

Scott Paulson, Ph.D.

Interdisciplinary Liberal Studies
James Madison University
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Education and Professional Training

2001-2004 Postdoctoral Researcher University of Pennsylvania, Philadelphia, PA
2000-2001 Postdoctoral Researcher Duke University, Durham, NC
2001 Ph.D. in Physics University of North Carolina, Chapel Hill, NC
1994 B.S. in Physics Saint Vincent College, Latrobe, PA

Academic Appointments

James Madison University (JMU)

2021-present Professor of Interdisciplinary Liberal Studies and Physics
2010-2020 Associate Professor of Interdisciplinary Liberal studies and Physics
2004-2010 Assistant Professor of Physics

University of Virginia

2012-2013 Visiting Associate Research Professor, Dept. of Molecular Physiology and Biophysics

Wake Forest University

1998-1999 Adjunct Instructor of Physics

Professional Experience

2021-Present Associate Dean of University Studies, *JMU*

- Responsible for operations of JMU/Study Group partnership, a collaboration that enrolls approximately 25 international students/year through direct admission and pathway programs.
- Oversee support for (exploratory) students without a declared major, including scholarships, advising and enrollment. Work with university advising, admissions, general education, and colleges within the university to provide equitable opportunities and outcomes for exploratory students.
- Oversight of curriculum and instruction for General Education, Honors, Interdisciplinary Liberal Studies and other programs that span multiple colleges. Evaluate transfer credits, shepherd new courses and programs through university and state processes.

2017- Present Department Head, Interdisciplinary Liberal Studies (IdLS), *JMU*

- Lead unit comprising one administrative staff and eight faculty with primary appointments in the unit, and an additional 20 faculty with joint appointments shared between IdLS and collaborating units. Responsibilities include annual evaluation, recommendations on tenure and promotion, providing professional development, course scheduling and assignment of teaching and service loads.
- Oversee the three academic programs, offered by the unit; the Interdisciplinary Liberal Studies major, the individually-designed Independent Scholars major, and the Middle

Grades Science Minor for prospective teachers. Duties include coordinating course offerings to serve as 900+ students, responsibility for program curricula, assessment, and advising.

- Lead faculty through a reimagining of mission and curriculum in response to statewide legislative changes which moved the responsibility for K-8 teacher preparation from the IdLS major to majors within the College of Education.
- Oversight of a budget of \$1.2M including \$75K of non-personnel.

2016- 2018 Faculty Associate for Teaching, Center for Faculty Innovation, *JMU*

- Facilitated for the annual signature event jmUDESIGN, a week-long course design institute based on backwards design principles. In this role I led multiple sessions, organized presenters, revised curriculum, and provided feedback to approximately 40 participants per year.
- Consulted with faculty upon their request for mid-semester feedback through the "Teaching Analysis Poll" program. <https://www.jmu.edu/cfi/teaching/teaching-consultations/taps.shtml>
- Contributed Teaching Toolboxes, a semi-weekly email to provide resources and practices relating to teaching and learning. Topics were effective use of PowerPoint and encouraging participation in large classes.
- Organize workshops and panels, particularly for topics of interest to general education instructors.

2011- 2018 Coordinator, Math and Science Area of General Education, *JMU*

- Oversight for delivering 10-credit curriculum to annual cohort of approximately 5,000 students. Coordinated the efforts of eight departments in three colleges offering approximately 40 courses to ensure students had adequate options to meet their university requirements. Worked closely with department heads and deans. Made recommendations for resource allocation.
- Responsible for area assessment and demonstration of student learning.
- Developed messaging and made regular presentations to audiences of prospective students and new students on the value of the liberal arts and a broad education to complement their major.
- Part of leadership team with oversight of all aspects of program including curriculum, program review and modification, student events and faculty engagement

Scholarly Interests

Physics education research
Effective practices in science teacher preparation
Novel microfabrication techniques
Electrical and mechanical interactions at nanoscale interfaces
Scanned-probe Microscopy

Awards and Professional Memberships

2016 Distinguished Teacher, College of Science and Mathematics, *JMU*
Member, American Associate of Physics Teachers (AAPT)
Member, American Physical Society (APS)
Associate Member, AAC&U

Selected Service to Professional Communities

2020-2023	Teacher Preparation Committee, AAPT Chair (2022-2023) Vice Chair (2021-2022) Member (2018-present)
2019-2022	Senior Physics Teacher Education Coalition (PhysTEC) Associate, APS
2011-2020	External Examiner, Physics Programs. Tunku Abdul Rahman University College, Malaysia
2011-2012	Virginia Department of Education, Science Textbook Approval Committee
Ongoing	Proposal Review National Science Foundation Research Corporation for Scientific Advancement Jeffress Memorial Trust
	Journal Referee Langmuir Journal of the American Chemical Society AIP Advances Royal Society of Chemistry Advances

Selected Service to University Community (JMU)

Search Committee Member, Dean of College of Education
 Search Committee Member, Dean of College of Science and Mathematics
 Search Committee Chair, General Education Math and Science Coordinator
 Search Committee Chair, General Education Arts and Humanities Coordinator
 Office of International Programs Advisory Board
 Provost's Task Force for Teacher Education
 Academic Affairs Commencement Committee
 Academic Affairs Strategic Plan Committee
 Curriculum and Instruction Committee
 Presenter at admitted student events on general and liberal education

Courses Taught

University Physics I
 University Physics I Lab
 University Physics II
 University Physics II Lab
 University Physics III
 Advanced Laboratory
 Introductory Materials Science
 Materials Characterization Laboratory
 Honors Seminar: *Science and Pseudoscience*
 Biophysics
 The Physical Nature of Light and Sound
 Physics, Chemistry and the Human Experience
 Science of the Small
 Special Topics in Physics: Physics Pedagogy
 Physical Science: Learning through teaching

Electricity and Magnetism

Undergraduate Research Students Mentored (24 total)

JMU: Michael Motal, Michael Clemens, Scott Fix, Alex Cimino-Hurt, Chelsea Lincoln, Casey Boutwell, Lok-Kun Tsui, Joseph Hardcastle, Chris Durcan, John Bridstrup, Jake Carey, Sami Fullerton, Ethan Rosenthal, Anthony Speziale, Tim Pote, Ricky Caperton, Jack Larsen, Chris Flint, Daniel Rubino, Philip Meyerhofer, Andrew Massonneau, Suzy Lynch, Trevor Luks
University of Pennsylvania: Kiran Thidani, Enrique Rojas, Jawaad Mahmood

Graduate Students Mentored

Letian Lin (UNC-CH) (Ph.D. Committee member)

External Funding Over \$2.4M Total

2018-2023 James Madison University Noyce Scholars Program
\$1,199,948 National Science Foundation (Senior Personnel)

2018-2019 Chesapeake Bay Project
\$1200 Chesapeake Bay Restoration Fund (PI)

2017-2018 Extending a Fabrication Network to Other Virginia Universities
\$5000, 4-VA (Co-PI)

2014-2018 James Madison University EPIC (Expanding Pathways, Identity and Capacity)
Science Education (Co-PI)
\$299,744, National Science Foundation

2012-2016 *A Comprehensive PhysTEC site at James Madison University*
\$300,000, Physics Teachers Education Coalition (PI)

2009-2012 *A Materials Science REU Program at James Madison University Including International Students* \$267,631, National Science Foundation (Senior Personnel)

2008-2011 *Intershell Interactions in Double-Walled Carbon Nanotubes*
\$40,000 Thomas and Kate Jeffress Memorial Trust (PI)

2007-2011 *Atomic-Scale Study of Friction for Nano-Electromechanical Structures*
\$60,000 National Science Foundation (PI)

2006-2008 *Electrical Properties of CVD grown Double-Walled Carbon Nanotubes*
\$41,651 Research Corporation (PI)

2005-2008 *An Evolutionary Approach to Nanoscience Education Across Undergraduate Chemistry Curriculum* \$190,000 National Science Foundation (Senior Personnel)

Publications

1. Utter, Brian C, Scott A Paulson, John T Almarode, and David B Daniel. "My Science Is Better than Your Science: Conceptual Change as a Goal in Teaching Science Majors Interested in Teaching Careers about Education." *Teacher Educators' Journal* 11 (2018) 12–21.
2. Constantin, C., C.Wm. Hughes, B.H. Augustine, and S. Paulson. "Shenandoah Valley Nanoscience Outreach Collaboration." In *Materials Research Society Symposium Proceedings*. Vol. 1583 (2013).
3. AR Hall, SA Paulson, T Cui, JP Lu, L-C Qin, and S Washburn, "Torsional electromechanical systems based on carbon nanotubes" *Rept Prog Phys* **75** (2012) 116501.
4. L Lin, S Washburn, LC Qin, S Paulson, "Electrical Resistance of Single-Wall Carbon

- Nanotubes with Determined Chiral Indices," Proc MRS (2010).
5. S. B. Chikkannanavar, Scott Paulson, A.T. Johnson and David E. Luzzi, "Electron Beam Induced Structural Transformations of SWNTs and DWNTs Grown on Si₃N₄/Si Substrates," J. Nanosci Nanotech. 5 1350-6 (2006)
 6. S.B. Chikkannanavar, D. E. Luzzi, S. Paulson, A.T. Johnson, "Synthesis of peapods using substrate grown single-wall carbon nanotubes: An enabling step towards peapod devices" Nano Letters 5, 151 – 155 (2005)
 7. D. E. Milkie, C. Staii, S. Paulson, E. Hindman, A.T. Johnson, and J. M. Kikkawa, "Controlled room-temperature switching of optical emission energies in semiconducting single-walled carbon nanotubes" Nano Letters 5, 1135 – 1138 (2005)
 8. Seeger, A., S. Paulson, M. Falvo, A. Helser, R.M. Taylor II, R. Superfine, and S. Washburn. 2001. "Hands-on Tools for Nanotechnology." Journal of Vacuum Science and Technology B: Microelectronics and Nanometer Structures 19 (6).
 9. Guthold, Martin, Michael R Falvo, W Garrett Matthews, Scott Paulson, Sean Washburn, Dorothy A Erie, Richard Superfine, F P Brooks, and Russell M Taylor. 2000. "Controlled Manipulation of Molecular Samples with the Nanomanipulator." IEEE/ASME Transactions on Mechatronics 5 (2): 189–98.
 10. S Paulson, A Helser, M Buongiorno Nardelli, RM Taylor II, M Falvo, R Superfine, S Washburn. "Tunable resistance of a carbon nanotube-graphite interface," Science, 290 (2000) 1742-4.
 11. Guthold, M., M. Falvo, W.G. Matthews, S. Paulson, et al. 1999. "Investigation and Modification of Molecular Structures with the NanoManipulator." Journal of Molecular Graphics and Modelling 17 (3–4).
 12. S Paulson, M Falvo, N. Snider, A Helser, T Hudson, A Seeger, RM Taylor II, R Superfine, S Washburn. "In situ resistance measurements of strained carbon nanotubes," Appl. Phys. Lett. 75, 2936-8 (1999).
 13. Falvo, M.R., G. Clary, A. Helser, S. Paulson, R.M. Taylor II, V. Chi, F.P. Brooks Jr., S. Washburn, and R. Superfine. "Nanomanipulation Experiments Exploring Frictional and Mechanical Properties of Carbon Nanotubes." Microscopy and Microanalysis 4 (1998).
 14. Superfine, R, M R Falvo, G J Clary, S Paulson, R M Taylor, V Chi, F P Brooks, and S Washburn. "Nanomanipulation for Material Properties, Substrate Interactions and Devices." Microscopy and Microanalysis 4 (1998) 336–37.
 15. Taylor, Russell M, Jun hen, Shoji Okimoto, Noel Llopis-Artime, Vernon L Chi, F P Brooks, Mike Falvo, Scott Paulson, Pichet Thiansathaporn, and David Glick. "Pearls Found on the Way to the Ideal Interface for Scanned Probe Microscopes." In Proceedings. Visualization'97 (1997), 467–70. IEEE.
 16. Superfine, Richard, Michael R Falvo, Scott Paulson, Sean Washburn, Russell M Taylor II, G J Clary, Vernon Chi, and Frederick P Brooks Jr. "Manipulation of Nanometer Objects: Friction, Mechanical Properties and Devices." In Proceedings of the International Conference on Novel Materials, (1997) 3–7

Invited Presentations, Seminars and Panels

1. "Building Institutional Commitment for Teacher Education" Stamatis Vokos, Scott Paulson, John Simonetti. Physics Teacher Education Coalition Conference, 2020 (panelist)
2. "Small is Different" Tunku Abdul Rahman University College, Physics Department Seminar, 2019
3. "Diversity Makes us Better" Commencement Address for the College of Science and Mathematics, James Madison University, 2016

4. "Partnering Effectively with Schools of Education" Valerie Otero, Stamatis Vokos, Scott Paulson, Brian Thoms. Physics Teacher Education Coalition Conference, 2016 (panelist)
5. "Lessons Learned From Flipping Physics". High Point University, Chemistry and Physics departments joint seminar, 2014
6. "Flipped Instruction in Introductory Science Courses" "American Association of State Colleges and University, Provost's meeting, 2014
7. "Carbon Nanotubes and Materials Science at the Nanoscale" Tunku Abdul Rahman College (Kuala Lumpur, Malaysia), 2011
8. "Graphene: The 2010 Nobel Prize in Physics" Saint Vincent College Physics Seminar, 2011
9. "Graphene: The 2010 Nobel Prize in Physics" James Madison University Physics Seminar, 2010
10. Scanned Probe Microscopy as an Educational Tool Virginia Commonwealth Univ. Physics Department Colloquium, 2009

National and International Conference Presentations

1. Pyle, Eric J, Barbara Reisner, Robbie Higdon, Scott Paulson, and Kerry Cresawn. 2017. "Preservice Teachers' Dual Identities: Earth Scientist and Earth Science Teacher" GSA Annual Meeting 2017.
2. Reisner, Barbara, Kerry Cresawn, Eric Pyle, Scott Paulson, and Robbie Higdon. 2017. "EPIC Science Education at James Madison University: Expanding Pathways, Identity and Capacity (EPIC) in Secondary Education." Meeting of the American Chemical Society, 2017.
3. Paulson, Scott. "Introductory Sequence Reform at James Madison University." March Meeting of the American Physical Society, 2016.
4. "Flipped Instruction in Introductory Science Courses" American Association of Colleges and Universities, 2016.
5. Paulson, SA "A kaleidoscope of STEM teaching innovations: reforms inspired by the summer leadership institute" PKAL Transforming Undergraduate STEM Education: Implications for 21st Century Society, 2016.
6. Hughes, Chris, and Scott Paulson. "Assessing the Impacts of a Hybrid 'Flipped' Approach to University Physics." March Meeting of the American Physical Society, 2015.
7. Bridstrup, John, Anthony Speziale, and Scott Paulson. 2012. "Fabrication of Micro-Electromagnetic Devices for the Manipulation of Carbon Nanotubes." March Meeting of the American Physical Society, 2012.
8. Taylor II, R M, W Robinett, V L Chi, F P Brooks Jr, W V Wright, R S Williams, E J Snyder, J Chen, S Okimoto, and N Llopis-Artime. n.d. 2009 "Computer-Integrated Systems for Microscopy and Manipulation." IEEE VisWeek
9. Paulson, Scott, Lok-kin Tsuii, and Joseph Hardcastle. 2009. "Fabricating Substrates to Combine Electron Microscopy and Diffraction with Electrical Characterization of Single and Double-Walled Carbon Nanotubes." March Meeting of the American Physical Society, 2009.
10. S. Paulson. "Electronics at Atomically Smooth Interfaces" US-India Nanoscience and Engineering Institute" Chennai, India, 2008.
11. Reisner, Barbara A, Brian H Augustine, Kevin L Caran, and Scott A Paulson. 2008. "CHED 87-Using Nanoscience as a Focus for Science Outreach Activities." Meeting of the American Chemical Society, 2008.
12. Fix, Scott, Chelsea Lincoln, and Scott Paulson. "Electrical Measurements of CVD Grown Double-Walled Nanotubes." March Meeting of the American Physical Society, 2007.
13. S Paulson, B.H. Augustine, W.C. Hughes, J. Wyrick*, "Instructional project for introductory course in materials science at James Madison University", Materials Research Society Fall 2007.

14. Paulson, Scott, Satishkumar Chikkannanavar, and David Luzzi. 2004. "Combining TEM and Transport in Carbon Nanotube Devices." March Meeting of the American Physical Society, 2004.
15. Rojas, Enrique, Scott Paulson, Mike Stern, Cristian Staii, Mary Dratman, and Alan Johnson. 2004. "Biomolecular Doping of Single-Walled Carbon Nanotubes by Thyroid Hormone." March Meeting of the American Physical Society, 2004.
16. Paulson, Scott, Jawaad Mahmood, Chi Heon Lee, Jack Fischer, David Luzzi, and A T Johnson. "Electronic Transport in Nanotube Peapods." March Meeting of the American Physical Society, 2002.
17. Paulson, Scott, Michael Falvo, Richard Superfine, Sean Washburn, and Marco Buongiorno Nardelli. "Resistance of a Nanotube-Graphite Interface." March Meeting of the American Physical Society, 2001.
18. Falvo, Michael, Scott Paulson, Phillip A Williams, Neal E Snider, Sean Washburn, and Richard Superfine. "Progress on CNT Nanoelectromechanical Devices." March Meeting of the American Physical Society, 2000.
19. Falvo, M R, J Steele, S Paulson, R M Taylor, S Washburn, and R Superfine. "Rolling Nanotubes: Atomic Lattices as Gears and Contacts." In AIP Conference Proceedings, 544:294–98. American Institute of Physics. 2000.
20. Snider, Neal, Scott Paulson, Aron Helser, Adam Seeger, Russell Taylor, Richard Superfine, and Sean Washburn. 2000. "Inter-Bundle Electronic Transport in Single Walled Carbon Nanotubes." March Meeting of the American Physical Society, 2000.
21. Paulson, Scott, Neal Snider, Aron Helser, Russel Taylor, Richard Superfine, and Sean Washburn. "Electronics of Strained Nanotubes and Multiple Nanotube Junctions." March Meeting of the American Physical Society, 2000.
22. Williams, Phillip A, Michael R Falvo, Neal Snider, Scott Paulson, Richard Superfine, Sean Washburn, Chris Dwyer, and Russell M Taylor. "Construction of a Carbon Nanotube Electromechanical Actuator." March Meeting of the American Physical Society, 2000.
23. Scott Paulson, Michael R. Falvo, Adam Seeger, Russell M. Taylor II, Richard Superfine, Sean Washburn. "Effect of Commensurate Contact on Electronic Transport Across the CNT/HOPG Interface." Fall Meeting of the Materials Research Society, 2000.
24. Phillip Williams, Neal Snider, Scott Paulson, Michael R. Falvo, Sean Washburn and Richard Superfine. "Progress on CNT Nanoelectromechanical Devices." Fall Meeting of the Materials Research Society, 2000.
25. S. Paulson, N. Snider, M.R. Falvo, A. Seeger, A. Helser, R.M. Taylor III, R. Superfine, S. Washburn. "Effect of Strain on Electrical Properties of Carbon Nanotubes" Meeting of the American Vacuum Society, 1999.
26. Snider, Neal, Scott Paulson, Adam Seeger, Aron Helser, Russell Taylor, Richard Superfine, and Sean Washburn. "Electronic Interaction Between Single-Wall Carbon Nanotube Bundles." March Meeting of the American Physical Society, 1999.
27. Williams, Phillip A, Michael R Falvo, Chris Dwyer, Scott Paulson, Richard Superfine, Russell M Taylor, and Sean Washburn. "Carbon Nanotube as an Electromechanical Switch." March Meeting of the American Physical Society, 1999.
28. S Paulson, M.R. Falvo, N. Snider, R. Superfine, Sean Washburn. "Effect of Strain on the Resistance of Carbon Nanotubes." Fall Meeting of the Materials Research Society, 1999.
29. N. Snider, S Paulson, M.R. Falvo, A. Seeger, A. Helser, S. Razaque, R.M. Taylor, R. Superfine, S Washburn. "Electronic Interactions Between Single-Wall Carbon Nanotube Bundles." Fall Meeting of the Materials Research Society, 1999.
30. Superfine, R, M R Falvo, G J Clary, S Paulson, R M Taylor, V Chi, F P Brooks, and S Washburn. 1998. "Nanomanipulation for Material Properties, Substrate Interactions and Devices." *Microscopy and Microanalysis* 4 (S2): 336–37.

31. Bower, C, O Zhou, L Jin, S Paulson, R Superfine, L McNeil, S Suzuki, and K Tanigaki.
"Synthesis and Characterization of Single-Walled Carbon Nanotubes." March Meeting of the American Physical Society, 1998.
32. Falvo, M R, S Paulson, O Zhou, S Washburn, R Superfine, R M Chi, and V Brooks Jr.
"Manipulation of Carbon Nanotubes with AFM." March Meeting of the American Physical Society, 1997.

References

Available upon request