SYMPOSIUM

GRAPPLING WITH THE FUTURES

Insights from Philosophy, History, and Science, Technology and Society

Sunday, April 29 - Monday, April 30, 2018

Hosted in Boston by

Harvard University (Department of the History of Science)
&
Boston University (Department of Philosophy)

BOSTON UNIVERSITY

WELCOME

It is my pleasure to extend a warm welcome to all Symposium participants and attendees. "Grappling with the Futures: Insights from Philosophy, History, and Science, Technology and Society" features 44 presentations by speakers from 18 countries, with near gender balance. What brings them together is the depth and boldness of their reflection on the theory and practice of the disciplined exploration of alternative futures. In history, philosophy, and STS, research on futures studies is booming and reflects back on the very practice of these disciplines. "Prospective, which owes so much to history and philosophy, may itself be of some service to those disciplines," noted Gaston Berger, a French philosopher of Senegalese descent and futures studies pioneer, exactly sixty years ago. We hope to create a convivial and intellectually stimulating space conducive to long-term cross-fertilization between futures studies, history, philosophy, and STS.

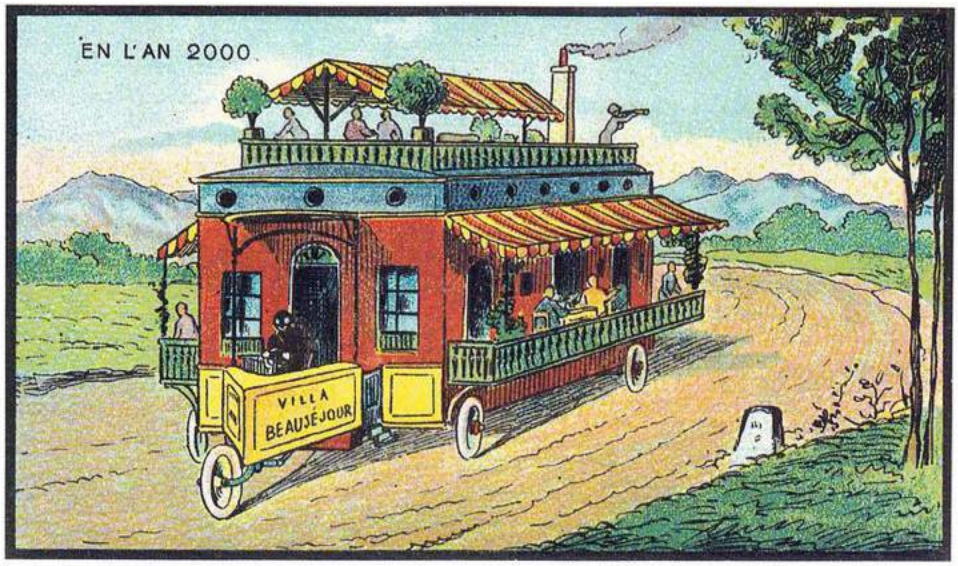
Without the enthusiastic support of Harvard University and Boston University, this symposium would not have been possible. I would like to thank all the co-organizers, committee members, Chairs, and co-sponsors of this event. Particular thanks go to Noreen Nouza, Elizabeth Ramirez, Anastassia Solovieva, and all our other teams for their invaluable help with the logistics, editing, and website design.

Futuristically,

Yashar Saghai
Johns Hopkins University
The Millennium Project

BOSTON UNIVERSITY

WELCOME



A House Rolling Through the Countryside

ORGANIZERS

Yashar Saghai (Johns Hopkins University and The Millennium Project)
Roberto Poli (University of Trento)
Peter Galison (Harvard University)
Russell Powell (Boston University)

SYMPOSIUM COMMITTEE

Tian Cao (Boston University)
Jerome Glenn (The Millennium Project: Global Futures Research and Studies)
Ted Gordon (The Millennium Project: Global Futures Research and Studies)
Axel Gosseries (Université Catholique de Louvain)
Jeremy Greene (Johns Hopkins University)
Sirkka Heinonen (University of Turku, Finland)
Stefan Helmreich (MIT)
Evan Hepler-Smith (Harvard University)
Sophia Roosth (Harvard University)
Elke Seefried (Institut für Zeitgeschichte München-Berlin)

CO-SPONSORS

The Millennium Project: Global Futures Studies and Research
The Mellon Foundation and The BU Center for Philosophy & History of Science
The Institut für Zeitgeschichte (Contemporary History) München-Berlin

WELCOME

KEYNOTE SPEAKERS

Peter Galison, Harvard University

Naomi Oreskes, Harvard University [CANCELED]

Roberto Poli, University of Trento

Cynthia Selin, Arizona State University and University of Oxford

GUEST OF HONOR

Riel Miller, UNESCO

INVITED SPEAKERS

Jon Burmeister, Boston University

Quentin Deluermoz, University Paris XIII and **Pierre Singaravélou**, University Paris I

Sophia Roosth, Harvard University

Yashar Saghai, Johns Hopkins University and The Millennium Project

Elke Seefried, Institut für Zeitgeschichte München-Berlin

Marjolein van Asselt, Maastricht University, **Susan van 't Klooster**, Dutch School of Foresight and **Tessa Cramer**, Maastricht University

SESSION CHAIRS

Stuart Candy, Carnegie Mellon University

Tian Cao, Boston University

Gretchen Gano, University of Massachusetts Amherst

Jerome Glenn, The Millennium Project

Ted Gordon, The Millennium Project

Stefan Helmreich, MIT

Evan Hepler-Smith, Harvard University

Russell Powell, Boston University

Sophia Roosth, Harvard University

Robin Scheffler, MIT

Elke Seefried, Institut für Zeitgeschichte München-Berlin

Cynthia Selin, Arizona State University and University of Oxford

Stephen Wilson, Chelsea College of Arts, University of the Arts, London

VENUE ADDRESSES AND MAPS

BOSTON UNIVERSITY:

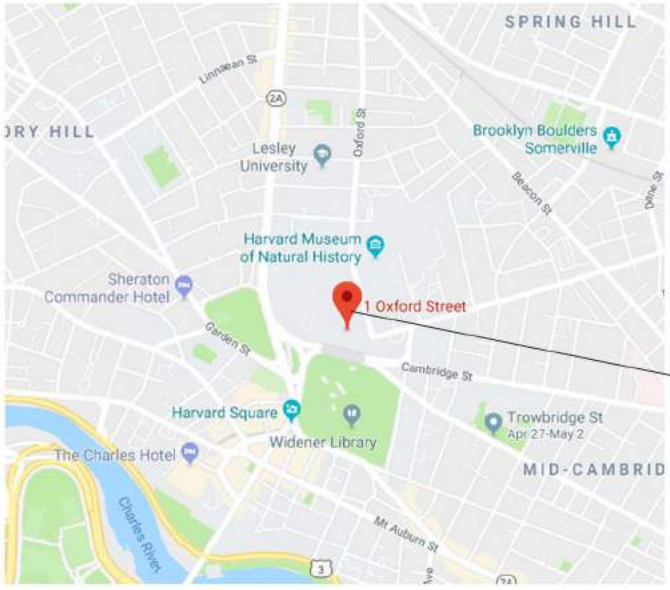
Room #101

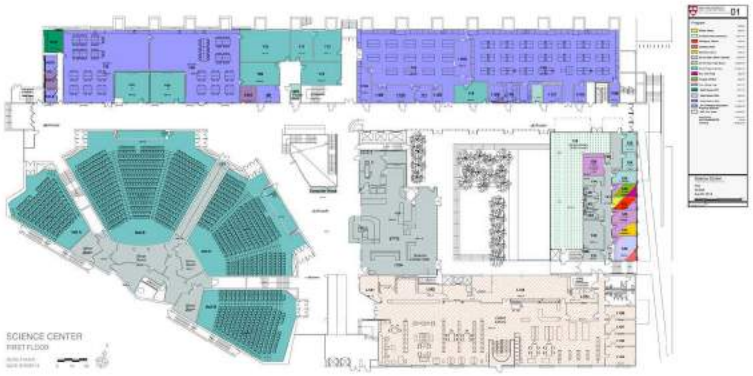
Kilachand Center for Integrated Life Sciences & Engineering

610 Commonwealth Avenue, Boston, MA

Closest T Stop: Blandford Street Station

HARVARD UNIVERSITY:





Science Center Building

1 Oxford Street,

Cambridge, MA

Closest T Stop: Harvard Square

Public Transportation Options for Traveling between Harvard and BU:

Subway: Take the Red Line at Harvard Square stop in the direction of Braintree.
Transfer to the Green Line at the Park Street stop. Take the Green Line to Blandford Street Station.
Approximately 30 min.

Bus: MBTA Line # 1, requires about a 10 min walk to BU campus from nearest stop.
Approximately 30 min.

KEYNOTE SPEAKERS

Peter Galison, Harvard University

The Buried Past of the Far Future: Scenario Thought in the Nuclear Age

Out of the late stages of World War II and on into the Cold War, came a new form of coping with radical uncertainty: scenario futures. Caught somewhere between apocalypse and bureaucracy, between science fiction on one side and a nuclear present, a new breed of futurists tried to narrate things to come. Back in the 1920s, scenarios were widely understood to be sketches of a larger story, glimpses, not a continuous dialogue or story. Bit by bit these short-form story-sketches took hold as a way of outlining an event, a "what if" imagination of the results of a fundamentally disruptive accident, attack, embargo or invention in order to project possible outcomes. These sometimes cataclysmic reflections made their way into economic and natural earthquakes, culminating, (in terms of the degree of futurity) in the attempt to imagine the world 10,000 as a governmentally-required prerequisite to opening the major nuclear waste repository near Carlsbad, New Mexico, the Waste Isolation Pilot Plant. The goal: warn our descendants--400 or even 40,000 generations from now about what we have done with our nuclear detritus so they would not accidentally blunder into it.
I conclude with some reflections on the kinds of futures that that scenario thought opens and forecloses.

Peter Galison is the Pellegrino University Professor of the History of Science and of Physics at Harvard University. In 1997 Galison was awarded a John D. and Catherine T. MacArthur Foundation Fellowship; won a 1998 Pfizer Award (for Image and Logic) as the best book that year in the History of Science; in 1999 received the Max Planck and Humboldt Stiftung Prize, and in 2018, the Abraham Pais Award in the History of Physics. His other books include How Experiments End (1987); Einstein's Clocks, Poincaré's Maps (2003),; and Objectivity (with Lorraine Daston, 2007). Among his films are "Ultimate Weapon: The H-bomb Dilemma" (with Pamela Hogan); with Robb Moss, he directed and produced "Secrecy" which premiered at Sundance (2008), and, also, "Containment," (2015), about the need to guard radioactive materials for the 10,000 year future. Galison has collaborated with South African artist, William Kentridge, on a multi-screen installation, "The Refusal of Time" (2012) and an associated chamber opera, "Refuse the Hour," and he is now making a feature-length documentary about black holes and limits of knowledge.

KEYNOTE SPEAKERS

Naomi Oreskes, Harvard University

Grappling with the future: What use is fiction?

In 2014, Erik Conway and I published a novella, *The Collapse of Western Civilization: A View from the Future*. One might think of the book as a non-numerical simulation model: it was an attempt to take the projections of the Intergovernmental Panel on Climate Change (IPCC) reports and translate them into human terms. In this talk, I will discuss the reception of the book—where it has connected and where it has not—and consider how and why fiction may be effective where fact is not.

Dr. Naomi Oreskes is professor of the history of science and affiliated professor of Earth and planetary sciences at Harvard University, and an internationally renowned geologist, science historian, and author. She is the author of both scholarly and popular books and articles on the history of earth and environmental science, and in recent decades has been a leading voice on the issue of anthropogenic climate change. In 2014, Oreskes had the opportunity to meet Pope Francis at a special meeting at the Vatican on climate change and sustainability, and in 2015 wrote the introduction to the Melville House edition of the Papal Encyclical on Climate Change and Inequality, *Laudato Si'*.

CANCELED

UNFORTUNATELY NAOMI ORESKES CANNOT GIVE HER LECTURE TODAY AS SHE IS RECOVERING FROM SURGERY AFTER A SKI INJURY

KEYNOTE SPEAKERS

Roberto Poli, UNESCO Chair in Anticipatory Systems – University of Trento

Anticipation: The Philosophy of the Future

A philosophy of the future sees the world as an unfinished process, as a continuous tendency towards new horizons. Within this process, what matters most is the tendency itself, more than its starting and ending points. To understand this situation, one needs an ontology of the not-yet, of being as processual, and therefore of being understood as an incomplete, still unfolding reality, indeterminate with respect to its endpoint, leaving room for entirely new determinations as well as for growing or maturing ones. A philosophy of the future provides guidance for distinguishing genuine from not genuine futures. Similarly, it distinguishes between utopia as focused on the endpoint and utopia as focused on everyday life, especially its humblest, tiniest aspects – which is a way of saying that the roots of the future are in the present, if only we learn to see them. My talk sketches the categorical grid that may underlie and support futures studies.

Roberto Poli (PhD Utrecht) is Associate Professor of Philosophy of Science at the University of Trento (Italy).
Poli has been awarded the first UNESCO Chair in Anticipatory Systems http://www.projectanticipation.org, is fellow of WAAS—World Academy of Art and Science and STIAS—Stellenbosch Institute for Advanced Study. Poli is editor-in-chief of *Axiomathes* (Springer), editor of the series *Categories* (De Gruyter) and *Anticipation Science* (Springer). Poli heads the Master programme in Social Foresight. With a background in both the School of Brentano and phenomenology from one side and logic and formal modeling on the other side, Poli's research interests include
Anticipatory systems, i.e. system able to take decisions according to their possible future development (R. Poli, *Introduction to Anticipation Studies*, Springer 2017; Poli (ed.), *Handbook of Anticipation*, Springer 2018).
Ontology, in both its traditional philosophical understanding and the new, computer-oriented, understanding (*ALWIS. Ontology for Knowledge Engineers*, PhD Thesis, Utrecht, 2001; *Theory and Applications of Ontology*, 2 vol. Springer 2010).
Poli has published six books, edited or co-edited more than 20 books or journal's special issues and published more than 250 scientific papers.

KEYNOTE SPEAKERS

Cynthia Selin, Arizona State University and University of Oxford

Tempting Futures

As the pace of technological innovation quickens in dynamic interplay with society, novelty reigns. To make sense of such volatile conditions, we seek to imagine and assess consequences. Yet the handholds of certainty that might anchor decision-making are harder and harder to come by. Though predictive techniques can work miracles, in the settings that nest society's most vexing challenges, ambiguity, novelty and complexity disrupt quests to know futures with certainty.

The question is if there are better ways to reimagine change and consequence. Foresight practices offer another lens, one that does not seek to conceal or calculate uncertainty, but rather aims to create space for reflexivity. In these modes, the point is to question assumptions or enliven the senses, rather than to pin down complexity or tame uncertainty.

Perspectives emanating from Science and Technology Studies (STS) offer touchstones that help to reveal the underlying structures and logics of foresight. In this talk, I will investigate some of the theoretical apparatus on hand in STS to help conceptualize grappling with futures. Tending first to theories of change, we'll explore several pivotal moves made by STS scholars related to notions of temporality, plausibility, trajectorism and irreversibility. Next, STS has important takes on practice—if we frame foresight methods as technologies of engagement, we can borrow insight from STS analyses of socio-technical systems to better understand what happens when foresight tools are deployed.

Both in terms of theory and practice, STS perspectives help to illuminate how in tempting futures out into the open for reflection and critique, foresight work creates spaces of contestation. The future is no blank slate or innocent fantasy, but rife with power play. Care must be taken to tend to the politics and ethics of futuring.

Dr. Cynthia Selin explores how the future serves as a conceptual and concrete resource to make sense of the uncertainty, ambiguity and complexity of socio-technical change. By combining qualitative social science research with cutting edge experimental practice, Dr. Selin's work advances scholarly understandings of anticipation and invents new approaches to cultivating foresight. Dr. Selin is an Associate Professor at Arizona State University in the School for the Future of Innovation in Society and the School of Sustainability. She is also an Associate Fellow at the Saïd Business School, University of Oxford where she teaches in the Oxford Scenarios Programme.

GUEST OF HONOR

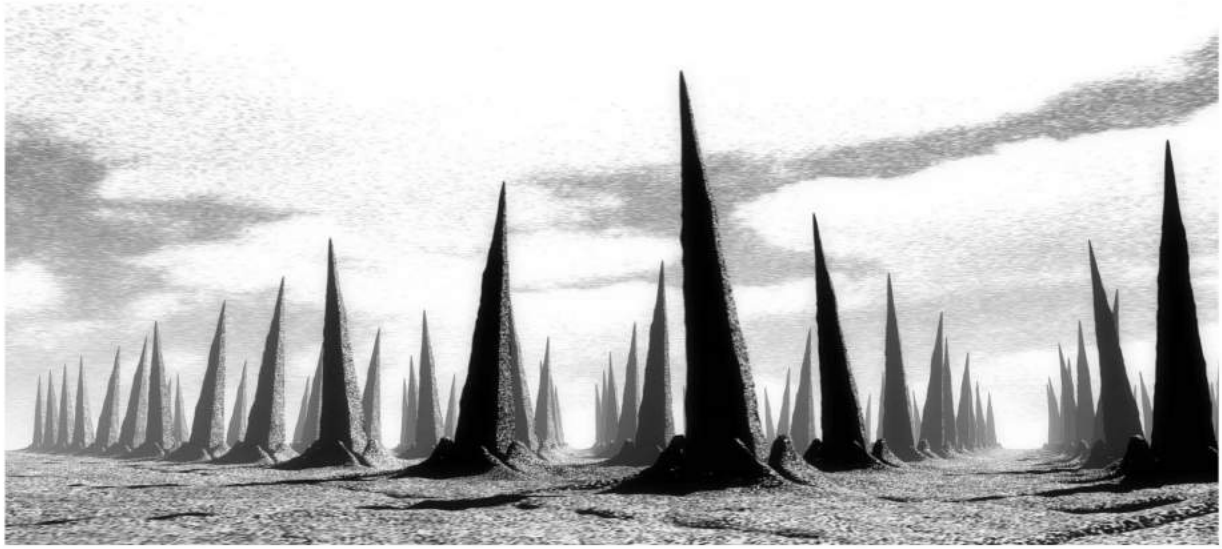
Riel Miller, UNESCO

Transforming the Future: Anticipation in the 21st Century

What does it mean to "transform the future"? Are the conditions for conscious human anticipation changing? Recent work on the apacity to 'use-the-future', defined as the ability to understand different anticipatory systems and processes, point to answers along both ontological and epistemological lines. This presentation will explore the theory and practice of the field of Futures Literacy (the capacity to 'use-the-future') presenting recent results from the UNESCO Futures Literacy Project. This project has conducted over 36 Futures Literacy Laboratories (FLL) in more than 20 countries, testing the effectiveness and efficiency of a Futures Literacy Framework for the design and implementation of FLL. The results of this research provide proof-of-concept level evidence that being able to explicitly take advantage of the diversity of conscious human reasons and methods for 'using-the-future' alters the conditions for both innovation, understood as the general category of 'ontological expansion', and for the conscious relationships – reflexive and performative – that humans construct to connect past, present and future. The development of Futures Literacy calls into question the current dominant framing of human agency, opening up a paradigmatically distinct perspective on how humans might pursue their capacity to be free.

Riel Miller is currently Head of Futures Literacy in the Research, Policy and Foresight Section, Social and Human Sciences Sector, at UNESCO headquarters in Paris. He holds a PhD in Economics from the New School for Social Research. For over thirty years Riel Miller has been pioneering advances in the theory and practice of using the future as a means to improve management and public policy, with a focus on transformational leadership. He has designed and implemented hundreds of projects around the world, deploying innovative ways of using the future in order to change what people see and do. In all his projects Riel walks-the-talk of co-creation, harnessing the collective intelligence of everyone, from CEOs and Prime Ministers to shop-floor workers and school children. He is an experienced and innovative educator, a pioneer of the field of Futures Literacy and the Discipline of Anticipation. He is widely published in academic journals and other media on a range of topics, from the future of education and the Internet to the transformation of leadership and productivity. He worked for the OECD for over a decade and as a Senior Manager in the Government of Ontario. He established and ran a consultancy, Xperidox, and has taught at universities around the world. He is the editor of the upcoming book (Spring 2018), *Transforming the Future: Anticipation in the 21st Century*, published with Routledge.

SCREENING OF *CONTAINMENT* DOCUMENTARY FILM



A FILM BY PETER GALISON AND ROBB MOSS, 2016, 81 MINS

Can we contain some of the deadliest, most long-lasting substances ever produced? Left over from the Cold War are a hundred million gallons of radioactive sludge, covering vast radioactive lands. Governments around the world, desperate to protect future generations, have begun imagining society 10,000 years from now in order to create monuments that will speak across time. Part observational essay filmed in weapons plants, Fukushima and deep underground—and part graphic novel—Containment weaves between an uneasy present and an imaginative, troubled far future, exploring the idea that over millennia, nothing stays put.

Containment is the second film directed by Peter Galison and Robb Moss. The two also directed *Secrecy* (2008), which premiered at the Sundance Film Festival and showed at Tribeca, South by Southwest and over two dozen other film festivals around the world.

Peter Galison is a Pellegrino University Professor of the History of Science and of Physics at Harvard University. Galison's previous film on the moral-political debates over the *H-bomb, Ultimate Weapon: The H-bomb Dilemma* (with Pamela Hogan, 2002) was awarded a John D. and Catherine T. MacArthur Foundation Fellowship; won a 1998 Pfizer Award for *Image and Logic* as the best book that year in the History of Science; and in 1999 received the Max Planck and Humboldt Stiftung Prize. His books include *How Experiments End* (1987), *Einstein's Clocks, Poincaré's Maps* (2003), and *Objectivity* (with L. Daston, 2007). Galison's work also features artistic collaborations, including with South African artist William Kentridge on a multi-screen installation, "The Refusal of Time."

A discussion with Peter Galison will follow the screening.
The screening is now open to all registered symposium attendees

For more information, please go to www.containmentmovie.com

SUNDAY APRIL 29, 8 PM - 10:30 PM

BOSTON TEAM REPORT

Theodore J. Gordon (Futures Group, Founder)
Michael Baram (Boston University)
Wendell Bell (Yale University)
Bernard Cohen (University of Pittsburgh)

NICKEY NUKE AND WIPP WORLDS, 11991

Summary: The WIPP Museum and WIPP Worlds became permanent off-site, self-perpetuating, and self-financing markers, institutionalizing the memory of nuclear energy and the location and dangers of nuclear waste. Hundreds of thousands of visitors came each year to be both educated and entertained. Moreover, the deliberately created fictional character, Nickey Nuke, became the protagonist in stories, poems, films, live theatre, and other media featuring nuclear themes. As long as Nickey Nuke lives, so shall the story of WIPP--and Nickey Nuke, though a mere idea, does not rust, erode, or disappear. He may live forever.

Probabilities

- Very low of something like a WIPP Museum, a WIPP Worlds, or a fictional character such as Nickey Nuke being created and surviving 10,000 years. (But why not provide a modest government subsidy for a commercial venture of this sort--or interest those speculative capitalists from Minsk? There may be more buried treasure here than meets the eye.)

- Low of deliberate creation of legends in poetry and other media.

- High of a museum and legends preventing memory loss of WIPP, if they existed.

ACKNOWLEDGEMENTS

Video and Media:

Joyce Bettencourt is co-founder of AvaCon, Inc., a nonprofit dedicated to promoting the growth, enhancement, and development of the metaverse, virtual worlds, augmented reality and 3D immersive spaces.
AvaCon were organizers of the Second Life Community Convention, the Federal Consortium of Virtual Worlds virtual workshops, and the ongoing OpenSimulator Community Conference. She is also Creative Director of The Vesuvius Group, a collaborative studio developing online immersive learning and social environments. Joyce is a 2012 graduate of the Singularity University Graduate Studies program, focused on applying exponential technologies to addressing Global Grand Challenges.

Jason Ganz is a futurist and a technologist who is passionate about the intersection of emerging technology and culture. Currently he is focused on combining Data Science with Progressive politics and activism. Prior to that he founded a virtual reality telecommunications company, Agora VR. He is a strong believer in future focused communities, getting his start as an intern at the Millennium Project, then going on to lead the DC Virtual Reality meetup from creation to 1500+ members. He was an early moderator of the reddit Futurology community, guiding it from 250 users to over 5 million.

Patty Rangel holds an MFA in Producing from CalArts, is alumni of the GSP program of SU at NASA, the U.N. Summer Intensive program, HIVE Global Leaders, and is a published Author of the International Astronautical Congress 2017 on the topic of “Open Space: Virtual Learning Environments”. Patty has been a featured speaker at the LORT Conference on the topic of "Engaging Audiences with New Media", ATHE (Association for Theater in Higher Education) on the topic of "Storytelling: The Essential Force of Virtual Reality in Live Spectacle", QI/Calit2 "Future of Virtual Reality Conference", and the Digital L.A. "Digital Women Conference".

ACKNOWLEDGEMENTS

Harvard and BU Team

Noreen Nouza is Interim Faculty Assistant to Professor Peter Galison in the Department of History of Science at Harvard University. In addition, Noreen is an award-winning educator, keynote speaker, author, and mother. Before moving to Boston, her career started as a public school classroom teacher. Noreen's passion for developing character education programs and community partnerships led to becoming a building administrator, then an educational leader responsible for the professional development of over 3,000 educators. Noreen became New York's first Gallup Certified Strength Coach, and her passion for supporting personal & professional development launched into a new phase. Along with her experience as a lead evaluator for the New York State Education Department, Noreen began to make a positive impact on those who manage and work with high conflict personalities. She has used this experience and knowledge to develop the "Talking with Toxic" communication protocols. Noreen presents these strategies at conferences and during a weekly webinar. Helping others find understanding through education, problem-solving, and reflection is Noreen's passion. www.restorationmentors.com.

Elizabeth Ramirez is Administrative Assistant at the Center for Philosophy and History of Science, Boston Univerisity.

Website, Graphics and General Management

Gina Constantino is a hopeful doctoral student of Science, Technology, and Science. At the University of Puget Sound, she graduated with a degree in STS, bioethics, and humanities. Her senior project considered how data visualization could improve the public's understanding of the overuse of antibiotics. Gina is helping with logistics and registration at the Symposium.

Anastassia Solovieva is a landscape designer, ceramic artist and logistics specialist. She has designed and maintains the Symposium's website, created the flyers and will be helping with general management and registration during the Symposium and post-Symposium events.

ACKNOWLEDGEMENTS

Johns Hopkins Team

Proofreading and Editing:

Amelia Hood is a Research Program Coordinator at the Johns Hopkins Berman Institute of Bioethics. At the Berman Institute, she provides research support for faculty and outreach and communications for the Institute. Amelia received her Master's in Applied Anthropology from the University of Maryland and Bachelor's in Anthropology from the University of Florida. Her Master's thesis focused on the economic sustainability of fisheries and fair wages for small-scale fishermen.

PPT Emergency Team:

Angie Boyce is a Hecht-Levi Postdoctoral Fellow at the Johns Hopkins Berman Institute of Bioethics. She is also the Project Director of the JHU Center for Bridging Infectious Disease, Genomics, and Society. She received her AB in History and Science from Harvard College in 2003, and completed her PhD in 2014 at Cornell University in the Department of Science & Technology Studies. From 2014-2016, she was a Robert Wood Johnson Foundation Health and Society Scholar at the Harvard T.H. Chan School of Public Health. Her research interests include: ethical issues in infectious disease; regulatory politics, inter-agency collaboration, and consumer advocacy; and translating genomics into population health benefit.

Emily Farmer is a Master's student in Bioethics at Johns Hopkins. She currently works as a Research Program Coordinator for a transitional research lab in the Johns Hopkins School of Medicine, which specializes in the development of therapeutic vaccines for the treatment of HPV and HPV-associated malignancies. Her research interests include women's reproductive rights and health policy; maternal/child health policy; child and adolescent health and development; and translational research ethics.

Alexis Walker is currently a Hecht-Levi Postdoctoral Fellow at the Johns Hopkins Berman Institute of Bioethics, where she works with the Center for Bridging Infectious Disease, Genomics and Society. She is a political and medical anthropologist trained in Cornell University's Department of Science and Technology Studies, where she received her PhD in 2017. Her research critically investigates relationships of finance, expertise, and health across a variety of settings – from the global health efforts of international financial institutions to the worlds of genomics startup companies.

Rebecca Wilbanks received her PhD from Stanford's Program in Modern Thought and Literature and is currently a Hecht-Levi postdoctoral fellow at the Berman Institute of Bioethics and a postdoctoral fellow in the History of Medicine at Johns Hopkins, where she is also affiliated with the Center for Bridging Infectious Disease, Genomics and Society. Her research is broadly interested in the intersection of science and culture, and her book project, *Life's Imagined Futures*, explores the speculative science and speculative fiction of synthetic biology.

ACKNOWLEDGEMENTS

Interview Team

Interviews:

Jerome Glenn is the CEO of The Millennium Project, a leading global participatory think tank since 1996, which now has 63 Nodes around the world. He is the lead-author of the *State of the Future* reports for the past 20 years, co-editor of its *Futures Research Methodology 1.0-3.0*, and designed and manages the online Global Futures Intelligence System. He invented the "Futures Wheel" methods and concepts such as conscious-technology, self-actualization economy, and definitions of environmental security and collective Intelligence. He wrote merging mystics and technocrats and information warfare in the late 1980s in his book *Future Mind*, sent his first email in 1973, and in the mid-1980s, he was instrumental in getting X.25 packet switching in 29 developing countries for low-cost Internet access. His *Future Work/Tech 2050 Global Scenarios* are currently being used in national workshops in 18 countries. He was instrumental in naming the first Space Shuttle the Enterprise and banning FOBS (space weapon) in SALT II.

Peter Scoblic is a doctoral candidate at Harvard Business School and a fellow at New America. He previously served as executive editor of *Foreign Policy* and *The New Republic*. He was also deputy staff director of the Senate Committee on Foreign Relations, where he worked on approval of the New START agreement and was the chief foreign policy speechwriter for Chairman John Kerry. He has published widely, in outlets from *The New York Times* to *Science*, and is the author of *U.S. vs. Them*, a history of conservatism and American nuclear policy. He received his A.B. from Brown University.

ACKNOWLEDGEMENTS

Post-Symposium Events Organizers

Greentown Labs:

Benedict Kim (Tufts Institute of the Environment liaison to Greentown Labs) and Grappling with the Futures speaker **Eric Kemp-Benedict** (Stockholm Environment Institute US and Tufts Institute of the Environment affiliated faculty)

MIT Media Lab:

Darien Carr (MIT)

MIT List Visual Arts Center, Public Art and Architecture:

Emily A. Garner (MIT Campus and Public Programs Manager at the List Center) and **Yuri Stone** (Assistant Curator at the List Center)

MIT Trope Tank:

Nick Montfort (director and professor of digital media at MIT)

Future of Life Institute:

Lucas Perry and **Richard Mallah** (director of advanced analytics)

Grappling with the Futures Symposium Schedule
At a Glance
Updated April 20, 2018

Day 1, Sunday April 29 (Harvard University)

Hours	Session	Hall E	Room 469	Room 359	Room 252
8:30-9:00AM	**Registration**				
9:00-9:25AM	**Plenary**	**Welcome & Introductory Address: Peter Galison and Yashar Saghai** Chair: J. Glenn			
9:30-10:20AM	**Plenary**	**Keynote 1 & Q&A Cynthia Selin**			
10:20-10:50AM	**Coffee Break (Clover Cafe) on your own**				

Hours	Session	Hall E	Room 469	Room 359	Room 252
10:50-11:45	**Plenary**	**Keynote 2** **&** **Q&A** **Peter Galison** (Naomi Oreskes unable to attend)			
11:50-12:15AM	**Plenary**	**Keynote 3** **&** **Q&A** **Roberto Poli** **Video**			
12:15-12:30PM	**Plenary**	**Discussion** Chair: J. Glenn			
12:20-2:00PM	**Lunch (Clover Restaurant) on your own**				
2:00-3:30PM	**Parallel Sessions 1, 2, 3, 4**	**1** **Plausible Futures (PHIL)** Chair : C. Selin	**2** **Global Histories of Futures Studies (HIST)** Chair: T. Gordon	**3** **Anticipation & Visioning (INTER)** Chair: T. Cao	**4** **Health & FS (STS)** Chair: E. Hepler-Smith

Hours	Session	Hall E	Room 469	Room 359	Room 252
3:30-4:00PM	**Coffee Break (Clover Café) on you own**				
4:00-5:30PM	**Parallel Sessions 5, 6, 7, 8**	**5** **Counterfactuals in History & Futures Studies (HIST)** Chair: S. Candy	**6** **Norms in Futures Studies (PHIL)** Chair: R. Powell	**7** **Education, Expertise & Futures Studies (STS)** Chair: R. Scheffler	**8** **History, Imaginaries & the Future (HIST)** Chair: E. Seefried
5:30-8:00PM	**Dinner (on your own)**				
8:00-10:00PM	**Documentary Screening (open to all registered participants)**	**Screening of *Containment* and discussion with Peter Galison** Moderator: Y. Saghai			

Day 2, Monday April 30 (Boston University)

Hours	Session	Room 101	106B	106D	106C
8:00-8:30					
9:00-10:40AM	**Parallel Sessions 9, 10, 11, 12**	**9 Foresight in Practice (STS)** Chair: S. Helmreich	**10 Technology, Philosophy & Future Studies (PHIL)** Chair: S. Wilson	**11 Histories of Futures Studies & the Corporate Sector (HIST)** Chair: S. Roosth	**12 Infrastructure for the Future: Energy, Environment, Food (INTER)** Chair: G. Gano
10:30-11:00AM	**Coffee Break**				
11:00-1:00PM	**Plenary**	**Guest of Honor Riel Miller & Roundtable: Next Steps** Chair: R. Powell			

1:00-2:00PM	**Lunch (Offered by BU)**				
2:30-7:30PM	**Optional Post-Symposium Activities**				

Grappling with the Futures Symposium Detailed Agenda

DAY 1 – SUNDAY, APRIL 29, 2018 (HARVARD UNIVERSITY)

Keynotes Lectures

- Cynthia Selin, *Tempting futures* (STS)
- Peter Galison, *The buried past of the far future: Scenario thought in the Nuclear Age* (HIST)
- Roberto Poli, *Anticipation the philosophy of the future* (PHIL)

Session 1: Plausible Futures (PHILOSOPHY)

- Nele Fischer and Sascha Dannenberg, *Troping Futures. Applying philosophy of language to examine the prefiguration of continuity and disruption*
- Yashar Saghai, *How do we get from now to then? On the merits and limits of explanatory pluralism in future scenarios*
- Eric Kemp-Benedict, *A critical realist approach to scenario modeling practice*

Session 2: Global Histories of Futures Studies (HISTORY)

- Elke Seefried, *Cold War futures? Political epistemologies and flows of knowledge in transnational futures studies, 1950-1990*
- Joanna Radin, *How Cold War anthropology tried (and failed) to decolonize 'Third World' futures*
- Jenny Andersson, *Futures as global expertise*

Session 3: Anticipation and Visioning (INTERDISCIPLINARY)

- Liliana Albertazzi, *Anticipation by magnifying glass*
- Luciano d'Andrea, *Anticipatory process and social research: going beyond a prescriptive and policy-oriented view of anticipation*
- Dirk Hommrich and Paulina Dobroc, *Distorting mirrors of the present: Future visions as socio-epistemic practices*

Session 4: Health and Futures Studies (STS)

- Robin Wolfe Scheffler, *Managing the future: Planning cancer virus research at the National Cancer Institute*
- Karen Dam Nielsen and Mariane Boenink, *Critical reflections on "futuring" in responsible research and innovation: the case of Alzheimer's research*
- Ari Schick*, Understanding the past and rethinking the future of anticipatory bioethics*

Session 5: Counterfactuals in History and Futures Studies (HISTORY)

- Quentin Deluermoz and Pierre Singaravélou, *Counterfactuals: Historian's approaches*
- Mariana Todorova, *Counterfacts as cliché breakers and seeds of the future*
- David Staley, *The future as a domain of historical inquiry*

Session 6: Norms in Futures Studies (PHILOSOPHY)

- Erduana Shala, *Values in futures research - which ones should we accept?*
- Henk van den Belt, *The anticipatory stance in Futures Studies and Responsible Innovation: Can we really get ahead of ourselves?*
- Florian Schuetz, Johann Jakob Häußermann, Marie-Lena Heidingsfelder and Martina Schraudner, *Who shapes Our future? – On the normative status of citizen engagement in research and Innovation*

Session 7: Education and Futures Studies (STS)

- Sandra Kemp, *'Powerfully seductive forms of mass public entertainment and education': Narratives of the future at scientific soirées*
- Keri Facer*, University futures before futures studies*
- Stephen Wilson, *Transpersonal futures: Artisthood in posthumous digital-life limiting conditions.*

Session 8: History, Imaginaries and the Future (HISTORY)

- Sophia Roosth, *The genesis of life in the Valley of Death*
- William Deringer, *The "social rate of discount" and the techno-politics of the future in postwar America*
- Emanuelle Burton and Alec Nevala-Lee, *Fictional futures: The past, present and future of future studies and science fiction*

DAY 2 – MONDAY, APRIL 30, 2018 (BOSTON UNIVERSITY):

Session 9: Foresight in Practice (STS)

- Marjolein van Asselt, Susan van 't Klooster and Tessa Cramer, *Foresight in action, professionals and their practices*
- Mark Swilling, Edgar Pieterse and Maarten Hajer, *Futuring, experimentation and transformative urban politics*
- Sumin Myung, *Is the world for the future forest? Forest sciences, long-term planning, and nested futures in South Korea*
- Patrick van der Duin and Dhoya Snijders*, How the Dutch shape their future: governmental think tanks and advisory think tanks at work in an increasingly uncertain world*

Session 10: Technology, Philosophy and Futures Studies (PHILOSOPHY)

- Cor van der Weele, *How do paths into the future emerge? The case of cultured meat*
- Benjamin Aldes Wurgaft, *Image and uncertainty in the cultured meat movement*
- Wenceslao J. Gonzalez, *The future of the internet: Prediction and prescription of applied Sciences in the context of complexity*
- Jon Burmeister, *The future of meaningful work: What will A.I.'s impact be?*

Session 11: Histories of Futures Studies and the Corporate Sector (HISTORY)

- Susan Erikson, *The "Ebola Bond" and the financialization of humanitarian aid*
- Thomas J. Chermack, *Pierre Wack's contributions to scenario planning: Past, present and future*
- Erik Baker, *Privatizing the future: Neo-optimism, philanthrocapitalism, and the end of history*
- Bretton Fosbrook, *Conjuring corporate environments: Entanglements and translations in the methods of scenario planning in the 1960s and 1970s*

Session 12: Infrastructure for the Future: Energy, Environment, Food (INTERDISCIPLINARY)

- Tanja Schneider, *Enacting food futures: Sociotechnical imaginaries in food tech entrepreneurs' TED talks*
- Gregg Macey, *Environmental legal futurism*
- Kamilla Karhunmaa, *Carbon neutrality and feasible futures in Finnish parliamentary and city council debates*
- Jens Marquardt, *Contested visions of the future: Germany's energy transition between revolution and technocentrism*

Final Plenary Session:

- Riel Miller, *Transforming the future: Anticipation in the 21st century* (INTERDISCIPLINARY)
- Open discussion with panel and Symposium participants about next steps.

Session Structure

Opening Plenary (April 29) Chaired by Jerome Glenn:

1. Welcome by Peter Galison (5 minutes) and introductory address by Yashar Saghai (15 minutes)
2 35-minute keynote by Cynthia Selin on STS perspective, followed by 15-minute Q&A
3 35-minute keynote by Peter Galison on historical perspective (graciously replacing Naomi Orekes who will unfortunately not be able to be with us because of a ski injury), followed by 15-minute Q&A
4 20-minute video keynote by Roberto Poli on philosophical perspective, followed by 5-minute remote Q&A
5 15-minute open discussion with panel and participants

Parallel Sessions:

Day 1: 90-minute sessions with 3 speakers:

1. Introduction of topic and speakers by Chairs (5 minutes based on bios and titles)
2. Each speaker will give a 20-minute talk (with or without PPT). No Q&A between presentations.
3. After the three presentations, 25-minute Q&A

Day 2: 100-minute sessions with 4 speakers:

1. Introduction of topic and speakers by Chairs (5 minutes based on bios and titles)
2. Two speakers will each give a 20-minute talk consecutively (with or without PPT), followed by a 10-minute Q&A addressed to both of them
3. The two next speakers will each give a 20-minute talk consecutively (with or without PPT), followed by a 10-minute Q&A addressed to both of them

Final Plenary (April 30):

1. 25-minute talk by Guest of Honor Riel Miller
2. 90-minute informal discussion between panelists and symposium participants about next steps: Ideas for creating a permanent network connecting history, philosophy, STS and Futures Studies, brainstorming on goals, scope, platforms, and emerging issues, roundtable about related and complementary organizations and initiatives, and possible collaborations

SESSION 3: ANTICIPATION AND VISIONING

Liliana Albertazzi, University of Trento

Anticipation by Magnifying Glass

Among the several conceptions of anticipation, such as biological anticipation (a necessary condition for being alive) (Rosen 1991; Louie 2009), foresight (the analytical exploration of possible future), future expectation (a forward-looking stance to change the present conditions) (Appadurai, 2013; Louie, Poli 2011), the process itself of anticipating makes visible how we actually experience the environment. Rooted in our perceptual and mental structures, the anticipation process follows specific laws of subjective completion in awareness (Kanizsa 1979; Libet 2004; Wertheimer 1912/2012), occurs in very short durations in the psychic present (Pöppel, Bao 2014), and embeds fringes of the future (Husserl 1966/1991). The subjective process of anticipation developing in the now is not reducible to psychophysical and/or neurophysiological behaviour (Libet 2004), because it contains an internal and predictive model of itself, which is not explained by external causes (Albertazzi 2013, 2017; Albertazzi, Louie 2016). My presentation discusses the nature of the anticipation process in awareness on the basis of the magnifying glass of experimental findings.

Liliana Albertazzi is Senior Professor at the University of Trento, Italy https://webapps.unitn.it/Search/it/Web?q=albertazzi&refsite=www.unitn.it and author of 5 books, about 200 papers, and editor of 21 books in some of the best publishing houses such as MIT Press, Wiley, Springer, Wiley, Ashgate, and Benjamins (http://webapps.unitn.it/Ugcvp/it/Web/ProdottiAutore/PER0003088). With a series of experimental works Albertazzi revitalized the philosophical tradition of phenomenology in current studies of vision science, colour perception, cross-modality, and more recently in biological studies (http://r.unitn.it/en/lett/labexp). Currently she is working on a theory of qualitative phenomena, their measurement, and modelling.

SESSION 2: GLOBAL HISTORIES OF FUTURES STUDIES

Jenny Andersson, Sciences Po, Paris

Futures as Global Expertise

The interest in the history of the different strands of 'futurology' – future research, futures studies, forecasting and scenario making – is currently booming. Meanwhile, much of the emerging literature still struggles to make sense of what future research was: Was it a Cold War science based on hardcore rationality assumptions and informed by gaming, strategizing and prediction? Was it a high modernist form of planning, used by state structures to make sense of post industrial times? Was it a form of counterculture, techno-scientific 'visioneering' or even a form of dissidence? Did the 1960s and 1970s interest in future research hide the embryos of a coming expert culture and 'neoliberal' forms of surveillance and management?

My paper, based on a forthcoming book for Oxford on the history of the multiple strands of futures research, proposes to view 'futurology' as a reflection of a set of oftentimes contradictory discourses on global interconnectedness, and as expressing a central conception of the world as a 'system'. While system meant many different and often directly conflicting things to different approaches, this system had in common that it appeared as a manageable entity, an object that could be engineered and redesigned in order to project desirable outcomes. Such processes of design could yield multiple world outcomes, a fact that posited a central question: what were the good futures of the world system, and who could be trusted with the social role of giving these life? My paper will argue that important strands of future research began in rejections of Cold War culture and as a desire to project 'alternative' world futures. By the end of the Cold War era, however, futurists had become entangled with manifold forms of global expertise and oftentimes associated with market based advice, consultancy, and thinktank activity. Many futurists became directly involved with processes of global governance, transition and development projects. As such they were representative, I argue, of a new kind of world expertise, or expertise in world futures. The paper explores how futuristic expertise interacts with notions of market making and statist power.

Jenny Andersson is CNRS Research professor at Sciences Po, Paris, and Co Director of the MaxPo research center. She has published works on the transformation of European social democracy, and directed the Futurepol project in Paris. Her book *The Future of the World. Futurology, Futurists and the Struggle for the Cold War Imagination* will be published by Oxford University Press in the Spring of 2018.

SESSION 11: HISTORIES OF FS AND THE CORPORATE SECTOR

Erik Baker, Harvard University

Privatizing the Future: Neo-Optimism, Philanthrocapitalism, and the End of History

The headlines are pretty bleak these days, with regular talk of nuclear armageddon, catastrophic climate change, mass shootings, and intense political dysfunction. But a group of libertarian-leaning social scientists and popular writers -- Steven Pinker, Michael Shermer, Matt Ridley, and others -- have, in recent years, promulgated a far sunnier vision. Thanks to the spread of free markets, evolutionarily programmed instincts towards altruism, and the inevitable process of enlightenment that Pinker calls the "escalator of reason," they argue that there has never been a better time to be alive, and that we can comfortably expect the foreseeable future to be even better -- with or without collective political action to address issues of public concern. In this paper, I contend that these "neo-optimists," and their predecessors over the last several decades, represent a significant departure from past traditions of futurism; and I trace the institutional and financial networks in which this development emerged since 1980. Older generations of science-minded socialists and command-and-control Cold Warriors alike had emphasized planning and looked to future-oriented social science as a tool for the rational design of political, economic, and social structures. But working in venues such as the Cato Institute, the Hudson Institute, the Independent Institute, and the Santa Fe Institute, a newer group of scholars and writers instead claimed that planning was rendered otiose at best and disastrously counterproductive at worst by the ingenuity and beneficence of a spontaneously coordinated "independent sector" of entrepreneurs, industrial capitalists, and philanthropists.

Erik Baker is a doctoral student in the Department of History of Science at Harvard University. His research explores themes of spontaneity, entrepreneurship, and privatization in the twenty- and twenty-first-century social and human sciences in the United States. Before arriving at Harvard, Erik received a B.A. from Northwestern University in mathematics and science studies.

Jon K. Burmeister, Boston College and Boston University

The Future of Meaningful Work: What Will A.I's Impact Be?

In this century, many meaningful and fulfilling jobs will be made obsolete by artificial intelligence, specifically, by machine learning. Some predict that this will eventually lead to a post-work heaven of leisure, while others predict a hellish state of poverty and boredom. It's thus worth thinking through a few questions: 1.) in the coming few decades, what sorts of jobs might be destroyed by machine learning, and what sorts might endure, and might be created? 2.) to remain employed, how might we prepare for this? and 3.) how will these shifts affect how we find meaning in our work?

To think more clearly about work, automation, and meaning, I first imagine how they play out in three generations of shoemakers: a medieval cobbler, an industrial shoe factory worker, and a 21st c. computer-aided shoe designer. Particular focus will be given to how automated processes impact the level of satisfaction each of these three people receive from their job.

Next, I examine the basic concepts behind machine learning (ML) and the impact that ML will have on different kinds of work over the next several decades. To illustrate what it means to say that an algorithm 'learns,' I discuss Netflix's system of recommendations and the mechanisms behind self-driving cars. Building off of this, I make predictions about the kinds of jobs most likely to be automated, taking into account the roboticist axiom known as "Moravec's paradox" to think through ML's strengths and weaknesses.

It is not controversial to say that creativity will be one of the most challenging activities for ML to master, since creativity is the activity of imagining the not-yet-actual in an undefined space, and then making it actual. What kind of education, then, best fosters creativity, thereby preparing people to remain employable even as ML grows in its sophistication? The liberal arts, I argue, do just that, by fostering the kind of thinking which is capable of stepping outside of pre-established customs and looking at them from the outside in.

Finally, I examine in more detail the question of what makes work meaningful for the worker, and what the short-term trends in ML portend for such work. Drawing from Hannah Arendt's contrast in *The Human Condition* of the factory worker and the craftsmen, I discuss the idea that one kind of meaningful work involves (like the craftsman) contributing to an overall goal that one was involved in setting. Because ML is – for the next few decades, at least – weaker at those kinds of tasks, and stronger in the narrower, more repetitive, and more circumscribed tasks, I argue that ML will, in the short term, work in favor of meaningful human work. Furthermore, I claim that even when ML is able to replace more creative and more craft-like tasks *within* a particular job, this will often not put the person out of work but rather will free her up to do more of those tasks which require more craft-like skills. Thus we see again that, in the short term, ML will act in the interests of meaningful, fulfilling work.

Jon K. Burmeister teaches in the Perspectives Program at Boston College, and is a 2017-2018 Mellon Sawyer Fellow at Boston University. His research focuses on philosophy of technology and 19th & 20th century continental philosophy. As part of an NEH "Enduring Questions" grant on the topic of work and leisure, he is exploring ethical and political responses to the coming age of AI-driven work and technologically-dominated leisure. Read more at workandleisure.org.

SESSION 8: HISTORY, IMAGINARIES AND THE FUTURE

Emanuelle Burton, University of Illinois and Alec Nevala-Lee, writer

Fictional Futures: The Past, Present and Future of Future Studies and Science Fiction

This paper examines the history of mutual influence between science fiction and future studies, and uses that past as a critical frame for understanding how the imaginary posited in science fiction production is both vehicle and testing-ground for the viability of various futures.

In the 1940s, *Astounding* editor John W. Campbell—motivated by the rise of Hitler and the war in Europe—reinvented science fiction as a collaborative laboratory for generating analogies and scenarios about the future, hoping the genre would produce ideas and innovations that would aid in strategic planning and national defense. Through *Astounding* and other science fiction magazines, the theories of Marx, Spengler, and Toynbee reached a huge popular audience in applied form through the metahistorical architecture of stories by de Camp, Asimov and others. This audience included leaders in the United States government, the military, and researchers at Bell Labs, many of whom explicitly identified science fiction as a tool for thinking about the future. Works of this era continue to exert influence on future-oriented disciplines through figures such as Elon Musk and Paul Krugman, who cites Asimov's *Foundation* series as the impetus for wanting to "us[e] my understanding of the mathematics of human behavior to save civilization."

Contemporary science fiction likewise excavates and operates within an imaginary that is fruitful for future studies. In framing an approach to contemporary science fiction for future studies, we will particularly consider The Tomorrow Project, which sponsors "science-based fiction that explores possible futures…[and] can be used as inspiration to scientists, or as data for cultural anthropologists."

Emanuelle Burton holds a PhD. in religion and literature from the University of Chicago. She teaches ethics courses in the College of Engineering at University of Illinois at Chicago, and is collaborating with computer scientists at the University of Kentucky in developing a science fiction-based ethics curriculum for computer science departments. Her solo scholarship focuses on ethics and world-making in non-realist literature for young readers. She had published articles on several works of children's and young adult fantasy literature, and is completing a book for the University Press of Mississippi on the *Chronicles of Narnia*.

Alec Nevala-Lee is the author of *Astounding: John W. Campbell, Isaac Asimov, Robert A. Heinlein, L. Ron Hubbard, and the Golden Age of Science Fiction*, which will be released by Dey Street Books in 2018. His other work includes a trilogy of novels published by Penguin; articles in the Los Angeles *Times*, *The Daily Beast*, *Salon*, *The Rumpus*, *Longreads*, and the San Francisco *Bay Guardian*; and short stories in *Analog Science Fiction and Fact*, *Lightspeed*, and *The Year's Best Science Fiction*. He graduated from Harvard College with a bachelor's degree in Classics, and he lives in Oak Park, Illinois.

SESSION 11: HISTORIES OF FS AND THE CORPORATE SECTOR

Thomas J. Chermack, Colorado State University

Pierre Wack's Contributions to Scenario Planning: Past, Present and Future

This presentation highlights the life and major insights of Pierre Wack for studying futures. Based on my recent book, this presentation summarizes the evolution of the scenario method according to Pierre Wack. Wack led the scenarios team at Shell from 1971 to 1982, and was able institutionalize scenarios as a standard planning practice. What Wack was able to achieve remains in use at Shell today. The presentation begins with a description of the motivation for writing the book and the situation leading to a need for telling his story. A brief bio sketch of Wack is presented, including the socio-political context of the time, followed by the influential themes of his life that enabled him to connect scenarios to corporate strategy. After establishing these contextual factors, the main focus of the presentation is what can be learned from the historical study of one of the foremost scenario planning pioneers. The major themes of Wack's scenario approach are: 1) the team, 2) isolation and inspiration, 3) tension, 4) meditation / contemplative practice, 5) testing ideas, 6) predetermined elements, 7) remarkable people, 8) presentations, 9) mental models, and 10) decisions. Each of these themes is elaborated upon using specific examples from Wack's scenario work, as well as a rigorous assessment of implications for modern day scenario planning. Finally, two unfinished aspects of Wack's legacy are discussed and offered as possibilities for continuing to evolve the original scenario method.

Thomas J. Chermack is a Professor of Organizational Learning, Performance and Change at Colorado State University where he also directs the Scenario Planning Institute. As a researcher, he has focused on studying the history and outcomes of scenario planning. As the author of "Scenario Planning in Organizations", and "Foundations of Scenario Planning: The Story of Pierre Wack" he focuses on how Organizational leaders use scenarios to manage uncertainty. He is frequently quoted in academic research and consults widely related to scenarios. He is a frequent speaker at planning and futures conferences around the world.

SESSION 3: ANTICIPATION AND VISIONING

Luciano d'Andrea, Knowledge and Innovation Research Center, Rome

Anticipatory Process and Social Research: Going Beyond a Prescriptive and Policy-Oriented View of Anticipation

The issue of anticipation is increasingly moving into the core of STS in connection with the adoption of Responsible Research and Innovation (RRI) as the major European Commission (EC) policy framework for research and innovation. First, the paper will dwell upon the use of anticipation as a tenet of RRI, exploring its potentials and problematic issues. The analysis will show how RRI is grounded on a prevalently prescriptive and policy-oriented approach to anticipation mainly attributing to stakeholders' intentionality the capacity to largely shape the future by modifying the present. Hence the importance recognized to approaches based on dialogue and consultation, aimed at scanning intentionality and visions (of experts, stakeholders, the public at large, etc.) understood as precursors and main shapers of future. However, this "prescriptive" combination of social constructivism and policy making overlooks the intrinsic complexity of the social process and the many factors actually shaping social life. The paper will then explore an alternative approach to anticipation that revolves around the idea of an "anticipatory research" scanning society in order to identify "anticipatory experiences", i.e., emerging social phenomena more endowed than others with the capacity to increase the likelihood that specific new standards, social configurations and cultural patterns emerge and consolidate. On the basis of the author', Rome research experience on the transition to post-carbon society and on RRI (especially the EC-funded FIT4RRI project), some categories and concepts to identify anticipatory experiences and to provide a basis for a sound anticipatory research will be proposed.

Luciano d'Andrea is senior researcher at Knowledge and Innovation (K&I), an independent social research centre based in Rome (Italy). His research interests in the last decade have mainly focused on science-society relationships, understood as a privileged observation field to analyze transformation processes affecting contemporary societies. He has also been taking part in research projects on public engagement with science and technology, gender equality in science, responsible research, knowledge brokerage, and the socialisation process of science and innovation.

SESSION 5: COUNTERFACTUALS IN HISTORY AND FUTURES STUDIES

Quentin Deluermoz, Université Paris XIII and Pierre Singaravélou, Université Paris I Panthéon Sorbonne

Counterfactuals: Historian's Approaches

Based on our book *Pour une histoire des possibles. Approches contrefactuelles et futurs non advenus* (Seuil, 2016), the presentation will evoke the importance of the counterfactual reasoning in history and social sciences. It will show the problems it raises, explaining why this kind of interrogation sparks debates, and the opportunity it offers for historians as citizens. We will insist in particular on the rejection of determinism, the uses of fiction and the epistemological and political stakes of the possible futures of the pasts. In the meantime, the question of the diversity of perceptions of time - and futures - in a global perspective, and of the temporal situation of our own reflections, will be evoked, too.

Quentin Deluermoz is Associate Professor of Contemporary History at Université Paris 13. He is an associate member of the Centre de recherches historiques (CRH - EHESS) and a Member of the Institut Universitaire de France (IUF). His research, at the crossroad of sociology, anthropology and history focuses on history of order and disorder in 19th Century Europe (including its Empires). He has published *Le crepuscule des revolutions* (1848-1871)" (Paris, Seuil, Histoire de la France contemporaine, 2012), *Norbert Elias et le XXe siècle* (Paris, Tempus, 2014), and, with Pierre Singaravélou *Pour une histoire des possibles* (Paris, Seuil, 2016).

Pierre Singaravélou is Professor of Contemporary History at Paris 1 Pantheon Sorbonne University and a member of the Institut Universitaire de France (IUF). He has published numerous books on the history of colonization and globalization in the 19th and 20th centuries: *Les Empires coloniaux* (Seuil, 2013), *Pour une histoire des possibles* (Seuil, 2016), *Tianjin Cosmopolis, Une autre histoire de la mondialisation* (Seuil, 2017), *Histoire du monde au XIXe siècle* (avec S. Venayre, Fayard 2017).

SESSION 8: HISTORY, IMAGINARIES AND THE FUTURE

William Deringer, MIT

The "Social Rate of Discount" and the Political Economy of the Future in Postwar America

Few techniques are more essential to how modern firms and governments grapple with the future than exponential discounting. A centuries-old calculation grounded in the financial logic of compound interest, discounting assigns a monetary "present value" to gains or losses expected to materialize in the future. The value *today* of $100 to-be-received fifty years from now is however much you would have to save today to yield $100 in fifty years, assuming compound interest at a fixed "discount rate." From business to public administration to law, discounting calculations are how future imaginaries are made operable in today's present. The power discounting wields in contemporary future-making has been cast into stark relief by recent debates about climate change economics. Yet relatively little attention has been paid to the history of how discounting gained such epistemic authority. This paper examines one crucial chapter in that story. Beginning around 1960, the question of what discount rate to use in cost-benefit analyses of public infrastructure investments, especially water projects, crystallized into an organizing problematic within economic and governmental thinking about the future. These discount rate debates developed alongside, and entangled with, other forms of Cold War-era future-making, including economic growth projections and the national defense techniques cultivated by the RAND Corporation. This paper reconstructs the constitution of the "social rate of discount" as a concept, an object of social-scientific knowledge, and a political problem across four diverse, linked sites: RAND, the Harvard Water Program, the Kennedy Administration, and the political maneuvering of Senator William Proxmire.

William Deringer is Leo Marx Career Development Assistant Professor of Science, Technology, and Society at M.I.T. and currently Fellow at the Davis Center for Historical Studies at Princeton University. His research excavates the history of economic and political knowledge practices. His first book, *Calculated Values: Finance, Politics, and the Quantitative Age* (Harvard University Press, 2018) reconstructs how numerical calculation became an authoritative mode of public reasoning in Anglophone political culture. His new project, *Discounting: A History of the Modern Future (in One Calculation)*, traces the history of "present value" calculations from the early-modern period to contemporary debates about climate change.

SESSION 11: HISTORIES OF FS AND THE CORPORATE SECTOR

Prof. S. L. Erikson, Simon Fraser University

Speculated Futures: The 'Ebola Bond' and the Financialization of Humanitarian Aid

Since 2010, there has been a discernable expansion of humanitarian financing forms – from the conventional provisioning by governments and charities to new forms of provisioning via capital market investing. Health data has played a key role in that shift. This paper explores shifts in enumerative health value regimes, from accountability to invest-ability, exposing the rationalities of catastrophic bond financing. Based on multi-sited ethnographic research in global financial centers as well as on-the-ground with enumerators in Sierra Leone, the paper shows how risks and uncertainties in pandemic domains are now being navigated through investor sensibilities of problem solving. Long-held notions of using data for project and program accountability are still operative, but invest-ability has become an adjuvant and decidedly more lucrative use of health data. Re-insurance, catastrophic forecast, and extreme mortality modeling is central to the functionalities of new speculative instruments. To show this, I present the logics of a new financial instrument promoted by the World Bank and the World Health Organization, the colloquially named 'Ebola Bond'. Using theories of performativity and speculation, I explore the ways that data measures perform the future that global health becomes; that is, speculative finance is now poised to catalyze the future conditions of global health by creating feedback loops of 'return'. Instruments that successfully yield profit establish and continue, even though they will not always correlate to disease containment and improved outcomes. Analyzing these instruments as artifacts of a financialization age helps us explore the shift-ability of normative domains, and may well assist us in imagining futures through which we can assess desirable/undesirable global health futures.

Susan Erikson is an anthropologist who conducts ethnographic research on global health futures, the financialization of humanitarian aid, and the political economy of global health. Since 2007, she has been with the Faculty of Health Sciences at Simon Fraser University in Vancouver. In 2013, she won the Society for Medical Anthropology's Virchow Prize. She was a Fellow at the Käte Hamburger Kolleg think tank in Duisburg, Germany in 2014-2015. In 2016, she was a Mercator Fellow at the Universities of Leipzig and Halle, Germany. Since 2013, she has conducted fieldwork research in Sierra Leone on health data and finance. (slerikson@sfu.ca)

SESSION 7: EDUCATION, EXPERTISE AND FUTURES STUDIES

Keri Facer, University of Bristol

University Futures before Futures Studies

Futures studies and STS are not the first academic disciplines to deal with the future; nor are they the university's first attempt to position itself institutionally in relation to the future. Indeed, they are developing as distinct fields within a complex and multi-layered institutional history that encompasses diverse futures orientations: from the stewardship of medieval colleges; to the principles of experimentation and discovery guiding the post-enlightenment university; to the traditions of critique and reflexivity in the contemporary lecture hall. This paper will trace this deep history, exploring the latent and historical strategies for stewarding, critiquing and making the future that pre-existed the emergence of these fields and in so doing, contribute to the symposium's desire to 'build an interdisciplinary dialogue interrogating the goals and methods of futures studies'. In this way, the paper hopes to connect the symposium's debate to the wider intellectual and institutional history of universities.

In particular, the paper will explore the institutional history of future-making in universities in relation to the university-society nexus; examining how the boundaries drawn between academy and society are often associated specifically with different conceptions of the university's relation to 'the future'. This suggests that there are important and interesting ethical questions that face scholars working in explicitly futures-oriented disciplines in the university; not least - How are the boundaries between expertise being drawn and redrawn with the emergence of Futures Studies? and Who is invited and who excluded from these newly institutionalised practices of futures-making?

Keri Facer is Professor of Educational and Social Futures at the University of Bristol and Arts and Humanities Research Council Leadership Fellow for the Connected Communities Programme. She works on the relationship between educational practices and social, technological and environmental change. Her research focuses on three areas: 1. How cities adapt to change and the forms of learning that support civic empowerment and adaptation 2. The relationship between university and public knowledges in research collaboration 3. Educational futures, in particular the development of alternative forms of schooling. She was chair of the 2017 Anticipation Conference and has collaborated with a wide range of partners from the BBC, UNESCO and Microsoft to artists, community groups and city farms. Her publications explore a range of themes, from the theorization of the relationship between educational institutions and potential futures to innovations in augmented reality gaming to engagement with local, indigenous and community knowledge as a resource for social adaptation. She is currently working on two books: 'The role of the University as Engine of Anticipation' and the 'City as a Learning Commons'.

SESSION 1: PLAUSIBLE FUTURES

Nele Fischer and Sascha Dannenberg, Freie Universität Berlin

Troping Futures. Applying Philosophy of Language to Examine the Prefiguration of Continuity and Disruption

In general, the future is anticipated as a deviation from the present: future then is understood as an open space of potential states, connected to the present (as an already realized state) through different developmental paths. Thinking about such developments, whether exploring possibilities or creating preferable futures, is deeply connected to thinking about the continuities and disruptions shaping each path. One of the prominent problems then is to figure out what continues and what changes. Although closely linked to this problem, the foundations to reasonably assume continuity or disruption are rarely discussed in Futures Studies.

Building on H. White's Tropology, this paper examines theoretically how the elaboration on continuity and disruption is prefigured through specific tropes or narratives structures. These - at least implicitly - lead the selection of facts and their arrangement as well as their description, thereby constructing plausible developments. Using different narratives, assuming continuity/disruption is more or less plausible, and respectively leads to different assessments of (felt) probability. Consequently, we assume that the meaning and value of the distinction between possible, probable, plausible and preferable futures is at least as much linked to aesthetics as it is to epistemology.

Building on these theoretical elaborations, we look at specific case studies, questioning the way possible, probable or preferable futures are anticipated. In effect, we propose and test a well-known theoretical framework from the historical sciences as well as philosophy of language to advance the theoretical foundations of Futures Studies.

Nele Fischer studied Futures Studies (M.A.) at the Freie Universität Berlin (Germany) and is currently a Research Fellow in Futures Studies at Freie Universität Berlin. In her PhD thesis she elaborates on applying poststructural and semiotic approaches in Futures Studies.

Sascha Dannenberg studied Futures Studies (M.A.) at the Freie Universität Berlin (Germany) and is currently a Research Fellow in Futures Studies. His PhD is concerned with the systemic implications of language for the perception of futures.

SESSION 11: HISTORIES OF FS AND THE CORPORATE SECTOR

Bretton Fosbrook , University of Toronto

Conjuring Corporate Environments: Entanglements and Translations in the Methods of Scenario Planning in the 1960s and 1970s

Formulated by the notorious American defence strategist Herman Kahn at the Hudson Institute, and supported by over 100 multinational corporations including General Electric, Royal Dutch Shell, and Xerox, the Corporate Environment Program introduced scenario planning as a legitimate strategy for multinational corporations in the 1970s—a technique that prized stories over the latest data gathering and analyzing techniques in the fields of long-range and strategic planning. In the wake of rapid technological innovations, large-scale geopolitical turmoil, and rising critiques of modern industrial society from countercultural movements in post-1968 America, corporations wrestled with the shortcomings of their technological tools in the face of what they envisioned to be a turbulent future. This paper examines the jumble of contradictory epistemologies—including formal, rule-based techniques from World War II military strategy advancements, critical theories concerned with human reasoning, and socio-technical studies of science and technology from the fields of sociology, history, and philosophy—that the Hudson Institute consolidated as they conjured the changing "technological, economic, social, cultural and political" forces making up the future corporate environment. Inspirations for the Hudson Institute's scenario methods, like sociologist of science Robert Merton's paradigm and sociologist Daniel Bell's post-industrial society, points to the ways that corporate scenario planning developed in conversations with postwar critiques of science and technology, epistemologies that animated the early history of science studies as well as business strategy in the 1970s. By recovering the efforts of mid-to-late twentieth century corporate scenario planners, this essay explores how historical analysis that is alert to the entanglements between science studies and corporate techniques can shed light on pathways for new future alternatives.

Bretton Fosbrook is a Postdoctoral Fellow at the Institute for Gender + the Economy at the Rotman School of Management at the University of Toronto, and an affiliated researcher at the Technoscience Research Unit. He earned his PhD in Science Studies from York University in 2017. His research examines how corporate strategies, like scenario planning, have formed in response to future uncertainties and social and technological changes, like the increasing awareness of systemic racial and gender discrimination and catastrophic climate change.

KEYNOTE SPEAKERS

Peter Galison, Harvard University

The Buried Past of the Far Future: Scenario Thought in the Nuclear Age

Out of the late stages of World War II and on into the Cold War, came a new form of coping with radical uncertainty: scenario futures. Caught somewhere between apocalypse and bureaucracy, between science fiction on one side and a nuclear present, a new breed of futurists tried to narrate things to come. Back in the 1920s, scenarios were widely understood to be sketches of a larger story, glimpses, not a continuous dialogue or story. Bit by bit these short-form story-sketches took hold as a way of outlining an event, a "what if" imagination of the results of a fundamentally disruptive accident, attack, embargo or invention in order to project possible outcomes. These sometimes cataclysmic reflections made their way into economic and natural earthquakes, culminating, (in terms of the degree of futurity) in the attempt to imagine the world 10,000 as a governmentally-required prerequisite to opening the major nuclear waste repository near Carlsbad, New Mexico, the Waste Isolation Pilot Plant. The goal: warn our descendants--400 or even 40,000 generations from now about what we have done with our nuclear detritus so they would not accidentally blunder into it.
I conclude with some reflections on the kinds of futures that that scenario thought opens and forecloses.

Peter Galison is the Pellegrino University Professor of the History of Science and of Physics at Harvard University. In 1997 Galison was awarded a John D. and Catherine T. MacArthur Foundation Fellowship; won a 1998 Pfizer Award (for Image and Logic) as the best book that year in the History of Science; in 1999 received the Max Planck and Humboldt Stiftung Prize, and in 2018, the Abraham Pais Award in the History of Physics. His other books include How Experiments End (1987); Einstein's Clocks, Poincaré's Maps (2003),; and Objectivity (with Lorraine Daston, 2007). Among his films are "Ultimate Weapon: The H-bomb Dilemma" (with Pamela Hogan); with Robb Moss, he directed and produced "Secrecy" which premiered at Sundance (2008), and, also, "Containment," (2015), about the need to guard radioactive materials for the 10,000 year future. Galison has collaborated with South African artist, William Kentridge, on a multi-screen installation, "The Refusal of Time" (2012) and an associated chamber opera, "Refuse the Hour," and he is now making a feature-length documentary about black holes and limits of knowledge.

Wenceslao J. Gonzalez, University of A Coruña

The Future of the Internet: Prediction and Prescription of Applied Sciences in the Context of Complexity

A key aspect for our society is the future of the Internet, which will be played out in the short, middle, and long run as well as at the micro, meso, and macro levels. These temporal and ontological aspects concern two main human dimensions of the Internet: scientific activity and social consequences which will shape our social future to a large extent. These aspects focus this paper, which deals with the structural and dynamic problems raised by the development of the Internet.

First, regarding the structural and dynamic complexity of science, the role of prediction and prescription of the applied sciences related to the Internet require study (web science, network science, the specific science for the technological platform of the Internet, and data science). (i) This includes the prediction of the possible future in the short, middle, and long run of the sciences of the artificial used for the development of the Internet. (ii) The prescription of the patterns for solving problems at the micro, meso, and macro levels is also needed, because design sciences are applied sciences that should offer new solutions to the concrete problems of the Internet.

Second, the social consequences of the world wide use of the Internet —in particular, the web— also require prediction and prescription to deal with the problems —structural and dynamic— related to human possibilities of citizens. The use of the applied sciences of design is particularly important in two fields: education and communication, since they shape our social environment.

Wenceslao J. Gonzalez is Professor of Logic and Philosophy of Science (University of A Coruña). He is a Full Member of the *International Academy for Philosophy of Sciences*. He has been a Team Leader of the European Science Foundation program entitled "The Philosophy of Science in a European Perspective" (2008-2013).

SESSION 3: ANTICIPATION AND VISIONING

Dirk Hommrich and Paulina Dobroc, Karlsruhe Institute of Technology

Distorting Mirrors of the Present: Future Visions as Socio-Epistemic Practices

Visions are increasingly important elements in innovation processes and their regulatory governance. Our paper introduces a theoretical concept of future visions as socio-epistemic practices, which allows a multi-dimensional investigation of the formation, functions and effects of techno-futuristic visions in those processes.
First, we outline the conceptual framework which we use to analyze socio-technical images and imaginations of prospective scenarios: Visions are thought of as media, which capture several functions: 1. visions accomplish a translational and orienting function between the present and the future, 2. visions have a communicative function, 3. visions permit the coordination of practices and actors, and 4. visions bear the potential to activate their recipients.
Second, we exemplify our theoretical concept. One example is the vision of so called "brain-based learning and teaching" (BBLT), another one is the bunch of visions within the discourse on "openness". While BBLT tends to conceal the gap between the present and the future by emphasizing traditional problems of education and the educational system, the vision of "openness" in contrast highlights Open Data, Open Source, Open Access, Open Science, Open Government, etc., as vehicles towards a participatory, transparent and creative as well as collaborative future society. Our conclusion regarding both our examples and our theoretical framework is that there is a need for a comprehensive systematic comparison of today's future imaginations – at least if we try to come to terms with those anticipatory signs which "preflect" contemporary socio-technical conditions so that future visions could also be called distorting mirrors of the present.

Dirk Hommrich studied philosophy, history, sociology and political science at the Universities of Karlsruhe and Frankfurt on the Main, Germany with a PhD thesis on the visual culture of popular brain research. 2012-2015 He was Lecturer at the Department of Humanities and Social Sciences, Helmut Schmidt University / University of the Federal Armed Forces Hamburg. In 2012 he was a freelancer at CC Foresight Fraunhofer Institute for Systems and Innovation Research ISI, Karlsruhe. Since 2017 he is a senior researcher at the Institute for Technology Assessment and Systems Analysis (ITAS) of the Karlsruhe Institute of Technology (KIT) and a board member of the Institute for the Study of Culture Heidelberg.

Paulina Dobroc studied Polish philology in Poland, German studies in Germany at Karlsruhe Institute of Technology (KIT) and Comparative studies in Germany at Johannes Gutenberg University of Mainz. Since 2016 she is working on her PhD at KIT at Institute for Technology Assessment and Systems Analysis (ITAS) and at Institute for German Studies (Science Communication). Dissertation title: "Facets of openness' vision and its social consequences. Linguistic discourse analysis of the Open Source concept". In 2017 she was recipient of a PhD Scholarship by Hans Böckler Foundation.

SESSION 12: INFRASTRUCTURE FOR THE FUTURE: ENERGY, ENVIRONMENT, FOOD

Kamilla Karhunmaa, Harvard University and University of Helsinki

Carbon Neutrality and Feasible Futures in Finnish Parliamentary and City Council Debates

How do political actors at different scales discuss what is feasible when proposing governance options for energy policy? Making energy policy involves debates about a better future, but also about the role of policy and governance in bringing about these futures. I build on the concept of sociotechnical imaginaries (Jasanoff 2015) to discuss not only what are viewed as good and desirable energy futures but also what are suggested as feasible means of attaining those futures. I conduct a comparative analysis of the proposed means for reaching carbon neutrality at the national and city level in Finland. The analysis is based on documentary materials and speeches in the national parliament of Finland and the city council of Helsinki in the years 2011-2015. I examine how actors at different levels envision the scope and limitations of their own actions in making energy policy in the context of uncertainty. Broad sociotechnical imaginaries like carbon neutrality unite actors across governance scales to hold similar views about desirable energy transitions. Differences arise, however, in the proposed ways for attaining carbon neutrality with parliamentarians stressing the responsibility of the state to create stability whereas city councilors focus on promoting flexible policy measures in response to technological development. What are presented as good and desirable means for achieving carbon neutrality is strongly shaped by what lies within the scope of possible action at different governance levels.

Kamilla Karhunmaa is a PhD candidate at the University of Helsinki and a Visiting Fulbright Research Fellow at the Program on Science, Technology and Society at Harvard University. Her PhD examines how the relationships between change and stability in energy policy and transitions are debated in Finland. She is interested in questions related to expertise and knowledge production in environmental policy. Kamilla has a BSc with Honours in Environmental Policy from the London School of Economics and a Master's in Social and Public Policy from the University of Helsinki. She has previously worked on the intersection of climate change policy and development policy at Finland Futures Research Centre, University of Turku.

SESSION 7: EDUCATION, EXPERTISE AND FUTURES STUDIES

Sandra Kemp, Lancaster University and Imperial College, London.

'Powerfully Seductive Forms of Mass Public Entertainment and Education': Narratives of the Future at Scientific Soirées

'History alone', remarked Eric Hobsbawm over 35 years ago, 'provides orientation and anyone who faces the future without it is not only blind but dangerous, especially in the era of high technology' (1981, 16).

Taking scientific soireés as a case study, this presentation will explore the potential contribution of the growing field of visual STS to understanding the exploration of the futures as a material, social and institutional practice. By the mid-19th century a typical soirée programme included an informal evening meeting at a museum, learned society or civic building, a trade show-like exhibition and a number of lectures (Alberti 2003). How have narratives of the future been mobilised and materialised through the informal networking and encounters with new technologies at these events? And are soirées forgotten or marginalised sites of future-making, amongst what Bennett (2004) called the 'secondary discourses' of exhibitions.

By focussing how our understanding of 'futures past' (Koselleck 1985), can inform our anticipations of the future, this presentation also explores aims to broaden perceptions of the inter-relationships between past, present and future, and the agency of different understandings of history and of historical methodologies in the process. What do the internal geographies of such events tell us about the visions for the future development of the objects and expertise within the specialist disciplines concerned? In foregrounding the central role of museums in relation to futures, the presentation posits curatorship and exhibition development as powerful methodological resources for futures studies, reflecting social, cultural and economic concerns.

Professor Sandra Kemp is Director of the Ruskin Library, Museum and Research Centre for Culture, Landscape and the Environment at Lancaster University and Visiting Professor at Imperial College London (ICL). Her futures-related work includes the exhibition and monograph, *Future Face: Image, Innovation, Identity* at the London Science Museum. She led *The Future is our Business: The Visual History of Future Expertise* project at the Victoria and Albert Museum, which investigated visual manifestations of futures expertise in a range of disciplines from the Renaissance to-date. Her current project *Universal Histories and Universal Museums* (https://universalhistories.org/) on the role of the museum in building knowledge about the future is in collaboration with museums in London and Paris.

SESSION 1: PLAUSIBLE FUTURES

Eric Kemp-Benedict, Stockholm Environment Institute

A Critical Realist Approach to Scenario Modeling Practice

Futures Studies emphasizes that the futures are not predetermined; our own actions, those of other people, and the developments and responses of the systems of which we are a part can result in qualitatively distinct worlds. Nevertheless, some outcomes are not possible, or highly unlikely, because of thermodynamics, genetics, or regular features of social and technological change. The underlying reality constraining our actions can be captured by quantitative and qualitative models, which help keep a foresight exercise within plausible bounds. But models in practice have also been straitjackets, ruling out worlds that are possible, although quite different from the one we currently inhabit.

Following Wendell Bell, this presentation approaches Futures Studies, and scenario modeling, from the perspective of critical realism. Noting that systems are open, while models must be closed to be solved, we introduce the idea of "conditional closures". This approach is often followed in heterodox macroeconomics, as noted by Mark Setterfield. In Futures Studies, alternative closures can take the form of "posits" about the future. We shall argue that this is consistent with the spirit of quantitative scenario modeling practices such as Story-and-Simulation and the eXternal factors-policy Levers-Relationships -Metrics (XLRM) approach, and qualitative modeling methods such as morphological field analysis and cross-impact balances. But posits can also suggest alternative *mechanisms*, as well as closures, which are rarely considered when building scenario models. We position existing methods in a critical realist frame to identify commonalities and potential areas for improvement in scenario modeling practice.

Eric Kemp-Benedict is a senior scientist at the Stockholm Environment Institute in Somerville, MA. His research focuses on economic analysis of a sustainability transition. From the time Eric joined SEI in 1997, he has contributed to studies on diverse topics of relevance to sustainability at national, regional, and global levels. He led SEI's Asia Center from 2013 to 2016. Eric has been involved in high-level foresight activities, including for the Global Scenario Group, UNEP Global Environment Outlook, and development of the Shared Socioeconomic Pathways. He holds a Ph.D. in theoretical physics from Boston University.

SESSION 12: INFRASTRUCTURE FOR THE FUTURE: ENERGY, ENVIRONMENT, FOOD

Gregg Macey, Brooklyn Law School, Harvard and MIT

Environmental Legal Futurism

Technological forecasts from the late 1960s and early 1970s were remarkably accurate in some respects. *The Year 2000* (1967), for example, foretold ubiquitous computers, networked communications, and the capacity for pervasive surveillance, although it also promised artificial moons and interstellar travel. Forecasts are even more problematic when we venture from technological innovation to the social, economic, and legal institutional changes that enable or constrain it. In part, this reflects a circumstance where lawyers and legal scholars, frequently engaged with the futures of legal practice, are less systematically concerned with the futures of the laws themselves and related institutions such as regulatory design tools. The present study concerns how legal scholars and regulators engage in research design, analysis, and response to imagined environmental legal futures. I rely on three data sets: hundreds of law review articles and symposia, published between 1978 and 2018, that explicitly address "the future of environmental law," broadly defined; U.S. Environmental Protection Agency five-year strategic plans and efforts to purposefully engage in legal futurism (e.g., "Next Generation Environmental Compliance"); and statutory futurism (e.g., Clean Air Act and Clean Water Act timetables for "zero emissions" and "integrity of the nation's waters"; the National Environmental Policy Act's brief concern for "worst-case scenarios"). Environmental law grapples with futures in ways that parallel and diverge from prevailing approaches (e.g., time horizons, scenario-building, complex adaptive systems). The co-evolution of knowledge and governance in "environmental legal futurism" yields important constraints, absences, and spaces for intervention and reform.

Gregg Macey is Professor of Law at Brooklyn Law School, where he teaches courses on environmental law and property, Visiting Professor at MIT, where he teaches a course in environmental justice law and policy, and Visiting Research Fellow with Harvard's STS Program. His research interests include environmental and energy law, environmental health, and organizations. His articles appear in *Georgetown Law Journal*, *Environmental Health*, *Arizona State Law Journal*, *Cornell Law Review*, *Environmental Management*, and the *Journal of Policy Analysis and Management*, among other journals. Professor Macey has also published chapters in *Risk Analysis of Natural Hazards* (2016) and *Legal Pathways to Deep Decarbonization in the United States* (2018), as well as a co-edited volume on the future of the Superfund program, *Reclaiming the Land* (with Jon Cannon).

SESSION 12: INFRASTRUCTURE FOR THE FUTURE: ENERGY, ENVIRONMENT, FOOD

Jens Marquardt, Harvard University

Contested Visions of the Future: Germany's Energy Transition Between Revolution and Technocentrism

Although the Fukushima nuclear disaster is widely perceived as a turning point in Germany's energy politics, describing it as an embodiment of a German energy transition is highly problematic. Traced back to its origins in the 1980s, the "Energiewende" is entangled with visions for the energy system and the future of society at large that stand in stark contrast to the policies implemented under the heading of the Energiewende in response to Fukushima. While the term has been narrowed down to innovations, measurable targets for renewables and ideas of technological leadership, other normative imaginaries of the Energiewende related to sufficiency, energy democracy or people participation have become less visible. Looking at the Energiewende from a future studies perspective reveals a story of interpretative struggles, conflicting norms, power relations, modes of settlement and changing utopian – and dystopian – visions of the future of society. Paradoxically, the triumph of renewable energy technologies as once fostered by environmental groups goes hand in hand with the fade and marginalization of more profound societal changes that these groups once fought for. This contribution investigates how competing socio-technical imaginaries of desired futures (Jasanoff 2015) play out here. News articles and historical documents primarily from the Green Party, the federal government and NGOs form the basis of an analysis that links the materialized discourse to power relations in society. Such a perspective sheds light on modes of marginalization, silencing and powerful interest groups' strategies to colonize visions of the future (de Leon, 1984). Linking these phenomena to the sociology of expectations (Brown & Michael, 2010) uncovers how the emergence of a technology-dominated narrative undermines the demand for more revolutionary societal change through the energy transition as once envisioned by the anti-nuclear movement.

Jens Marquardt is a visiting research fellow at the Science, Technology, and Society Program at Harvard, a lecturer at the University of Halle and associated with the Environmental Policy Research Centre in Berlin. Jens is particularly interested in the links between social sciences and environmental technologies, the role of power and coordination in multi-level governance systems, and the process of policy implementation. Jens received his Ph.D. in Political Science at the Freie Universität Berlin in 2015. His book "How Power Shapes Energy Transitions in Southeast Asia" investigates the complex relations between power and environmental governance.

GUEST OF HONOR

Riel Miller, UNESCO

Transforming the Future: Anticipation in the 21st Century

What does it mean to "transform the future"? Are the conditions for conscious human anticipation changing? Recent work on the apacity to 'use-the-future', defined as the ability to understand different anticipatory systems and processes, point to answers along both ontological and epistemological lines. This presentation will explore the theory and practice of the field of Futures Literacy (the capacity to 'use-the-future') presenting recent results from the UNESCO Futures Literacy Project. This project has conducted over 36 Futures Literacy Laboratories (FLL) in more than 20 countries, testing the effectiveness and efficiency of a Futures Literacy Framework for the design and implementation of FLL. The results of this research provide proof-of-concept level evidence that being able to explicitly take advantage of the diversity of conscious human reasons and methods for 'using-the-future' alters the conditions for both innovation, understood as the general category of 'ontological expansion', and for the conscious relationships – reflexive and performative – that humans construct to connect past, present and future. The development of Futures Literacy calls into question the current dominant framing of human agency, opening up a paradigmatically distinct perspective on how humans might pursue their capacity to be free.

Riel Miller is currently Head of Futures Literacy in the Research, Policy and Foresight Section, Social and Human Sciences Sector, at UNESCO headquarters in Paris. He holds a PhD in Economics from the New School for Social Research. For over thirty years Riel Miller has been pioneering advances in the theory and practice of using the future as a means to improve management and public policy, with a focus on transformational leadership. He has designed and implemented hundreds of projects around the world, deploying innovative ways of using the future in order to change what people see and do. In all his projects Riel walks-the-talk of co-creation, harnessing the collective intelligence of everyone, from CEOs and Prime Ministers to shop-floor workers and school children. He is an experienced and innovative educator, a pioneer of the field of Futures Literacy and the Discipline of Anticipation. He is widely published in academic journals and other media on a range of topics, from the future of education and the Internet to the transformation of leadership and productivity. He worked for the OECD for over a decade and as a Senior Manager in the Government of Ontario. He established and ran a consultancy, Xperidox, and has taught at universities around the world. He is the editor of the upcoming book (Spring 2018), *Transforming the Future: Anticipation in the 21st Century*, published with Routledge.

SESSION 9: FORESIGHT IN PRACTICE

Sumin Myung, Johns Hopkins University

Is The Word for the Future Forest?: Forest Sciences, Long-Term Planning, and Nested Futures in South Korea

The surge of the "Anthropocene" scholarship in the field of anthropology has animated conversations about the future, not just as the object of inquiry but also as the form of political and ethical imaginations including "hope," "becoming otherwise" or "beyond the human." Despite their legitimate valences, I understand that many of these interventions are burdened with moral impulses at the risk of losing their touch with empirical complexities. Drawing on my ethnographic and archival research on forest sciences, I attempt to interpose in the quandary. The government and forest scientists in South Korea claim that the nation is a rare case that "successfully" afforested its territory after undergoing colonial exploitation, civil war and industrialization. However, these anthropogenic forests are facing new challenges such as climate change, aging trees and ecological degradations that overshadow the future of forests. While these problems are overdetermined by the recent past, a future-oriented and long-term solution—the 6th National Basic Plan of Forest (2018-2037)—emerges based on scientific modeling. Rather than just dissecting the Plan itself, this paper examines the endeavors or debates of forest scientists in labs, field-sites and conferences. They work across multiple scale-domains from the cellular level to the atmospheric level, while running into what I call nested futures. This paper demonstrates what sorts of frictions and tensions arise in their efforts and in what ways these discrepancies are mapped onto emerging futures—not the singular and overarching future. I will also discuss the contested places of moral impulses and historicity in the accounts of nested futures.

Sumin Myung is a PhD student in Anthropology at Johns Hopkins University. His research interest is the history and politics of the field sciences in East Asia, with special focus on forest sciences.

SESSION 4: HEALTH AND FUTURES STUDIES

Karen Dam Nielsen & Marianne Boenink, University of Twente

Critical Reflections on "Futuring" in Responsible Research and Innovation: The Case of Alzheimer's Research

Located at the intersection of philosophy and STS, the field of Responsible Research and Innovation (RRI) offers an explicitly normative framework for "futuring" (imagining, exploring and shaping the future), in particular related to technological innovation. One of the central assumptions of RRI is that futuring practices can and should be democratized: engaging stakeholders in anticipatory deliberation about emerging technologies is supposed to contribute to shaping futures that are ethically and societally desirable (von Schomberg 2013; Owen et al 2012; Blok 2014). In this paper, we reflect on this assumption, starting from the practical challenges we encountered when working as RRI-inspired ethicists in a research project on biomarkers for diagnosing Alzheimer's Disease (AD), engaging patients in an exploration of desirable futures of AD diagnostics. While never an easy feat, futuring has proven particularly complex in this case. First of all, we (and the participants) have grappled with an elusive technology – immaterial and highly hypothetical in its utility. Secondly, anticipating and deliberating futures seems particularly "slippery" as horizons of people with dementia quickly fade or are deliberately moved as close as possible to the present. This has a number of intertwined implications that we boil down to one question: How can stakeholders even begin to anticipate, let alone shape, desirable (technological) futures when elusiveness of research/technology and different personal horizons may make 'the future' so distant that it becomes unimaginable or even irrelevant? We argue that "responsible futuring" requires further attention to this question – methodologically, empirically and philosophically.

Karen Dam Nielsen is a postdoctoral researcher at the Department of Philosophy, University of Twente, The Netherlands. Her research focuses on social and ethical implications of emergent technologies in healthcare and, in particular, the role of patient and public involvement in innovation practices. While previously having studied patient participation in e-health innovation, her current research is on participatory, ethical assessment of biomarkers for Alzheimer's disease. She works at the intersection between STS, RRI and empirical philosophy.

Marianne Boenink is a health scientist and philosopher by background. She currently is Associate Professor in Philosophy and ethics of biomedical technologies at the University of Twente in the Netherlands. She is also Program Director of the MSc Philosophy of Science, Technology and Society. Her research particularly focuses on conceptual and normative analysis of visions of the future in biomedicine, on ethics of emerging diagnostic and prognostic technologies, and on developing methods for early societal and ethical assessment of emerging technologies.

KEYNOTE SPEAKERS

Naomi Oreskes, Harvard University

Grappling with the future: What use is fiction?

In 2014, Erik Conway and I published a novella, *The Collapse of Western Civilization: A View from the Future*. One might think of the book as a non-numerical simulation model: it was an attempt to take the projections of the Intergovernmental Panel on Climate Change (IPCC) reports and translate them into human terms. In this talk, I will discuss the reception of the book—where it has connected and where it has not—and consider how and why fiction may be effective where fact is not.

Dr. Naomi Oreskes is professor of the history of science and affiliated professor of Earth and planetary sciences at Harvard University, and an internationally renowned geologist, science historian, and author. She is the author of both scholarly and popular books and articles on the history of earth and environmental science, and in recent decades has been a leading voice on the issue of anthropogenic climate change. In 2014, Oreskes had the opportunity to meet Pope Francis at a special meeting at the Vatican on climate change and sustainability, and in 2015 wrote the introduction to the Melville House edition of the Papal Encyclical on Climate Change and Inequality, *Laudato Si'*.

CANCELED

UNFORTUNATELY NAOMI ORESKES CANNOT GIVE HER LECTURE TODAY AS SHE IS RECOVERING FROM SURGERY AFTER A SKI INJURY

KEYNOTE SPEAKERS

Roberto Poli, UNESCO Chair in Anticipatory Systems – University of Trento

Anticipation: The Philosophy of the Future

A philosophy of the future sees the world as an unfinished process, as a continuous tendency towards new horizons. Within this process, what matters most is the tendency itself, more than its starting and ending points. To understand this situation, one needs an ontology of the not-yet, of being as processual, and therefore of being understood as an incomplete, still unfolding reality, indeterminate with respect to its endpoint, leaving room for entirely new determinations as well as for growing or maturing ones. A philosophy of the future provides guidance for distinguishing genuine from not genuine futures. Similarly, it distinguishes between utopia as focused on the endpoint and utopia as focused on everyday life, especially its humblest, tiniest aspects – which is a way of saying that the roots of the future are in the present, if only we learn to see them. My talk sketches the categorical grid that may underlie and support futures studies.

Roberto Poli (PhD Utrecht) is Associate Professor of Philosophy of Science at the University of Trento (Italy).
Poli has been awarded the first UNESCO Chair in Anticipatory Systems http://www.projectanticipation.org, is fellow of WAAS—World Academy of Art and Science and STIAS—Stellenbosch Institute for Advanced Study. Poli is editor-in-chief of *Axiomathes* (Springer), editor of the series *Categories* (De Gruyter) and *Anticipation Science* (Springer). Poli heads the Master programme in Social Foresight. With a background in both the School of Brentano and phenomenology from one side and logic and formal modeling on the other side, Poli's research interests include
Anticipatory systems, i.e. system able to take decisions according to their possible future development (R. Poli, *Introduction to Anticipation Studies*, Springer 2017; Poli (ed.), *Handbook of Anticipation*, Springer 2018).
Ontology, in both its traditional philosophical understanding and the new, computer-oriented, understanding (*ALWIS. Ontology for Knowledge Engineers*, PhD Thesis, Utrecht, 2001; *Theory and Applications of Ontology*, 2 vol. Springer 2010).
Poli has published six books, edited or co-edited more than 20 books or journal's special issues and published more than 250 scientific papers.

SESSION 2: GLOBAL HISTORIES OF FUTURES STUDIES

Joanna Radin, Yale University

How Cold War Anthropology Tried (And Failed) To Decolonize 'Third World' Futures

This paper focuses on the discipline of Anthropology's engagement with futurology in the 1970s. At a time of deep anxiety about planetary social order and natural resource scarcity, a group of anthropologists called for a decolonization of ideas about the future, a move away from Aristotelian values towards what they hailed as a "polyocular" vision of human culture. The movement involved well known figures like Alvin Toffler, Margaret Mead, Sol Tax, and Elise Boulding (regarded as the "matriarch" of the Peace Movement) and culminated in a volume titled *Cultures of the Future*, published in 1978. Crucially, it also privileged—or at least attempted to privilege—the perspectives of anthropologists less known among Western audiences, from Africa, Latin America and Asia-Oceania. These non-Western experts articulated radically different visions of knowledge and with it, of human futures.

Despite the ambitious and progressive political nature of this effort, the project was not readily embraced. This paper offers a historical and philosophical account of this moment, bringing in considerations of the then incipient field of STS about the sociology and politics of knowledge. It provides an alternative narrative of Cold War anthropology that disrupts and reorients narratives of East vs. West, to foreground the then latent promises ascribed to what French anthropologist Alfred Sauvy imagined for the "third world," a world from which alternatives to Capitalism or Communism would emerge. I consider how Euro-American investments in "the future" have proved resistant to alternative epistemologies as I conclude by calling attention to these anthropologists' simultaneous interest in contemplating culture on planetary alternatives to Earth.

Joanna Radin is an Assistant Professor of History of Medicine at Yale and core member of the Program in History of Science and Medicine. She also holds appointments in History; Anthropology; American Studies; Race Ethnicity and Migration; and Religion and Modernity. She is the author of *Life on Ice: A History of New Uses for Cold Blood* (University of Chicago Press, 2017), a history of the biobank, named a "best book" by *Nature*. With Emma Kowal she edited *Cryopolitics: Frozen Life in a Melting World* (MIT University Press, 2017), which examines the ethical and political challenges presented by the emergence of practices of freezing across realms of reproduction and conservation. Her current work examines the history of postwar biomedical and anthropological ideas about the future.

SESSION 8: HISTORY, IMAGINARIES AND THE FUTURE

Sophia Roosth, Harvard University

The Genesis of Life in the Valley of Death

Near the border of Swaziland, a small town in South Africa faces socioeconomic ruination and medical crisis. As coal, gold and asbestos mines have shut down, the local economy has plummeted, and today the town is best known as having been the site of a notorious Apartheid prison. What future might await such a place? One possible answer is its distant past. Rich life teemed on this land 3.5 billion years ago, and geologists now recognize the rocks in the surrounding mountains as harboring some of the most ancient putative life-forms on Earth. This talk reports on anthropological fieldwork I conducted with geobiologists, researchers who combine the tools, methods and theories of the earth and life sciences to study the co-evolution of Earth and its biosphere. They are here to study Archean rocks of South Africa, imaginatively projecting themselves into a distant past when this land was a shallow ocean shelf devoid of oxygen beneath a pale young sun. They also seek to make this land a UNESCO World Heritage Site and tourist destination, which would revitalize the local economy by drawing visitors to see the fossilized remains of ancient volcanoes, microbial mats and iron-rich sea floors. In narrating this tale of uncertain futures and primeval pasts, I attend to how problems of historical periodization run parallel to demarcating geological eons. Further, I ask how geological and political temporalities might function as allegories for one another. Here, biographical, national and epochal time-scales are interleaved as shared imaginaries of perpetual crisis.

Sophia Roosth is a historian and anthropologist of the life sciences. She served as the 2016 Anna-Maria Kellen Fellow of the American Academy in Berlin and the Joy Foundation Fellow of the Radcliffe Institute for Advanced Study (2013-2014). In her first book, *Synthetic: How Life Got Made* (Chicago 2017), Roosth asks what happens to "life" as a conceptual category when experimentation and fabrication converge. Grounded in an ethnographic study of synthetic biologists, she documents the profound shifts biology has undergone in the post-genomic age. Roosth publishes widely in journals including *Critical Inquiry*, *Representations*, *Differences*, *American Anthropologist*, *Science*, *Res* and *Grey Room*.

SESSION 1: PLAUSIBLE FUTURES

Yashar Saghai, Johns Hopkins University and The Millennium Project

How do We Get from Now to Then? On the Merits and Limits of Explanatory Pluralism in Future Scenarios

The approach to scenario construction that Herman Kahn advocated states that "scenarios are hypothetical sequences of events constructed for the purpose of focusing attention on causal processes and decision-points" (Kahn and Wiener, 1967). Therefore, the job of scenario builders is not limited to presenting images of challenging and relevant alternative futures. Rather, the selection of a set of alternative futures has to be non-arbitrary, inform decisions, and have a heuristic value. To do this, scenario builders and analysts ought to expand their imagination and knowledge-base and causally explain how we could *plausibly* get from the present to selected futures. Scenario theorists and practitioners have naturally criticized this influential approach, given well-known philosophical disputes about the meaning and demandingness of causal explanations and notorious practical difficulties in hunting causes in sciences and other social practices. But they went beyond raising objections: they have put forward several alternative approaches to Kahn's style of scenario construction. In this paper, I critically discuss some of them. Supporters of the most radical view advocate abandoning the requirement of plausibility altogether and argue for a pluralistic view according to which past, present and future worlds are constructed. They do not demand plausible explanations to support the art of worldmaking (Vervoort et al., 2015). I raise objections against this radical approach and I sketch an alternative view, "bounded explanatory pluralism," for scenario construction theory and practice.

Yashar Saghai, MA, PhD, is a Research Scholar and Associate Faculty at the Johns Hopkins Berman Institute of Bioethics and a Senior Scholar at The Millennium Project: Global Futures Studies and Research, a DC-based think tank. His research focuses on philosophy *of* foresight and philosophy *with* foresight practice, as well as practical ethics and political political philosophy. The topical focus of his interdisciplinary work is on health, food, the environment, behavioral economics, and AI. At Hopkins, he was the Director of the Global Food Ethics Project and lead a project on global food futures in collaboration with a team from Wageningen University & Research in the Netherlands. He holds a Ph.D. in Philosophy from Georgetown University and several graduate degrees in Philosophy and Medical Ethics from the University of Paris, in his native city. More information here: https://yasharsaghai.com.

SESSION 4: HEALTH AND FUTURES STUDIES

Robin Wolfe Scheffler, MIT

Managing the Future: Planning Cancer Virus Research at the National Cancer Institute

In 1964, the US National Cancer Institute established the Special Virus Leukemia Program (SLVP), a program that aggressively sought to develop a cancer vaccine using contracts to manage research in molecular biology and virology, spending the equivalent of six billion dollars in the next fifteen years. Remarkably, however, the object of the SLVP—a human leukemia virus—was not even known to exist. The SVLP represented a milestone for both cancer virus research and the development of 'big biomedicine,' presaging the future-based innovation schemes of the biotechnology industry by decades. At midcentury, the administrators of the SVLP drew deeply upon the philosophy of science and management theory in an effort to anticipate the future of biomedical research.

Through a genealogy of the SVLP's management structures this paper traces the emergence of cancer viruses as "administrative objects." Cancer viruses stood at a juncture of the crisis atmosphere stoked by childhood disease advocacy and the articulation of Cold War research and development strategies. This atmosphere redefined the central question as one of not *if* human cancer viruses existed but *when* a human cancer vaccine would be developed. By foregrounding temporal urgency, these forces fashioned leukemia viruses as objects for management before they were recognized as scientific objects. These administrative frameworks gave planners a vocabulary to operate within future discoveries rather than current scientific knowledge. While this envisioned future may not have come to pass, the infrastructure built upon these administrative objects played a vital role in the emergence of new forms of molecular object-hood for cancer viruses.

Robin Wolfe Scheffler holds the Leo Marx Career Development Assistant Professorship in History and Culture of Science and Technology in the Program in Science, Technology, and Society at MIT. His first book, A Contagious Cause: The Search for Cancer Viruses and the Growth of American Biomedicine, will appear with the University of Chicago Press in 2019. His second book project, Building a Gene Economy, examines the emergence and growth of the biotechnology industry in the Boston area.

SESSION 4: HEALTH AND FUTURES STUDIES

Ari Schick, Harvard University

Understanding the Past and Rethinking the Future of Anticipatory Bioethics

Much like futures studies, professional bioethics in the U.S. emerged partly in response to growing public concern over technological futures. Developments in molecular genetics and embryology in the 1960s-70s were linked in the scientific and popular imaginations with nearing futures in which human reproduction and evolution would come under technoscientific control. With scientists no longer seen as trustworthy arbiters of such futures, ethicists assumed a mediating role, contributing to the discourse and field that became known as bioethics.

Given the centrality of technological futures to early bioethics, its practitioners might have developed methods for analyzing possible futures, perhaps building on successes and failures in areas such as technology assessment. Instead, as it became institutionalized in the 1970s-80s, mainstream bioethics primarily sought to focus on newly deployed biotechnologies, leaving technological futures at the margins. Later, when the Human Genome Project's ELSI initiative did make anticipated futures a central concern, bioethicists simply applied the dominant modes of analysis developed for present-day issues. Anticipatory bioethics therefore proceeded without well-formulated goals or sound theoretical and methodological foundations.

Future-oriented bioethics has only become more prominent over the past several decades, but its deficits have seldom been systematically addressed. Bioethicists must begin to approach anticipatory and speculative discourses as distinct aspects of bioethical inquiry, incorporating resources developed at the intersection of futures studies and STS. Scholarship on the nature and function of technological expectations and sociotechnical imaginaries will be particularly important to foster bioethics' appreciation of its own place in the expectational economies that drive technoscience.

Ari Schick is a fellow-in-residence at the Edmond J. Safra Center for Ethics at Harvard University. He received a doctorate in Philosophy from Michigan State University in 2014 and has since held research fellowships in the US and Israel. He is currently completing a book on speculative bioethics and related discourses on future technologies.

SESSION 12: INFRASTRUCTURE FOR THE FUTURE: ENERGY, ENVIRONMENT,FOOD

Tanja Schneider, University of St. Gallen and University of Oxford

Enacting Food Futures: Sociotechnical Imaginaries in Food Tech Entrepreneurs' TED talks

The future of food is a topic that is controversially discussed in a wide range of sectors and settings, including academia, industry, government and international organizations. In this paper I focus on yet another sector that contributes to debates on the future of food: food start-ups. In recent years a vanguard of entrepreneurs based in Silicon Valley and beyond has been developing novel foods and agricultural technologies – so-called foodtech and agtech innovation - with the aim to transform the way we produce, distribute and consume food. What is particularly interesting about many of these start-ups is how they present their products or services as market-based solutions to address the problem of food security. In this paper I explore entrepreneurs' promises and expectations related to the novel food products they present. I consider start-ups as 'promissory enterprises that create forms of value that rest on expectations of the future'. To do so, I conduct a narrative analysis of purposefully selected YouTube videos by food and agtech entrepreneurs presenting a diverse set of sustainable solutions, ranging from insect-based proteins and vertical farming to laboratory-cultured meat.

In particular, I attend in my analysis to 'future-oriented abstractions' expressed in these videos and consider how these contribute to broader 'sociotechnical imaginaries' of technology-enabled food futures. These imaginaries can be vital in framing collective ideas of how to achieve food security. They privilege the use of novel technologies over other potential solutions for achieving food security as desirable and attainable.

Tanja Schneider is Senior Lecturer in Sociology at the Institute of Sociology, University of St. Gallen, Switzerland, and Research Associate at the Institute for Science, Innovation and Society (InSIS), University of Oxford, UK. Her food-related research focuses on novel foods, food marketing and digital food activism (Routledge, 2018), and is situated at the intersections of science and technology studies (STS), economic sociology and critical food studies. Tanja's latest research project explores the uptake of venture capital in food and food-related settings at the forefront of developing novel materials, technologies and business models affecting food production, distribution and consumption.

SESSION 6: NORMS IN FUTURES STUDIES

Florian Schütz, Johann Jakob Häußermann, Marie-Lena Heidingsfelder and Martina Schraudner, Fraunhofer IAO, Center for Responsible Research and Innovation, Berlin; Freie Universität Berlin; Institute of Philosophy; Technische Universität Berlin

Who Shapes our Future? – On the Normative Status of Citizen Engagement in Research and Innovation

Increasingly, national and international strategies for research and innovation prioritize greater public involvement in order to enhance the responses to societal challenges. Often such arguments are underpinned by consequentialist arguments of superior outcomes, ethical reasoning of equal participation or by concerns of legitimacy in regard to tax-paying citizens.

In a first step, we present results of the project *Shaping Future,* which aimed at developing a new approach for public engagement in research planning based on methods from social sciences and design research. Thereby, laypersons were empowered to articulate their needs and reflect on desirable futures. We examine the scientific discourse on participatory shaping of the future focusing on methodological challenges and issues of philosophy of science, such as the freedom of science and research.

However, what remains largely unexplored by current research is the perspective of those who are to be involved – the citizens themselves. So far, almost no research has been done on their preferences and motivations toward participatory processes. In a second step, we therefore present empirical insights based on 50 interviews with laypersons having participatory experience about their opinions on the value of such interaction and the goals it should pursue.

Finally, we scrutinize the normative status of participatory concepts in the context of broader debates in political philosophy.

This paper offers an interdisciplinary perspective, which links innovation studies, science and technology studies, design theory and ethics. In this way, we provide a first step in investigating public preferences toward participatory approaches and discussing their normative status.

Florian Schütz is responsible for *Innovation Ecosystem Strategies* at Fraunhofer Center for Responsible Research and Innovation. His studies focus on the management of research and innovation with the aim to foster knowledge and technology transfer between science, industry, government and society. In particular he develops new approaches for radical innovation and business model innovation with a high societal impact. Over a number of years, he has conceptualized and conducted a range of research and consulting projects for scientific, political, and commercial organizations. His areas of expertise include social studies and innovation research.

Johann Jakob Häußermann works at Fraunhofer Center for Responsible Research and Innovation. He holds a Master's Degree in Philosophy, Politics and Law from the Freie Universität Berlin and is currently preparing for a PhD. He works at the intersection of philosophy and economics with a focus on ethics, innovation, and technology. In different research and consultancy projects he develops participatory and inclusive innovation processes and ethical frameworks for business and technology. Recent working papers focus on normative aspects of behavioral economics, fairness in international trade and concepts of responsible innovation.

SESSION 6: NORMS IN FUTURES STUDIES

Marie-Lena Heidingsfelder works at Fraunhofer Center for Responsible Research and Innovation. Current projects focus on need-oriented research planning and on technology and knowledge transfer. As media and communication scientist, Marie holds a binational Bachelor Degree from the Bauhaus University Weimar and the Université Lumière Lyon II, and a Master's Degree from the Technical University in Berlin. She is a PhD candidate at the University of the Arts Berlin with a research focus on science communication and design fiction. She co-develops teachings and gives classes at University of Konstanz on the topics of innovation and diversity management.

Martina Schraudner is the Head of Fraunhofer Center for Responsible Research and Innovation. Her research focuses on methods, instruments and processes to make diversity accessible and manageable for organizations and companies. She is a member of several national and international selection committees.

SESSION 2: GLOBAL HISTORIES OF FUTURES STUDIES

Elke Seefried, University of Augsburg and Institute for Contemporary History Munich/Berlin

Cold War Futures? Political Epistemologies and Flows of Knowledge in Transnational Futures Studies, 1950-1990

This presentation provides a historical overview of transnational 'futures studies' from the 1950s up to the 1980s, exploring both the impact the Cold War had on the field and the limits of this impact. It has three sections. First, I concentrate on the USA and Western Europe, analyzing the role Cold War Science and the Ford Foundation played in forming the emergent discipline of futures studies during the 1950s and 1960s. Secondly, I describe how social prognostics developed in the GDR and the socialist states, casting light on political epistemologies, and the similarities and differences between this approach and the "Western" futures field. And thirdly, I examine mutual perceptions and the trans-bloc exchange of futures knowledge that took place during the 1960s and 1970s, noting the epistemic effects this mingling of different orders of knowledge brought about.

Dr Elke Seefried, historian and economist, is Professor of Modern History at the University of Augsburg and Second Deputy Director of the Institute for Contemporary History Munich/Berlin; fields of research: history of the future and of future(s) knowledge; emigration and exile; German and European history since the 1960s; environmental and Cold War history.
Recent publications: (as editor) *Politics and Time from the 1960s to the 1980* (*Journal of Modern European History* 13/3, 2015); *Zukünfte. Aufstieg und Krise der Zukunftsforschung 1945-1980*, 2nd ed. Berlin 2017; (as editor with Agnes Bresselau von Bressensdorf and Christian F. Ostermann) *West Germany, the Global South and the Cold War* (*German Yearbook of Contemporary History*, Vol. 2), Berlin 2017.

KEYNOTE SPEAKERS

Cynthia Selin, Arizona State University and University of Oxford

Tempting Futures

As the pace of technological innovation quickens in dynamic interplay with society, novelty reigns. To make sense of such volatile conditions, we seek to imagine and assess consequences. Yet the handholds of certainty that might anchor decision-making are harder and harder to come by. Though predictive techniques can work miracles, in the settings that nest society's most vexing challenges, ambiguity, novelty and complexity disrupt quests to know futures with certainty.

The question is if there are better ways to reimagine change and consequence. Foresight practices offer another lens, one that does not seek to conceal or calculate uncertainty, but rather aims to create space for reflexivity. In these modes, the point is to question assumptions or enliven the senses, rather than to pin down complexity or tame uncertainty.

Perspectives emanating from Science and Technology Studies (STS) offer touchstones that help to reveal the underlying structures and logics of foresight. In this talk, I will investigate some of the theoretical apparatus on hand in STS to help conceptualize grappling with futures. Tending first to theories of change, we'll explore several pivotal moves made by STS scholars related to notions of temporality, plausibility, trajectorism and irreversibility. Next, STS has important takes on practice—if we frame foresight methods as technologies of engagement, we can borrow insight from STS analyses of socio-technical systems to better understand what happens when foresight tools are deployed.

Both in terms of theory and practice, STS perspectives help to illuminate how in tempting futures out into the open for reflection and critique, foresight work creates spaces of contestation. The future is no blank slate or innocent fantasy, but rife with power play. Care must be taken to tend to the politics and ethics of futuring.

Dr. Cynthia Selin explores how the future serves as a conceptual and concrete resource to make sense of the uncertainty, ambiguity and complexity of socio-technical change. By combining qualitative social science research with cutting edge experimental practice, Dr. Selin's work advances scholarly understandings of anticipation and invents new approaches to cultivating foresight. Dr. Selin is an Associate Professor at Arizona State University in the School for the Future of Innovation in Society and the School of Sustainability. She is also an Associate Fellow at the Saïd Business School, University of Oxford where she teaches in the Oxford Scenarios Programme.

SESSION 6: NORMS IN FUTURES STUDIES

Erduana Shala, Karlsruhe Institute of Technology

Values in Futures Research – Which Ones Should We Accept?

In contemporary philosophy of science there is a growing awareness of the impact of values in scientific practice. Philosophers like Longino (1990, 2002) and Kitcher (2001) argue that science is a social and pluralistic practice. Douglas (2009, 2011) questions the way values enter research processes. Such positions reflecting the social dimensions of scientific practice are also subsumed as social epistemology. A scientific debate on the potentials of social epistemology for epistemic reflections in futures research is still missing. Futures research is, nevertheless, an exemplary field to demonstrate how values enter science both on an epistemic level and in practice, for example in foresight projects or in scenarios. A targeted application of values may even contribute to credibility and foster reliability in futures research. However, values are not acceptable at all stages in scientific processes. Thus, cognitive, social and ethical values are differentiated in this paper, as well as the direct and indirect roles they may play in futures theory and practice. These reflections build upon Douglas's (2009, 2013) classification of objectivity forms in science and the different roles and forms of values. It is argued how futures research is based upon interactive objectivity and how a reflected consideration of acceptable values may contribute to the epistemic base of futures research.

Erduana Shala is a research consultant at acatech – National Academy of Science and Engineering in Munich, Germany. She holds a M.A. degree in European cultural studies and history of ideas from the Karlsruhe Institute of Technology (KIT) in Karlsruhe, Germany, where she is a doctoral candidate in philosophy. Her research focuses on history and philosophy of science and technology, social epistemology, ethics, and man-machine interactions. In her doctoral thesis she analyses the epistemic foundations of foresight. Having worked at Fraunhofer Institute for Systems and Innovation Research ISI for several years, she is also a passionate foresight practitioner, especially using scenario techniques.

SESSION 5: COUNTERFACTUALS IN HISTORY AND FUTURES STUDIES

David J. Staley, Ohio State University

The Future as a Domain of Historical Inquiry

It turns out that the historical method is particularly effective for rigorously thinking about the future. By historical method, I refer to the thought process employed by all historians—asking questions, seeking evidence, drawing inferences, composing narratives—and not the identification of patterns in the past that we then project forward, Karl Popper having rejected such "historicism." I wish to stake a claim for the future as a domain of historical investigation.

The future is not already pre-formed and is driven by contingency: history is as much the study of contingency as anything else. This is one reason why counterfactuals have established a place in historical thought and practice. Indeed, I will draw parallels between how historians investigate the subjunctive conceptual space of counterfactuals and they might explore the subjunctive space of the future.

When we say we want to know the future, what we usually mean is we want to know the state of some complex system at point *n* in the future. Non-linear science and chaos theory informs us that complex adaptive systems are exquisitely complex and difficult/impossible to predict. At best, we can approximate various states the system might take. Historians understand the behaviors of complex adaptive systems, and are therefore especially well-suited to exploring the possible states of such complex systems in the future. As Frank Ankersmit says about historical representation, representations of the future are also "proposals."

The historical imagination proves particularly effective when directed toward the future. Can we identify the features of a "futures imagination?"

David Staley is Interim Director of the Humanities Institute and Director of the Center for the Humanities in Practice at The Ohio State University. He is an associate professor in the Department of History and holds courtesy appointments in the departments of Design and Educational Studies. He is the author of *Brain, Mind and Internet: A Deep History and Future* (Palgrave Macmillan, 2014), *Computers, Visualization and History*, 2nd ed. (Routledge, 2014) and *History and Future: Using Historical Thinking to Imagine the Future* (Lexington Books, 2007). He is the President of Columbus Futurists, and host of CreativeMornings Columbus .

SESSION 9: FORESIGHT IN PRACTICE

Mark Swilling, University of Stellenbosch, Edgar Pieterse, University of Cape Town and Maarten Hajer, University of Utrecht

Futuring, Experimentation and Transformative Urban Politics

Urban spaces offer unique opportunities for manifesting in practice future-oriented thinking that is used to shape actions in the present. Urban spaces – and larger or fast-growing cities in particular – tend to get shaped by constant reinventions of the evolutionary potential of the present as expressed in a wide variety of imaginaries: policy, strategy and planning documents as well as artistic, fictional, aesthetic and visual media that respond to the modalities of urban governance, market dynamics, cultural shifts and socio-demographic changes as individuals and households make locational choices. However, this uniqueness is inadequately captured by two dominant ways of conceptualising this dynamic that tend never to meet, namely futuring and experimentation. By futuring we mean the wide range of practices that have emerged over recent decades to explore the future, including forecasting, foresight and more recently anticipatory thinking. By experimentation we mean the wide range of activities that are described using various terms, such as innovation, niche experiments, social innovation, 'urban labs' and urban experimentation. It is argued that in a majority urban world where so much about the future will be determined by what happens within urban spaces (especially major cities), it will be necessary to synthesize futuring and experimentation to gain a better understanding of anticipatory thinking in an urban context. Urban spaces have emerged as arenas for expressing selected futures in practical small- and large-scale urban experiments that can potentially coalesce into implementable alternative futures that get captured in an ever-evolving set of imaginaries of the future. In short, what we will describe as the politics of urban transformation.

Mark Swilling is appointed as the Distinguished Professor of Sustainable Development at Stellenbosch University; Co-Director of the Centre for Complex Systems in Transition (www0.sun.ac.za/cst/), Academic Director of the Sustainability Institute (www.sustainabilityinstitute.net); and Programme Coordinator of the Masters Programme in Sustainable Development that gets delivered at the Sustainability Institute. He has published several books and over 60 journal articles in the fields of governance, urban change and sustainability. He is a member of the International Resource Panel (since 2007) hosted by UN Environment, Board of the Development Bank of Southern Africa, and member of the Economic Policy Working Group of South Africa's National Convention.

Edgar Pieterse occupies the South African Research Chair in Urban Policy at the University of Cape Town, and is Director of the African Centre for Cities. He is an urbanist fascinated by the drama of cities everywhere and at different moments in time, including the future, the past and science fiction invocations. Simultaneously, he endeavours to remain grounded in the tough and messy realities of cities working with materialist and aesthetic optics. His work is rooted in two South African cities, Johannesburg and Cape Town but he also tracks the fortunes of African cities as part of larger discourses on sustainable urban transitions and Southern urbanism. His most recent publication *New Urban Worlds*, co-authored AbdouMaliq Simone.

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Maarten Hajer is Distinguished Professor of Urban Futures at the Utrecht University since October 2015. Before that he was professor of Public Policy at the University of Amsterdam (1998-2015) and Director of the Netherlands Environmental Assessment Agency (PBL – Planbureau voor de Leefomgeving, 2008-2015). Hajer was Chief Curator of the International Architecture Biennale Rotterdam in 2016. He has published several books and dozens of journal articles on a wide range of themes related to governance, public policy and sustainability. His main interest now is in techniques of futuring combining social science, science fiction and art to find more fruitful ways of framing the discussions about urban transition.

Mariana Todorova, Bulgarian Academy of Sciences

Counterfacts as Cliché Breakers and Seeds of the Future

Counterfactuals are turning points in the evolving future and are often used to describe how the present or future might be different if, at a past turning point, another route had been taken. Among the most precious contributions of the counterfactual analysis is its ability to turn down the myth of definite statements, assertions and theses. It is as a method of breaking theoretical clichés and confirming scientific statements by guaranteeing alternative developments for comparisons. This survey aims to expose how counterfactual analysis of past or current phenomena may impact forecasting, scenario building, etc.

Another crucial purpose of this paper is to apply counterfactual analysis that has often been used in studies of history to futures studies, in particular to uncover unexpected events, such as wild cards and "Black Swans". After defining four aspects of counterfactuality and counterfact (1) dormant facts; 2) reinterpretation, reinvention of facts; 3) rumor, gossip and hypothesis; 4) fake news as artificially constructed facts, and placing each of them in varying historical or current contexts, the author outlines their predicting potential with specific reference to recent events whose differing interpretations have profound implications for future policy and international relations planning.

In the context of the constructive approach, the paper demonstrates how some constructed concepts remain, while others, having turned in scientific fashion, fade. Both, however, influence politics, economics, social life, etc., and nurture further geopolitical and ideological interpretations.

Reality is a complex concept (construct) – which exists at an intersection of real (factual) and imaginary (counterfactual) events. To foresee the future, both facts and counterfacts need to be taken into account. The paper contributes to future studies engaging different perspectives of counterfactual theories.

Mariana Todorova is a futurist. She has a PhD degree in Future Studies.

At present she is an Assistant Professor at Bulgarian Academy of Sciences. Until February 2017, she was a Member of Parliament and Deputy Chair Person of her parliamentary group. She has also managed a local office of the European Parliament in Bulgaria. Todorova used to be an advisor to the President of the Republic of Bulgaria in the 2008-2012 period.

She has specialized leadership in the US State Department, Harvard Kennedy School of Government, and Chinese Academy of Governance.

Currently, Todorova is Head of the Bulgarian Node of The Millennium project.

SESSION 9: FORESIGHT IN PRACTICE

Marjolein van Asselt, Maastricht University, Susan van 't Klooster, Dutch School of Foresight and Tessa Cramer, Maastricht University

Foresight in Action, Professionals and their Practices.

Our research builds upon the constructivist tradition and employs approaches and concepts developed in STS. Social processes of knowledge construction and 'boundary work' between the realms of expertise and policy are central subjects of study in STS. Researching foresight practices can be considered a particular specialisation. We will draw from insights from previous research (e.g., as described in our book 'Foresight in Action: Developing Policy-Oriented Scenarios (2010)) as well as recent work.

We situate our work in so-called 'evaluative foresight'. In our research projects, we describe, analyse and give meaning to foresight processes and foresight in action. We focus on the production of future 'knowledge', including enabling and impeding factors related to foresight. In the presentation, we will highlight 1. the professionals and 2. their practice. We will reflect on the producers of knowledge and refer to them as the futurists. We argue that their practice can be seen as an example of a 'mode 2' profession. And, subsequently, we will address key principles, challenges, tensions and pitfalls related to foresight in action.

In our work, we reflect on what the textbooks say and what practice does. This way, we aim to draft new answers to the question of how futurists assess the future. Our analysis of 'foresight in action' makes clear that there is no simple answer to that question. We did not come across standard approaches. Instead, we saw futurists struggle with - for example - 'the policy-free principle', with would-be standard foresight tools such as the scenario matrix, and with prospective uncertainty. Each of these tensions can be understood as manifestations of the conflict between the constructive nature of the activity (futurists construct scenarios in a social endeavour) and the positivistic ideals which are invoked with the ambition of academic foresight.

Prof.dr.ir. Marjolein B.A. van Asselt holds the Risk Governance chair at Maastricht University, the Netherlands. Currently, Marjolein B.A. van Asselt is a board member of the Dutch Safety Board. From January 2008 till July 2014 she was a member of the Scientific Council for Government Policy (Wetenschappelijke Raad voor het Regeringsbeleid - WRR). Van Asselt studied Computer Science and Philosophy of Science, Technology and Society at the University of Twente, The Netherlands. From 2005-2010, Marjolein B.A. van Asselt was a member of the Young Academy (De Jonge Akademie - DJA) of the Dutch Royal Academy of Sciences (KNAW) and she was a member of the first board.

Dr. Susan van 't Klooster was trained as a cultural scientist at Maastricht University. In 2002, she became a PhD student at the STS Research Unit at Maastricht University, and in 2008 she defended her PhD thesis 'Foresight: ambitions and practice' (in Dutch). From 2006 to 2011 Susan was a researcher at the Institute for Environmental Studies at the VU University in Amsterdam. Currently, she researches and advises strategic policy and decision-making processes as a freelance consultant. She is specialized in foresight methodology, practice and processes. Susan is a teacher at the Dutch School of Foresight and co-founder and former board member of the Dutch Future Society (a local chapter of the World Future Society).

SESSION 9: FORESIGHT IN PRACTICE

Marjolein van Asselt, Maastricht University, Susan van 't Klooster, Dutch School of Foresight and Tessa Cramer, Maastricht University

Foresight in Action, Professionals and their Practices.

Our research builds upon the constructivist tradition and employs approaches and concepts developed in STS. Social processes of knowledge construction and 'boundary work' between the realms of expertise and policy are central subjects of study in STS. Researching foresight practices can be considered a particular specialisation. We will draw from insights from previous research (e.g., as described in our book 'Foresight in Action: Developing Policy-Oriented Scenarios (2010)) as well as recent work.

We situate our work in so-called 'evaluative foresight'. In our research projects, we describe, analyse and give meaning to foresight processes and foresight in action. We focus on the production of future 'knowledge', including enabling and impeding factors related to foresight. In the presentation, we will highlight 1. the professionals and 2. their practice. We will reflect on the producers of knowledge and refer to them as the futurists. We argue that their practice can be seen as an example of a 'mode 2' profession. And, subsequently, we will address key principles, challenges, tensions and pitfalls related to foresight in action.

In our work, we reflect on what the textbooks say and what practice does. This way, we aim to draft new answers to the question of how futurists assess the future. Our analysis of 'foresight in action' makes clear that there is no simple answer to that question. We did not come across standard approaches. Instead, we saw futurists struggle with - for example - 'the policy-free principle', with would-be standard foresight tools such as the scenario matrix, and with prospective uncertainty. Each of these tensions can be understood as manifestations of the conflict between the constructive nature of the activity (futurists construct scenarios in a social endeavour) and the positivistic ideals which are invoked with the ambition of academic foresight.

Tessa Cramer holds a Master's degree from the University of Amsterdam in cultural sociology and is currently in the midst of finishing her dissertation with the title 'The Futurists' at Maastricht University. In this study Tessa Cramer examines the process of professionalization of futurists. Tessa Cramer is senior lecturer in futures research and sociology at Fontys Academy for Creative Industries. Last year, Tessa Cramer has co-founded a Trend Research Lab to translate the future to the general public. She is also a member of the advisory board of the Dutch Future Society and a local think tank focussed on the future, BrabantKennis.

SESSION 6: NORMS IN FUTURES STUDIES

Henk van den Belt, Wageningen University

The Anticipatory Stance in Futures Studies and Responsible Innovation: Can We Really Get Ahead of Ourselves?

Proponents of Responsible Innovation are confronted with a critical problem that also plagues the practitioners of Futures Studies: Can we actually foresee the long-term consequences of our actions vis-à-vis an uncertain future? What meaning, if any, can still be given to the idea of being individually and collectively responsible for those consequences? It is usually held that the future is fundamentally open or that there are, at any given point in time, multiple futures facing us. While most futurists thus concede that 'the' future cannot be predicted, many would argue that we can still attempt to anticipate it and to obtain a kind of knowledge about possible futures that reaches some minimal plausibility. The German philosopher Alfred Nordmann has challenged even this more modest knowledge claim. He argues that we cannot possibly "get ahead of ourselves" and proposes to abandon the anticipatory stance altogether in the societal practice of Responsible Innovation. He also points to the egregious paradox of having to assess, from the vantage point of the present, the future social impacts of allegedly transformative technological changes that by virtue of this special character are supposed to alter the very moral standards by which people judge. Nordmann's challenge also seems relevant for the practitioners of Futures Studies. In this paper I will try to find out whether it can be effectively addressed.

Henk van den Belt studied sociology at the University of Groningen, The Netherlands, where he developed an early interest in what would later be called STS. He did research on the development of the synthetic dye industry in the 19th century and wrote a dissertation on Ludwik Fleck's work on serology and bacteriology. His subsequent research activities can be subsumed under the philosophy and sociology of the life sciences. These include such topics as the role of patents in the life sciences and the cultural resonance of the Frankenstein motif in public responses to synthetic biology.

SESSION 9: FORESIGHT IN PRACTICE

Patrick van der Duin and Dhoya Snijders, the Netherlands Study Centre for Technology Trends

How the Dutch Shape their Future: Governmental Think Tanks at Work in an Increasingly Uncertain World

Fast and unforeseen technological, political, and socio-economic developments make it increasingly difficult to do foresight, while these uncertain conditions have also raised the appeal and need to do so to develop strategic policy. Over the last few decades, the Dutch government has promoted long-term thinking by creating an extensive and diverse landscape of governmental think tanks and advisory councils, whose task is to research future developments, analyse their possible impact on the Netherlands and to formulate policy recommendations on how to cope with change. These organizations have in common that they aim to do foresight scientifically, that they value an apolitical and independent role and that they operate on the crossroads of policy and society. Their diversity is expressed in the different foresight methodologies they apply (qualitative, quantitative), the importance they attribute to foresight in their overall set of activities and the sectors they advise on (e.g., transport, environment and healthcare). Their work is generally appreciated both within and outside government, but their specific impact is determined by various factors such as the timing of their work in relation to the political cycle, their influence on public discourse and their relation to competing public and private research. This paper is based on comparative research into twelve recent foresight studies done by Dutch governmental think tanks and advisory councils. We analyse the role of different types of foresight in light of increasing societal uncertainty and sketch a detailed view of how the Dutch government aims to shape the future.

Patrick van der Duin is a macro-economist and worked at KPN Research, Delft University of Technology, and Fontys Academy for Creative Industries. He studies how organizations apply foresight methods and manage innovation processes. He published in journals such as *Futures*, *Technological Forecasting & Social Change*, and *The Journal of Futures Studies*. Recently he edited *Foresight in Organizations. Method and Tools* (Routledge, 2016). Currently he is the managing director of the Netherlands Study Center for Technology Trends, a public-private think-tank on technological and societal developments.

Dr Dhoya Snijders works for STT, the Dutch Study Center for Technology Trends and is currently carrying out a foresight study on the future of technology and learning. Dhoya holds an MA in Philosophy from the University of Amsterdam, an MA in Public Information Management from the Erasmus University Rotterdam and an MA and PhD in Organizational Studies from the VU University Amsterdam. His dissertation research was done in South Africa where he looked at 'official taxonomies' - ways in which the state classifies species. He has been active publishing in future studies, science and technology studies and information science.

SESSION 10: TECHNOLOGY, PHILOSOPHY AND FUTURES STUDIES

Cor van der Weele, Wageningen University

How Do Paths into the Future Emerge? The Case of Cultured Meat

New technologies lead to moral changes, as the history and philosophy of technology have made abundantly clear. New technologies can therefore be considered as experiments in, or with, morality. How can we study what goes on during such experiments? Technological forecasting takes its starting point in the development of technology, and tends to discuss moral 'responses' in terms of acceptance or rejection, which is expressed in consumer behaviour, or through scenarios with predetermined choices. In this talk, with cultured meat as its case, I will argue that more is needed to understand technology as a motor of moral change. In order to understand its cultural appropriation we need to look below the surface of acceptance, rejection, behaviour, and dichotomous choices. Instead, we need to pay more attention to ambiguity and ambivalence – to the distinction between these phenomena as well as to to their interplay. Cultured meat triggers widespread ambivalence about meat: we have come to both love and hate it. Ambiguity resides in the uncertain meanings of cultured meat – is it really meat? – which in turn makes traditional meat itself an ambiguous kind of food. I will explore how the interplay of technology, ambivalence and ambiguity undermines existing moral self-evidences as well as moral identities. Paths into the future gradually emerge from this interplay in ways that remain invisible if the theoretical focus is on rejection versus acceptance, on behaviour, or on scenarios.

Cor van der Weele is professor of humanistic philosophy at Wageningen University, The Netherlands. She was trained as a biologist as well as a philosopher and has worked in different boundary areas of those disciplines, with a special interest in embodied morality, as expressed, e.g., in metaphors and in the relevance of mixed human motivation for moral change. She published, for example, on 'strategic ignorance' as a signal of ambivalence rather than indifference.

SESSION 7: EDUCATION, EXPERTISE AND FUTURES STUDIES

Dr Stephen Wilson, Chelsea College of Arts, University of the Arts, London

Transpersonal Futures: Artisthood in Posthumous Digital-Life Limiting Conditions.

Transpersonal Futures seeks to relay anticipatory systems and strategies of present day artistic consciousness that go beyond the limits of personal and institutional identity. In examining technology communication through a lens of contemporary artistic production, including peak and spiritual experience such as near-death phenomena, psychotechnologies, belonging, profiling and a networked history of the web, this paper will explore how *grappling with the futures* offers a resistant-theory and adjusted future studies of interdisciplinary engagement within history, art, science, technology and life. The paper discusses the social and environmental implications between 'artisthood' and 'pallative care nursing' in *Revisiting Genesis* – a web-series in twelve episodes and a feature length experimental film conceived by London based artist Oreet Ashery in 2016. In relation to the ongoing maturity of Future Studies, this artwork focuses on digital and emerging technologies of dying, social networks, care and feminist reincarnations of women artists. *Revisiting Genesis* mixes fictional dialogues and real-life interviews with people who have life limiting conditions. This paper draws on how this reflects upon Future Studies itself, what are the life limiting conditions within this study? When are Future Studies decommissioned by the tribalised political consciousness of the present?

Transpersonal futures: artisthood in posthumous digital-life limiting conditions will present a short clip from Ashery's web series to draw out the grappling and intricate connections, links, chainings and mutations within the history and reproduction of art, STS and futures autonomy.

Dr Stephen Wilson is a writer, practitioner and theorist who programmes and curates in contemporary art and is currently senior lecturer and postgraduate theory coordinator at Chelsea College of Arts, University of the Arts, London. Recent co-edited publications include: *Memories of the Future: On Countervision* (Peter Lang 2017), *The Persistence of Taste: Art, Museums and Everyday Life After Bourdieu* (Routledge 2018) and *Where Theory Belongs* (Open Editions 2019). Wilson earned his doctorate at the Royal College of Art and has since been an Abbey Award holder in the British School at Rome and a visiting scholar at Columbia University in the Department of Anthropology, New York. Current projects include: *Transpersonal: Art and Life Directives*, a series of co-curated talks and exhibitions held at the ICA London, Künstlerhaus Stuttgart and the Jorge B. Vargas Museum and Filipiniana Research Center in Manila, Philippines.

Benjamin Aldes Wurgaft, MIT

"Image and Uncertainty in the Cultured Meat Movement"

Drawing from four years of fieldwork with professional futurists, scientists, and designers who imagine a future in which we grow meat in laboratories using tissue culture techniques, this talk explores the semiotics of their practice. In other words, it explores the ways in which visual images have helped to make cultured meat "imaginable." I argue that the visual images used to promote cultured meat both to the general public and within the cultured meat movement have contributed to a form of imaginative "closure" in which many of the possible consequences of using tissue engineering techniques for food production, consequences both positive and negative, are sidelined. I will also show that, at the same time, efforts to visualize cultured meat inevitably introduce elements of contingency that subvert the "official future" of cultured meat. They remind us of this novel technology's sheer strangeness, and the unlikelihood that scientists will succeed in perfectly copying conventional meat taken from animals. This makes the semiotics of cultured meat an ideal case study that prompts us to ask a question about philosophy and futurism: what is the relationship between "making" and "knowing" and are there forms of prospective knowledge that, while entangled with projects of future-making, are nevertheless relatively agnostic and thus open to surprise? And how can "the Weird" which in the case of cultured meat is the capacity of new forms of food biotechnology to surprise us and defy our expectations, teach us philosophical lessons that transfer to other futurist exercises?

Benjamin Aldes Wurgaft is a writer and historian, currently completing a book about laboratory-grown meat and the history of the future of food. He received his doctorate in intellectual history from Berkeley, and was subsequently a Mellon postdoctoral fellow at the New School for Social Research and a National Science Foundation postdoctoral fellow at MIT, where he is currently a visiting scholar. In 2016 his book *Thinking in Public: Strauss, Levinas, Arendt,* appeared from the University of Pennsylvania Press.