossible to discern in the current moment and prolonged into the distant future, producing a certain kind of temporality of discovering truth, which could be considered antithetical to premature announcements of crisis.

My interlocutors' reservations about claims of crisis point to the way in which claims of crisis can act as a powerful tool of political manipulation. José David Gómez-Urrego's presentation dealt with the use of crisis as a political resource through the kind of radical rupture of expectations declaration of crisis enables. He

elaborated this through an account of 'Yachay city of knowledge' in Ecuador – a high-profile, vast investment project advanced by the country's long-term president Rafael Correa. In his presentation, Gómez-Urrego shows how in a matter of days Yachay went from "the most important private investment in the history of the country" to "a farce". Gómez-Urrego argues that this radical change came about when the new president Lenín Moreno and his administration declared a crisis, reframing the last decade of Ecuadorian politics and questioning the previous government's narrative of improvement. This, Gómez-Urrego argues, enabled destroying the long-term time horizons, which had justified the vast investments to Yachay, and abandoning the project as a failure.

Further, the presentation by Christian Colella and his colleagues addressed contestations around problem setting during a declared environmental crisis. Their case study concerned the detection of *Xylella fastidiosa* bacteria in Puglia in Italy, which threatened the region's famous olive trees, which became hosts for the bacteria. Colella et al's presentation elaborates the different framings of problem setting; the first one, advanced by EU bodies, focused on the pathogen as the cause of the trouble and advocated eradicating the infected trees as a solution to the problem, insisting on the urgency of this effort. The second approach, advanced by political and social movements in the region, argued for a more holistic and contextualized approach, seeking to address the decline of the olive trees instead of focusing on the bacteria, and questioning the "state of emergency". Importantly, Colella et al's presentation showed how the ways in which framing the problem as "crisis" also affects the ways in which potential solutions were understood.

Overall, the presentations in the panel shed light on the ways in which attention to the affective and temporal dimensions of crisis talk can help us understand contestations around different kinds of crises and their stakes. For example, the idea that "the problem" of climate change skepticism can be simply solved by providing the "right" kind of information, is if we understand that people's evaluations of knowledge claims involve much more than the "logical operations of falsification, verification, and probability attribution" (2018, 169), as Mathijs Pelkmans points out. Further, the presentations also reminded us of the importance of carefully contextualizing our case studies and remaining sensitive to the power dynamics underlying both claims and contestations of crisis.

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Rethinking Multiple Ontologies and Ecologies: A review

Jaya Sarkar

This article highlights three presentations from the panel "Interspecies Agencies: Controversies, Ontologies and New Forms of Cohabitation" that was a part of the EASST "Politics of Technoscientific Futures Conference". The article reviews these presentations and demonstrates how they are linked together to argue an interspecies agency among different humans and non-humans, including pigeons, animals, mushrooms, and microorganisms. This article further highlights how each of the presentations expands the discussions of new ontologies and ecologies in relation to the interspecies framework.

This article focuses on the panel titled "Interspecies Agencies: Controversies, Ontologies and New Forms of Cohabitation", presented on the 8th and 9th of July, 2022, at the EASST "Politics of Technoscientific Futures Conference" held in Madrid. The aim of the panel was to observe the interspecies bond that is manifested in various dimensions, including human-animal cooperation, public health, interspecies contagion through close contact with microorganisms, and issues related to nature and wildlife conservations. The panel included presentations that lie at the intersections of interspecies agencies and socially controversial aspects. The presentations also focused on multiple modes of scientific knowledge about animals, mushrooms, and microorganisms. New discussions and perspectives about multiple ontologies were initiated, and there was also a strong focus on theories and concepts related to 'beyond the human'.

Humans and animals are brought together to the same scene by active participants in a set of socio-technical networks that includes different agents under diverse conditions and various possibilities. The primary focus of all the presentations was on the set of possibilities available for living with the animal, and their co-existence will evoke a new interspecies regime. In the panel, the presentation titled "Attuning to Trans-species Pidgin Articulations: Pigeon Racing as a Creolization of Interspecies Subjectives", Kristen Livera uses the actor network theory to describe her anthropological inquiries into the re-inscribation and re-articulation of racing pigeons and their fanciers in the world. Using this theory, she demonstrates how the pigeons "aren't bound by the subjective limits of a world of beliefs and fantasies, but cohabit a common vital world" (Ferreira, 2019: 275). Her presentation highlighted how the various actants are dragged into the politics of pigeon racing and have created "uneven topographies" (Bennett, 2010: 25). These uneven topographies (Fig. 1) include wind, fog, cow herding, radio turbines, and global warming. Such a diverse array of actants are found to be heterogeneously diffused across the topographies. Livera focuses on how her research seeks different ways of co-constructing the reality and re-articulating the bodies to be represented differently within a space of third-subjectivities (Despret, 2004).

In the presentation titled "De-extinction and the Role of Animal Charisma in Forging New Human-Animal Relations", the panelists focus on how scientists are currently working towards the resurrection of extinct species using synthetic biology. This process of resurrection is known as de-extinction (Seddon et al., 2014). The presentation treats de-extinction as a method of nature conservation. They also bring into conversation the debates regarding the ethical implications of de-extinction

Fig. 1. Kristen Livera presenting on "Attuning to Trans-species Pidgin Articulations: Pigeon Racing as a Creolization of Interspecies Subjectives". Source: Jaya Sarkar, 8th July, 2022, Madrid.

(Sandler, 2017) and how the effectiveness of this method has been constantly interrogated. De-extinction contributes to the redefining of the human-animal relationships and gives rise to a new interspecies bond where the animals are also active participants in the existing complicated socio-technical networks. The presenters demonstrated that the selection of de-extinction species depends on the animal's charisma. Using theories of priority setting in research (Ciarli and Rafols, 2019; Dalrymple, 2006), it is argued that the charisma of the animals exerts such a strong influence that it outweighs even conservation benefits.. Further, the charisma of the animals is associated with the relationships shared between the researchers and their sponsors, users, and the public in general.

The next presentation, titled "Disciplining Fungi Growth: Plantationocene in Post/Socialist Ruins", focuses on plantation production, which is analyzed under the lens of disciplination of crops and workers (Tsing, Mathews and Bubandt, 2019). Further, plantation production is analyzed within the genealogy of market economy and capitalist production. The presentation discussed the production and the economy of the cultivated Shiitake mushrooms in the Czech Republic. The state socialist regime was responsible for transforming mushroom cultivation from

Fig.2. Koen Beumer presenting on "De-extinction and the Role of Animal Charisma in Forging New Human-Animal Relations". Source: Jaya Sarkar, 8th July, 2022, Madrid.

a public business to a private business. After the change in regime, mushroom cultivation began in abandoned spaces such as pigsties, cowsheds, and military areas. When the Czech Republic became a part of the European Union in 2004, mushroom cultivation was upscaled and became a part of large-scale trade. The presentation demonstrated the ecologies, infrastructures and commercial strategies that were adopted for the growth of the Plantiationocene in areas of post/socialist ruins. It highlights the method used by the growers of the shiitake mushrooms in order to engage in global markets with their commodities.

These three presentations highlighted three different tents of the panel titled "Interspecies Agencies: Controversies, Ontologies and New Forms of Cohabitation". The humans shown alongside the pigeons, the animals, and the mushrooms exist within an interspecies agency, and a transformative space is created where the social constructions and entanglements between humans and non-humans are re-constructed. The kind of materialism that the pigeon fanciers or the mushroom cultivators embody expresses a vitalist force of life and prioritizes ethical values which centralize life itself. The embodied and embedded beings sustain each other to overcome the different levels of complexities. The interspecies agencies acknowledge the sense of attachment to multiple ecologies of human and non-human relations. By paying attention to the actual world-making practices of other entities, an interspecies worlding framework arises. These presentations highlight how the new forms of cohabitation become a shared, plural, hopeful concept that is rigid and understandable.

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EASST Story Competition

First-ever poetry, flash fiction and short story competition... introducing the winners

Michela Cozza, Nina Klimburg-Witjes & Sally Wyatt

METHODS, FORMS AND NORMS

TECHNO-SCIENCE FICTIONAL

GAZING AT THE STARS

We had the honour and pleasure of being entrusted with organising a sub-plenary session for the 2022 EASST Conference. The official title of the session was 'Techno-science fictional futures: Methods, forms, norms', but this can also be formulated as a haiku (see above). The aim of the sub-plenary was to stimulate the individual and collective imagination of STS scholars through paying attention to and engaging with poetic, literary, and artistic renderings of techno-scientific futures. Our invited guests – Katja Mayer (University of Vienna), Andreas Philippopoulos-Mihalopoulos (University of Westminster) and Laura Watts (University of Edinburgh) – certainly succeeded in realising that aim with their spectacular performances.

We know that scientific and speculative fictions (SSF) are a source of visions and imaginaries for scientists, engineers and others. Many STS students are avid readers and watchers of science fiction. This shouldn't come as a surprise, as SSF is a way of imagining other worlds, of representing alternative engagements with technoscience, and of expressing different ontological orderings. All of these are matters of concern for the STS community. SSF, especially when written as creative non-fiction, can also be a method and device for STS scholars to engage with interlocutors during fieldwork and with wider audiences, including people in their roles as citizens, workers, patients, artists or policy makers. (See, for example, Maguire, Watts & Ross Winthereik, 2021; Shaviro, 2021; Woolgar, Vogel, Moats & Helgesson, 2021.)

EASST members are very creative, so as part of the session, we also decided to hold a competition, inviting those planning to attend the conference to send us their poems, flash fictions and short stories. It was a real joy to read the material that people submitted. Those who did emphasised the pleasure they had in this creative writing and in participating in this experimental competition. This was all very gratifying for us as organisers, but it was also rather worrying because it raises questions about the state of academic publishing. Luckily, STS journals and book publishers are more tolerant than much of academia. However, there is evidence that articles in the leading STS journals have become more homogenous in form (including length, numbers of references) over the past years, perhaps due to the rise of quantified assessment practices (Kaltenbrunner, Birch, van Leeuwen & Amuchastegui, 2022). STS has had its more adventurous moments such as when it experimented with the literary turn, radical reflexivity and experimenting with form (see, for example, Ashmore, 1989; Mol, 2003; Rappert, 2009; Woolgar, 1988).

The sub-plenary and the competition were ways to celebrate the creativity of our community and its desire to communicate, and to remind ourselves that writing poetry and short stories, as fiction or creative non-fiction, always helps us to write better traditional academic texts and to think otherwise. Other forms of writing and representation open up new possibilities for research, representation, collaboration, and maybe even better worlds.

We are very grateful to the EASST Council for supporting this experiment, and hope they will find ways to continue to support similar initiatives in the future. We are also grateful to Andreas, Katja and Laura for helping us to judge the entries and declare the winners. Bristol University Press, Goldsmiths Press and Mattering Press generously provided some of their own creative books as prizes. Most of all, we would like to thank everyone who participated for their boldness and creativity.

It is our pleasure to present the full texts of the winning entries and the honourable mentions in this issue of EASST Review. We hope you enjoy reading them.

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Nina Klimburg-Witjes is a post-doctoral researcher at the STS Department, University of Vienna, and an elected member of the EASST council. Her research focuses on infrastructures and imaginaries of outer space, and on the politics and practices of in/security. She recently co-edited Sensing In/Security: Sensors as Transnational Security Infrastructures (with Geoffrey Bowker and Nikolaus Poechhacker, Mattering Press 2021). Her current book project explores space infrastructures and visions of European integration in outer space.

Sally Wyatt is Professor of Digital Cultures at Maastricht University, the Netherlands. She was President of EASST between 2000-2004 (York and Paris conferences). Together with Anna Harris and Susan Kelly, she is co-author of CyberGenetics, Health Genetics and New Media (Routledge, 2016). The conclusion includes three speculative futures about genetic testing, using the future-oriented discourses of genetic testing companies to explore alternative futures about the role of genetic testing. Contact via email: sally.wyatt@maastrichtuniversity.nl or via Twitter @wyatt_sally

Poetical Science (for Ada Lovelace)

Eva Hilberg

Winner – Poetry – Eva Hilberg

To think that form makes the poem
Is like
Thinking that science is about numbers
Is like
Looking at a machine and seeing pegs
Is like
Seeing an equation and reading only letters
Is like
Thinking a computer to be an oversized calculator
Is like
Looking at the history of computing as an exercise of accountancy
Is like
Calling invention a feat of engineering
Is like
Saying Charles Babbage without saying Ada Lovelace
Is like
Thinking ideas will leap from any pen
Is like
Thinking that programming is not writing
Is like
Thinking that words and numbers are so very different
Is like
Inventing an analytical engine to do sums
Is like
Saying Lovelace without saying Byron
Is like
Thinking creativity comes from order
Is like
Thinking genius is about recall
Is like
Thinking truth the result of arithmetic
Is like
Thinking you have to know where you are going to make a start

Eva Hilberg is a Post-doctoral Research Associate in Sociological Studies at the University of Sheffield, where she analyses the use of drug regulation, new technologies, and intellectual property rights in the definition of global health priorities. She currently also studies for an MSt in Creative Writing at the University of Oxford. Her poetry has been longlisted for the 2021 Live Canon International Poetry Competition, has appeared in HMC magazine, and as part of the Dark Canadee project.
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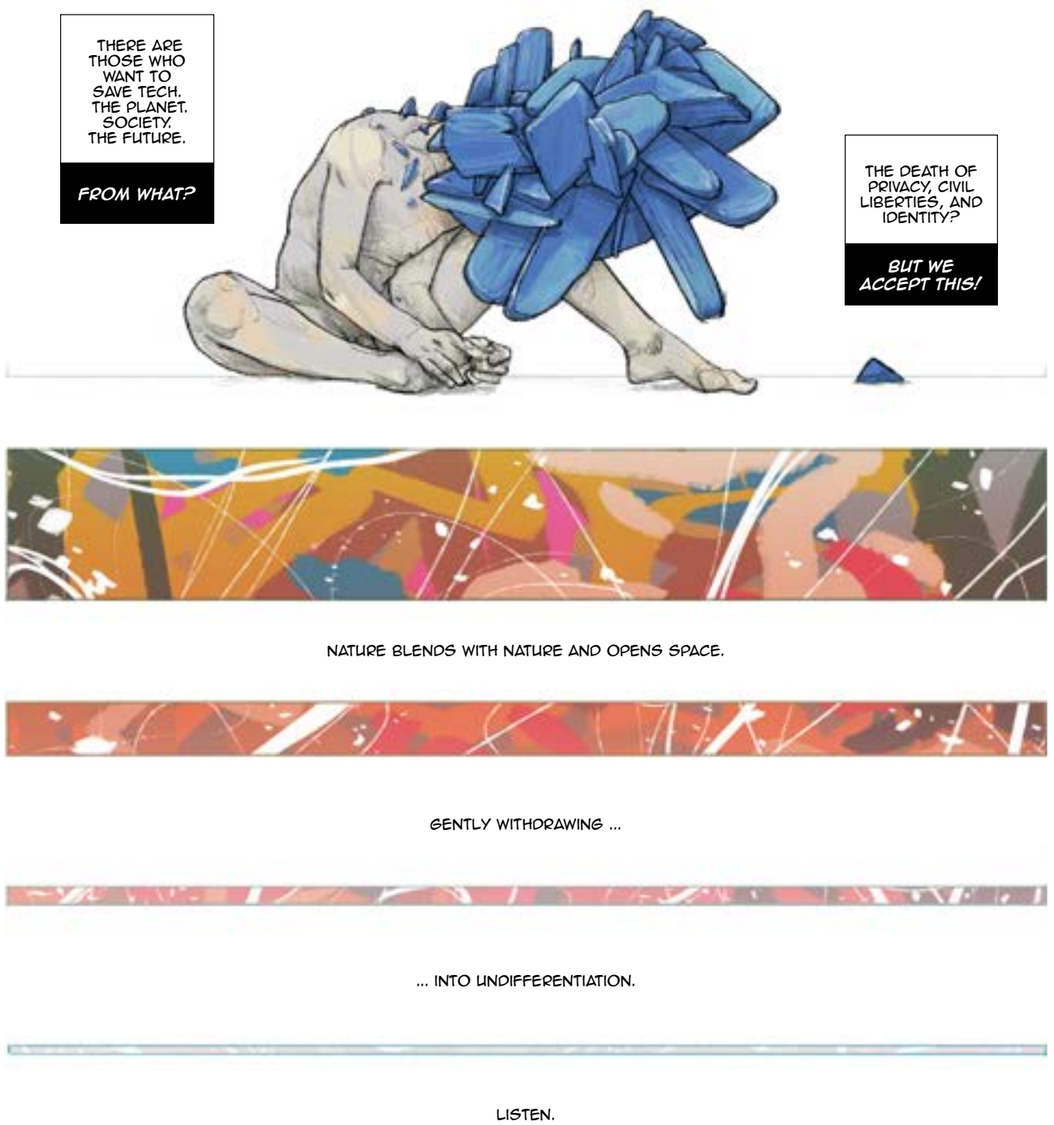
CRYSTALLIZATION

BOEYKENS, H. / VAN OUDHEUSDEN, M. 2022 (S.A.D.) CRYSTALLIZATION, SUBPLENARY SHORT STORY, FLASH FICTION AND POETRY COMPETITION, EASST CONFERENCE 'POLITICS OF TECHNO-SCIENTIFIC FUTURES,' MADRID (6-9 JULY).



Honourable Mention – Poetry – Hans Boeykens / Michiel Van Oudheusden

Hans Boeykens unwittingly launched his career as an independent illustrator when he defied his 7th grade teacher's orders to stop doodling faces of cartoon characters on music sheets. From that moment on, he was hooked on drawing. His illustrations have appeared in Dutch-language children's books, science fiction magazines, and romance tales. He is a passionate landscape gardener. hanz_boeykens@yahoo.com
Michiel van Oudheusden is a sociologist, who experiments with storytelling, graphics, and music as a way of 'artifying' research and opening up scholarship to society. He has led research projects on citizen science and responsible innovation at the universities of Cambridge and Leuven. He loves brewing, smelling, pouring, tasting, and holding tea. michiel.vanoudheusden@kuleuven.be

Sobriety in a time of planetary crisis

Stephanie Lavau

Winner – Flash Fiction – Stephanie Lavau

I'm regretting the metallic puffer jacket. Futuristic fashion of the 1990s; nostalgic fashion in the 2020s; innov-chic now, in the 2050s. A sheen of retro-futuro-techno-optimism, worn to mask my true self. It shimmers under the streetlights as I approach the building, illuminating my shame.

Inside, I follow a sign to the appointed room. Self-conscious, I take an empty seat and cast a quick glance around at those already in the circle. Recognition. The dark rings under the eyes. The hands that tremble, as if unable to contain a message. AA: a fellowship of people who have lost control.

A newcomer, I'm invited to introduce myself, my vice and my misfortune. Scientist that I am, I follow the formula. "Hello, my name is Stephanie, and I'm an..." Awkward pause at the moment of truth. Truth, a fickle companion in this time of planetary crisis. "I'm an academic. I've lost control of my thinking." Academic. The word brims with rebuke.

Sympathetic nods as my dreadful secrets tumble out. "It takes me weeks to develop an idea. I can't meet my performance targets of posts and likes. I'm scared I'm going to lose my job as a thought leader." More nodding as I stream on. "I ask peers to review my thinking before I post. I crave evidence." Deep breath. "I know my job is optimism-isation, but I just want to be sober." I lower my eyes in shame and rub my elbows nervously, longing for leather patches on corduroy.

Dr Stephanie Lavau is a Senior Lecturer in Interdisciplinary Environmental Practice at The University of Melbourne. Her socio-cultural research focuses on environmental management, governance and knowledge practices, particularly in relation to urban water management and biodiversity conservation. Stephanie leads research on civic ecology and citizen data practices for the Melbourne Waterways Research-Practice Partnership. Stephanie gratefully lives and works on the unceded lands of the Kulin Nations.

Dam Visions

Kathrin Eitel

Honourable Mention – Flash Fiction - Kathrin Eitel

What Kasio saw was impressive. Ngo had become really adept at visualizing stories and songs she had recorded that were full of hopes and fears for the future. He put in his VR contact lenses and clicked through different characters. In each scenario, he saw the dam he had built to keep the floods away from the city.

There was a little boy with green eyes that reminded him of a lagoon. He showed him his family, and the hand-woven fishing baskets that were empty and remained so. As the boy grew older, he moved across the dam to the city. Uprooted from his traditions and the footsteps he once should have followed, he stumbled through the noisy life of the big city, which crushed him with a hiss. When he returned to his village one day, he found nothing left but the bamboo poles of his parents' house and the old altar, on the sides of which the remains of the once engraved fishes were still visible. Their gods and mediators.

Kasio shivered as he took off his lenses.

It was known to them that the fish population would be drastically reduced by the construction of the dam since the natural waterways would be blocked by it. They had also already developed solutions. But they had not considered that whole customs and identities could be disconnected. At least, it had not been so apparent to him.

"Alright", he said to Ngo. "I want to know what you propose."

Kathrin Eitel is a cultural anthropologist and feminist STS scholar currently working at the Department of Social Anthropology and Cultural Studies at the University of Zurich. Her work focuses on urban resilience, technological megaprojects, and resource scarcity, mainly in Southeast Asia and Europe. Kathrin is currently very interested in the different forms anthropological knowledge can take and the impact collaborative and transdisciplinary projects can have on social inequalities, (post)colonial structures, and the effects of climate change. Twitter: @kathrin.eitel

Skylark

Steven Gonzalez Monserrate

Winner – Short Story – Steven Gonzalez Monserrate

Silence. Every morning I wake to silence. Sometimes at dawn, I go out to greet it, to look up at the sun-drenched sky, tinged red with the blood of what calamity claimed. Above, the canvas of the heavens is parched, naked. I hear nothing but wind as it combs through the desert, longing to remember the songs of skylarks. There isn't even a whisper of birds anymore. This world is quiet. Empty. Like the blank, barren sky, bereft of those formless flocks of white that now only live in memory. But this is our reality now, our penance for not heeding Nature's signals, or the warnings of indigenous shamans or the politically incompetent outrage of scientists who tried to stop it. They cried out in terror, their voices tapering as they echoed in the nothingness that is this wilderness after clouds. For the clouds have gone the way of the skylark; extinct. They are but dreams now, for those of us left who remember how to dream of them, for those us fortunate enough to be born before they departed.

Some of us tried to stop them from leaving. Perhaps we were naive. Perhaps we were vain. But we believed we understood them. Their signs. The clues they left behind for us hidden in choreographies of vapor. I still remember what it was like to see them teeming in puffy flocks, their great sails thick enough to cast shadows on the mortals below. The children always shudder when I tell them of cloud shadows by the hearth fires in the dead of night. They want to hear Uncle Nimbus tell them about the clouds that were. So I tell them my story. I recount the wonder of a world of clouds as they stare at me, eager to absorb every detail, some of them turning their gaze to the curling smoke from the red blaze, the closest thing to clouds they might ever see.

I never begin the story the same way. Perhaps I am in denial that the past is immutable, that what I did or failed to do is irrelevant in the face of the simple fact that cloudkind is extinct. Perhaps I feel remorse for these children, the only ones left standing who can judge me for my actions. Whatever the reason, the last time I started my story, I began the story in the days of my youth. There I was, eyes twinkling with promise and wonder, a freshly minted Dr. Esteban Bisumn, computational meterologist, a student of the skies and the hidden calculus of their ever-shifting constellations. It was the year that the cumulus cloud was declared an endangered species. I was admitted to a global team of researchers in those last hours of civilization, when the United Nations Parliament invested heavily in attempting to reverse the slow burning of our world. While most of the research teams were devoted to developing geo-engineering fixes to undo the catastrophe of global heating (terraforming algorithms, atmospheric chemistry modifications, etc.), we were part of a limited research group charged with the welfare of clouds.

Why clouds? Why not devote my efforts and skillset to stopping global heating? Well, it turns out, clouds were something of an enigma. They eluded our climate models and terraforming algorithms. They seemed to defy our predictive capabilities, and we couldn't understand why. Careful study of cloud morphology and behaviors revealed that something profound was missing from our understanding of their shifting nature.. No matter how we refined our calculations or how much additional data we collected to feed our algorithms and expand our databases, the enigma persisted. Clouds, those ever-shifting dreams of vapor, appeared to defy conventional scientific wisdom and the laws of Nature that were said to govern all things. Clouds exceeded. They exceeded our epistemologies, or lexicon of ideas about the natural world. So rather than continue to capture them in the language of science, of albedo effects and water cycles, we took a different, more controversial approach.

Following the counsel of indigenous communities in the Amazon, the Malay peninsula, and the Caribbean, we started to take seriously the possibility that clouds were…alive. Cloud sapience might be the only explanation for the persistent deviations we were observing in cloud behavior. This led us to our second conclusion; if clouds were indeed intelligent as the Zuni and Yanomami nations had long suggested, then perhaps the clouds were capable of communication. Perhaps we could send a message, no - a plea - for the clouds to stay rather than depart. Over the years, there were weeks when our errand felt hopeless. And then there were days filled with the wonder and joy of discovery as we inched closer and closer to the day of first contact. The sky was bright and blue in the morning when we gathered on the rooftop of our meteorological station at the Massachusetts Institute of Technology, where an unusual cloud convergence was occurring. There I stood with my collaborators, a motley crew of scientists and humanists now dubbed Anthronephologists. Today was the day we would activate our machine, the nephosemiosis engine, the culmination of tedious years of meticulous research, cataloging the various behaviors, patterns, and species of cloud as they manifested in all corners of the globe. Using the finest cloud of computers that MIT could conjure, we excavated nephosemes, the secret language of the heavens. Puffy patterns of inchoate moisture that were units of meaning. In those phase-changing molecular arrays of noble gasses and vapors, we found ideas and words; Flying elephants. The faces of the Gods. Pillows. Continents - whatever shapes human eyes imposed upon the fickle geometries as they waltzed and deliquesced in our bright skies. But the signals were now clear. Computation clarified the mist. The dense tangle of ether could now be deciphered. With our rosetta stone in hand, a message could finally be crafted and sent back. To communicate with the clouds, we had to fashion some of our own.

The wind picked up as we primed the machine. Dr. Rydra Usratt, veteran expert on hydrology, helped me initiate the calibration sequence, her long black hair flapping in the wind.

"What do you think they'll say?" She said, nearly shouting to be heard above the crosswinds.

Dr. Marina Suculum, a former Anthropologist from Brazil broke in with an answer of her own, "This isn't first contact, remember? The Yanomani have been in communication with them for thousands of years."

"True," I said, "but this time is different. We have science on our side.."

"I hope so, " Marina said warily, her dark eyes narrowing.

"Well, here goes," Rydra said through clenched teeth, "initiate calibration."

I glance at the infrared scanner to verify proper condensation, "Nephosemese are cued up properly."

"All looks good here," Rydra says, her face brightening, "condensation underway."

The message had been pre-written. After hours of debate and deliberation, the team agreed upon a message that was as direct as possible. After all, our linguistic facility with the Cloud language was at best provisional, at worst theoretical. The simpler the message, the better.

"Here goes!" I shouted, giddily. Marina and I stepped back from the steaming apparatus as it churned and belched vapors. Like a balloon unfurling, a long tunnel of buoyant plastichrome heaved upward into the troposphere. We watched as white steam billowed and crystallized in the shaft, bobbing as it sailed toward the firmament nearly 5 kilometers above them.

Rydra studied the sky, watching closely as the clotted bales of cloud subtly parted.

Was their message already being interpreted? How fast or how slow would they take to respond? We were riveted to the sky, our curiosity and urgency bursting from our pores. If clouds were endangered species, then perhaps this machine might be the key to their salvation, if not the preservation of their memory, their culture, their histories. In that moment we felt like the Anthropologists of old, the last hope for documenting cultures and languages that were swiftly vanishing.

How might they reply to our message? We had puzzled over hypothetical replies and mapped potential conversations on chalkboards and whiteboards and virtual breakout rooms. But some of us feared that all of our scenario modeling might turn out to be futile. If clouds were alive, how could we possibly anticipate their reply? They were so unlike us in so many ways and yet like them we are mostly water. We hoped our hydraulic kinship would be enough to bridge our differences.

Why are you leaving?

The message was simple, perhaps too simple, but it was a step toward negotiation, dialogue, or diplomacy with a great empyrean civilization. All possibilities were too exciting. Perhaps the thrill of discovery and the wonder our subjects inspired had clouded our judgment. For hours, we gaped up at the void, watching in terror as the bilious tendrils of the cloud convergence dissipated, revealing the blank, azure canvas of sky, like seafoam dissolving into a hungry surf. We stared and waited and stared and waited.

"Maybe we miscalibrated," Rydra proposed, after a long silence. Hope was a desperate, crazed glimmer in her eyes. But I recognized her fear, her denial, because I felt it too.

"We failed," Dr. Marina said, after another hour, throwing up her arms. "Science can't save them, or us it seems."

Failure was hard to accept. We had simulated this precise moment countless times. We had mapped and anticipated every possible outcome and scenario. We knew the clouds. We could understand them. Our machine was perfect. Everything worked on paper, in theory, but how, why, was it failing?

"I don't understand, all the diagnostics indicate that everything is functioning properly," Rydra frowned, puzzling over the data streams on the console.

"There is one possibility," I said slowly, my throat parched, "one scenario we never considered in our naivety."

Marina rest her hands on our shoulders. Of course, somehow she already knew what we failed to consider, what we refused to believe.

"They hear us," Marina gestured to the sky, "but they refuse to listen."

I nodded, numb and in a delirium of exhaustion and frustration, "They refuse to listen, just as we refused to listen to them until it was too late."

"They have no reply," Rydra said, choked with emotion, "maybe we're unworthy."

Marina turned to her colleagues, "or maybe we are not even at the cusp of understanding their complexity, their brilliance."

I stood there with them, defeated. I stood there and wept. I wept for our hubris. I wept for the future, for a world without clouds, and I wept knowing that such a wonder might forever elude human comprehension. Or maybe as Marina said, perhaps the select few scientists who burned the world with one hand and proposed to fix it with the other were unworthy of communication. Perhaps, the indigenous elders had been right all along.

And so, shortly after our failed attempt at contact, the clouds vanished and the world was forever deprived of their pearlescent beauty. For years, I tinkered with computers, trying to understand where went wrong. But no matter how I shifted the variables or refined the data, I always reached the same conclusion. The clouds ignored us. They heard but did not reply. And now, years after the Cloud of computer networks have evaporated, I can no longer torture myself with answering the unanswerable.

Instead, I try to be useful. I wander the yesterlakes and arid wrecklands in search of dew. I etch my maths on paper, trying to pinpoint where moisture might fall, so that our roving band of survivors, my new family, can survive. At night, I tell stories of rain and thunder and clouds that were alive to youngsters so that they might rekindle them in their dreams. I tell them of the bone-white cumulus, of the undulating gray nimbus, and the gossamer strands of cirrus that once painted the oceanic void above us. I tell stories so that posterity will remember the lesson we failed to learn, so that if the clouds ever return we are ready to hear them, we are ready to listen, and then perhaps, one day, they might be inclined to listen to us.

Steven Gonzalez Monserrate is a PhD Candidate in the History, Anthropology, Science, Technology & Society (HASTS) program at the Massachusetts Institute of Technology. Steven's dissertation surveys the diverse ecological impacts of computing and digital data storage in New England, Arizona, Puerto Rico, and Iceland. Steven holds an MA in Anthropology from Brandeis University and a BA in Feminist Anthropology from Keene State College.

The President

Judith Igelsböck

Honourable Mention – Short Story – Judith Igelsböck

Monday 7am. The president is walking through the corridor on her way to the office as she witnesses how, in a nearby room, some of her closest colleagues are sitting in front of a screen, laughing their asses off. Are they laughing about me? she wonders. She recognizes her voice and also her image while silently approaching the screen. As her colleagues notice that she has entered the room, they quickly turn off the video and immediately start apologizing.

Sorry, one of the colleagues says, we should not have even watched this. It is just yet another 'deep fake' somebody found yesterday. Don't even think about it. Forget that it exists. You do not need to worry about that at all.

But what is it about? the president asks. What is the fake me saying?

Nothing, a colleague replies. It is just pure crap.

Would you send me the link to this video or, even better, could you download it for me, please? the president insists, I need to attend a meeting now.

Monday 9pm. The president returns home. She briefly lets her team know that she does not need anything anymore and takes a shower. She has cancelled her evening yoga session with her personal trainer. Better tomorrow. She picks up a beer from the fridge, lights a cigarette and jumps into her bed. Again, she skims through her mail. Nothing extremely urgent, she happily notices. She clicks on the email with the subject matter 'Deep fake from the morning'. She knows that this is probably not a good idea, but she cannot leave it. Dear Marta, the email says, please find enclosed the link to the downloaded deep fake from the morning. I understand that you are curious, but I would not recommend watching it. It is not pornographic or anything but, still, we do not know who is behind it yet. It did not create much public attention, in any case. Nevertheless, you should better think of yourself and your actual life. We will take care of the rest. Have a nice evening, Mitzi.

Now the president got even more curious. She picks up another small beer and starts watching the video on big screen in her bedroom. It is incredible, she notices. Of course, she would not have believed for a second that this was really her. But she is surprised that the video doesn't give her the creeps at all. She is even intrigued. The video is a sort of dark comedy of her current presidency. Somebody has taken a lot of time and effort to deconstruct the politics she is pursuing. Who is behind this, she wonders? Who takes the time to create such content? Political opponents? Students in computer science? A frustrated citizen who spends the whole day in front of the TV? Activists? Is it just one person or a whole team? Is it a professional campaign against her or the past time of some wannabe politician? She has a hard time falling asleep.

Tuesday 7:30am. The president is late for her meeting. Her assistant brings her an extra cup of coffee. Mitzi, the president asks, have you figured out who is behind this deep fake video? Are you still thinking about this? Mitzi replies, we are working on it. You do not need to worry about it at all. Hardly anybody seemed to be interested in the video. Deep fakes have become such a common thing. Nobody takes them seriously anymore. And all eyes are on the outbreak of the volcano.

Speaking of which, the plan is that you will leave at 2pm to meet the local authorities. I will assemble a proper outfit for you and join you on the trip. I will provide you with an update of the latest developments later. Have a good morning.

Tuesday 9:30pm. The president is in the car staring out of the window. She is tired from this trip and got a headache on the plane. She sends a message to the yoga teacher who is waiting for her: I'll be there soon, sorry for the delay.

The yoga makes her feel a little better. She closes her eyes to enjoy the final pose, Shavasana, and breathes deeply. The purpose of this exercise is not to think of anything, she knows. But the image of herself who is not herself does not move out of her head.

Wednesday 7am. The president is on her way to the office. Skimming through her emails. Good news, Mitzi writes, we believe that we have an idea where the video is coming from. It just seems to be a 'lay deep-faker'. Otherwise, we wouldn't have been able to find the person so fast. We will keep doing more research, but from what it seems, there is no reason to be worried, as we suspected. Happy to hear, the president replies, have you contacted the person?

Wednesday 12am. The president is returning to the office from a reception in a nearby town. Her colleagues have picked up lunch for all. Regarding the deep-fake, Mitzi says, as she enters her office with an espresso and the idea to briefly go through the afternoon schedule with her, what do you mean by contacting the person? It is not really how we are working. We are trying to understand whether this was more of a joke or a sort of 'attack.' It has all the looks of being more of a project out of boredom or something of the like. Most probably, there is no reason to be worried. The president lowers the voice when she replies: Mitzi, do you have the contact information? I would really appreciate to be informed about all of the details, not only about what you think is relevant for me. Of course, Mitzi replies, I will send you all we have.

Wednesday 5pm. Two more events. The president thinks about how much she would love to cancel and just take two days off. Today she is not in the mood at all. She knows that it looks unprofessional but she is checking the inbox while waiting for her turn to speak. Mitzi has sent a 10-page report containing all of the information they have found on the alleged deep-faker, including three email addresses and a telephone number. Deep Fake: Confidential and unconfirmed, it says in the subject matter. She is surprised to learn that apparently a 56 years old woman has published the video. She has been working as a mathematics teacher for the last 30 years, has two kids who are both studying at different universities, and divorced from her husband 6 years ago. She is living in the countryside, more than 1000 kilometres away from here. She has an absolutely clean slate. The president knows that this is what Mitzi wanted to avoid, when she chooses one of her non-official email addresses that she has kept for newsletters from online-shops and other kind of spam and starts typing: Dear 'Ms. President', I have watched this recent video of yours (or should I say of mine) in which you criticize my work. I was wondering whether you could also impersonate the president you would wish for? What is it that you would like me to do? Is there the possibility of producing a constructive deep-fake?
If yes, I would like to get in conversation.
Kind regards, The President.

Thursday 5:15am. The president wakes up before the alarm rings. She has a bad feeling. What was she doing? Why would she get in contact with a person who is deep-faking her? She has no idea about her intentions and also not whether it was really her or not. She checks the mail. No reply. She has a hard time going back to sleep and finally decides to take a shower and start the day early.

Thursday 9pm. Still no reply. Maybe there won't be any, the president thinks. She meets with a friend in her favourite bar. They are sitting in a booth that allows them to watch other guests, while they cannot be seen. The president loves listening to her friend's stories. She lives the life of a 20-year-old student, always dating three people at the same time. Together they are usually debating about who she should meet again and who maybe not. When was the last date I had? the president wonders. Must be more than two years ago. And it was such a disaster, she remembers.

Friday 7am. The president wakes up with a slight headache. She cancels the first meeting and takes a stroll with her dog in the nearby woods. She is not happy that upon return she immediately checks the mail. Nothing. She is looking in the spam folder. And there it is: 'Happy to talk', it says. The reply came from another email address, none of the ones mentioned in the report. There is an invitation to a video-call. Subject matter: 'President meets President.' The president can feel her heart beating fast. Time: Saturday October 30, 2021 08:00 PM Amsterdam, Berlin, Rome, Stockholm, Vienna. She decides to ignore the mail for now and jumps into the shower.

Friday 10pm. The email kept distracting her during the whole day. What should she do? Can she join such a meeting? Is it going to be a trap? Would that cost her the presidency in the end? Is she going to get known for being the most stupid president ever - inviting her enemies? Should she involve Mitzi? She has not taken any action throughout the whole day and now –sitting on the couch with a beer and a pizza– she is staring at the email. And then she suddenly replies: Great. Let's talk! See you tomorrow. And to her own surprise she presses the send button.

Saturday 9am. The president has slept wonderfully. She feels revived and for the first time in a while, full of power. Of course, she also has to attend a few events today, but this will be done in a couple of hours. A funeral, an opening of a festival, and a birthday celebration. She takes the dog outside. It is a beautifully sunny day.

Saturday 7:45pm. The president cools her nerves with a strong drink. Just do not join the call, she tells herself. She does not remember when was the last time she was that nervous. Why not, she now hears herself thinking, what can go wrong? What else is there to do this evening? She imagines the meeting being aired live in one of these horrifying private television channels, or going viral on diverse social media. But then, curiosity prevails. At exactly 8pm she joins the meeting. And as soon as the connection is established, she looks into her own face. Good evening, the fake her says in her voice. Good evening, she replies...

The short story 'The President' is inspired by a homonymous and semi-documentary novel written by Clemens Berger (2020) in which the author takes us to the moment in Jay Immer's life in which he (with immigrant parents and having worked as policeman his entire life) is hired as body-double for then president Ronald Reagan. While at first Jay Immer enjoys the excitement and privilege that comes with this position, he continuously finds himself parting away from Reagan's political agenda, specifically with regards to labour rights and environmental sustainability. Gradually, Jay Immer turns from being a dutiful impersonator into an 'evil twin.'

In the short story, 'The President' gets transferred into an imaginary present-day nation in Europe. It is playing with the very same issues, namely: impersonators and doubles, yet in the 'digital age'. While the 'original' novel narrates from a body-double going rogue, in the digital version of 'The President' what is usually considered to be a variety of an 'evil twin' of unclear intentions and origins (the deep fake) turns out to be a potential 'twin stranger', creating the possibility for a lonely president to reconnect with the world.

Writing digital twin fiction –such as the short story 'The President'– is part of an ongoing project[1] that revolves around the metaphor of the 'digital twin': a current hyped-up expression of intelligent digital representation and simulation. By now, digital twins have mostly been deployed in industrial production (e.g., for predictive maintenance) and urban development (e.g., for the simulation of future mobility solutions), but digital twins are also imagined to be useful as medical applications, as for instance in preventive tele-care (see e.g., Apte & Spanes 2021, Bruynseels et al. 2018, Lattanzi et al. 2021). In the promissory discourse, the digital twin gets depicted as an intelligent replica of a 'real world' entity, which –due to continuous technological advancement and increasing availability of 'real-time' data– continuously progresses with the 'original'.

The social sciences have highlighted in various ways, however, that digital worlds are not solely representational spaces but integral parts of our reality – with performative, and accordingly, transformational powers. Despite the reductionist deployment of the metaphor of the digital twin, the project does not argue for dismissing it all along. In contrast, it seeks to explore potential ways of dealing with digital representation and data 'about us' and 'our worlds' through the metaphor of the twin. Concretely, the discourse on digital twins is confronted with a variety of twin types and twin-relations human twin studies and twin fiction have been generating (such as the twin stranger, the evil twin, the parasitical twin, see e.g., Sullivan 2004, Viney 2021). Narrating digital twin relations creatively gives space to those facets the promoters of digital twin technologies implicitly capitalize on (such as our fascination with twins) or those dimensions that tend to get silenced (such as matters of ownership, algorithmic injustice, privacy, transparency, or artificial unintelligence, see e.g., Broussard 2018, Katsh & Rabinovich-Einy 2017).

To give an example: Following the logics of Shakespeare's 'Comedy of Errors', a consumer of a medical digital twin application for preventive care could be fed with somebody else's data, which in turn could positively or negatively influence on her well-being. In another story, the very same application could suddenly be unavailable due to the bankruptcy of the software company, leaving our protagonist with the feeling of having left a part of her body, and confronting her with the

1 https://www.mcts.tum.de/en/research/der-digitale-zwilling-viel-mehr-als-ein-abbild/

challenge of either needing to redevelop a sense for her body or finding a way to recreate the digital twin in some way (just like in the heart-breaking graphic novel 'The Phantom Twin' by Brown 2020).

Fiction allows the exploration of a multiplicity of possible digital twin relations without the need of having to think too much about technical accuracy or the question of whether a digital twin technology is or will be existing in this exact way or not. At the same time, writing digital twin fiction opens up for a critical expansion of the current digital twin discourse, which is presenting the digital twin as 'ready-to-use', fully unproblematic, and politically neutral 'product.' Parting away from that narrow vision, digital twin fiction seeks to encourage a critical yet techno-optimistic engagement with emerging technologies, and wanting to share the impression that –just like human twin relations– digital twin relations can be manifold and that we have a stake in defining and shaping what they will become.

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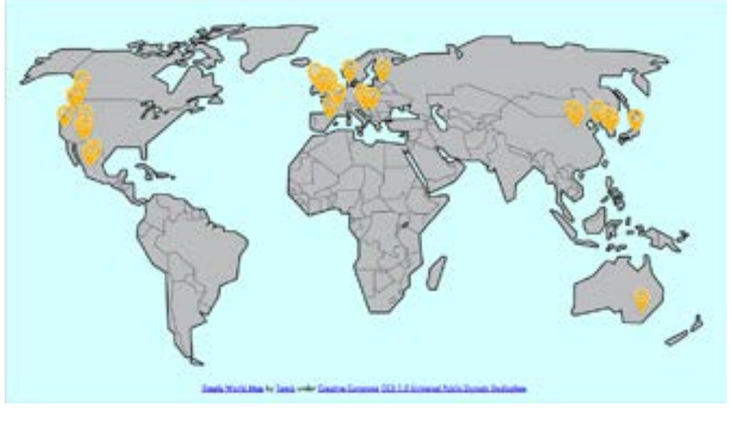
STS Events

Traveling through the past and into the future of Socio-Technical Integration Research (STIR): Midpoint report on the 2022 STIR Seminar Series

Mareike Smolka, Erik Fisher, Cynthia Pickering, Lyric Peate

In a recently published special issue on "RRI Futures," van Oudheusden and Shelley-Egan (2021) emphasize that the reflexive questioning of science and technology has become ever more urgent. In light of the COVID-19 pandemic, climate change debates, and the emergence of 'post-truth' politics, STS scholars following responsible research and innovation (RRI) agendas need to reinforce their efforts to open up reflexive spaces where the social shaping of science, technology, and innovation becomes an object of collaborative inquiry and critical reflection. Although more than a decade of research under the label 'RRI' has been invested in such efforts, reflexive spaces in science and technology development have remained rather small and marginal. Institutional path dependencies separating the 'two cultures' (McCormick et al. 2012; Viseu 2015), resilient norms that posit the social beyond scientists' and engineers' spheres of responsibility (Cech 2014), and managerial reforms of the university system expected to increase output and efficiency through auditing and ranking structures (Fochler 2016; Shore 2008) are among the reasons why time, space, and resources for reflection are curtailed across technoscientific disciplines and professions (Felt 2017).

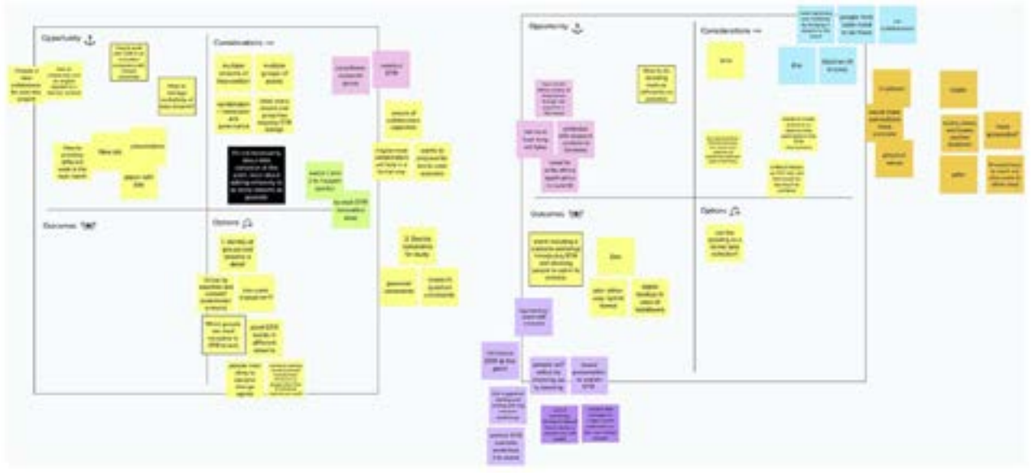
These developments have urged us to take stock of the accomplishments and shortcomings in opening up and preserving reflexive spaces in Socio-Technical Integration Research (STIR). STIR is a collaborative research method that studies the role of scientists and engineers in the social shaping of science, technology, and innovation (Fisher 2007; Fisher and Schuurbiers 2013). For this purpose, STIR commonly embeds a researcher from the social sciences or humanities into a laboratory space to stimulate reflections among technoscientific experts on the societal dimensions of their decision-making. The primary aim of the collaborative process is to understand the nature and limitations of expert capacities to participate in the normative governance of research and innovation in society. A secondary effect of collaborative inquiries across socio-technical divides is the expansion of such capacities. This effect has been documented in multiple scientific articles that resulted from more than 80 STIR studies conducted in over 20 countries on four continents. To initiate a discussion on the successes and failures of a selection of these studies, we launched the STIR Seminar Series in January 2022.



Map of STIR studies conducted between 2006 and 2022 ©Lyric Peate

STIR seminars and practice lab

The STIR Seminar Series comprises 12 talks by experienced STIR scholars who present and discuss studies circulated in advance among seminar participants. The talks take place online every last Friday of the month in 2022. Social scholars, policy makers, and professionals who are interested in STIR are welcome to join. The aim of the seminar series is to provide opportunities for learning, connecting, and growing a diverse STIR community worldwide. To facilitate hands-on learning, the seminar series is complemented with a practice lab for STIR researchers. The term 'practice lab' puts emphasis on two features of space. On the one hand, it accentuates that social researchers, just like natural scientists, require a space (if only digital) where they can identify as part of a research group and repackage individual scholarly activities as team work (cf. Ku and Zehr 2022). On the other hand, it acknowledges that social researchers need to actively create reflexive spaces for themselves where they can practice, refine, and rethink their own methods. In this spirit, the practice lab offers opportunities to gain practical experience in using the decision protocol, a methodological core component of STIR that helps structure and map decision-making processes in real-time.



Digital STIR decision protocol grids completed collaboratively during a practice lab session

While the practice lab helps train a future generation of STIR researchers, the seminar series is meant to provide a historical look at how STIR has evolved over time. Seminal STIR studies that laid the foundations of the method, expanded its scope of application, and contributed to its conceptual repertoire are presented during the seminar series. By delving into previous STIR activities, shedding light on their strengths and pitfalls, we seek to illuminate possible pathways for its future development.

Tracing the history of a method

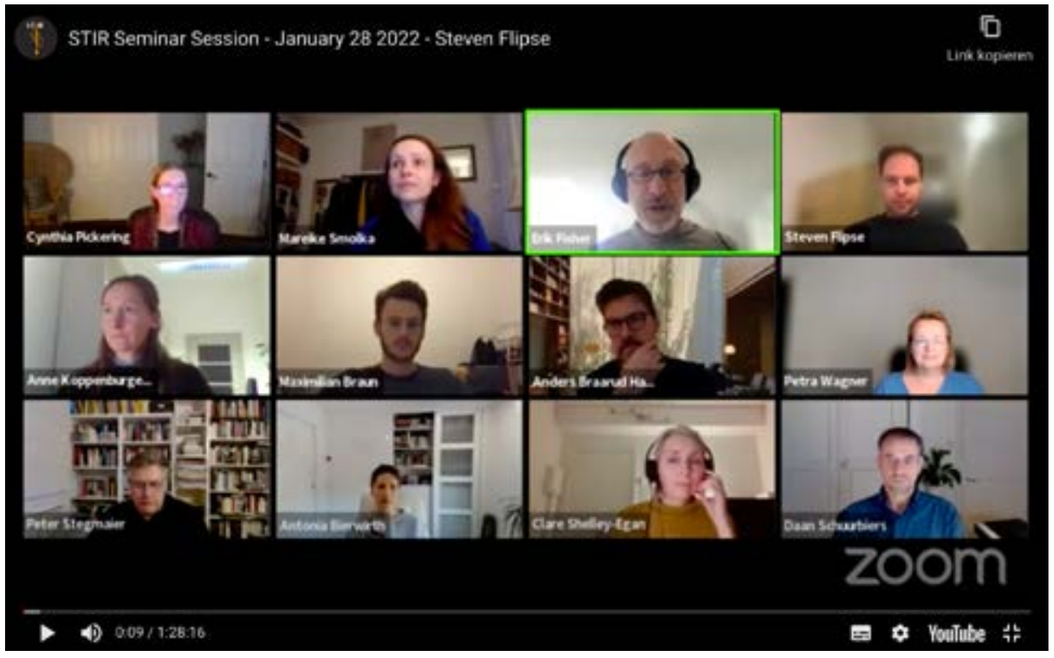
In the first half of the STIR seminar series, five presentations reconstructed the history of STIR since the method's development in the early 2000s. The first pilot study (Fisher 2007) was presented by Erik Fisher, the developer of STIR and the moderator of the seminar series. In the early days of refining the conceptual and methodological approach of STIR, Fisher worked together with Daan Schuurbiers. During a seminar, Schuurbiers shared his experiences of conducting one of the earliest comparative STIR studies (Schuurbiers 2011). He was part of a group of 20 doctoral students, 10 of whom each carried out two paired STIR studies while the other 10 students each conducted one STIR study (for a total of 30 STIR

studies), thanks to a National Science Foundation award that Erik Fisher and Dave Guston received for this purpose. The paired STIR studies sought to assess and compare the varying pressures on technoscientific experts as well as their capacities to integrate broader societal considerations into their work. Among the students conducting these studies were Steven Flipse and Shannon Conley whose seminar presentations traced how STIR became introduced into wider fields of application, including industry (Flipse et al. 2013) and pedagogy (Conley and Fisher 2019). Lastly, Mareike Smolka presented a recent STIR study (Smolka et al. 2021), which sheds light on one of the blind spots in prior integrative research: the role of the body and affective labor. In what follows, the aforementioned seminar presentations and audience discussions will be summarized in more detail.

Erik Fisher's seminar presentation recounted the origin story of STIR as a response to the 21st Century Nanotechnology Research and Development Act (US Congress 2003), which required that "research on societal concerns" was "integrated with nanotechnology research and development" (p. 117). As the idea of integration across socio-technical boundaries had historically been contested, Fisher operationalized the concept in the 12-week STIR program which allowed researchers who might have disagreed on the exact nature of integration to work together in an open-ended, collaborative manner. He developed the program from within the Thermal and Nanotechnology Laboratory at the University of Colorado in Boulder, where he had conducted participant observation, interviews, and archival research for three years until he tested STIR with three graduate engineers in 2006. In his seminar talk, he emphasized how the effects of the pilot study hit him by surprise. Although he had designed STIR as a method of assessment, it "miraculously turned out to be a tool for intervention" for it helped align the material practices of one of the graduate engineers with broader environmental concerns. As Fisher solely asked probing questions, refraining from any "value advocacy" (cf. Shilton 2014), the introduction of environmental concerns appeared "miraculous." The "miracle" was interrogated in the seminar discussion: which aspects of STIR create practical collaborative effects – the decision protocol, the characteristics of the STIR researchers, or the maieutic interplay of questions and answers in STIR dialogues? To answer this question, discussants suggested, future research could examine the micro-dynamics and interpersonal relations that function as carriers of STIR interactions, although some of the unintended effects of STIR can perhaps never be fully understood.

Whereas Fisher framed STIR as a method for research and assessment with practical "side effects," Daan Schuurbiers' interest was sparked primarily by these effects. His PhD research at Delft University in the Netherlands from 2005 to 2010 sought to "empower scientists in their social responsibility." He decided that STIR could be a suitable means for this end after meeting Fisher on a train in the Netherlands. In the aftermath of this train ride, Fisher invited Schuurbiers to Arizona State University in the United States to conduct a STIR study in the School of Life Sciences, which Schuurbiers compared to a second STIR study carried out at the Department of Biotechnology at Delft University. Understanding himself somewhere in-between on a spectrum that has a critical social scientist on one end and an intervention-oriented action researcher on the other, Schuurbiers later decided to transfer his knowledge on STIR into consultancy work. He described this transition as follows: "I love the rigor of science, but I do not like that academic careers are determined by the papers we write . . . I rather want to make practical effects possible and 'STIR' as much as I can to enhance social responsibility in research and innovation." A few years after completing his PhD, he founded *De Proeffabriek*, a consultancy for responsible innovation, where he has further leveraged the potential of STIR and other interventionist methods to change the research system (www.proeffabriek.nl).

As a "first-generation" STIR researcher who had learned the method from Fisher, Schuurbiers became involved in training the "second generation," including Steven Flipse. Flipse completed his PhD research from 2009 to 2013 in Delft where he introduced STIR to industry – a context which had received little attention by STIR researchers at the time. His STIR study in a multi-national biotechnology company indicates that industrial actors became increasingly interested in STIR as soon as they perceived that the method offered "added value" for the company in terms of efficiency and revenue. Flipse revealed during the seminar that, as a result of his STIR intervention, the company saved money because they decided to stop a specific line of research and reallocated the budget to other projects. According to Schuurbiers (2011), if STIR advances the (scientific or economic) agendas of participants, they are likely to show more willingness to critically reflect on societal considerations and public interests. Such observations stimulated discussions in the audience about whether STIR stabilizes contemporary technoscientific paradigms and socioeconomic systems or whether it can subtly disrupt hegemonic structures from within.



Opening of the STIR Seminar Series with a presentation by Steven Flipse

Shannon Conley engaged in STIR research at roughly the same time as Flipse. While her initial STIR studies took place in reproductive genetics laboratories in Canada and the UK, her research focus on competence development and learning helped introduce STIR into educational contexts later on in her academic career (York and Conley 2018). She is convinced that students can benefit from approaches that deconstruct disciplinary silos, develop capacities for critical thinking, and competences for interdisciplinary collaboration. This conviction partly results from her own experience as a learner in laboratories where her STIR collaborators taught her material practices and linguistic skills characterizing their epistemic culture. By acknowledging her own disciplinary blind spots and by actively participating in laboratory bench work, Conley transitioned from being an 'outsider' to eventually mentoring student biologists in material lab practices. In contrast to the majority of STIR studies conducted thus far, Conley pays specific attention to how her shifting positionalities shaped the collaborative research process. In her presentation, she pointed out that her collaborators initially suspected that she had journalistic interests and jokingly called her a "lab psychologist." She only became a valued lab team member after she had overcome their initial wariness by building a relationship of trust and mutual support through ongoing STIR interactions.

Experiences of wariness, ambivalence, insecurity, and other affective disturbances are the starting point of Mareike Smolka's STIR research. In a co-authored article, Smolka, Fisher, and Hausstein (2021) analyze how attending to affective disturbances, more specifically disconcertment (Verran 2001), became a resource for interdisciplinary knowledge production in three independent STIR studies. In the seminar presentation, Smolka focused on her experiences of disconcertment when conducting STIR research in a clinical trial on mindfulness meditation in the French Normandy. By engaging in affective labor to recognize, amplify, and minimize disconcertment, Smolka navigated her liminal position as insider/outsider in several modalities of STIR: regular cross-disciplinary dialogues, a group discussion, and a reflexive seminar session. In each modality, working with and through disconcertment stimulated reflexivity about taken-for-granted disciplinary norms, latent socio-ethical considerations, and more socially responsive courses of action. Whereas seminar participants were interested in systematic strategies for detecting and engaging with disconcertment in integrative research, Smolka pointed out that working with affect depended on interpersonal, embodied sensibilities which could be cultivated but not formalized. Moreover, in response to a question about emotional bias, Smolka emphasized that she did not consider affect as a superior source of knowledge. Instead, she argued, that drawing on multiple forms of knowledge could help develop a more holistic and socially informed view on technical decisions, especially in academic contexts where bodies tend to be ignored or disciplined for the sake of 'objective' reasoning.

Future seminars

Between Smolka et al.'s research on the affective substrates of STIR collaborations and Fisher's initial pilot study, 15 years passed. In the remainder of the 2022 seminar series, we will fill this timespan with a mix of presentations on earlier and more recent STIR studies. Paul Ellwood will share experiences of his doctoral research within the aforementioned coordinated set of paired STIR studies that took place more than 10 years ago. Anthony Levenda will introduce the STIR Cities project, which received a National Science Foundation award in 2015 to bring STIR from the laboratory to the city to help key stakeholders imagine alternative forms of social and technological order in constructing smart energy systems. Robert Pronk, a "third-generation" STIR researcher trained by Flipse, will illuminate several characteristics of the communication between STIR researcher and participants. While Pronk will zoom into the communicative underpinnings of the STIR process, the presentations by Lukovics as well as by Puga Gonzales and Garcia will discuss how cross-disciplinary communication unfolds in different national contexts: Lukovics will draw lessons from STIR research in post-socialist innovation environments; Puga Gonzales and Garcia will elaborate on the cultural as well as structural challenges they faced when 'STIRring' research groups in Mexico. On yet another continent, Bastien Miorin will talk about how his STIR training has shaped his career as a risk manager in Melbourne, Australia, and how it helped him integrate discussions on societal dimensions of innovation in large-scale infrastructure projects and complex organizations. Lastly, François Thoreau will offer a critical perspective on STIR, calling for greater reflexivity not only among technoscientific experts but also among STIR researchers about the tacit assumptions informing their research practices.

To sign up for upcoming seminars, access video recordings of previous seminars, and find more information about the STIR practice lab, please visit the website stir-sessions.card.co.

Flyer of STIR seminar series ©Lyric Peate

Acknowledgements

We highly appreciate the contributions from all the seminar speakers (see overview on the flyer above). We are also grateful to our co-organizers who have advertised the seminar series within their scholarly as well as professional networks. Many thanks go to Antonia Bierwirth, Steven Flipse, Alexandra Hausstein, Miklós Lucovics, Michiel van Oudheusden, Mone Spindler, Peter Stegmaier, and Alan Tkaczyk (alphabetical order). Finally, we thank EASST for supporting the STIR seminar series with the EASST Fund 2021–22 as well as the National Science Foundation whose awards (#0849101 and #1535120) supported some of the studies presented during the seminar series.

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Mareike Smolka completed her PhD research in STS at Maastricht University in the Netherlands and recently started her postdoctoral research at the Human Technology Center of RWTH Aachen University in Germany where she studies the responsible governance of innovation ecosystems. She has four years of experience in conducting STIR research and has organized several STIR workshops for students as well as researchers.

Erik Fisher was trained as a policy scientist and holds degrees in environmental studies, classics, and philosophy and mathematics. He is Associate Professor at the School for the Future of Innovation in Society and directs the Center for Responsible Innovation in the Global Institute of Sustainability and Innovation at Arizona State University. He developed the STIR method and the corresponding analytical framework of midstream modulation

Cynthia Pickering is an electrical engineer with 35 years of experience in the high-tech industry in software development, artificial intelligence, information technology, and collaboration systems. She is currently the co-PI for three NSF grants at the Center for Broadening Participation in STEM and a PhD researcher at the School for the Future of Innovation in Society at Arizona State University where she investigates capacities for socio-technical learning in undergraduate STEM education.

Lyric Peate is a user experience designer and researcher at Northern Arizona University. In 2022, she will complete an MS in Public Interest Technology at Arizona State University. Her thesis project is an artificial reality game focused on misinformation and the role of «egotistic relativity» in social media. She designs flyers, presentations, and the website of the STIR seminar series.

New from the Council

Conferences and upcoming elections

Maja Horst

On the first day of our EASST 2022 conference in Madrid, I had a very joyful experience. I walked through the large hall, from one end to the other and back. Everywhere I looked, I saw colleagues greeting and talking with each other – with much laughter and smiles. After the long Covid break, it was clear that we all enjoyed seeing each other again, sharing thoughts and experiences, and simply coming together as a community. That moment was magic and I was so happy and grateful that we managed to make it happen.

Of course, the entire conference was wonderful. I listened to interesting talks. I spoke with PhD students, who were near the end of their studies and had never before participated in a physical conference. I re-united with old friends and made new ones. Thank you to all who were there and made it such a great conference.

That said, I promised in the members meeting at the conference to re-iterate what I wrote in an earlier edition of the EASST Review. In the EASST Council, we know the conference fee for Madrid was high. When we originally had to decide on a venue, we basically had no choice. There were no universities,

which would let us book their venues and there were no other venues, which could host a conference that size with possible Covid restrictions. So at that moment our choice was between the expensive IFEMA – or no conference. Thanks to the fact that so many of you managed to come, we expect that the final accounts will end very close to a balance. And I should probably add that EASST activities are not entirely covered by our membership subscription fees, so a small surplus from conferences is generally necessary to continue as we do at the moment.

While we are still enjoying the afterthoughts of the Madrid conference, Council is already working on deciding the next venue for the conference joint with 4S in 2024. We expect to make a decision this autumn. As part of this, we will also consider the future of STS conferences. One option is to make hybrid conferences, another idea is to host EASST conference every year, so it is always possible to travel to an annual STS conference by train (see also the excellent piece on conference travel in this issue). We would like to develop a system so that we reduce our carbon footprint, but we also think physical meetings are important.

Council has also been working with the editors of our house journal Science and Technology Studies to find a new coordinating editor. The new editor will be announced soon. Finally, I want to emphasize that we have elections for Council coming up, with the deadline for nominations 1 October. I hope many of you will consider running for Council. It is a nice collective to be part of – and if you have opinions on conferences, the future publication landscape of STS, or other important topics, this is the place to engage.

Maja Horst, President of EASST

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