

# Topics in Philosophy of Science: Models and Consensus

## Period III: January 13 – February 26, 2013

Objectives: In-depth exploration of the use of models in science, their relation to theories and experiments, and their use in achieving, or debunking, scientific consensus.

Classes (weekly): Tuesdays 10.15 - 11:45 and Wednesdays 12.15 - 13:45 - Classroom: U40 A110.

Assessment (attendance of 11/13 classes is required for credits):

- 40% class attendance and weekly readings
- 60% final paper (4000 words)

### Contents of the course

For much of the XX century philosophy of science has been mostly theory-focused; the idea being that scientific advancement is from theory to theory. But more and more, in recent decades, philosophers have started paying attention to the role of models. The consequences of this shift are still unfolding in the literature, as we will explore in this class. Changing the focus changes the questions: for example ‘What are good models, rather than good theories?’; ‘How does a scientist explain a phenomenon through a model, rather than through a theory?’; etc. When we focus on models, though, we realize that many models are good for the same phenomenon, data, etc. so how do we agree on the ‘right’ models? In other words, how do we reach a consensus in science? But is a consensus even necessary? Some think it’s not: pluralism, and other currents, stress the importance of dissensus and diversity in scientific enquiry. But then, isn’t some degree of consensus about, say, climate change, or the effectiveness of austerity measures, necessary for (good) policy making? In the second half of the course we will try to understand the problem of consensus and disagreement in science and society.

### Structure of the course

This class is very much based on class discussion, student presentations are welcome but not required. Typically, in the first 30 minutes of the class I will briefly introduce the topic and a number of research questions based on the assigned readings, and we will then spend the rest of the time discussing the topic. Students should read the assigned texts in advance of class. We will meet twice a week for one term. The final exam for 5 credits will be a final paper, fewer credits for smaller assignments are negotiable.

## Schedule of classes & list of required readings

★ I may make small changes to the following list during the course. I will provide a reader. ★

1. **Science, Models, Theories, Progress and Consensus** **January 13, 2014**  
Giere, R.N. *Explaining Science* – Chapter 2
2. **Introduction 1: Models** **January 15, 2014**  
Mäki, U. ‘Models’ *International Encyclopedia of the Social and Behavioral Sciences*  
Hartmann, S. ‘Models in Science’, *The Stanford Encyclopedia of Philosophy*
3. **Model-Theory Relation** **January 20, 2014**  
Giere, R.N. *Explaining Science* – Chapter 3  
Suppes, P. ‘What is a scientific theory?’ (1964)  
Suppe, F. ‘Understanding Scientific Theories (1969-1998)’
4. **Model-Experiment Relation** **January 22, 2014**  
Giere, R.N. *Explaining Science* – Chapter 7  
Mäki, U. ‘Models are experiments, experiments are models’ (2005)
5. **Realism** **January 27, 2014**  
Mäki, U. ‘Models and the locus of their truth’ (2009)  
Lehtinen, A. ‘Uskali Mäki’s realist philosophy of economics’ (2012)  
Ladyman, J. and D. Ross. *Every thing must go: Metaphysics naturalized* – Chapter 2
6. **Instrumentalism** **January 29, 2014**  
Cartwright, Shomar, Suárez, ‘The toolbox of Science’ (1995)  
Reiss, J. ‘Idealization and the aims of economics: three cheers for instrumentalism’ (2012)
7. **What are models?** **February 3, 2014**  
Minsky, M. ‘Matter, Minds and Models’ (1965)  
Teller, P. ‘Twilight of the perfect model model’ (2001)
8. **Introduction 2: From Logical Empiricism to Kuhn** **February 5, 2014**  
Kuhn, T. *The structure of scientific revolutions*  
Entries ‘Logical Empiricism’ and ‘Thomas Kuhn’ in:  
the Stanford Encyclopedia of Philosophy
9. **Consensus and rational inquiry** **February 10, 2014**  
Rescher, N. *Pluralism: against the demand for consensus* (1993)  
Chapters 1 and 2
10. **Rational consensus** **February 12, 2014**  
Lehrer, K. and C. Wagner *Rational consensus in science and society* – Chapter 3  
Lehrer, K. ‘When Rational Disagreement is Impossible’ (1976)
11. **Seeking Consensus** **February 17, 2014**  
Solomon, M. *Social Empiricism* – Chapters 1,2 and 6  
Solomon, M. ‘The Social Epistemology of NIH Consensus Conference’ (2007)
12. **Climate Science Consensus** **February 19, 2014**  
Oreskes, Naomi. ‘The scientific consensus on climate change’ (2004)  
Van der Sluijs, J.P. et al. - Beyond consensus (2010)
13. **Wrap-up** **February 24, 2014**