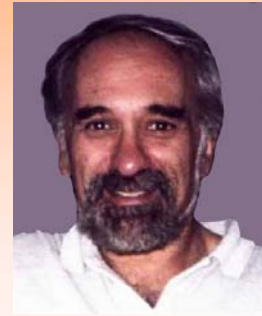


Prof. Eduardo Sontag
Rutgers University



**Friday October 16: *Dynamics and Control
Problems in Systems Biology***

3:30 PM
222 Bowen Hall

The Life Sciences are in the midst of a major revolution in quantitative theoretical formulations, perhaps not unlike the transformation that physics underwent starting in the 17th century. It is widely recognized by leading biologists that the typical "reductionist" approach is not powerful enough to describe, analyze, and interpret the complex behaviors of networks involving DNA, RNA, proteins, metabolites, and small molecules in cells, including the signal transduction pathways that play a central role in cancers and other diseases.

Quantitative formalisms, concepts, tools, and models are required, and there is a major role to be played by engineers and mathematicians in applying and adapting known theory to model and understand specific systems. Conversely, the study of problems in molecular systems biology leads naturally to new mathematical questions in established areas of mathematics, from probability, PDE's, theoretical computer science, and algebraic geometry, to dynamics and control theory. The talk will introduce the general topic, and discuss an example of new theoretical developments.

Biography

Eduardo Sontag received his undergraduate degree in Mathematics from the University of Buenos Aires in 1972, and his Ph.D. in Mathematics from the University of Florida in 1976, working under Rudolf E. Kalman. His major research interests include areas of systems molecular biology, control theory, bioinformatics, and learning and neural networks. He has published over 400 papers in these fields (h-index=62) as well as two books.

Since 1977, Sontag has been with the Department of Mathematics at Rutgers University, where he is a Professor of Mathematics as well as a Member of the Graduate Faculties of the Department of Computer Science and of the Department of Electrical and Computer Engineering. He is also the director of SYCON, the Rutgers Center for Systems and Control, and is a co-founder and a member of the Advisory Committee of the BioMaPS Institute for Quantitative Biology. He is in the Editorial Board of IET Systems Biology, SIAM Review, Synthetic and Systems Biology, International Journal of Biological Sciences, Nonlinear Analysis: Hybrid Systems, Nonlinear Dynamics and Systems Theory, and the Journal of Computer and Systems Sciences, and is a co-founder and co-Managing Editor of Mathematics of Control, Signals, and Systems.

Sontag is a Fellow of the IEEE and of SIAM. He was awarded the Reid Prize (SIAM) in 2001, the Bode Prize (IEEE) in 2002, and the 2002 Board of Trustees Award for Excellence in Research and the 2005 Teacher/Scholar Award from Rutgers.

*Social Period to follow outside of the lecture room
All are welcome!*

For inquiries regarding departmental seminars, please contact Louis Riehl at lr1eh1@princeton.edu; 609-258-5126