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Philosophy and Physics

DESCRYING THE WORLD IN PHYSICS

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A main concern of philosophy since the scientific revolution has been to address apparent conflicts between various aspects of our common sense view of the world (the “manifest image”) and what the sciences, especially physics, tell us what the world is like in its most fundamental nature (“the scientific image”). According to the manifest image space is three dimensional, time flows from past to future, there are material objects that persist through time and that causally interact with one another and there are cognitive agents capable of knowledge, consciousness and freedom. According to the scientific image the world at its most fundamental level consists of particles and/or fields occupying relativistic space-time and characterized by quantum mechanical wave functions that conform to a few fundamental laws. The two images are obviously vastly different and in places inconsistent. The philosophical problem is the problem of reconciling them either by finding the common sense ontology in the scientific image or by showing how our common sense views are mistaken or doing a bit of both. That is, as title of the course says, “Decrying the world in Physics.”

The problem of decrying the world in physics is obviously enormous and many faceted. In the course we will be satisfied to set the general framework of the problem and to delve a bit into a few of these facets.

The first week of the course will be devoted to a non-technical but exact treatment of features of the scientific image. We will discuss the general outlines of the contemporary scientific image according to relativity theory, quantum mechanics, and statistical mechanics. Among the issues to be discussed are the measurement problem in quantum mechanics, alternative interpretations of quantum mechanics, the formulation and status of statistical mechanics and the metaphysics of laws and probability. In the second week we will be concerned with how various aspects of the manifest image can be described within the scientific account. Among the issues to be discussed will be counterfactuals, causation, the direction of time, freedom and whether consciousness presents an insuperable obstacle to reconciliation with the scientific image.

The course is designed for graduate students and junior faculty in philosophy and the sciences who already have some familiarity with issues in the philosophy of science and with the fundamentals of twentieth century physics. The course is a condensed and streamlined version of a joint Columbia and Rutgers seminar given by Albert and Loewer in the spring of 2005.

It will be helpful for prospective students to have some familiarity with the following books:

Albert, David: *Quantum Mechanics and Experience*, Harvard Press 1992

Albert, David: *Time and Chance*, Harvard Press 2001

Green, Brian: *The Fabric of the Cosmos*,

Lewis, David: *Collected Papers Vol II*, Oxford University

Maudlin, Tim: *Quantum Mechanics and Non-locality*, Blackwell's 1994

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