

Mukarram A Tahir – Resume

CONTACT INFORMATION

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RESEARCH PUBLICATIONS

M. A. Tahir and H. Vahedi Tafreshi, “Influence of Fiber Orientation on the Through-plane Permeability of Fibrous Media”, *Physics of Fluids*, **21**, 1-5 (2009).

A. Ashari, T. M. Bucher, H. V. Tafreshi, **M. A. Tahir**, and M. S. A. Rahman, “Modeling Fluid Absorption in Thin Fibrous Sheets: Effects of Fiber Orientation”, *International Journal of Heat and Mass Transfer*, **53**, 1750 (2010).

M. A. Tahir, H. Vahedi Tafreshi, S. A. Hosseini, and B. Pourdeyhimi, “Modeling the Role of Microstructural Parameters in Radiative Heat Transfer through Disordered Fibrous Media”, *International Journal of Heat and Mass Transfer*, **53**, 4629-4637 (2010).

Q. Wang, **M. A. Tahir**, L. Zhang, and X. Zhao, “Electro-creasing Instability in Deformed Polymers: Experiment and Theory”, *Soft Matter*, **7**, 6583 (2011).

L. Gao, **M. A. Tahir**, L. N. Virgin, and B. B. Yellen, “Multiplexing Superparamagnetic Beads Using Phase-Modulated Multi-Frequency Ratchets”, *Lab on a Chip*, **11**, 4214-4220 (2011).

M. A. Tahir, L. Gao, L. N. Virgin, and B. B. Yellen, “Transport of Superparamagnetic Beads through a Two-Dimensional Potential Energy Landscape”, *Physical Review E*, **84**, 011403 (2011).

Q. Wang, **M. A. Tahir**, J. Zang, and X. Zhao, “Dynamic Electrostatic Lithography: Multiscale On-demand Patterning on Large-Area Curved Surfaces”, *Advanced Materials*, **24**, 1947-1951 (2012).

Y. Ouyang, **M. A. Tahir**, and B. B. Yellen, “On the origin of multiplexing capabilities of multi-frequency magnetic ratchets”, *Physical Review E*, **85**, 041407 (2012).

K. Khalil, A. Sagastegui, **M. A. Tahir**, B. J. Wiley, and B. B. Yellen, “Binary colloidal structures assembled through Ising interactions”, *Nature Communications*, **3**, 794 (2012).

M. A. Tahir, Y. Ouyang, F. Nori, and B. B. Yellen, “Dynamically Tunable Colloidal Bandpass and Bandgap Filters”, Submitted to *Physical Review Letters*.

PROFESSIONAL EXPERIENCE

Duke University Magnetic Nanosystems Laboratory, Durham, North Carolina, USA

Research Assistant

August 2009 – Present

Performing experimental studies and numerical simulations relating to the dynamics of superparamagnetic beads in a traveling magnetic field wave, with assessment of applications in colloidal separation.

University of Michigan – Shanghai Jiaotong University, Shanghai, P. R. China

Research Assistant

June 2011 – August 2011

Research Assistant

May 2012 – August 2012

Assisted in establishment of research laboratory, and performed experimental work on transport of magnetic beads in multi-frequency magnetic ratchets.

Duke University Soft-Active Materials Laboratory, Durham, North Carolina, USA

Research Assistant

August 2010 – June 2011

Characterizing the surface instability of polymer films (initiation and development) under high electric fields, with focus on the impact of mechanical pre-stresses.

Duke University Non-Linear Dynamics Group, Durham, North Carolina, USA

Research Assistant

September 2009 – May 2010

Exploration of the non-linear dynamics of a rocking blocking over an excited foundation.

Duke University – ME 83 Structure of Solids, Durham, North Carolina, USA

Teaching Assistant

September 2011 – December 2011

Assisted in running weekly student laboratory sessions, graded lab reports, and hosted office hours.

Duke University – EGR 53 Computational Methods, Durham, North Carolina, USA

Grader

September 2010 – December 2010

Graded weekly assignments and midterm examinations, and supervised student laboratory sessions.

Duke University Human Neuroeconomics Laboratory, Durham, North Carolina, USA

Programmer - Federal Work Study

September 2009 – January 2010

Designed scripts for applying statistical methods to fMRI data in order to understand decision making.

VCU Porous Media and Multiphase Flows Laboratory, Richmond, Virginia, USA

Research Assistant

September 2008 – August 2009

Devised and implemented numerical simulations for heat and fluid transport in fibrous porous media.

HONOURS AND
AWARDS

NSF Travel Grant to ASME IMECE 2012 Conference

Lord Foundation Grant for Undergraduate Research Utilizing SMIF

Pratt Research Fellowship

Duke URS Research Grant

President's Education Award for Outstanding Academic Excellence

National AP Scholar

Research Award, Mathematics and Science High School at Clover Hill

Principal's Award, Clover Hill High School

Intel Excellence in Computer Science Award, Intel Corporation

Virginia Dental Association - State Science Award

Naval Science Award, Office of Naval Research

EDUCATION

Duke University, Durham, North Carolina, United States

Bachelor of Science Mechanical Engineering and Materials Science **September 2009 – present**

John Tyler Community College, Midlothian, Virginia, United States

Dual Enrollment

September 2008 – June 2009

Mathematics and Science High School at Clover Hill, Midlothian, Virginia, United States

High School Diploma

September 2006 – June 2009

Trinity High School, Washington, Pennsylvania, United States

High School Coursework

February 2006 – June 2006

Islamia English School, Abu Dhabi, United Arab Emirates

High School Coursework

September 1999 – January 2006

PROGRAMMING

Python, Mathematica, MathCAD, C, C++, Matlab, LabVIEW, Linux shell scripting, Visual BASIC 6, \LaTeX 2 ϵ , Java.

INSTRUMENTS

Extensive experience with clean room fabrication and characterization equipment, including electron-beam metal evaporator, photo-mask aligners, reactive-ion etching, photolithography, profilometry, and scanning electron microscopy, as well as handle of basic experimental tools such as optical microscopes, programmable power supplies, and high-voltage generators.

SOFTWARE

Conducted research projects involving extensive use of Computational Fluid Dynamics packages such as Gambit and Fluent. Knowledge of office software such as Microsoft Word, Excel, and Powerpoint, as well as document preparation tools such as \LaTeX and LyX. Experience with parallel computing libraries and software, including OpenMPI, MPICH, and pyMPI.