

# EASST *Review*

European Association for the Study of Science and Technology



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# EDITORIAL

# NEUTRINOS, JET FUEL, ENDINGS AND BEGINNINGS

James Besse, Niki Vermeulen,  
Sarah Schönbauer, Vincenzo Pavone

History does not move in a linear, unidirectional, or constant manner. If anything, it moves in fits and starts, suddenly rushing ahead, only to stop suddenly and meander about, or change direction altogether. The seemingly blinding pace of global crises and shocks that have characterized the past two decades have been a testament to that. As we seem to exit the era of COVID-19 and the unprecedented public health measures used to control it, we become preoccupied with concerns over the war in Ukraine and the renewed potential of nuclear war, alongside the existing climate crises, the fragility of the global economy, and threats to the cohesion of the European Union, which have hovered in the background throughout the public health crisis. This issue of the EASST Review reflects on science and technology in these current times, and the evolution of our field within it.

Most importantly, we are deeply saddened by the Russian government's invasion of Ukraine and our hearts go out to all victims, and especially to our colleagues and friends in Ukraine and Russia, alongside the STS communities in these countries. We laud the efforts (especially on behalf of the Polish community and everyone else involved in Central and Eastern Europe) to welcome refugees from Ukraine, and we hope that such a welcoming stance is extended toward all other refugees. Europeans need no reminder of the cruelty and violence that results from limiting the scope of one's sympathies. We all agree that STS is political, but it is not always clear what that means. We are especially grateful for the various academic initiatives to welcome refugees, and during the conference in Madrid and future editions of the Review, we invite an open dialogue about the responsibility our community has in the face of such tragedies, as also indicated by our President Maja Horst in the section **News of the Council**. This edition of the Review offers a start in **STS Events**, with Ivan Tchalakov's account of the panel *The war in Ukraine and European (dis) integration: possible axes of change*, organised by his STS centre at the University of Plovdiv in Bulgaria on March 22. In addition, **Translations** is offering broader reflections on the concept of *internationalisation*, inviting us to rethink our engagement with a process that is significant, both in our analysis and our working environments.

For this edition, we had already invited a number of contributions on the political dimensions of outer space research and exploration for **STS Live**. Richard Tutton's piece reflects on the social weightlessness of billionaires' private space flights and attends to the limits of escapism. Eleanor Armstrong explores the ways that science museum gift shops reinforce limited – and sometimes explicitly sexist and nationalist – understandings of who can conduct space research and exploration. Finally, the piece by Matjaz Vidmar and Saskia Vermeylen shows how science museums can offer alternative, more inclusive visions of space science. Things can always be otherwise, and this paper offers visions for such alternative futures.

This is in line with the upcoming EASST conference in Madrid, (increasingly) appropriately named "The Politics of Technoscientific Futures" which will offer a look into the future of STS, science, and technology. Vincenzo Pavone has written an update, highlighting the immense work of the local committee in organizing a conference in times of war and pandemic. The meeting is now open to register and will feature an impressive number of contributions and promising plenaries (see the last EASST Review and [conference website](#) for more information).

As always there will be an event for early career researchers, this time organized by Rose Bieszcza (EASST Council), Andrea Núñez Casal, and James Besse, offering a space for a new generation of STS researchers to reflect upon what they see as the future of the field. It is our first in-person meeting since the onset of the COVID-19 pandemic, and we look forward to meeting STS colleagues and friends, new and old.

Unfortunately, our community lost another valued member and friend: Trevor Pinch sadly passed away at the end of last year. In addition to the many tributes to him, Wiebe Bijker and Karin Bijsterveld jointly wrote an obituary for our Review. Our sincere condolences to his family, friends and colleagues. STS, and all of us personally, owe a debt of gratitude to Trevor for his long career of research, teaching, and relentless advancement of our field in both Europe and the US. Among many other memories and things, countless much-loved copies of *The Golem* and the inclusion of sounds and synthesizers in STS are what Trevor leaves behind.

In this issue we also take the opportunity to reflect on the important work of Ulrike Felt as EASST Council President, who handed over to our new president Maja Horst. This ceremony unfortunately took place online due to reinstated travel measures, but we want to make sure to mark the occasion. A heartfelt thanks to Uli, for all the important work you did for EASST and we look forward to thank you in person during the meeting in Madrid. As the Vienna STS department has already featured in **STS Multiple**, we thought it was fitting to highlight the development of STS Austria to provide a local context to Uli's boundaryless work.

We would also like to warmly congratulate Sheila Jasanoff for receiving the prestigious Holberg Prize 2022 granted by the Norwegian Ministry of Education and Research at the University of Bergen. This prize reflects her indispensable research and theoretical contributions to STS, contributions that have an immense impact in and beyond STS. Hilde Reinertsen, Tone Druglitrø and Ana Delgado write on this achievement in the **STS Events** section.

Finally, as we already told you in the last edition, our editorial assistant Sabine Biedermann is now succeeded by James Besse. We want to take the opportunity to thank Sabine again for all of her contributions and we definitely missed her knowledge in putting these last issues together. You will be able to meet James in Madrid, but in the meantime a brief introduction to the new member of our team. He is a doctoral candidate in STS at the University of Edinburgh, working on identity and access management and its applications in the public sector. James' research is engaged with ongoing political and legal discussions, especially related to Freedom of Movement. In addition to his PhD research and his involvement in EASST, James is currently working on building networks between STS research groups working on the study of information infrastructures. Together with Léa Stiefel (STS Laboratory, University of Lausanne), he recently organized a workshop bringing together more than 30 STS researchers from across Europe for a workshop in Lausanne, Switzerland, questioning the politics and governance of sociotechnical infrastructures. James is also involved in discussions of methodology in STS, especially mixed-methods research, alongside teaching computer programming and statistical methods to social scientists. As such, he is certainly the right candidate to help us develop the EASST Review as a shared publication infrastructure. And if you want to know more about the University of Edinburgh, you can explore the Curious Edinburgh project in **Cherish not Perish**.

The next issue will be dedicated to summaries and impressions of the Madrid event, and we welcome everyone's contribution via [review@easst.net](mailto:review@easst.net).

In the meantime, take good care of yourself and each other,  
James, Niki, Sarah and Vincenzo (the editorial team)

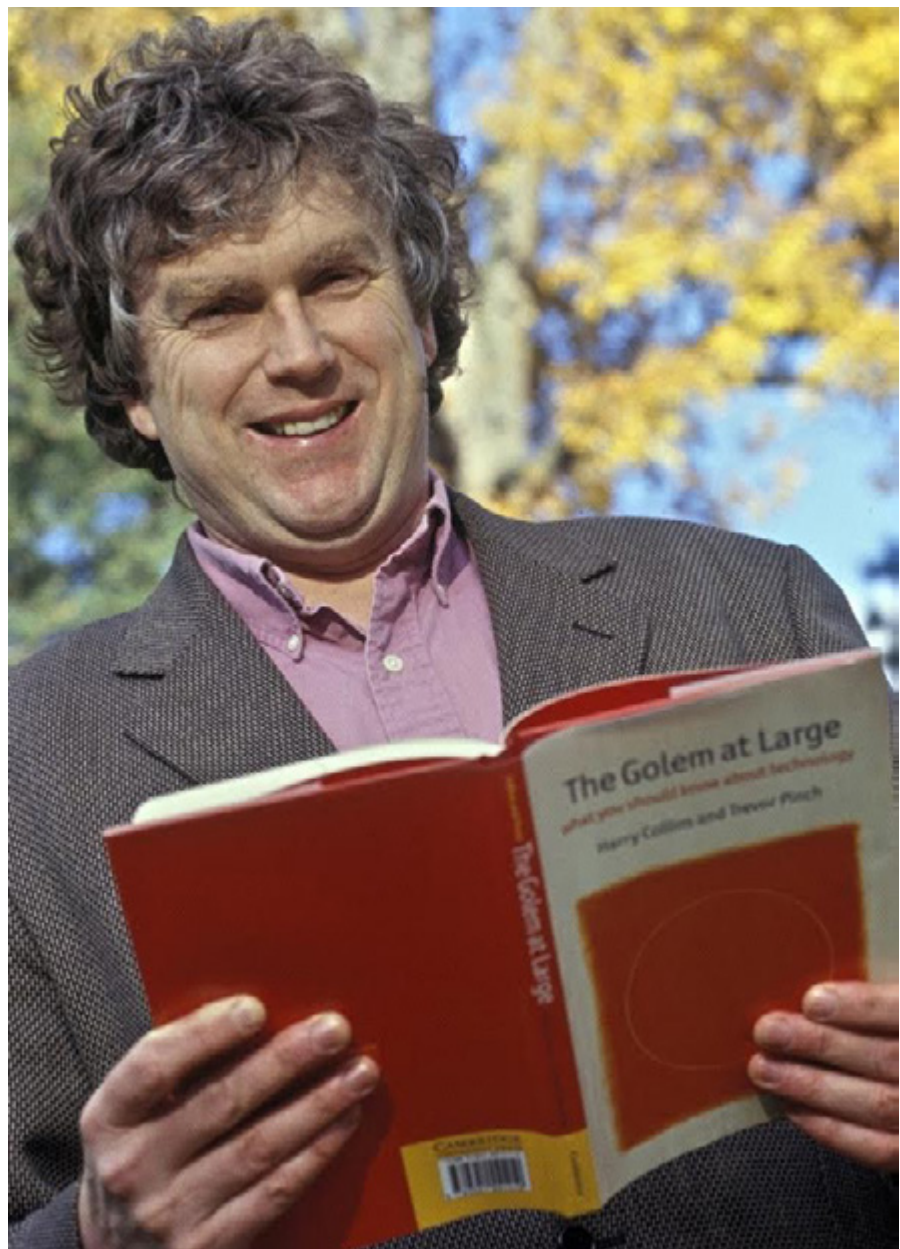
REMEMBERING

# IN MEMORIAM

## TREVOR PINCH (1952-2021)

Wiebe Bijker and Karin Bijsterveld

Trevor Pinch has been immensely important to the field of science and technology studies, and way beyond. Not just by his impressive range and quality of publications, but because Trevor was life itself. Such a creative mind and lucid writer, his emails were always sparkling with energy, full of humour and exclamation marks. Evenings with Trevor, at dinners in the margins of workshops and conferences, were cheerful as the colourful stories he had to tell. His scholarship was genuinely collaborative. It was about enthusiastically sharing ideas, books, music and links, and a seemingly endless stream of ideas he found inspiring. To us, Trevor embodied the ideal colleague.



Trevor Pinch was distinguished Goldwin Smith Professor of Science & Technology Studies and Professor of Sociology at Cornell University, Ithaca, NY. He has been especially known for his prominent roles in establishing the scholarly fields of social studies of technology and sound studies. But he did much more. He started his science studies career with Harry Collins in Bath, UK, with studies of parapsychology and neutrino detection (Collins and Pinch 1982, Pinch 1986).<sup>1</sup> His anthropological study of market traders was sold in airport bookshops (Clark and Pinch 1995). And an even larger readership he reached with the book series *The Golem: What Everyone Should Know About Science, Technology and Medicine*, written together with Harry Collins (Collins and Pinch 1993 (1998), Collins and Pinch 1998, Collins and Pinch 2005). This 3-volume series has been translated into 12 other languages. And then he played a self-built analogue synthesizer in the *Electric Golem* band, which earned him yet another audience in clubs in Ithaca and New York and on Spotify.

In 1981, Trevor attended the very first EASST conference in the *Burg Deutschlandsberg*, near Graz in Austria. He presented his work on the detection of solar neutrino's, resulting from his PhD research in Bath. That PhD project was almost finished, and Trevor would soon be on the job market. Wiebe Bijker was at the same conference to present his first paper on "The Social Construction of Technology". They met over dinner and in the bar, trying the local *Schilcherfrizzante*. At the end of this pink-champagne drinking, Trevor accepted a one-year postdoc position at Twente University, The Netherlands, where he started on January 4th, 1982. That collaboration between Trevor and Wiebe resulted in the paper "The Social Construction of Facts and Artifacts: or How the Sociology of Science and the Sociology of Technology might Benefit Each Other", first presented in a Paris workshop in Autumn 1982, then at the annual 4S conference in 1983, and finally published in 1984 (Pinch and Bijker 1984). The acronym SCOT for the proposed new approach of a 'social construction of technology' was coined by David Edge, the Edinburgh-based editor of *Social Studies of Science*.

The presentations of this paper and the ensuing discussions made Trevor and Wiebe realize that there was a dormant interest within the science studies community to start investigating technologies. Hence, they decided to organize a workshop in Twente in 1983, to which, following Donald MacKenzie's suggestion, they also invited historians of technology such as Thomas Hughes, Ruth Schwartz Cowan and Ed Constant. This resulted in an edited volume that among American students came to be called 'the school bus book', because of its yellow-black cover (Bijker, Hughes, and Pinch 2012 [1987]). That book spurred MIT Press to invite Trevor and Wiebe to start the book series 'Inside Technology', now counting almost 90 titles. Only 4 weeks before his death, Trevor wrote his last emails as editor of this series.<sup>2</sup>

After his postdoc at Twente University, Trevor became lecturer in sociology at the University of York. His interest in economic questions was spurred by the collaboration on the *Health and Efficiency* book with Malcolm Ashmore and Michael Mulkay (Ashmore, Mulkay, and Pinch 1989). Later, in 2008, he followed this interest in developing an economic sociology *cum* STS perspective in his collaboration with Richard Svedberg (Pinch and Svedberg 2008). In 1990, Trevor moved to Cornell University, where he joined Sheila Jasanoff and helped to create the Department of Science and Technology Studies. Trevor became a full professor in 1994. He served as chair of that Department for eight years. Among his many contributions to STS in those and the following years was the widely cited volume *How Users Matter: The Co-construction of Users and Technology*, co-edited with Nelly Oudshoorn (Oudshoorn and Pinch 2003).

Trevor's pioneering role in sound studies resulted from his combined love for building a synthesizer, playing it and doing science and technology studies. His first presentations about music and technology focused on the early days of the synthesizer and culminated in the wonderfully written *Analog Days: The Invention*

1 For more details about Trevor's work in Bath, see Collins (Collins 2022)

2 For more details about the workshop, the first edited volume and the book series, see the introductions to the anniversary edition (Bijker, Hughes, and Pinch 2012 [1987]).



and *Impact of the Moog synthesizer* (Pinch and Trocco 2002). Some of his earlier interests, like that in markets, returned in his examination of the sales techniques—and the boundary shifting between the world of engineering and music involved—that Bob Moog used to pitch his synthesizers as musical instruments to wide audiences. Yet Trevor also showed how the synthesizer's sound tuned in with the psychedelic technologies of light shows and drugs in the spirit of the 1960s. *Analog Days* became a Harvard UP bestseller. Yet what Trevor seemed to appreciate most in the success of the book was how it brought him new contacts in the music world that otherwise would probably not have been available to him.

While finalizing *Analog Days*, Trevor began preparing the special issue “Sound Studies” for *Social Studies of Science* with Karin Bijsterveld, arguing that the dramatic socio-technical shifts in the production and consumption of music since the 1950s, and the emerging reflection on how machines, soundscapes and listening practices intersected, made sound and listening matter for STS (Bijsterveld and Pinch 2004). Ever since, sound definitely mattered to him, leading up to the publication of the *Oxford Handbook of Sound Studies*, again with Karin (Pinch and Bijsterveld 2012). It was very “Trevorish” that he was only prepared to accept the invitation for that Handbook if the book would be allowed to be more than just stocktaking. After all, Trevor always kept reading the newest ‘stuff.’ Instead of summarizing existing sound studies’ work, he aimed at making a volume that would show the newest directions in the field. To him, unsurprisingly perhaps, many of these new directions closely aligned with science and technology studies.

Trevor Pinch was a prolific writer, authoring and editing 16 books and more than 80 scholarly articles, to which we can do no full justice here. He has been visiting professor to more than 10 universities, from Denmark to Korea and including Maastricht. He has also fulfilled all possible roles of intellectual leadership in the international scientific community. On top of doing his work for the MIT series, he acted as one of the co-editors of the first edition of the STS Handbook (Jasanoff et al. 1995), and served as 4S president (2012-2013).

He genuinely loved teaching. No matter how many prizes and distinctions he was awarded—such as that of honorary doctor at Maastricht University (2013) or the 4S John Desmond Bernal Prize for distinguished contributions to the social studies of science (2018)—he never turned into the type of senior that has ‘been there, done that.’ In 1992, Trevor returned from a conference in Germany and excitedly reported that someone had come up to him to inquire whether “this paper is from your PhD project? When will you be finished?” — for Trevor, no bigger compliment for his research than being compared with a young PhD student. He remained curious to hear which new topics students examined, which technologies they used, and which musical subcultures they co-constructed. In that sense, he kept surrounding himself with the social life that constituted science, technology and sound—and he kept teaching about this until well into the Fall of 2021.

Trevor Pinch is survived by his longtime partner, Christine Leuenberger, senior lecturer in STS, and his daughters, Benika and Annika.

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THANK YOU TO THE OUTGOING EASST PRESIDENT

# CELEBRATING OUR FORMER EASST PRESIDENT PROF. ULRIKE FELT

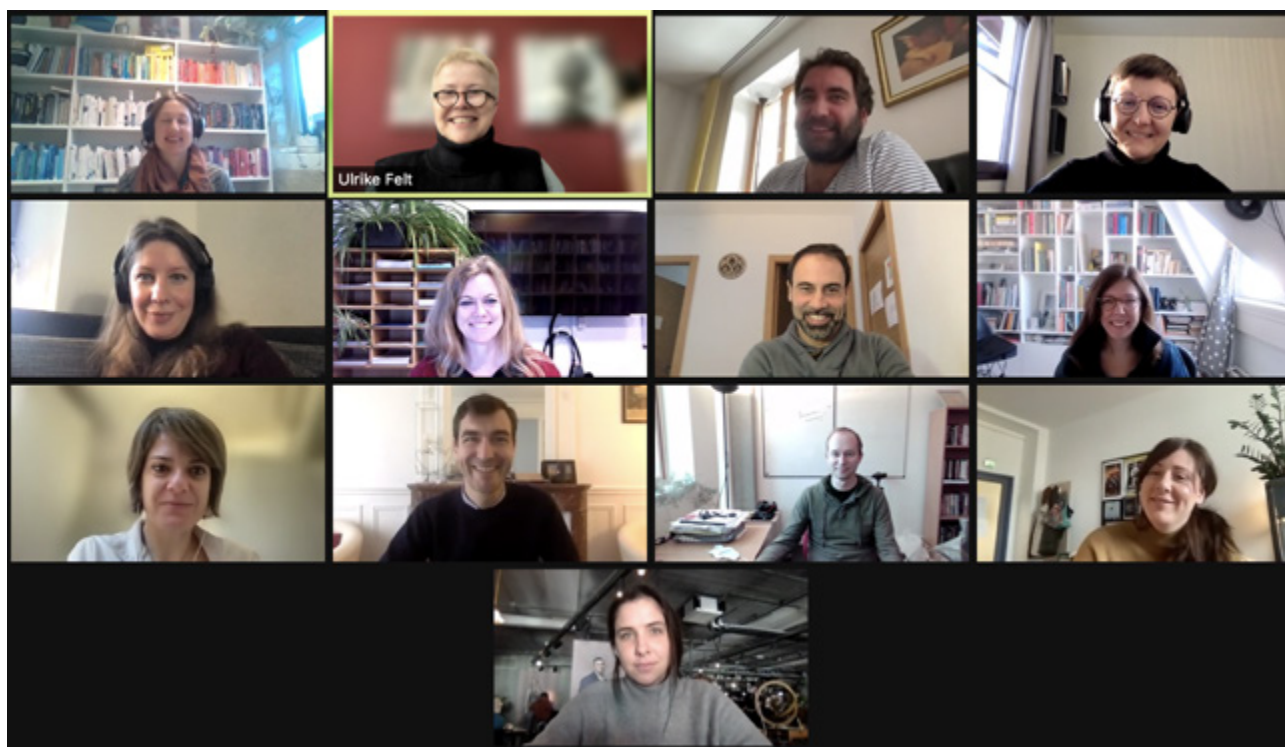
Unfortunately, the last EASST council meeting organised and chaired by Ulrike Felt which was supposed to take place in Vienna last December, took place online instead due to the reinstatement of travel measures. To make sure to not just let this moment go by unnoticed, we want to mark the occasion by some words of thanks. We asked some witnesses for reflections on the important work Uli did for EASST as an association, both as its president and during earlier years including the organisation of the EASST meeting in Vienna. We hope you will join us in thanking her in person during the EASST meeting in Madrid.

## MESSAGE FROM THE EASST COUNCIL:

The EASST Council would like to thank prof. Ulrike Felt for having acted as President from 2017 to 2021. Thanks to her proactive thrust, organizational skills and contagious enthusiasm, Ulrike has shepherded the Council and the broader Association towards a new degree of professionalization. We will remember the warm welcomes at Council meetings where she never run off cakes or (when on-line) amusing jokes. While her Presidency has coincided with a difficult moment for EASST, the academic community and global health, she has managed to make the voice of the EASST community been heard amidst the pandemic turmoil.

Thanks and good luck with your next adventures, Uli!

Screenshot from Uli's last council meeting online



**MESSAGE FROM IGNACIO FARÍAS, HUMBOLDT UNIVERSITÄT ZU BERLIN  
(FORMER EASST COUNCIL MEMBER AND FORMER EDITOR OF THE EASST REVIEW):**

When Uli enters into a room, there is no way you can't notice. There she comes, full of energy, ideas, positions, visions, jokes, and no matter how comfortable or tired or cozy or bored you were, doing whatever it was you were doing, you react, get activated, start to think with, along, otherwise - it doesn't matter how exactly, what matters is the energizing momentum, the activation.

If this is what happens when she enters into a room, then imagine what happens when she takes over the direction of something: a journal, a department, a professional association like EASST. Things change and gain momentum. I've been lucky enough to be in such rooms with her and see things unfolding with my very own eyes.

During her tenure as a president of EASST, Uli put an incredible amount energy and enthusiasm in advancing the professionalization of our beloved EASST, but always finding the balance to maintain it as the infrastructure of intellectual friendship that it is. Squaring that circle has been a major accomplishment. As a former editor of the EASST Review, I'd like to thank her for all the support and trust, especially when it came to ensuring the necessary funding for the Review and opening up spaces for imagining its future.

On the funny side, perhaps EASST members should know that there was a time during her presidency, when Uli would regularly write emails to EASST council members urgently asking for money. You can imagine what happened. Yes, someone hacked the email account of the EASST presidency and, of course, how could it be different, it took ages to make it work again.

Dear Uli, I am looking forward to meeting and thanking you for all these years, when we all meet in Madrid, and I am especially curious to hear about your plans for continuing supporting the institutionalization of STS in Europe and abroad.

**MESSAGE FROM SALLY WYATT, UNIVERSITY OF MAASTRICHT (FORMER EASST PRESIDENT):**

*Night train to Vienna*

I first met Ulrike during the EASST-4S conference in Vienna in 2000. I don't remember the exact moment, but I do remember that meeting Ulrike contributed to my general feeling of being completely overwhelmed by the numbers of people, variety of panels and presentations. It was the first time I attended a joint meeting of the associations, and it may well have been my first trip to Vienna.

I found the university itself overwhelming, and I couldn't navigate the space. So I picked a meeting room that was near the entrance, toilets and coffee, and waited to be educated, informed and sometimes entertained by a variety of STS colleagues on a huge range of topics. I still do this sometimes at a big conference. It's not a bad strategy. I am rarely disappointed by what I hear, and certainly not more than I would be if I had deeply studied the programme.

Maybe I just looked very lost, but somewhere in that first day, I bumped into Ulrike. She must have been completely up to her eyes in mislaid registrations, disgruntled participants, double-booked rooms, coffee that arrived in the wrong place at the wrong time. Her energy was palpable, and she was completely unflappable. She made me feel as if the most important thing in the world to her at that moment was that I was having an interesting time, and that eventually I would dare to leave my comfortable meeting room near the entrance to find where my own presentation was to be held.

Since then, I have had the enormous honour and pleasure to work with Ulrike on a couple of research projects, teach in the STS group, take part in the Raach writing retreat, and contribute to the STS Handbook 4th Edition. Once we were both part of a EU Commission advisory group, and for me it was the first time. Again, Ulrike helped me to navigate that strange bureaucratic process. The breadth of Ulrike's knowledge, her sense of humour, and her apparently limitless energy made her an excellent EASST president, including during a couple of difficult corona years.

**MESSAGE FROM ALAN IRWIN, COPENHAGEN BUSINESS SCHOOL:**

*'no hay camino, se hace camino al andar' (Antonio Machado)*

*'there is no path, the path is made by walking'*

I won't pretend that Spanish poetry is my area of expertise. But I do like this quotation. And it's a rather good characterization of Uli Felt. Whether as EASST President, the head of a major European STS centre, producing influential European reports or organising the famous Vienna 4S/EASST conference, Uli keeps walking and she keeps making new paths.

At times, the STS community has asked whether we really need a European space for our activities. Aren't we all global these days? For me, Uli is the positive embodiment of a European intellectual spirit: alert to our differences as well as similarities; working to make European institutions open to our contributions; recognizing that there are strands of European culture and European history which can caution, challenge, provoke and inspire us.

With Uli also comes conviviality and a sense of mischief – plus the irrepressible urge to laugh out loud. I have learnt that it can be disruptive, even dangerous, to sit next to her in the conference room. Of course, I do it anyway.

All this means that Uli was the perfect choice to serve as EASST President. And now we thank her for encouraging us to walk forward and for reminding us about what, despite everything, we have in common. Let Uli and EASST keep making that path.

**MESSAGE FROM ROB HAGENDIJK, UNIVERSITY OF AMSTERDAM:**

*Uli's EASST*

I've known Uli since she invited me for a workshop on 'public understanding of science' she organized in Vienna. The workshop was exciting, Vienna was wonderful and Uli deeply impressed me with her unique and joyful combination of intellectual ambition, organizational abilities and - above all - her excellent sense of humor, sharp eye for people and her unmatched ability for infectious laughter. In the margin of the meeting I also started to grasp her taste for good food, nose for enjoyable wineries and biergartens, and also her love for chats about stuff to read, items to pursue and authors to follow. Somebody to stay in touch with and to meet more often. EASST became a defining element for that. Starting when we met again as members of the EASST council under Aant Elzinga's leadership.

Late 2021 she stepped down as EASST's ninth president and after twenty-five years serving EASST. A remarkable accomplishment, as the society exists only forty years. Alongside her involvement in EASST, Uli also managed to establish her

own department, served as a Dean in her university, was an advisor to the EU science policy process, editor of STHV and of the fourth edition of the 4S Handbook. She attended an endless number of meetings, preferably in attractive locations and associated possibilities to enjoy cultural and other interesting events. And, in between, she of course supported her steady growing flock of PhD students, helping her PhDs forward with the work to be done and more. The steady flow of reports and articles to be published continues to flow out of her computer.

EASST and 4S have amply profited from her ability to handle 'fun' and 'trouble' of all sorts. A major proof of her mettle became the 4S/EASST Conference in Vienna in 2000. Uli was the chair of the local organizing and of the program committee. She had already started to raise funds, reserved hotel space and meeting rooms. And then, Austria tumbled into a deep political crisis. Jörg Haider's extreme right-wing party won the elections and became a defining element of the new government coalition. It reminded many of the Nazification of Austria in the 1930's. Protests erupted and the Ring in front of the main university building became the venue where activists met and marched. International scientific societies, professional associations and others started to cancel meetings. Members of 4S and EASST questioned whether we should not do the same in support of the protests.

Uli, politically savvy as always, was shocked and in splits over what to do. She contacted us, that is Sheila Jasanoff, the acting president of 4S, and me as the EASST president, for consultation. Together we agreed on a plan. If consultation of the members of both societies would show sufficient backing Uli c.s. would press forward with a conference at which support for the progressive and democratic forces in Austria would be a major constitutive element. And so it happened. Uli's presence, leadership, efforts, secure hands and cool mind were key in that.

So, both societies owe her - and her family!- hugely. Unfortunately, thanking her in person was not possible at the EASST/4S conference in Prague, due to the Covid-19 pandemic. Let's hope we'll have a chance to do that in Madrid, in Uli's signature style.

#### **MESSAGE FROM MARTINA ERLEMANN, FREIE UNIVERSITÄT BERLIN:**

I thought over the 4S/EASST in Vienna in 2000 where I have been involved in the organisation as a then doctoral student but cannot recall some details of the conference organisation. But one for me personally remarkable challenge of that conference which Uli fabulously mastered was how she navigated the upcoming conference against the background of the change of government in Austria. The political change with the right-wing populist party as coalition partner in the beginning 2000 apparently produced some worries within the STS community if Vienna would really be a suitable location for the upcoming 4S/EASST. Here Uli argued in the spirit of "now more than ever" that Vienna would be the right place for an STS conference, since it is precisely the approaches of STS that enable a critique and scrutiny of technoscientific worlds and their entanglements with politics. And finally the conference has been a huge success.

#### **MESSAGE FROM MIKE MICHAEL, UNIVERSITY OF EXETER:**

I can't really write in detail about Uli's many contributions to EASST other than to say that she has been central to the society's development from strength to strength over the past several years.

However, I can offer a more impressionistic account of her presence at conferences. At the EASST and EASST/4S conferences, she seems always to be in motion – a whirlwind of greetings, welcomes, encouragements, and slyly humorous asides. In my mind's eye she is always surrounded by a group of people to whom she dispenses wisdom, inspiration, praise and critique. And all this is wrapped up with deep humanity, and a dose of scepticism to remind us of the challenges posed by our institutional and political worlds. In these respects, she shares her immense energy with the delegates, not least early career colleagues: at base, her presence adds immeasurably to the collegial and intellectual atmosphere of a conference.

However, there is also a dark side: the fear she generates in the panel sessions. There she sits in the audience, silent and attentive, biding her time. At the end of the talk, her hand goes up - perhaps a little too quickly - and she asks the most outrageously pithy and pitiless question, needlessly laced with erudition and critical insight. It goes without saying that I'm not speaking from experience, and I've certainly not had to re-think an entire paper on the basis of her intervention that I never received. What so many of us witness in these terrible moments is Uli's brilliance as a scholar, and her spectacular ability to cut to the core of a presentation and usefully - and with copious amounts of care, of course - reframe its matters of concern. For all these things (and many others), thank you Uli!



STS LIVE

# OUTER SPACE IN THE MUSEUM SHOP

Eleanor Armstrong

**WHAT DO SCIENCE MUSEUMS SELL AND WHY? IN THIS SHORT ARTICLE I PRESENT A HISTORY OF MUSEUM SHOPS, AND EXPLAIN WHY A FOCUS ON THE OBJECTS SOLD IN THESE SHOPS SHOULD BE AN IMPORTANT CONSIDERATIONS FOR STS, MUSEUM, AND EDUCATION SCHOLARS. I DEMONSTRATE THIS POINT WITH TWO EXAMPLES OF THE NARRATIVES AND TROPES THAT ARE PERPETUATED BY OBJECTS FOR SALE, AND CLOSE BY DISCUSSING SOME FUTURE DIRECTIONS FOR DIFFERENT INTERESTED PARTIES.**

YOU'VE SEEN THE ROCKETS. MARVELLED AT THE MOON ROCK, LIT UP LIKE IN THE NAVE OF A CHURCH. OGLED THE ASTRONAUT SUITS. WONDERED AT THE TASTE OF THE FOOD IN THOSE SILVER PACKAGES. MAKE SURE YOU HAVEN'T FORGOTTEN ANYTHING ALONG THE WAY – A LOVED TOY THAT HAD TO MAKE THE TRIP TOO – AND START HEADING OUT VIA THE SHOP. JUST A LOOK, JUST A LOOK PERHAPS. PICK UP AND TWIRL AROUND ONE OR TWO OF THE ITEMS. DON'T FORGET TO BY SOMETHING BRANDED SO PEOPLE KNOW. OR SOMETHING FUN TO CONTINUE LEARNING AT HOME. OR A POSTCARD OF YOUR FAVOURITE THING SO THAT YOU CAN STICK IT UP ON THE WALL AND REMEMBER IT UNTIL THE BLU-TAK FAILS AND IT FALLS DOWN THE BACK OF THE SOFA.

## EXIT AND GIFT SHOP

Scholarship about science museums and science centres focuses on gallery and exhibition content, databases, social media and websites, and hands-on science centres meaning there is engagement with the content that is housed in these spaces and what is shown to publics. By contrast, relatively little has been written about commercialisation in science museums, particularly their shops: what they sell, and if and how these materials are connected with informal science learning. Where there are case studies in the museum shop literature, they are dominated by shops in arts and socio-cultural museums. But science museum shop is likewise a site of constructing knowledge and demonstrating cultural power, and it too should be interrogated. Attending to the shop can help theorise who the museum is trying to reach and in what ways. Furthermore, the selection and sale of particular items at museum shops as take-home continuations of the museum experience can be a context in which to address tropes that are embedded and reinforced in cultural narratives about science.

While museums are framed as having their roots in Enlightenment knowledge impulses to collect and catalogue the world in European *Wunderkammer* museum shops find their origin in the twentieth-century rise of western consumerism. From the 1940s, museums in the USA started selling mementos related to their collections. Kovach (2014) argues that over the course of the 1900s, US museum shops

shifted from being small stalls that sold postcards to become elaborate collaborative design collections, offering items unique to the museum. Unsurprisingly, prestigious art and design museums such as The Metropolitan Museum of Art had the greatest success with such collections. Rising consumption patterns and declining national funding pots for museums have dove-tailed to see the rise of what Booth and Powell (2016, p.131) describe as the “future of the museum as a ‘cultural shop’, implying a growing organisational orientation towards income generation.” The objects for sale are aimed at consumers in the hope that they will purchase something that has been stocked specifically to entice them. The visitors who attend science museum shops are understood not within the context of in the galleries, but as capitalist subjects (ie. consumers of knowledge and products, not participants in culture and the sharing of knowledge). This delineation is messy, however. Kent’s (2009) research on the UK’s Imperial War Museum shop shows how visitors themselves frame purchases from the shop as a supplement to the education from the museum and a way of carrying it with them back into their day-to-day lives.

The boundaries of purpose are blurred on ethics of reproduction too. During their podcast *Cursed Objects* (2022); hosts Tee, Hancox and Procter have given critical attention to how the choices of what is being sold in museums have included capitalising on mental health crisis (an “Eraser” at a van Gogh exhibition), genocide (selling red diaries at the Anne Frank Museum), colonial theft and plundering (Tipu’s Tiger Christmas gift at the Victoria and Albert Museum or Egyptian mummy pencil cases), with questions about whether it is right to make money from such content. These objects trivialise and commercialise events and conditions that should be treated responsibly by institutions such as museums that ostensibly are teaching visitors how to understand the world around.

How do shops know what to stock? Rationalised within a corporate version of the museum, visitors are segmented based on their ‘types of intent’ for visiting the museum, which might include interest in cultural participation, ‘out-of-school’ learning for the family, school trips, dates, and going for a coffee. Many museums collect their own data on their visitors to inform this segmentation. This understanding of the visitor draws on the theorists Falk and Dirking (e.g. 2016), who argued that the visit to the museum is motivated by a visitor’s ‘personal context’ (interests, attitudes, needs, beliefs), their ‘sociocultural context’ (including customs, values, language all shared within subgroups of a larger society), and their ‘physical context’ (architecture, location, ambiance). Critics argue this encourages institutions to focus on those who *already* attend museums, and to shape the experience around them. Using this approach favours the most privileged groups in society (particularly those privileged through their racialisation, education, wealth, ability, and class) who actively participate in science museum visits, allowing their cultural biases and norms to continue to dominate what is available at museums. This in turn perpetuates structurally unequal access to these spaces, and shapes the stories they tell.

Purchasing an item from the shop at a science museum will make that object part of the visitor’s everyday science learning, both at the time of purchase and after the museum visit. These items, then, are part of what Emily Dawson’s (2019) characterises as everyday science learning, the broadest definition of experiences between science and publics. In this instance, the item comes home from the museum with the visitor, bringing science learning into a different sphere of a visitor’s life, and arguably allowing the item to influence secondary communities, such as family members and larger school groups. Science (and by extension, everyday science learning) never happen in a vacuum, but instead reflect and magnify broader social and political issues in the society in which the museum sits.

#### THIS WAY TO GIFT SHOP AND BOUTIQUE

I am going to think through the delivery of some of these everyday science narratives related to outer space, using specific examples from museums around the world. Outer space represents a particularly salient case study, given that it is highly popular among visitors and is widely merchandised both in and outside of museums. One thing that can be found across museum shops is a focus on NASA and the American flag. One NASA postcard, t-shirt, or baseball cap looks much like another, so I won't fill this article with them, but know they are out there by the bucket load in London, in New York, in Stockholm. Instead, as an exemplar of this category, the London Design Museum's *Moving to Mars* exhibition shop, that gave patrons the opportunity to buy a Christmas tree bauble of an astronaut planting a US flag. In the context of sitting directly outside an exhibition that discussed a move to the Mars as being 'for all humankind', a reification of a white, American cis-man as being the representation of who 'humankind' is limits any broadening of this idea that has taken place elsewhere in the exhibition.



Elsewhere, I have demonstrated that displays of space in museums in Western Europe and Canada frequently align themselves with the US space programme (see Armstrong 2020). NASA's branding spills over into popular culture far more significantly than that of any other space agency – onto catwalk clothes, pop-culture-trendy bags, riffs in movies, and music videos. This popularity of NASA, which is a branch of the US government, continues the circulation of the popular justifications behind the US space programme through culture. Invocations of 'manifest destiny' – the divine right of the USA to lead in outer space as it did in the colonising the American West, by violently displacing Indigenous peoples for resource extraction and wealth amalgamation – is thus propagated in popular culture. This capitalist practice and selling of Americana nationalism around the world teaches those participating in everyday science learning to relate to and think about science as a practice that is dominated by US-centric, and capitalist, narratives.



The second theme to draw attention to is the construction of gender within science practices. In many contexts this is the selling of 'pink' versions of items (space suits, NASA caps, socks etc) that are the same as the 'blue' ones (or other neutral colours: white, orange, black) – a *pinkification* of girls' participation. Pinkification constructs items for girls as 'other': for instance a ball can be any colour, but a pink ball is a girls' ball. Sometimes, this pinkification goes further than simply being the same items in pink. At the Space Center Houston pink jackets are sold that are specifically about 'women's' roles in of the space and aviation history (e.g. the Women Airforce Service Pilots) whereas blue jackets show projects that involved people of multiple genders (e.g. the badges of the space shuttle programme). Elsewhere in the shop gendered narratives about how children or adults should participate in science are constructed. Pink t-shirts read "Girls rule the galaxy";



"How do you get a baby astronaut to sleep? You rocket"; or "I love you to the moon and back". Reinforcing tropes of Girl-Bosses, needing girls as being subdued and passive, or preparing girls for care work and reproductive labour, the messages of these objects build gendered expectations for girls that discourage them from equal participation in science. This contrasts to the blue shirts that have detailed rocket-plans reproduced on them, images of rockets going to space or slogans such as "It's not rocket science. Oh wait, yes it is". Museums also sell "girlie" versions of hegemonically 'masculine' toys such as the 'Women of Space' lego set; or science versions of "girlie" toys, such as Astronaut Barbie (or generic similar looking dolls) with lunar dig sets and space helmets.

These items reinforce a gendering of science space. Where considerable effort and critical scholarship has tackled pluralising gendered representation in science museum exhibitions, museum databases, and science museums' advertising aimed at young people, this is often not seen in the very same institutions' own shops. This makes the contrast between what is available for purchase at science museums and the aims of progressive science research particularly stark.

### **DON'T FORGET TO VISIT THE GIFT SHOP ON YOUR WAY OUT!**

The examples I've provided in this brief text are not exhaustive. They show how nationalist narratives dominate over and above the transnational collaborative practice that takes place in the research of space science. These objects construct and communicate binarised gender-specific roles for people in space science. This separation of 'pink' clothing items with descriptions characterises the young people wearing them as having a different relationship to space than being properly part of the scientific work. Such discrepancies point to a disconnect between the practices of space science and the ways that it is being circulated in traditional everyday science learning spaces and beyond. This disconnect is not unique to space science, and can be seen elsewhere in the commercialisation of science learning. This should push us as theorists in the social studies of science to examine why this occurs, which narratives are being perpetuated in these practices, and how this micro-commercialisation is perhaps linked to the larger scale privatisation of space (for a longer discussion of this please see Armstrong & Bimm, forthcoming).

Some museums do make special efforts to reject this gendering. The shop at the Science Museum in London has moved away from pink and blue items – a step which is particularly visible in their whole floor dedicated to space merchandising. This distinct choice to only sell 'neutral' colours (orange/white), I was told in informal conversation, was specifically motivated by queer inclusion in science education. This is not only helpful for bringing the shop in line with other efforts across the museum, but is also an inclusive practice that rejects binarized gendering and pluralises the possible (scientific) futures that are available for owners of such items. To my knowledge, the pluralisation of space agencies is not common, but more research would explore this further. As museum workers, pushing for change internally, alongside building interdepartmental bridges to share experiences, will be key to seeing change in stocking practices.

So as a visitor, or a researcher, what can be done? Certainly drawing attention to these practices is important. The grassroots campaign *Let clothes be clothes*<sup>1</sup> tackled a 2014 collaboration between UK retailer Marks and Spencer and the Natural History Museum that produced a dinosaur-oriented clothing range exclusively marketed at boys. A 5,000 strong petition and support from UK members of parliament has resulted in both organisations now producing a unisex line of science themed clothes. Participating in such actions are possible, and *Let clothes be clothes* have template letters for giving retailers feedback that could be adapted to tackle gendered, racialised or ableist science museum shop items.

1 See <https://www.letclothesbeclothes.co.uk/>

Researchers thinking of everyday science learning could consider the impacts of commercialisation on science narratives. Already, scholarship in the field pays attention to the cost of participating in science museum learning (e.g. travel, entry, and time-off-work costs) and who this includes or excludes (see Dawson 2019), so further consideration of how commercialisation shapes access is worth attention – especially as the brands and museums that have been the focus of this text are but a small set of all museum shops that sell science-related items.

#### EXIT THROUGH THE GIFT SHOP

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# THE UNBEARABLE LIGHTNESS OF BILLIONAIRES IN SPACE

Richard Tutton

**THIS PIECE REFLECTS ON THE EVENTS OF SUMMER 2021 WHEN TWO BILLIONAIRES - RICHARD BRANSON AND JEFF BEZOS - VIED TO BE THE FIRST TO FLY TO THE 'EDGE OF SPACE' AND SO LAUNCH THEIR SPACE TOURIST BUSINESSES. I DISCUSS HOW BRANSON, BEZOS AND OTHERS TALKED ABOUT THE EXPERIENCE OF BEING WEIGHTLESS AND USE THIS AS A LENS THROUGH WHICH TO CRITICALLY REFLECT ON THE SIGNIFICANCE OF THESE FLIGHTS IN THE CONTEXT OF GLOBAL DEVELOPMENTS.**

During the Summer of 2021, on our multitude of screens, we were invited to pay witness to billionaires flying to or near the arbitrary Karman line, to watch both their personal pleasures and to be persuaded by the feasibility and desirability of a new elite experience called 'space tourism'. With their safe return, much was then written in op-eds, blogs, and tweets about those flights and their contested significance. One aspect that drew my attention was how, for Richard Branson and Jeff Bezos, the sensations of weightlessness loomed large in the accounts they gave of their experiences. While the poetry addresses the transfigurative potential of the 'overview effect', video from within the cabins show that spinning around, laughing, floating, pushing objects to each other appeared to be the real highlight of the trip for those who went. After his flight, Branson tweeted: 'So joyful I still felt weightless', and Bezos opined in the post-launch event that being in that state of weightlessness 'felt so normal, it felt as if humans had evolved to be in that environment [...] it felt peaceful, serene, very pleasurable' (see: <https://www.blueorigin.com/news/first-human-flight-updates>).

I'm confident that it's an awesome feeling. As the editorial in the Chicago Tribune (2021) commented: 'who does not crave the chance to float around like the great astronauts of our childhood dreams, Earth's gravitational pull falling away with our quotidian worries?' In this paper I wish to explore this claim seriously and to consider how the fantasy and desire to experience weightlessness comes to signify another kind of weightlessness as a strategy to escape the urgencies and pull of today's world.

For STS, weightlessness is an interesting topic. In the early days of developing human spaceflight capabilities, weightlessness was the source of some consternation and was not necessarily an experience to be craved. One leader in the field of what became known as space medicine - Heinz Haber who worked for the Luftwaffe Institute for Aviation Medicine in World War II and was later taken to the US through Operation Paperclip - drew attention to what he called the 'human factor' of spaceflight. Writing in 1951 he ventured that:

From his conquered home-planet man has begun to look expectantly toward new worlds in the heavens. The Moon and the neighbouring planets, Venus and Mars, irresistibly challenge his fancy with the same spell that the seven seas once cast over their explorers. Like the pioneers who first ventured to sea in sailing ships, we are preparing to launch our first frail craft in the vast ocean of space. (Haber 1951: x)

However, he argued that the success of space exploration lay not only with rocket design but also with managing the effects of spaceflight on the human body



(and, in particular, on the male body assumed to be the only viable astronaut body at the time). In particular, the field of space medicine was engaged in efforts to better understand what would be involved in weightlessness. Haber speculated that 'a man liberated from the shackles of gravity would most probably be in a constant state of physiological and psychological tension (1951: 18). As alluded to above, during World War II, Haber and other scientists, including Otto Gauer (another beneficiary of Operation Paperclip) had speculated on the possible effects of weightlessness. They had a paper included in the US Air Force's compendium of aeromedical research conducted in Germany during the war, in which they expressed the concern that weightlessness could have dire consequences for the person experiencing it, rendering them with 'an absolute incapacity to act' (Gauer and Haber 1949). In the 1950s, to develop more of an understanding, US scientists turned to using non-human animals, strapping them into the nose cones of sounding rockets and blasting them up into the atmosphere, where eventually some survived their landing and were assessed, showing no ill-effects of being weightless (Swenson et al 1989).

As the quote from Haber's 1950 paper shows, the concern with the effects of weightlessness on the human body was bound up with the colonial ambitions that he and others envisaged for humans in outer space. As many scholars working within historical and social studies of outer space have shown, advocates of spaceflight often frame this endeavour in such colonial terms and view 'the space frontier as a site of renewal, a place where we can resolve the domestic and global battles that have paralyzed our progress on Earth' (Kilgore 2003: 1-2). For Cosmists in the early twentieth century, for example, it was linked to how humans would overcome death and attain immortality by escaping gravity, travelling through space and establishing life in the cosmos (Groys, 2018). Weightlessness would be a desirable state of being, signifying the escape from Earth and death.

In our times, the pursuit of weightlessness by very wealthy men is troubling, because these momentary, experiential states of weightlessness are connected to other practices and strategies of 'social weightlessness' - to adopt the term that feminist scholar Lois McNay (2014) discusses in her work. The title of this paper is a riff on one of the chapters in her 2014 book *The Misguided Search for the Political* ('The unbearable lightness of theory', which is in turn of course a play on Milan Kundera's novel). Drawing on the writings of Pierre Bourdieu, McNay (2014: 40) uses 'social weightlessness' to describe a mode of thought that is 'far removed from the practical mundanities and urgencies of the world'. She relates how Bourdieu shows that elites act to establish a "magical boundary" between themselves and the mundane world. This apartness from the everyday world is both a liberatory break and a potentially crippling separation' (McNay 2014: 41).

For McNay (2014: 39), her concern with 'social weightlessness' is directed at certain academic theories and their tendency to 'rarefaction'. But in this paper I read the flights of these billionaires and the space tourism they prefigure as an expression of another mode of 'social weightlessness'. Flying high into the atmosphere, reaching or exceeding the Karman Line to escape gravity becomes then a 'magical boundary', which indeed achieves a 'liberatory break' for those privileged to experience it. It is a few minutes in which a fantasy of freedom can be celebrated, freed as the *Chicago Tribune* suggests, of our 'quotidian worries'. But in fact, rather than this being an experience a great many ordinary people will experience, access to space tourism - to the weightlessness of space - is one to be enjoyed by those who already enjoy a good degree of 'social weightlessness'. Aside from a few lottery winners, few will experience what is otherwise closed to anyone who is not a millionaire.

Yet this pursuit of weightlessness both seeks justification from and is fatally entangled with the urgencies of the world. Bezos proposes that development of new space vehicles is a step towards ensuring that 'our children can build the future'. He believes with apparent passion and conviction that human expansion in the

solar system will produce a better future for humanity. While acknowledging that there are immediate social problems that need addressing – pollution, homelessness, poverty – Bezos prefers to think long term. Faced with the prospect that capitalist economies will eventually be unable to meet their energy demands, Bezos proposes that to avoid a society characterized by ‘stasis and rationing’. We must pursue one of dynamism and growth that comes from expanding into the solar system, where there are unlimited resources. These resources would support a human civilization of a ‘trillion humans [...] which means we’d have a thousand Mozarts and a thousand Einsteins. This would be an incredible civilization’, Bezos concludes.

Outer space then is Bezos’ imagined new ‘Great Frontier’ (Moore 2021) for capitalism. Moore (2021: 3) argues that ‘capitalism emerged through a prodigiously generative nexus of Cheap Labor, imperial power, and the unpaid work/energy of previously uncaptialized soils, forests, streams, and all manner of indigenous flora and fauna’. In Bezos’ vision, the ‘uncaptialized’ entities are moons, asteroids, and planets in the cosmos. And science fiction has long imagined who would be the ‘Cheap Labour’ (see for example, *The Expanse*, a series financed and shown by Amazon Prime!).

In the here and now, however, the entire existence of Blue Origin - Bezos’ aerospace company - is dependent on Amazon and its multi-billion dollar profit margins. Bezos explicitly acknowledged this relationship in the post-launch press event, going so far as to extend his thanks ‘to every Amazon employee and every Amazon customer, because you guys paid for all this’ (see: <https://www.blueorigin.com/news/first-human-flight-updates>).

After Branson’s flight, Virgin ran an ad to celebrate both his achievement and to promote its various businesses in travel, finance and media (see: <https://www.virgin.com/about-virgin/latest/if-we-can-do-this-imagine-what-else-we-can-do>). The ad asked ‘if we can do this... imagine what you can do’, ‘if we can feel this .. imagine what you can feel free’, with scenes of ordinary people living with their ‘practical mundanities and urgencies’ (McNay 2014: 40) striving to overcome adversity, to escape the weight of their worlds. The promise is that they too can attain a state of weightlessness. The privileged experience of a select few inspiring everyone else to throw off their shackles.

In this short paper, I have explored weightlessness, as a valorized embodied experience of space tourism that is also an expression of another kind of weightlessness - a ‘social weightlessness’ pursued by the extremely wealthy to escape the attraction of mundane realities and pressing social problems. Further, it is a cruel promise directed at those struggling with adversity that a simple escape is possible, as exemplified by the pleasures of billionaires as they fly to the edge of space.

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# UTOPIA(S), OUTER SPACE LAW AND ECOLOGY

Matjaz Vidmar and Saskia Vermeulen\*

**PRIVATE, COMMERCIAL SPACE EXPLOITATION IS GROWING BECAUSE OF THE PROSPECT OF RESOURCE EXTRACTION. CURRENT OUTER SPACE LAW IS NOT WELL EQUIPPED TO DEAL WITH GOVERNING THIS NEW CHAPTER OF SPACE EXPLOITATION AS IT WAS NEGOTIATED DURING THE COLD WAR WHEN MINING RESOURCES IN OUTER SPACE WAS STILL FICTIONAL. AS INTERNATIONAL LAW, INCLUDING SPACE LAW, IS CRITICISED FOR BEING NEO-COLONIAL, WE ARGUE THAT IT IS NECESSARY TO INJECT CRITICAL PERSPECTIVES INTO IT IN ORDER TO MAKE IT RELEVANT FOR THE PRESENT AND THE FUTURE. WE DRAW ON AFRICANFUTURIST ART TO HELP RE-FRAME THE GOVERNANCE OF OUTER SPACE FOR ALL. THROUGH REPRESENTING THE JOURNEY OF AFRONAUTS, THE EXTR-ACTIVISM EXHIBITION EXAMINES THE FUTURE THROUGH RE-DEFINING THE PAST SPACE EXPLORATION FROM A NON-EURO-AMERICAN POINT OF VIEW AND SETTING IT TO THE BACK-DROP OF THE CONTINUOUS EXPLOITATION ON/OFF THE AFRICAN CONTINENT. DEPLOYING AN ECOLOGICAL PERSPECTIVE, A TENTATIVE FRAMEWORK FOR ALL-SPACE GOVERNANCE IS ESTABLISHED WITHIN THE PARLIAMENT OF EVERYONE. BUT IS THIS A SOCIO-TECHNICAL UTOPIA OR IS IT THE FUTURE?**

## UTOPIAS AND REALITIES: THE NEW SPACE RACE

The seeming remoteness of Outer Space has enabled Earth-bound humans to view the expanse of the off-Earth space as *terra nullius* – no-one's land or empty. This leads to a spectrum of socio-technical utopias about multi-planetary futures, with human settlements on the Moon, Mars and extraction of minerals from asteroids, to name but a few. However, such narratives, that are steeped in frontier thinking of expanding territorial conquest, foster resurgence of past approaches to places deemed un-occupied merely by the virtue of not belonging to the legal framework applied by the explorers/invaders. The increasing privatisation of access to Outer Space and its resources is framed with a sense of such "entrepreneurs" (Vidmar, 2019) unquestioned entitlement to yet "un-occupied" places, reaffirming the capitalist ideology of growth through expansionist, mercantilist and colonial means.

Under this pressure, several asymmetrical challenges have emerged:

1. New spacefaring nations, including China's growing unilateral prominence, gave rise to a spectrum of potential and attempted non-compliance, contestation and controversies in civil and military sphere.
2. Smaller nations with established Space Industry, such as Luxembourg, are attempting to remain competitive by attracting the private sector bent on commercial exploitation of Outer Space resources.
3. The growing appreciation of the space sector's importance for sustainable development resulted in a new generation initiatives in the global South, including the emerging African Space Agency.

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4. Major existing space powers such as the US, have led deregulation through the Spurring Private Aerospace Competitiveness and Entrepreneurship Act of 2015 (SPACE Act) and Artemis Accords (NASA 2020). Combined, these allow US citizens to possess, own, transport, use and sell resources extracted from Outer Space. Such privileges are also extended to citizens of all signatory states, including Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, and the United Kingdom.

5. Signing of the Artemis Accords has supported the idea that future governance in space should be regulated through bilateral agreements that can advance the ability to extract and utilise resources on the Moon, Asteroids, and Mars.

At the same time, there is rising consensus amongst legal scholars that international space law based around the 1967 Outer Space Treaty is no longer fit for purpose. Though it has always sought to safeguard space and its resources for peaceful benefit of all humankind, the current technological advances and proliferation of actors in this arena seem to have been unforeseeable at the peak of the Cold-war era tensions between nation-states. A prominent feature in the 1979 Agreement Governing the Activities of States on the Moon and other Celestial Bodies (the Moon Agreement) is a utopian vision for fair and equitable sharing of the benefits derived from the development (Art 7(b)) or use (Art 7(c)) of the natural resources on the Moon amongst developed and developing nations. However, this Agreement was never ratified and only eighteen countries have signed it. But despite this failure, the general cooperative spirit of international space law is clearly stated in the preamble of the Outer Space Treaty that the progress of exploration and use of Outer Space is for the benefit of all peoples irrespective of the degree of their economic or scientific development. In contrast, the commercial space sector actors now lobby for exclusionary private ownership of space resources, first at national level and then through bilateral agreements.

The proliferation of New Space actors is also leading to a growing interdependence between military, civil, and commercial space institutions. The lack of enforceable regulation and outdated international norms are creating a dangerous mix of growing counter-space military capabilities (e.g. satellite deorbiting) and aggressive space policies (e.g. creation of space branches of military). Moreover, there is a growing threat to continuous space access and operation in the form of the rapid expansion of space waste (thousands of disused satellites and upper stages of rockets) and space debris (tens of thousands of small fragments of the above) “occupying” orbits around the Earth. Added to the mix are emerging mega-constellations - formations of thousands of small satellites creating new networks in space – which can interfere with both terrestrial (astronomy) and space activities (environmental monitoring, telecommunications, navigation). Such challenges gave rise to more interdisciplinary and holistic, (eco)systemic, inquiries and perspectives onto Outer Space (Vidmar, 2020), since new governance and legal frameworks are clearly required, to not only to manage human-made objects and provide (fair) space traffic management, but also for planetary protection against biological (cross)contamination, if material and resources are moved across different bodies.

#### **FROM ASTROCOLONIALISM TO AFRICANFUTURISM: USE OF CRITICAL ART FOR EXPLORATION**

Directly addressing these emerging concerns within the legal uncertainty and ambiguous language around resource ownership in the ratified Outer Space Treaty, the 2022 *EXTR-Activism* exhibition presents an artistic and activist reflection on Euro-American positivist law. The exhibition adopts an Africanfuturist perspective, which is a philosophical, historiographical and aesthetic movement exploring

the African point of view (for more details on Africanfuturism see Vermeylen and Njere 2022). Often deploying multi-dimensional speculative fiction and design practice, critical Africanfuturist art can be used as a source of experiential knowledge making - exploring both the subject-matter and the knowledge making practice itself by imagining a possible future through a black cultural lens (for more details about the relationship between space art and space law and definitions about Africanfuturism see Vermeylen 2021a, 2021b, Vermeylen and Njere 2022).

Cutting across issues related primarily to settling and mineral mining across time and space, the EXTR-Activism exhibition becomes a *place* to visualise and reflect upon the connection between the existing colonial extractivism (for a more details on the history of the term extractivism see e.g. Burchardt and Dietz 2014) on Earth and the emerging colonial extractivism in Outer Space. Launching in Vienna, the exhibition also provides a critical reflection on the relationship between capital and private interests and the United Nations, as Vienna hosts the United Nations Office for Outer Space Affairs, and thus opens a *space* for artistic practices to interrogate the fairness and equity of international space law which promises that space exploration and the use of Outer Space shall be carried out for the benefit and in the interest of all countries and shall be the province of humankind (see Art I of the Outer Space Treaty). However, as is widely commented upon, space travel has excluded many countries and peoples from benefiting from space exploration (Vermeylen 2021a, 2021b)

The artworks from the global North and South explore extractivism and (neo-) colonialism of the New Space era against the background of African countries developing their own space programme (most notably South Africa and Nigeria). Hence, it seems that this new chapter in the Space Race fails to decolonise the Euro-American-centric perspective – the dominant political and economic narrative is set to displace extractivist activities into Outer Space without ever properly reflecting, let alone agreeing, on how and why Western socio-economic approach has made such a mess on planet Earth. This is a particularly stark juxtaposition – toying with the precipice between the renewed interest in colonisation of Moon and Mars by the private entrepreneurs and corporations vis-a-vis the rapid widening of the communities of space protagonists. Can we govern (in) Outer Space more inclusively?

The exhibition is curated as an immersive performance (led by Vermeylen) wherein the decolonial body plays a central role moving around the exhibition space. Applying Mignolo's (2011) idea of decoloniality to art curating, the driving objective is to (re)inscribe hidden and silenced voices and histories in space exploration, extractivism and space law. Following the tradition of African storytelling, the praying mantis, which is simultaneously the creator deity and cunning trickster for the San peoples in Southern Africa, takes us on a journey that mocks and ridicules – as tricksters do – the deeply rooted colonial epistemologies and ontologies that have informed current space explorations and laws.

Through interactive art installations which bring together artists, academics, performers, musicians, writers and storytellers, the exhibition challenges Eurocentric categories of aesthetics and law making and retells the story of extractivism and space travel from the perspective of African astronauts - Afronauts. The forgotten socio-technical histories, contested legacies and repressed memories are explored through a plethora of art practices that blur the boundaries between fiction and reality. This blurring allows us to imagine how Outer Space extractivism would look like if and as we do not learn from our past and current ecocides and genocides. Through the curatorial and arts practices, the exhibition exposes how our earthly extractive practices have already been propelled into Outer Space. Raw materials, such as platinum are already congesting space. And space debris floating in space is implicated into gross human rights abuses in extractive industries. The Marikana massacre in 2012 in South Africa, which killed 34 miners, acts as the anchoring point, and has provoked an activist and aesthetic call and

response between the Widows of the Marikana and other South African artists. EXTR-Activism is, therefore, also a response to the many environmental and human massacres committed by extractive industries.

By their journey, Afronauts rewrite the past and future of space exploration and frame a living artwork, *All-space Treaty*, which stops the exploitation of humans, non-humans and more-than-humans. During a performative and immersive exploration in the exhibition space after the opening of the show, participating artists reflected on the need that in order to challenge and transform current shortcomings of the Outer Space Treaty it was important to acknowledge first and foremost the entanglements of earth with space and what is needed is a space treaty that does not draw boundaries between earth and Outer Space, and humans and non-humans (the latter a category that is almost completely silenced in the current Outer Space Treaty). What the exhibition explores is a counterfactual history of the Space Race - exploring the future through an alternative past. The film *Afronauts* (2014) by the Ghanaian-born filmmaker Nuotama Bodomo has set the tone for the exhibition and retells the story of the Zambian space program during the Cold War. In her film, Bodomo refers to the Zambian schoolteacher Edward Makuka Nkloso and his space program but gives it a speculative spin and offers a perspective for a better future by critiquing and deconstructing perceived ideas about Africa both in the past and present. A similar questioning is at the heart of the exhibition. If the first person on the Moon was a Maasai woman or cyborg (Vermeylen and Njere 2022), how would space law have evolved? What would governance of Outer Space resources look like, if it reflected and engaged with lessons from terrestrial extractivism?

#### **TENTATIVE STEPS TOWARDS A PARLIAMENT OF EVERYONE**

The exhibition's staging, set to the soundtrack by "intergalactic DJ" Crater Digger, has been inspired by the work of the British-Nigerian artist Yinka Shonibare CBE, who has offered a strong critique of the commercial space race through appropriating colonial and neocolonial epistemology. Shonibare opens two parallel discourses. He questions the history of Outer Space exploration through the lens of the Western desire to conquer new spaces. But he also suggests in his arts practice that an African Space Program is viable by layering the iconic white spacesuit with batik fabric steeped in colonial atrocities. Shonibare's utopian Afronauts have an empowering quality – they are on a journey of rejection of current legal discourses and establishment of a different kind of Outer Space.

#### **STOPS ON THE AFRONAUTS EXTR-ACTIVISM JOURNEY...\***

##### *1,2,3... Lift-Off!*

The exhibition starts with an immersive soundscape by the South African musician Guy Buttery, representing the lift-off of a pan-African spaceship on a mission to rescue Mars from overexploitation. On the space ship are Afronauts who face the dangers of so much space junk that the Afronauts fear for their lives as their spaceship can be fatally hit by debris that earthlings have sent into Outer Space.

##### *Journey through Space Junk*

The history of space travel is retold through iconic events but with a twist. All art installations that are displayed during the journey are African-centric. The hegemony of the Euro-American centric space history is exposed through a post-colonial and decolonial aesthetic immersion.

### *Terraforming*

The official archive of space travel portrays history as a factual progression of known events, using the frontier as the main trope to justify the thinking that space is empty. It is a myth that is used to justify the replication of settler-colonial practices of homesteading, planting flags, and making roots. Earth's history may repeat itself on Mars unless we can halt it. The artworks in this part of the exhibition question the techniques that have been used to colonise other people's land. But land is *never terra nullius* or empty. Although we like to think that Mars is empty, so we can justify space settlements on Mars, the idea that Mars is empty is a very anthropocentric understanding of what life on Mars may look like. Furthermore, on our way to Mars we have already littered space with our debris, and left already an imprint through rovers on Mars that may have already disturbed microorganisms. History is already repeating itself before the first Martians have left their footprint on the red surface.

### *The Space Junk Graveyard*

This section of the exhibition shows the trauma, exploitation, and pollution of extractivism. The installations exposing the genocide and ecocide of mining are staged as if these massacres have happened on Mars or on other extra-terrestrial bodies. The centre piece of this section is the Body Maps of the Widows of Marikana in dialogue and conversation with other pieces that reflect upon the massacre.

### *Occupy Space*

In this section of the exhibition the Afronauts fight extractivism and proper-tisation of Outer Space by proposing other ways of living and governing Outer Space. Inspired and in dialogue with the Occupy movements, alternative visions of space exploration are emerging that contest extractivism and mining in Outer Space but also propose a decolonised space programme that is beneficial for human, non-human and more-than-human kind. In order to fulfil the promise of international space law that space exploration and use of space and its resources should be for the benefit of humankind, we first need to acknowledge that space exploration has been part of a colonialist vision that space is the next frontier in our long history of capitalist and extractivist practices. This includes the exploitation of both humans and nature in order to support a wealth maximisation paradigm. Decolonising space shows how current property regimes and laws are only benefiting the privileged classes at the expense of those who are exploited which includes both humans and non-humans.

### *New Space Manifesto*

The last space capsule embodies hope and an alternative future. It is also a space which allows visitors to redesign space law, reflecting on their immersive space travel experience.

\*From the exhibition catalogue ([link](#)).





EXTR-Activism Exhibition.  
© Wolfgang Thaler, 2022

Right at the end of the EXTR-Acrivism exhibition journey, the *Parliament of Every/No/where/one* explores an evolutionary perspective of governance as could be seen from outside the Euro-American legal system. Reflecting on how the architectural structures of the infrastructure for and of talking – parliaments – changed through time leads to a reflection on the perpetual (re-)emergence of hierarchies of governance and attempts for their dissolution. Outer Space in particular, through its existential criticality may become (or may already be) a place for renewal of collective and communal decision-making (Vidmar, forthcoming), including the regulation of extractivism. However, controlling hierarchies may re-assert themselves in the future. As such, the piece looks at how ecological expansion into Outer Space provides an opportunity for reflection on the Earthly practices, alongside offering new constraints and affordances that constitute opportunities for reconnection and renewal within the expanded ecosystem (Vidmar, forthcoming). Situating the first installation of this exhibition, and its performative *All-Space Treaty*, in Vienna is an important political-activist statement because of the presence of United Nations Office for Outer Space Affairs in the city. Furthermore, the exhibition, and its strong focus on African storytelling as a pedagogical method to decolonise the curatorial practice, also contributes to opening up academic writing practices to African worldviews and ways of knowing, including through this piece in *EASST Review*.

The work specifically explores the intersection of visual language, social and physical architecture, and the core activity of (democratic) governance: speaking (*parler*). Charting its way from prototype communal assemblies towards highly sophisticated and complex institutions, the *Parliament of Every/No/where/one* explores the “evolution” of representation and its inclusivity. Mapping onto historical contexts of exploration, occupation and exploitation of “new” territories, this interactive work asks if we are ready on an individual and collective level to develop and sustain a framework of governance which would be distributed everywhere (in Outer Space?) and include everyone.

Through five visual metaphors and a short accompanying essay, the *Parliament of Every/No/where/one* reflects on the critical contribution of the exhibition: the necessary and critical expansion of the voices expressed and listened to in the context of Outer Space governance. As such, this piece is also concluding the Afronauts’ journey, namely arriving at *Parliament of Everyone, Everywhere* to formulate and articulate an *All-Space Treaty*, a manifesto for fair and equitable distribution of benefits of activities across all space(s), on and off Earth. This trans-planetary intervention thus re-establishes the ecological interconnectedness of all living things, even those not known or not recognised as “living”. As we all meet in Vienna, the praying mantis trickster lets us believe this is not a utopia, but the future.

## PARLIAMENT OF EVERY/NO | WHERE/ONE

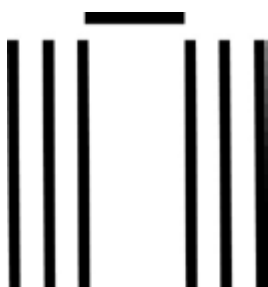
Matjaz Vidmar, 2022, mixed-media essay/installation, [www.parliament.gallery](http://www.parliament.gallery)



The earliest vestiges of community organisation are thought to literally circle around one common shared asset – fire. Even now, social groups operating off the grid – whether they be religious groups, camping expeditions or pastoralist communities – meet in round circles to talk about past experiences, future challenges and the strategies to persevere. Consensual leadership is often a feature of such groupings – where capabilities of individuals are mutually recognised and most efficient distribution of responsibility is sought. This common form of a talking circle – a sort of proto-parliament – is known everywhere and notionally open to everyone.



For much of the last 2022 years, the structure of governance involved primarily being talked at. In this case, formal representation is about subservience and downward exertion of control from the leader(ship). As the talking circles broke up due to the expansion of populace, so did the capability-based system of contribution to decision-making. Claiming spiritual investiture everywhere, the hereditary leader needs representation from no-one. Is a silent parliament better or worse than having no parliament at all?



With further population growth strictly hierarchical structures are tested as devolved decision-making is necessary in order to manage large-scale provision of resources and community organisation. Cultural norms may hold social order together, but every time (social) power erodes, dialectic frameworks of governance (re)emerge. This is especially the case in oppositional politics, where argumentative discussion marks the alternation of political dominance. Though noisy, many such parliaments have a largely performative role, whereby a “winner-takes-all” power dynamics favours agreeing with no-one and leading nowhere.



Some forms of dialogue-based decision-making have emerged, largely at the two opposing ends of the spectrum: in small communities and in the really large ones. Examples are local authorities, regional governments, small nation states as well as supranational frameworks such as the European Union or United Nations. At these levels, where it is hard to predict political outcomes, the guiding principles and practical reality tend to favour consensus making and forming of interest coalitions. In theory, this should lead to a more inclusive representation of everyone, but is often so complex it looks like decisions appear from nowhere and with little accountability.



Expansion into new spatial domains, such as Outer Space, is an opportunity for redefinition of governance structures as new ecological reality forces new communal responses. Due to size and remoteness, it is easy to see the old proto-parliaments returning, but the question remains if these forms could be made more stable and sustainable, and pave the way for a new way of collective decision-making. The laws of the sea made the ships of (colonial) explorers into such capsules of egalitarianism, but the governance approach taken when they reached the new shores was devastating to indigenous people and their environment. So, as we emerge into a new era of exploration, everyone everywhere needs to be able express their position and respectfully listen to those around them...

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STS MULTIPLE

# BUILDING ACADEMIC LIVING SPACES FROM HETEROGENEOUS NETWORKS: THE STORY OF STS AUSTRIA

Helene Sorgner, Nikolaus Poehhacker

**STS AUSTRIA WAS ESTABLISHED IN 2015 TO REPRESENT AND INTEGRATE THE THRIVING COMMUNITY OF STS RESEARCHERS IN AUSTRIA, WHICH HAS DEVELOPED ACROSS SEVERAL DIFFERENT INSTITUTIONS AND RESEARCH PROGRAMMES DURING THE LAST TWO DECADES. THE ORGANISATION FOSTERS INTERNAL EXCHANGE AND INTERNATIONAL VISIBILITY OF THE AUSTRIAN STS COMMUNITY THROUGH REGULAR SCHOLARLY EVENTS. A PARTICULAR EMPHASIS HAS BEEN ON ACTIVITIES SUPPORTING STUDENTS AND EARLY-CAREER RESEARCHERS IN STS, SUCH AS A CAREER ORIENTATION WORKSHOPS AND AN AWARD FOR OUTSTANDING PUBLICATIONS BY YOUNG SCHOLARS.**

*STS as a (un)discipline has always emphasised the need for reflection and the practices of (infra)structuring scientific communities. Staying true to these ideals, we appreciate the opportunity to reflect our own efforts of institution building, becoming and being as (a part of) STS Austria. In the following, we want to describe some of the processes involved in assembling a heterogeneous network of researchers and institutions into a shared national organisation and common academic living space. But before we can do so, we have to ask ourselves an important question ...*

*What do we mean when we say “STS Austria”?*

Since 2015, “STS Austria” designates a **not-for-profit organisation** established to represent and integrate the thriving community of STS researchers in Austria. According to its bylaws, the organisation aims to foster the institutional establishment of Science and Technology Studies in Austria, improve scholarly communication and exchange in the field, support and integrate junior STS researchers, link the Austrian STS community to other national and international STS bodies, and increase the visibility of the subject outside the field. Membership is open to all active scholars in the field of Science and Technology Studies who support these objectives. The organisation is run by a president and a board, each elected from among the members for a period of two years. Its first elected president was Ulrike Felt (2015-2017), followed by Max Fochler (2017-2020) and Daniel Barben (since 2020).

The organisation “STS Austria” was launched to represent a **research community** with a comparatively long and institutionally diverse tradition in Austrian academia. Pioneered by Helga Nowotny, who established and held the first chair for Social Studies of Science at the University of Vienna, the research field has been well institutionalised in Austria since the 1980s (see *EASST Review* 34(4), December 2015). During the last two decades, research groups at the University of Klagenfurt, the Technical University of Graz, the Institute of Advanced Studies, the Austrian Institute of Technology or the Institute of Technology Assessment were founded or adopted STS as a dedicated approach. Two master’s programmes, one in Vienna (since 2009) at the department chaired by Ulrike Felt and one in Klagenfurt (since 2016), further institutionalised STS in Austrian universities, spawning a growing community of STS graduates and early-career researchers. STS Austria was initiated to connect members of these numerous research groups across institutions and research topics. To emphasise this cross-institutional character, we take care that all participating research groups are represented in the organisation’s board, including master’s and PhD students.



STS Austria provides a meeting and networking place for the Austrian STS community and increases its international visibility mainly by regularly organising **academic events**. From the beginning, the annual assemblies of STS Austria have been public events that combined the business meeting with public guest lectures and panel discussions. The launch of STS Austria was celebrated with an international conference in autumn 2015 (see *EASST Review* 35(1) 2016). Following the success of this conference, the first research workshop supported by STS Austria took place in early 2017. Organized chiefly by Karen Kastenhofer and Martina Merz, it brought together an international group of researchers investigating the shifting meanings of '*Community and Identity in Contemporary Techno-Sciences*'. A selection of contributions to this workshop was recently published as the *Springer Sociology of the Sciences Yearbook* in 2021, edited by Karen Kastenhofer and Susan Molyneux-Hodgson.

The thematic focus of the second international conference on 'Innovation and Societal Transformation: Science, Democracy, and Sustainable Futures', organised in September 2018 at the University of Klagenfurt, resulted in a smaller event, with around thirty participants engaging in concentrated formal and informal exchanges around a single stream of talks. With Luigi Pellizzoni as a keynote speaker arriving from nearby Udine, this event also showed the viability of connecting to neighbouring STS communities, in this case, STS Italia. The **workshop format**, allowing the discussion of a smaller number of thematically connected contributions in a focused manner, proved to be the preferred type of events for STS Austria ever since.

The 2018 conference was the first to include a dedicated junior track in the form of a pre-conference workshop, which allowed students and early-career researchers to present their work and receive feedback from senior STS Austria members. This pre-conference workshop marked the beginning of a series of initiatives explicitly dedicated to **supporting students and junior researchers** in STS. Shortly after, the workshop '*Ignorance and non-knowledge: what consequences for democratic governance, politics and policy?*' in Vienna, co-sponsored by STS Austria, combined high-profile keynotes and panel discussions with contributions from international early-career researchers.

A particularly successful initiative intended to support the young STS community have been two workshops dedicated to **mapping out career paths** in and with STS. These events invited STS master's students to learn first-hand about potential career paths from STS graduates working in a range of occupations within and beyond academia (see text on the "Living Books"-format below). To also support early-career researchers in a more tangible sense, STS Austria opened a call for outstanding publications (including master's theses and doctoral dissertations) by junior researchers in 2019. The first *STS Austria Prizes for Early Career Publications* were awarded to Ruth Falkenberg, Nils Matzner and Andrea Schikowitz at the annual business meeting in February 2020.

Unknown to us at the time, this award ceremony would remain the last physical meeting of STS Austria - both as an organisation and a community - for more than 18 months. Despite the challenges of the COVID-19 pandemic, the newly elected board managed to organise two well-received events in the autumn of 2021, with the workshop '*Digital Living, Digital Infrastructuring*' even taking place in person at the University of Graz (see workshop report below). As this difficult period is coming to an end, some of us are leaving the board while others will stay on for another two years, we hope to continue our mission of providing virtual and physical venues that foster engagement and new alliances among Austrian STS researchers, building an academic living space for a diverse and thriving community.

If you would like to support us on this mission, please consider becoming a member or join us as a candidate for the STS Austria board: <http://www.sts-austria.org/join/>  
If you have an idea for a project or event that could be supported by STS Austria, feel free to send us your proposal: [office@sts-austria.org](mailto:office@sts-austria.org)

# SKILLS, (CAREER) TRAJECTORIES, AND STORIES: THE “LIVING BOOKS”-WORKSHOP

Helene Sorgner

**WITH STS BECOMING MORE AND MORE INSTITUTIONALISED AND POPULAR AS A STUDY PROGRAMME, A GROWING NUMBER OF STS GRADUATES NEEDS TO FIND WAYS OF TURNING THEIR SKILLS AND EXPERTISE INTO SUSTAINABLE CAREERS. THE “LIVING BOOKS”-WORKSHOPS ORGANIZED BY STS AUSTRIA PROVIDED STUDENTS WITH THE OPPORTUNITY TO LEARN FIRST-HAND FROM STS ALUMNI ABOUT THE WIDE RANGE OF OPPORTUNITIES FOR WORKING IN AND WITH STS. WE ORGANISED TWO OF THESE WORKSHOPS TO DATE, ONE IN VIENNA IN DECEMBER 2019, AND A SECOND ONE TAKING PLACE ONLINE IN NOVEMBER 2021.**

As STS becomes increasingly institutionalised and popular not only as a research discipline, but also as a study programme, the question naturally arises what kinds of careers it prepares its students for. After all, as multiple as the approaches, themes and concepts constituting contemporary Science and Technology Studies are, so are the areas of their potential application. Following up a discussion at the Klagenfurt conference in 2018, the student representatives on the STS Austria board decided to organise an event where current STS students could learn first-hand where their expertise and skills may be applied. Our solution was a workshop bringing together STS students with STS alumni in the format of a “living books”-discussion. Following an introductory keynote on the international landscape of STS training and the timely relevance of STS researchers’ skills, the core of these workshops were structured group discussions in which invited STS alumni would serve as “living books”. For three rounds of 20 minutes each, workshop participants could join one of the “living books”, who would share stories and insights about their individual careers and experiences since graduating from an STS program.

Two workshops of this kind have taken place so far, the initial installment in December 2019 (featuring a keynote by Jessica Mesman) and an online event in November 2021 (with a keynote by Aristotle Tympas). While ideally happening in person, the “living books”-format also lends itself well to video conferences with breakout rooms, as we learned when yet another lockdown required a last-minute change of plans. In preparing these workshops, we made sure to invite “living books” who represented a diverse range of occupations within academia and beyond. We also sought to invite STS alumni with an international outlook alongside those based in Austria. Our “living books” thus included STS graduates who were pursuing a PhD abroad and had returned to offer their expertise as consultants in urban design and public health; professionals working in science communication and research administration; and researchers in applied social sciences at consulting agencies as well as non-profit organisations.

The response to these workshops has been overwhelmingly positive. Students appreciated the informal exchanges with STS alumni, reporting that these discussions had provided new perspectives and deepened their understanding of what working in and with STS could potentially mean. The “living books” themselves enjoyed the opportunity to reflect on and share their experiences. Not least, entering this space of mutual learning also conveyed a sense of being part of a community beyond one’s own cohort of students, an experience many participants made for





Picture of Living Books workshop by  
Max Fochler

the first time. We hope that we will be able to organise many more “living books” workshops in the future, ideally including STS alumni who have taken their skills to the private sector. We also hope that this format might inspire other initiatives - if you would like to take part as a living book or organise one of these workshops yourself, we are looking forward to hearing from you!

# BRINGING (DIGITAL) INFRASTRUCTURES (BACK) TO LIFE: AN STS AUSTRIA WORKSHOP REPORT

Erik Aarden & Nikolaus Poechhacker

**AFTER A LONG PANDEMIC HIATUS, STS AUSTRIA MANAGED TO ORGANISE A WORKSHOP HAPPENING IN PART ONLINE AND IN PART ON LOCATION AT THE UNIVERSITY OF GRAZ IN SEPTEMBER 2021. UNDER THE TITLE '*DIGITAL LIVING, DIGITAL INFRASTRUCTURING*', AROUND TWENTY PARTICIPANTS ENGAGED IN THREE DAYS OF EXPLORING THE MANIFOLD DIMENSIONS OF 'THE DIGITAL' AND ITS SIGNIFICANCE FOR A RANGE OF AREAS OF CONCERN TO STS - FROM HEALTH, TO SECURITY, TO DATAFICATION IN RESEARCH, TO URBAN SPACES AND MUCH MORE. AS SUCH, THE WORKSHOP FORMED AN ILLUSTRATION OF THE LIVELINESS OF THE INFRASTRUCTURES OF STS ITSELF.**

After a nearly two year hiatus in which few, if any, conferences and workshops could take place in a shared physical space, STS Austria attempted to hold an event that happened primarily "in real life". We aimed to get together in a relatively small workshop setting towards the end of summer, when the virus had somewhat loosened its grip on our lives. After much fretting and organising under considerable uncertainty, the idea ultimately worked out. Around twenty STS colleagues from within and beyond Austria met in the baroque Meerscheinschlössel at the University of Graz from the 13th to the 15th of September 2021. To be sure, it took some getting used to seeing more of most of our colleagues than their faces on a computer screen. We had to stick to some strict rules - a limited number of places in the room, restrictions on the availability of coffee - and had to make some accommodations, like only speaking with a microphone, for participants who were only virtually present due to travel restrictions. Yet in spite of a few technical hiccups, things mostly worked out, and the workshop was a good reminder of how stimulating it can be to get together in a room with our STS colleagues.

Fittingly, the title of the workshop was '*Digital living, digital infrastructuring*' and presentations reflected both how our lives had gotten 'more digital' over the past two years, and covered a wide range of other areas in which digital technologies take shape together with the previously 'analog' world. A first panel addressed the omnipresence of some of the major digital platforms - including e.g. Facebook and Google - in our everyday lives, and the ways they have thus become infrastructural to a host of social activities. The view of online platforms as infrastructures resulted in questions concerning their political entanglements with social activism and political imaginaries of the internet on a global and national scale. Somewhat different imaginaries were at the heart of a panel on digital knowledge infrastructures, which included contributions on the making of a European research infrastructure, on the question if and how artificial intelligence may contribute to curatorial decisions in art exhibits, and on the choreographies involved in organising our own work under the new digital conditions created by the COVID-19 pandemic.

Questions of social science research and digital data were also central in one of the two keynotes. Katharina Kinder-Kurlanda (University of Klagenfurt) discussed some of the promises and complexities associated with 'big data' and asked the question what these imply for STS research. While acknowledging some of the disadvantages of working with big platform providers, she nevertheless provided

a promising outlook for both the ways STS can make use of digital data technologies and for the potential of STS for applying its sensibilities for the workings of knowledge tools to these technologies. In a second keynote, Nina Klimburg-Witjes (University of Vienna) presented examples of a critical engagement with novel data and sensing technologies, drawing from the recently published volume *Sensing In/security. Sensors as transnational security infrastructures* (co-edited with Geoffrey Bowker and Nikolaus Poehchhacker). Her keynote not only covered a wide range of domains in which sensors are employed - from the environment, to health, to migration - but also addressed the intricate entanglements of security infrastructures and social orders, and the diverse methods through which STS may unravel them.

Issues related to security were discussed further in a paper session that connected digital infrastructures to questions of place and space. This panel included - again - contributions on migration and the digital displacement and reproduction of borders, as well as presentations on how rights, responsibilities and privileges in the urban space are reconfigured through digital applications ranging from smart traffic lights to mapping. Finally, various papers considered the experiences with and visions of digital technologies among workers, patients and citizens in relation to care and health data platforms, questioning notions of empowerment. Of course, the ongoing pandemic did not only set the conditions of our meeting, but was also an object of analysis. A few presentations considered the development of digital contact tracing, in particular, both in relation to questions of biological citizenship and expertise and ignorance.

In all, the workshop illustrated how wide-ranging STS engagements with the digital can be, without losing sight of the very specific and situated forms digital infrastructures and their effects can take across geographies and societal domains. This quality of connecting different sites in what Karin Knorr called the synthetic situation allowed for a hybrid experience, including also colleagues that could not be present in the same space. Digital infrastructures facilitated broader participation than might have been possible otherwise, even when our collective presence on-site was a reminder of the kinds of exchanges and engagements in a more-than-digital world that we missed so dearly and hope to experience again in future events.



Picture of Graz workshop by Max Fochler

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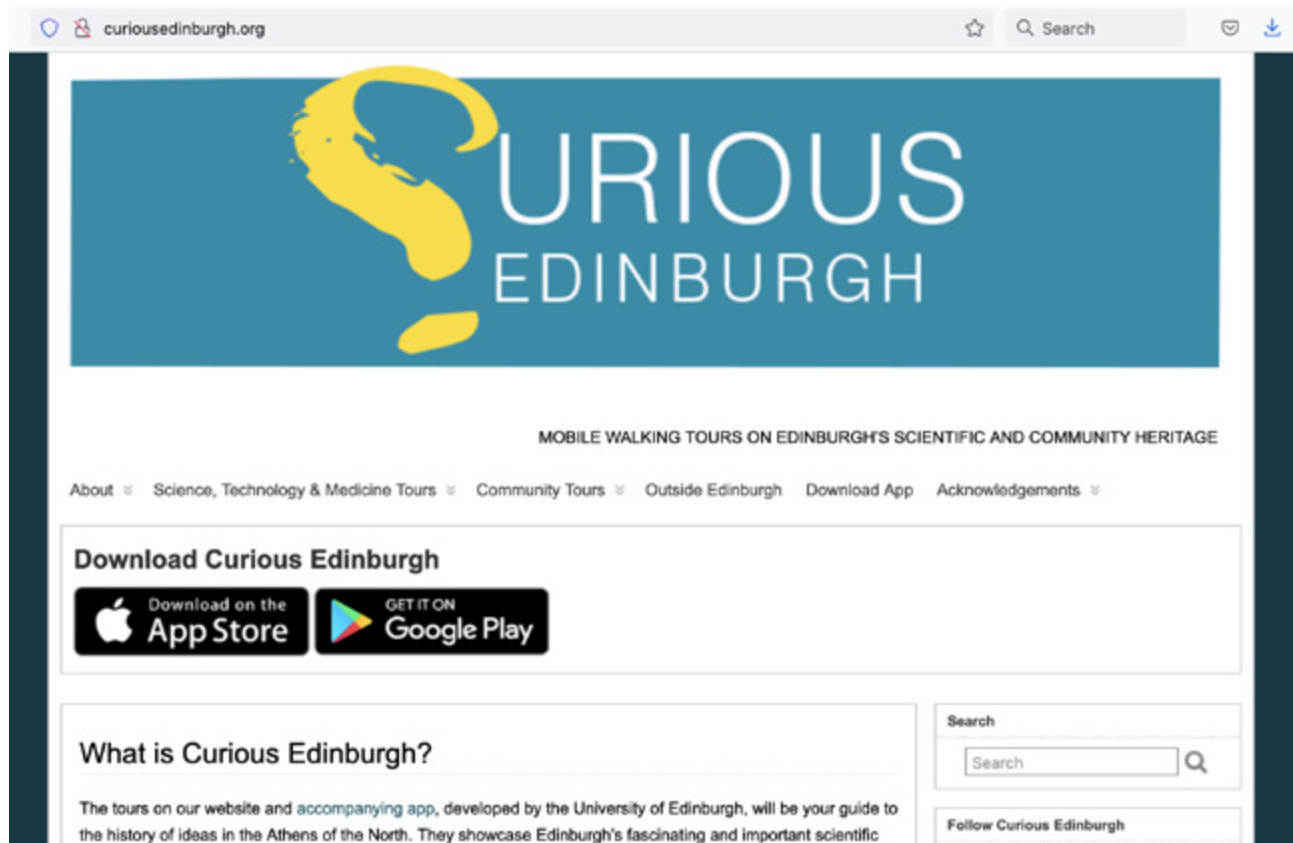
*Erik Aarden is postdoc at the Department of Science, Technology & Society Studies at the University of Klagenfurt and board member of STS Austria. In his research to date, he has focused on biomedical science and technology in relation to democracy and the distribution of (public) resources through a comparative lens. His teaching has focused on a wide range of STS themes, including introductory theory and methods courses.*



CHERISH, NOT PERISH

# CURIOUS EDINBURGH

Kate Bowell & Niki Vermeulen



Steps away from the mosaic that marks the Tollboth *where Thomas Aikenhead was held* before he became the last person executed for blasphemy in the United Kingdom, a *plaque displayed in St. Giles Cathedral* commemorates Sophia Jex-Blake, Scotland's first female doctor. In Edinburgh, history is literally paved into the streets and embedded into the walls and as you pass through the city, you are surrounded by stories that have shaped Edinburgh, Scotland, and the world.

*Curious Edinburgh*, a website and mobile app developed by Niki Vermeulen, Kate Bowell, Matjaz Vidmar, Bill Jenkins and various other members of the University of Edinburgh's Science, Technology, and Innovation Studies (STIS) group, was first created as a way to make the university's History of Science course more interactive by grounding the curriculum within the geography of the city. Because of this, it started simply with a known set of stories that we could build a walking tour around. In the past 6 years, the project has grown from one tour to 19, with plans for many more, and has expanded beyond the boundaries of both the university and Edinburgh. Even so, the core principles of how we form partnerships, develop tours, and help students, courses, community groups, and the general public use our platform as a learning and engagement tool has remained the same.

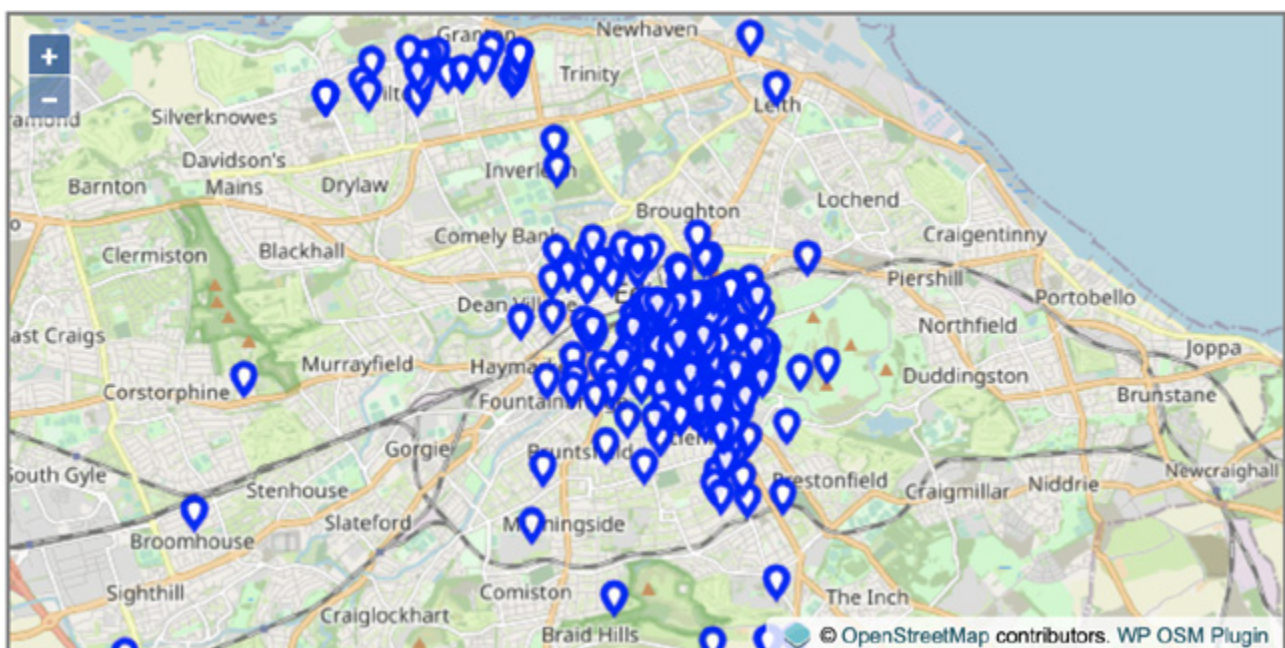
Every tour begins with a local story to tell. In the beginning of *Curious Edinburgh*, those stories came from courses connected to the STIS department. As the app's



reputation grew, we began cultivating relationships with researchers and lecturers outside the department and community members outside the university. For every tour, we spend considerable time with our partners crafting strong, accessible narratives. This means dedicating time to editing and shaping the stories of each stop to ensure they are clear, concise, and cohesive, with one focused story per stop that complements, but is not dependent upon, any of the others. Key to this process is the tour template we developed with specific guidelines for story structure, image details, location data, and other ancillary information. Using the template helps everyone involved in a tour stay on the same page (literally). Moreover, the development and maintenance of the technical side of the app would not have been possible without close collaboration with the University of Edinburgh's tech wizards, EDINA and Learning, Teaching and Web Services.

There are multiple ways students engage with *Curious Edinburgh's* content. As learners, the app is a complementary tool that encourages independent learning by allowing students to encounter course content outside of the classroom on their own schedule and at their own pace. The app also provides new context for the immediacy of that information, situating historical events within present spaces. Place matters and through *Curious Edinburgh* historiographic literature on spatial dimensions of science becomes connected to local stories. As creators, students have used the app platform as a way to develop their own science communication and public engagement abilities. Several university courses have incorporated the creation of tour stops into their curricula, inviting students to develop critical thinking and practical skills around producing content for different audiences. A student evaluated the app against another University of Edinburgh app as a final assessment for the University's Education and Digital Cultures course. His youtube video essay provided us with valuable feedback and he stated "it does give you a different relationship with your surroundings."

The audience for *Curious Edinburgh* tours has also grown beyond the classroom. We are the most-used app from the University of Edinburgh and through the development of new walking tours we are able to connect our users to the ways and places current global issues are playing out locally. In our recent *Public Health* tour, launched in collaboration with Edinburgh Medical School, the story of the *Usher Institute* public health department connects Edinburgh's medical past with the current health responses in both Scotland and the UK, providing another perspective on the pandemic. The debates around decolonisation of the University



of Edinburgh led by *UncoverED* and the presence of the global Black Lives Matter movement in the city were the focus of two tours in 2020, and climate change, specifically the challenges for Scottish coastal communities, is the focus of a new series of Curious Coastline walks we hope to develop soon. By working with local community groups, activist networks, and concerned citizens, *Curious Edinburgh* becomes a tool to help make their stories and causes visible to larger audience.

By telling new stories about known places, *Curious Edinburgh* is a source of learning – not only for those using our tours, but also for those developing our platform. Maintenance of the app and finding continued financial support has proved one of the project's biggest challenges, and we are extremely grateful for a *diversity of people and funding sources* supporting us throughout the past 6 years and for the *Tam Dalyell Prize for Excellence in Public Engagement* we won in 2017.

It has been incredibly gratifying to watch *Curious Edinburgh* grow as a tool for students and the public as users and creators and we look forward to continuing to develop share new histories both within Edinburgh and beyond. So visit our website, take a tour, or, if you're in Edinburgh, open up the app. You never know what stories may have happened right where you're standing...





# TRANSLATIONS

# INTERNATIONALISATION IN CONTEXT: DOMINANT AND PERIPHERAL DISCOURSES

Rodrigo Liscovsky Barrera

*It is quite certain that science cannot progress properly  
except by the fullest internationalism.*

A.V. Hill (1933, 954)

## INTRODUCTION

Hill's quote is extracted from an article published in *Nature* at a time when purges and political violence had begun striking German universities under the newly Nazi regime. The quote not only illustrates the deep concern of the Nobel laureate over the rise of fanatic nationalism across Western Europe at the time; it also works as a restatement of the long-held vision of science: its inherent *transnational character* and *solidarity*. While according to almost all accounts, science has always had an international dimension, the need to defend or promote its internationalism has not been exclusive of politically convulse times.

With the advent of globalisation (i.e. the higher, faster and more intense connect-edness of countries since the second half of the 20th century), as science started to be perceived as an asset to compete in the global economy, internationalisation begun to be regarded as the means to increase economic growth and promote well-being and human development. Science, in other words, was to become *more internationalised*.

But what does internationalisation actually mean? With the popularisation of internationalisation strategies since the 1990s, internationalisation has become a buzzword and a container concept that includes everything that relates to the 'international' (de Haan 2014; de Wit 2001).

In general, contemporary notions of internationalisation embrace the assumption that by making science "more international", it becomes *better*, i.e. more collaborative, innovative, dynamic, and of greater quality. Such a positive conceptualisation of internationalisation, however, rests on interpretations coming almost exclusively from the Global North that systematically ignore power dynamics in scientific practice and that regard scientific internationalisation as an unproblematic transformative process and as a desired outcome. I argue that in order to understand internationalisation, we need to understand its meanings in different contexts.

## THE DOMINANT DISCOURSE OF INTERNATIONALISATION IN STS

The vast majority of the relevant literature on internationalisation comes from Higher Education Studies (HES), where the concept originated in the 1990s. Since then, definitions of internationalisation in HES have undergone various phases (de Haan 2014) to eventually settle as a top-down process of "*infusing or embedding the international and intercultural dimension into policies and programs to ensure that the international dimension remains central, not marginal, and is sustainable*" (Knight 2003, 3). Though in recent years, some have stressed the need to incorporate views coming from developing countries (Jones and de Wit 2012; de Wit 2013), in general, the dominant discourse of internationalisation in HES has not

fully moved away from a western, neo-colonial concept. That is, internationalisation continues to be perceived as a positive process bringing mainly positive transformations in education, and is therefore regarded as a desired outcome.

Unlike HES, in STS thus far there has not been a collective discussion about the meaning of internationalisation (Woldegiyorgis, Proctor, and de Wit 2018). Internationalisation is still a phenomenon largely understood through the lens of the Global North; namely as a process free from conflict that leads to better science. This is observed in evaluation and scientometric studies describing how research impact and visibility are greatly related to practices of international mobility and collaboration (see Sugimoto et al. 2017; Robinson-Garcia et al. 2019; Halevi, Moed, and Bar-Ilan 2016; Edler 2007; Edler, Fier, and Grimpe 2011; Zhou and Leydesdorff 2006). In social studies of science, the influence of the dominant view of internationalisation can be appreciated in studies of the so-called 'Big Sciences', namely high-energy physics (Price 1963; Galison 1997; Knorr-Cetina 1999; Shrum, Genuth, and Chompalov 2007). Along with an increase in numbers (e.g. researchers, publications, investments, institutions, disciplines and instruments), Big Science has evolved to entail a process of *greater internationalisation* involving a geographical expansion and growing multinational cooperation that adds another layer of analysis to understand how science gets 'big' (Vermeulen 2009).

The life sciences are an interesting case of the intervention of the internationalisation discourse in STS. Compared to big physics, the life sciences were not regarded initially as Big Science, but rather as a bodily and lab-bench science governed by an individual ontology (Knorr-Cetina 1999). It has been more recently that research on life has begun to be considered as another form of Big Science. That is, a research field that has become increasingly large, collaborative, international and networked (Vermeulen 2009; Vermeulen, Parker, and Penders 2013).

Within this body of research, social studies on model organism research – *Drosophila* and as *C. Elegans* are well-known examples – are perhaps the clearest cases of the impact of the dominant vision of internationalisation in STS. In general, practices of collaboration and resource exchange (e.g. techniques, specimens and data) are said to be common to all model organism communities, which have themselves become models for good behaviour in science (Kohler 1994; Rosenthal and Ashburner 2002; Ankeny and Leonelli 2011; Nelson 2013). As such, the pillars of these research communities are formed by practices commonly associated with the positive effects of internationalisation, including: more international and increasingly accessible community infrastructures, transnational collaborative networks and a social commitment to openness expressed in actively contributing to develop such community resources. This scientific "*repertoire*" is crucial to the point that it explains how relatively stable communities of researchers in the life sciences are created, managed and persist in the long term (see Leonelli and Ankeny 2015).

While these studies describe – albeit indirectly – the transformative impact of internationalisation dynamics in the life sciences, they tend to decontextualize the very same international research communities they analyse and ignore the power dynamics present in them. In particular, they leave unexamined notions of asymmetry and dependency in practices of resource exchange as well as the structural configurations that determine the norms and expectations operating in these communities. What remains then is a propensity to view such communities as uniform and harmonious international ecosystems governed by a strong and inherent collaborative ethos.

Overall, the lack of discussions on the power dynamics present in these international communities shows the extent in which in the social study of the life sciences, scholars have continued to take for granted the notion of internationalisation.

## THE LATIN AMERICAN TAKE ON INTERNATIONALISATION

While critical perspectives on related concepts such as universalism, transnational, multinational and globalisation exist in the STS literature (Leclerc and Gagné 1994; Hakala 1998; Somsen 2008), it is in Latin American STS where researchers can find a long and rich record of research on internationalisation with a strong critical component. Nearly thirty years before the concept was developed in HES, the first STS thinkers in this region stood up to denounce inequalities present in the international scientific system (see Sabato and Botana 1968; Varsavsky 1969; Herrera 1972). This mixed group of pioneers linked the underdevelopment of Latin American countries to dynamics of dependency and asymmetry in international science and technology, which they saw reflected in the programmes sponsored by international organisations such as the OAS and UNESCO throughout the 1950s and 1960s.

From the 1980s onwards, Latin American STS began a process of consolidation in which sociological and anthropological research based on case studies gained predominance over the normative analyses of the previous decades (Martínez Vidal and Marí 2002; Thomas 2010). The Latin American STS literature came to fill a gap in the social study of internationalisation and develop a critical perspective that was missing in internationalisation studies. Though sometimes breaking with the classical diffusionist model while in others embracing it fully, this new critical perspective continued to focus on the development question of the previous decades. Particularly, case studies aimed to show how internationalisation both enables and hinders scientific research in the periphery (Cueto 1989; Vessuri 1994; Vessuri, Guédon, and Cetto 2013; Velho 1996; Kreimer 2006; Kreimer and Zabala 2007).

In sum, scholarly discussions around scientific internationalisation in this region have been linked historically to wider questions about dependency, asymmetries and development in (and beyond) science, which continue until present days. Visions of internationalisation in Latin America often portray a mixture of positive and negative connotations, which indicate a more complex conceptualisation of this phenomenon that is often observed elsewhere (Kreimer 2013).

## MOVING FORWARD

The discourse of internationalisation in science studies has many vertices. The positive conceptualisation of internationalisation can be observed, for instance, in studies confirming the positive correlation between practices of internationalisation and research impact. Opposite to this, critical perspectives in STS have denounced internationalisation's counter effects, such as the reinforcement of core-periphery dynamics bringing a more restrictive and uneven access to facilities, resources, knowledge and expertise (see Leydesdorff and Wagner 2008; Olechnicka, Ploszaj, and Celińska-Janowicz 2018; Robinson-Garcia et al. 2019). Critical perspectives on scientific internationalisation are not new though. STS scholars from Latin America have traditionally denounced the inequalities of the international scientific system, even before the concept was introduced in HES in the 1990s. However, the works of this group of academics is rarely cited in mainstream STS literature. It is therefore vital that a much needed future conversation about the meaning of internationalisation in STS beings not only by engaging with the concept directly, but also by bringing together dominant and peripheral discourses of internationalisation.

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## NEWS FROM THE COUNCIL



## DEAR EASST MEMBERS,

In the EASST Council, as everywhere else, we are horrified by the events taking place in Ukraine. We wish to express our deepest sympathies with all the people who are currently suffering as a result of this terrible war. First and foremost, our thoughts are with the people of Ukraine. We also want to express our sympathy for all other victims of this war, including people in Russia and Belarus, who are experiencing hardship, trauma and oppression. As we know from our scholarship, the entire world is interconnected in ways we rarely think about. We do not yet know the full extent of the suffering unleashed by this war. However, we fervently hope that it ends soon and that more constructive and peaceful interactions can begin.

EASST Council does not have a specific policy on international relations. However, we have taken one important decision. We will not from now allow EASST funds to be used for expenses related to individuals from institutions in Russia and Belarus. We have not yet decided if further sanctions should be applied to the conference in Madrid. We will decide on this at the next Council meeting. If you, the membership, have opinions about this, please do let us know.

As you will see elsewhere in this edition of EASST Review, preparations for the Madrid conference are gathering speed under the excellent leadership of Vincenzo Pavone. We are all very much looking forward to this opportunity to meet in person after our long stay-at-home. Unfortunately, COVID restrictions mean that the banquet and party space will accommodate fewer people than we would like. We have not been able to find a better alternative. However, we are sure that all of you will have a good conference and find ways of enjoying the reunion.

While the conference takes up much of the attention of the Council, we have also discussed other points of importance. We have decided to allocate two more portions of EASST funding to activities that support our scholarly community. We are also finalizing decisions on the EASST awards – which will be given at the conference in Madrid – and we have discussed general issues of governance regarding our two publications (the journal *Science and Technology Studies* and the *EASST Review*). In the Autumn we will continue our discussion of the future publication landscape of STS in Europe. If you have input towards this, please let us know.

I want to express my deep gratitude to Ulrike Felt who has stepped down as President of EASST after serving in this capacity the last five years. Uli is a source of scholarship, strength and fun that we have all benefitted from in so many capacities. You will find in this Review a nice collection of excellent reasons for why Uli has been crucial for the development of the field of STS in Europe. I hope you will join me in Madrid, when we will thank her in person.

Finally, one person, who sadly will not be at the conference is our dear friend and colleague, Trevor Pinch. Many of us have fond memories of Trevor (one improvised whisky-tasting session at the Copenhagen conference comes particularly to my mind). But Trevor would not want us to stop having fun, enjoying each other's company and being playful. Even in the terrible circumstances we find ourselves in. Let us enjoy life and the possibilities for engaging in scholarship on matters we find so fascinating and worthwhile.

Maja Horst, EASST president

## CONFERENCE UPDATES IN TIMES OF WAR

It sounds partially surreal to be quietly sitting at a desk, pondering and composing new and exciting updates on our upcoming conference in Madrid, while the world around me anxiously awaits the latest news on the Ukraine front, with war raging at the borders of the European Union. This was indeed something we did not take into consideration almost a year ago when preparing our proposal to host the next face-to-face EASST conference in Madrid.

Busy between the hope of a vaccination campaign would eventually bring the pandemic to a close, and the dream of a return to a normality we could no longer imagine so neatly, we were rather more puzzled by the many times we almost reached and suddenly lost the long prophesized herd immunity. And yet, as the process of conference organization unfolded, the world has changed many times. A succession of COVID 19 variants annihilated our hopes of anything even close to herd immunity, the fading effectiveness of the vaccines led many of us to get extra shots and live a life resting on the ability to get a Green Pass or a Covid certificate. And in our distraction, we did not see the gradual emergence of new challenges, beginning with the rising costs of energy and the spiral of inflation. The invasion of Ukraine took us by surprise, still recovering from the slow demise of the Omicron variant, but it was something that we could have seen coming. And now, almost one month into the war, with a tragic stalemate on the horizon, a state of continued violence and stagflation is the most likely short-term scenario, with our lives turned upside down by unaffordable petrol and gas costs, suffering for Ukrainians, concerns about the risk of an escalation of the conflict, and the horror of a nuclear threat.

Our scientific work, along with our desire to share it beyond national, epistemic and community borders, remains however a fundamental source of hope. Some years ago, reading Sarah Franklin's book on *Biological Relatives*, I was struck by her fundamental question on what assisted reproduction techniques reproduce apart from babies. This question should remind us that conferences like the one we are hoping to join and celebrate in Madrid do not merely reproduce (and advance) scientific knowledge. There is much more about scientific conferences than just the advancement of science. By meeting together, especially in a face-to-face event, we will be "reproducing" our fundamental belief in the value of respect, transparency, solidarity, and collaboration beyond national borders, religious beliefs, ethnic belonging, political sides, etc. This is, alone, the best and most important contribution that our scholarly community may give to Europe in these dark times.

With these thoughts in mind, it is a pleasure for me to share with you all some news on the conference. We have recently closed the evaluation process for contributions, which took longer than expected because we have transferred the papers that initially did not find space in their original choice of panel two more times. Finally, we have accepted 904 papers, which will be distributed across 187 sessions, 173 of which are open panel sessions, 14 are closed panel sessions and 9 are thematic cluster sessions. Under the current circumstances, we believe this is a fantastic result and we thank all of the authors who submitted their papers, believed in the conference, and made these numbers possible!

Despite COVID restrictions, we have also been able to find an outdoor venue for our conference dinner. It is with pride and pleasure that I can announce that the EASST 2022 dinner will take place on the roof terrace of the Casa Encendida, an emblematic building in the historical center of Madrid, located in the even more emblematic neighborhood of Lavapiés. Lavapiés is a neighborhood that has been traditionally characterized by the presence of migrant populations and has been host to various political and cultural movements during the past 20 years. I myself had the privilege of living there for ten years, and I am especially thrilled that it will be the venue of our dinner.

After the dinner, we will also have a surprise for you! It will be possible to keep celebrating our conference at a dancing party in the courtyard of the same building, from 11 pm to 2 am. Obviously, participants will be able to choose whether to join just the dinner, just the party, or both. Unfortunately, due to COVID restrictions and soaring prices of outdoor venues, participation is restricted to 250 participants per event.

I have to especially emphasize the amazing work done by the local committee in making all of this possible. Without them, we would not have been able to share of all of this with you.

We have recently opened the registration process, and we are very much looking forward to meeting you all in Madrid very soon

Vincenzo Pavone,

On behalf of the Local Committee

# STS EVENTS

# PRESTIGIOUS HOLBERG PRIZE GOES TO SHEILA JASANOFF

As members of the STS community in Norway, we are thrilled to share that Sheila Jasanoff has been awarded the prestigious [Holberg Prize for 2022](#) “for her pioneering research in the field of Science and Technology Studies”.

The Holberg prize is awarded annually to “a scholar who has made outstanding contributions to research in the humanities, social science, law or theology, either in one of these fields or through interdisciplinary work”.

The Holberg prize was established by the Norwegian parliament in 2003 as an independent foundation. The prize is named after [Ludvig Holberg](#) (1684-1754), a Danish-Norwegian scholar, playwright and author born in Bergen, Norway. Holberg is known for both for his imaginative sci-fi-like stories, his humorous characters, and for his contribution to scientific and political thought in the early Nordic enlightenment movement.

Jasanoff joins Bruno Latour as key STS scholars having received this major prize, which amounts to 6.000.000 Norwegian kroner (approx. EUR 600.000 / USD 670.000). Other [previous laureates](#) include Martha Nussbaum, Paul Gilroy, Ian Hacking and Julia Kristeva.

The award ceremony takes place in Bergen, Norway on June 9, 2022. This annual ceremony is a major event within the Norwegian humanities and social sciences and will spotlight STS in Norwegian public and intellectual life in the coming months.

Picture by Martha Stewart and the Holberg Prize



In their [prize announcement](#), the Holberg Committee highlights Jasanoff's many achievements, emphasizing her contributions both within and beyond STS:

"Jasanoff has developed much of the conceptual repertoire for theorizing the political and policy relations of science and technology in contemporary societies. Her theoretical contributions to the political sociology of scientific governance are transformational, recognising that scientific practices and knowledges along with the policy and legal frameworks governing them must be understood as culturally situated and socially constructed. This argument is captured in her collected essays *Science and Public Reason* (2012)."

"Through sharing her work in both academic and popular forums, Jasanoff is a significant public intellectual, offering timely comments on topics of public concern such as fake news and climate change. Crucially, Jasanoff combines a high level of conceptual creativity with empirical rigour and accessible writing. Indeed, Jasanoff is read not only by humanities and social science scholars but also by natural and medical scientists and policymakers, her work being truly wide-ranging and cross-disciplinary."

We congratulate Sheila Jasanoff on this achievement! We are proud and inspired by the Holberg Committee's decision. Together with STS'ers across the country we look forward to welcoming Jasanoff back to Norway in June.

*Hilde Reinertsen, Tone Druglitrø and Ana Delgado,  
TIK Centre for Technology, Innovation and Culture, University of Oslo, Norway*

# THE WAR IN UKRAINE AND EUROPEAN (DIS)INTEGRATION: POSSIBLE AXES OF CHANGE

Ivan Tchalakov, Bilyana Milleva

22nd of March, 2022 - "Paissii Hilendarski" University of Plovdiv, Compass Conference Hall<sup>1</sup>

The Bulgarian political scientist Ivan Krastev has described the war in Ukraine as the end of more than 30 years of "peace in Europe" after the Cold War and a dangerous beginning of a new era, which changes the world in which Europeans have lived so far. To discuss current events, a round table was organized by the Jean Monnet Center of Excellence at "Paisii Hilendarski" University of Plovdiv, Bulgaria, with teachers, students and members of the public participating in person and online. The Center is part of a European network that brings together expertise of researchers to develop interdisciplinary research and training in European studies.

The round table discussed the war in Ukraine in three panels, each addressing the areas of our center's specialization – 1) *Humanitarian crisis, welfare, social and youth policies in the context of European values and identity*; 2) *Democracy, law and the rule of law, including the prospects for EU enlargement*; and 3) *Science, Technology and Innovation in the context of military opposition*. The text below briefly outlines the first two panels, to focus in more details on the last panel. The members of *Science, Technology, and Innovation* unit at the university's Department of Applied and Institutional Sociology contributed to the panel.

In the first panel on "*Humanitarian crisis, social and youth policies in the context of European values and identity*" the participants Assoc. Prof. Dr. Abel Polese (Dublin City University, Ireland) and Assoc. Prof. Dr. Irina Popravko (Tomsk State University, Russia) presented their insights "from within" the humanitarian crisis and its dimensions. Abel was leading several research projects in Ukraine and flew to Kyiv on February 23. A day later he had to escape by car under the bombs to Romania with "his children, two cats, his ex-wife and her husband". Having already published his bitter account from the war's first days, he focused on the disturbing positions spreading already in some EC countries, one blaming the expansion of NATO that pushed Putin to invade, and the other hoping everything to settle down once Ukraine surrendered. He argued in detail why such views are incompatible and in deep contradiction with the core European values he has studied extensively and which are at the heart of the EU project. He discussed how these values should be reshaped in the future after being practically inactive before and immediately after the war. He also pointed out the importance of having a critical mind that allows to check what comes to you in the form of information, rather than dogmatically believing on what is presented as "absolute truth".

<sup>1</sup> Our tanks to Petar Parapanov, Vanesa Laleva and Zoro Zorov, B.A. Students at the Department of Applied and Institutional Sociology, University of Plovdiv who helped in transcribing the talks at the Round Table. We would like to thank also Dr. Dimiter Panchev for English editing.

Irina Popravko reflected on the war from an anthropological perspective. She pointed out that the first visible effect of the war is splitting Russian society into two parts, those who are supporting Putin's aggression in Ukraine, and those who are not. This split happened not only in public sphere, but also in families, professional communities, and so on. It is possible to talk about a "society/community of trauma", because most of them define the war as a milestone that divided their lives 'before' and 'after' February 24th. Starting from this there are problems with different kinds of social identity people have, such as national, local, and professional (e.g. social and humanitarian researchers, teachers, journalists). Another

preliminary effect of the war is self-descriptions of an 'antiwar' part of Russian society in terms of collective responsibility: what we did not do, or did not do enough to allow Putin's regime to start the war. Searching for the answers and trying to conceptualize the new reality some of Russian anthropologists have started to re-read Hannah Arendt. She pointed as the main problem of Russian society its passive, indirect complicity in Putin's actions. Traumatized Russian society, especially older people who lived during the Soviet era, is forever marked by the war, and their lives are based more on survival than living.

Their views were complemented by a speech of a famous public figure, Manol Peykov, who manages one of Bulgaria's largest publishing houses and is owner of two printing houses. He presented his civic initiative in support of Ukraine and the refugees from the war. During the first seven days he actively translated important texts, mainly from the Russian-language media by journalists and researchers, as well as stories from the actual situation in Ukraine. This activity, against the background of the limited coverage of events in the Bulgarian media, gained him followers at his personal Facebook profile which gradually became an information center about the war in Ukraine and part of other practical activities in support of Ukraine: donations of medicine, essential products, materials and other items sent to regions such as Odessa, Kharkiv, Nikolaev. He soon provided his personal bank account for monetary donations to make it easier for people who are willing to help but do not have the physical time to donate products at crisis centers. Within 10 days, Mr. Peykov's bank account received about BGN 40,000 from donors (about 20 000 euro): "This bound me with careful and accurate accountability, because after all, these people give this money to me, not to a large institution, because they associate my face with a person who is concerned", explains Manol Peykov. He used the funds to support a group of Ukrainian students in Bulgarian universities who after the war could not receive funds from their relatives in Ukraine, for renovation of kindergartens for the children of Ukrainian refugees in Plovdiv, etc. He pointed that "at one point I was in a whirlwind by the logic that doing something meaningful leads to something more meaningful, and so on. I think this was the way to change the world for the better since we cannot hope that someone from above will start things, but we are the ones who should do it!" He explained the popularity of such personal initiatives in light of the inability of institutions to rapidly respond to what is happening: people are looking for someone they trust to channel their energy and contributions.

The journalist Veselin Stoynev outlined a "dark picture" of the effects of the war in Ukraine on Bulgarian society, which seems divided in two relatively equal camps. The first comprises nostalgic people turned to the past, for whom the results of the post-communist transition are not considered fair and who therefore do not accept the newly established order and its values, institutions and projects for the future. The other camp includes people who are against the Russian invasion, who take position and provide assistance to Ukraine. This part of society is less noisy, while the pro-Russian camp expresses its positions loudly, often claiming that the military conflict is a 'staged play' and that everything is a media product. Stoynev claimed that Russian propaganda finds its way to the "other" Bulgaria effectively and professionally, directing focused information flows to targeted groups via social networks and special websites. According to Stoynev, the Bulgarian media also contributed to this split in society, failing to fulfill their role as a responsible public mediator. They often hide behind the principle of "presenting all points of view" providing a platform to reactionary politicians whose ideas are against the interests of the country and its membership in EU.

The second panel on *"Democracy, law and the rule of law, including prospects for EU enlargement, consolidation and positioning as a global factor for the stability"* was opened by Prof. Georgi Dimitrov from University of Sofia. By analyzing the process of preparation and membership of Bulgaria in the EU, as well as Romania,

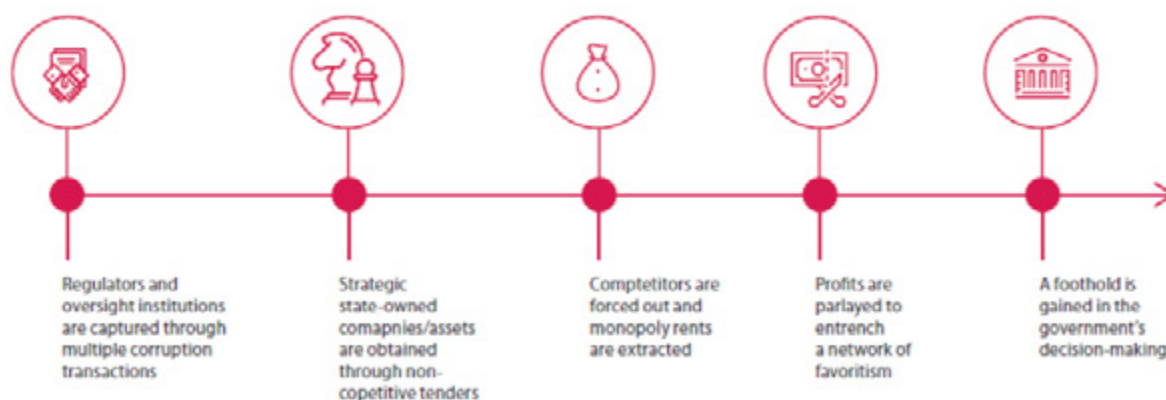


Hungary and Poland, he defended the thesis that there is no “fast path to EU membership”. The Union cannot influence the local policies of a Member State, so the Europeanization of the candidate country must be successfully completed before it can join the EU. Ukraine needs to be admitted to the EU, but it will not be able to cope on its own and must receive a comprehensive strategic program with adequate funding to prepare for membership. Prof. Dr. Irena Ilieva, Head of the Institute of State and Law at the Bulgarian Academy of Sciences and Dimitar Angelov, PhD candidate, spoke about the special status of “asylum seekers” from the war as different from the status of the “refugee” and assessed the reactions of the institutions in the EU and the member states. The panel discussed some persistent lacunas in legal and policy framework of European integration in the field of health, that became apparent during the Covid-19 pandemic and related this to the existence of similar gaps in the field of defense.

The third panel focused on “*Science, technology and innovation in the context of the war in Ukraine*” in two particular areas: 1) the energy and technology issues between EU and Russia in the context of sanctions, and 2) limits of the geopolitical frame of reasoning.

In the first area, papers were presented by Dr. Todor Galev and Konstanza Rangelova, researchers at the Center for the Study of Democracy (CSD), a Bulgarian think tank. Their reports have been based on a so-called [Kremlin Playbook](#), a series of CSD analyzes of the ways in which Russia exerts political and economic influence in Europe. The basic scheme of Russia’s economic influence is the presence of Russian businesses or businesses that are completely dependent on Russia in EU countries (see Figure 1 below). These are not only local companies with legal ties to Russian companies, but also those having a so-called indirect economic footprint. For example, *Lukoil Bulgaria* – wholly owned by Russia, possesses plants and headquarters in the city of Burgas which is the only site in Bulgaria of such national importance, guarded by armed guards from Russia who are in a sense completely independent of the Bulgarian army or police.

Figure 1. The process of the Kremlin’s influence on foreign governments



Source: CSD.

Todor Galev provided data about the extremely high degree of integration of the Russian financial and banking system into the financial and banking system of Europe, where Austria, Germany and Italy serve as the main channels through which Russian capital enters the European economy. EU banks' exposure to Russia by the end of 2019 is also substantial (almost 130 billion of euro), although it is almost half as much compared to 2014 (before the Russian invasion in Crimea). He also shared his observations and initial conclusions about the impact of sanctions on Russia's science and technology policy and the later 'hybrid' response.

The technological policy of the Russian Federation, even since the Soviet era, is based on two main postulates: own development of key technologies through re-engineering and less original innovations. Particularly in the field of energy extraction the partnership with Western companies for access to high technologies dominates. In the field of armaments there is a combination of the use of own technologies and the purchase of key technologies and / or an elemental base from Western companies. Consequently, Todor Galev outlined the effects of Western sanctions on Russia after February 24th on aviation, bank sector, heavy industry and machine building and provided details on Western companies in each sector differentiating them in four groups (Withdrawal of all activities, Suspension, Reduction of reliability, Economic cooperation in opposition of sanctions). The most serious effects of sanctions on Russian technology include the *breakdown of supply chains* (especially of materials and components already stretched by Covid 19 pandemics), *restriction of R&D investment*, *brain-drain*, *isolation of Russian scientific communities* from their Western partners and *significant delays* in many research projects, *unemployment of intermediate and highly qualified staff*.

The Russian 'hybrid response' to this are 'counter-sanctions', strengthening of disinformation and propaganda, belittling the effect of Western sanctions and claiming stronger effect of 'counter-sanctions', mobilizing 'friendly' public opinion abroad, increase of the efforts in illicit (illegitimate) financing. Galev expected that Russia will further use the instruments for political and economic influence in EU by showing support for pro-Russian parties and leaders, locking in defense cooperation, continuous reliance on spy networks and security services, as well as benefiting from managerial deficits (including corruption) in some EU countries to influence national policies.

Konstanza Rangelova talked about the energy and climate risks of the war in Ukraine and its effect on the EU Green Deal. She pointed out that large Russian companies such as *Gazprom* and *Lukoil*, through their influence on EU institutions and businesses, are building informal networks that penetrate deep into the European economy. These networks impose a vicious circle that intensifies corrupt practices and directly imposes Russian political interests in exchange for business opportunities for their local partners. In this way, Russia is increasingly interfering in politics and strategic decision-making in Europe.

In addition to these informal networks, the main weapon of intervention is the income Russia receives in foreign currency from the sale of oil and gas. These revenues are huge - at current prices *the daily income is almost 1 billion dollars a day*, of which almost 400 million goes directly to the Russian government in the form of taxes and fees. These revenues largely minimize the effect of the sanctions imposed so far and make EU a major financial donor, given the sanctions. Simply talking about new sanctions against Russia increases the price of its oil and gas, and thus its revenues. The most dependent on Russian oil are Germany, Poland and the Netherlands, and in absolute terms Germany and the Netherlands are the major importers of Russian oil. Other countries such as Finland, Slovakia, Lithuania, Bulgaria and Hungary are also heavily dependent on it.

Figure 2 – Some key EU energy companies through which Russia imposes its interests

The Figure 2 below shows the main energy companies as agents through which Russia can impose its interest in Europe, where the danger is directly dependent on the proximity of each of these companies with Russia and the corresponding profits for both countries.



So, if at political level the EU is talking about energy diversification, in reality on the ground there is a deepening of the process of integration and mutual penetration between EU and Russia. In 2020-2021 Rosneft increased its shares in a large number of companies engaged in oil transportation in Germany, and in 2022 the company is processing the largest share of oil in Germany through its subsidiaries Bayernoil, Raffinerie GmbH, and MiRO. Oil traders are also important because they also rely on close relations within Russian companies, most of which are based in Switzerland and have historically gained experience in avoiding various types of sanctions, not just with Russia. Similarly, in recent years, instead of declining, the EU's dependence on Russian gas has increased, with some countries relying on 75% or more.

Discussing possible EU responses to the energy dependence on Russia, Rangelova stressed the importance of developing a comprehensive strategy that includes immediate measures to be taken together with measures in the medium and long term. *Short-term measures* should concentrate on putting energy security back in the energy policies' mix, making binding gas solidarity agreements between EU Member States, a EU Common Gas Purchasing Mechanism, reducing excise and VAT duties on natural gas, integrating Ukraine in European gas and hydrogen markets, and cancelling large-scale Russia-led energy projects such as nuclear power plants and natural gas infrastructures. *In medium term* Europe should renew domestic gas production in Groningen and Denmark, remove take-or-pay clauses on existing contracts with Gazprom, accelerate strategic interconnectors and gas storage projects, further develop green hydrogen technology, expanding offshore wind and battery storage as replacement of natural gas in power generation, and limit the penetration of Russian capital in strategic markets. *Long-term solutions* are electrification based on renewable energy sources, improved integration and

liberalization of natural gas and power markets in Europe, renovation programs to reduce energy consumption, strategic alignment of U.S. and EU energy and climate security policy, investments of EU and U.S. in regional infrastructure projects and improving the security of supply, diversification and de-carbonization.

Prof. Ivo Hristov (Sociology of Law) presented a geopolitical account on the main trends in the development of worlds' powers, entitled *"On the eve of a new era"*. According to him, current events mark the end of the cycle after the fall of the Berlin Wall, in which a unipolar model dominated by the United States was imposed. He suggests that the geopolitical model of the world distribution of power is being reshaped in cycles of about 20-25 years. As such, the crisis is not a temporary violation of the existing status quo, but is based on a qualitative change in the status quo as such.

He outlined the following key characteristics of the new geopolitical circumstances: 1) De-globalisation, which could be characterized also by the circumstances surrounding the outbreak of the global SARS-CoV-2 pandemic and the cessation of movement between countries of people, goods and capital. 2) Following de-globalization, the new distribution of power will focus on several economic and military centers, each considered as regional alliance with a population of 300-500 million people.

For the past 30 years or so, the world has been built around its dependence on the industrial north, namely United States and the Euro-Atlantic core. This model was guided by several rules: the dollar as the world's reserve currency; China as world's factory for export to the 'western' industrial center; and Russia, the former territories of USSR, and the Middle East - as world raw material appendage. The emerging geopolitical blocs will replace the current unipolar model and will be formed in relation to each other as several military, economic and political *autarkies* that will exist relatively independently. Tentatively they are the following:

- The US and the EU, as Europeans need US raw materials and industry.
- China and Russia, which will be drawn away from China's economic mentoring as a result of „Western“ isolation.
- Arab-Muslim with dominance probably of Turkey, Egypt or Saudi Arabia
- East Asian bloc - Japan, Korea, New Zealand, Australia. In this scheme India can be either a stand-alone bloc or part of the East Asian bloc.

According to Hristov, the problem for Bulgaria is that it is located around the borders of the respective emerging blocs, i.e. where the „frictions“ between the „geopolitical plates“ take place. The Bulgarian state and political elite which lack vision in the emerging geopolitical circumstances and is generally unable to lead the country, is going through economic and demographic crises. Hence Bulgaria is completely unable to adequately respond to the upcoming geopolitical shifts. Globally, the post-war institutions that emerged after World War II - such as the United Nations and others, and which are based on a certain power structure that has sustained the globalization process so far, are expected to be nullified.

In their presentation *"Geopolitics as a "style of thinking": modern legacies and current limitations"* Prof. Ivan Tchalakov (Sociology of S&T) and doctoral student Bilyana Mileva draw from the obvious incompatibility between the tragic events of the war in Ukraine which we witnessed from the media, refugee stories and immediate participants on the one hand and geopolitical concepts of various analysts on the other hand explaining in the same media how Putin had no choice because Ukraine is subordinate to the United States and NATO, etc. As researchers in the field of STS, they observe how the classical sociological conception of science has given way to an understanding of the various contemporary problems

Photos from the discussion



in which modern science and technology are involved. Today we are much freer to critically examine the theses of expert scientists, while they argue that geopolitics seems to have remained in a way of thinking whose foundations are in the second half of the 19th century.

They turn to the book *Geopolitics*, in which Colin Flint states that geopolitics is attractive because of "its apparent ability to explain in simple terms a complex and, for some, threatening and uncertain world. In offering simple explanations geopolitics can be reassuring, providing one-dimensional explanations and solutions. Such explanations are reassuring because they create the illusion of being able to know and hence to understand the world." These simple explanations give political elites a comparative horizon on the basis of which to plan their political actions. In fact, since its very beginning in the late 19th century, geopolitics was made by political elites and their experts, and not so much by the academic community of geographers. It was not until the end of the Cold War that "critical geopolitics" emerged as an academic discipline that began to criticize this approach. As such, it is important to keep the possibility of another geopolitics, which does not reduce but recognizes the complexity of the world and hence no longer imposes the point of view of one or another (political) actor and their order, but works as a framework for distancing from the obvious.

Regarding the war in Ukraine and the period immediately preceding it, the characteristic features of classical geopolitics are particularly evident in the works of Alexander Dugin as one of the ideologues of the new Russian expansion. Analyzing one of his extensive interviews on Bulgarian TV channel in 2017, Tchalakov and Mileva find the typical simplified and reduced understanding of our complex world:

- eternal conflict between the Eurasian continent and the Atlantic powers with its dynamics, where at the end of the Cold War Russia briefly "lost its identity" as a Eurasian power
- tension between the peoples with their lasting and "eternal" features (culture, religion, race – e.g. "Slavic affiliation") on the one hand, and the political elites who may change their orientation, sometimes against the will of the "people"
- eternal and unchanging characteristics of peoples, as well as their historical memory, determining the lasting relationship of love and gratitude between them, as well as who their "real enemy" is
- asymmetry between countries from the "periphery" that could choose in the opposition between West and East and 'core

The insolvency of this simplistic view of the world is obvious and the critique summarized by Colin Flint in the above-mentioned book, is fully applicable here too. First of all, Dugin speaks from the privileged position of an expert, belonging to the ruling political elite - well, not the Atlantic and Protestant, but the Russian and Orthodox elites. Secondly, he presents a typically masculine position of an empowered white man who "knows everything" and has the right to provide classifications and make distinctions. Thirdly, this "empowered white adult Eurasian" is applying the scientific method of geopolitics, through which he builds an "objective" historical theory of what is happening in the world, and which sets and justifies the relevant foreign policy. Fourth, precisely because of their objectivity and appeal to be scientific, but also because of their simplicity similar to the laws of mechanics, these easy-to-understand and simple schemes aim to gain public support. Last but not least, geopolitics speaks of large-scale beings – "Orthodoxy", "Russia", "Eurasia", which are presented as objective facts while these are labels and constructions used by small groups of people in power (who

control significant material, human and communication resources) to impose their private interests.

As such, Dugin presents, in post-modernist language, an ideological meta-narrative. But this story can by no means claim universality, much less "objectivity". In fact, geopolitics is a resource for building actor-networks where it not possible to draw a firm distinction between the global, national and local levels. Therefore, this "wholesale" thinking creates a certain deficit of "embodied" perspective and "situational knowledge", of talking about real people in real places, i.e. there is a lack of purely human stories of broken destinies, lost lives and sacrifices - something that classic geopolitical analysts like Dugin cannot (and may not want to!) to admit in their analysis.

Consequently, Tchalakov and Mileva turn to Bruno Latour with his concept of "Gaia", i.e. not the Earth as a globe, an abstract map, but as a thin layer (crust) capable of sustaining life, which is in fact a system without scale. Latour argues that we cannot separate micro from macro level, just as we cannot separate microorganisms (useful or harmful) from the human body and from other animals. After Lovelock, Latour speaks of Gaia that is suitable for life (habitation) and in which all our interactions take place. As such, we cannot really go back to the old and traditional way of life, but we also cannot go back to the new one - the idea of the Earth as a planet, because it is impossible to fit the interpretations of different actors into what our planet is, and what our direction of development is. Thus, Gaia is a complex and ambiguous entity, very different from that of the old geography, through which to unravel the ethical, political, theological and scientific aspects of the already outdated notion of nature. And in fact, what we have to do and where we have to start is the relationship with the person next to us, the one we argue with or the one we are friends with.

The authors are therefore convinced that the geographical side of geopolitics will sooner or later become "meaningless", in the same way that the idea of the existence of "eternal" racial, religious or cultural characteristics of peoples has lost its scientific basis. And that even if they matter, geographical, religious, cultural and racial factors are only part of a much more complex picture of the world, in which they are often of limited importance. However, the danger remains - in the event of educational failures and when growing masses of people refuse to think critically, educate themselves and question the suggestions offered to them, geopolitical schemes will remain popular and convincing, and thus serve as an excuse for openly misanthropic and criminal policies.

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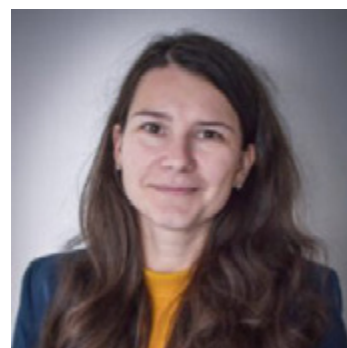
Obtaining his PhD in sociology of science at BAS Institute of Sociology in 1988, he visited the Department of Science and Technology Dynamics, University of Amsterdam, The Netherlands during 1990-1991. Between 1993 and 1998 he carried out an ethnographic study of Bulgarian research lab in the field of holograph. After extensive research on post-communist science and innovation (Tchalakov 2003, 2011, Nikula and Tchalakov 2013), he turned to STS studies of Outer Space comparing post-communist entrepreneurs with New Space entrepreneurs (Tchalakov 207, 2015, Чалаков Поправко 2019) and as Fulbright Fellow (2016-2017) he focussed on US space entrepreneurs. Between 2011 and 2015 Ivan led a team who won a project at Bulgarian government for establishing a Technology Transfer Office (TTO) at University of Plovdiv. These years deepened his understanding of university-industry relationships. Since 2020 Ivan is head of Jean Monnet Centre of Excellence at University of Plovdiv, established under Erasmus+ research and teaching grant focused on the processes of hidden (dis) integration of Europe.



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