



The Center for Control, Dynamical Systems, and Computation  
University of California at Santa Barbara  
Winter 2010 Seminar Series  
Presents

## Problems of Estimation and Control of a Class of Nonlinear Thermoelastic Heat Problems

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**Abstract:** In this seminar we will discuss results related to controllability and estimation for a class of parabolic distributed parameter systems described by nonlinear, non-local partial differential equations. We consider a thermoelastic rod that may come into contact with a rigid obstacle. The model captures many issues common to a number of practical problems such as brake heating where thermoelastic effects are important. These problems are such that virtually all well known methods for treating distributed problems cannot be applied since the non-linear, non-local nature of the model means that most assumptions required by these methods simply do not hold.

**About the Speaker:** Michael P. Polis received the B.S.E.E. Degree from the University of Florida, Gainesville, FL, and the M.S.E.E. and Ph.D. degrees from Purdue University, West Lafayette, IN, in 1966, 1968, and 1972, respectively. From 1972 to 1983 he was a faculty member in the Department of Electrical Engineering, Ecole Polytechnique de Montreal, Montreal, Quebec, Canada. From 1983 to 1987 he was Director of the Systems Theory and Operations Research Program at the National Science Foundation, Washington, D.C. In 1987 he joined the faculty of Wayne State University, Detroit, MI, as Chair of the Department Electrical and Computer Engineering. From 1993 to 2001 he was Dean of the School of Engineering and Computer Science, Oakland University, Rochester, MI, where he is currently a Professor and Interim Chair of the Department of Industrial and Systems Engineering. Dr. Polis has served as a consultant for several companies, including Sidbec Dosco Inc., in Montreal, and Ameritech Michigan, in Detroit. He has also served as an expert witness for numerous law firms in Michigan. His research interests are in optimization, transportation systems and the identification, estimation and control of distributed parameter systems. Dr. Polis is co-author of the paper that was named the “Best Paper IEEE Transactions on Automatic Control 1974 - 1975.” He is a Distinguished Member, IEEE Control Systems Society, and has been an elected member of the society’s Board of Governors (1998 - 2000), Vice President Membership Activities (1990 – 1991), Associate Editor At Large for the IEEE Transactions on Automatic Control (1989 - 1992), and General Chairman of the 27th IEEE Conference on Decision and Control. He currently serves as an Associate Editor for Book Reviews for the IEEE Control Systems Magazine (2006-present).

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