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# Department of Chemistry

## Gassman Lectureship in Chemistry

### April 22-25, 2013

## Professor Donna Blackmond

Department of Chemistry Scripps Research Institute

Donna G. Blackmond received a doctorate in Chemical Engineering from Carnegie-Mellon University in 1984. She has held professorships in chemistry and in chemical engineering in the United States, Germany, and the United Kingdom, and she has worked in industrial research in the pharmaceutical industry. In 2010, she moved from a research chair at Imperial College London to her present position as professor of chemistry at The Scripps Research Institute in La Jolla, California.

Blackmond has received Royal Society of Chemistry awards in Physical Organic Chemistry and in Process Technology, a Royal Society Wolfson Research Merit Award and an ACS Arthur C. Cope Scholar Award. She has been a Woodward Visiting Scholar at Harvard and a Miller Institute Research Fellow at Berkeley. She received the Max-Planck-Society's Award for Outstanding Women Scientists and she was an NSF Presidential Young Investigator. She has received the Paul H. Emmett Award in Fundamental Catalysis from the North American Catalysis Society and the Paul Rylander Award from the Organic Reactions Catalysis Society. In 2013, Blackmond was elected as a member of the US National Academy of Engineering.



Professor Blackmond's research focuses on kinetic and mechanistic studies of catalytic reactions for pharmaceutical applications, including asymmetric catalysis, as well as on fundamental investigations of the origin of biological homochirality.

Website: <http://www.scripps.edu/research/faculty/blackmond>

### Lecture #1: 4:15 p.m. Monday, April 22, 331 Smith Hall (reception following in 117/119 Smith Hall)

#### ***Reaction Progress Kinetic Analysis: A Powerful Methodology for Streamlining Mechanistic Analysis of Organic Catalytic Reactions***

*Reaction Progress Kinetic Analysis* (RPKA) combines highly accurate in-situ data collection with facile graphical manipulations, permitting a rapid mechanistic description of catalytic reactions. In contrast to the classical role of kinetics to corroborate a previously proposed mechanism, RPKA employs kinetic studies at the outset to suggest mechanistic proposals. This "kinetic-assisted mechanistic analysis" aids in the design of further supporting experiments including conventional mechanistic tools such as studies of isotope effects and spectroscopic studies for structural and compositional information. One of the most powerful aspects of the methodology is its ability to deconvolute rate processes occurring **on** the catalytic cycle from those occurring **off** the cycle. Prominent examples of the application of this methodology to quantitative understanding of complex organic reactions and reaction networks include asymmetric hydrogenation, asymmetric organocatalytic reactions, Pd-catalyzed C-C and C-N bond forming reactions, and transition-metal catalyzed competitive reactions including kinetic resolutions. RPKA finds important application in the pharmaceutical industry, where streamlining process R&D based RPKA is becoming an industry-wide standard.

Regents Professor Paul G. Gassman died in April 1993, at the age of 57. He was internationally known in the chemical community, and left behind a legacy of achievement. During his career, he served as mentor and adviser to 85 doctoral and master's candidates as well as dozens of postdoctoral associates and undergraduate students. Numerous awards, honors, and honorary degrees were bestowed in recognition of his contributions to research and his service to the scientific, professional, and university communities. Some of these awards include election to the National Academy of Sciences (1989) and to the American Academy of Arts and Sciences (1992); the James Flack Norris Award in Physical Organic Chemistry (1985); Arthur C. Cope Scholar Award (1986); and the National Catalyst Award of the Chemical Manufacturers Association (1990). He served as president of the American Chemical Society in 1990. He was co-chair of the organizing committees of the National Organic Symposium (1991) and the National Conferences on Undergraduate Research meeting (1992), on the University of Minnesota campus. It was his wish that a lectureship be established to bring distinguished organic chemists to the Department of Chemistry. We are proud to present this lecture series in his honor.

