

Saurabh Nath

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Education

- 2014–present **MS in Engineering Mechanics**, *Department of Biomedical Engineering and Mechanics, Virginia Tech, Blacksburg, Virginia,* GPA - 3.85/4.0.
Advisor: [Jonathan B. Boreyko](#)
- 2010–2014 **BE in Mechanical Engineering**, *Department of Mechanical Engineering, Jadavpur University, Kolkata, India,* GPA - 7.76/10.

Journal Publications

1. **S.Nath**, S.F. Ahmadi and J. B. Boreyko. "A Review of Condensation Frosting." *Nanoscale and Microscale Thermophysical Engineering, Special Issue, 2016* DOI: [10.1080/15567265.2016.1256007](https://doi.org/10.1080/15567265.2016.1256007), (In print by December 2016)
2. **S. Nath** and J. B. Boreyko. "On Localized Vapor Pressure Gradients Governing Condensation and Frost Phenomena." *Langmuir*, (2016), DOI: [10.1021/acs.langmuir.6b01488](https://doi.org/10.1021/acs.langmuir.6b01488).
3. J. B. Boreyko, R. R. Hansen, K. R. Murphy, **S. Nath**, S. T. Retterer and C. P. Collier. "Controlling condensation and frost growth with chemical micropatterns." *Scientific Reports*(2016), 6, 19131, DOI:[10.1038/srep19131](https://doi.org/10.1038/srep19131).
 - Featured in *Science News for Students*: "Beetles offer people lessons in moisture control"
 - Featured in *Popular Science*: "Desert Beetle teaches scientists about how frost forms"
 - Featured in *The Christian Science Monitor*: "How the Namib Desert beetle could help stop frost on airplanes"
 - Featured in *USA Today*: "Could this desert beetle be the solution to preventing frost on airplane wings?"
 - Featured in *Discovery Channel Canada*: Daily Planet, Jan. 22.
4. **S. Nath**, A. Mukherjee and S. Chatterjee. "Can Oil Float Completely Submerged in Water?" *arXiv:1309.7727* (2013).

Patent

- **S.Nath**, S. T. Retterer, C. P. Collier, C. E. Bisbano, G. J. Iliff and J. B. Boreyko "Passive Anti-frosting Surfaces Comprised of Microscopic Wettability Patterns Containing Sacrificial Ice", U.S. Patent Application No: 62/403,924 (provisional patent filed).

Honors and Awards

- 2013 **TIFR Summer Research Fellowship**, TATA INSTITUTE OF FUNDAMENTAL RESEARCH–CENTRE FOR INTERDISCIPLINARY SCIENCES, INDIA.

- 2012 **Indian Academy of Sciences Fellowship**, INDIAN ACADEMY OF SCIENCES– INDIAN NATIONAL SCIENCE ACADEMY–NATIONAL ACADEMY OF SCIENCES, INDIA.
- 2011 **First Prize, Jagadis Bose National Scholar Project Presentation**, JAGADIS BOSE CENTRE FOR EXCELLENCE, INDIA.
Project: *Analysis of Water Droplet Flotation on Oil* – Saurabh Nath & Anish Mukherjee
- 2010 **Jagadis Bose National Scholar**, JAGADIS BOSE CENTER FOR EXCELLENCE, INDIA.

Research Experience

- 2015– present **Graduate Research Assistant**, NATURE-INSPIRED FLUIDS AND INTERFACES LAB, Department of Biomedical Engineering and Mechanics, Virginia Tech.
Advisor: Dr. Jonathan Boreyko.
- June 2015 **Clean Room Experience**, CENTER FOR NANOPHASE MATERIALS SCIENCES, OAK RIDGE NATIONAL LABORATORY, Oak Ridge, Tennessee.
Advisors: Dr. Jonathan Boreyko & Dr. Patrick Collier
- Summer & Winter 2013 **Undergraduate Research Assistant**, TATA INSTITUTE OF FUNDAMENTAL RESEARCH– CENTER FOR INTERDISCIPLINARY SCIENCES, Hyderabad, India.
Advisor: Prof. Rama Govindarajan
- Summer 2012 **Undergraduate Research Assistant**, ENGINEERING MECHANICS UNIT, JAWAHAR LAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH, Bangalore, India.
Advisor: Prof. K. R. Sreenivas
- Spring 2012– Spring 2014 **Undergraduate Research Assistant**, DEPARTMENT OF MECHANICAL ENGINEERING, JADAVPUR UNIVERSITY, Kolkata, India.
Advisors: Prof. Swarnendu Sen & Prof. Ranjan Ganguly

Conference Presentations (*denotes speaking author)

1. **S.Nath***, R. R. Hansen, K. R. Murphy and J. B. Boreyko. "Can Ice Prevent Frost Growth?" *68th APS DFD Meeting, Boston, MA (2015)*.
2. K. R. Murphy*, R. R. Hansen, **S.Nath**, S. T. Retterer, C. P. Collier and J. B. Boreyko. "Spatial Control of Condensation using Chemical Micropatterns" *68th APS DFD Meeting, Boston, MA (2015)*.
3. C. Bisbano*, **S.Nath** and J. B. Boreyko. "Dry Zones around Frozen Droplets" *68th APS DFD Meeting, Boston, MA (2015)*.
4. **S.Nath***, A. Mukherjee, S. Chatterjee, R. Ganguly, S. Sen, A. Mukhopadhyay, and J. B. Boreyko. "Inverse Flotation" *67th APS DFD Meeting, San Francisco, CA (2014)*.
5. **S.Nath***, A. Mukherjee and S. Chatterjee. "Flotation and Subsequent Spreading of a Submerged Buoyant Drop" *39th National Conference on Fluid Mechanics and Fluid Power, Surat, India (2012)*.

Conference Posters (*denotes speaking author)

1. **S.Nath***, G. J. Iliff, B. R. Srijanto, S. T. Retterer, C. P. Collier and J. B. Boreyko. "Ice as an Anti-Frosting Agent" *Macromolecules Innovation Institute Technical Conference and Review*, Blacksburg, VA (2016).
2. G. J. Iliff*, **S.Nath** and J. B. Boreyko. "Phase-Change Driven Pathogen Transport on Wheat Crops" *Macromolecules Innovation Institute Technical Conference and Review*, Blacksburg, VA (2016).
3. C. Bisbano*, **S.Nath** and J. B. Boreyko. "Dry Zones around Frozen Droplets" *Macromolecules Innovation Institute Technical Conference and Review*, Blacksburg, VA (2016).
4. **S.Nath***, B. R. Srijanto, S. T. Retterer, C. P. Collier and J. B. Boreyko. "Anti-Frosting Surfaces using Ice as Humidity Sinks" *Oak Ridge National Laboratory CNMS User Meeting*, Portland, OR (2016).
5. **S.Nath** and J. B. Boreyko*. "Passive Anti-Frosting Surfaces" *3M Company, Faculty Day*, St. Paul, MN (2016).
6. **S.Nath***, D. Deka, K. R. Sreenivas and D. K. Singh. "Model Near Surface Temperature Inversion in Boundary Layer and the Role of Suspended Particles" *Indian Aerosol and Technology Association Conference IASTA- 2012*, [IASTA-2012/Session-IV/P-125](#), BARC, Mumbai, India (2012).

Selected Graduate Courses

- | | |
|--|---|
| <input type="checkbox"/> Viscous Flow | <input type="checkbox"/> Chaos and Nonlinear Dynamics |
| <input type="checkbox"/> Intermediate Dynamics | <input type="checkbox"/> Continuum Mechanics |
| <input type="checkbox"/> Theory of Elasticity | <input type="checkbox"/> Introduction to Perturbation |

Teaching and Mentoring Experience

As a Research Mentor to Undergraduate Students

- ☐ C. E. Bisbano (Project: Dry Zone around Frozen Droplets)
- ☐ G. J. Iliff (Project: Phase-Change Driven Pathogen Transport on Wheat Leaves)

As a Teaching Assistant

o Statics

Professor: [Prof. Scott Hendricks](#), *Engineering Science and Mechanics Program Chair, Virginia Tech.*

Duration: *Spring 2015*

Responsibilities: *Holding problem sessions, providing solutions for problem sets.*

As a Lab Instructor

o Undergraduate Lab– Introduction to Fluid Mechanics

Professor: [Prof. Anne Staples](#), *Department of Biomedical Engineering and Mechanics, Virginia Tech.*

Duration: *Fall 2014*

Responsibilities: *Supervising as Lab Instructor, preparing lecture notes, grading students' assignments.*

Professional and Synergistic Activities

2016 **Co-creator and Supervisor.**

A 'Jumping Drops and Ice Bridges!' teaching module used for two summer camp programs: C-Tech2 and IMAGINATION. These programs are run through the Center for the Enhancement of Engineering Diversity (CEED); C-Tech2 targets rising high-school junior and senior women while IMAGINATION targets middle school students.

2015– present **Member**, *Macromolecules Innovation Institute, Virginia Tech.*

2014– present **Member**, *Bio-Inspired Science & Technology Center, Virginia Tech.*

Member, *American Physical Society (APS).*

Member, *Association for India's Development, Blacksburg.*

Member, *Bengali Students' Association, Virginia Tech.*

2012– present **Member**, *Indian Society for Refrigeration, Heating and Air-Condition Engineering.*

Software Knowledge

☐ Microsoft Word & Excel

☐ L^AT_EX

☐ ImageJ

☐ Wolfram Mathematica

☐ Layout Editor

☐ Matlab

Interests and Hobbies

Watching Movies, Writing, Acting and Directing Plays.

Performed six plays in Jadavpur University and one in Virginia Tech called 'How to Screw Your Grad Life' on October 4th, 2014 at the Commonwealth Ballroom, Virginia Tech.

References

Dr. Jonathan B. Boreyko

Assistant Professor

*Dept. of Biomedical Engineering and Mechanics
Virginia Tech.*

e-mail: boreyko@vt.edu

Dr. Pengtao Yue

Associate Professor

*Dept. of Mathematics
Virginia Tech.*

e-mail: ptyue@math.vt.edu

Dr. Sunny Jung

Associate Professor

*Dept. of Biomedical Engineering and Mechanics
Virginia Tech.*

e-mail: sunnyjsh@vt.edu

Dr. Mark R. Paul

Professor

*Dept. of Mechanical Engineering
Virginia Tech.*

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