



Sean Eric Anderson, PhD



39 Wilson Ave.
Lynbrook, NY 11563
☎ (516) 582-7042

✉ s.e.anderson12@gmail.com

🌐 <http://bau.seas.upenn.edu/people/sean-anderson>

🌐 <https://www.linkedin.com/in/seaneanderson/>

Education

PhD, MS	University of Pennsylvania Mechanical Engineering and Applied Mechanics CTL Teaching Certification	May 2015
BS	The College of New Jersey Mechanical Engineering <i>Summa Cum Laude</i>	May 2009

Career Interests

Mechanical Engineering, Chemical and Bioengineering, Research and Development, Nano/Biotechnology, Tissue Engineering, Biomedical Devices, Micro/Nanofluidics, Neuroscience, Lab-on-Chip, High-Throughput Screening, Diagnostics, MEMS, Aerospace

Research Experience

PhD Research

University of Pennsylvania	2009-2015
Philadelphia, PA	
Micro and Nanofluidics Lab, Advisor Prof. Haim H. Bau	
Thesis: “Carbon Nanopipettes for Advanced Cellular Probing and Microinjection”	

Supervisory Experience	2013-2015
Chengzhi Qi, UPenn MEAM Master’s Candidate	
Project: “Carbon Nanopipette-based Automated Cellular Microinjection System”	

Research Assistant

Commissariat à l’énergie atomique et aux énergies alternatives	2011
Grenoble, France	
NanoBio Center, Advisors Dr. François Vinet and Dr. Guillaume Nonglaton	
Project: “Development and Characterization of Silicon Surface Functionalizations for the Reversible Capture of Bacteria”	

NASA Langley Research Center	2008
Hampton, VA	
Systems Analysis and Concepts Directorate, Advisor Jay H. Robinson	
Project: “A Next-Generation Engine Concept for Improved Fuel Economy of Commercial Jet Aircraft”	

The College of New Jersey	2008
Ewing, NJ	
Department of Mechanical Engineering, Advisor Prof. Lisa Grega	
Project: “Aerodynamics of Saccate Pollen Grains”	

Publications

- [1] **Sean E. Anderson** and Haim H. Bau, “Carbon nanoelectrodes for single-cell probing”, *Nanotechnology* **2015**, 26, 185101
- [2] Hillary R. Rees, **Sean E. Anderson**, Eve Privman, Haim H. Bau, B. Jill Venton, “Carbon nanopipette electrodes for dopamine detection in *Drosophila*”, *Analytical Chemistry* **2015**, 87 (7), pp 3849–3855
- [3] **Sean E. Anderson** and Haim H. Bau, “Electrical detection of cellular penetration during microinjection with carbon nanopipettes”, *Nanotechnology* **2014**, 25, 245102
- [4] Lisa Grega, **Sean E. Anderson**, Matthew Cheetham, Matthew Clemente, Alex Colletti, Winston Moy, David Talarico, Scott L. Thatcher, and Jeffrey M. Osborn, “Aerodynamic Characteristics of Saccate Pollen Grains”, *International Journal of Plant Sciences* **2013**, 174 (3), Special Issue: Conceptual Advances in Fossil Plant Biology Edited by Gar Rothwell and Ruth Stockey, pp. 499-510

Conference:

- [5] **Sean E. Anderson**, Anna Kashina, Haim H. Bau, and Barry S. Cooperman, “Microinjection of fl-tRNA for the Study of tRNA Subcellular Dynamics”, *Biophysical Journal* **2015**, 108 (2), 571a

Press:

- [6] Mark S. Reisch, “Better Electrodes For Neurochemistry”, *Chemical and Engineering News* **2015**, 93 (13), pp. 33-38, ACS Publications, <<http://cen.acs.org/articles/93/i13/Instrument-Makers-Seek-Growth.html#2>>, March 30, **2015**
- [7] **Sean E. Anderson** and Haim H. Bau, “Carbon nanopipettes for automated injection”, Press Release, nanotechweb.org, IOP Publishing, <<http://nanotechweb.org/cws/article/lab/57226>>, May 16, **2014**

In Preparation:

- [8] **Sean E. Anderson**, Raphaël Puset, Audrey Berrier, Françoise Vinet, and Guillaume Nonglaton, “Adaptable functionalization processes for localized bacterial capture” *Under Revision*
- [9] **Sean E. Anderson**, Ian Farrell, Barry S. Cooperman, and Haim H. Bau, “Stressor-Induced tRNA Subcellular Kinetics”, *In Preparation*

Invited Presentations and Seminars

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| [1] | “Carbon Nanopipettes for Advanced Cellular Probing and Microinjection”
Louisiana Tech University
Department of Mechanical Engineering | Jan. 2015 |
| [2] | “Carbon Nanopipettes for Advanced Cellular Probing and Microinjection”
University of Pennsylvania
MEAM Departmental Seminar | Jul. 2014 |
| [3] | “Electrical Detection of Cellular Penetration with Carbon Nanopipettes”
ASME International Mechanical Engineering
Congress & Exposition, San Diego, CA | Nov. 2013 |
| [4] | “Biological Applications of Carbon Nanopipettes”
University of Pennsylvania
Nano/Bio Interface Center RT2 Meeting | Oct. 2013 |

- [5] “Carbon Nanopipettes”
The College of New Jersey
Mechanical Engineering Departmental Seminar Nov. 2011
- [6] “Bacterial Capture on Silicon Pillar Array Chips”,
MINATEC Summer Research Program
Best Presentation Award Jul. 2011
- [7] “TCNJ Solar Boat 2009”
ASME Greater Trenton Area Meeting Apr. 2009

Honors and Awards

- [1] NIH NIBIB R21 Grant (Coauthor, Funded)
“Carbon Nanopipette-Based Automated Cell Injection System” 2014-Present
- [2] Department of Education GAANN Fellow 2013-2015
- [3] University of Pennsylvania Ashton Fellow 2009-2011
- [4] Bau Laboratory Safety Officer 2012-2015
- [5] UPenn MEAM Departmental Fellow 2010-2015
- [6] MINATEC International Summer Research Program, Best Presentation 2011-2012
- [7] MEAM Departmental Teaching Award, Finalist 2011
- [8] Penn Prize for Excellence in Teaching by Graduate Students, Finalist 2010
- [9] IEEE/PELS Solar Splash
Outstanding Hull Design 2012
Outstanding Systems Design 2009
4th Place Overall 2009
2nd Place Slalom 2009
3rd Place Sprint 2009
2nd Place Visual Display 2009
- [10] ASME Student Chapter President 2008-2009
- [11] Fred O. Armstrong Scholars Award (3X Sole-recipient) 2007-2009
- [12] TCNJ Dean’s List 2006-2009
- [13] TCNJ OSRP Full Academic Scholarship 2005-2009

Estimated Total Funding (Scholarships, Fellowships, Grants): >**\$800,000**

Teaching Experience

- Teaching Certification - Center for Teaching and Learning** 2014
Completed UPenn CTL Certification Program
- US Department of Education GAANN Fellow** 2014
Completed Additional Teacher-Education Requirements

Guest Lecturer

MEAM 575 – Micro and Nanofluidics (2X)	2013
MEAM 302 – Fluid Mechanics (2X)	2011, 2010
MEAM 347 – Junior Design Laboratory (1X)	2011

Teaching Assistant

MEAM 302 - Fluid Mechanics (2X) 2X Teaching Award Finalist	2011, 2010
MEAM 347 - Junior Design Laboratory	2011

Leadership and Community Involvement

[1] Habitat for Humanity Philadelphia (9X, General Construction)	2011-2015
[2] UPenn Void Ultimate – Athlete, Coach	2009-2015
[3] UPenn GSEG - Ronal McDonald House Guest Chef Meal	2014
[4] NBIC NanoDay Volunteer (3X)	2012-2014
[5] AUDL – Philadelphia Phoenix (Professional Ultimate) – Athlete	2013
Solanco High School Community Outreach Event	2013
[6] TCNJ ASME Student Chapter President	2008-2009
[7] TCNJ Residence Hall Association	
Executive Board Member	2008-2009
Member	2005-2008
[8] Lynbrook Fire Department - Volunteer Firefighter	2008

Technical Skills

Cellular Microinjection	Cell Culture
Live-Cell Imaging	Fluorescence Microscopy
Confocal Microscopy	Patch Clamp Electrophysiology
Amperometry	Cyclic Voltammetry
Scanning Electrochemical Microscopy	Energy Dispersive X-Ray Spectroscopy
Scanning Electron Microscopy	Electrode Characterization
Micro/Nanofabrication	Chemical Vapor Deposition
Surface Characterization	Finite Element Methods
Electroporation	Welding (MIG/TIG/Stick)
Atomic Force Microscopy	Raman Spectroscopy
Machining	Woodworking

Computer Skills

Microsoft Office	COMSOL Multiphysics
Matlab	FIJI/ImageJ
Adobe Photoshop	Solidworks
Pro/Engineer Wildfire	Ansys
PATCHMASTER	Fluoview
MetaMorph	C++

Professional Licensure

New Jersey State Board of Professional Engineers and Land Surveyors
Engineer in Training

2009

Professional Affiliations

[1] American Society of Mechanical Engineers
Membership #100696138

[2] Biophysical Society
Membership #70295

References

Prof. Haim H. Bau
Towne Bldg. 229
220 S. 33rd St.
Philadelphia, PA 19104
(215) 898-8363
bau@seas.upenn.edu
Relationship: PhD Advisor

Prof. Barry Cooperman
Dept. of Chemistry
Room 358N
231 S. 34th St.
Philadelphia, PA 19104
(215) 898-6330
cooprman@pobox.upenn.edu
Relationship: Research Collaborator

Prof. Paulo Arratia
Towne Bldg. 229
220 S. 33rd St.
Philadelphia, PA 19104
(215) 746-2174
parratia@seas.upenn.edu
Relationship: Teaching Advisor

Dr. Guillaume Nonglaton
CEA MINATEC Campus
17 rue des Martyrs
38054 Grenoble Cedex 9
+33 (0)4 38 78 91 29
guillaume.nonglaton@cea.fr
Relationship: Research Advisor

Prof. B. Jill Venton
University of Virginia
Dept. of Chemistry
Rm. 108 PLSB
P.O. Box 400319
Charlottesville, VA 22904
(434) 243-2132
bjv2n@virginia.edu
Relationship: Research Collaborator