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*Control in the Sciences of Vast Length and
Timescales*

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ABSTRACT:

The control of physical, chemical, and biological phenomena is a pervasive goal in the sciences. The dynamics involved are highly diverse, spanning from scientists' control of quantum phenomena in the laboratory, at one extreme, to Nature's "control" of species populations, at the other. Despite the obvious diversity of such scenarios, striking commonality is revealed when seeking optimal control in the various domains. The word optimal is emphasized because in each case, whether an experiment is performed by a scientist or by other Nature through evolution, the best outcome is sought. Evidence of common behavior in these vast realms of science will be presented from the control of quantum, chemical, and biological processes.

BIOGRAPHY:

Herschel Rabitz received his Ph.D. in Chemical Physics from Harvard University in 1970. In 1971, Professor Rabitz joined the faculty of the Princeton University Department of Chemistry, and from 1993 to 1996, he was chair of the department. He is also an affiliated member of Princeton University's Program in Applied and Computational Mathematics.

Professor Rabitz's research interests lie at the interface of chemistry, physics, and engineering, with principal areas of focus including: molecular dynamics, biophysical chemistry, chemical kinetics, optical interactions with matter, and molecular scale systems analysis.

Andrea Woody is Department Chair and Professor of Philosophy at the University of Washington. She is currently Editor-in-Chief of Philosophy of Science, and until recently an Associate Editor for Historical Studies in the Natural Sciences. Professor Woody's research interests include philosophy of science, history of science, and aesthetics. She received her A.B., in chemistry, and certification in Theater and Dance, from Princeton and her Ph.D., in history