



The John E. Hilliard Symposium is our annual capstone event, at which time we highlight the original research of our senior graduate students. In its twenty-fourth year, this Symposium is intended to encourage communication between our department and representatives of the companies and agencies that support this work. We would also like to take this opportunity to welcome back alumnae and alumni in the audience.

JOHN E. HILLIARD

May 14, 1926 -- April 21, 1987

Professor John E. Hilliard joined the faculty of Northwestern University in 1962, where he taught for a quarter of a century. Born and educated in England, Professor Hilliard received his Ph.D. from the University of Liverpool, followed by a postdoctoral appointment at MIT and six years at the G. E. Research Laboratory. His work included four areas of research: the study of the thermodynamic and kinetic processes in inhomogeneous systems, the quantitative characterization of structure, the theoretical and experimental study of spinodal decomposition, and the synthesis and investigation of compositionally modulated films. These latter two areas represent pioneering work, for which his publications are cited with enormous frequency.

Dr. Hilliard was an inspiring teacher, not only for his students, but also for his colleagues and the wider metallurgical community.

SYMPOSIUM SCHEDULE

- 8:30 am *Registration*
(Norris Center: 101 Wildcat Room)
- 9:00 **Keynote: Boris Vuchic**
"From Y-Ba-Cu-O to Wall Street:
Observations from a Random Walk into the
Investment World"
(Norris Center: McCormick Auditorium)

STUDENT PRESENTATIONS

- 9:50 **Manish K. Mundra**, "Dramatic Effects of
Nanoconfinement on Thermophysical
Properties of Thin Polymer Films and 1D
Patterned Polymer Nanostructures"
Adviser: John M. Torkelson
- 10:10 **Murat Guvendiren**, "Self-Assembly and
Adhesion of DOPA Containing Hydrogels"
Adviser: Kenneth R. Shull
- 10:30 **Suresh Donthu**, "Soft-electron Beam
Lithography as an Enabling Approach for
Structural Engineering of Functional
Nanopatterns"
Adviser: Vinayak P. Dravid
- 10:50 *Break*
- 11:10 **Courtney Lanier**, "The (0001) Surface of
 $\alpha - \text{Fe}_2\text{O}_3$: The Single-Phase Structure of
the Biphasic Surface"
Adviser: Laurence Marks and Ken
Poepfelmeier
- 11:30 **Nathan L. Yoder**, "Desorption of Saturated
Hydrocarbons on Silicon: UHV-STM and
Density Functional Theory"
Adviser: Mark C. Hersam

12:00 pm *Break for 12:30 lunch for speakers,*

*advisers, and guests at the James Allen
Center*

- 2:00 **Marina Sofos** "Self-Assembly of
Nanostructured Electronically Active
Hybrids"
Adviser: Samuel I. Stupp
- 2:20 **Zixiao Pan** "Single Crystal Conversion
and Morphologic Control of Functional
Oxide Nanopatterns"
Adviser: Vinayak P. Dravid
- 2:40 *Break*
- 3:00 **Peter Hseih**, "Liquid Metal
Lubrication of Sliding Electrical
Contacts"
Advisers: Yip-Wah Chung and
Jane Wang
- 3:20 **Richard A. Karnesky**, "3-D
Microstructure and Mechanical
Properties of Al-Sc-Er"
Advisers: David N. Seidman and
David C. Dunand

*Adjourn for reception and award presentations
in the Cook Hall lobby*

The Keynote Speaker

Boris Vuchic, Ph.D. 1995
Partner, Pennant Capital

Abstract

The scientific and engineering communities have long been a source of technology, innovation, and talent for industry, but the connections between them have grown increasingly strong over recent decades. Commercial enterprises have greater needs on multiple levels – from the tighter interplay between internal R&D divisions and sales and marketing groups – to the greater preponderance of innovation-led startups that have become an accepted form of outsourced R&D for larger corporations. Academic institutions and federally funded research laboratories have also become increasingly a source of innovation as some of the larger corporate laboratories have been pressured with the need for short-term results at the expense of less directed research. Furthermore, the simple need for more talent at all enterprises has driven many more scientists and engineers to become more involved either directly in the commercial aspects of enterprises, or as consultants or even as investors.

The presenter will discuss his experiences in the context of a Ph.D. scientist directly entering into the business world. Observations on a career that began as a management consultant at McKinsey & Company through to his current role as a partner at Pennant Capital, a \$1.6 billion hedge fund, and an angel investor in technology-led startups will be presented. Specifically some of the benefits of being a Ph.D. trained scientist will be addressed in addition to typical hurdles that are often challenges in making the transition. Also opportunities for academic institutions to create more ties with the business community, and/or encourage entrepreneurial activities in the context of a world-class academic setting will be discussed.

The Student Speakers

SURESH DONTU
MS, National University of Singapore

MURAT GUVENDIREN
MS, Middle East Technical University

PETER Y. HSIEH
MS, Massachusetts Institute of Technology

RICHARD A. KARNESKY
BS, California Institute of Technology

COURTNEY LANIER
BS, Brown University

MANISH K. MUNDRA
MS, Indian Institute of Technology - Bombay

ZIXIAO PAN
MS, Tsinghua University

MARINA SOFOS
BS, Brown University

NATHAN L. YODER
BS, Purdue University

Special thanks to our sponsors:
The Dow Chemical Company, the Chicago Regional
Chapter of ASM International, and the American
Vacuum Society.

The John E. Hilliard Symposium

Thursday, May 17, 2007

*McCormick Auditorium
Norris University Center
9:00 a.m. to 4:00 p.m.*

*4:30 p.m.
Reception in the
Lobby of Cook Hall*

Department of Materials Science
and Engineering

Robert R. McCormick School
of Engineering and Applied Science
Northwestern University
Evanston, Illinois