

Mehrdad Mahmoudi Zarandi

Mehrdad Mahmoudi Zarandi
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Research Interests

Broad interest in physical and chemical rate processes and in their applications in the study of the cardiovascular system, its formation and development from embryonic stage, its hemodynamics, biomechanics and related issues in the design of cardiac assist devices and artificial organs.

Education

California Institute of Technology (Caltech) Pasadena, California
Ph.D. in Chemical Engineering June 2000
Thesis: "Steady and Pulsatile Flow in Curved Vessels"
Thesis Advisor: Prof. Mory Gharib

Isfahan University of Technology Isfahan, IRAN
B.Sc. in Chemical Engineering. Class Rank: 1/46 August 1985

Work Experience

California Institute of Technology (Caltech) Pasadena, California
Visiting Scientist in Aeronautics and Bioengineering 2001-Present

Occidental College Los Angeles, California
Adjunct Professor in Physics 2000-2002

California Institute of Technology (Caltech) Pasadena, California
Postdoctoral Research Scientist 1999-2002

California Institute of Technology (Caltech) Pasadena, California
Graduate Research Assistant (with Prof. M. Gharib) 1995-1999

- Worked on different projects related to the *in-vitro* studies of cardiovascular fluid dynamics.

Graduate Research Assistant (with Prof. M. Lidstrom) Summer 1995

- Studied Methanotroph bacteria and developed a systematic approach leading to the discovery of the role of Formaldehyde in their metabolic pathways.

Graduate Research Assistant (with Prof. Z. Wang) 1994-1995

- Analyzed the theories of polymer-surfactant interactions
- Studied surface tension driven flows in relation to lung surfactants and their role in drug delivery.
- Developed a theoretical model for grafted polymers in connection with controlled release drug delivery methods

Isfahan University of Technology Isfahan, IRAN
Lecturer in Chemical Engineering and director of research laboratories 1985-1993

- Conducted research on electrolytic zinc extraction from pilot plant to industrial scale design
- Worked on the “Dusty Gas Model” for the study of diffusion in mesoporous materials
- Designed, conducted and supervised experiments in the following laboratories:
 - General Chemistry, Organic Chemistry, Physical Chemistry, Polymer Science and Technology, Fluid Mechanics, Heat Transfer and Unit Operations laboratory

Teaching Experience

California Institute of Technology (Caltech) Pasadena, California
Graduate Teaching Assistant 1994-1997

- Lectured recitation sessions, designed problem sets, graded homework and prepared solution sets for homework and exams, guided students in their term project, monitored laboratory sections, and helped students during office hours. Courses: Experimental Methods, Fluid Dynamics of the Nature and Biofluid Dynamics, Statistical Thermodynamics, and Physics laboratory

Occidental College Los Angeles, California
Adjunct Professor in Physics 2000-2002

- Lectured general physics courses and laboratories for the first and second year students majoring in physics and mathematics

Isfahan University of Technology Isfahan, IRAN
Lecturer in Chemical Engineering 1985-1993

- Lectured the following courses: Material and Energy Balance, Fluid Mechanics, Thermodynamics, Heat Transfer

Arak University Arak, IRAN
Visiting Scholar in Mathematics 1990-1991

- Lectured the following courses: Mathematical Logic, Philosophy of Mathematics, History of Mathematics

Academic Honors

- Mobil graduate fellowship award (Caltech) Academic year 1993-1994

Language skills

- Fluent in English, French, German and Persian
- Available upon request. (a list is attached)

References

Selected Publications

Books

1. *Science and the Myth of Progress*, Collection of essays, World Wisdom, Bloomington, Indiana 2004 forthcoming.

Papers and Articles

1. M. Zarandi, M. Gharib, "Steady and Pulsatile Flow in Curved Vessels", *Journal of Fluid Mechanics* 2004, Submitted for publication.
2. B. Seifert, K. DesRochers, M. Ta, G. Giraud, M. Zarandi, M. Gharib, D. J. Sahn, "Accuracy of Doppler methods for estimating peak-to-peak and peak instantaneous gradients across coarctation of the aorta: An *In-Vitro* study", *Journal of American Society of Echocardiology*, Volume 12 Number 9, September 1999.
3. S. Wanitkun, M. Gharib, M. Mahmoudi Zarandi, T. Shiota and D. Sahn, "Evaluation of Descending Aortic Flow Volumes and Effective Orifice Area Through Aortic Coarctation by Spatiotemporal Integration of Color Doppler Data: An *In-Vitro* Study", *Journal of American Society of Echocardiology*, Volume 12 Number 6, June 1999.
4. E. Rambod, M. Mahmoudi Zarandi and M. Gharib, "*In-Vitro* Comparative Study by MRI and DPIV of Flow Through Normal and Thrombosed Bileaflet Aortic Valve: Velocity and Vorticity Mapping and Shear Stress Analysis", *Journal of American College of Cardiology*, Volume 31 Number 2 (Supp.), February 1998. Presented at the *47th Annual Scientific Session of American College of Cardiology*, Atlanta, Georgia, February 1998.
5. E. Rambod, M. Mahmoudi Zarandi and M. Gharib, "Vortices in the Heart", Presented at the *Division of Fluid Dynamics (DFD) 1997 Meeting of the American Physical Society*, San Francisco, California, November 1997.
6. M. Mahmoudi Zarandi and M. Gharib, "*in-vitro* Study of the Flow in Aortic Arch Using Digital Particle Image Velocimetry," Presented at the *1997 Annual Meeting of the Biomedical Engineering Society (BMES)*, San Diego, California, October 1997.
7. E. Moskun, M. Wu and M. Mahmoudi Zarandi, "The Wake Structures of the Air Bubbles Rising in a Hele-Shaw cell", Presented at the *Division of Fluid Dynamics (DFD) 1997 Meeting of the American Physical Society*, San Francisco, California, November 1997.
8. M. Mahmoudi Zarandi and S.H. Javadpour, "Numerical Solution of the Helical Flow of a non-Newtonian Fluid," Presented at the *11th International Conference of Rheology*, Brussels, Belgium, August 1992.

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List of References

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Pasadena, CA 91125, USA
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E-mail: mory@caltech.edu
2. Prof. Guruswaminaidu Ravichandran
California Institute of Technology (Caltech)
Graduate Aeronautical Laboratories, Mail Code: 105-50
Pasadena, CA 91125, USA
Tel: (626) 395-4525, Fax: (626) 304-0175
E-mail: ravi@caltech.edu
3. Professor Ali Shakouri
Room 253A Applied Sciences Building
Quantum Electronics Group, Jack Baskin School of Engineering
1156 High Street, University of California at Santa Cruz
Santa Cruz, CA 95064-1077
Tel: (831) 459-3821, Fax: (831) 459-4829
E-mail: ali@cse.ucsc.edu
4. Prof. David J. Sahn
Director, The Clinical Care Center for Congenital Heart Diseases Department of Radiology
Oregon Health Sciences University
Sam Jackson Park Road, UHN 60
Portland, Oregon 97201-3098
Tel: (503) 494-2192, Fax: (503) 494-2190
E-mail: sahnd@ohsu.edu
5. Professor Mingming Wu
Department of Physics, Occidental College
Los Angeles, CA 90041 USA
Tel: (323) 259-2809
E-mail: mingming@oxy.edu