Abstracts

Keynotes

Dunja Šešelja
How the Way We Assess Scientific Hypotheses Can Undermine Public Trust in Science

While evidence plays a central role in the evaluation of scientific hypotheses by scientists and policy makers, it is often insufficiently understood what exactly should count as evidence. In this talk I argue that a simplified evidentialist approach to the evaluation of scientific hypotheses, sometimes employed in scientific practice, carries the risk of undermining public trust in science. To highlight problems inherent to this type of assessment, I focus on two particularly challenging contexts: the context of scientific disagreements and the context of 'fast science'. While scientific disagreements and controversies typically come with opposing or incomplete evidence, 'fast science' is characterized by the need for quick yet reliable assessments, in spite of the limited evidence. I start by identifying two main aspects of the simplified evidentialist approach: a) exclusive focus on 'first-order evidence' and b) exclusive focus on 'evidential reasons'. I illustrate both issues with case studies from the history of medicine and contemporary medical research and I argue that more attention should be paid to 'higher-order evidence' (Skipper and Steglich-Petersen, 2019, Friedman and Šešelja, 2021) and to 'inquisitive reasons' (Fleisher, 2021). Finally, I show how this discussion bears on the recent practice of 'fact-checking' applied to scientific claims. (The talk is partially based on joint work with Daniel Cserhalmi Friedman, Stanford University)

Andrea Roth (Berkeley Law)

Should We Trust Machine Testimony More Than Human Testimony?

The potential unreliability of eyewitness identifications and confessions is now well documented. Given the problems with human testimony, it is tempting to see the rise of machine-generated proof in criminal trials as a promising development. After all, machines and algorithms -- such as blood-alcohol software, Google Earth, and complex expert systems that interpret DNA evidence -- are arguably more objective, more uniform, and more accurate than humans. But machines carry their own "black-box" dangers, potentially leading to even greater and more systematic inaccuracies and injustices if left undetected and unscrutinized. Moreover, there are tasks necessary to the moral legitimacy of human-rendered justice that should not be delegated to machines. Justice systems should recognize four key rights of the accused with respect to machine-generated proof: (1) front-end development and testing safeguards to minimize error and bias (based on a consensus view of "algorithmic fairness"); (2) meaningful and equitable pretrial access, including disclosure requirements, eliminating trade secret privileges, and allowing defense testing; (3) contestation, including a right to be heard in the development and testing process and access to experts; and (4) keeping a "human in the loop," to protect equity and mercy, avoid automation complacency, and reject dehumanizing technologies.

Talks

Maria del Rosario Martinez Ordaz

Trusting defective information in big data contexts: Some reflections on empirical adequacy and veracity

Here I provide a way in which we can explain the rationality behind scientists' trust in big data products, even when knowing that such products are not always reliable.

First, the data in raw form, naturally, contains redundancies, and given its size and the way it is pieced together via different surveys, contains conflicting information that if pieced together would lead to inconsistencies. Second, the data in reduced form is more likely to be missing information, given the very nature of the process of information reduction. And third, structured data itself is problematic as a source of objective information, since its production involves the use of conjecture, guess work and heavy-duty theoretical work, all of which make it more likely that the structured state is biased. Hence, we see that the sort of data employed by scientists leads, at different stages, to the scientific reliance on data which is either vague, redundant, incomplete, inconsistent or biased. It is, in other words, defective. However, while the presence of defective information in science tends to be naturally seen as part of the dynamics of scientific development, it is a fact that the larger the defectiveness of the information that scientists work with, the less justified they are in trusting such information.

In light of the above, there has always been a need for explaining under which circumstances scientists can, rationally, trust defective information in the sciences; yet, in recent years, this need has only increased due to the incorporation of novel epistemic practices into the scientific activity. In particular, during the last decades, the design of new technological and formal resources has allowed scientists to receive, order, and integrate enormously large amounts of data. Big data is the field that concerns the use of this kind of datasets -whose size is beyond the ability of typical database software tools to capture, analyze, store, and manage (Manyika et al., 2011). And while the incorporation of big data in different disciplines has come with a considerable amount of success and high levels of trust in the results of big data practices, it has also problematized the explanation and preservation of scientific rationality in defective contexts.

What I am addressing here is the source of the scientists' trust in the products of big data, and whether such trust is justified.

My main thesis can be summarized by the following two points:

(1) Even if scientists cannot fully reconstruct the paths that are followed in the computer processes, they rationally trust the outcomes of these processes.

(2)The justification of this trust comes from the quality of the outcomes themselves; in particular, the information that the outputs contain is significantly veracious to the point in which it increases the empirical adequacy of the entailed measurements, descriptions, predictions, and explanations.

In order to explain this in more detail, explain how the reliability of some products of big data implementation comes from a specific kind of empirical adequacy --that connects directly with high degrees of veracity of the information contained by such products. And I illustrate this with a case from observational cosmology.

Alessandro Demichelis

Vaccine hesitancy and trust: lessons from the COVID-19 pandemic

Among the social problems that the COVID-19 pandemics has highlighted, vaccine hesitancy is one of the most subtle. On one hand, the recent events have increase the perception of vaccine as an important form of protection for public health; on the other hand, they have made evident how denialism of the scientic consensus can have disastrous consequences.

Vaccine hesitancy is a complex phenomenon. It sprouts from a whole array of dierent socio-political reasons (Brown et al., 2010, Yaqub et al., 2014)and raises a broad spectrum of ethical, social, and epistemological issues (Navin,2015, Goldenberg, 2016, Grignolio, 2018). Much attention has been given in recent years to its analysis, but the COVID-19 has brought new elements to the table and forced old positions to be reconsidered. In order to fully comprehend this phenomena, and therefore to start improving the situation, we must focus our attention on it most crucial determinant: trust.

This paper, therefore, focuses on what are the determinants and the most relevant objects of distrust, and on how to design eective strategies to foster public trust in vaccines.

Regarding the former question, the crucial role played by trust in causing vaccine hesitancy has been underlined by many authors (Benin et al., 2006, Browne et al., 2015, Goldenberg, 2021), but several questions remain open. Specically, who is the most important recipient of trust? Which one between trust in science or trust in politics is more relevant? A precise identication on where to allocate resources is of utmost importance to not waste money, time, and eorts in ineective interventions. Compliance with medical policies seems to be inextricably tied with public trust [Bargain and Aminjonov, 2020], and fostering such kind of trust seems to be a promising solution [Bavel et al., 2020]. Credibility of institutions seems to have played a crucial role in shaping behaviours during previous epidemics, such as the 2009 H1N1 (Quinn et al.,2013) and the 2018 Ebola crisis (Vinck et al., 2019).

Regarding COVID-19, however, there are indications that political trust plays a more secondary role: for example, country-level trust in science appeared to be a strong predictor of compliance with medical policies, whereas trust in the government generated only modest eects (Bicchieri et al., 2020). In order to pre-empt resistance to vaccination, therefore, it would appear preferential to foster trust in science, rather than in political institutions, even if it is often hard to completely disentangle the two concepts (John, 2020).Regarding the latter question, rather than look for a single solution, we should promote an array of specic, well-targeted interventions. For example, enhancing people's judging capabilities regarding risk evaluation (Gigerenzer, 2013) can be coupled with creating mental antibodies" toward inaccurate news (Baggio and Motterlini, 2017), a cognitive inoculation" that can be achieved with the help of gamication [(Basol, Roozenbeek, and Van der Linden, 2020). For another example, the development of online, automatic response systems known as chatbots (Altay et al., 2020) may help in dealing with the weaknesses of traditional face-to-face and norm-based interventions, that have been shown to have mixed results, ranging from unsatisfactory cost-eectiveness (Kaufman et al., 2018), to ineectiveness (Bilancini et al., 2020), to even backre (Nyhan et al., 2014).

Isabel Briz Hernandez

Re(imagining) Trust in Biomedical Technology in China: Oncology Trials with Personalised Immunotherapy

In recent years, immunotherapy, especially Chimeric-Antigen-Receptor (CAR) T-cell therapy has come to be considered a breakthrough in cancer and a promising new pillar for its treatment. This new therapy is a personalised living drug that aims to enhance the potential of the immune system to fight cancer. T-cells are extracted from the patients' body, harvested, genetically edited into CAR T-cells and injected back into the patient. As the name of the therapy describes, a chimera, that consists in a T-cell surface and a synthetic T-cell receptor, is created to target precisely the specific antigen of each patient's cancer cells. This promissory cure for cancer is currently being tested at the bedside. In 2017, two CAR T cell products were approved for commercialization by the Food and Drug Administration in the US and since then the number of trials on this therapy has been increasing significantly worldwide. China, immersed in its transition to a knowledge economy and focusing on biopharma and translational science as key sectors of development, is betting strongly on the potential of CAR T cells and already hosts the highest number of clinical trials on this therapy in the world. Most research subjects are Chinese nationals but in recent years, an increasing number of trials started accepting foreign patients. A question that easily follows from this illustration is why do biological labs running clinical trials for immunotherapy turn to foreign patients in China, a country with one of the largest populations in the world, and potentially one of the biggest pools of available research subjects?

Based on 15 months of fieldwork on oncology trials for personalized immunotherapy in two Chinese cities, in this paper I approach the uncanny presence of foreign trial patients by delving into science-making in China. Specifically, I focus on how scientists navigate the international mistrust and suspicion towards technoscience in China, the national trust at a state level on science and technology as the panacea for national rejuvenation, and the increasing mistrust in biomedical technology among ordinary Chinese people.

Nicola Mößner

Trusting science? - Challenges by social dynamics and new technologies

The focus of this talk will be on the division of epistemic labour as a prerequisite for trust in science. Usually, hypotheses and scientific ideas are developed during critical discussions. They are tested and, if necessary, revised. In this sense, the division of epistemic labour is commonly regarded as an important prerequisite for scientific progress, too.
Now, Naomi Oreskes (2019) has pointed out recently that it is by these social mechanisms – by this vetting of hypotheses – that scientific knowledge becomes reliable and can thus be trusted. She argues that, even though some scientific theories might turn out to be false and even though some researchers have been found guilty of tampering with their data as a result of wrong motivations, it is scientists' ability of reaching a consensus in a setting of a diversity of theories and explanatory accounts which speaks in favour of an overall trustworthiness of scientific results (see Oreskes 2019, 142f.)
Yet, current developments with regard to science communication, namely the implementation of certain information and communication technologies (ICTs) in these processes of the exchange of scientists' ideas, seem to challenge this relation between social mechanisms, the development of scientific knowledge and trust.
In this talk, a case study on the database 'Scopus' will be presented. It will be summarised what the intended purposes of this database are and how it actually works. The case study will be used to show that by implementing ICTs such as 'Scopus' right at the heart of the division of epistemic labour, a third party gets involved in the process of communicating and developing ideas. And this party has got the potential to distort scientific reasoning processes. In particular, it will be argued that, due to its working mechanisms, 'Scopus' exhibits a tendency to support mainstream research and, thereby, might contribute to reduce the relevant diversity that Oreskes draws our attention to. She highlights the relevance of such a particular pluralistic perspective in science by arguing that we are striving for the

availability of a diverse set of hypotheses to choose from, because only one of these will be picked out as the one that reliably describes, explains and predicts how things really are. ICTs such as 'Scopus', however, seem to reduce this crucial diversity right at the start and, thereby, challenge crucially Oreskes's considerations about why people can trust scientific results.

Paula Muhr

Building Trust in the Novel Algorithms: The Integral Role of Simulation in the Construction of the First 'Direct' Images of a Black Hole

When the first empirical images of a black hole produced by the Event Horizon Telescope (EHT) Collaboration were revealed in April 2019, the official narrative focused on emphasising the trustworthiness of these visual artefacts. Although they appear deceivingly simple, the four images that show a blurry ring of shiny matter against a black backdrop took several years to make. Moreover, these images are revolutionary, as they have made observable an invisible cosmic object that was initially predicted by the general theory of relativity. In doing so, the EHT images have not only provided the first 'direct' proof that black holes exist but also serve as a new source of empirical information about an actual black. Hence, the trustworthiness of these images is of paramount importance.
To establish the general public's trust in the EHT images, the popular press has designated them as photographs that were captured through a synchronised use of eight telescopes across the globe. Such non-specialist narratives tend to gloss over the extensive labour that went into reconstructing the EHT images from the measurement data. At best, it is mentioned that the 'photographic' images were composed algorithmically from the data.
By contrast, within the scientific community, to establish the trust of their colleagues in the first 'direct' images of a black hole, the EHT team published multiple papers that included detailed descriptions of each step entailed in the painstaking production of the images. The descriptions included the details of the configuration of telescopes deployed for collecting the data, the novel algorithmic procedures used in the phase of data preprocessing, and the details of the novel AI algorithms developed explicitly for reconstructing the EHT images from the preprocessed data. A closer look at these descriptions reveals that to generate trustworthy empirical images of a black hole, the EHT team faced a twofold challenge. First, they were imaging an essentially invisible object and had no previous empirical images of a black hole against which they could verify their results. Second, they used new modelling procedures and specifically tailored AI algorithms, which could have been biased or led to arbitrary results.
Hence, to build trust in their novel algorithmic procedures, the EHT team reverted to computer simulations. To test their image-reconstruction AI algorithms, the team generated simulated, synthetic data derived both from predefined mathematical models and various existing images. Only after passing such elaborate simulation-based tests that verified the accuracy of their performance were the algorithms applied to the actual empirical data. This paper analyses how in the scientific community the establishment of trust in the first empirical images of a black hole hinged on the targeted use of simulations to validate the results of the algorithmic modelling of measurement data that underpinned the production of these images.

Petar Nurkić

$#! scientists say: monitoring trust with content analysis

In addition to existing practices and norms within the institutions to which they belong, scientists form one specific community. The flow of information determines the structure of such a community, belief formation processes, provided justifications, and truthfulness of the assumptions that scientists make (Kruglanski, 2005). We can call such a community an epistemic community. Depending on whether community members communicate only with each other or with members of another institution and the wider community, as the general public, the roles they occupy can be categorized into epistemic

experts or epistemic agents. In specific circumstances, such as the crisis caused by the COVID-19 pandemic, the existing organization, and conventions within the epistemic community are disrupted. In times of crisis, ethnographic dimensions become equally crucial as scientific knowledge. Trust, as one such dimension, is the main focus of our research. More specifically, the trust that epistemic agents have in epistemic experts (i.e., scientists). We will examine how experts' epistemic authority influences the trust that other epistemic agents have in the expertise and how the degree of trust directly affects roles within the epistemic community. We will single out some of the qualitative research methods by which we can monitor trust in epistemic communities (Krippendorff, 2004). As a suitable method, we propose content analysis for analyzing public statements made by epistemic experts through digital media. In the era of epistemological impatience, electronic media often are the primary sources of information. Public statements, through which experts communicate with other epistemic agents, form the basis of our analysis. We hope that our analysis of data collected from the media will shed light on the trust degree that individuals instil in science during crises.

Elena Popa

Decision Making, Values and Trust in Science: Two Cases from Public Health

The question of values is particularly important in questions of science and policy (see Elliott 2017). This paper will investigate values relevant to decision making in public health and their relation to trust in science. I will argue that translating scientific findings into policy requires taking into consideration values such as equity and justice. My argument will be build upon cases where decisions have disproportionately affected the most vulnerable. By failing to represent everyone's interests, such decisions are likely to decrease trust in science. To counter this, decision making should be guided by equity.

I base my argument on two case studies. The first will look at the COVID-19 pandemic and the effects of lockdowns. Lockdowns had disproportionate effects on those unable to work remotely and already in more precarious economic conditions, with these effects exacerbated in contexts where livelihoods depend on informal economies. As inequality increased during the pandemic (Gray 2021), one may conclude that the pandemic measures did not consider the interests of the less well off. If decision making is guided by equity, such effects can be mitigated by additional measures – a strong social security system, a compensation system for workers who have more to lose as a result of lockdowns etc. The second case investigates a policy regarding maternal and child health. Measures aiming to counter neurodevelopment problems in newborns due to metyl mercury ingestion during pregnancy have included a recommendation that pregnant women not eat fish due to the high concentrations of the substance in the ocean (Mansfield 2012; Lock 2016). This measure, however, took a disproportionate toll on native American women, some of whom saw themselves as personally responsible for problems during pregnancy. Others had few alternatives in contexts where fish was part of their traditional diet. A more equitable decision making process would take into consideration holding the main polluters responsible and having regulations in place, while providing pregnant women from the said communities with additional nutritional support.

One interesting aspect of both of these cases is that a fairer decision making process includes looking at a plurality of aspects and evidence. The former case highlights economic and social factors, not only epidemiological ones. The latter case emphasizes ecological problems, not only individual decisions regarding diet.

Alexander Schniedermann

Reporting Guidelines and their Mission to increase Trust in Biomedicine

During the last decades, prolific experts have acclaimed the “scandal of poor medical research” (Altman 1994, 283) and deemed many of its outputs as "wasted efforts" (Ioannidis 2005, e124) that pay “a disservice to patients and society (Van Calster et al. 2021). Especially the omission of information about a study's characteristics makes doctors - and researchers alike - unable to judge the rigor and relevance of the results. This opacity is worsened by the evidence about the varieties of biases that can influence the research process at many stages and push it away from its epistemic ideals. In conclusion, the quality of published research remains uncertain which erodes trust in science (Vazire 2017).

To tackle this problem, method experts developed so-called 'reporting guidelines' that aim at making publications more transparent. Widely applied for randomized-controlled trials and meta-analyses, biomedicine's gold and platinum standards (Stegenga 2011), reporting guidelines provide authors with checklists and flowcharts that demand the reporting of very specific information about the performed study. In addition, low costs of application, as well as enforcement by editorial processes led to a wide dissemination of some of the guidelines.

In our study, we explored the emergence and development of PRISMA, a reporting guideline for meta-analyses and systematic reviews. Since reporting guidelines employ specific conceptions or re-conceptions about epistemic practices, individual expertise or scientific methods, we performed a document analysis to uncover the means by which PRISMA interferes with scientific communication and the ethos of science, such as disinterestedness and organized skepticism (Merton 1973). In addition, we performed expert interviews with guideline developers to find out how they perceive the proclaimed credibility crisis and why tools such as PRISMA can help to reinstate trust in biomedical knowledge.

Nathalie Schwichtenberg

Giants or dwarfs on stilts? – Scientific trust within research specialties

For a long time the scientific production process has been known as resting on the "shoulders of giants" (Merton 1965). But how do scientists know that these giants are actually giants and not dwarfs on stilts? Where do they get their firm footing in science from? How do they know they won't hit hard ground?

They do trust in the giants.

Trust has always been one of the cornerstones of social life (Rotenburg 2018) and yet sociology so far has only been partly investigating and conceptualizing the phenomenon. The existing studies are either missing any empirical basis (Luhmann 1968) or they lack a theoretically based concept of trust (Henslin 1968). The same applies to science studies, for which a concept of trust would be at least as relevant as for sociology. The collective process of knowledge production builds on the trust of its participants in its functioning (Shapin 1995). However, so far science studies focus rather on the trust between public and science (Irwin & Wynne 2003) than on its constructive role within epistemic communities. Even when this perspective is taken, the studies care more about disappointed trust (Krige 2001) than how it works when it is working, or are theoretically constructed, but not empirically tested (Wilholt 2013). An empirically founded theory of medium range on scientific trust is still pending.

My paper would like to address this challenge inductively and deals with the role of trust for scientific reception processes within research specialties. What is scientific trust based on? How is it formed and what role do field-inherent epistemic conditions play in its formation?

I investigate these questions using a qualitative field-comparative field design. For this I am focusing on two research specialties within biology and astronomy and have examined them in ethnographic field stays for several months. Through the combination of participant observation and interviews and additional expert interviews, respective field understandings were developed that supported the investigation of the reception processes of the field participants. The concentration on the reception

of scientific contributions enables a collection of data which allows the reconstruction of the relevant elements of the trust situation. At the same time, the challenge of the latency of the trust phenomenon can be dealt with through the communicative stimulation of derivations (Ullrich 1999). Based on an interpretative pattern analysis this derivations can be translated into dimensions of scientific trust which shape the pattern that I call scientific trust.
This paper aims to draw a systematic picture of the role of scientific trust within research specialties. By its field comparative approach it offers a concept of trust for science studies which can be discussed, expanded and modified to apply to further research specialties, disciplines and areas of scientific work.

Vlasta Sikimic

Why is an interdisciplinary approach necessary for increasing trust in science?

The current global health crisis has made clear the fundamental and increasing importance of science for society. At the same time, we are witnessing scientific disputes that have serious consequences on human lives, such as the one regarding vaccine skepticism.

I argue that for building epistemic trust (cf. Wilholt 2013) as a response to global threats one has to take into account particularities of different cultural settings and approach them from an interdisciplinary perspective. Both of these requirements are illustrated in an example related to the recent Ebola outbreak in Congo. Maxmen (2019) reported about a vaccinated person being killed by his frightened neighbors who believed that the vaccine made him infectious. To address such risks, the researchers changed their vaccination approach: instead of vaccinating people close to their homes, they directed interested people to vaccination sides in neighboring cities (Maxmen 2019). This solution required an understanding of the local beliefs and showed how valuable the insights from social sciences are.

On the micro-level, trust in science is mainly achieved through communication with the closest experts on the field – local doctors. To properly educate the general public about research in life sciences, communication with the local doctors is, therefore, of crucial importance. They can amplify the message and are for many patients the most trustworthy source of information. Moreover, trust between scientists and the general public is something that has to be built through addressing all the questions and potential worries of the public. Science cannot be blindly trusted and all research results need to be properly justified. This is an important lesson from history and philosophy of science which taught us that different ideas and approaches should be pursued to reach the most reliable conclusion. The difference in opinions is important for the scientific pursuit, however, it creates tension regarding science communication. For the general public, it is frequently hard to differentiate between mainstream scientific beliefs, concerns of a minority of researchers, and people who pursue a non-scientific agenda and only pretend to identify flaws in the mainstream views.

The starting point of successful science communication should be the assumption that there might be reasons for mistrust in a particular scientific result and an effort should be put in identifying and addressing them. These reasons might have something to do with personal and collective experiences, cultural context, exposure to certain information, etc. Once the trust is broken, it takes effort to restore it. Solutions that work in one context might not be efficient in another. To gain a deeper understanding of the beliefs of people, and later intervene appropriately, an open-minded and interdisciplinary approach should be practiced.

Andrija Šoć & Monika Jovanović

Only a Theory? The Importance of Scientific Communication in Restoring the Trust in Science

One of the key misunderstandings about what the trust in science entails lies in thinking, by both scientists and the general public, that the only item of interest regarding science is its results. In fact,

the central problem is conveying the nuances of the scientific process itself, be it the question of methodology, obtaining results that do not match the predictions, misinterpreting the data, etc. What the general public can see as weaknesses of the scientific method – the lack of ready-made answers, attaching probabilities and uncertainties to an expressed view, or frequent missteps in a wide variety of research projects – actually represents the natural process of discovering the elements of a wide range of complex phenomena. All this is clear enough to a scientist or a philosopher of science. However, why haven't others caught up to the satisfying degree? And how can that situation be remedied? Answering this question is paramount since the lack of trust in science, as has been evident in the past few years, can endanger public health, environment and overall quality of life.

The topic of this paper lies at the intersection of two questions: how science is presented to the public and why science is easily doubted by the public. Both topics fall under the general heading of the problem of scientific communication. One of the earliest cases where scientific communication arose as the subject of interest was the debate about the theory of evolution. However, even after decades of talking about the importance of competent, impartial, and widely understandable communication of scientific claims, one still can often hear the phrase 'but it's just a theory'. This is compounded by the troubling phenomenon that at a time when accurate information, educational tools, and books written for any type of audience are available with only a few clicks, the trust in science is easily shaken and very hard to acquire.

Let us look at one example. In a recent poll, over 40% of those interviewed stated that their trust in the American epidemiologist Anthony Fauci has decreased during the past year. One of the recurring charges against Fauci is shifting opinions on mask-wearing and on the number of people that must be vaccinated for the USA to reach collective immunity. However, such criticism only reflects the misunderstanding of science. The worldview provided by science is usually contrasted to that of religion and even pseudoscientific movements (such as homeopathy or intelligent design). In place of every instance in which a scientists admit ignorance, such enterprises can provide the illusion of certainty with easily graspable, though ill-founded claims. The only way to counter such sentiments is to emphasize all the elements of scientific process, rather than simply underline its results or lack thereof. To establish effective communication with the general public, scientists must approach their research not just as experts, but also as educators.

Elizabeth Stewart

Trust science with what? Negotiating the boundaries of trust in science

Many conversations regarding trustworthiness center around whether a trustee is willing and able to do what has been entrusted to them (Hardin, 2001; Tutić & Voss, 2020). Disagreements regarding trustworthy science on this view amount to disagreements about whether scientists are willing and able to do science. However, this account of trustworthiness is inadequate for making sense of many disagreements regarding the trustworthiness of science. For example, throughout the Covid-19 pandemic, public distrust in science often had less to do with whether scientists were capable of doing science properly and had more to do with the appropriate role of science with relation to policy-making and individual decision-making (Goldenberg, 2021).

In this paper, I offer an alternative framework for identifying different sources of disagreement regarding trustworthiness. When we trust others, we trust them with respect to some specific domain (Baier, 1986). However, what is included in that domain, what I call a "trust domain", is often unclear to both trusters and trustees, which can result in trustees inadvertently breaking trust. When the public is asked to trust science, it is not immediately obvious what that domain includes.

Does it simply include generating knowledge about the structure of the world? Or does it also include translating that knowledge into public policy? If people answer such questions about the trust domain differently, they will likely disagree as to whether science is trustworthy.

There are three features of trust domains that generate disagreement regarding trustworthiness: scope, rigidity and ordering of expectations. The scope of a trust domain concerns the expected actions of trustees. For example, is the trustworthy scientist the one who can sequence the DNA of a novel virus or the one who is also capable of translating that information into guidance for policy-makers? Domain rigidity has to do with how easily these expectations can change. If we have previously viewed the domain of science as simply generating knowledge, should we change our expectations to include policy-making, or vice-versa? Finally, the ordering of expectations concerns the features that cannot be reasonably be excluded from the domain. We might reasonably disagree over whether to trust a scientist who isn't good at making policy decisions. However, we shouldn't disagree over whether to trust a scientist who lacks basic scientific abilities, such as numerical literacy.

In all these cases, disagreements regarding the trustworthiness of science first arise when stakeholders disagree about what it is that we are trusting scientists with. In order to develop the trustworthiness of science, then, we must first determine the appropriate scope, rigidity and ordering of expectations. Only once we've located the appropriate boundaries of the trust domain of science can we assess whether scientists are willing and able to act within those boundaries.

Marianne van Panhuys & Rafaela Hillerbrand

Epistemic risks and computer simulation: a case study from particle physics

In philosophy of sciences, the issue of epistemic risk is usually addressed in terms of inductive risk, focusing on the process of decision-making to accept or reject hypotheses based on empirical evidence. This topic is widely discussed in the literature on the Argument from Inductive Risk (AIR) (Steel, 2010) and mainly concerns with the role of value-laden judgements in weighing evidence to prevent from social and ethical harm.

In many sciences today, however, empirical reasoning is highly inferential as experiments rely on complex instrumented disposals. This means that there is a long process before confronting evidence to hypothesis. This process often involves an increasing use of computer simulations, may it be in life science or particle physics where computer simulations are, for example, centrally involved in the design of particle detectors and data generation. The crucial role of these computer-based practices, which are in this context precondition for empirical reasoning, call for further philosophical insight regarding risks.

In this paper, we zoom in on particle physics and aim to expand the framework of epistemic risks to particularly address the issue of computer simulation-related risks. Based on a case study from ATLAS experiment in top-quark physics we argue that there are relevant epistemic risks besides inductive ones that go beyond social and ethical impacts. The subsumption of risks under inductive ones is insufficient to address the variety of risk arising in the course of scientific inquiry as well as to address the collaborative feature of producing scientific knowledge (Biddle & Kukla, 2017). After analyzing contingent choices made in the experimental process, we propose to frame epistemic risk as the risk to not fulfill one’s epistemic aim, distinguishing between local (e.g., prediction) and global (e.g., discovery) aims. Our contribution can be understood as an attempt to locate uncertainty and risks and explicate relationships at stake.

Georgios Zoukas

Trust and science communication in the internet era: The case of mainstream climate blogging

Much of the discussion about the relationship between science and society today revolves around the potential of fostering public trust in scientists and the institution of science. However, establishing public trust in science can be challenging, especially when it comes to scientific fields distinguished by increased degrees of complexity. Despite the overwhelming scientific consensus on the anthropogenic nature of global warming and climate change, climate science represents one of those fields, while the issue of climate change has become one of the most controversial topics on political, economic, and social levels. At the same time, there has been a growing scholarly interest in the capacity of internet platforms as new tools for communicating science that intersects, as it were, with people's lives; an interest indicative of a general academic focus towards the significance of direct communication between scientists and a broader, non-specialized but concerned, audience. This paper deals with the notion of trust in science in the internet era, examining the example of blogs (weblogs), one of the oldest and most popular social media platforms, generally praised for their independent character and the communicative possibilities they have introduced. By centring on a selection of twelve climate blogs produced by mainstream scientists (scientists concurring with the mainstream scientific assessment that global warming and climate change are human-made and dangerous), my primary aim has been to investigate the role of these blogs in the communication of climate science, looking at the blogs' character as well as the perceptions and experiences of both the scientist-bloggers and the blog readers. To that end, I have followed a qualitative multiple-case study research method, which involves semi-structured in-depth interviews with thirty-eight blog users and thematic analysis of more than 320 blog posts. Regarding the use of theory, I have drawn upon the field of Science and Technology Studies (STS), particularly the Sociology of Scientific Knowledge (SSK), having also utilized conceptual tools from media and communication research to analyse the opportunities for science communication afforded by the blogging platform. I argue that what could be described as 'mainstream climate blogging' is, by and large, a reaction to the mis/disinformation and the communicational inefficiency typifying considerably the media environment of climate communication, especially the internet environment. The mainstream climate blogs constitute a trustworthy niche of climate communication which appeals to an interested and dedicated audience who is willing to engage with the intricacies of the expert-oriented and science-based knowledge communicated by the scientist-bloggers. As such, this paper contributes to the discourse on the intersection between trust and science, providing insight into the literature on science communication in the age of the internet.