

Danvers E. Johnston, Ph.D.

Assistant Professor and Graduate Program Director, Department of Environmental and Civil Engineering, U. A. Whitaker College of Engineering, Florida Gulf Coast University, Fort Myers, Florida | djohnston@fgcu.edu | 239-745-4311

EDUCATION

University of Pennsylvania

Ph.D., Physics (Condensed Matter), 2008

Thesis: "Electrical Contacts to Individual Nanostructures and Fabrication of Nanoscale Gaps by Feedback-Controlled Electromigration"

Advisor: A.T. Charlie Johnson (Physics and Astronomy; Materials Science and Engineering; Electrical and Systems Engineering)

M.Sc., Physics, 2004

Tel Aviv University

B.Sc., Physics, 2002

ACADEMIC AFFILIATIONS

Florida Gulf Coast University

Graduate Program Director, U. A. Whitaker College of Engineering, 2019–present

Assistant Professor, Department of Environmental & Civil Engineering, 2014–present

University of Pennsylvania

Graduate Teaching Assistant, Department of Physics and Astronomy, 2002 and 2006

COURSES TAUGHT

Florida Gulf Coast University, 2014 – present

- Advanced Engineering Analysis (1 semester)
- Environmental Thermodynamics (4 semesters)
- Sustainable Energy Sources (2 semesters)
- Engineering Fluid Mechanics (6 semesters)
- Thermodynamics (5 semesters)
- Computational Tools for Engineers (4 semesters)
- Science and Technology of Solar Energy (6 semesters)
- Special Topics: Introduction to Renewable Energy Engineering (1 semester)

University of Central Florida, 2013

- Direct Energy Conversion (1 semester)

University of Pennsylvania (while pursuing graduate degrees)

- Physics Laboratory (4 semesters)
- Carbon Nanotube Electronics (lecture for Engineering Entrepreneurship)
- Carbon Nanotube Electronics (video lecture for Universidad de Puerto Rico en Humacao)

RESEARCH AFFILIATIONS

University of Central Florida

Research Scientist, Department of Mechanical & Aerospace Engineering, 2012–2014

Brookhaven National Laboratory

Postdoctoral Research Associate, Center for Functional Nanomaterials, 2009–2012

RESEARCH ACTIVITIES

Florida Gulf Coast University (Assistant Professor)

- Mentor for Blaire Foundation Scholarship recipient in Environmental Engineering
- Mentor for environmental engineering, bioengineering and software engineering students in the following projects:
 - Nanocomposite films by electrospray for advanced water filtration and solar cells
 - Data analysis of FGCU Solar Field performance
 - Virtual Reality-based teaching modules for Solar Energy education

University of Central Florida (Research Scientist)

- Developed high-throughput electrospray deposition methods of semiconducting polymer films for roll-to-roll manufacturing of nanostructured film morphologies.
- Conducted characterization by X-ray diffraction, Scanning Electron Microscopy, Atomic Force Microscopy and electrical transport measurement.

Brookhaven National Laboratory (Postdoctoral Research Associate)

- Investigated nanopatterning substrates for low-cost solar cells.
- Developed, fabricated and characterized nano-structured organic transistors.

University of Pennsylvania (Graduate Research Assistant)

- Investigated and developed nanogaps for single-molecule transistors.
- Characterized solution-processed industrial-grade carbon nanotubes for electronic applications.

INDUSTRY AFFILIATIONS

MilSys Technologies LLC, Bridgeport, Pennsylvania

Software Consultant, 2006–2007

- Developed NI LabVIEW-based tools for laboratory instrumentation control and data acquisition.

AWARDS

- ASCE ExCEED Fellow, ASCE ExCEED Teaching Workshop, United States Military Academy (West Point), 2017.
- Summer stipend award, STEM Professional Academy for Reinvigorating the Culture of Teaching (SPARCT), Florida Gulf Coast University 2015–2016.
- Merit-based fellowship, National Science Foundation Integrative Graduate Education and Research Traineeship in Nanoscale Science and Engineering, NSF Grant No. DGE-0221664, 2003–2006.

PATENTS

- United States Patent 8,918,152: "Parallel fabrication of nanogaps and devices thereof," D. R. Strachan, D. E. Johnston, B. S. Guiton, P. K. Davies, D. A. Bonnell, A. T. Johnson, Jr., December 23, 2014

PUBLICATIONS*Published in Refereed Journals*

1. P. R. Michael, D. E. Johnston and W. Moreno, "A Conversion Guide: Solar Irradiance and Lux Illuminance," *Journal of Measurements in Engineering*, 8, 153-166 (2020).
2. N. J. Harvey, D. E. Johnston and T. M. Missimer, "Long-term pumping-induced groundwater quality changes at a brackish-water desalination facility, Sanibel Island, Florida," *Desalination and Water Treatment*, 202, 1–13 (2020).
3. X.-Y. Zhao, D. E. Johnston, J. C. Rodriguez, Z. Tao, B.-X. Mi and W. Deng, "Nanostructured Semiconducting Polymer Films with Enhanced Crystallinity and Reorientation of Crystalline Domains by Electrospray Deposition," *Macromolecular Materials and Engineering*, 302, 1700090 (2017).
4. S. Novak, D. E. Johnston, C. Li, W. Deng and K. A. Richardson, "Deposition of Ge₂₃Sb₇S₇₀ Chalcogenide Glass Films by Electrospray," *Thin Solid Films* 588, 56–60 (2015).
5. D. E. Johnston, K. G. Yager, H. Hlaing, X. Lu, B. M. Ocko and C. T. Black, "Nanostructured Surfaces Frustrate Polymer Semiconductor Molecular Orientational Order," *ACS Nano* 8, 243–249 (2014).
6. X. Lu, K. G. Yager, D. E. Johnston, C. T. Black and B. M. Ocko, "Grazing-incidence transmission X-ray scattering: surface scattering in the Born approximation," *Journal of Applied Crystallography* 46, 165–172 (2013).
7. R. Ruiz, L. Wan, J. Lille, K. C. Patel, E. Dobisz, D. E. Johnston, K. Kisslinger, and C. T. Black, "Image quality and pattern transfer in directed self-assembly with block-selective atomic layer deposition," *Journal of Vacuum Science & Technology B: Microelectronics and Nanometer Structures* 30, 06F202 (2012).
8. D. E. Johnston, K. G. Yager, C. -Y. Nam, B. M. Ocko and C. T. Black, "One-Volt Operation of High-Current Vertical Channel Polymer Semiconductor Field-Effect Transistors," *Nano Letters* 12, 4181–4186 (2012).
9. C. K. Riley, E. A. Muller, B. E. Feldman, C. M. Cross, K. L. van Aken, D. E. Johnston, Y. Lu, A. T. Johnson, J. C. de Paula and W. F. Smith, "Effects of O₂, Xe, and Gating on the Photoconductivity and Persistent Photoconductivity of Porphyrin Nanorods," *Journal of Physical Chemistry C* 114, 19227–19233 (2010).
10. D. R. Strachan, D. E. Johnston, B. S. Guiton, S. S. Datta, P. K. Davies, D. A. Bonnell and A. T. Charlie Johnson, "Real-Time TEM Imaging of the Formation of Crystalline Nanoscale Gaps." *Physical Review Letters* 100, 056805 (2008).
11. A. L. Yeats, A. D. Schwab, B. Massare, D. E. Johnston, A. T. Johnson, J. C. de Paula and W. F. Smith, "Photoconductivity of Self-Assembled Nanotapes Made from meso-Tri(4-sulfonatophenyl) monophenylporphine," *Journal of Physical Chemistry C* 112, 2170–2176 (2008).

12. D. E. Johnston, D. R. Strachan and A. T. Charlie Johnson, "Parallel Fabrication of Nanogap Electrodes," *Nano Letters* 7, 2774–2777 (2007).
13. D. R. Strachan, D. E. Smith, M. D. Fischbein, D. E. Johnston, B. S. Guiton, M. Drndic, D. A. Bonnell and A. T. Charlie Johnson, "Clean Electromigrated Nanogaps Imaged by Transmission Electron Microscopy," *Nano Letters* 6, 441–444 (2006).
14. D. R. Strachan, D. E. Smith, D. E. Johnston, T.-H. Park, M. J. Therien, D. A. Bonnell and A. T. Johnson, "Controlled Fabrication of Nanogaps in Ambient Environment for Molecular Electronics," *Applied Physics Letters* 86, 043109 (2005).
15. D. E. Johnston, M. F. Islam, A. G. Yodh and A. T. Charlie Johnson, "Electronic Devices Based on Purified Carbon Nanotubes Grown by High Pressure Decomposition of Carbon Monoxide," *Nature Materials* 4, 589–592 (2005).
16. A. D. Schwab, D. E. Smith, B. Bond-Watts, D. E. Johnston, J. Hone, A. T. Johnson, J. C. de Paula and W. F. Smith, "Photoconductivity of Self-assembled Porphyrin Nanorods," *Nano Letters* 4, 1261–1265 (2004).

Published in Refereed Conference Proceedings

17. D. E. Johnston, M. Lu and C. T. Black, "Plasma Etch Transfer of Self-Assembled Polymer Patterns," *Proceedings of the SPIE*, 8328, 82380A (2012).
18. D. E. Johnston, D. R. Strachan, B. S. Guiton, P. K. Davies, D. A. Bonnell and A. T. Charlie Johnson, "High Quality Nanogap Electrodes for Electronic Transport Measurements of Single Molecules," *NSTI Nanotech 2007* 1, 562–565 (2007).

PRESENTATIONS

Oral Presentations

1. J. A. Eisenoff, W. H. Mejia and D. E. Johnston, "Development of Virtual Reality-Based Lesson Modules for Solar Energy Education," *FGCU Research Day*, April, 2020.
2. D. E. Johnston, K. G. Yager, C. -Y. Nam, H. Hlaing, X. Lu, B. M. Ocko and C. T. Black, "Control of Semiconducting Polymer Chain Orientation in Nanostructured Devices," *NANOSMAT USA*, Tampa, Florida, March, 2012.
3. D. E. Johnston, K. G. Yager, H. Hlaing, X. Lu, B. M. Ocko and C. T. Black, "Control of Semiconducting Polymer Chain Orientation Through Nanostructured Device Architectures," *MRS Spring Meeting*, San Francisco, California, April, 2011.
4. D. E. Johnston, D. R. Strachan, B. S. Guiton, P. K. Davies, D. A. Bonnell and A. T. Johnson, "High Quality Nanogap Electrodes by Controlled Electromigration," *NSTI Nanotech*, Santa Clara, California, May, 2007.
5. D. E. Johnston, D. R. Strachan, B. S. Guiton, P. K. Davies and A. T. Johnson, "Parallel Fabrication of Nanogaps by Controlled Electromigration," *March Meeting of the American Physical Society*, Denver, Colorado, March, 2007.
6. D. E. Johnston, M. F. Islam, A. G. Yodh and A. T. Johnson, "Single-nanotube Devices from Purified HiPCO Material," *March Meeting of the American Physical Society*, Los Angeles, California, March, 2005.

Poster Presentations

7. D. E. Johnston, J. C. Rodriguez, W. Deng, "Control of Semiconducting Polymer Chain Orientation Through Electrospray Deposition," *MRS Spring Meeting*, San Francisco, California, April, 2014.
8. D. E. Johnston, K. G. Yager, H. Hlaing, X. Lu, B. M. Ocko and C. T. Black, "Control of Semiconducting Polymer Chain Orientation Through Nanostructured Device Architectures," *Energy Frontier Research Center at Columbia University Annual Retreat*, Palisades, New York, May, 2011.
9. D. E. Johnston, K. G. Yager, H. Hlaing, X. Lu, B. M. Ocko and C. T. Black, "Control of Semiconducting Polymer Chain Orientation Through Nanostructured Device Architectures," *NSLS/CFN Joint User's Meeting, Brookhaven National Laboratory*, Upton, New York, May, 2011.
10. D. E. Johnston, M. F. Islam, A. G. Yodh and A. T. Johnson, "Electronic Devices Based on Purified HiPCO Carbon Nanotubes," *New Jersey Technology Council: Commercializing Nanotechnology in Energy Conversion and Storage*, Piscataway, New Jersey, November, 2005.
11. D. E. Johnston, M. F. Islam, A. G. Yodh and A. T. Johnson, "Electronic Devices Based on Purified HiPCO Carbon Nanotubes," *Gordon Research Conference: Condensed Matter Physics*, New London, Connecticut, June, 2005.

PROFESSIONAL SERVICE

Journal Reviews

- Reviewer for *Nature–Scientific Reports*: 1 review
- Reviewer for *Elsevier–Thin Solid Films*: 3 reviews
- Reviewer for *ACS–Nano Letters*: 1 review
- Reviewer for *Wiley–Small*: 1 review
- Reviewer for *Journal of Visual Experiments (JoVE)*: 1 review

PROFESSIONAL AFFILIATIONS

- Materials Research Society, 2009–present
- American Physical Society, 2001–2008
- American Society of Civil Engineers, 2017

PROFESSIONAL DEVELOPMENT ACTIVITIES

- Drop-in Conversation on "Quick Tips for Remote Instruction", Lucas Center for Faculty Development, Florida Gulf Coast University, October 2020.
- Integrating Sustainability Across the Curriculum (ISAC) Academy, Florida Gulf Coast University, May 2019.
- ASCE ExCEED Teaching Workshop, United States Military Academy, July 2017.
- STEM Professional Academy for Reinvigorating the Culture of Teaching (SPARCT), Florida Gulf Coast University, May 2015.
- New Faculty Academy, FGCU Lucas Center for Faculty Development, Fall 2014.

SCIENTIFIC OUTREACH ACTIVITIES

- Mentor, FSW Collegiate High School senior student for Thomas Alva Edison Kiwanis Regional Science & Engineering Fair on project “Graphene use in Solar Sail Membranes”
 - Student awarded ASM Outstanding Exhibit in Materials Science, CIO Excellence in STEM from Lee County school district, 1st place in Physics at the senior level, 2nd runner up for Best in Fair in Physical Science
 - Student progressed to Florida Science and Engineering Fair, Lakeland, Florida, Mar. 2019
- Judge, Edison Fairs Safety Review Committee, Lee/Charlotte county Science Fair, Feb. 2017.
- Tour Guide to FGCU solar panels for the Bonita Springs and Ft Myers Beach Elementary schools, March 2017.
- Judge, SunChase solar-powered go-kart team presentations, April 2017.
- Supervisor, “Eagle Expo” Open House Event, UA Whitaker College of Engineering, Florida Gulf Coast University, 2014-present.
- Module Manager, “Summer Sundays” Open House Event, Center for Functional Nanomaterials, Brookhaven National Laboratory, July 2011.
- Judge, Elementary School Science Fair Brookhaven National Laboratory, May 2010.
- Instructor, American Collegiate Adventures, Inc. and University of Wisconsin-Madison, July 2008.
- Judge, High School Science Fair Nanoday@Penn, University of Pennsylvania, October 2005.