Science and Justice Working Group End of the Year Report 2010-11
And Proposal for 2011-12

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This document describes the activities of the Science and Justice Working Group (SJWG) in the academic year 2010-2011 and presents a proposal for the 2011-2012 academic year.

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I. Executive Summary

Science & Justice brings together faculty and graduate students from all five academic divisions on the UC Santa Cruz campus to collaboratively address common problems. In a time when science and technology increasingly shape our lives, the Science & Justice community is committed to generating modes of inquiry and empirically rigorous research that can enable a diversity of livable technoscientific worlds. To this end, over the course of the last six years, the University of California Santa Cruz has formed an innovative initiative in Science & Justice funded by the University and the U.S. National Science Foundation that is increasingly recognized nationally and internationally for its leading role in developing these new forms of inquiry and action. The initiative builds on the UCSC campus' historic commitments to social justice and strengths in science studies and interdisciplinary research.

In the 2010-2011 academic year Science & Justice saw significant growth, gained substantial national and international attention for our pedagogy and research projects, and made strides toward becoming a core component of UCSC's graduate eduction and research communities. The Working Group hosted a dozen of our regular colloquia in addition to a major conference at the end of the year. The first cohort of Science & Justice Training Program Fellows made significant contributions to our programming this year, and helped bring in new faculty and graduate student members. The second cohort of Fellows began their training, and we were able to meet goals of recruiting a more disciplinarily diverse group of Fellows. The instructors of the Training Program courses were able to substantially improve the courses by orienting the reading, discussions, and assignments more toward developing student projects.

The Science & Justice community also made progress toward becoming a more prominent and permanent member of the UCSC campus, including beginning negotiations for becoming a Research Center. These efforts resulted in new funding sources and opportunities for integrating the Working Group and Training Program with other campus programs.

II. Introduction

Below we describe SJWG's recent accomplishments, history, themes, events from the 2010-2011 academic year, the Science & Justice Training Program and it's relationship with the Working Group, our plans for next year, and a proposed budget. Appended are selected documents describing this year's events.

Summary of 2010-2011 Accomplishments

The 2010-11 academic year was a period of impressive growth for the Science & Justice Working Group and our associated Science & Justice Training Program. Attendance at our events increased substantially, regularly bringing in over forty attendees, including a marked increase in the number of scientists and engineers. A number of events were standing room only. The first cohort of Training Program Fellows completed their coursework, began fieldwork, and hosted several successful SJWG events, including the ongoing Climate Cluster symposium series, and began their research projects. The second cohort of Fellows (which included a substantial increase in the number of engineering and physical science graduate students) took the introductory course and proposed a number of fascinating projects. The Working Group hosted and co-hosted over a dozen events, including colloquia, conferences, and ongoing topical symposia. The year's programming concluded with a conference dedicated to exploring how justice matters politically and methodologically in contemporary conduct of science and engineering.

Several major goals of the Training Program were met this year. Integrating insights from the prior year, PI Jenny Reardon and co-PI Karen Barad were able to improve the Introductory Seminar by recruiting engineering and science students earlier (allowing greater numbers to enroll) and focusing more on students' projects. Most importantly, the instructors decided to adjust the relationships between the students' own projects and the theoretical underpinnings of the Training Program. Rather than expecting students to learn theory and then apply it to their projects, students were allowed more and earlier opportunities to collaboratively reflect on the ethical and social dimensions of their projects, thus allowing them to integrate theoretical insights in a more grounded and productive manner. By encouraging students to narrate their projects in a co-production framework early in the course, collaborative efforts and interdisciplinary camaraderie developed substantially faster than the previous year.

As planned, this year we also developed a more synergistic relationship between the Working Group and Training Program. Because of the larger cohorts, and greater numbers of science and engineering students, we had higher attendance and more disciplinarily diverse graduate students at Working Group meetings. Members of the first cohort also began presenting their SJTP-supported research in a variety of Science & Justice events. SJTP students hosted four events and presented three papers at the year-end conference, in addition to several other students conducting field research. Altogether, this demonstrated the success of our model of providing

intellectual space, funding, and infrastructure for developing interdisciplinary research and allowing the students to build it out in unexpected and innovative ways.

The National Science Foundation provided $15,000 in supplementary funds for the Training Program, specified for an extension of the Postdoctoral Fellow's salary. Jacob Metcalf, the Postdoctoral Fellow, provides support to the Training Program by assisting with the course, leading a reading discussion group, and facilitating Working Group meetings and programming, including the primary organizing work on for the year-end conference.

This year also included a substantial increase in institution building labor on the part of Reardon. In the process of soliciting funding for SJTP Fellowships and organizing a proposal to form a Research Center, Reardon met with several campus deans and vice provosts. There was also an effort to build more formal institutional relationships with the Center for Biomolecular Sciences and Engineering, including support for the Research Center proposal. Through such conversations, we were able to build new links to faculty and administration from across the campus and articulate campus infrastructures to us.

Finally, Reardon presented a number of talks about Science & Justice, sometimes assisted by Metcalf. The Environmental Science, Policy, and Management Department at UC Berkeley invited Reardon and Metcalf to present at their departmental colloquium. Reardon presented a poster at an annual PI meeting at the National Science Foundation. The program was also discussed formally by Reardon at meetings at the London School of Economics, Leicester University, and San Francisco State University. Metcalf and Reardon have also begun co-authoring several journal articles about the pedagogy used in the Training Program and lessons learned by SJWG about creating and maintaining an interdisciplinary community.

History of the Science & Justice Working Group

The Science and Justice Working Group formed in September of 2006 with the goal of expanding UCSC's historical focus on social justice to include questions about the formation of science and technology, and related public-policy debates. Since its inaugural year, the group has added many members from all University divisions, continued to build cross-divisional intellectual and institutional relationships, and developed new strategies for interdisciplinary collaborations, all while hosting well attended events discussing topics of local importance and national and international relevance.

The initiative grew out of conversations between faculty in the Division of Social Sciences (Jenny Reardon, Sociology; Michael Hutchison, then Dean of the Division of Social Sciences), the School of Engineering (David Haussler, Biomolecular Sciences and Engineering (BMSE); David Deamer, BMSE; Steve Kang, then Dean of the School of Engineering), and the Humanities Division (Donna Haraway, History of Consciousness; Karen Barad, Feminist Studies). The Group recognized early on that to be successful, it would have to emerge from

meaningful interdivisional dialogue, involving all five divisions of the University. In the academic year 2006-07, the group focused on building this dialogue. Although at the beginning of the year, the group consisted mostly of Social Science and Humanities faculty and graduate students, by the year's end, the thirty or so active members of the group (faculty, staff, and graduate students) were almost evenly split between the Social Science, Engineering, Arts, Physical and Biological Sciences and Humanities divisions. The activities the Group pursued to build this interdivisional conversation consisted of a research seminar, a Critical Friends Series, a movie screening series, and end-of-year meeting.

In the 2007–2008 academic year, SJWG built on its success in interdisciplinary events and dialogues, increasing our regular attendance rate and hosting multiple well–attended public events. Our ability to encourage dialogue among people with varying intellectual background was facilitated by two decisions. First, we moved toward a problem driven model of inquiry. Rather than focusing on large, theoretical questions, we used specific problems as a concrete object around which we could discuss the major themes of our group. This model gave all members—social science, humanities, engineering, and natural sciences—entree into the discussions. Second, as the Group developed more familiarity between core members, we found that a habit of "red–flagging" jargon or assumptions that members found disconcerting improved our dialogues.

In the 2008-2009 academic year, SJWG continued to sponsor interdisciplinary programming, hosted several well-attended symposia, and wrote a successful grant to the Ethics Education in Science and Engineering division of the National Science Foundation (NSF). We continued to build on the problem-based model of inquiry adopted in the previous year and emphasized the small symposium format that worked well in the previous year's Race Work event. These events drew in larger than usual audiences, including from science and engineering departments that have not been substantial participants in SJWG's programming previously. The NSF grant (NSF#0933027, "Ethics and Justice in Science and Engineering Training Grant"), written by Jenny Reardon with substantial help from Jake Metcalf (then graduate student in Philosophy and hired as a GSR to assist the development of the working group) and feedback from Zia Isola (CBSE) and Karen Barad (Feminist Studies) was awarded funding to develop a training program for graduate students that will sponsor research on ethics and justice in scientific practice.

The intellectual foundation of the training program—that ethics and justice are inextricable components of scientific practice and cannot be analyzed separately—are the same as those of SJWG. Furthermore, the process of developing the program cemented relationships between SJWG, academic departments in the natural sciences, engineering, humanities, and social sciences. Although SJWG will continue as a distinct organization, the training program formalized the methods of interdisciplinary inquiry developed by SJWG members, shares programming funding, and provides new participants within SJWG.

In the 2009-2010 academic year, SJWG began to implement the NSF grant, and continued its efforts to formalize our successes and create closer relationships across the Divisions at UCSC.

Although SJWG and SJTP remained separate organizations, the synergistic relationship between them facilitated new research and programming, attracted new regular members, and encouraged new collaborations between faculty and graduate students between different divisions. The inaugural cohort of Science & Justice Fellows proposed new research clusters and events. Within the regular research seminar SJWG continued to build on research and collaboration methods, emphasizing problem-driven inquiry. Among our best-attended events was a collaboration with UCSC's branch of Women In Science and Engineering and a conversation about geoengineering, both of which grew organically from the interests of SJWG members and drew new members from the sciences and engineerings. Additionally, SJWG hosted nearly twenty colloquia, seminars, and symposia which included international scholars, researchers from private industry, faculty from other UC campuses, and USCS faculty from every division. We also developed a new website infrastructure that was launched in Fall 2010 designed to increase the visibility of Science and Justice and to host collaborative blogs. SJWG and SJTP also hosted a visiting scholar and postdoctoral fellow for the first time this year, marking UCSC and the Science & Justice networks as a location for producing innovative research.

In the 2010-2011 academic year, SJWG saw a substantial increase in attendance at regular SJWG events, in part assisted by the cohorts of SJTP Fellows who invited colleagues and professors from their departments and hosted events with wide appeal across the university. With the addition of the second cohort which began with SJTP in Spring term, the SJTP saw the fulfillment of several key goals of the grant: to broaden the constituencies of Science & Justice, financial and intellectual support for original research, and the creation of new opportunities for interdisciplinary collaborations.

Working Group Themes

The Working Group has developed a series of themes that guide our research and programming.

Curiosity as a Virtue

Doing "science and justice" work means creating an environment that supports efforts to engage with one another across differences. In the context of S&J research seminars, this means creating an environment in which participants are willing to make mistakes and to revise their own positions, views, and practices. Central to this is the effort to cultivate curiosity as a virtue of the seminar space. "Being curious" implies stepping beyond habitual modes of engagement in order to explore other possible ways of looking, questioning, and engaging with one another. Many of our Science and Justice events have been oriented toward cultivating curiosity as a virtue, including our ongoing "critical friends" series.

Scientific Literacy

In recent decades, on both sides of the political spectrum, we have seen an increasing tendency for people to react against new developments in science and technology. Debates about stem cell

research and genetically engineered foods are cases in point. We agree that it is absolutely necessary to recognize and address the potentially negative consequences of scientific innovations, but, as SJWG member Donna Haraway suggests, we need to learn to respond to these developments instead of reacting. Whereas "reaction" has the connotation of an unconscious reflex or a conditioned behavior, "response" suggests taking a step back to understand the situation so that one can intervene effectively. In the Working Group, we seek to develop our ability to respond to both developments in biotechnology and each other's different perspectives on the position of science in society. This has been achieved by incorporating some reflexive discussion about the Group itself within most events.
These efforts have been bolstered by also incorporating Working Group member Karen Barad's emphasis the importance of "scientific literacy". Scientific literacy is not simply a matter of educating non-scientists about how science works. For Barad, the important question is: What does it mean to do science responsibly, and what kind of literacy is required for that? There is no formula for "how to do science responsibly", and therefore what "scientific literacy" means, and whose literacy we are concerned with, depends on the context. The Working Group's problem–based approach facilitates developing this broad notion of scientific literacy. The Working Group also strives to incorporate the ethical, historical, social, and technological contexts and implications of the topics under discussion.

Partnerships in Science and Justice

The demands of thinking critically about science and social justice require that we challenge current notions of "expertise." The idea that we can turn to scientific "experts" to interpret recent scientific findings, or "ethical experts" to explain the ethical implications of emerging technologies has become deeply problematic because fields of expertise can't be separated out so neatly. The really important questions often arise at the limits, boundaries, and intersections of expert domains.

In order to confront the moral and political complexities of our times we need new forms of dialogue, new hybrid languages, and new kinds of research collaborations. This is the idea behind "partnerships in science and justice". Under this heading we explored what kind of partnerships are coming into being that can adequately respond to specific situated concerns at the intersection of scientific practice and social justice activism. Partnerships such as these necessarily transform the meaning of "expertise" because they require a greater degree of communicative competence across fields of knowledge.

The Science and Justice working group has considered the promises and challenges of partnerships in environmental justice (popular epidemiology, toxicology and toxicogenomics) and alternative energy and transportation systems (biofuels, personal rapid transit).

Reframing Bioethics

Given the interdisciplinary character of SJWG, there are many opinions of what bioethics as a discipline can and ought to do with regard to biotechnological problems. One of the virtues of the SJWG is the ability to illuminate the many points at which ethical decisions get made, and sometimes the places that they fail to get made. Thus, a common theme in our discussions was opening up the methods available to ethical inquiries. We found that bioethics as a discipline and institution often "arrives too late" at the table to make important interventions. A general consensus in the group is that traditional applied ethics methodologies that understand ethics as abstract value mediations are partly to blame for this problem. Because biotechnology often involves practices that remake boundaries often taken for granted—such as between species or individual human subjects—ethical theories that rely on those boundaries being stable and determinate fit poorly within the challenges that biotechnology presents. Our discussions seek to reframe ethical inquiries around a broader conception of flourishing for the human and non–human actors under consideration. Such an approach understands that an important aspect of ethical inquiry is accounting for the ways that our knowledge producing practices, our ethical concepts, and the materiality of our scientific endeavors are all entangled together. Thus, our conversations often contain critical engagements with ethical theory and methodology, allowing interdisciplinary reflections of the stakes in biotechnology.

III. Summary of Activities

Below is a summary of SJWG hosted and sponsored events in the academic year 2009-2010.

SJWG Steering Committee

In the previous years, a group of regular participants formed Steering Committee in order to shape the agenda of SJWG. The Steering Committee meets three to five times per year, including a year-end meeting to discuss what was accomplished in the past year and discuss goals for the upcoming year. Members of the Steering Committee regularly contribute to the functions of SJWG by planning events, writing reports of events, designing flyers, and reflecting on the methods and culture of SJWG.

The following people served on the Steering Committee in 2010-2011:

- Mark Diekhans, UCSC Genome Browser Team
- Martha Kenney, History of Consciousness
- Jacob Metcalf, Postdoctoral Fellow, Science and Justice Training Program
- Natalie Purcell, Sociology
- Jenny Reardon, Sociology

Visiting Scholars & Postdoctoral Fellows

This year the SJWG had one visiting scholars and a postdoctoral fellow. Ruth Müller (University of Vienna), a Ph.D. student, studies the co-constitution of the life sciences and society through

the prism of junior researchers' biographies. While at UCSC for two months she worked closely with Reardon, presented her research to SJWG, and presented at the end of year symposium. Jacob Metcalf was the Science & Justice Training Program Postdoctoral Fellow and worked closely with both the Training Program and Working Group.

Science and Justice Seminars

Below are descriptions of the Science and Justice seminars for 2010-2011.

Slow Science? Fast Science? How Pace Matters in Science

October 6, 2010

A brief perusal of key scientific journals and science policy documents reveals that questions about how fast science can produce new knowledge and innovation has become a widely acknowledged concern. Scientists promise to be close to breakthroughs, policy makers argue that "we" need to win the "science race" in order that rising powers such as India or China not outpace "us," and the media asks when science will finally deliver cures and remedies for the ills of the world. For the most part, the inherently beneficial character of producing knowledge in a fast paced manner goes undoubted. Criticism is often easily dismissed as a rejection of scientific advance. However, a more fine-grained engagement with the meanings and effects of ever faster-paced modes of research processes might yield a more complex picture. Instead of operating within binary categories of embracing or rejecting scientific progress, this Science & Justice Working Group meeting aimed at exploring the multiple levels on which the pace of science becomes meaningful: How does it influence the lives of scientists and their practices of working? How do expectations about the speed of knowledge production influence the questions asked and the forms of knowledge produced? Which social and ethical issues do different paces of science address and eclipse? What kind of response and response-abilities are possible in research cultures that encourage constant acceleration of the pace of new knowledge and innovation? The event brought together different disciplinary and experiential perspectives to identify potential issues linked to different tempos of knowledge production.

Panel Members:

Ruth Mueller, Department of Social Studies of Science, University of Vienna, Austria
Thom Van Dooren, Chancellor's Postdoctoral Research Fellow at the University of Technology Sydney, Australia
Risto Sarvas, Aalto University, Helsinki, Finland
Mark Diekhans, UCSC Center for Biomolecular Science and Engineering

Bound to Nothing but Science Itself? Academic Life Science Careers and the Nomadic Disposable Research Scientist

Ruth Müller (University of Vienna)

October 20th, 2010

Donna Haraway has argued that "the exclusion of the non-independent person" (Haraway 1997) has been constitutive for the social organization of the emerging modern sciences, practically excluding everyone but the bourgeois white man from participating in scientific knowledge production, in part because the multiple others were perceived as socially and emotionally bound, attached and tied. Drawing on recent research work in Austria and the US, in this talk Müller explored how independence, tielessness and detachment are essential features of the scientific self in contemporary academic life sciences. She argued that the ideal scientific person – especially in fast growing, highly global and increasingly commercialized fields such as the life sciences – is still imagined as being tied to nothing but science itself, happily subordinating other interests in life to the scientific vocation.

Against a backdrop of rising competition for academic positions, it seems that in the life sciences and in academia beyond, increasingly normative ideas are emerging about what a scientist's life course should look like in order to qualify for a career in science. Central elements of this normative vision include engaging in international mobility and global competition, as well as submitting to ongoing procedures of evaluation, application and selection. Together, these requirements constitute a kind of "blueprint" for measuring the quality of the scientists' work and the suitability of their lives for careers in research – a blueprint which has become institutionalized in the employment and assessment policies of contemporary academic institutions.

These contemporary career rationales both draw on and rework the notion of the detached, independent, tieless scientists on a number of levels, participating in the shaping of a nomadic, disposable research scientist who is accumulating nothing "but the absence of inhibition, a sort of free energy prepared to invest itself anywhere." (Latour 1984)

However, at any given moment in time, these scientists are also part of specific local collectives – such as research group, project teams – in which they work and live. Müller's paper explored how young scientists make sense of these different forms of collectivity in their local research environments, given the current career rationales that emphasise individualism, competition, mobility and tielessness. She argued that what we are currently witnessing is a trend towards the institutionalization of highly fragile and exploitative social relations in academic settings and of a "devil-may-care" mentality towards colleagues, groups and institutions that young scientists increasingly consider an obligatory trait for making a career in the life sciences today.

Ruth Müller's talk was followed by a short response from Martha Kenney (History of Consciousness, UCSC) and a lively discussion.

Genomics Forum: A Conversation with Steve Sturdy

November 3, 2010

Steve Sturdy, Deputy Director of the Genomics Forum in the UK (see bio below), joined us to discuss recent experimentation with science and society relations. The Genomics Forum (http://www.genomicsnetwork.ac.uk/) was created by the UK government in 2005 to foster greater exchanges between the social and life sciences, sciences and publics, and academics researchers and policy makers. The Forum has spent the last five years experimenting with new ways to conceive of and enact science and society relations with major backing from the UK government. Steve's visit will gave us a unique opportunity to learn about what the Forum does and to discuss recent experimentations in science-society relations.

Steve Sturdy joined the staff of the University of Edinburgh in 1994 as a lecturer in the Science Studies Unit, and was appointed Deputy Director of the ESRC Genomics Forum in September 2006. Originally trained in the natural sciences, he began postgraduate studies in philosophy of science, but quickly moved into social studies of science,which he found to offer a more satisfactory account of what scientists actually do.

Sturdy's research combines perspectives from the history and sociology of medicine and the sociology of scientific knowledge, and focuses on the evolving relationship between medical science, medical practice and medical policy in Britain since the mid-19th century. Sturdy has published widely in academic journals and edited collections. He has also edited; Medicine, Health and the Public Sphere in Britain,1600-2000 (Routledge, 2002) and, with Roger Cooter and Mark Harrison,War, Medicine and Modernity (Sutton, 1998) and Medicine and Modern Warfare (Rodopi, 1999).

DIY Bio and the Creation of Community Norms: A Conversation with Jason Bobe

January 19, 2011

Jason Bobe, Executive Director of PersonalGenomes.org, and Director of Community for the Personal Genome Project, and founder of DIYBio.org, joined SJWG to discuss the creation of community norms in the DIYBio community. DIY, or do-it-yourself, biology is a movement of amateur biologists who use increasingly inexpensive genetic technologies in their own home or small lab as hobbyists. DIYBio participants are between two forms of scientific and technological ethics: the hacker/DIY model of self-directed research and the model of

professional codes of ethics common to scientists. Bobe is part of an effort to define community norms for DIYBio that would encapsulates both models.

The Science and Politics of Psychedelic Research

Wednesday, March 2

Hosted by Ben Roome (Philosophy, SJTP Fellow)

The development of new pharmacological therapies for Post Traumatic Stress Disorder (PTSD) and other mental disorders requires an intricate lattice of practices. The Multidisciplinary Association for Psychedelic Studies has pursued the application of various compounds for therapeutic use for over 20 years. The group's recent success in carrying out clinical drug trials for the use of MDMA in the treatment of PTSD is the result of careful scientific and political collaboration. In order for these and other trials to be approved by the FDA a complex set of engagements has been developed through painstaking research, careful argument and deep commitment. This event brought together key members of MAPS into the space of the Science and Justice Working Group for discussion of the unprecedented collaborations and the delicate consensus needed to bring this science more fully into mainstream medicine.

Gaming and the Sociological Imagination

Michael Mateas (UCSC)

Wednesday, March 9

Michael Mateas runs the Expressive Intelligence Studio at UC Santa Cruz, which explores the intersection of artificial intelligence, art, and design. Their goal is to create compelling new forms of interactive art and entertainment that provide more deeply autonomous, generative, and dynamic responses to interaction. A major thrust of this work is advanced artificial intelligence (AI) for video agames, including autonomous characters and interactive story telling. By viewing AI as an expressive medium, their work raises and answers novel AI research questions while pushing the boundaries of the conceivable and possible in interactive experiences. Current projects in the group include automated support for game generation, automatic generation of autonomous character conversations, story management, and authoring tools for interactive storytelling.

Standardization on the Hoof: Pedigrees, Genetic Disease, and Genomic-Enhanced Breeding Practices

Scout Calvert (Wayne State University)

April 13, 2011

For decades, beef breed associations have been gathering performance data on registered animals that have become the basis for "expected progeny differences," calculations made by comparing the cattle in electronic pedigrees, or herdbooks. The American Angus Association began digitizing its herdbook in the 1960s. In 1978, it launched the Certified Angus Beef branding program, a marketing promotion that has successfully made the Angus breed co-extensive with succulent beef through a voluntary certification process, and which enables small but important premiums for beef growers. As EPDs became popular tools for the selection of artificial insemination sires, three genetic diseases reached frequencies of 10% or more in the pure-bred population. EPDs coordinated a shared quest for Angus certification that also resulted in a catastrophic narrowing of the Angus gene pool. Still reeling from the identification of these three diseases since 2008, in 2010, the Angus Association introduced Genomic-Enhanced EPDs. These pedigrees now include data from genetic markers for desirable phenotype characteristics, an innovation with ramifications for animal breeders and human genealogists alike.

Tracking Ghosts: Hauntings from a eugenic past

Banu Subramaniam (UMass Amherst)

May 11, 2011

What do morning glory flowers or exotic plant and animal species have to do with the history of race or eugenics? In this talk, Subramaniam traced the genealogies of ecology and evolutionary biology to explore how histories of gender and race shape contemporary biological theories and what lessons we can learn about the relationships between natures and cultures.

Subramaniam is associate professor of Women, Gender, Sexuality Studies at the University of Massachusetts, Amherst. She is coeditor of Feminist Science Studies: A New Generation (Routledge, 2001) and Making Threats: Biofears and Environmental Anxieties (Rowman and Littlefield, 2005). Trained as a plant evolutionary biologist, she seeks to engage the social and cultural studies of science in the practice of science. Spanning the humanities, social sciences, and the biological sciences, her research is located at the intersections of biology, women's studies, ethnic studies and postcolonial studies. Her current work focuses on the genealogies of variation in evolutionary biology, the xenophobia and nativism that accompany frameworks on invasive plant species, and the relationship of science and religious nationalism in India.

Conferences and Symposia

Below are descriptions of the Science and Justice conferences and symposia for 2010-2011.

Climate Cluster Symposium Series

The Climate Cluster, run by SJTP graduate student fellows, held a series of three interdisciplinary discussions about climate science and politics. See appended rapporteur reports for more detailed discussions.

Thinking Through the Technical Fix
Fall 2010 Climate Cluster Panel

November 10, 2010

The scope of climate change science has expanded from projections of long-term weather trends to include proposals to technically "fix" the climate, such as geoengineering and carbon mitigation strategies. Like climate modeling, proposals for technical remediation contain scientific uncertainties that translate awkwardly in the political sphere. This situation compounds the difficulties in planning for future climate conditions.

This panel discussion we explored several interrelated themes that arise in discussions of technical approaches to climate change including scientific consensus, uncertainty, indeterminacy and model downscaling. It also focussed on the possibilities of creating, integrating and communicating climate change research through mechanisms such as climate models and geographical information systems.

PANELISTS:
Michael Loik, Associate Professor, Environmental Studies
(Plant & Ecosystem Responses to Climate Change)
Andrew Mathews, Assistant Professor, Anthropology
(Scientific and Bureaucratic Forms of Knowledge and Authority)
Barry Nickel, Lecturer & Director of the Center for Integrated Spatial Research, Environmental Studies
(Spatial Ecology & Geospatial Tool Development)
Bruce Daniels, PhD candidate, Earth & Planetary Sciences
(Science of Climatology & Hydrology)

Climate Researchers In The Trenches
Winter 2011 Quarter Panel Discussion

Thursday, February 24, 2011, 12:00 p.m. E2 Room 599

Climate change science is attracting an exceptional amount of public interest, yet debates over the merit and implications of climate change research seldom unpack the complex set of

practices and networks that make up this field. This panel explored the multiple realities of conducting climate change science at a time of heightened skepticism and media attention.

Panelists:
Jason Box Associate Professor of Geography Atmospheric Sciences & Program Researcher at Byrd Polar Research Center, Ohio State University
Jeffrey Bury Associate Professor, Environmental Studies, UCSC
Ken Mankoff Ph.D. Student, Earth and Planetary Sciences, UCSC
Lisa Sloan Professor of Earth and Planetary Sciences & Director of the Climate Change and Impacts Laboratory, UCSC

Climate Science Communication And Skepticism
Spring 2011 Climate Cluster Panel

Wednesday, May 25, 2011

Why is climate change a hot button issue? Through an interdisciplinary conversation, this panel explored the heated dynamics of climate politics. It discussed many dimensions of climate science and politics and their relation to one another, e.g.: ideological polarization, climate ontology and epistemology, climate communication and scientific literacy.

Panelists:
Ronnie Lipschutz, Professor of Politics, UCSC
Chaone Mallory, Assistant Professor, Philosophy, Villanova University
Mark Snyder, Ph.D., Earth and Planetary Sciences, UCSC, Assistant Project Earth Scientist and Lecturer

Emerging Terraformations: Climate Change, Geoengineering and Science Fiction

Kresge Town Hall, UC Santa Cruz, October 22-23, 2010

This conference was co-sponsored by Science and Justice and was organized by Science and Justice Working Group member, Andrew Mathews (Anthropology). It explored how scientific and fictional imaginaries of the world as a biogeochemical unit come to inspire practices of remaking the world. Science fiction writers, environmental scientists, and social scientists concerned with climate change and the environment gathered to reflect on practices of speculative world-making. Kim Stanley Robinson was the keynote speaker, and other presenters included Ken Caldeira of Stanford University who has been one of the most prominent researchers on possible solar radiation management approaches to controlling atmospheric temperature increase.

The State of Science & Justice: Conversation in Honor of Susan Leigh Star

June 2-3, 2011, at the UCSC University Center

This end-of-year conference brought leading scholars from the Bay Area and across the U.S. and from the U.K. to examine how questions of justice inform the practices of science and engineering. Leigh Star, who passed away in March 2010, was a scholar of the sociology of science who lived in Santa Cruz and taught at a number of Bay Area institutions, in addition to being a friend and intellectual inspiration for many at UCSC. One of her lasting contributions to the field was the insistence that questions about the distribution of power in technoscientific systems be central to how we discuss and design these system. The conference was organized around the themes of her work.

Fund Raising

This year's S&J fundraising efforts included:

1) A successful bid for $15,000 in supplemental funds received from NSF
2) Initiating relations with the Development Office at UCSC
3) Working with the Center for Biomolecular Science and Engineering to create jointly-funded research in Genomics and Society
4) Organizing co-sponsorship of S&J events with multiple campus units

IV. Future Directions and Proposed Activities

The SJWG will continue to host collaborative and interdisciplinary programming, support timely research on locally important and nationally and internationally relevant issues, further integrate with the Training Program, and develop cross-divisional relationships between students and faculty.

The primary organizational goal for SJWG in the 2011-12 academic year will be to formally integrate as a University of California Research Center. In addition to developing this existing initiative into an internationally recognized training program in ethics and justice in science and engineering at Santa Cruz, creating a Research Center would help foster collaborative relations between natural and social scientists, engineers, humanists, and artists, relations that are increasingly important to major funding bodies. In many instances, granting agencies—such as the NIH and the NSF—now require that research be collaborative not just across fields in the sciences and engineering, but across the physical, biological, and social sciences and humanities. We expect such a Center could help support this sort of interdisciplinary grant-funded research. To support the continuing development of this unique and thriving area of transdisciplinary work, we seek to create a Science and Justice Research Center. This Center would do five things:

- Continue to support a space for graduate students and faculty to interact informally in a manner that fosters innovative, cross-divisional research.
- Support a Visiting Fellows Program.
- Support the development of the graduate training program with a goal of creating a graduate group.
- Support bringing together faculty from across the divisions with key actors in industry, NGOs, and government to develop research and address key problems (particularly in the areas of biomedicine, health, informatics and ‘green energy’).
- Develop undergraduate (e.g., a large lecture course on Science, Technology and Society)

With these resources, UCSC would be well-positioned to make good on an opportunity to be a world leader in an area increasingly recognized as vital to economic, social and political well-being. Integrating science and engineering with social science, humanities and arts training is vital in a world that is increasingly mediated by novel forms of science and engineering. UCSC is one of the few places where these efforts have produced not discord, but promising and inspiring new collaborations.

Creating a Center would enable the Science and Justice community at UCSC to raise the profile of the Science and Justice community at UCSC and focus its efforts on developing three to four

main research themes. Possible themes that emerged meetings with potential Steering Committee members and Deans included:

1) Public Knowledge/Science

Some of the most important questions facing governments and universities today revolve around determining what it means to create knowledge and science that serves the public good. New democratic practices (such as those enabled by new digital media), forms of privatization (such as those tied up with new forms of public-ness), and processes of globalization all are reshaping the meaning and possibilities of a public sphere. What forms knowledge—with its intimate ties to the concept of the public—will take in these new contexts is a concern of many Science and Justice members, and has emerged as a theme of the working group. These problems cut across the interests of many of our members, and are especially pertinent to medical/personal genomics and climate science.

2) Sustainable Lives in Uncertain/Indeterminate Times

Many contemporary societal problems require making decisions in conditions that are uncertain and/or indeterminate (where uncertainty means we don't know what the fact of the matter is and indeterminacy means there is no fact of the matter outside a certain experimental configuration). The Working Group has developed particular cross-divisional capacities for addressing such problems: e.g., climate change, fishery management, and water policy. It has developed skills in elucidating different cultures of uncertainty, and how different understandings/approaches to uncertainty affect the ability of scientists, policy makers, activists, NGOs and other key actors to work together to address these problems. Members of the group, led in particular by Karen Barad, have also helped to forge the analytics needed to distinguish between problems of uncertainty and those of indeterminacy.

3) Genomics and Justice

Given the collaborative working relations that have been built between David Haussler and Jenny Reardon over the last five years, relations that played an important role in enabling the emergence of the SJWG, genomics and justice will likely be a focal area for the research center. Specifically, research in this area would elucidate what Reardon has named the postgenomic condition: a condition in which the creation, maintenance, and enhancement of life and its biological bits (e.g., DNA, tumor tissues, cell lines) has increasingly become incorporated into collectivized and industrialized bioinformatic infrastructures. These novel infrastructures pose questions new and old about the constitution of credible modes of knowing and governing the world, and play important roles in shaping who lives and dies in and how in worlds increasingly shaped by the convergence of biology with informatics.

4) Response-able Science and Engineering

This theme speaks to the strengths of UCSC's Science and Justice community, as well as the need of UCSC to construct credible and sustainable Responsible Conduct of Research policies. The lessons learned and institutional infrastructures built by the Ethics and Justice in Science and Engineering Training Program are a tremendous asset for the University, and the question now is how to translate these strengths into novel approaches to Responsible Conduct of Research programming, as well as RCR policies that are not bureaucratic hoops, but meaningful practices that build the capacity of UCSC researchers to respond to moments in which doing good science requires addressing questions of ethics and justice. This theme is in concert with important theoretical contributions from our members Barad and Haraway, who have argued that we require new ethical tools to adequately respond to a world in which in no longer works to treat science and society as existing in separate domains.

5) The meaning of justice in a technoscientific, post-human age

What does it mean to think about justice and responsibility in an age when science and technology mediate—or indeed conduct—so much of social life? How do we decide who and what should be responsible in a world where algorithms, computers and claims to 'objective' knowledge play ever more central roles in decision-making processes? Who is the 'we' who decides? These questions might be at the heart of a theme on post-human justice, or could just cut across all the Center's themes.

At this point, these are only possible themes (although ones with considerable potential). In the first year of the Center, the Steering Committee would solidify three or four themes, and begin to develop them through organizing initial events, as well as grant writing.

V. Addenda

Rapporteur Reports

Climate Cluster I: Thinking Through the Technical Fix
Moderated by Tiffany Wise-West

Wednesday, November 10, 2010

The scope of climate change science has expanded from projections of long-term weather trends to include proposals to technically "fix" the climate, such as geoengineering and carbon mitigation strategies. Like climate modeling, proposals for technical remediation contain scientific uncertainties that translate awkwardly in the political sphere. This situation compounds the difficulties in planning for future climate conditions. The Climate Cluster's fall panel discussion explored several interrelated themes that arise in discussions of technical approaches to climate change including consensus, uncertainty, indeterminacy and model downscaling. The discussion also focused on the possibilities of creating, integrating and communicating climate change research through mechanisms such as climate modeling and geographical information systems (GIS).

Panelists:

Andrew Mathews, Assistant Professor, Anthropology (Technopolitics & Environmental Institutions)
Michael Loik, Associate Professor, Environmental Studies (Plant & Ecosystem Responses to Climate Change)
Barry Nickel, Lecturer & Director of the Center for Intergrated Spatial Research, Environmental Studies (Spatial Ecology & Geospatial Tool Development
Bruce Daniels, PhD Candidate, Earth & Planetary Science (Science of Climatology & Hydrology)

Moderated by Tiffany Wise-West, Ph.D. Student, Environmental Studies.

Discussion

Uncertainty: The panelists began by discussing ways to improve the predictive power of climate models and other tools that scientists use to predict the impacts of climate change in habitats and species. Some of the challenges that were identified by Barry Nickel, Michael Loik and Bruce

Daniels for improving climate change predictions were 1) improving the resolution of climate models which at the moment fail to capture important local variability 2) capturing variables in dynamic systems. Andrew Matthews raised the concern that "more knowledge doesn't necessarily make the uncertainty go away, sometimes it makes even worse." With this comment, Prof. Matthews is referring to the political uncertainty that surrounds scientific issues such as climate change that have widespread implications for a variety of stakeholders.

The panelists proceeded by discussing some of the sources of uncertainty and how they affect their respective work.

Barry Nickel stressed the distinction between uncertainty in measurements and uncertainty in understanding. He referred to the chain of uncertainty that is created when GIS models incorporate and combine various global climate models (GMCs). He concluded by saying that "his world is filled with uncertainty." He also stated that that uncertainty is not necessarily a bad thing as it can lead to new forms of knowledge.

Michael Loik explained how the biogeochemical models, which he uses in his work are driven in part by GCMS to which they incorporate biological functions to find out, for example, whether changes in precipitation would lead to increased vegetations in a specific area. In his work, one of the great challenges stems from matching the 'simple' results of the biogeochemical models with the complex matrix of biological and ecological found in-situ. Loik stated that him and his lab embrace uncertainty in their field design by often testing opposing hypotheses as they relate to climate change predictions.

Bruce Daniels discussed how most models are parameterized (i.e. averaged) to reality. He also reframed the conversation by emphasizing the importance of trust over that of scientific certainty. He explained that trust has a lot to do with knowing what scientists are actually doing and developing relationships over time.

Andrew Matthews then asked about the credibility of trust and whether we can trust a scientists based on their academic accomplishments and affiliations. He concluded by saying that modeling is concerned with the technical side of imagining futures, but not concerned enough with how these futures are taken up by politics and social system.

Collaboration & Communication: Tiffany Wise-West asked the panelists to talk about the type of collaborations that they have been involved in and the publics with whom they communicate.

Bruce Daniels, Michael Loik and Barry Nickel all talked about collaborating with and communicating their findings to professors in various departments on the UCSC campus and other non-academic groups in Santa Cruz and the Bay Area. Bruce Daniels talked about the importance of seeing the needs of our surrounding communities, even needs that they don't know they will have yet. Andrew Matthews talked about the importance of using ways to communicate

findings that the public can use in the way they use information (e.g. a poster can be better than an article).

Andrew Matthews expressed his opinion that social scientists are sometimes "poorly socialized" and don't cooperate as much as natural scientists. He spoke of forced collaborations and the ethical questions they raise.

IPCC Scandals & Consensus: Tiffany Wise-West asked the panelists their opinions regarding the recent IPCC scandals dubbed 'climategate.' The panelists talked about how politics play an important role in the IPCC. Michael Loik emphasized that sloppiness was at the root of the scandals and that the IPCC is the best climate change science that we have. He also said that framing and portrayal are ultimately key as the scientific process must go through political filter.

Andrew Matthews asked: What kind of institutions would be able to make better use of the facts hat we do have? He also argued that really good data has often come out of really sloppy processes and that nobody would have picked up on the IPCC sloppiness if they hadn't been looking for ways to discredit the IPCC as a knowledge-making institution. Bruce Daniels stressed the difficulty of reaching a consensus that threatens vested interest.

The panelists concluded by suggesting that the IPCC should perhaps include a media section in their assessment reports that would facilitate communicate their findings to the public. Michael Loik also brought up some examples of successful science-policy collaborations such as the Montreal Protocol.

When panelist were asked how each of them reached consensus with their colleagues, they spoke of comparing various models as well as comparing models to past and present climate and conditions. Michael Loik also spoke of using synthetic meetings for people to bring their data from their field studies and use meta-analysis to quantify common themes. Andrew Matthews that in his field consensus seems to be reached when others can relate to the story you are telling.

Shadow Politics: Tiffany Wise-West asked Andrew Matthews to explain his use of the term 'shadow politics.' Matthews explained that when you create a model, you also create, consciously or not, an imagined institutions/actor that can use that model.
Barry Nickel added to that by remarking that the unintentional creation of the politics around "what we do" actually has ramifications for "the work that gets done."

Science and the Public: The conversation then shifted to talking about the importance of how climate change science is presented to the public and about the dangers of the public misusing scientific tools when these become too accessible to non-experts.

A person in the public brought up the idea of multiple publics and the importance of focusing on those publics that are most worth communicating to. He also talked about the difference between ethos, logos and pathos, and about how pathos is the real challenge to tackling the challenges of global climate change.
Bruce Daniels proposed the idea of creating a public forum to take climate change science on the road and to the general public. Another member of the public brought up the importance of literacy and science literacy in particular.

In conclusion, Karen Barad asked about the kinds of uncertainty that should we care about and about the ways in which we can deconstruct the word uncertainty to make it helpful to us. Bruce Daniels compared the uncertainty around climate change to the uncertainty of investing in market stocks – an uncertainty which doesn't freeze people.

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The Climate Cluster is a collaborative and interactive "experiment" led by a group of three UCSC graduate students: Felicia Peck (Politics), Costanza Rampini (Environmental Studies), and Tiffany Wise-West (Environmental Studies). The goal of the Climate Cluster is create a platform to explore the potential for fruitful interdisciplinary communication between climate change scholars from across the disciplines and divisions.

For more information go to http://scijust.ucsc.edu or write to us at climate.cluster@gmail.com.

Climate Cluster II: Climate Researchers In The Trenches

Thursday, February 24, 2011, 12:00 p.m. E2 Room 599

Panelists:
Lisa Sloan - Professor of Earth and Planetary Sciences
& Director of the Climate Change and Impacts Laboratory, UCSC
Jason Box - Associate Professor of Geography Atmospheric Sciences & Program Researcher at Byrd Polar Research Center, Ohio State University
Jeff Bury - Associate Professor, Environmental Studies, UCSC
Ken Mankoff - Ph.D. Student, Earth and Planetary Sciences, UCSC

Costanza Rampini -- Moderator

Climate change science is attracting an exceptional amount of public interest, yet debates over the merit and implications of climate change research seldom unpack the complex set of practices and networks that make up this field. This panel explored the multiple realities of conducting climate change science at a time of heightened skepticism and media attention.

Rampini began by showing a cover of Rolling Stone, noting that the fact that climate change has made it to the same cover as Lil Dwayne shows how popular this topic has become. Rampini continued that most discussions of climate change don't take the time to unpack for us for it means to conduct climate change science. The four panelists were introduced as scholars who could help the audience understand what it means to be a climate change scientist.

Rampini then asked the panelists to introduce themselves, briefly explain their work, and say whether they identify as a climate change scientist. (panelists answers are paraphrased below)

Sloan: Emphatically, yes, I a am a climate scientist and I work on paleo climate. People on an airplance want to change their seat if you tell them you are a climate scientist. Knowing about the past can help you understand the envelope of behavior the future might bring.

Box: I am a physical climatologist and geographer. I work in Greenland and technically yes I am a climate change scientist because I study climate and the climate is always changing. I want to make the physical science matter and so always want to bring it back to the human impacts. Otherwise the science is just for the science.

Bury: I identify as a social scientist, not a climate change scientist, but 3:1 is a good ratio for this conversation. I work on the Andes.

Mankoff: I am a climate change scientist to be. I am a computer scientist by training and I study how oceans warm Antarctica, and used to be a climate modeler before returning to school. I also volunteered for Al Gore's group and gave custom live versions of An Inconvenient Truth, and the motivation was to get people to do behavioral change.

Rampini's next question was about collaboration. She prefaced that, because Climate change science generally involves transboundary collaboration whether over disciplinary boundaries or national boundaries. Collaboration can be very fruitful and very challenging, and asked the panelists to share their experience with transboundary collaboration, especially and instances that were particularly successful or difficult.

Sloan: Not sure what you mean by disciplinary boundaries. Interdisciplinarity on this campus is pretty good and this campus is a good incubator for cross-disciplinary work. Last night I gave a talk to a senior center and this town is pretty good at breaking down boundaries too.

Box: I want my department to have more impact and give back to society and not just do science for the sake of science. I am between physical and social science boundaries and I have talked with a social scientist in my Geography department who sees climate change as the biggest issue out there, which is encouraging.

Mankoff: I have been warned against doing interdisciplinary work, for example I am discouraged from doing field work, but I am doing interdisciplinary work anyway.

Bury: I come at this from an International Relations perspective, and also see where I am coming from as transdisciplinarity. I work a lot with Peruvian scientists and have seen the Balkanization of the snow and ice people, i.e. different research teams who sneak in and out of the field and don't want to talk to each other.

Box: I can confirm that I've similarly seen epistemological differences with the scientists in Peru as well, whereas in Greenland things are much friendlier.
Rampini then asked about how uncertainty manifests in the panelists' work and how they deal with it.

Bury: uncertainty is one of the primary things we try to deal with in our work. The challenge is how to devise the right methods that get the confidence of scientific colleagues when measuring what goes on in Peruvian communities. There is deep uncertainty about what future costs will be.

Sloan: uncertainty comes with science. The classic problem is that when we hear about the climate change debate people speak in absolutes, but scientists can't do that. That's a tough one to me.

Mankoff: I try to explain that a scientist doesn't have to say that gravity is just a theory, but that doesn't mean we don't think it's happening when I talk to non-scientists. The other way I deal with it is with an error bar that gets spit out of a software program.

Box: Science is only a tool, a way of knowing, and a quantitative statement should always be accompanied by an uncertainty measurement. The IPCC does an excellent job by qualifying each of its statements about uncertainty with a word (e.g. unequivocal, likely, very likely, etc.). Weather forecasters shouldn't way "it's going to rain tomorrow," they should say "there's a 95% chance it's going to rain tomorrow."

Mankoff: I will go so far as to say that species going extinct is bad, and I think this is more compelling, though subjective, than saying "we have observed a 90% decline"

Box: without a value system we are unable to make decisions, and perhaps the wall between left and right is that they simply have different value structures. This is a problem we need to consider if we want to get beyond it.

Rampini then noted how the 'climategate' scandal has been compared to the OJ Simpson trial. In the case of OJ Simpson, the large amount of evidence helped lawyers in finding flaws in the police procedures. Rampini then suggested the possibility that more information (or in the case of climate change, data) doesn't make uncertainty go away but that it can make it worse. Rampini asked if the panelists thought the debate over climate change had left the scientific lab

and entered the political arena. She also asked what kind of role, if any, do scientists still have in these political debates.

Box: sea level rise will have wider error bars in the 5th IPCC assessment and that will cause confusion for the public.

Sloan: Not sure that outside skepticism makes the science better. What is going on with Inhoffe is ugly, what is going on with the political side of things makes me think the scientists aren't playing a decent role in the political arena so I feel pessimistic.

Bury: The scandals have taught me not to leave emails on the server. USAID's whole program is now all about climate change and I brought them together with people from the World Bank. This story shows how the politicization of science in Washington has consequences for development.

Rampini then asked about audience, and whether the panelists had any experiences communicating their research to a general public or policy-makers.

Bury: I have been very impressed by how Box has communicated his findings about Greenland with lots of internet resources and being on a Greenpeace ship. What I'm working on is developing new formats for communicating findings to visually demonstrate glacier repression in the Andes. I won't take USAID's money but I do give them free advice. We have no skepticism in Peru, everyone there believes that climate change is taking place.

Mankoff: I have had people walk out of the room and say I am trying to poison them with CFL lightbulbs.

Box: Know your audience. I was sponsored by the UCC to talk with my congressperson about climate science. To speak with conservatives I couldn't rely on the typical environmental message. Instead, it is wise to make appeals to patriotism, and ask them what we are leaving for our kids, speak in terms of stewardship and to speak of economic competitiveness, e.g. with solar manufacturers in China.

Sloan: Make it local, that gives your audience a stake in what climate change might mean. E.g. say that Beach Hill in Santa Cruz may become Beach Island.

The audience also asked a number of questions of the panelists. One participant asked whether the way the panelists conducted their work had changed in response to the skeptic movement, e.g. if there was more pressure for transparency.

Box: The more transparency the better.

Sloan: The NSF now wants a data management plan that includes how it will be archived so that anyone can access it, but this causing issues about how to pay for and manage the data management.

Bury: I also need a data management plan that will be public, which is difficult since I work with human subjects.

Other conversations that were prompted by comments from the audience included: the problem of translating knowledge into action (where even in environmental education one participant had noted substantial gaps between awareness and action); whether tackling the effects and causes of climate change were competing policy priorities; and whether scientists are invested in changing values and perhaps should think more about values. Mankoff commented that it is important to make both causes and effects policy priorities and that values do not come into the science, as that would not be science. Box noted that more than nine out of ten climate scientists come from a liberal perspective, and discussion on what should be done about climate change politically included references to "psychological warfare." Bury noted that he studies the scientists and asks them to come to policy meetings with him, and that he also brings ethicists into the field with him. Discussion turned to the notion of objectivity as itself a value and the possibility of valuing objectivity.

Climate Cluster Event III: Skepticism and Science Politics

Ronnie Lipschutz, Professor, Politics, UCSC
Chaone Mallory, Assistant Prof, Philosophy, Villanova University
Mark Snyder, Lecturer, Earth & Planetary Sciences, UCSC

Licia Peck – Moderator

Q1: What do you know and how do you know it?

Mark: Studies climate systems using climate models. Fundamental question is how do greenhouse gasses enter atmosphere and how do we know it? We can use paleontological historical records to infer what past climates were like. We can also use isotopic tracking to determine a range of past carbon dioxide levels. How do we look to the future? We look to climate models. There are uncertainties associated with such models because we do not understand these processes completely, for example representation of clouds. We deal with these uncertainties through parameterizations, using expert judgment. Though there is uncertainty, we do know that temperature is indeed increasing. Question then becomes narrowing uncertainty.

Chaone: As an interdisciplinary-trained environmental philosopher, the kind of data we draw on and how we do it is different than natural and social scientists by thinking about the relation of bodies in place, i.e. the phenomenological experience in addition to empirical observations. Part

of what counts also include what counts as knowledge, stories and narratives. In her work, she interrogates the knowledge and power, and who is included. Specifically, she explores TEK, traditional ecological knowledge, in native American cultures.

Ronnie: He is originally a trained in physics and energy but now his research has more to do with ontology. What are the assumptions that people bring to the table when they hear and process knowledge? How do we understand this process that we call science and what it generates. What do people bring to the table as foundational beliefs?

Q2: Why is the consensus of most scientists accepted in some arenas and discounted in others?

Ronnie: Politicizing is not a bad thing as it points to the fact that shape of politics is strange and gets back to foundational beliefs. Do you believe in God or something transcendental? Science becomes somewhat transcendentalist in that if you don't subscribe and act, you die! Rather than life or death it is really a matter of deep seeded belief and meaning. For some reason climate change has become one of the ideological splits broadly, similar to how communism/capitalism were a split in past, perhaps much more than it deserves. What kind of role is it becoming?

Mark: To take Ronnie's analogy of science as a religion, skeptics play the role of the heretic, by attacking small points that the average person doesn't know. Skeptics might come from science background but not climate science and don't usually conduct research but rather scrutinize science that is published.

Chaone: What material interests or psychological investments are threatened by accepting that climate change is real and we know it is happening? Agrees with Ronnie that if climate policy is political, that's not a bad thing as it forces us to become explicit about the fate of the planet. If we acknowledge this, we can talk about the kinds of values we want to come down on.

Ronnie follow up: Using the term "interests" is problematic, because there are two sides. Secondly, he thinks more is stake than interests as we are talking about the long term benefits to people if we address this problem now. The problem lies at the level of meanings. Not just a question if it's good for me or not but draws on the question of why am I here?

Chaone: Clarifies her thoughts on "interests." Deeply invested in anthroprocentrism. Ronnie feels a worldview of anthropocentrism is very valid since we are the only species that can cause such destruction.

Mark: Belief in God or religion allows people to not be concerned about this. Are skeptics and deniers preventing some research from being conducted? Very difficult to justify validity of research in light of this.

Q3: How do you think your work might influence politics?

Mark: From a funding perspective, what we research is somewhat politically driven (i.e. NSF). Something that will be useful with politicians requires some dialogue. Long term projections of 30, 40 and 50 years are not aligned with politicians term cycles so thus they kick the can down the road. California has initiated this kind of long-term thinking.

Chaone: Recognizing the politics in our knowledge process is important. References Val Plumwood, ecofeminist, perspective on care and respect of research in politics. Suggests that the role of non-natural sciences in influencing politics is less clear. What can philosophers contribute to this debate? Part of this is taking voices seriously, especially those outside of the traditionally authoritative powers.

Ronnie: "Why are academics so eager to give advice to politics when there is no indication that politicians listen?" Has to do with politics of research enterprise and retail politics (i.e. what goes on in DC). The kind of research that has impact is likely research that fits one or another proclivity out there and is used for political ends. With respect to philosophers, if he gets into debate with economist, he cannot debate solidly. However, if he debates an economist about ethics, he will have a leg up over the economist. This is where the argument needs to take place and there is a role for it.

Simply, he does not think his work has an influence on politics.

If we lived for 1000 years, we would have a very different perspective on this topic. There is a disconnect between time frames and valuation. Especially since people say, "the future never does anything for me."

Q4: How does time come into play in your thoughts on climate change and science?

Chaone: Do we need to accept the fact that the future is always discounted? Is that the essence of being an economist or politician? Do we have a moral obligation to future generations? What are the properties and characteristics of a right holder? Presenting other scenarios than "politicians are never going to get on board." Can we train the next set of politicians to consider this?

Ronnie: Very pessimistic. Politics as we understand it in democratic societies are driven purely by the next election. Public policy has a longer view but as a rule is rooted in economic terms and is constrained by the election cycle. An example: the best thing the president could do would be a $6/gallon tax on gasoline. He assures us that no one that did that would stand a chance of winning the next election. He has trouble seeing the way out of this. Time does play an important role. Our material interests play a big role also. We violate our biocentric beliefs hundreds of times every day. Must be deeply embedded in the norms of everyday life such that we don't do those bad acts anymore.

Mark: He thinks of timescales of models and conditions in the future. Based on how economics, politics, technology transfer effect the world and thus the future world. Interesting that these more social science fields will influence the material and natural world.

Q5: In what ways does it matter if the public trusts the institution of climate science?

Mark: Believe in the public ranges from deniers to believers. In looking at those in between, those that are open to convincing, the trust is very important. For example, IPCC climate gate was a very specific way to create distrust in science. Clever and targeted way to do so. His climate change media training says that we should project a positive image going forward and that there are things we can do to improve the situation. Frame climate science to address the issues important to the target audience, i.e. jobs. Then you enter the role of advocacate. Do we want to cross into that world and should we cross into that world?

Chaone: Who is the public? What are the spaces of the public sphere? The norms of social behavior are part of that space. We need multiple angles in approach.

Ronnie: Says Steve Schneider was trying to straddle the science/public advocate roles and it was a challenge. Once you cross the boundary into public advocacy you face rules. Communicating the bad stuff seems to work i.e. opportunity does not gain as much traction as fear. It's about framing and telling persuasive stories people will accept, which sounds a lot like social engineering and propaganda. He points out that we are subjected to this everyday through advertisements, etc.

Q6: Can you make a recommendation as to how your discipline can help?

Mark: Physical science needs to focus on communication
Ronnie: He'd like his field to stop studying climate change and start focusing on environmental justice.
Chaone: Wants more study in philosophy and wants it taken seriously. Wants voices to be heard.

The panel was followed by a question and answer session with the audience.

The Science and Politics of Psychedelic Research
MAPS engages with the Science and Justice Working Group

March 2nd, 2011

Four key members of the Multidisciplinary Association for Psychedelic Studies joined the space of the Science and Justice working group to focus on the practices involved with bringing the

psychedelic compound MDMA (more commonly known as 'ecstasy') to phase III drug trials for the treatment of Post-Traumatic Stress Disorder (PTSD).

The meeting opened with a brief history of the MAPS mission in relation to MDMA related by by Josh Sonstroem (MAPS Director of Finance and IT). A tremendous controversy around MDMA emerged in the mid eighties. As therapists explored potential applications for the compound in therapeutic use, MDMA was also discovered by the party community, causing a political backlash that would ultimately lead to the drug becoming a Schedule I controlled substance, meaning it would be classified as having no medical use and a high potential for abuse. MAPS founder and director Rick Doblin thus began a 20 year battle to reassert the medical uses of MDMA. His efforts to bring therapists who had used the drug with therapeutic success were waylaid by studies funded by the National Institute of Drug Abuse (NIDA) claiming that MDMA caused brain damage after only one use. Although these studies were later shown to be scientifically inaccurate in several ways, a tremendous amount of ground would have to be regained in order to reclassify the drug as medically valuable.

Valerie Mojeiko (MAPS Deputy Director and Leader of the Psychedelic Harm-Reduction Program) thus picked up the thread at this point to explain MAPS early positioning as a non-profit focused on public education. Beyond publishing and disseminating information about psychedelic research, MAPS began the Psychedelic Harm-Reduction Program with the Black Rock City Rangers, a volunteer group at the Burning Man Festival that focuses on mediating difficult situations, including uncomfortable psychedelic experiences. It was in this context that MAPS was first able to develop a form of psychedelic therapeutic practices.

Brad Burge (MAPS Communication and Education Associate) brought the discussion further along in history by explaining how the early Ricardi study, the one that claimed to show that MDMA has only-adverse effects, was ultimately overturned by later research. Burge also helped to explain how early NIDA-funded studies actually contained a tremendous amount of data that would be used to support MAPS's argument that MDMA was safe for human use. While the presentational tone of these studies focused on the dangers of MDMA, the actual data they contained showed that MDMA did not carry any lasting adverse effects. This elegant re-appropriation of scientific data produced by anti-MDMA groups would typify the MAPS strategy in future engagements.

Berra Yazar-Klosinksi (MAPS Clinical Research Associate followed up by providing an in-depth explanation of clinical practices employed in MAPS funded studies being carried out in North Carolina, Switzerland, Israel and Jordan. The crux of this explanation was to demonstrate that the measurement techniques employed by the FDA to test other compounds for the treatment of PTSD are tremendously well suited to MDMA therapy. In particular, the Clinician Administered PTSD Scale (CAPS) very successfully demonstrates the value of three MDMA assisted therapy sessions for the treatment of PTSD. It is primarily these successes that have led MAPS to recently rebrand itself as a non-profit drug development organization. Berra also discussed the difficulties of applying the CAPS in the various languages and social milieus in which MDMA

trials are being carried out. A tremendous amount of work still needs to be done to bring MDMA into mainstream medicine. Every year MAPS becomes more successful at addressing what needs to be accomplished and finding creative new ways to achieve their goals.

Members of the Science and Justice Workgroup then contributed comments, suggestions and critiques that might help MAPS members explore new possibilities for successful scientific practices. Jake Metcalf opened with questions about MAPS branding practices associated with their prospectus. In particular, Metcalf discussed the imagery used in the prospectus; the prospectus shows a variety of stock photos of 'mainstream' people such as soldiers and housewives and assiduously avoids counterculture tropes. The ensuing discussion about MAPS' branding practices considered the challenges of simultaneously appealing to funders, adopting a pose of objective scientific research practices, and maintaining some connection to MAPS' countercultural roots. Jenny Reardon followed this thread with a series of questions focused on considering how MAPS might challenge the scientific practices employed by the FDA while still moving towards their goal of mainstream medical acceptance. She suggested that while MAPS may be trying to take the drugs out of the counterculture and take the counterculture out of the drugs, there may be useful epistemic insights in countercultural science. She noted that particularly in Northern California there is a long history of important technoscience endeavors initiated by members of the counterculture as a countercultural effort. Martha Kenney focused on concerns surrounding the translations issues of the CAPS, and suggested a moved towards critically considering these issues as part of the measurement practices, rather than as a mere veil to objective understanding. This sparked discussion from the MAPS guests about the various challenges of testing for PTSD in different cultures—if the tests are translated from English on the fly by the tester then there is no consistency in the test. But even translating in advance poses a challenge because PTSD is articulated through a culture's psycho-social constructs. Natalie Purcell also posed a valuable question about how MDMA treatment might be producing a certain conception of the phenomenon of PTSD across cultures that deserves critical attention. Karen Barad posed a question about the expression of side-effects to MDMA therapy, and how they might be addressed through good scientific practices.

MAPS representatives took these considerations in the spirit of collaboration and expressed their excitement at exploring them further, both within MAPS itself, and as part of future meetings of the Science and Justice Working Group.

The State of Science & Justice: Conversations in Honor of Susan Leigh Star

Science & Justice Working Group Rapporteur Report

UCSC University Center
June 2-3, 2011

This year-end conference brought together members of the extended Science & Justice community to discuss how justice informs the study of scientific practices and knowledge production. The conference was held in part to honor Susan Leigh Star, an intellectual mentor and friend to many in the UCSC community, who passed away unexpectedly in March 2010. Star's work is often noted for insisting that justice play a central topical and methodological role in the field of science and technology studies (STS). Organized around several major themes of her work, the presentations and discussions focused on how scientific practices can be reworked around concern for lives that are routinely marginalized, opening the possibility of forms of science and engineering that are both more just and epistemically robust. The first day of the conference memorialized Star's life and contributions to STS. The second day of the conference was structured around two major themes of her work—Cui Bono? and Values in Infrastructure and Design—and included a presentation of graduate research sponsored by the Science and Justice Training Program.

Thursday, June 2

Keynote: Geoffrey Bowker (University of Pittsburgh)
"Working the Boundaries: Justice in a Distributed World"

Geoffrey Bowker was Leigh Star's long time partner, collaborator, and co-author for numerous books and articles. In concert with Star's insistence on weaving together one's biography and intellectual work, Bowker's keynote discussed how Star's experiences informed her intellectual labor. Bowker explained that Star had grown up in a working class family in Rhode Island, where her family had once owned a painting supplies store. Her father evinced a number of racial biases, with a particular animus toward Jews. It was only late in life that Star learned that she was in fact Jewish through her maternal family. She was bookish from the beginning of her life, often finding in reading a type of solace from the constrained sorts of life that were available to working class women in rural New England at the time. Not realizing the Leland Stanford Junior University was the full name of elite Stanford University, she turned down a full undergraduate fellowship offer from them. She eventually found her way to an organic farming commune in Venezuela where she would hungrily read any English language literature and philosophy she could cart in on the back of a donkey. One piece in particular, pragmatist philosopher and social theorist Arthur Bentley's essay "The Human Skin: Philosophy's Last Line of Defense," drew her back to formal education. She left Venezuela enrolled in the Sociology doctorate program at the University of Chicago, working under the pragmatist sociologists Anselm Strauss and Howard Becker. Bowker also discussed other components of Star's personal

and political identities: her bisexuality and her struggles with coming out to her family; her spiritual curiosity that took the form of commitments to Judaism, Buddhism, and Wicca; her long term illnesses and struggles with severe pain; and their deep intellectual and romantic relationship that began while they were both studying in France.

Bowker used these biographical details to explore the way in which Star's personal experiences shaped her intellectual work, in particular her methodological commitment to following the marginalized and silenced people whose lives are often a better illustration of how work actually gets done in social and epistemological systems. Contrary to the commitments of the Actor Network Theory that has been highly influential in STS for the past 20 years, Bowker argued that Star's oeuvre demonstrates that the worst thing a sociologist of science can do is to follow the actors because they are all equally blind to what happens in the system. Instead one must "listen forth" for the silences that can better demonstrate the structures that shape knowledge production. Done appropriately, tracking the knowledge production of the marginalized members of society is both compassionate and empirically robust.

Bowker summarized Star's major contributions to the field in this context. *Boundary objects*, first formulated in collaboration with Jim Griesemer, describe objects that are plastic enough to be used by multiple communities with divergent and locally tailored purposes, while stable enough to maintain integrity and meaning across their multiple usages. The weakly structured nature of boundary objects allows them to be coherent across multiple social worlds. *Torque* describes the pressure exerted on the aspects of lived lives that do not fit the categories assigned to them by infrastructures and bureaucracies. Described at length in Bowker's and Star's study of South African apartheid racial classification bureaucracy, torque is identified with the contortions that one must undertake to make themselves function within categories that they did not choose —all people do not fit some categories, but maldistributions of power place far more torque on some people than others. Having studied the damage wrought by unjust infrastructures, *social engineering* was a significant focus later in Star's career when she focused on how to build more flexible infrastructures that would allow people to work in the world in rich and full ways. The core problematic for her was how to flip social values by designing and manipulating infrastructures.

Bowker concluded by arguing that those who study scientific and engineering practices do not adequately learn how to read and play with values within our work. However, by not learning how to read and play with values, we become unable to read and play with infrastructures. In order to study infrastructures of knowledge it has become obligatory for scholars to develop a poetics of infrastructure that would enable more of the marginalized and silenced public to stay alive in a rich and full way by navigating the standards built into our lives. It has become necessary to listen forth to science and technology and hear it's silences.

Keynote Respondents

Maria Puig de la Bellacasa (Leicester University, UK)
Puig de la Bellacasa began her response by noting that Leigh Star inhabits the infrastructure of her soul. Most importantly, Star's influence had taught her to consider the modes of attention that are at play in the sociology and philosophy of science. Star's commitments to social justice taught her ask "who will see the spaces between?" The notion of "spaces between" in technoscientific systems comes from a poem Star included in one of her edited books:

"oh seductive metaphor
network flung over reality
filaments spun from the body
connections of magic
extend
extend
extend

who will see the spaces between?"

From *The Net, Ecologies of Knowledge*, 1995

Star's work asked us to attend to the forgotten and to see the violence in forgetting. Doing so requires making space for others and engaging creatively with justice.

Puig de la Bellacasa noted that Star's work demonstrated that adopting justice as a methodological commitment does not require a simplistic analysis that would reject all infrastructures as oppressive. She identified several complicating themes from within Star's studies of infrastructures:

1) Engaging in justice is not limited to insisting on one's fair share of technology for everybody. Such an assumption gives way to the addictive power of technoscience.
2) There can be no condemnation of standardization. We can try to make distinctions in how categories work. Not all silences are malign or benevolent, and we all productively occupy problematic and residual categories in some circumstances.
3) Making visible the invisible has a price. It is not beneficial in all circumstances to be visible, despite the habits of justice advocates to insist on knowing and showing.

These themes fit with Star's pragmatist philosophy: resisting all absolutisms, any commitment to justice must be thick, and avoid righteousness. Importantly, it is necessary to dwell with speculative commitments and remain loyal to attachment and situatedness. There is a force in reminding ourselves that some things are just not right. However, there is also a value in remaining speculative—in not defining in advance what we should do in response to what is wrong, as we don't know what the "spaces between" can become.

Puig de la Bellacasa closed with a discussion of why Star chose the metaphors of ecology over the metaphors of networks. In Star's introductory chapter to the collection *Ecologies of Knowledge*, she writes, "A web is composed of filaments, and a seamless web should be an oxymoronic term. There is no empty space in a seamless web, but our image of network is that it is filaments with space between. For this reason I prefer ecology" (27). In contrast to the infinite extension evoked by network metaphors, Star preferred the stabilizing and seamless aspects of ecology because it encourages material and grounded connections. In this vein, Puig de la Bellacasa encouraged the audience to be open to discussions that couple spirituality, ecology, and technology in honor of Star's efforts to integrate all such components of a full life.

Donna Haraway (UCSC)
"Living in Torque and Staying with the Trouble: Playing Cat's Cradle with Leigh Star"

Haraway opened her response by noting the importance of being re-formed by each other, and acknowledging the ways in which Star's work interpolated the members of Science & Justice. She then discussed what she sees as the primary theme of her recent work: "staying with the trouble." She evoked the metaphor of the cat's cradle to describe what scholarship that stays with the trouble might look like. Playing cat's cradle (a children's string game) can be done on many sorts of limbs as long as rhythms of accepting and giving are sustained. Cat's cradle scholarship as a form of relaying and thinking-with involves "particular sorts of materialist, naturalcultural entanglements, patterning, dropping threads, knotting, storying-making-thinking intra-action and intra-patience. ... A game of relaying patterns, of one hand, or pair of hands, or mouths and feet, or other sorts of tentacular things, holding still to receive something from another, and then relaying by adding something new, by proposing another knot, another web." In this way, scholarship is not really about the "hands" that do the gesturing, but rather the patterning that is done through the collaborative game. In order to move the patterning along, the players require passion and action, holding still and moving, anchoring, and launching.

Haraway discussed the ways in which the game of cat's cradle can be a materialization of ontologies and mythologies. A particular variation of cat's cradle played in Navajo communities illustrates the creation story in which the trickster coyote disrupts the sun god's orderly creation of stars in the heavens. As the story is told, time is kept through the complex gestures used to make a string model of the Dilyéhé/Pleiades constellation. Riffing on Marilyn Strathern's claim that "It matters what ideas we use to think other ideas (with)," Harway stated: "It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what ties tie ties. It matters what stories make worlds, what worlds make stories." She described several case studies from her recent work on the human-sheep naturecultures of the Navajo Southwest that are maintained and reworked in contemporary worlds by ancient storytelling practices such as the Dilyéhé/Pleiades cat's cradle

Haraway cited the many cat's cradles enabled by Star's persistent staying with the trouble and descriptions of people who live with torque. She described Star's contributions as stories that tell stories that are not finished. In this sense, Star's model of science studies operates as speculative

science fiction. She closed by offering a fictional multiple integral equation that models what an intersectional/intra-actional theory would look like in Terrapolis. She desribed this as a formalism of sf mathematics, where sf means not only science fiction, but also "so far," such that we can open up what is yet-to-come in pasts, presents and futures.

$$\int_{\alpha}^{\Omega} \text{Terra}[X]n = \iiint\ldots\iint \text{Terra}(X1,X2,X3,X4,\ldots,Xn,t)\, dX1\, dX2\, dX3\, dX4\ldots dXn\, dt = \text{Terrapolis}$$

X1 = stuff/physis, X2 = capacity, X3 = sociality, X4 = materiality, Xn = ??
α (alpha) = not zoë, but ecoevodevo's multispecies epigenesis
Ω (omega) = not bios, but recuperating terra's pluriverse
t = multi-scalar times, entangled times of past/present/yet-to-come, worlding times, not container time

Terrapolis is a fictional integral equation, a speculative fabulation.
Terrapolis is an n-dimensional hyper volume; in ecological theory, a niche space.
Terrapolis is a niche space for multispecies becoming-with.
Terrapolis is a n-dimensional volume in naturecultures.
Terrapolis is the semiotic material worlding of EcoEvoDevo in multi-scalar times and places.
Terrapolis is the cat's cradling set of string figures tied in intra-action and intra-patience.
Terrapolis is networked re-enactments for flourishing in mortal terrain living and dying.
Terrapolis is multispecies story telling, multispecies worlding in sf modes.
Terrapolis is open, not poor in world, full of connections and networked re-enactments.
Terrapolis is a chimera of materials, languages, histories; a mongrel of Greek and Latin.
Terrapolis is playing cat's cradle with Isabelle Stengers' cosmopolitics, tugging at the threads of coherence in the interests of co-habitation.
Terrapolis is the home of transdisciplinarities that are at risk of becoming-with.
Terrapolis is at risk of dropping threads and missing dimensions in the action and passion of caring.
Terrapolis is full of companion species — not "post-human" but "com-post."
Terrapolis is of and for humus, the stuff of guman, an old earthy Indoeuropean word for workers of the soil, not the stuff of homo, that figure of the bright and airy sacred image of the same.
Terrapolis is not a system, not even a hopeful 3rd-order or nth-order cybernetic system; but its values are determinable, locatable, accountable, and open to change.
Terrapolis is abstract and concrete.
Terrapolis is sf.

Jacob Metcalf (UCSC)
"Traces of Justice, or Love as an Ontology"

Metcalf began his response by discussing how he came to know Star better through her absence than he had in life. However, her absence is not straightforward—the traces of care and love that she manifested through friendships and scholarship remain strong. In Star's introduction to *Ecologies of Knowledge*, she discusses the pragmatist philosopher John Dewey's critique of reflex psychology. Prescient in 1986, Dewey notes that there is a common image in psychology that a stimulus would happen, 'go in' the brain, stop there, be processed, and something would come back out as a reaction. This was complete nonsense according to Dewey. Stimuli don't 'go in' through nothingness, bridging the philosophical gap that representationalism posits must be there. There is an event that changes the air, interacts with skin, with nerves, spinning electrons through the brain, and capacitating response. Whatever we might identify as 'the event' is actually continuous, and there is never a time when it 'stops'. Metcalf claimed that the arc of stimuli just leaping into the brain is a convenient notation for a dualist, reductionist psychology, and makes certain things amenable to quantification.

Writing in the context of destabilizing and decentering the knowing subject, particularly it's cognitive and linguistic processes, Star writes: "I reiterate Dewey's critique with respect to cognition and the individual, and recommend it to researchers in STS. Learning ... is a series of continuous events, of changes, rearrangements in the space-time of your body. Once the process gets going it keeps on going, given constant interactions with other people and all kinds of humans and nonhumans in the world. I don't know enough about death to know whether or in exactly what forms it might keep going afterwards, except that the ongoing actions we leave embedded in the world constitute one such action; for example, the books we write may be read after our deaths." Why, in the middle of a clear and straightforward introduction to the philosophical and moral issues of STS, did Leigh discuss her death?

Metcalf stated that it is in this spirit that we should understand Star's presence:
life as a form of work, of ongoing actions that rearrange bodies in timespace, with constant interactions in a world of multiplicity and partiality. The point of discussing Star's traces and evoking her ghost is not to show that the world is traces all the way down, although she might agree with that. Instead, these are pragmatist traces: they exist because they do work in a lived world full of existing bodies, bodies that are full of pain and pleasure, happiness and mourning. Metcalf posed the question: What do Star's ongoing actions that she left embedded in this world *do* to us?

He followed with a discussion of Star's contribution to the volume *5 Questions: Philosophy of Technology*, a collection of responses to the same five questions from different theorists of technoscience. Whereas almost all of the other respondents focused on professionalized concerns about whom they studied with, or what abstractions grabbed their attention, Star gave a lengthy biography and emphasized the need to attend to the experience of the neglected and silenced members of society:

Q: "With respect to present and future inquiry, how can the most important philosophical problems concerning technology be identified and explored?"

A:"If we begin to refuse the types of walls alluded to above, we could stop using technology to sequester people and their experiences. If we begin with those who are excluded, shamed, and silenced, their lives will become the most important philosophical questions to be answered."

The notion that the most important philosophical questions could be illuminated by attending to the marginalized is heretical to the philosophy of science and technology. Yet this served as a core commitment of Star's research topics and methodologies, especially her efforts to keep grand ideas grounded in lived lives.

Friday, June 3

Opening Comments
Jenny Reardon

Reardon opened with a discussion of how and why she came to UCSC and how the environment here has sustained the Science & Justice community. Honoring Star's commitment to acknowledging spirituality in academic work, Reardon said that it was her soul that drew her here. She was attracted by the unique constellation of faculty here at Santa Cruz—a faculty that had managed to resist the rote routinization that institutions can too easily fall prey to, and had managed to always ask after the most important questions: why and how to live?

Reardon suggested it is important to reflect on how we come to combine these rather lofty, powerful words like science and justice. Given justice's strong historical ties to divine and natural law, in some senses it is surprising that in conjunction with science, it gathers so many of us and why Star and others have found this hitching together inspiring.

While the figure of ethics did a lot of work in the early years of conjoining science and society, for many of us the infrastructural work of building institutional routes, habits and practices around "ethics" fell flat because it became an administrative hoop to jump through. In that same 10-20 years, justice emerged as something different—as that which inspired, and was not punitive.

Reardon suggested that justice inspires because it moves oneself out of the space of thinking yet again about the self, and the conduct of the self, in this age of the self and orients us around the collective. Historically, this collectivizing component of justice contained a transcendent note, an 'elsewhere' from which to proceed. Recently, the figure of humanity has emerged as a secular ground for those who are powerless to make justice claims. This ground is of increased salience in a world that seeks to build binding relations among humans and non-humans in spaces beyond the nation-state. Rather than God, nature, humanity—gathering points of the highest order—Reardon thinks we seek something more speculative: an embrace and an opening all at

once; holding together while always offering up the space of freedom; the space of speculative fictions.

Reardon asked if science has the same dynamic as justice: a higher power that claims to represent all humans. Technoscientific figures, like genomics, suggest this. In a moment where the global and the universals that facilitate it are on the rise, genomics and justice appear likely pairs. Articulating technoscientific figures to justice feels already written into the script of contemporary technoscientific dramas, from Facebook and Google to personal genomics. The very predictability and power of this script, Reardon suggested, should give us pause. While it is compelling, where is it leading us? Is this somewhere we all really want to go?

Reardon thinks answering that question will depend on us "keeping with the trouble." As Puig de la Bellacasa outlined yesterday, a particular kind of trouble is created if we allow justice to be figured as just getting our fair share of a universal good—the project of justice then just becomes a matter of better practices of inclusion. But inclusion is not sufficient for understanding how justice intersects with science—providing genomic science to communities that remain severely economically disadvantaged cannot be the entire scope of scientific responsibility. If we instead cede this critical problem, questions about whose interests and problems are addressed with ever-limited resources fall out of view. A too easy embrace of a justice frame, with its tendency to frame things in terms of universals, hides these issues.

Reardon argued that if we are to embrace justice, then we must move towards a critical embrace that moderates justice's feverish pitch with sober interrogations of its underlying assumptions. We require a thick commitment to justice that questions the upholder of the law, steers clear of righteousness, and keeps us passionately with the trouble and with the loss. The loss, as Puig de la Bellacasa described in her talk the previous day, that comes when we don't see the other possible worlds. This requires a justice that embraces speculative commitment, and a loyal attachment to situated visions.

Reardon concluded by suggesting that despite its dangers, we should embrace justice, for whenever we are able to claim justice we have found an open, a fissure between the world as it is and the world as we want it to be. That open we should not cede.

Panel: Cui Bono?
Chair: Karen Barad (UCSC)

In one of her most influential essays, Star discusses the uneven distribution of costs for those who cannot fit within infrastrucutres. She writes that it is necessary to always ask "cui bono?," or who benefits, when examining technoscientific systems. This panel was organized to explore the central role of cui bono in feminist science studies. Karen Barad, chair of the panel, discussed the need for building spaces that are welcoming to the arts, humanities, engineering, and social sciences in order to keep questions of justice at the center of our research projects. Because of

the hunger for research that can get at the rich complexities of technoscientific systems, feminist science studies should not be considered a mere subfield of STS, but rather a model for how to intervene in those systems without a pretense that such interventions can be clean.

Astrid Schrader (Sarah Lawrence)
Resituating "Cui bono?" — Exploring Conceptions of Time as Infrastructure in Harmful Algae Research

This paper is inspired by Leigh Star's often quoted assertion that "it is both more analytically interesting and more politically just to begin with the question cui bono, than to begin with a celebration of the fact of human/non-human mingling" (1991: 43). Schrader stated being challenged by Star's question of where to begin. How does one avoid leveling human/nonhuman differences that Star finds at work in Latour and Callon's version of actor network theory, and remain attentive to relations of power, without re-affirming a political epistemology that—in Latour's terms—g rants historicity only to humans and artifacts, and denies it to nonhumans. Schrader is interested here in the relationship of specific kinds of 'human/nonhuman mingling,' and the very possibility to pose the question 'cui bono?' from within in scientific practices. In other words, she seeks to understand how can the question cui bono can become a necessary part of the common referent of scientific knowledge across communities, and how epistemological and ontological assumptions about human/nonhuman differences may foreclose the very possibility to ask this question. In particular, she is curious what happens to the construction of boundary objects when the objects of scientific investigations are lively things that may have their 'own points of view,' by which she means things that have their own ecologies, 'technologies' and historicities.

Schrader pursued these questions with the help of dinoflagellates – marine unicellular microorganism - that are categorized as Harmful Algae. In recent years, Harmful Algal Blooms (HABs) have become a major environmental concern, and the increased frequency of their occurrences affects costal water around the globe. HABs endanger the livelihood of sea mammals, birds, and fish and also adversely affect human health and can destroy entire ecosystems. What renders some dinoflagellate species part of a boundary object endowed with the capacity to unify a diverse community of practice is a particular judgment: namely, that they are harmful to specific human economies. She further argued that the notion of 'harmful algae' becomes a boundary object whose common identity is constituted as a threat to specific economies. The technologies used to detect HABs materialize a notion of 'our' time as an unalterable and continuously acceleration movement of Homo Economicus.

Detection technologies that seek to approach 'real-time' demonstrate a profound complicity with short-term economic calculations. Relying on the assumption that there once was a nature all by itself unpolluted by technological deferrals and accelerations, 'real-time' technologies seek their own disappearance as technology through the de-temporalization of time. At the same time, they can be directly linked to an acceleration of human time that is fundamentally distinct from the genetically or informationally programmed rhythms of the rest of nature.

Harmful dinoflagellates, however, don't pre-exist our technoscientific intervention, nor are they produced by them. Who the harmful dinoflagellates are, and how they act, can only be determined in the context of specific matters of concern. Their historicity requires the re-construction of a shared time, which is only possible when cui bono—or who benefits and suffers—becomes part of the referent that determines their harmful being. In this way, humans are no longer the only actors, and scientific knowledge production can no longer hide it's relation to utility.

Harmful microbes thus may provide an opportunity to reconfigure our time – that is, now - and ask anew to whom the ecological transformations of the oceans matter. Her point is not a specific answer, but the very possibility to pose the question that has been effaced by assumptions about the unalterable movement of the global economy of 'our' time. An assessment of harmfulness in terms of cost-benefit calculations can no longer follow automatically as an expression of 'our' time.

Maria Puig de la Bellacasa (Leicester University, UK)
Encountering the Infrastructure of Bios: Ecological Struggles and the Science of Soil
Puig de la Bellacasa proposed a new path into the discussion of infrastructure by proposing soil as a metaphor for it. As soil is often neglected and mistreated, yet overtly present, it also opens questions that are consonant with Star's attention to the silenced. Puig de la Bellacasa encouraged a shift in our modes of attention to the soil, with glimpses of transformative relationships between the sciences, ecological struggles at the level of everyday practices. Such a shift would enable us to confront the destruction of this mistreated living ecosystem and contribute to the renewal of humans' relationships with their fellow Earthlings. This is contrary to the imaginary common to soil science of soil as a layer of earth rather than a living ecosystem. She discussed how soil is both a repository of the earth's material memories, and cultural site for horror about the decay of life. It is where most residues end up: all the unclassifiable in the everyday 'sorting out' of things; 'non recyclable' materials that gather in categories such as 'organic waste.' But from the perspective of ecological living, waste that cannot decay has become a highly ethically charged category of matter: if it cannot become soil, we have a problem.

Soil is an infrastructure in the senses articluted by Star and Rudheler (Star and Rudheler 1999). It is relational as a background for other kinds of work, and it is embedded because it is successful if nobody notices it. Yet in ecological and political moments, soil is not always silent and we are required to ask, 'For whom are we trying to save the soil.?' As the infrastructure of Bios, soil is supported by many invisible workers, and we are required to consider who gives voice to those workers.

Puig de la Bellacasa discussed some of her experiences with Earthactivist collectives that work on permaculture projects. What these movements have in common is that all are calling for planetary awareness starting from the local level in a way that also reveals another characteristic

of infrastructure: its particular 'reach or scope' always 'goes beyond a single event or one-site practice' (Star, 381). Infrastructure manifests its existence locally, through our material everyday relationships with it. Here she is interested in how ecological movements are calling upon the knowledge of scientists of soil for this task. She also insisted that we keep in mind the spiritual aspect of soil, and recognize workers who maintain it. Soil radically puts the spiritual/material into question. Soil is not seen as dust to receive humans after death, nor is it a soulless inert matter shaped by god and infused with spirit to create a soulful form (humans). Soil is in itself part of a living organic web of being of which many creatures, including humans, are part. Putting the spiritual and scientific together, in the tradition of Star's work, we can avoid separating the material practices and what trascends them. In so doing, we can create an *infranatural* dimension: something that exceeds us individually and collectively, but from within.

Katie King (University of Maryland): Growing Boundary Objects: Among Transcontextual Feminisms

The sudden, unexpected death of Susan Leigh Star has made us all conscious of her vibrant contributions to feminist methods across many knowledge worlds. In this talk, King emulated and reflected upon Star's ability to "grow boundary objects" by refusing, as she puts it, "to strip away the ambiguity of the objects of learning and impose or ignore membership categories." (Bowker and Star 1999: 305). With this practice in mind, she considered how feminists' "tacking back-and-forth" in the layered restructurings of pivotal boundary objects register affects of affiliation and disidentification as kinds of boundary labor (Star 2010: 613). The "rigor" of transcontextual feminist methods comes into play when we welcome that "People often cannot see what they take for granted until they encounter someone who does not take it for granted" (Bowker and Star 1999: 291), and work for an exquisite sensitivity to each horizon of possible resources and infrastructures, local exigencies, and differential memberships. Transcontextual feminisms, as King has come to understand them, inspired by Star's investigations among cognitive infrastructures, have to scope and scale among Ecologies of Knowledge (the title of Star's 1995 edited collection). They work to remain curious about the passionate affiliations that intensive knowledge work require and produce.

A full version of King's talk is available at: **http://growbobjects.blogspot.com/**

Panel: Experiments in Collaboration: The Science & Justice Training Program
Chair: Andrew Matthews (UCSC)

The UCSC Science & Justice Training Program is an NSF-sponsored affiliate of the Science & Justice Working Group that trains graduate students in interdisciplinary, collaborative research projects at the intersection of science and society. Echoing Leigh Star's efforts to continually mentor younger scholars and recognize their contributions, members of the Training Program were invited to present their research projects at the conference.

Jennie Liss Ohayon (UCSC)
Restoring Justice? Public Participation in the Environmental Restoration of Military Superfund Sites

While no longer commissioned for battle, former military lands around the United States have become sites of struggles over environmental remediation. Since 1988, approximately one hundred major military installations have been closed under the direction of the federal government. In most cases, a legacy of toxic contamination is left behind, with many of these installations being listed among the nation's worst hazardous waste sites. This has serious implications for public and ecological health.
As a result of the adoption of several statutes and regulations, incorporating meaningful public participation into decisions on environmental remediation has become a key goal for several government agencies, including the Environmental Protection Agency (EPA) and Department of Defense. This has been implemented in the form of citizen advisory committees, public hearings and workshops, and funding for communities to hire independent experts for scientific consultation. The implementation of these programs, however, has had mixed results ranging from long-functioning citizen advisory committees to the disbanding of committees and strained relationships. Ohayon's research analyzes citizen participation in decision-making processes on cleanup and reuse in three decommissioned military bases in California. All three of the case studies were approved for closure in 1991 and are listed under the National Priority List (NPL), which includes the most polluted sites in the U.S. Despite similarities in region and policy backdrop, there are differences across sites in how communities have accessed, engaged, produced and interpreted scientific information, and the influence that these processes have had on restoration and reuse opportunities. Her research analyzes these efforts to democratize scientific knowledge production in environmental remediation, pay attention in particular to the following three themes:

Participatory Structure: What is community participation meant to accomplish according to different stakeholders? What methods are used to involve participants? Who participates?

Knowledge Production: How is scientific information transferred among participants in these programs and what information is deemed credible? How is uncertain and contested scientific knowledge addressed?

Outcomes: Does public participation in decision making change remedial activities and restoration outcomes?

The broader impacts of the proposed area of inquiry lie in its contribution to research on how to improve public participation processes in decision-making that relates to the protection of human health and the environment. Furthermore, Ohayon assess how participation processes have been carried out across different sociopolitical contexts. This includes marginalized communities that have suffered disproportionately from local environmental risks and hazards, with the EPA

underscoring that "equal access to the decision-making process" is a matter of environmental justice.

Martha Kenney (UCSC) and Ruth Müller (University of Vienna)
"Relating Within Research Apparatuses"

Ruth Müller dissertation research focuses on the lives and careers of postdoctoral fellows in the life sciences in Austria. In this paper, Müller explored how current career rationales in the academic life sciences, which emphasize mobility, short-term employment and competition influence how young scientists engage with the concrete local collective contexts of their work, such as research teams. Building on interviews conducted in the framework of a larger research project called "Living Changes in the Life Sciences," she argued that we are currently witnessing a trend towards an institutionalization of highly fragile and exploitative social relations in such academic settings, which encourage a "devil-may-care" mentality towards colleagues, groups and institutions. Young scientists increasingly feel that individualism and tieless-ness are necessary for making an academic career in the life sciences, which has substantial consequences for both their personal and epistemic choices. Müller asked how we might begin to make micro-shifts towards a system that would be more livable for scientists, while at the same time cultivating a kind of research contributes to building a more livable world.

Martha Kenney considered how the "reflexive peer-to-peer interviews" conducted by Müller and her colleagues are already participating in creating spaces that allow for micro-shifts in the system. Instead of understanding these interviews as simply an information-gathering exercise, she argues that we might also think of this innovative interview technique as a kind of STS apparatus that has the potential to materialize different ways of living in the academy, for both the life scientists (interviewees) and STS scholars (interviewers). By characterizing interviews as a dynamic interpersonal practices, Kenney shows how they can be an important sites where the concerns of struggling scientists are brought into relation with the commitments of STS scholars. Bringing out the relational quality of Müller's interviews allows us to open broader questions about how STS scholars can contribute to changing the conditions of scientific knowledge production, not only through policy recommendations but through a careful attention to our own mundane but consequential research practices.

Alexis Mourenza (UCSC)
Potentialities and the Indeterminacy of Nonhuman Animal Minds

Potentialities can only be identified when the appropriate conditions that elicit them have been provided, when they are expressed in functioning form. That is, potentials cannot be observed, only expressions of those potentials can. Refocusing attention on the potentialities rather than the competencies of nonhuman animal minds changes the debate, and the implications for responsibility in scientific practice. Recognizing the plasticity of minds and role of interactions between experimenter and subject in the emergence of complex cognition raises problems for assumptions about the necessity of ecological validity in Adaptive Behavior and Cognition

(ABC) research as well as for claims of the uniqueness of human cognition by calling into question not only the status but also the content of such claims of 'human uniqueness.' By examining the process by which an experimental program seeks to demonstrate the possession or absence of a given cognitive capacity by an animal subject Mourenza seeks to show that cognitive competencies demonstrated experimentally are the product of the interaction of the organism's physiological potentials with the training and testing procedures they undergo in the lab.

Experimental work coming out of the pinniped lab at the Long Marine Laboratory at the University of California, Santa Cruz offers an informing example of indeterminacy in nonhuman animal cognition. The sea lion subject Rio is the first nonhuman animal to demonstrate the formation of equivalence relations between perceptually disparate stimuli. In other words, she understands some basic rules of deductive logic. The UCSC researchers attribute her success to the nature of the training and testing procedure they utilized, which provided Rio with experience with a sufficient number of exemplars to grasp the interrelated concepts of reflexivity, symmetry, and transitivity. After being taught that a number of samples and comparisons are interchangeable, Rio rapidly learned to respond to novel equivalence relations the first time she encountered them. The particular sequence of tests conducted were designed to maximize Rio's correct performance on test trials by ensuring that she had demonstrated all of the prerequisites for a given test before that test was given. This provides a concrete case in which even the experimenters themselves acknowledge that they are not investigating an observer-independent object but phenomena that come into being only within the interaction of researcher and experimental subject. The interface of the experimental procedure and the subject's mind provides the evidence of her formation of equivalence relations and is exactly where (in time and space) that the object (phenomena) itself emerges. Mourenza advocated a shift of focus from the sole emphasis on epistemological uncertainties (questions of species-typical traits and our failure to elicit them in a laboratory setting) of nonhuman animal cognition to include an exploration of the ontological indeterminacy (potentialities and plasticity) of what their minds can do and the joint role played by both the human experimenters and the animal subjects in the experimental processes of demonstrating complex cognition in nonhuman animals.

Panel: Values in Infrastructure and Design
Chair: Ellen Balka (Simon Frasier University)

Although questions of values in infrastructure were preeminent throughout Star's career, her later work was marked by a move toward an interrogation of design practices in a similar light. In particular, she became more interested in how design processes that attended to values could contribute to a reworking the values of society at large, and open new degrees of freedom for those whose lives were negatively impacted within technoscientific systems. The following discussion considered the need for design labs that can figure out the value levers and can pose questions about what we aren't seeing in technoscientific systems. Because of the direction of

consumer-oriented design that emphasizes individual uniqueness, it has become challenging to build objects and systems that elicit visions of a common good.

Cory Knobel (University of Pittsburgh): Unpacking Justice {by | through} Design

Knobel discussed where Star's work was headed when she died. She had come to the realization that a focus on silence and suffering wrought from residual categories can come from an ultimately authoritarian perspective. She instead wanted to explore how entire worlds of robust processes, routines, encounters, and systems could exist inside the residual categories. Within residual categories are infrastructures as robust and functional as those in the legitimated categories. These systems – designed, enacted, and lived by the silent, the suffering, the citizens of the residual – serve (at least) two purposes. First, as all infrastructures do, they accommodate the conduct of everyday activities and work. Additionally, they often serve to perpetuate the categorical boundaries that establish the residual, the other, the uncategorizable. Infrastructures make specific systems that underlie the conduct of our lives invisible. These "infrastructures of neglect" render the residual category itself impenetrable, and quite often invisible beyond its hardened shell. Once inside, though, the categories become lived lives; the ways of knowing become ways of being in the world. Knobel argued it was necessary to understand Star's work on infrastructures in light of her pragmatist and phenomenological commitments. She always interpreted the world through the confluence of intellect, body, sexuality, spirituality, politics, and loves – and gently, yet fiercely, pushed back against the Transcendental Walls of Shame that would de-legitimate explicating the world from a place of Being and Becoming.

Knobel discussed the emerging themes from Star's work of listening forth, falling forth, and designing forth. Listening forth is what we do *for* each other: developing modes of attention that are a form of care. Falling forth is what we do *with* each other: a way to find meaning and joy in the physicality and viscerality of our relationships with each other, with objects, with knowledges and knowings, and with discovering that there is silence and suffering in the world. Designing forth is what we are enabled to do *because of* each other: making the world more livable by flipping infrastructural values through design practices. Knobel referenced the phrase "I shall not remain insignificant" from Ann Frank's diary as an inspiration to Star as she thought about designing forth. She had also been inspired by Freek Vermeulen's statement in the *Journal of the Academy of Management* that we cannot, should not design and manage systems without the active engagement of the populations who engage and live with them.

Katie Shilton (UCLA)
Building Values Into the Design of Pervasive Mobile Technologies

Shilton discussed methods for promoting social values as design criteria within technology engineering labs. It focused on how social values get designed into technologies, and ways that ethicists and social scientists can encourage social justice values as part of design. The paper presented results from an ethnographic study of a lab that builds data collection software for mobile phones to track participants' locations, habits, and behaviors. This technical work raised a

number of social justice challenges, particularly around privacy, consent, equity, and forgetting. The study suggested that there are activities within design that can encourage engineers to agree on social values as design criteria. It describes these design activities as values levers: practices that open new conversations about social values, and encourage consensus around those values as design criteria. Laboratory leaders and outside values advocates can enable and strengthen these levers to make social justice values an explicit part of design practice.

Fred Turner (Stanford University)
Image and Infrastructure: Multi-screen Propaganda in World War II

In the early 1940s, many Americans believed that the fate of the Western world hinged on questions of communication and aesthetics. Turner's presentation trace the rise of that belief and argued for a new historical analysis of the politics of attention and of the media infrastructures that emerged to shape it. The talk returned first to the 1930s, where it outlined the ubiquitous fear that mass media might create the sort of "mass men" then coming to power in Nazi Germany. Such fears depended on a Freudian model of the self and a sender-message-receiver model of communication. The presentation then showed how Bauhaus refugees working in New York and Chicago drew on Gestalt psychology to develop an immersive, multi-screen aesthetic that they hoped would help create "democratic personalities." The talk concluded by arguing that this turn represented a tap root of contemporary multimedia aesthetics and a powerful lens with which to explore the politics of attention and of media infrastructures today.

Collective Reflection at end of conference

Several themes emerged during the collective reflections at the conference's close.

Where are opportunities for justice located?
Jenny Reardon noted that it is extraordinarily important to think about how we move values out of the individual, and to value the public. This issue has many levels of resonance, especially in a public schools at this time. How do we create the infrastructures that relate us to the collective? Katie King noted an interest in agency not located at the same level of the unit of control, the private individual. She is nterested in sensations of agency that are not about being determined, but are also infrastructural and relational. To work on justice and values at a level other than the individual requires notions of agency that are more processual, and thus we should always looking for examples where the units of agency are different from the unit of control or unit of individual consciousness. Often, the politics of justice that have moved our technologies have been about reshaping individual agency rather than building more expansive notions of agency. Sometimes we don't know how to value new technologies in this manner, but sometimes we want to be part of things we don't yet understand.

How do we inherit Star's work?
Donna Haraway stated that the conference was like experiencing the ritual space in which a friend is becoming an ancestor. Star's work and life are transformed through her ongoing agency. The deeply personal and profoundly collective rituals that have followed after her death produce Star as our ancestor in a way that has to do with living forth. Her ideas of cui bono, standardization and torque can become the collectivizing of people through a shared ancestor. Reardon echoed this experience, stating that it felt as if Star was becoming even more a member of our community as a figure that we return to and thus newly know.

Metaphors for thinking about science and justice
Geoffrey Bowker noted an appreciation for the wealth of metaphors at play throughout the conference, and the resultant expansion of a conceptual toolkit that helps you think the world differently. He found Puig de la Bellacasa's use of soil a striking example, particularly in light of how much of our metaphoric space is dedicated to space and water. Whitney Boesel reflected on the power of thinking about the spaces in between for understanding science and justice, particularly in contrast with the networkedness. Sha Labare noted metaphors of ecology is showing up in a number of places. He noted that its easy when thinking of environment to focus on networks, but such a focus misses some beautiful things to be said about the thickness of life.

The state of the academy, and the possibility of hope for the future
Reardon reflected on how the conference moved between the beautiful and the concrete issues in how we make up our world. The ability to do so is something unique about the space created by the Science & Justice Working Group, and is especially the contributions of the humanities of the arts. Warren Sack noted that there is a lot of gathering of people in humanities worlds that don't explicitly think about making, but a lot of the conversation at this conference had been about analyzing and designing.

Donna Haraway argued we need to foreground the current wave of academic restructuring. She had been thinking about the vulnerability of people in the room who are barely holding on in early academic careers, but were nonetheless committing ongoing scholarship. She challenged members of the community to articulate what would count as responsibility toward the people who are disappearing at a remarkable level of intensity. Its present as a community sensation. Reardon related this challenge to the shrinking of the public, and what can be funded by the public. How to make what is going on legible and articulable to resources to make this stuff come alive. I for one will be spending time thinking about it, and want help in engaging in the practical project.

Bowker recalled conversations with Star in which they wondered "when is a disaster?" Society seems to know how to deal with acute disasters, but we do not know at what point you say something like "Southern California cannot continue?" For instance, how might we use the number of asthma cases as a measure of disaster and livability? Similarly, we have a lot of vulnerability in the academy, and the university has become a disaster. We need way so thinking about disaster without counting causalities. Reardon stated that the celebratory moment of

technoscience attends to a very small range of things, and we need to understand it in a broader sense so we can make sense of such slow disasters.

Fred Turner suggested that he wanted to be hopeful because he was raised in an intellectual tradition in the academy to resist and change and intervene. Given that, he wanted to pause to remember that Star was a tremendous teacher; she would just sit down and be with you a certain way and was very powerful. We have been teaching each other, demonstrating the value of doing this in a public space. As academics, we can't save the whole world, but we can teach hundred in our classes. Ben Roome seconded the message of hope, and connected to Katie King's discussion of occupying multiple reality tracks and occupying multiple futures. If we can occupy those tracks, we can produce one that is livable.

Jenny Reardon closed with a reflection on the sense of renewal with Star and a belief in the space created by the Science & Justice Working Group. Despite the disasters and cuts, this space continues to let us think we can pull off things we never imagined; Star pulls us into that feeling.

Sponsorship

The following organizations co-sponsored this event:

The UCSC Science & Justice Working Group, Science & Justice Training Program, The National Science Foundation, the UCSC Center for Biomolecular Science & Engineering, the UCSC Division of Graduate Studies, Department of Sociology, Department of Anthropology, Department of Environmental Studies, History of Consciousness Department, College 8, and the Digital Arts and New Media Department.

Reports on Science & Justice Fellows Research and Activities

The Science & Justice Training Program offers a space for graduate students from all university divisions to engage in collaborative, interdisciplinary research projects that are legible in their own fields. These projects can contribute to a students' dissertation project, or may take other forms. Below are summaries of projects of Science & Justice Fellows.

2010 Science & Justice Training Program Cohort

Costanza Rampini

As a fellow in the Science and Justice Training Program at UCSC, Costanza is working in cohort with Ph.D. students Tiffany Wise-West and Licia Peck to host a series of lectures and workshops that would foster a transdisciplinary dialogue on climate change issues on the UCSC campus. Together we have been inspired by readings of Longino (1990), van der Sluijs (1998), Latour (2004, 2005), and Brown et al. (2010) to ask the following questions: How do climate change scientists assemble and around which matters of concern? What kind of consensus exists in the climate change community? How do cultural and political assumptions/values trigger and influence climate change research? What are the dynamics between the scientific and political discourse over climate change? How is uncertainty represented in the climate change discourse? What constitutes evidence for the different disciplines involved in climate change science? How is local 'lay' knowledge integrated in climate change science? The overall goal of our activities is to create a new collective space around a shared matter of concern (climate change) whereby UCSC climate change scientists can inform and share research as well as forge collaborative relationships that will inform and enrich existing projects and potentially catalyze the start of new projects.

Martha Kenney

Martha Kenney is an interdisciplinary humanities scholar who writes and teaches about the politics of knowledge. For her training program project, she is collaborating with Ruth Mueller, a doctoral candidate in the Social Studies of Science department at the University of Vienna. Mueller's dissertation is an interview-based study of postdoctoral life scientists in Austria. She has found that career rationales in the academic life sciences encourage competition, international mobility, and individualism, which has a substantial impact on the personal and epistemic choices of the scientists. In their collaborative project Kenney and Mueller explore together ways to make micro-shifts towards a system that would be more livable for scientists, while at the same time cultivating a kind of research contributes to building a more livable world. Drawing on Kenney's writing about the political potential of Science and Technology Studies, they suggest that that the biographical interviews Mueller conducted for her dissertation can help address this problem by creating a space for scientists to pause from the high-speed

culture of the life sciences and think differently about the relationship between their work and their lives. Kenney and Mueller have presented this work at two conference in the spring of 2011 and are preparing an article for submission to academic journals in the fall of 2012.

Alexis Mourenza

Alexis Mourenza is a PhD student in the Philosophy department at UC Santa Cruz and her area of emphasis is in the philosophy of nonhuman animal minds. Her project for the Science and Justice Training Program, "Potentialities and the Indeterminacy of Nonhuman Animal Cognition," will examine the process by which an experimental program seeks to demonstrate the possession or absence of a given cognitive capacity by an animal subject. She will seek to show that cognitive competencies demonstrated are the product of the interaction of the organism's physiological potentials with the training and testing procedures they undergo in the lab. She will examine how animal behavior and cognition research could benefit from a shift of focus from the demonstration of species-typical cognitive traits to an investigation of the potentialities and plasticity of nonhuman animal minds. In so doing she will explore issues not only of uncertainty resulting from methodological biases of the experimental paradigms available and the nonscientific background assumptions held by the researchers that hinder the demonstration of complex cognition in nonlinguistic animals, but also of the indeterminacy in the objects under investigation, i.e. the cognitive skills of the nonhuman animal subjects. She will examine how cognitive competencies emerge and come to be through the interactions of the human researchers and the nonhuman animal subjects within the experimental procedure itself of demonstrating the subject's possession of those skills.

Micha Rahder

Micha Rahder, a PhD candidate in Anthropology, is conducting research that examines the role of remote sensing and GIS sciences in forest conservation in Guatemala's Maya Biosphere Reserve. Remote sensing technologies, such as satellite imagery, along with GIS computer programs that can analyze complex multi-scalar spatial data, are emerging as key instruments in the global conservation toolbox. This project will address the political and material effects of remote sensing and GIS in the Reserve, as well as how these technologies figure into the production of natural landscapes and social difference. In addition to traditional ethnographic fieldwork in Guatemala, Micha's research will incorporate a variety of collaborative methodologies in the field and at UCSC, working with scientists, community-level conservation workers, and local community members to explore the possibilities and limitations of these emerging scientific tools. These projects include building GIS maps and analyses in collaboration with a wide range of actors, and organizing a workshop in Guatemala around the themes of monitoring and mapping in the Maya Biosphere Reserve.

Tiffany Wise-West

The intent of my research is to study the integration of the socio-economic, policy, hydrologic

and climate science dimensions of water resource management by developing an adaptation strategy analysis tool for decision-makers whose policy-driven or institutionally derived socio-economic goals are explicit. This tool will be similar to those developed for specific regions but whose inputs are limited to select aspects of water management dynamics and whose outputs fail to produce outcomes in socio-economic terms. I have developed a conceptual analysis framework, which takes an integrated approach to assessing adaptive capacity by including economic, policy, hydrologic, and climate inputs. This analysis framework will be applied to regional urban water resource case studies (i.e. management institutions) to ascertain the marginal cost of adaptive capacity building strategies under various climate scenarios and policy options. It will also be utilized to examine the socioeconomic outcomes of climate change adaptation strategies, with an eye toward mitigating adverse impacts on marginalized populations. By bringing focus to the micro-process dynamics of water resource management to a regional watershed scale, this research has a high potential to assist water managers in considering all aspects of and actors in climate change planning and decision-making. Its overarching goal is to bring consideration to marginalized populations, which will also produce better outcomes for those groups. This analysis will also facilitate differentiation between actual and perceived vulnerabilities as well serve as a tool in reducing vulnerability while simultaneously increasing system resilience.

Benjamin Roome

As a Science & Justice Fellow Benjamin Roome is exploring the relationship between pharmacological therapies and mental disorders in order to open new possibilities for health in psychiatry. The Science & Justice Training Program has helped Ben to learn how to engage in and promote dialogue amongst interdisciplinary research communities involved in pharmacological research. By helping scientists to critically examine their experiments, Ben's work opens a different kind of discussion about how drugs can be most effectively used in psychiatric research. By better understanding, for instance, how psychostimulants affect measurement practices for ADHD, researchers will be equipped to create and defend innovative hybrid therapies for ADHD that depend less on administering harmful compounds to children. Through these dialogues, the multifarious groups involved in this research are better able to produce healthy and just futures for patients, clinicians and researchers.

Felicia Peck

As a fellow in the UCSC Science & Justice Training Program, Felicia Allegra Peck is collaboratively hosting a series of experimental events that provide an opportunity for researchers to explore the intersections between the political and scientific dimensions of climate change through interdisciplinary conversations. Peck's research tracks how political attention to climate change relates to the relatively new prominence of the language of "carbon" in environmental discourse. The research explores how carbon navigates the fact/value divide by linking together economic valuation, social values, and the scientific value of objectivity. The research also explores the paradoxical role of carbon as a contributor to consensus and a catalyst

for contestation, examining to what extent carbon might hold the key to bringing about climate justice, or if it is a false prophet.

Jennie Liss Ohayon

Jennie Ohayon is a PhD student in the Environmental Studies Department. As part of her tenure as a Science and Justice Fellow, Jennie Liss Ohayon is analyzing how citizen participation programs influence the production of scientific knowledge and the subsequent restoration of Californian Superfund sites. Policy to incorporate public participation into environmental decision-making in the nation's worst hazardous waste sites has had mixed results, with citizen advisory committees being disbanded in some cases due to conflict over scientific information and remedial activities. As a Science and Justice Fellow, she interacts with cleanup teams, community members, and scientists to understand what different actors envision participation programs to accomplish, how ecological risks are interpreted differently among actors in these programs, and how uncertain and contested scientific knowledge is addressed. The aim is to increase the capacity for community input into environmental decision-making when conflicts over reuse and environmental justice issues are prominent.

As a Science and Justice Fellow, Jennie also has the opportunity to bring together individuals interested in progressive education. She has worked in educational programs in community housing developments and a rural high school and in the upcoming Winter will be organizing a Science and Justice event that brings together educators to strategize around educational innovations in teaching and learning.

Celina Kapoor

At least 29 million people worldwide—in resource-rich and resource-poor societies—die from a chronic condition each year (Yach et al 2004). The number who live with any given chronic condition is much larger. 285 million adults worldwide, for example, have diabetes (Ambinder 2010; Kenner 2008; Shaw and Zimmet 2009; Taubes 2011). Type-2 diabetes is only one of many chronic illnesses including cancer, heart disease, and asthma. Intergovernmental, as well as local and national public health, organizations are scrambling to stem the tide. Explanations are often posed within a micro-level/macro-level dichotomy, highlighting either individual or community-level struggles against larger political or economic forces, or structural forces that render the individual or the community helpless (Spurlock 2004). At the same time the numbers of individuals with chronic and disabling conditions continues to rise. Critiques are often directed at corporations and politics; interventions to reduce the burden of chronic illnesses, however, overwhelmingly strive for individual behavior change. By engaging a larger public in an on-going discussion about my work, my research contributes to an analysis of chronic illnesses by drawing on the unique skills of anthropology to understand micro- and macro-level processes as always co-existing.

Although this is not an applied medical anthropology project, I intend to produce research findings that I can circulate in academic and health-based research arenas. I will share my preliminary research findings with audiences while conducting research. Specifically, a McAllen-based physician has asked that join him on his call-in radio show hosted by Radio Esperanza, a Spanish-language station that has audiences in the U.S. and in Mexico. He has asked that I use the time on his program to discuss my on-going research findings and answer peoples questions about it. The back-and-forth discussion format that is provided by the radio allows for a unique kind of "publishing" of my findings. Indeed, it allows the "readers" (listeners) to critique my analysis and respond to it. Additionally, I will present and discuss my findings in a workshop format with staff and clients at the medical center and public health research center where I will be conducing a portion of my research. I will make non-academic presentations—while in the field and afterwards—in Spanish and English about the intersections of diabetes, everyday life, and identity categories.