MEKALA KRISHNAN

Address: 245 Upson Hall, Cornell University, Ithaca NY 14853
Phone: 6072292581, *E-mail:* mk399@cornell.edu

Education

2006 – Present **M.S./Ph.D. in Mechanical Engineering**
Sibley School of Mechanical and Aerospace Engineering,
Cornell University, Ithaca, New York
Research: Microfluidically enabled Programmable Matter
Advisor: Prof. David Erickson
GPA: 3.9/4.0

2002 – 2006 **B. Tech. in Mechanical Engineering**
Department of Mechanical Engineering,
Indian Institute of Technology (IIT) Delhi, New Delhi, India
Thesis: Design and fabrication of a flap wing mechanism
Advisors: Prof. Sanjeev Sanghi and Prof. Sudipto Mukherjee
GPA: 9.055/10 (3.622/4)
Rank : 3/66
GRE Results: Quantitative 800/800, Verbal 720/800, Writing 5.0/6.0

Aug. – Dec. 2004 **Exchange Student**
Kungliga Tekniska Högskolan (KTH), Stockholm, Sweden

Research and Work Experience

Jan. – May 2009 **Teaching Assistant**
Sibley School of Mechanical and Aerospace Engineering,
Cornell University, Ithaca, New York
Course: Thermodynamics (ENGRD 221)
Instructor: Prof. David Erickson
Responsibilities: Holding office hours, conducting weekly tutorials and class experiments, grading duties for a class of 100 undergraduate students

Jan. – May 2008 **Teaching Assistant**
Sibley School of Mechanical and Aerospace Engineering,
Cornell University, Ithaca, New York
Course: Thermodynamics (ENGRD 221)
Instructor: Prof. Kenneth Torrance
Responsibilities: Holding office hours, conducting weekly tutorials and class experiments, grading duties for a class of 80 undergraduate students

2007 – Present **Graduate Research Assistant**
Sibley School of Mechanical and Aerospace Engineering,
Cornell University, Ithaca, New York
Advisor: Prof. David Erickson
Responsibilities: Research duties in micro- and nanofluidic systems as part of a funded research grant

2005 – 2006 **Undergraduate Researcher**
Mechatronics Laboratory,
Indian Institute of Technology (IIT) Delhi, New Delhi, India
Advisors: Prof. Sanjeev Sanghi and Prof. Sudipto Mukherjee
Responsibilities: Studied lift in flapping through numerical analysis and the design and fabrication of a flapping apparatus

May – July 2005 **Summer Intern**
The Energy and Resources Institute (TERI), New Delhi, India
Advisor: Prosanto Pal
Responsibilities: Automated the design of a venturi scrubber to control particulate emission from a furnace

Honors and Awards

May 2008 **Exceptional Teaching Assistant Award**
Sibley School of Mechanical and Aerospace Engineering,
Cornell University, Ithaca, New York
Awarded for significant contribution, effort and skill as a teaching assistant

Nov. 2007 **Best Presentation Award**
ASME – IMECE Microfluidics 2007: Fluids Engineering in Micro- and Nanosystems Symposium, Seattle, WA
Awarded for significant contribution of the research work presented and the quality of the presentation

2006 – 2007 **Sibley School of Mechanical and Aerospace Engineering Fellowship**
Sibley School of Mechanical and Aerospace Engineering,
Cornell University, Ithaca, New York
Awarded a fellowship amount of $59,000

Aug. 2006 **Director's Gold Medal**
Indian Institute of Technology (IIT) Delhi, New Delhi, India
Awarded to one graduating student from the entire institute for best all-round achievements in academic and extra-curricular activities

May 2006 **Award for Outstanding Contribution to Student Affairs**
Indian Institute of Technology (IIT) Delhi, New Delhi, India
Awarded to a graduating student for outstanding contributions to student affairs

2002 – 2006 **Academic excellence awards**
Indian Institute of Technology (IIT) Delhi, New Delhi, India
Awarded to students in the top 7% of the institute for academic excellence

Publications

Refereed Journal Publications

1. **Krishnan M.**, Park J., Erickson D., "Opto-thermorheological flow manipulation" *Optics Letters* 34, 1976 (2009).
2. **Krishnan M.**, Tolley M. T., Lipson H., Erickson D., "Hydrodynamically Tunable Affinities for Programmable Matter" *Langmuir* 25, 3769 (2009).
3. Tolley M. T., **Krishnan M.**, Erickson D., Lipson H., "Dynamically Programmable Fluidic Assembly" *Applied Physics Letters* 93, 254105 (2008).
4. **Krishnan M.**, Tolley M. T., Lipson H., Erickson D., "Increased Robustness for Fluidic Self-Assembly" *Physics of Fluids* 20, 077304 (2008).

Invited Articles and Book Chapters

1. **Krishnan M.**, Erickson D., "Introduction to Microfluidic and Optofludic Transport" in Handbook of Optofluidics (H. Schmidt, A. Hawkins Eds.) Wiley (2009).
2. Erickson, D., **Krishnan. M.**, "Introduction to Electrokinetic Transport in Microfluidic Systems" in Lab-on-Chip Technologies and Applications (A. Rasooly, K. Herold Eds.) Horizon (2008).

Refereed Conference Publications and Presentations

1. Park J., **Krishnan M.**, Erickson D., "Opto-thermorheologically reconfigurable microfluidics" Conference on Lasers and Electrooptics (CLEO) – Symposium on Optofluidics, Baltimore MD (2009). **Presenting Author**
2. **Krishnan M.**, Tolley M. T., Lipson H., Erickson D., "Directed Hierarchical Self Assembly - Active Fluid Mechanics at the Micro and Nanoscales" Proceedings of AIChE Annual Meeting, Philadelphia PA (2008).
3. Tolley M. T., **Krishnan M.**, Lipson H., Erickson D., "Advances Towards Programmable Matter" Proceedings of the 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), San Diego CA, pp. 653-655 (2008).
4. Tolley M. T., Baisch A., **Krishnan M.**, Erickson D., Lipson H., "Interfacing Methods for Fluidically-Assembled Microcomponents" Proceedings of IEEE International Conference on Micro Electro Mechanical Systems (MEMS), Tucson AZ, pp. 1073-1076 (2008).
5. **Krishnan M.**, Tolley M. T., Lipson H., Erickson D., "Directed Hierarchical Self Assembly - Active Fluid Mechanics at the Micro and Nanoscales" Proceedings of ASME International Mechanical Engineering Congress and Exposition (IMECE), Seattle WA, 41784 (2007).

Other Publications

1. Tolley M. T., **Krishnan M.**, Erickson D., Lipson H., "Approaches to dynamically programmable self-assembly" Proceedings of Foundations of Nanoscience (FNANO), Snowbird, Utah (2008).

Other Presentations

1. **Krishnan M.**, "Active Fluid Mechanics for Programmable Matter" *Electron Devices Society Seminar Series*, Cornell University, Ithaca, NY, *May 2009*.
2. **Krishnan M.**, "Active Fluid Mechanics of Directed Microfluidic Self Assembly" *SiGMA Student Seminar Series*, Cornell University, Ithaca, NY, *June 2008*.
3. **Krishnan M.**, "Active Fluid Mechanics of Directed Hierarchical Fluidic Self Assembly" *Cornell Fluid Dynamics Seminar Series*, Ithaca, NY, *March 2008*.

Professional Skills

- Microfabrication including lithography, etching, thin film processing
- Microfluidics
- Self Assembly/Microassembly
- Computational Fluid Dynamics simulations including fluid-structure interactions
- Programming languages: C, C++, Java
- Engineering software: Matlab, Mathematica, Fluent, Comsol Multiphysics, LEdit
- Other software: EndNote, Adobe Premier Pro

Professional Experience

May 2008 – Present **Professional Development Director, SiGMA**
Sibley School of Mechanical and Aerospace Engineering, Cornell University
Organize professional seminars for graduate students in engineering on behalf of SiGMA, a graduate student organization in the Sibley School

Jun. 2008 – Apr. 2009 **Session Chair, Cornell Engineering Research Conference 2009**
Cornell University, Ithaca, New York
Worked to organize the first engineering research conference for Cornell students, with oral and poster presentations aimed at an audience of 500 people

May 2008 – Present	**Undergraduate Research Mentor** Sibley School of Mechanical and Aerospace Engineering, Cornell University Research mentor to an undergraduate student, Joonsik Park (Project title: Dynamic channel manipulation using optothermal nanoparticles)
May 2007	**Research Demonstration Organizer, The Society of Women Engineers** Cornell University, Ithaca, New York Conducted a module on microfluidics as part of a research demonstration for prospective undergraduates in the College of Engineering at Cornell University
2006 – Present	**President and Member, Asha Cornell** Cornell University, Ithaca, New York Volunteer at Asha Cornell, a non-profit organization working to raise money for rural education in India through fund raising events, raising up to $10,000 a year
2006 - Present	**Volunteer and Workshop Organizer, Expand Your Horizons (EYH)** Cornell University, Ithaca, New York Organized workshop on fluid mechanics for EYH, an annual outreach event to encourage high school girls to pursue careers in engineering and science
2005 – 2006	**General Secretary, Student Affairs Council** Indian Institute of Technology (IIT) Delhi, New Delhi, India Highest Student Representative at IIT Delhi, representing 2500 students
2005 – 2006	**Representative, Institute Senate** Indian Institute of Technology (IIT) Delhi, New Delhi, India Student representative to the highest authority on academic policy at IIT Delhi