

Post-detection for the 2020s: fundamentals, current concerns, and new discussions

Breakout session series for The First Penn State SETI Symposium, 27-30 June 2022, Penn State University, State College PA <https://sites.psu.edu/setisymposium2022/>

A collaboration by K. Denning, B. McConnell, C. Haramia, G. Profitiliotis, R. Charbonneau, J. Tarter, S. Wright

Schedule: (Eastern Time)

Part 1, Post-Detection Primer, Mon 27 June 1:00-3:00 pm

Part 2, Active Philosophy Workshop, and Post-Detection Infrastructure & Protocols, Weds 29 June 1:00-3:00 pm

Part 3, Post-detection Exploratory Foresight Workshop, Thurs 30 June 1:00-3:00 pm

Format: This session will be hybrid in format, with a combination of in-person and remote presenters and participants. It will combine talks with workshop exercises inviting active participation from attendees.

Breakout Series Description: Post-detection is a topic of perennial importance in SETI, and certainly a hot topic today. Our intention in this session is to foster inclusive, interdisciplinary discussion about post-detection challenges in the 2020s, focusing on policy, public communication, and scientific responsibility in the different detection scenarios that are possible today and in the near future. Combining our perspectives as researchers from multiple different fields, we aim to facilitate conversations about post-detection concerns, being mindful of the participation of researchers and students of different career stages, different disciplinary backgrounds, and with varying degrees of practical familiarity with technosignatures research. We further hope that engaging in an 'active philosophy' discussion (Part 2) and exploratory foresight exercise (Part 3) will demonstrate to participants how these different methods cultivate insights and generate useful understandings. n.b. A caveat: post-detection is a matter of international significance and although it is certainly important to *explore* post-detection at this symposium, it is not the place/time for definitive decisions about policy etc.

Background Resources for Participants: There is a Googledocs folder with relevant materials at: <https://drive.google.com/drive/folders/1A0rhTHGmdScubs0cUkIRvoZjrv7QPcWo?usp=sharing> (please go to that link and request access, or contact Kathryn Denning kdenning@yorku.ca)

Co-organizers / Presenters:

Kathryn Denning, Associate Professor, Anthropology, York University, Canada, and SETI Institute Science Advisory Board. kdenning@yorku.ca

Brian McConnell, SETI Open Data Archive. Software developer, author of *The Alien Communication Handbook* (2021) and *Beyond Contact* (2001). bsmccconnell@gmail.com

Rebecca Charbonneau, Historian-in-Residence, Harvard-Smithsonian Center for Astrophysics (until June 2022); starting Aug 2022, Jansky Fellow, NRAO. rebecca.charbonneau@cfa.harvard.edu

Chelsea Haramia, Associate Professor of Philosophy, Spring Hill College. charamia@shc.edu

George Profitiliotis, Foresight Expert at the UNESCO Chair on Futures Research of the Foundation for Research and Technology – Hellas; Postdoctoral Researcher, Dept of Humanities, Social Sciences, and Law of the National Technical University of Athens, Blue Marble Space Institute of Science gprofitil@mail.ntua.gr

Presenters:

Jill Tarter, Chair Emeritus for SETI Research, SETI Institute

Shelley Wright, Associate Professor in Physics at University of California, San Diego

Part 1: Post-Detection Primer (Monday 27 June 1:00-3:00 Eastern)

This first day of our breakout series will provide an interdisciplinary orientation to some different aspects of post-detection, ranging through the history of science, astronomy, social science, philosophy, data science, and futures studies. We will cover aspects of the SETI Protocols, technosignatures verification, dilemmas for technosignatures researchers, moral reasoning and ethics, foresight and anticipation, and practical issues in post-detection analysis. This interdisciplinary overview will also be useful background and preparation for Part 2 and Part 3.

1:00 – 1:05. Kathryn Denning, Post-Detection for the 2020s Breakout Session Introduction (remote presentation)

1:05 – 1:15. Rebecca Charbonneau, SETI in the 60s: Establishing the Need for a Protocol (on-site presentation)

Abstract: In this brief presentation, Rebecca Charbonneau will recount the first “false alarm” in SETI history— the detection of radio variability in CTA-102 by the Soviet Union. This episode and the subsequent international fallout was one of the first moments in SETI history to highlight the need to develop a rigorous post-detection protocol.

1:15 – 1:40. Jill Tarter, When Do We Get To Drink The Champagne? (remote presentation)

Abstract: Claims of detecting electromagnetic signals from extraterrestrial intelligence have been made multiple times. Evidence has not backed up these claims. There is still much unknown about the cosmos, and physics we don't yet understand. ET should be the last resort for explaining the unexpected. Researchers have tried to develop a scale to explain the significance and credibility of any future claims, something analogous to the Richter Scale for earthquakes. It is called the Rio 2.0 scale and you can rank your favorite science fiction scenario here <https://dh4gan.github.io/rioscale2/>.

1:40 – 1:55. Kathryn Denning, Navigating Discovery in the 2020s (remote presentation)

Abstract: The SETI Protocols were an important early effort to define SETI researchers' responsibilities to the world in terms of scientific reliability, transparency, and restraint (i.e. no unilateral responses to incoming transmissions). Now, 3 decades later: potential technosignatures and biosignatures search and discovery scenarios are increasingly diverse, generating new questions and ethical issues; the players involved have changed and multiplied; multiple 'false alarms'/rehearsals have occurred; popular culture involving ETI is proliferating; the UAP/UFO discussion has evolved; human expansion into our solar system is brewing; many consider eventual interstellar missions to be realistic, with myriad implications; AI is developing quickly, as are concepts of postbiological ETI; abundant scientist-generated speculation and debate about ETI is in the public domain; attempts among scientists to achieve consensus regarding outbound transmissions have not succeeded; the global news media landscape has changed significantly; social media is a dominant force with very rapid content dissemination and a spectrum of social interaction from friendly to abusive; public attitudes towards science are diverse and sometimes daunting; climate change is increasingly recognized worldwide as an escalating existential threat, but global agreements have been difficult; and, finally, mis/disinformation has reached astonishing proportions, with serious real-world consequences. All this change has *extensive* implications for a technosignatures discovery and its consequences. How should the technosignatures community navigate now? What is in your control, and what isn't? What answers to crucial and predictable questions could you give to the global public after a discovery? What are the technosignatures community's responsibilities now, in the 2020s, and how might these best be fulfilled?

1:55 – 2:10. Chelsea Haramia, What to Do When Moral Reasons Compete (on-site presentation)

Abstract: All scientists are moral agents. They are capable of evaluating moral reasons, making moral decisions, and being held morally responsible for their choices. When scientists engage in projects that have significant public interest and potentially wide impact, they typically must make *complex* moral decisions. When making such decisions, one is often faced with *competing* moral reasons—there may be both good reasons to perform a certain action and good reasons not to perform that action. This kind of situation can be challenging. Ethical Pluralism is a moral theory that provides a method for engaging in complex moral decision-making and adjudicating between competing moral reasons. This primer will provide an overview of Ethical Pluralism and its

application to scientific projects with significant public interest and impact. This approach rejects that any one moral feature automatically takes precedence over all others, and it takes seriously the possibility of rational regret—the idea that *right* actions can still come with significant moral costs. Recognizing moral costs and moral complexity can foster greater awareness of and respect for those who fall within the moral scope of a given scientific project. Familiarity with this approach can help scientists to strengthen their moral decision-making skills, to develop greater sensitivity to the moral features that are present in their projects and deliberations, and to play an active role in determining *what counts* as a morally relevant feature.

2:10 – 2:25. George Profitiotis, Blending Monster Theory and Futures Studies for an anticipatory governance of the search for extraterrestrial life (remote presentation)

Abstract: The discipline of Futures Studies has developed through three levels: forecasting, the discipline’s properly predictive component that is often quantitative and uses predictive models to extrapolate or project the past into short- or long-term time horizons; foresight, which includes most of the discipline’s traditional fields and is often qualitative, non-predictive, and produces a variety of possible futures, usually through scenarios; and anticipation, which is based on the outcomes resulting from forecasting and foresight to implement them into decisions and actions. Anticipation shares some of the features of foresight, as it is non-predictive, qualitative, and focused on discontinuity, but also includes “futures literacy” and the acceptance of impredicativity and complexity. Anticipation is particularly critical in the “anticipatory governance” paradigm, which can be defined as a new model of decision-making under high uncertainty that uses a wide range of possible futures to anticipate adaptation strategies, and then monitors change and uses these strategies to guide decision-making. According to Derrida, the future “is necessarily monstrous”, as it is unpredictable, incalculable, and surprising. Following the approach of “thinking with monsters” to engage with future(s), introduced by Hovorka and Peter, I will argue that futures studies, when imbued with the essence of monster theory, i.e. a theoretical framework for studying newly perceived ambiguous phenomena which fit simultaneously two preconditioned cultural categories that were originally thought to be mutually exclusive, may offer new conceptual tools and methods for governing the inherently future-oriented matter of post-detection in an anticipatory manner.

2:25 – 2:40 Brian McConnell, The Post Detection Analysis Pipeline (on-site presentation)

Abstract: Should one of the SETI or OSETI programs detect an artificial signal, what happens next? While the work of detecting extraterrestrial signals is the domain of a small group of subject experts, the work of extracting data and deciphering it will involve a much larger and diverse group of professional and citizen scientists. What information infrastructure should be prepared in advance to support such an effort? How can an authoritative source of information help blunt the effects of misinformation (which is likely to be rampant in the wake of a confirmed detection).

2:40 – 3:00 Questions, discussion, wrap-up.

Part 2: Active Philosophy Workshop, and Post-Detection Infrastructure and Protocols (Weds 29 June 1:00-3:00 Eastern)

1:00 – 1:05 Intro / Recap

1:05 – 1:50 Chelsea Haramia will lead an Active Philosophy workshop. (on-site presentation)

Description: Information, Justification, and a Moral Responsibility to Disclose: An Active Philosophy Workshop. Participants will watch a brief video prompt. We will then engage in a community of philosophical inquiry centered on the following question: *When do scientists have a moral responsibility to disclose information that shifts justification?* All participants will be in a position to offer their own ideas, challenges, reasons, and concerns. Our goal is not to settle on a decisive answer to this question. Our goal is to collectively assess which morally relevant features must be considered when answering this question, and to come to a greater understanding of how to deliberate about such issues.

1:50 – 2:50 Brian McConnell will lead a workshop on Post-Detection Infrastructure and Protocols.

First, **Shelley Wright, Post-Detection and Optical SETI** (remote presentation): short talk discussing potential post-detection strategies and follow-up protocols for optical SETI for either continuous and pulsed transient SETI candidates. I will briefly discuss suggested practices and planning for candidate signals with follow-up facilities.

Next, a longer talk from **Brian McConnell: Post-Detection Infrastructure and Protocols**, with group discussion to follow. (on-site presentation)

Abstract: SETI organizations have developed protocols around the announcement of an engineered radio or optical signal of extraterrestrial origin. Yet, there has been relatively little discussion about the analysis and comprehension effort that would follow the detection of a potentially information bearing signal. Unlike the detection effort, which involves a small group of subject experts, the effort to comprehend the information content of a transmission will be interdisciplinary and highly distributed. In this breakout session, we discuss the potential hazards of passive detection (e.g, misinformation), the current state of the art in cloud computing and storage tech and services, and how these can be used to build a robust and scalable platform for the analysis and comprehension effort should we experience a confirmed detection.

McConnell is also the author of 'The Alien Communication Handbook' (Springer Nature, 2021), which explores the different modes of communication that may be possible, and how we would go about making sense of the contents of an information bearing signal from another civilization.

2:50 – 3:00 Session Wrap-Up.

Part 3: Post-detection Exploratory Foresight Workshop (Thurs 30 June 1:00-3:00 Eastern)

(remote facilitation with in-person and remote participation)

1: 00 – 1:10 Recap / Introduction

1:10 – 2:40 Participatory Foresight Exercise.

George Profitiliotis is a foresight expert with considerable experience running foresight & futures workshops. In this session, we will follow an interactive story that explores a character's decisions and actions in a detection scenario taking place in the future. Building upon an overarching foresight scenario of one potential mid-term future of scientific research, this exercise will take the form of a participatory game that will highlight major occurrences that might unfold in the course of a detection/confirmation process, such as the interaction of scientists with the public, news sources, etc. By collectively exploring and experiencing such a future of "unfamiliar familiarity" and actively contemplating on and debating the character's decisions, specific challenges for post-detection impact may be identified, encouraging further thoughtful engagement with alternative post-detection futures to guide action in the present. This collaborative exercise will introduce participants to the benefits of active futures thinking, setting the groundwork for potential follow-up "futures literacy" workshops that could help technosignatures researchers cultivate a prepared mind, by gaining better understanding of why and how they can use the future, not only for preparation and planning but also as a tool to reframe their perceptions of the present towards making sense of novel phenomena.

2:40 – 3:00 Closing review / discussion for this breakout series.