



COLLEGE OF
ARTS AND SCIENCES
CASE WESTERN RESERVE
UNIVERSITY

Frontiers in Chemistry

Case Western Reserve University
10900 Euclid Avenue
Cleveland, Ohio 44106-7078



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The Seventy-First FRONTIERS IN CHEMISTRY



2011-2012

FRONTIERS IN CHEMISTRY

Case Western Reserve University
2011-2012

The Frontiers in Chemistry Series dates to 1941. The speakers are sponsored by local industrial and government laboratories, and the University. The lectures are free.

SCHEDULE The lectures are on Thursdays at 4:30 p.m., except for the February 2 lecture which will be at 11:30 a.m. Coffee and tea are available before the lectures.

LOCATION The lectures are in the Goodyear Lecture Hall (Clapp 108).

PARKING Parking is available at all Case visitor parking lots. Please bring your parking stub for validation.

DINNER The lectures are generally followed by dinner at a local restaurant. Those who wish to may join the dinner (participants pay the restaurant individually). Dinner reservations are required by the Monday preceding the lecture.

INQUIRIES AND DINNER RESERVATIONS

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ONLINE INFORMATION

www.case.edu/chem/

FRONTIERS LECTURE SERIES COMMITTEE

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Chair, *Frontiers in Chemistry* Series
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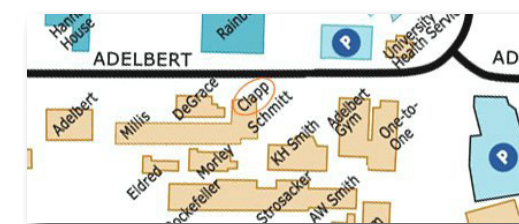
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NASA

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Sherwin-Williams

Dr. Scott Rickert
NanoFilm

The University acknowledges with appreciation the guidance provided by the external members of the Frontiers in Chemistry Lecture Series Committee and the support provided by the organizations indicated. Support for production of this brochure by Sherwin-Williams is gratefully acknowledged.



Maps, driving directions, bus stops, and more can be found on the web at Case Visitor Central:

www.case.edu/visit/

Chemical Frontiers in Nanomedicine

Gold Nanoparticles Can Destroy Cancer Cells in More Than One Way: How, What, and Why? September 8, 2011

Gold is an excellent example of a material that changes its properties on the nanometer scale. It captures and enhances the electromagnetic field of light, converts light energy into thermal energy, and binds drug molecules. By tuning the properties of gold nanoparticles, we were able to accomplish what the title suggests.



Mostafa A. El-Sayed

Julius Brown Chair and Regents Professor
Department of Chemistry & Biochemistry
Georgia Institute of Technology

Case Lecturer

campus host C. Burda

Impact of Nanoparticles and Other Emerging Compounds on Society November 3, 2011



Vicki L. Colvin

Kenneth S. Pitzer-Schlumberger Professor
of Chemistry
Department of Chemistry
Rice University

NASA Lecturer

campus host T. Gray

Semiconductor Nanocrystals in Biological and Biomedical Applications November 10, 2011

This talk will explore challenges and solutions to applying semiconductor nanocrystals, aka quantum dots, in biological and biomedical imaging, at the cellular level, and also *in vivo*. We will also review recent work in creating quantum dot complexes that can both image and “sense” their microenvironment, and the application of quantum dots in understanding the optimization of size and shape in nanoscale drug delivery schemes.



Mounqi G. Bawendi

Lester Wolfe Professor
Department of Chemistry
Massachusetts Institute of Technology

BASF Lecturer

campus host C. Burda

Sensing and Self-Assembly with Hierarchical Nanomaterials November 17, 2011

Our research exploits the synergy between the sizes of nanomaterials and biomolecules to develop high-performance sensing systems and complex self-assembled optical materials. Recent work with metal and semiconductor based materials will be highlighted.



Shana O. Kelley

Professor and Director
Division of Biomolecular Science
University of Toronto

Innovation Chemical Technologies Lecturer

campus host A. Samia

Chemistry & Biology of Natural Products

Natural Products, Synthetic Catalysts, Unnatural Products

February 2, 2012 note: lecture at 11:30

The lecture will focus on the application of simple peptides as catalysts for a variety of intriguing reactions. The utility of the catalysts for selective modification of natural product scaffolds will be a particular emphasis.



Scott J. Miller

Irene du Pont Professor of Chemistry
Department of Chemistry
Yale University

Energizer Lecturer

campus host R. Viswanathan

Studies in Natural Product Synthesis

March 8, 2012

This talk will focus on advances in heterocyclic chemistry made as a consequence of studying palau'amine and related alkaloids.



Phil S. Baran

Professor
Department of Chemistry
Skaggs Institute for Chemical Biology
Scripps Research Institute

Lubrizol Lecturer

campus host G. Tochtrop

Synthesis of Natural and Unnatural Products

March 22, 2012

The development of new chemical reactions and their application to the synthesis of naturally occurring compounds as well as molecules of design will be presented. Specifically, recent work from our laboratory on the synthesis of phenazines as a key step in the construction of diverse chemical structures, and the design and synthesis of new cancer chemotherapeutic agents will be discussed.



Jeffrey D. Winkler

Merriam Professor of Chemistry
Department of Chemistry
University of Pennsylvania

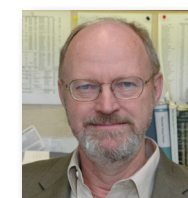
Case Lecturer

campus host A. Pearson

Synthesis of Molecules and Materials Using Olefin Metathesis Catalysts

April 19, 2012

Ruthenium metathesis catalysts that are well defined and can be modified in a predictable manner have opened new strategies for the construction of carbon-carbon double bonds. With functional tolerant catalysts, a wide array of new materials and complexes molecular structures can be assembled with precision.



Robert H. Grubbs

Victor and Elizabeth Atkins Professor of
Chemistry
Department of Chemistry
California Institute of Technology
(photo courtesy of Caltech)

Case Graduate Student Lecturer

campus host B. Werry