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Curriculum Vitae

David Barry Graves

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Born: August 2, 1955, Daytona Beach, Florida

Education:
B.S., University of Arizona, 1978 (Chemical Engineering)
M.S., University of Arizona, 1981 (Chemical Engineering)
Ph.D., University of Minnesota, 1986 (Chemical Engineering)

Employment:
Computer process control engineer, Standard Oil of California, 1978 - 81.
Assistant Professor of Chemical Engineering, University of California, Berkeley, 1986 - 91
Associate Professor of Chemical Engineering, University of California, Berkeley, 1991 - 1997
Full Professor of Chemical Engineering, University of California, Berkeley, 1997 - present

Awards and Honors:
1983 Electrochemical Society Summer Research Fellowship.
1983 Electrochemical Society Young Author Award.
1989 NSF Presidential Young Investigator Award.
1998 Tegal Thinker Award
2001 Fellow of the American Vacuum Society (AVS)
2001 Plasma Prize, Plasma Science and Technology Division of the AVS
2004 Fellow Institute of Physics
2011-14 Chaire d'excellence, Nanoscience Foundation, Grenoble, France
2011-16 Lam Research Corporation Distinguished Chair, UC Berkeley
2014 Allis Prize for the Study of Ionized Gases, American Physical Society

Professional Societies:
American Institute of Chemical Engineers, American Physical Society, American Vacuum Society, Society for Plasma Medicine.

Professional and University Activities:
Chairman, Department of Chemical Engineering Faculty Search Committee (1991-92; member, 1994-95; 2014-15)
Instructor, University of California Extension Course on Reactive Plasmas, 1992-93.
Guest Editor, IEEE Trans. Plasma Sci., Special Issue on Modeling of Low Pressure Plasmas, 1991.
Organizer and Chair, National AIChE meeting sessions on plasma processing, 1989, 1990, 1992.

Organizing Committee, NATO ARW, Particles in Plasmas, 1993.
Executive Committee, Gaseous Electronics Conference (fall 1991-96)
Organizing Committee, Plasma Sources and Surface Interactions in Materials Processing Workshop, Fuji-Yoshida, Japan, (1995).
Organizer, (Secretary) Gaseous Electronics Conference, 1995.
Co-Chairman, National Research Council Panel on Database Needs in Plasma Processing, 1995-96.
Chairman, Plasma Science and Technology Division of the American Vacuum Society (1994-95).
Co-Editor, Report on Data Needs for Plasma Processing, National Research
Council, (1995-96)
Vice-Chair, Gordon Conference on Plasma Processing
Science, (1996-1998)
Chair Gordon Conference on Plasma Processing Science, (2000)
Vice-Chair, Department of Chemical Engineering, UC Berkeley, 2002-06
Associate Editor, Journal of Physics D, Institute of Physics, 2004-07
Associate Editor, Journal of Vacuum Science and Technology, 2007-
Maitre de Researche, Ecole Polytechnique, Paliseau, France, June 2006
International Scientific Chair, CIP, Toulouse, France, June, 2007
Co-Chair, "Plasma 2010-Low Temperature Plasma Science Workshop" (2008)
Co-Editor, "Low Temperature Plasma Science Challenges for the Next Decade." (2008)
Founding Member, Plasma Medicine Society, (2009)

RESEARCH INTERESTS:

Plasma medicine and biology

Thin film etching and deposition in semiconductor manufacturing

Plasma chemistry and plasma processing for semiconductors

Modeling and simulation of low temperature nonequilibrium plasmas

Plasma-surface interactions and plasma-surface chemistry

Nanofeature profile evolution simulation

Molecular dynamics of plasma-surface interactions

Particles and photons in plasmas

Optical and mass spectroscopy in low temperature plasmas

Environmental, health and safety issues in plasma processing

Microplasmas

PAST RESEARCH SUPPORT:

Intel Corporation, 1986-88, 90-92, 1996, 2000
California State MICRO, 1989 – 98
California State UC SMART, 1998-2001
IBM T.J. Watson Research Center, 1988-90
SEMATECH, 1990-92; 1997-2001
Sandia National Laboratory, 1993-96
Lawrence Livermore National Laboratory, 1994-96
Toshiba Corporation, 1997-98
Hitachi, Ltd., 1997-98
Mitsubishi Ltd., 1999-00
ERC on Environmentally Benign Manufacturing for Semiconductors, 1996-2007
Applied Materials Corporation, 1996-98
Kodak Corporation, 1996-2002
VAT Corporation, 2001
Department of Energy, 2000-03, 2009-present
Lam Research Corporation, 1995-99; 2002-3, 2004-present
National Science Foundation, 1988-91; 1989-94; 1996-present
Semiconductor Research Corporation, 1995-96; 1996-present
Tokyo Electron Ltd., 2007-2009
OnWafer Technologies 2005-2008
UC Discovery
Max Planck Institute for Extraterrestrial Physics
Blum Center Developing Economies (UC Berkeley)
Sustainable Products and Solutions Program (UC Berkeley)
DOE/NSF Basic Plasma Science
DOE Plasma Science Center
Hitachi Corporation
Lam Research Corporation
Samsung Corporation

Brief Biography

David B. Graves joined the University of California at Berkeley in 1986 after receiving his PhD in Chemical Engineering from the University of Minnesota. He is currently Full Professor of Chemical Engineering. David Graves served as vice-chair of the Department of Chemical Engineering from 2002-06 and again from 2008-2011. His research interests are in the general areas of low temperature plasma science and gas discharge phenomena. His group studies the physics and chemistry of chemically active low temperature plasmas, including modeling and simulation, experimental studies of plasma using various gas phase and surface spectroscopies, dusty plasmas, plasma stability, plasma-electromagnetic interactions, plasma-organic materials interactions, and studies of radical-, ion-, electron- and photon-surface interactions in high vacuum beam systems. New topics include plasmas used for biomedical applications, food disinfection and agricultural applications. David Graves has graduated 29 PhD students, and has supervised over 25 postdoctoral scholars. Many of these former students and postdoctoral scholars are now in positions of leadership in industry and academe.

He has over 100 invited conference presentations and numerous invited seminars. He is author or co-author of over 200 peer-reviewed publications, 20 of which have at least 100 citations.

David Graves is a fellow of the American Vacuum Society and the Institute of Physics and was the recipient of the Electrochemical Society Young Author Award, the NSF Presidential Young Investigator Award, the Tegal Plasma Thinker Award, the 3rd annual Plasma Prize of the Plasma Science and Technology Division of the AVS and the winner of the Allis Prize of the APS. David Graves co-chaired the 1996 National Research Council (NRC) workshop and co-edited the "Report on Data Needs for Plasma Processing," published by the NRC. He fulfilled a similar role in 2008 for the Department of Energy "Plasma 2010-Low Temperature Plasma Science Workshop" and report on "Low Temperature Plasma Science Challenges for the Next Decade." He chaired the 2000 Gordon Research Conference on Plasma Processing Science and the American Vacuum Society Plasma Science and Technology Division. He was Associate Editor for the Journal of Physics D, Institute of Physics from 2004-07. David Graves has served on the executive and organizing committees of many international plasma science conferences. He was named Maitre de Researche at the Ecole Polytechnique, Paliseau, France, in June 2006. During the year 2007-08, he was an invited researcher at the Groupe des Recherches Energetique des Milieux Ionisee (GREMI) at the Universite d'Orleans in Orleans, France, supported through the foundation *le STUDIUM*. He was an invited researcher at the University of Perpignan (France) in 2010. He is a founding member of the Society for Plasma Medicine. He received a *chaire d'excellence* from the Nanoscience Foundation, in Grenoble France for 2011-2014 to study plasma-graphene interactions. He was appointed the first Lam Research Distinguished Chair in Semiconductor Processing for 2011-2016. He received the Will Allis Prize in Ionized Gases from the American Physical Society in 2014. David Graves has been a consultant for numerous corporations and law firms for both scientific consulting as well as for intellectual property lawsuits. He has given numerous workshops and short courses on plasma science and technology.

PUBLICATIONS:

1. "Flammability Characteristics and Structure of Pulverized Coal, Laminar Opposed Jet Diffusion Flame (with J.O.L. Wendt), 19th Symposium (international) on Combustion, The Combustion Institute, 1189-1196, 1982.
2. "Modeling and Analysis of Low Pressure CVD Reactors," D.B. Graves, K.F. Jensen, J. Electrochem. Soc. 130(9), 1950-1957, 1983.
3. "CVD in Stagnation Point Flow," D.B. Graves, C. Houtman and K.F. Jensen, J. Electrochem Soc. 133(5), 1986, 961-970.
4. "Modeling of Reactors for Plasma Processing I. Silicon Etching by CF_4 in a Radial Flow Reactor," D.B. Graves, M. Dalvie and K.F. Jensen, Chem. Eng. Sci., 41(4), 653-660.
5. "A Continuum Model of DC and RF Discharges," D.B. Graves, K.F. Jensen, IEEE Trans. Plasma. Sci., PS-14 (2), 78-91, 1986.
6. "Theoretical and Computational Problems in Modeling glow Discharges," D.B. Graves and K.F. Jensen, Materials Research Soc. Symposia Proc., vol. 68, J.W. Coburn, R.A. Gottscho and D.W. Hess, Eds., 29-230, 1986.
7. "Modeling of Plasma Processing," D.B. Graves, Proc. 6th Symposium on Plasma Processing, vol. 87-6, Electrochem. Soc., G.S. Mathad, G.C. Schwartz and R.A. Gottscho, Eds., 267-288, 1987.
8. "Fluid Model Simulations of a 13.56 MHz RF Discharge: Time and Space Dependence of Rates of Electron Impact Excitation," D.B. Graves, J. Appl. Phys., 62(1), 88-94, 1987.
9. "Space-time Resolved Kinetics of Mixed Rare-gas-attaching Gas Plasmas," D. B. Graves, R.A. Gottscho, G.R. Scheller and T. Intrator, J. Vac. Sci. Tech. A, 6(3), 1393-1396, 1988.
10. "Quenching Rates of Ar Metastables in Radio-frequency Glow Discharges," D.B. Graves, G.R. Scheller, R.A. Gottscho and T. Intrator, J. Appl. Phys., 64(2), 598-606, 1988.
11. "Nonlinear Excitation and Dissociation Kinetics in Discharges through Mixtures of Rare and Attaching Gases," D.B. Graves, R.A. Gottscho, G.R. Scheller and T. Intrator), J. Appl. Phys., 64(9) 4384-4397, 1988.
12. "Local Field and Ballistic Electron Models for Low Pressure RF and DC Glow Discharges," D.B. Graves, R.A. Gottscho, A. Mitchell, G.R. Scheller, N.L. Schryer and J.-P Boeuf, Proc. Seventh Symposium on Plasma Processing, 88-22), 1, Eds. G.S. Mathad, G.C. Schwartz and D.W. Hess, Electrochemical Society, Pennington, NJ, 1988.
13. "Plasma Processing in Electronic Materials Processing," D.B. Graves, AIChE J. (Journal Review), 35, 1-29, 1989.
14. "Plasma-enhanced Etching and Deposition," D.B. Graves and D.W. Hess, Chapter 8 in *Microelectronics Processing*, Advances in Chemistry 221, American Chemical Society, Washington, DC, 1989.

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