

DISTINGUISHED LECTURER SERIES



FRANK ALLGÖWER

Director, Institute for Systems Theory and Automatic Control
Professor, Mechanical Engineering
University of Stuttgart

Reception

Monday, Oct. 15, 2007, 4:30 p.m.
Outside 1202 Glenn L. Martin Hall
(Resnik Auditorium)

Lecture

Monday, Oct. 15, 2007, 5:00 p.m.
1202 Glenn L. Martin Hall (Resnik Auditorium)

Roundtable discussion

Tuesday, Oct. 16, 2007, 10:30 a.m.
2168 A.V. Williams Building

Host

ISR Director Eyad Abed

**QUESTIONS? CALL ISR
AT 301-405-6615.**

The
Institute for
Systems
Research



A. JAMES CLARK
SCHOOL OF ENGINEERING

MONDAY, OCTOBER 15, 5:00 P.M.

SYSTEMS BIOLOGY: HOW CAN CONTROL ENGINEERS HELP TO UNDERSTAND BIOLOGY?

During the last decade, biology has faced a technological revolution with the development of high-throughput methods for the characterization of the genome, transcriptome and proteome and has given rise to an unprecedented amount of biological data. For the first time in history this data allows for a systematic mathematical modeling of a huge class of biological processes and phenomena with one of the goals being to complement in vivo experiments by computer simulations.

In this talk the role of systems theory and control for the development of the new field of systems biology will be discussed. In particular we will argue that the role of the systems sciences is not restricted to supporting the mathematical modeling process, but that systems theoretic investigations will play an important role for developing a better understanding of life. Conversely, the field of systems and control can also learn greatly from the way nature solves regulation problems in its highly complex networks. It can be expected that in the future systems biology will stimulate the development of new control paradigms inspired by nature.

BIOGRAPHY

Frank Allgöwer is director of the Institute for Systems Theory and Automatic Control and professor in the Mechanical Engineering Department at the University of Stuttgart in Germany. He received a Ph.D. in Chemical Engineering from the University of Stuttgart. He was a professor in the electrical engineering department at ETH Zurich and also held visiting positions at Caltech, the NASA Ames Research Center, DuPont and the University of California at Santa Barbara.

His research and teaching interests are in the development of new methods for analysis and control of nonlinear systems. In addition he is interested in practical applications and the experimental evaluation of benefits and limitations of developed methods. Applications range from chemical process control and control of mechatronic systems to control of atomic force microscopes and systems biology.

Allgöwer is editor of *Automatica*, associate editor of the *Journal of Process Control* and the *European Journal of Control* and is on the editorial board of *Robust and Nonlinear Control*, *IET Control Theory and Applications*, *Canadian Journal of Chemical Engineering*, *Chemical Engineering Science* and the *Springer Lecture Notes in Control and Information Sciences Series*. He serves on the scientific council of the German Society for Measurement and Control, is on the Board of Governors of the IEEE Control System Society, is chairman of the IFAC Technical Committee on Nonlinear Systems, is member of the IFAC Policy Committee and chairman of the International Affairs Committee of IEEE CSS and has been a member of the council of the European Union Control Association.

He has organized or co-organized several international conferences and has published more than 150 scientific articles. Allgöwer has received several recognitions for his work including the IEEE distinguished lectureship, the appointment as IFAC Fellow and the Leibniz prize, the most prestigious prize in science and engineering awarded by the German National Science Foundation (DFG).