You are
cordially invited to attend

The 35th Annual

Harry G. Fair Memorial Lecture in Chemical Engineering

Thursday, March 27, 2008
Seminar – 2:30 P.M.
M-204 Sarkeys Energy Center
100 East Boyd
University of Oklahoma
Norman, Oklahoma

Coffee and refreshments will be served prior to the lecture.

Harry G. Fair Memorial Lecturers

2008	Donald R. Paul, University of Texas at Austin
2007	David Mooney, Harvard University
2007	John Prausnitz, University of California, Berkeley
2006	George Georgiou, University of Texas at Austin
2005	James A. Dumesic, University of Wisconsin
2004	Robert C. Armstrong, Massachusetts Institute of Technology
2003	Nicholas Peppas, University of Texas at Austin
2002	Richard C. Alkire, University of Illinois
2001	Ralph T. Yang, University of Michigan
2000	Enrique Iglesia, University Of California, Berkeley
1999	George Stephanopoulos, Massachusetts Institute of Technology
1998	Stuart L. Cooper, University of Delaware
1997	Keith E. Gubbins, Cornell University
1996	H. Scott Fogler, University of Michigan
1995	Gary L. Haller, Yale University
1994	Christopher W. Macosko, University of Minnesota
1993	Larry V. McIntire, Rice University
1992	Dan Luss, University of Houston
1991	E.N. Lightfoot, University of Wisconsin
1990	George A. Samara, Sandia National Labs
1989	James Wei, Massachusetts Institute of Technology
1988	C. Judson King, University of California, Berkeley
1987	Eli Ruckenstein, SUNY Buffalo
1986	Stuart W. Churchill, University of Pennsylvania
1985	John M. Campbell, John M. Campbell & Co.
1984	Richard G. Askew, Phillips Chemical Co.
1983	B.H. Sellers, Sellers Chemical Co.
1982	Lynn T. Reed, Warren Petroleum Co.
1981	Robert S. Purgason, Perry Gas Processors
1980	A.B. Slaybaugh, Conoco Inc.
1979	Charles R. Perry, Perry Gas Cos.
1978	Raymond W. Lowe, E.I. DuPont de Nemours
1977	Laurance S. Reid, Ball-Reid Engineers Inc.
1976	Harry L. Blomquist Jr., Coastal States Gas Co.
1975	Stanley Learned, Phillips Petroleum Co.

School of Chemical, Biological and Materials Engineering
College of Engineering
University of Oklahoma
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chemical, biological & materials
college of engineering

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Harry G. Fair Memorial Lecture in Chemical Engineering 2008

Donald R. Paul
Department of Chemical Engineering
University of Texas at Austin
Austin, Texas 78712

Polyolefin Nanocomposites: Structure and Properties

Harry G. Fair

Each year, a special lecture is given in memory of Harry G. Fair, an outstanding OU alumnus. Fair was born in Okmulgee, Oklahoma, on June 3, 1916, and earned his bachelor of science degree in chemical engineering in 1939. He joined Phillips Petroleum Company in 1939 and worked his way up to vice president for supply and transportation, with responsibility for worldwide exchange of crude oil and all transportation facilities. In 1966, Fair joined M.W. Kellogg Company as executive vice president in charge of all engineering activities. He was named executive vice president of Coastal States Gas Corporation in 1971, a post he held until his death on July 27, 1974. A member of a number of professional societies and a licensed professional engineer, Fair was active in service to society and his alma mater.

This lecture is made possible by the Harry G. Fair Memorial Fund established by his widow, Jane Swift Fair. Arrangements for the lecture are made by the School of Chemical, Biological and Materials Engineering in OU's College of Engineering.

Polyolefin Nanocomposites: Structure and Properties

Donald R. Paul

Department of Chemical Engineering
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Austin, Texas 78712

Polymer-layered silicate nanocomposites formed from the organically modified clay mineral montmorillonite and related materials have attracted a great deal of technological and scientific interest in the past decade. These composites offer the promise of greatly improved properties over those of the matrix polymer owing to the nanoscale reinforcement and other effects caused by dispersing the one nanometer thick, high aspect ratio aluminosilicate layers. However, the key to achieving these benefits is dispersing the organoclay into the polymer matrix to generate high aspect ratio particles. This presentation will give a status report on what is known about generating nanocomposites based on various polymer matrices. Many factors are involved in achieving a high level of dispersion, or ultimately full exfoliation, but one of the most important is the complex interaction of the polymer matrix with the organoclay.

Donald R. Paul biography

Donald R. Paul is the Ernest Cockrell, Sr. Chair in Engineering in the Department of Chemical Engineering at the University of Texas at Austin and Director of the Texas Materials Institute.

Dr. Paul's research interests include the broad areas of polymer science and engineering and chemical engineering. Current research involves various aspects of polymeric materials including polymer blends; membranes for separations, drug delivery, packaging, etc.; and polymer processing. The blend research deals with the thermodynamics of polymer-polymer interactions (miscibility, phase diagrams, interfaces), reactive compatibilization of multiphase mixtures, rubber toughening, the control of phase morphology during processing by both chemical and physical means, and polymeric nanocomposites. The research on diffusion in polymers involves investigation of structure-property relationships to design better membranes for separation processes and improved barrier materials plus an interest in theories and models for describing sorption and permeation of small molecule penetrants in polymers including the rubbery, glassy, semicrystalline, and liquid crystalline states of these materials. The research on nanocomposites involves devising chemical and processing strategies for exfoliating layered silicates in polymer matrices for improvement of performance using nanoscale reinforcement. Synthesis, characterization, and performance of polymers are an integral part of the research in these areas.

Dr. Paul's education is from the University of Wisconsin and North Carolina State University. He is a member of the National Research Council, a member of the National Academy of Engineering, a Fellow of AIChE, and a Fellow of the Society of Plastics Engineers. He is co-author of three books and has published over 500 research papers. He has been editor of Industrial & Engineering Chemistry Research for over 20 years. Other honors include the William H. Walker Award from AIChE and the E.V. Murphree and Herman F. Mark Polymer Chemistry Awards from the American Chemical Society.