

International Workshop, September 28-29, 2009

Georgia Tech Library, Neely Lobby, Library & Information Center

Program

Sunday, September 27, 2009

Informal dinner at Baraonda. We will meet in the Georgia Tech Hotel lobby at 6:30pm

Monday, September 28, 2009

9:00 – 9:15am

Welcome Address: *Kenneth J. Knoespel*, Interim Dean of Ivan Allen College of Liberal Arts, Georgia Institute of Technology, Atlanta, USA

9:15 – 10:45	<i>Robert Frodeman</i> (University of North Texas, USA)	Interdisciplinarity and the Limits of Knowledge	In her chapter in the Oxford Handbook of Interdisciplinarity Julie Thompson Klein offers a masterful set of definitions of ‘interdisciplinarity’ and other cognate terms. But the term may be approached in another, more psychological and archeological manner, where we are alive to more obscurely felt resonances. ‘Interdisciplinarity’ often functions apophatically: it announces an absence, expressing our dissatisfaction with current modes of knowledge production. It contains a collective unconscious of worries about the changing place of knowledge in society. This talk explores some of these larger resonances.
	<i>Jan C. Schmidt</i> (Darmstadt University of Applied Sciences, Germany)	Towards a Philosophy of Interdisciplinarity: Identifying epistemological Challenges and Issues	Does the term “interdisciplinarity” carry any distinctive epistemic content and any <i>differentia specifica</i> ? In addition to what has been achieved in the field of reflection on interdisciplinarity (ID), the aim of this paper is to pose questions and to provide a philosophical foundation for a classification <i>and</i> criticism of the innumerable usages of interdisciplinarity. A plurality of meanings will be shown: There is not <i>one</i> type of ID, but various types coexist. With regard to established positions in the philosophy of science, different types of ID can be distinguished: the object type (“ontology”), the theory type (epistemology), the method type (methodology), and the problem / purpose type. I will apply this classification scheme to evaluate research programs on nanotechnology / converging technologies. I argue that the U.S. NSF’s program on converging technologies politics is based on what I call ‘techno-object interdisciplinarity’. This type of interdisciplinarity will be explicated and contrasted with the research program of the European Commission on converging technologies (CTEKS initiative).
Coffee / Tee			
11:00 – 12:30	<i>Britt Holbrook</i> (University of North Texas, USA)	Interdisciplinary Communication	My presentation is an attempt to answer one of the questions we were sent in the original announcement of this conference: <i>Do we need an interdisciplinary “meta-language” to improve communication, or how is it possible to translate between disciplinary languages?</i>

			<p>I argue that philosophers – even traditional philosophers who do not speak explicitly about interdisciplinarity – have something to offer in addressing this question. Playing somewhat fast-and-loose with traditional categories of the subdisciplines of philosophy, I group philosophers – mostly from the philosophy of science and ethical theory – and some non-philosophers together to provide three different, but related, answers to the question of interdisciplinary communication. The groups are as follows: (1) Lamont-Habermas, (2) Kuhn-MacIntyre, (3) Bataille-Lyotard. These groups can also be thought of in terms of the types of answers they give to the question of ID communication, especially in terms of the following key words (where the numbers correspond to the groups from the previous sentence): (1) consensus, (2) incommensurability, (3) invention. I also think we philosophers ought to think a bit about how we can make our insights more understandable to non-philosophers, and so I raise the possibility of generating a list of interdisciplinary virtues.</p>
	<p><i>Michael Hoffmann</i> (Georgia Tech, Atlanta, USA)</p>	<p>Explaining problems of interdisciplinary communication from a semiotic perspectives</p>	<p>Communication works when the signs someone produces (language, graphical representations, facial expressions, gestures, intonations, etc.) are interpreted as intended. Since interdisciplinary communication often does not work—or only after enormous amounts of time, energy, and nerve-racking good-will have been spent—I will try to model communication in a way that allows us to identify the crucial problems. The model I propose is based on an enlargement of Charles Peirce’s triadic semiotic model which defines a semiotic relation as a relation between sign, object, and interpretant. The enlargement includes a fourth necessary and irreducible element: collateral knowledge regarding a sign’s meaning. I would argue that interdisciplinary communication could be improved by employing methods that are designed to visualize collateral knowledge.</p>
Lunch	<p>Ferst Place Student Center</p>		
01:30 – 03:00	<p><i>Alan Porter</i> (Georgia Tech, Atlanta, USA)</p>	<p>Interdisciplinary Research: Recent Thinking about Concepts and Measures</p>	<p>I focus on what seems to be a convergent definition of research interdisciplinarity as knowledge integration, with brief attention to measuring that. As background, I share selected perspectives from the "Interstudy Era" (1970's and 1980's) on studying interdisciplinary research ("IDR") and how to foster it. Those ideas transition via the ongoing National Academies Keck Foundation Initiative to foster IDR and a recent workshop on tracking and evaluating IDR to pose a number of opportunities to facilitate and study IDR.</p>
	<p><i>Ismael Rafols</i> (University of Sussex, Brighton, England)</p>	<p>A model of interdisciplinarity in research communities: local integration, packaging and diffusion</p>	<p>Most study on interdisciplinary research focus take as unit of analysis of the cognitive and (less often) social interactions among individual investigators and/or laboratories. Here we present an attempt to look at the structure of interactions at a meso level, among laboratories that belong to an interdisciplinary topic, namely molecular motors.</p> <p>In science policy discourse, it is generally assumed that laboratories carrying out research in an interdisciplinary field are or should conduct interdisciplinary research. This is, one expects that the laboratory dynam-</p>

			<p>ics to follow a degree of knowledge integration correlated to the one observed in the research field as a whole (i.e. at the meso level). On the basis of interviews to researchers, regarding their scientific practices and collaborations, we propose that interdisciplinary effort, this is <i>new</i> knowledge integration, is a very local phenomenon, occurring in a small number of laboratories. In the case of molecular motors, this local integration is a process that generally involves the novel joint use of techniques based on disparate disciplines. However, one the use of a technique is achieved in a new field, it undergoes a process of packaging and standardization that progressively allows its diffusion to other laboratories with very limited efforts beyond the laboratory expertise –and therefore with of a weak interdisciplinary character.</p> <p>We suggest that this process of local integration, packaging and diffusion provides an interdisciplinary structure to an emergent field at the community level with a much lower degree of interdisciplinary at the laboratory level, even if one considers collaborative efforts.</p>
Coffee / Tee			
03:15 – 04:45	<i>Kenneth Fuchsman</i> (University of Connecticut, USA)	Epistemological Dilemmas in Interdisciplinary Studies	<p>The litmus test for interdisciplinarity, to some, is integration. There are disciplinary and epistemological obstacles to this goal. Disciplines and their sub-fields are often fragmented, ideologically divided, with diverging standards for obtaining and evaluating evidence. If disciplines themselves are often wracked by conceptual conflicts and lack coherence, creating interdisciplinary integration may be often but not always achievable. Integration, in the sense of unifying diverse elements, can no longer be a defining element of interdisciplinarity. Interdisciplinary studies needs to be redefined to incorporate epistemological pluralism. In addition, interdisciplinarity also needs to include the examination of the problems of knowledge that arise within and between disciplines and that create gaps within our current system of academic investigation.</p>
	<i>Robert Rosenberger</i> (Georgia Tech, Atlanta, USA)	Reflections on Disciplinary Overlap and Scientific Methodology	<p>Moments in the process of scientific theorizing and theory evaluation can be considered in terms of their potential for research to benefit from interdisciplinary collaboration and inspiration. In particular, I am interested in instances in scientific practice in which theoretical structures or claims from one discipline are borrowed and incorporated into the theoretical frameworks or arguments of another.</p> <p>To explore how this can occur I review a particular line of interactions between psychology and philosophy, specifically in the fields of cognitive developmental psychology and the philosophy of science. This history begins with philosopher of science Thomas Kuhn’s reflections on the work of Jean Piaget. Psychological researcher Susan Carey has influentially taken up some of Kuhn’s philosophical framework and used it in her theories about how children’s concepts about the world radically change throughout development. From there Carey and her interlocutors, such as Elizabeth Spelke and Alison Gopnik, have offered ideas back to the philosophy of science.</p> <p>I conclude with reflection on the recent account of</p>

			scientific expertise developed by sociologists of science Harry Collins and Robert Evans. Their notion of “interactional expertise” is useful for conceptualizing the kinds of experience important for successful interdisciplinary theorizing of the kind considered here.
05:00 – 06:30	<i>Nancy Nersessian</i> (Georgia Tech, Atlanta, USA)	Interdisciplinarity on the Bench-top: Model-based reasoning in interdisciplinary engineering	This presentation examines “model-based reasoning” in the interplay of representation and experiment in the context of two biomedical engineering (BME) research laboratories, where problem solving is by means of constructing, manipulating, and revising physical models. Designing, re-designing, and experimenting with <i>in vitro</i> simulation models (“devices”) is a signature cognitive practice. These physical models are technological devices that either simulate known mechanisms, such as the forces on arterial vessels from the flow of blood through them, or hypothesized mechanisms, such as how learning takes place among networks of neurons. Here I on the <i>hybrid</i> nature of these simulation models – they interlock conceptual, material, and methodological constraints from different disciplines. The hybrid nature of BME is reflected in the bio-engineered model-systems developed by the laboratories and in the characteristics of the researcher-students who are part of a program aimed explicitly at producing integrative, interdisciplinary thinkers. The laboratories and learning settings are what we deem <i>adaptive spaces</i> – designed to move beyond the traditional model of collaboration among engineers, biologists, and medical doctors to a new kind of integrative biomedical engineering. In the analysis I examine some of these multifaceted systems in the problem-solving practices of the laboratories, especially as they figure in experimental situations.
	<i>Bryan Norton</i> (Georgia Tech, Atlanta, USA)	Interdisciplinarity in Action: Looking at Interdisciplinarity from the Other End of the Knowledge Pipeline	As academics—I include myself—we tend, when thinking about interdisciplinarity, to think about crossing over or blurring disciplinary boundaries in academic settings—creation of centers or strategic merging of departments within universities. We accordingly emphasize interdisciplinarity in the production of knowledge. It is also useful to look at how knowledge from all of the diverse disciplines converges within a scientifically based search for solutions to real-problems. I will thus emphasize how knowledge from all the disciplines either does or, regrettably, does not come together in the search for improved policies. For concreteness, I will focus on the development and evolution of adaptive environmental management in the US, and discuss an opportunity for a real interdisciplinary breakthrough that seemed to be offered by attempts to embed ecological economics within a broader adaptive management approach . This opportunity—to develop a new conceptualization of environmental value—one informed by both science and values, however, will require a leap beyond the precise but limited methods of microeconomics. Against this backdrop, I will discuss two different visions of how science and values might be incorporated into a scientifically based management process like adaptive management. I will briefly characterize and reject the science and policy model—assumed by positivists and those influenced by the positivist separation of scientific and evaluative

			<p>discourse (I call it the “serial view of science and policy). I will contrast this science and policy model with a more defensible one, one that assumes feedbacks and iteration, that struggles over time to integrate scientific knowledge about ecological systems with social scientific knowledge about what people value. I believe that, in the case of adaptive management and ecological economics, the opportunity to create a truly new and post-disciplinary conception of environmental value has not been seized. Ecological economics has greatly encouraged more interactions and collaborations between ecologists and economists, but ecological economists have not pushed the limits of economic methodology far enough to escape the economic metaphor of nature as a system productive of human welfare. I will conclude with four, hopefully provocative, questions/lessons we might tentatively draw from observation of the birth of a “bridge discipline” such as ecological economics, and from its struggles to actually bridge the intellectual gaps represented by disciplinary boundaries and by management failures.</p>
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7:00 pm: Workshop dinner at the Georgia Tech Hotel.

Tuesday, September 29, 2009

9:00 – 10:30	<i>Paul Hirsch</i> (Program for the Advancement of Research on Conflict and Collaboration, Maxwell School of Citizenship and Public Affairs, Syracuse University)	From Interdisciplinary to Integrative: Reflections from the field	In this presentation, I will draw on conceptual work in cognitive science, critical systems theory, and the policy sciences to reflect on a yearlong engagement in an international, interdisciplinary, and cross-sector project called "Advancing Conservation in a Social Context: Working in a World of Trade-offs." The substantive basis of my discussion will be our collective attempt to develop a shared framework that includes both analytical and ethical components, allows for the productive inclusion of multiple disciplinary and organizational perspectives, and generates knowledge that is useful in understanding and informing trade-off decisions.
	<i>Paul Baer</i> (Georgia Tech, Atlanta):	Climate Change: The Interdisciplinary Problem from Hell	Climate change poses a vast array of difficult questions which require interdisciplinary communication and research. I address two different types of problems I have encountered in my own research: the need to combine analysis of coupled socio-economic and biophysical systems in the projection of future radiative forcing, and the problem of understanding <i>across</i> disciplines the disagreement <i>within</i> the discipline of economics about how to estimate the costs and benefits of reducing GHG emissions. In addition to characterizing the problems, I offer both concrete and more speculative responses that I have developed in my research.
Coffee / Tee			
10:45 – 12:15	<i>Thomas Wilmer</i> (Darmstadt University of Applied Sciences, Germany)	When pathologist meets midwife: Communication between legal and tech-	Interdisciplinary contacts between legal and technical disciplines often lead to massive frustration. Unequal self-conceptions result in communication problems which will be illustrated by some examples from the IT and internet business. The different disciplinary lan-

		nical disciplines	guages can hardly be merged, in fact a better understanding of the common targets and approaches is inevitable. The legal profession has to understand what's going on in the technical disciplines and has to express itself (within the limits of necessary self-preservation) in a comprehensible way...
	<i>Herbert Gerstberger</i> (Pädagogische Hochschule Weingarten, Germany)	Interdisciplinarity in Teaching Mathematics, Science, and Beyond	In learning and teaching, we are engaged in different kinds of mental and communicative activities which to a great deal can be identified according to the three categories: epistemic, ethical and aesthetical. Thus, interdisciplinarity can be subsumed under the idea of <i>intercategoricity</i> . I shall consider some structures in the teaching and learning of mathematics and science where epistemic and aesthetical aspects intersect, referring to the concept of <i>aisthetics</i> in the sense of G. Böhme. The mutual representations of mathematical, natural and aesthetical features are analysed as sign processes according to Ch. S. Peirce. In educational contexts, these intersections are mostly dealt with under the titles of language and media, and sometimes the teacher's performance is also taken into account. The same attention should be paid to the student's part. From the intercategory viewpoint we can understand the aesthetic aspects of the teaching and learning as factors of their own right and can develop methods to examine and improve them. Teaching can be improved if we deliberately adopt ideas and methods from the fine arts, from drama and creative writing.
Lunch	Neely Lobby, Catering		
01:15 – 02:45	<i>Hans Klein</i> (Georgia Tech, Atlanta, USA)	Politics By Other Means: Interdisciplinary Objects and Their Uses and Abuses	This paper examines "interdisciplinary objects" (IOs), which are objects that exist in more than one social sphere. An archetypal interdisciplinary object is an urban freeway, which is both an object for transportation (one social sphere) and an object for shaping land use (another social sphere.) Interdisciplinary objects can serve as vehicles of causality: changes to an object in one sphere may cause effects in another sphere. Thus the construction of a freeway (an IO) to improve urban transportation may cause changes to neighborhood boundaries, property values, urban lifestyles, etc. Understanding IOs requires interdisciplinary education. Recognizing the causal powers of IOs can prevent unanticipated consequences (e.g. building freeways that destroy neighborhoods) but may also open avenues for effecting unrecognized social change (e.g. Lessig's "code is law" thesis.)
	<i>James White</i> (Georgia Tech, Atlanta, USA)	Proposing to close the GAPP in globalization studies: reflections on the potential and pitfalls of interdisciplinary research	The aim of the Globalization Atlas and Portal Project (GAPP) was to facilitate cross-disciplinary research and create an authoritative globalization research resource. The premise of the GAPP project was that while globalization is often explored through a basically economic lens, the GAPP would take a broader, more inclusive approach based on linking thematic areas of study, and calling on interdisciplinary research conducted by teams of recognized specialists, and designed for a broad audience - including researchers, policymakers, students, and the public. The GAPP was understood as a globalization research collaboratory. To manage the enormous amounts of data and information, the GAPP was organized around interdisciplinary

			research foci, which provide a rich opportunity for broader research, and avoid the limitations of disciplinary engagements with globalization. The GAPP has produced a proof of concept prototype platform that provides a series of interactive, dynamic representations of globalization supported by a database. The prototype will be demonstrated and the practical difficulties of implementing cross-disciplinary research will be discussed.
Coffee / Tee			
03:00 – 03:30	Round table	Next steps! (network, publication project)	