

Sharjeel A. Tahir

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EDUCATION **University of Illinois at Urbana Champaign**, Champaign, Illinois, United States
Master of Science Material Science and Engineering **September 2015 – Present**

Courses:

Statistical Thermodynamics of Materials
Semiconductor Devices
Materials for Nanotechnology
Microstructure Determination
Polymer Chemistry
Integrated Circuit Device Fabrication and Theory
Surfaces and Colloids (Partial Audit)
Dynamics of Complex Fluids (Partial Audit)

Virginia Commonwealth University, Richmond, Virginia, United States

Bachelor of Science Mechanical Engineering **September 2009 – May 2012**

Technical Electives:

Advanced Engineering Mathematics
Radiative Heat Transfer
Engineering Vibrations
Advanced Flow Control

DEVICE Equipment list below used for the following purpose:

FABRICATION Fabrication of Integrated circuits such as p-n junction, BJT, MOS Transistors.
Fabrication of Molybdenum disulphide (MoS₂) based DNA sensor.

Disclaimer: Trained by the research group post-docs and/or university staff on the equipment listed below, but not necessarily used it.

Fabrication Method

Equipment

Silicon Nitride Deposition	STS Mesc Multiplex PECVD (dual frequency)
Silicon Etching	STS Mesc Multiplex Advanced Silicon Etcher
Al ₂ O ₃ deposition	Cambridge NanoTech Atomic Layer Deposition System
Photolithography	EVG 620 Mask Aligner, Ultratech 1000 Wide Field stepper
Oxidation	Lindberg-Tempress 8500 Dual Stack Furnace
Reactive Ion Etching	Plasmalab Freon/O ₂ Reactive Ion Etcher
Deposition of 2mm Al seed layer	CHA SEC-600 E-Beam\Thermal Evaporator
Gold Source-Drain contacts	CHA SEC-600 E-Beam\Thermal Evaporator
Graphene Transfer on Al ₂ O ₃	Copper Etchant, PMMA 495A2, PMMA 950A4, RIE, HCL
Degreasing(RCA method)	Acetone, HF, IPA
Positive/Negative Photoresist	Spinner
Flood Exposure	ABM Flood Exposure

Drilling 300 nm hole	FEI Dual Beam 235 FIB
Drilling 10 nm hole	JEOL 2010F EF-FEG TEM (Training by observation only)
Characterization	JEOL 2010F LaB6 TEM
Characterization	Hitachi S4700 SEM

Testing

N-Type or P-Type Silicon Wafer	Hot Point Probe
Wafer Resistivity	Four Point Probe
MoS ₂ I-V measurement	Probe Station
Ionic Current Measurement	Molecular Devices Axopatch 200 B Amplifier
Source Drain Current Measurement	Molecular Devices MultiClamp 700 B Amplifier
Film Thickness Measurement	Prometrix FT-650

RESEARCH
PUBLICATIONS

S.A. Tahir, A. Faraone, Y. Zhang, “Incoherent dynamics of *meta*-toluidine investigated by quasielastic neutron scattering”, *Journal of Chemical Physics – Submitted to Journal of Chemical Physics*

S.A. Tahir, M. Mital, “Numerical Investigation of laminar nanofluid developing flow and heat transfer in a circular channel”, *Applied Thermal Engineering*, **39**, 8-14 (2012).

S.A. Tahir, W.B. Moskowitz, and A.L. Throckmorton, “Numerical Analysis of Protective Cage Geometries for Mechanical Cavopulmonary Assistance in a Patient-Specific Fontan Physiology”, *Journal of Medical and Biological Engineering*, **33(3)**, 257-262 (2013).

A.L. Throckmorton, **S.A. Tahir**, S. Lopes, O.M. Rangus, and M.G. Sciolino, “Steady and Transient Flow Analysis of a Magnetically Levitated Pediatric VAD: Time Varying Boundary Conditions”, *International Journal of Artificial Organs*, **36(10)**, 693-699 (2013).

A.L. Throckmorton, J.P. Carr, **S.A. Tahir**, R. Tate, E.A. Downs, S. S. Bhavsar, Y. Wu, J. D. Grizzard, and W. B. Moskowitz, “Mechanical Cavopulmonary Assistance of a Patient-Specific Fontan Physiology: Numerical Simulations, Lumped Parameter Modelling, and Suction Experiments”, *Artificial Organs*, **35(11)**, 1036-1047(2011).

CONFERENCE
PRESENTATION

A.L. Throckmorton, J.P. Carr, **S.A. Tahir**, “Transient Fluid Analysis of a Magnetically Levitated Pediatric Ventricular Assist Device: Rotational Interfaces and Time Varying Boundary Conditions”, *57th Annual Conference of the American Society for Artificial Internal Organs*, Washington, D.C., USA, June 10-12-2011.

A.L. Throckmorton, J.P. Carr, **S.A. Tahir**, R. Tate, E.A. Downs, S.S. Bhavsar, Y. Wu, J.D. Grizzard, W.B. Moskowitz, “Mechanical Cavopulmonary Assistance of a Patient-Specific Fontan Physiology: Numerical Simulations, Lumped Parameter Modelling, and Suction Experiments”, *7th International Conference on Pediatric Mechanical Circulatory Support Systems and Pediatric Cardiopulmonary Perfusion*, Philadelphia, PA, USA, May 5-7, 2011. [40mm]

PROFESSIONAL
EXPERIENCE

Zhang Laboratory, University of Illinois at Urbana Champaign, Champaign, IL 61801

Research Intern

December 2015 – Present

Slow relaxations of molecular liquids: Incoherent dynamics of *meta*-toluidine investigated by quasielastic neutron scattering

Laboratory of Integrated Bio Medical Micro/Nanotechnology and Applications, University of Illinois at Urbana Champaign, Champaign, IL, 61801

Research Intern

June 2016 – August 2016

Training on the fabrication and testing of Molybdenum disulphide (MoS₂) based DNA sensor.

University of Virginia, Charlottesville, Virginia, USA

Research Intern

January 2015 – August 2015

Course: Thermodynamics and Kinetics of Materials

Research: Determination of local crystal structure, distinguishing fcc, hcp, bcc, and other relatively close-packed structures in computer simulation following guideline from a Physical Review paper.

Alstom, Midlothian, Virginia, USA

Thermodynamics and Steam-Path Engineer

May 2012 – October 2013

Design of steam turbine blades and steam-path layout.

Virginia Commonwealth University BioCirc Laboratory, Richmond, Virginia, USA

Research Intern

September 2010 – May 2012

Performing Computational Fluid Dynamics to investigate the hydraulic performance and fluid forces on the impeller of a blood pump used to assist patients with biventricular or univentricular physiology.

Virginia Commonwealth University Porous Media Laboratory, Richmond, Virginia, USA

Research Intern

May 2009 – August 2010

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

PROGRAMMING

Neutron Scattering data analysis in Matlab. Object-Oriented Programming in C++ to model physical systems using differential equations. Computer Graphics simulations in python using triangle meshes and Monte-Carlo ray tracing. Modelling of Coupled spring-mass systems in Matlab using ode45. General programming of Mathematica. ANSYS Fluent User-Defined Function scripting in C#. Experience with parallel computing libraries and software, including OpenMPI, MPICH, and pyMPI.