**John L. Falconer**

Mel and Virginia Clark Professor Emeritus  
President’s Teaching Scholar

Department of Chemical and Biological Engineering

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**Date and Place of Birth:** August 2, 1946 in Baltimore, Maryland

**Education:** Ph.D. (Chemical Engineering), Stanford University 1974 (1971-74), M.S. 1968  
 B.E.S. (Chemical Engineering), The Johns Hopkins University, 1967

**Research Interests:** Zeolite membrane preparation, characterization, and applications. Heterogeneous catalysis and photocatalysis. Adsorption in porous materials. Atomic and molecular layer deposition for catalysts and membranes.

**Teaching Interests:** Thermodynamics, Kinetics/Reaction Engineering, Active learning with ConcepTests, personal response systems, and peer instruction. Preparation of ConcepTests, screencasts ([www.learncheme.com](http://www.learncheme.com), [www.youtube.com/learncheme](http://www.youtube.com/learncheme)), and Mathematica interactive simulations for chemical engineering courses.

**Professional Experience:** Mel and Virginia Clark Professor Emeritus, 1/2019-  
Mel and Virginia Clark Professor, 7/2007-12/2018  
Chair of Chemical and Biological Engineering, 7/2007-7/2011  
Associate Chair of Chemical and Biological Engineering, 7/2005-6/2007  
Visiting Professor, Technical University of Delft, Netherlands, 1/98 - 3/98  
co-director: NSF-Research Experiences for Undergraduates Program in Membrane and Thin Film Science, 1993 – 2001, in Functional Materials 2003 - 2011  
James and Catherine Patten Professor, 1992 - 96  
Professor of Chemical Engineering, University of Colorado, 1985-present  
Associate Professor, 1980 - 1985. Assistant Professor, 1975 - 1980.  
Postdoctoral Fellow, Stanford Research Institute, Menlo Park, CA, 9/74 - 8/75  
Process Research Engineer, Fairchild Semiconductor R & D Lab, Palo Alto, CA, 5/69- 8/69

**Military Service:** Petroleum Laboratory Technician, U. S. Army, Fort Rucker, AL, 8/69 - 6/71

**Honors and Awards:** ASEE CHED Lifetime Achievement Award (2017)  
AIChE Warren K. Lewis Award for Chemical Engineering Education (2015)  
AIChEDavid Himmelblau Award for Innovations in Computer-Based Chemical Engineering Education, with J. deGrazia, J.W. Medlin, G.N. Nicodemus (2015)  
Chancellor's Award for Excellence in STEM Education (2015)Department Outstanding Undergraduate Teaching Award (2014)  
College of Engineering Dean’s Faculty Fellowship (2014-2015)Johansen-Crosby Lectureship, Michigan State University (2013)  
Featured chemical engineering educator in *Chemical Engineering Education* (2013)  
Fellow of American Institute of Chemical Engineers (2012)  
Chancellor's Award for Excellence in STEM Education (2011)  
Boulder Faculty Assembly Award for Excellence in Service (2011)Hazel Barnes Prize- highest faculty recognition for teaching and research given by the University of Colorado Boulder (2008)  
College of Engineering Max S. Peters Outstanding Service Award (2008)  
University of Colorado CRCW Faculty Fellowships (2004-05, 1997-98, 1990-91)  
2005 ASEE Annual Conference Best Zone Paper Award (with J. deGrazia, A. Weimer)   
University of Colorado President’s Teaching Scholar (the University’s highest teaching recognition, a lifetime appointment, 2000- )  
Boulder Faculty Assembly Excellence in Research, Scholarly, and Creative Work Award (1999)  
Chemical Manufacturers Association National Catalyst Award for Excellence in Teaching (1997)  
ASEE Rocky Mountain Section Outstanding Teaching Award (1997)  
Departmental Outstanding Teaching Awards (1988, 1994, 1995, 1997, 1999, 2000)  
ACS Colorado Section Award in Chemistry (1992)  
College of Engineering Outstanding Advisor Award (1992)  
College of Engineering Research Award (1991)  
Charles Hutchinson Memorial Teaching Award, College of Engineering (1990)  
University of Colorado Summer Research Initiation Fellowship (1975)

**Professional Engineer:** State of Colorado Reg. Number 16909

**Society Memberships and Boards:** *Chemical Engineering Education* Publication Board, 2017-2020; CACHE (Computer Aids for Chemical Engineering) Trustee, 2016-2022; Petroleum Research Fund Advisory Board, 2008-2014; AIChE (a director of the Catalysis and Reaction Engineering Division, 2007-2010); American Chemical Society; North American Catalysis Society; American Society of Engineering Education; International Zeolite Membrane Meeting Scientific Committees (2007, 2010, 2013)

**Short** **Course** **Instructor**: Polymer Reactor Engineering, Center for Professional Advancement: 1992-1998 (9 times): Amsterdam, The Netherlands; East Brunswick, NJ; Houston, TX

**Consultant:** Boeing Satellite Systems, El Segundo, CA, 2009;Chemical and Metals Industry, Hudson, CO, 2005; Intellectual Capital Management Group, Palo Alto, CA, 2004-2005; Boulder Center for Science and Policy, Boulder, CO, 1996,1997,1999; TDA Research, Wheatridge, CO, 1995; Weyerhaeuser, St. Louis, MO, 1994; Bend Research, Inc., Bend, OR, 1989-1992; Econalytic Systems, Boulder, CO, 1989, 1991; Elkem Metals, Norway, 1989, New York, 1987, 1989; Solar Energy Research Institute, Colorado, Texas, 1987; 3M Corp., St Paul, MN, 1983-84.

#### Educational Resources Developed

#### Our website [www.learncheme.com](http://www.learncheme.com) contains teaching materials that we developed for chemical engineering education including more than 2,000 ConcepTests, 1,600 screencast videos, 180 interactive simulations, 20 quiz-yourself simulations, and 35 interactive self-study modules. Course packages are also available for three chemical engineering courses: thermodynamics, kinetics, and material and energy balances. *The videos have been watched or downloaded more than 22 million times* on YouTube (<http://www.youtube.com/LearnChemE>) and iTunesU, and our YouTube channel has more than 84,000 subscribers. The interactive *Mathematica* simulations are on the Wolfram Project Demonstration site: (<http://demonstrations.wolfram.com/>). The AIChE Concept Warehouse website (<http://jimi.cbee.oregonstate.edu/concept_warehouse/>), which was developed under a joint NSF grant, has more than 2,000 ConcepTests.

**Journal Publications:** *(Web of Science: cited more than 12,375 times, h-index = 62;* [*Google Scholar*](https://scholar.google.com/citations?user=VioWXMgAAAAJ&hl=en) *cited more than 17,200 times, h-index = 73)*

1. McCarty, J., Falconer, J. L., Madix, R. J., "Decomposition of Formic Acid on Ni(110) I. Flash Decomposition from the Clean Surface and Flash Desorption of Reaction Products", **J. Catalysis 30**, 235-249 (1973).
2. Madix, R. J., Falconer, J. L., McCarty, J. G. "Surface Microcatalysis: The Enhanced Selectivity of Ni(110) (4x5)C for Dehydrogenation of Formic Acid", **J. Catalysis 31**, 316-318 (1973).
3. Falconer, J. L., McCarty, J. G., Madix, R. J., "Surface Explosion: HCOOH on Ni(110)", **Surface Science 42**, 329-330 (1974).
4. Falconer, J. L., Madix, R. J., "The Kinetics and Mechanism of the Autocatalytic Decomposition of HCOOH on Clean Ni(110)", **Surface Science 46**, 473-504 (1974).
5. Falconer, J. L., McCarty, J. G., Madix, R. J., "The Explosive Decomposition of Formic Acid on Clean Ni(110)", **Jap. J. App. Phys. Suppl. 2**, 525-528 (1974).
6. Falconer, J. L., Madix, R. J., "Flash Desorption Activation Energies: DCOOH Decomposition and CO Desorption from Ni(110)", **Surface Science 48**, 393-405 (1975).
7. Falconer, J. L., Madix, R. J., "Surface Stabilized Reaction Intermediate: Formic Anhydride", **Surface Science 51**, 546-548 (1975).
8. Madix, R. J., Falconer, J. L., Susko, A., "The Autocatalytic Decomposition of Acetic Acid on Ni(110)", **Surface Science 54**, 6-20 (1976).
9. Falconer, J. L., Wise, H., "Temperature Programmed Desorption Spectroscopy of N2H4 Decomposition on Al203 Supported Ir Catalyst", **J. Catalysis 43**, 220-233 (1976).
10. Falconer, J. L., Wentrcek, P. R., Wise, H., "Surface Interactions on Alumina Supported Iridium Catalysts: Oxygen and Carbon Monoxide", **J. Catalysis 45**, 248-255 (1976).
11. Falconer, J. L., Madix, R. J., "Desorption Rate Isotherms in Flash Desorption Analysis", **J. Catalysis 48**, 262-268 (1977).
12. Falconer, J. L., Madix, R. J., "The Desorption Kinetics of Water and Formic Acid from Ni(110) Following Low Temperature Adsorption", **J. Catalysis 51**, 47-63 (1978).
13. Zagli, A. E., Falconer, J. L., and Keenan, C. A., "Methanation on Supported Nickel Catalysts Using Temperature Programmed Heating", **J. Catalysis 56**, 453-467 (1979).
14. Falconer, J. L., Zagli, A. E., "Adsorption and Methanation of Carbon Dioxide on a Nickel/Silica Catalyst", **J. Catalysis 62**, 280-285 (1980).
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17. Frank, T. C., Falconer, J. L., "Surface Composition of Copper-Silicon Alloys", **Applications of Surface Science 14**, 359-374 (1983).
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19. Falconer, J. L., Bischke, S. D., Hanna, G. J., "Electron-Enhanced CO2 Adsorption and Stabilization on Aluminum Films", **Surface Science 131**, 455-462 (1983).
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24. Saber, J. M., Falconer, J. L., Brown, L. F., "Carbon Dioxide Gasification of Carbon: Isotope Study of Carbonate Catalysis", **J. Catalysis 90**, 65-74 (1984).
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65. Flesner, R. L., Falconer, J. L., "The Role of Spillover in Carbon Monoxide Hydrogenation over Alumina-Supported Platinum", **J.** **Catalysis 139**, 421-434 (1993).
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92. Cordi, E. M., Falconer, J. L., “Oxidation of Volatile Organic Compounds on Al2O3, Pd/Al2O3, and PdO/Al2O3 Catalysts”, **J. Catalysis** **162**, 104-117 (1996).
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96. Cordi, E. M., Falconer, J. L., ”Oxidation of Volatile Organic Compounds on a Ag/Al2O3 Catalyst”, **Applied Catalysis A** **151**, 179-191 (1997).
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98. Coronas, J., Falconer, J. L., and Noble, R.D., “Characterization and Permeation Properties of ZSM-5 Composite Membranes”, **AIChE Journal** **43**, 1797-1812 (1997).
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101. Coronas, J., Noble, R.D. Falconer, J. L., “Separations of C4 and C6 Isomers in ZSM-5 Tubular Membranes “, **Ind. Eng. Chem. Research 37**, 166-176 (1998).
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104. Falconer, J.L. and Magrini-Bair, K.A. “Photocatalytic and Thermal Catalytic Oxidation of Acetaldehyde on Pt/TiO2”, **J. Catalysis** **179,** 171-178 (1998).
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