What is Interdisciplinary?
Discipline (and punish? :-)

- Physics
- Chemistry
- Biology
- Mathematics
- Economics
- Psychology
- Etc.
Or . . .

Physics

Chemistry

Biology

Social Sciences

Etc.
Or . . .

Mathematics

Real World
But is this really . . .

Mathematics

Real World
Multidisciplinary involves pieces of more than one field. For example:

- Physics
- Chemistry
- Biology
- Mathematics
- Economics
- Psychology
- Etc.
Some disciplines seem to lend themselves easily to this . . .

- Mathematics
- Physics
- Biology
- Chemistry
- Psychology
- Economics
- Etc.
Or . . .

- Computer Science
  - Physics
  - Biology
  - Chemistry
  - Psychology
  - Economics
  - Etc.
Or, some claim . . .

- Philosophy
- Physics
- Biology
- Chemistry
- Psychology
- Economics
- Etc.
Interdisciplinary, on the other hand, lives in interstices:

- Philosophy
- Biology
- Cognitive Science
- Linguistics
- Computing
- Psychology
- Etc.
Eventually (or often, or hopefully) it goes both ways:

- Philosophy
- Biology
- Psychology
- Linguistics
- Computing
- Etc.
Another traditional example:
Sometimes, these become new disciplines:
Of course, this Summer School is:

- Physics
- Economics
- Biology
- Complex Systems
- Poly. Sci.
- Computing
- Etc.
How to become interdisciplinary . . .

- Exposure to a variety of disciplinary work
- Exposure to interdisciplinary work
- Exposure to and experience with tools and methods from a variety of disciplines
- Exposure to and experience with interdisciplinary tools and methods
- Experience working with others in an interdisciplinary mode . . .
And also, an understanding of how disciplines work . . .
A discipline typically has:

- A language (with technical terms . . .)
- An ontology (a collection of “objects”)
- An epistemology (what constitutes knowledge, and how to acquire and validate it)
- A collection of methods and tools
- A (collection of) theoretical perspective(s)
- Criteria for “acceptability” (of subject matter, methods, and behavior . . .)
To be interdisciplinary, one must be able to:

- Be comfortable with multiple languages, and shift easily among them
- Be comfortable with a variety of ontologies, epistemologies, methods, tools, and theoretical perspectives
- Be able to shift perspectives easily, and continually see things in new ways
- Use analogies and metaphors fluidly
And further . . .

- Develop facility with tools and methods from various disciplines
- Develop facility with new and innovative tools with multiple applicability
- Understand criteria of rigor and acceptability, and eventually, work to develop your own such criteria
- And, be willing to be an “outsider,” to take risks, and have internal measures of success and value . . .
During the Summer School,

- Expose you to a variety of discipline based subject matters, methods and tools

- Expose you to a variety of interdisciplinary examples, methods and tools (e.g., entropy and probabilistic methods)

- Expose you to uniquely interdisciplinary efforts currently being explored (e.g., network/graph methods, agent based modeling)

- Push you to engage in interdisciplinary work in a group context, and to work outside your familiar domain of experience
Important goals of the Summer School are:

• To help you build your experience and skills as interdisciplinary workers

• To have you serve as examples of such work after you leave the Summer School

• To be seeds, spreading new methods, new approaches, and new ideas

• And also, to provide a context in which those working in the field can present, discuss, and explore their work with the next generation . . .
Will it work?

- Obviously, there are no guarantees. The Summer School itself is an experiment in a variety of ways. Each Summer things are different. We explore different approaches to content, to pedagogy, to interaction with students, to schedules, etc.

- The continued interest by students in participating, and positive response to their experience, says we are doing at least some things right :-(