You are cordially invited to attend

The 39th Annual

Harry G. Fair
Memorial Lecture in Chemical Engineering
2013

Thursday, February 14, 2013
Seminar – 3:00 P.M.
Room M-204
Sarkeys Energy Center
100 East Boyd
University of Oklahoma
Norman, Oklahoma

Coffee and refreshments will be served.

Accommodations on the basis of disabilities are available by calling (405) 325-5811.

The University of Oklahoma is an equal opportunity institution. 2/13

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Harry G. Fair
Memorial Lecturers

2013  Alexis T. Bell, University of California, Berkeley
2012  Charles Zukoski, University of Illinois at Urbana-Champaign
2011  Peter C. Stair, Northwestern University
2010  Juan J. de Pablo, University of Wisconsin-Madison
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. Allaire, University of Illinois
2001  Ralph T. Yang, University of Michigan
2000  Enrique Iglesias, 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
1982  Lynn T. Reed, Warren Petroleum Co.
1981  Robert S. Purgason, Perry Gas Processors
1980  A. B. Slabaugh, Conoco Inc.
1979  Charles R. Perry, Perry Gas Co.
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.

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Alexis T. Bell
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Berkeley, California, USA

Effects of Local Composition, Structure and Confinement on the Activity and Selectivity of Catalytically Active Sites
Effects of Local Compositions, Structure, and Confinement on the Activity and Selectivity of Catalytically Active Sites

Alexis T. Bell
Chemical and Biomolecular Engineering
University of California
Berkeley, California, USA

The activity and selectivity of catalysts are strongly affected by the local environment of the active site. If the site is a well defined species, e.g., a metal cation, and metal oxo species, and can be described precisely, then it is possible to undertake careful modifications of the chemical and structural environment of the site. Such observations lead to the recognition that not only the electronic properties of the site, but also the spatial confinement of the site and the presence of elements not directly involved in the chemistry of the local site can affect the activity and selectivity of the site. This talk will illustrate these effects for several reactions and will demonstrate that considerable insight into the extent to which electronic versus structural factors affect the progress of catalytic reactions can be developed by combining experimental and theoretical techniques. Examples to be presented include the cracking and dehydrogenation of butane on H-MFI, H-BETA, and H-MOR; the carbonylation of dimethoxy methane by H-FAU and H-MFI; the oligomerization of propene by Ni-X; and the oxidation of propene to acrolein on Bi$_2$Mo$_3$O$_{12}$.

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 Co. 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 Co. as executive vice president in charge of all engineering activities. He was named executive vice president of Coastal States Gas Corp. 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.

Alexis T. Bell

Alexis T. Bell is the Dow Professor of Sustainable Chemistry in Chemical Engineering in the College of Chemistry at the University of California at Berkeley, and Principal Investigator at Lawrence Berkeley National Laboratory.

He received his undergraduate degree in Chemical Engineering from the Massachusetts Institute of Technology in 1964 and his Ph.D. from there in 1967. Bell has recorded over 596 publications on various aspects of heterogeneous catalysis and chemical reaction engineering.

From 1979-1981 he was the Assistant Dean, College of Chemistry, at the University of California, Berkeley, and Chairman of the Department of Chemical Engineering 1981-1991 and 2005-2006. He was Dean of the College of Chemistry from 1994-1999. He was the Theodore Vermeulen Professor of Chemical Engineering from 2007-2009 and became the Dow Professor of Sustainable Chemistry in 2009.

He has served as Editor in Chief, Chemical Engineering Science, 2006-2011; Editor in Chief, Catalysis Reviews-Science and Engineering, 1985-present; and as Editor, Proceedings of the National Academy of Sciences, 2011-present.

His honors and awards include Elected to the National Academy of Engineering, 1987; Fellow, Japan Society for the Promotion of Science, 1994; Robert Burwell Lecturer, North American Catalysis Society, 2003; AIChe William H. Walker Award for Contributions to the Chemical Engineering Literature, 2005; Michel Boudart Award for the Advancement of Catalysis, 2007; Giuseppe Paravanno Award for Excellence in Research in Catalysis, given by the Michigan Catalysis Society, 2007; elected member of the American Academy of Arts and Sciences, 2007; identified as one of the “One Hundred Engineers of the Modern Era” by AIChe, 2008; elected member of the National Academy of Sciences, 2010; ACS George A. Olah Award for Research in Hydrocarbon or Petroleum Chemistry, 2013.