Sam A. Hill

DrSamAHill@gmail.com
www.sahill.us

2525 Manchester Boulevard
Ottawa Hills, Ohio 43606
(419) 418-1096

Academic Positions

2016–2023	**Adrian College**
	Assistant Professor of Physics
2012–2016	**University of Toledo**
	Part-Time Faculty
2015	Nominated for the Shining Star Award for teaching
2013–2015	**Owens College**
	Adjunct Instructor
2009–2012	**University of Toledo**
	Visiting Assistant Professor of Physics
2007–2009	**University of Dallas**
	Adjunct Assistant Professor of Physics
2006–2007	**Southern Methodist University**
	Adjunct Professor of Physics
2006–2007	**Eastfield College**
	Adjunct Professor of Physics
2005	**Massachusetts College of Pharmacy and Health Sciences**
	Adjunct Professor of Mathematics
2005	**Rhode Island College**
	Visiting Assistant Professor of Physics
2004	**Northeastern University**
	Instructor

Education and Postdoctoral Experience

2005	**New England Complex Systems Institute**
	Postdoctoral research associate with Dr. Yaneer Bar-Yam
2003–2005	**Northeastern University**
	Postdoctoral research associate with Dr. Jorge V. José
1997–2002	**The University of Chicago**
2002	**Ph.D.** in Physics
2001	**S.M.** in Physics
	Dissertation with Dr. Gene F. Mazenko:
	Clustering in Granular Materials: A Hydrodynamic Simulation
1997–1999	U.S. Department of Education GAANN Fellowship
1993–1997	**Williams College**
1997	**B.A.** ***magna cum laude*** with high honors in Physics and Mathematics
1997	Finalist, LeRoy Apker Award for Undergraduate Physics Achievement (APS)
1997	Sigma Xi
1997	Phi Beta Kappa

Courses Taught

Introductory Physics

- **Introductory Mechanics**
  Kinematics, forces, fluids, and thermodynamics
  - **Algebra-Based:** 9 times, most recently in 2022
  - **Calculus-Based**: 3 times, most recently in 2012
- **Introductory Electricity and Magnetism**
  Electric and magnetic fields, waves, and optics
  - **Algebra-Based:** 7 times, most recently in 2022
  - **Calculus-Based:** 18 times, most recently in 2015

Advanced Physics

- **Thermal and Statistical Physics**: 11 times, most recently in 2022
  Using Schroeder's An Introduction to Thermal Physics
- **Electronics**: 3 times, most recently in 2021
  A lab course about direct, alternating, and nonlinear circuits, and Arduino programming
- **Mathematical Physics:** 1 time in 2010
  from Boas's Mathematical Methods in the Physical Sciences
- **Electrodynamics:** 1 time in 2006
  from Griffiths' Introduction to Electrodynamics
- **Modern Physics:** 4 times, most recently in 2022
  Special relativity, introductory quantum mechanics, condensed-matter, nuclear, and particle physics
- **Advanced Quantum Mechanics:** three times, most recently in 2019
  from Griffiths' Introduction to Quantum Mechanics
  and McIntyre's Quantum Mechanics: A Paradigms Approach
- **Experimental Physics:** 1 time in 2021
  A capstone course where students engage in independent research on provided topics

Applied Computer Science

- **Applied Computing:** Spring 2021
  An introduction to progamming in Python and data science, in collaboration with Google
- **Foundations of Python Programming:** Fall 2018 and Spring 2019
  An introduction to progamming using Python, in collaboration with Google
- **How to Think Like a Data Scientist:** Spring 2019
  An introduction to data science using Python, in collaboration with Google

Other Courses

- **Physical Science:** 2013
  An introduction to physics and chemistry for non-scientists
- **Physics and Calculus:** 2009
  Bridge course for potential physics majors who have taken algebra-based introductory courses
- **Introductory Astronomy:** 2006–2007
  Two-semester introduction to astronomy for non-scientists
- **College Algebra:** 2005
  One-semester algebra course for entering freshmen

Publications

- *How Things Move, Why Things Move: A Book of Introductory Physics.*
  Sam A. Hill. howwhy.nfshost.com. (Online textbook, in development.)
- "A measure for characterizing heavy-tailed networks"
  Sam A. Hill. Physical Review Research 3: 023257 (2021).
- "Dynamic model of time-dependent complex networks"
  S.A. Hill and Dan Braha. Physical Review E 82: 046105 (2010)
- "Holding strategies in a bus-route model."
  S.A. Hill. arXiv:0709.0078 [physics.soc-ph] (2007).
- "Locomotive network modeling based on identified neurons in zebrafish."
  Daniel P. Knudsen, John T. Arsenault, S.A. Hill, Donald M. O'Malley, and Jorge V. José. Neurocomputing 69: 1169-1174 (2006).
- "Neurokinematic Modeling of Complex Swimming Patterns of the Larval Zebrafish."
  S.A. Hill, Melissa A. Borla, Jorge V. José, and Donald M. O'Malley. Neurocomputing 65-66: 61-68 (2005).
- "Numerical analysis of a time-headway bus route model."
  S.A. Hill. Physica A 328: 261 (2003).
- "Granular clustering in a hydrodynamic simulation."
  S.A. Hill and Gene F. Mazenko. Physical Review E 67: 061302 (2003).
- "Nonlinear hydrodynamical approach to granular materials."
  S.A. Hill and Gene F. Mazenko. Physical Review E 63: 031303 (2001).
- "Entanglement of a pair of quantum bits."
  S. A. Hill and William K. Wootters. Physical Review Letters 78: 5022 (1997).

Invited Talks

- September 2010: "Six Degrees: An Introduction to Small-World Networks"
  Physics Department, University of Toledo
- September 2008: "An introduction to small-world networks."
  Physics Department, Williams College
- May 2006: "Waiting for the Bus: Stability in a Simple Bus-Route Model."
  Transit Research Group, MIT
- March 2006: "Hold the Bus! Holding strategies in a bus-route model."
  Physics Department, Southern Methodist University
- May 2005: "Waiting for the bus."
  New England Complex Systems Institute
- October 2003: "Waiting for the Bus."
  Northeastern University, CIRCS seminar series
- April 2003: "Shearing and clustering instabilities in granular gases."
  University of Michigan, Condensed Matter seminar series

Selected Conference Talks

- July 2022: AAPT Summer Meeting
  "Replacing the LMS as an ADHD Professor and Web Developer".
- May 2019: NetSci 2019
  "Beyond-Scale Free: A measure for characterizing heavy-tailed networks."
- May 2008 : Understanding Complex Systems Symposium, UIUC
  "A model for dynamic centrality in complex networks."
- May 2007 : Understanding Complex Systems Symposium, UIUC
  "Holding strategies in a bus-route model."

Selected Posters

- July 2022: AAPT Summer Meeting
  "Replacing the LMS as an ADHD Professor and Web Developer". Sam A. Hill.
- July 2022: AAPT Summer Meeting
  "A Streamlined Approach to the Introductory Physics Textbook". Sam A. Hill.
- June 2017 : NetSci 2017
  "Dynamic Centrality in Random Subnetworks." S.A. Hill.
- October 2016 : 2016 Annual Fall Meeting of the APS Ohio-Region Section
  "Dynamic Centrality in Random Subnetworks." S.A. Hill.
- October 2016 : Fall 2016 Meeting o the APS Ohio-Region Section
  "Dynamic centrality in random subnetworks." S.A. Hill.
- April 2012 : Spring 2012 Meeting of the APS Ohio-Region Section
  "Epidemic spreading on scale-free networks with dynamic centrality." Douglas Hoblet & S.A. Hill.
- November 2003 : Neuroscience 2003, New Orleans
  "Modeling the Neural Control of Zebrafish Locomotive Behaviors." S.A. Hill, Xiao-Ping Liu, Melissa A. Borla, Jorge V. José, and Donald M. O'Malley.
- November 2003: Dynamical Neuroscience Satellite Symposium, New Orleans
  "Complex Outputs of a Simple Neural Network: Neuro-Kinematic Model of Zebrafish Spinal Cord." S.A. Hill, Xiao-Ping Liu, Melissa A. Borla, Donald M. O'Malley, and Jorge V. José.
- May 2001 : Center for Nonlinear Studies Annual Conference, Santa Fe, New Mexico. Poster:
  "A nonlinear hydrodynamical approach to granular materials." S.A. Hill and Gene F. Mazenko.

Professional Service

- Department Chair, Adrian College Department of Physics, 2018–2022
- Curriculum Committee, Adrian College, 2017–2023
  - Chair, 2019–2022
  - Secretary, 2018–2019, 2022–2023
- Faculty Hiring Committees, 2018, 2019 (chair), 2022
- Member, Committee on Committees, Adrian College, 2018–2019
- Participant, Google Applied Computing Pilot Program, 2017–2019
  - Training Coach for Google, 2019