

Jim V. Zoval

- Education **1990 - 1996 University of California, Irvine Irvine, CA**
- Ph.D. Degree, **Chemistry**
- 1985 - 1990 University of California, Irvine Irvine, CA**
- B.S. Degree, **Chemistry**
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- Professional **11/2002-present University of California, Irvine, CA**
Experience Specialist IV
- Substitute Teaching: Graduate Thermodynamics, Graduate and Undergraduate Biochemical/Biomedical Engineering (BioMEMS), Graduate and Undergraduate Fundamentals of Microfabrication
 - Management of research in Polymer Physical Chemistry, Nanotechnology, Biochemistry, Molecular Biology, Materials Science, Spectroscopy, and Microscopy. Supervise 15 post-doc and graduate students. Proposal writing and teaching is also part of the position.
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- 12/2006 – present Rancho Santiago Community College, Orange, CA**
Adjunct Instructor
- Teach General Chemistry lecture and laboratory
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- 3/2000- 9/2002 Nanogen Inc., San Diego, CA**
Senior Project Engineer
- Development of new platforms for medical diagnostic applications. Areas of work include: surface chemistry of biomolecule attachment, microfluidic design fabrication and characterization, fluorescence microscopy and spectroscopy, Atomic Force Microscopy, photolithography, sample preparation platform development, and cantilever based assay platform development.
 - Writing proposals for government funding of R&D projects.
 - Management of “Lab on a Disc” collaboration with NASA. Using photolithographic based microfluidic fabrication on a centrifugal disc, an assay platform was developed for use in space.
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- 1/1999 – 4/2000 Burstein Technologies, Irvine, CA**
Senior Manager, Platform Development

- Development of CD based instrument and medical diagnostic assays. Immuno and DNA assay developmental research. DNA array imaging, application and characterization of reactive plastics to surfaces for covalent bonding and absorption of DNA for hybridization assays. Covalent and absorptive application and characterization of antibodies to solid state for immunoassays. Organic synthetic chemistry, Polymer chemistry, Atomic Force Microscopy.
- Responsible for technical marketing presentations for VC and private investors. Presentation of technical materials for new hire education.
- Involvement in IP portfolio development and research. Inventor on several patents for novel diagnostic CD designs, microfluidics, and chemistry.
- Developed pressure sensitive adhesive based microfluidic systems.

7/1997 – 1/1999 Lightsense Corporation Laguna Hills, CA

Research Scientist

- Development of sensor devices, specifically fluorescence based oxygen, carbon dioxide, and glucose sensors.
- Inventor for self-referencing, oxygen sensing dye and a method of attaching fluorophores to siloxane polymers.
- Optical design of LED/Photodetector fluorescence sensing devices
- Organic synthetic chemistry, Polymer synthetic chemistry, Chromatography, UV -VIS and fluorescence spectroscopy.

9/1990 – 7/1996 University of California, Irvine Irvine, CA

Graduate Teaching Assistant/Research Chemist

- Teaching discussion sections and lab sections for: General Chemistry, Inorganic Chemistry, Physical Chemistry, Quantitative Analysis, Instrumental Chemistry, and Computational Chemistry.
- Graduate Research: Laser Spectroscopy, Condensed Phase Photodynamics, IR and FTIR spectroscopy, Electrochemistry, Nanometer scale chemistry, Atomic Force Microscopy, Scanning Tunneling Microscopy, Optical Microscopy, Organic Physical Chemistry, GC, LC, HPLC, NMR

9/1995 – 7/1998 Golden West College Huntington Beach, CA

Chemistry Instructor

- Chemistry Instructor. Teaching: introductory chemistry, general chemistry, organic chemistry, and biochemistry.

Publications

Guangyao Jia , Jonathan Siegrist, Chengwu Denga, Jim V. Zoval, Gale Stewart, Regis Peytavi, Ann Huletsky, Michel G. Bergeron, Marc J. Madou, **A Low-Cost, Disposable Card for Rapid Polymerase Chain Reaction**, *Colloids Surf. B: Biointerfaces Special Edition*, (2007), in press.

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Han Xu, Chong Wang, Chunlei Wang, Jim Zoval, and Marc Madou., **Polymer Actuator Valves toward Controlled Drug Delivery Application**, *Biosensors and Bioelectronics*, Vol 21/11 pp 2094-2099, 2006

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Kim, J.; Jang, S. H.; Jia, G.; Zoval, J. V.; Da Silva N. A. and Marc J. Madou, **Cell Lysis On a Microfluidic CD (Compact Disc)**
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Régis Peytavi, Frédéric R. Raymond, Dominic Gagné, François J. Picard, Guangyao Jia, Jim Zoval, Marc Madou, Karel Boissinot, Maurice Boissinot, Luc Bissonnette, Marc Ouellette and Michel G. Bergeron **Microfluidic Device for Rapid (<15 min) Automated Microarray Hybridization**, *Clinical Chemistry*. 2005;51:1836-1844

Marc Madou, Jim Zoval, Guangyao Jia, Horacio Kido, Jitae Kim, and Nahui Kim, **Lab on a Disc**, *Annual Review of Biomedical Engineering*, Vol. 8, 2006, p. 601-628

Kim, J H S; Marafie, A; Jia, X Y; Zoval, J V; Madou, M J,
Characterization of DNA hybridization kinetics in a microfluidic flow channel, *Sensors and Actuators B.*, Vol. 113, no. 1. 17 Jan. 2006

Jia, G.; Ma, K.; Kim, J.; Zoval, J. V. and Madou, M. J.; Peytavi, R. and Bergeron, M. G., **Dynamic Automated DNA Hybridization and Detection on a CD (compact disc) Fluidic Platform**, *Sensors and Actuators B.* Vol. 114, no. 1, pp. 173-181. 30 Mar. 2006

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Zoval, J. V. and Madou, M. J., **Centrifuge Based Fluidic Platforms**, *Proceedings of IEEE*, 92, 140-153, 2004

Wang, Chong; Xu, H.; Wang, Chunlei; Zoval, J. V.; and Madou, M.
J. Artificial muscle valves for responsive drug delivery systems
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26 - 30 April 2004, Strasbourg, France

Wang, C.; Taherabadi, L.; Jia, G.; Kassegne, S.; Zoval, J. V. and
Madou, M. J.

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Samuel Kassegne, Marc Madou, Ralph Whitten, Jim Zoval,
Elizabeth Mather, Kamal Sarkar, Dalibor Hodko, Sandipan Maity
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Cantilever Devices**, Proceedings of the SPIE Conference on Smart
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**"Cage Exit Versus Cage-Induced Reaction Upon
Photodissociation of Matrix-Isolated H₂S - Experiment and
Statistical Theory"**
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Zoval J.V.; Imre D; Apkarian VA.
**"Spectroscopy of SH (A-X) Transition in Ar and Kr Matrices -
The Cage-Effect of Predissociation"**
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Matrices"**
Chemical Physics Letters, 197 (1992) 549-555.

Zoval J.V., Stiger, R. M., Biernacki, P., Penner, R. M.
**"Electrochemical Deposition of Silver Nanocrystallites on the
Atomically Smooth Graphite Basal Plane"**
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Zoval J.V., Biernacki, P., Penner, R.M.
**"Implementation of Electrochemically Deposited Silver
Nanocrystallites For the Preferential SERS of Defect Modes on
Thermally Etched Graphite Surfaces"**
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16. Zoval J.V. and Penner, R. M.
"Electrochemical Deposition of Platinum Nanocrystallites on

HOPG: Particle Size Control and Chemical Applications''
Journal of Physical Chemistry. (1996) Manuscript in Preparation.

J.V. Zoval, J. Lee, S. Gorer
**Electrochemical Preparation of Platinum Nanocrystals With
Size Selectivity on Basal Plane Oriented Graphite Surfaces, J.**
Phys. Chem. B, 102 (1998) 1166.

Patents

Zoval J.V.; Kido, H.; Virtanen J.A.
Optical Biodiscs with Reflective Layers
U.S. Patent Application No. 09/999,274

J. V. Zoval, **DEVICE AND METHODS FOR PROCESSING
SAMPLES AND DETECTING ANALYTES OF LOW
CONCENTRATION**, International Application No.
PCT/US2005/00092, 2005

H. Kido, J. V. Zoval, M. Madou, J. Kim, G. Jia, **Microfluidic
Device for Liquids**, WO Patent WO/2006/099,042, 2006

Zoval J.V.; Kido, H.; Virtanen J.A.
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999274, November 15, 2001

Werner, Martina Elisabeth, Valencia, Ramon Magpantay, Virtanen,
Jorma Antero, Zoval, Jim Vincent, **Surface assembly for
immobilizing DNA capture probes and bead-based assay
including optical bio-discs and methods relating thereto**
U.S. Patent No. 035836, December 21, 2001

Presentations

Zoval, Jim and Madou, Marc
**Centrifugal (CD) Microfluidic Platform for Nucleic Acid
Analysis**
Montreal Micro Array Symposium, October 12-13, Montreal,
Canada

Chunlei Wang, Lili Taherabadi, Rabih Zaouk, Marc Madou, Yuting
(Tim) Yeh and Bruce Dunn
C-MEMS Technology for Li Ion Microbatteries
Electrochemical Society Conference, October 12, 2004, Honolulu,
Hawaii

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Artificial muscle valves for responsive drug delivery systems
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Carbon-MEMS architectures for 3D microbatteries
Proceedings of SPIE International Symposium-Photonics Europe,
26 - 30 April 2004, Strasbourg, France

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Centrifugal Microfluidic Platform
American Chemical Society Symposium, 2005, San Diego, CA

J. Zoval, H. Kido, M. Madou Group

Centrifugal (CD) Microfluidic Platform for Nucleic Acid Analysis
Montreal Microarray Symposium
Oct 12-13, 2006