I. What is Cross-Disciplinary Research (CDR)?

II. CDR analysed

- We focus on research, as opposed to practice.
- We take disciplines to be epistemic communities, understood as internally constituted sets of practices that are sufficiently widespread and stable to receive institutional support.
- CDR: research involving the participation of more than one discipline

III. CDR illuminates SAE

- CDR provides an illuminating context for standard epistemological topics.
- Example: reasonable disagreement, SAE-type vs. CDR-type
- The Real Worry: unreasonable agreement

IV. SAE informs CDR

- Successful CDR requires harmony, negotiation, and compromise, and these require effective communication.
- SAE can help here by providing a framework within which to address certain fundamental obstacles to effective communication.
- The Idaho Toolbox Approach. (See toolbox handout.)

V. Outcomes

- Salutary impact on CDR teams + new insights for philosophical epistemologists
- Additional support for the NSF for “Improving Communication in Cross-Disciplinary Science” (over)
NSF Project Summary / Improving Communication in Cross-Disciplinary Research / 2008-2010

Many pressing, complex problems require cross-disciplinary research (CDR). An emerging literature on the challenges of CDR emphasizes the critical importance of effective communication for successful CDR. How this is to be achieved is less well understood. In this project, we adopt an explicitly philosophical approach to developing the intellectual “common ground” requisite for effective communication as part of CDR collaborations. The need for a philosophical approach stems from the disparate views about the nature of objects studied (metaphysics) and methods of knowing them (epistemology) favored by different disciplines. The premise of this proposal is that through a carefully structured process of identifying, understanding, and incorporating philosophical dimensions CDR teams can communicate and collaborate more effectively.

Three of the PIs of this proposal participated in the design and evaluation of such a structured process for promoting communication within CDR (Eigenbrode et al. 2007). This approach uses a set of questions—the “toolbox”—that probes the epistemological and metaphysical aspects of scientific research. In a workshop setting, CDR participants examine these questions as individuals and share their views within their team. The proposed project will extend and improve the toolbox-based method through six activities: (1) describe the diversity of existing CDR collaborations for which the method can be effective, (2) analyze knowledge construction and communication in predominant types of CDR teams, (3) adapt the toolbox method for greatest effectiveness in these CDR teams, (4) test the revised toolbox with working CDR teams, (5) use these test sessions to study communication processes and dynamics within CDR, (6) disseminate findings to the community of CDR practitioners and students through publications, a conference, and an edited volume.

Intellectual Merit. Given the increasing importance of CDR, deliberate effort to develop generally applicable methods to improve its effectiveness is imperative. Despite the consensus that effective communication is central to CDR, there have been few approaches to address this need. The proposed project squarely addresses this lacuna by developing an outline for such a method based on the philosophical analysis of science. The approach will build on a successful model and improve it for wider applicability. In the process of testing the refined approach with working teams, the PIs will extract information that can improve theoretical and practical understanding of the process of CDR collaboration, specifically by examining the philosophical dimensions. The team of PIs comprises two philosophers, a sociologist and an ecologist, all of whom have interdisciplinary experience and expertise in aspects of this project. An advisory panel to the project is similarly composed. Participants will include students and faculty members involved in CDR, including IGERT programs and other integrated programs and projects. The interactions among project participants will be harnessed in a conference and published volume designed to illuminate the topic and present insights and approaches useful for students and researchers involved in CDR.

Broader Impacts. The project will improve the practice of CDR in diverse types of collaboration. Its impacts will therefore be felt across the range of activities in which CDR is required. Some of these areas of collaborative research are critical for guiding policies aimed to improve human wellbeing, such as those concerning sustainable natural systems and complex public health issues. Others are part of expanding interdisciplinary research at the forefront of discovery, such as computational biology, neurosciences, and nanotechnology. The rush to discovery and the urgency of problems addressed by some CDR can discourage a deeper, methodical delineation of the common ground requisite for greatest creativity. This project will examine the methods and merits of this delineation within CDR teams and generate a widely applicable approach that can help them meet their important objectives. In addition, the work aims to advance epistemology and the philosophy of science by incorporating insights from scientists engaged in CDR—philosophy, therefore, is not merely a resource for this project but a direct beneficiary of it. The project will also promote teaching, training, and learning by improving the sophistication and skills of graduate students directly involved as workshop participants and those who work as research collaborators. The conference/workshop and project deliverables will reach the growing international audience of students and scientists seeking to build their capacity for cross-disciplinary collaboration.