

Kaelyn Danielle Leake

kleake@citadel.edu

Doctor of Philosophy, Electrical Engineering, 2015

University of California, Santa Cruz, Santa Cruz CA

Thesis: On-chip Particle Trapping and Manipulation

Bachelors of Science, Engineering Science and Physics, Magna Cum Laude, 2009

Sweet Briar College, Sweet Briar VA

Assistant Professor, Department of Physics, The Citadel, 2020-present

- Setting up optics research laboratory, emphasis on thin films, sensor systems, collaborating with undergraduate researchers
- Teaching responsibilities include optics, senior research, calculus based physics lab
- Significant involvement teaching innovative hands-on events for high school students to increase interest in STEM

Assistant Professor, Department of Engineering and Physics, Sweet Briar College, 2015-2020

- Courses taught- circuits, mechatronics, systems modeling and controls, senior capstone, statics, dynamics, materials science, design thinking, introduction to engineering
- College service- Assessment Committee, Curriculum Committee, Admissions Committee, Student Advancement Committee, first year advising, majors advising
- Designed, taught and worked with high school students to promote, recruit and introduce women to engineering
- Active contributor to department ABET assessment efforts
- Collaborated with students on design of automated system for layer-by-layer thin films
- Consultant for a large automotive company to design a high-sensitivity capacitive sensor for the measurement of air quantity in a fluid.

Teaching Assistant (2013-2015) and Research Assistant (2009-2015), Electrical Engineering Department, University of California, Santa Cruz, 2013-2015

- TA for- Modern Electronic Technology and How it Works, Designing a Sustainable Future, and Properties of Materials
- Used COMSOL and MATLAB to design an accurate particle manipulation simulation program
- Designed, simulated and tested optical sorting and trapping methods

Grants

Lt. Col. James B. Near. Jr. Center for Climate Studies, The Citadel, \$11,250, October 15, 2020 to December 15, 2021, Long-Term Study of Tides on the Ashley River: Flow Speed and Water Levels

Palmetto Academy Grant, South Carolina Space Grant, \$15,000, May 28, 2021 to August 4, 2021, Novel Modified Layer-by-Layer Ionic Self-Assembly for 3D control

Reviewer

Applied Optics
Applied Physics Letters

Honors and Fellowships

Outstanding TA Award, University of California, Santa Cruz, 2013-2014
QB3 Keck Fellowship, University of California, Santa Cruz, 2009-2010
Phi Beta Kappa, Inducted 2009
George H. Lenz Excellence in Physics Award, Sweet Briar College, 2009

Conferences and Publications

K.D. Leake, J. Salvatore, C. Penfield, and J. Harris, “Design thinking as part of the core curriculum at Sweet Briar College”, Engineering and Liberal Education Symposium, May 31-Jun 1 (2019).

Z. Vasquez, M. Groetsch, **K.D. Leake**, and H. Yochum, “Waveguides and layer-by-layer self assembly”, Mid-Atlantic Conference on Undergraduate Scholarship, Randolph College, Lynchburg VA (2019)

M. Groetsch, Z. Vasquez, H. Yochum, and **K.D. Leake**, “Laser patterning of polymer films”, Mid-Atlantic Conference on Undergraduate Scholarship, Randolph College, Lynchburg VA (2019)

K.D. Leake, “Explore Computer Science and Engineering”, Design Thinking Experiment Exchange, May 23-24 (2018).

L. Tucker, R. Runyon, **K.D. Leake**, and H. Yochum, “Laser heating of polymer films”, Mid-Atlantic Conference on Undergraduate Scholarship, Sweet Briar College, Sweet Briar, VA (2018).

R. Runyon, L. Tucker, H. Yochum, and **K.D. Leake**, “Layer-by-layer based waveguide design”, Mid-Atlantic Conference on Undergraduate Scholarship, Sweet Briar College, Sweet Briar, VA (2018).

D. Ozelik, H. Cai, **K.D. Leake**, A.R. Hawkins, and H. Schmidt, "Optofluidic bioanalysis: Fundamentals and applications", Nanophotonics (2017).

T.A. Wall, J. Parks, **K.D. Leake**, H. Schmidt and A.R. Hawkins, "Optofluidic Waveguiding for Biomedical Sensing", MRS Proceedings 1720, 953 (2015).

K.D. Leake, M. Olson, D. Ozcelik, A. Hawkins, and H. Schmidt, "Spectrally Reconfigurable Multi-Spot Trap on Optofluidic ARROW Chip", CLEO Conference, San Jose CA, May 10-15 (2015).

K.D. Leake, D. Ozcelik, B.S. Phillips, A.R. Hawkins, and H. Schmidt, "Advanced optical particle manipulation on an integrated optofluidic platform", SPIE Optics & Photonics Conference, San Diego, August 17-21 (2014).

H. Cai, J.W. Parks, T. Wall, **K. Leake**, T. Yuzvinsky, J. Kim, R. Carrion, J. Patterson, R.A. Mathies, A.R. Hawkins, and H. Schmidt, "Integrated optofluidics for on-chip biological sample preparation and analysis", SPIE Photonics West Conference, San Francisco, CA, Feb 2-6 (2014).

K.D. Leake, B.S. Phillips, T.D. Yuzvinsky, A.R. Hawkins, and H. Schmidt, "Optical particle sorting on an optofluidic chip", Optics Express, 21, 32605–32610 (2013). Also selected for the February 11, 2014 issue of the Virtual Journal for Biomedical Optics.

D. Ozcelik, J. Parks, L. Zempoaltecatl, **K. Leake**, J. Black, Y. Lim, A.R. Hawkins, and H. Schmidt, "High Sensitivity Fluorescence Detection with Multi-spot Excitation Using Y-splitters", CLEO Conference, San Jose CA, June 9-14 (2013).

J.W. Parks, H. Cai, L. Zempoaltecatl, T.D. Yuzvinsky, **K. Leake**, A.R. Hawkins, and H. Schmidt, "Hybrid optofluidic integration", Lab on a Chip, 13, 4118-4123 (2013).

K.D. Leake, H. Schmidt, and A.R. Hawkins, "All-optical particle trap using orthogonally intersecting beams", Photonics Research, 1, 47-51 (2013).

K.D. Leake, S. Mascharak, P. Measor, B.S. Philips, A.R. Hawkins, P. Mascharak, and H. Schmidt, "Manipulation, Trapping, and SERS Detection of Nanoparticle-Coated Microspheres in Optofluidic Waveguides", SPIE Photonics West Conference, San Francisco, CA, January (2012).

Y. Zhao, **K. Leake**, P. Measor, M. Jenkins, J. Keeley, H. Schmidt, and A.R. Hawkins, "Optimization of Interface Transmission between Integrated Solid Core and Optofluidic Waveguides", IEEE Photonics Technology Letters 24, 46-48 (2012).

Y. Zhao, M. Jenkins, P. Measor, **K. Leake**, S. Liu, H. Schmidt, and A. R. Hawkins, "Hollow Waveguides with Low Intrinsic Photoluminescence Fabricated with Ta₂O₅ and SiO₂ Films," Applied Physics Letters 98, 091104 (2011).

A. Chen, M. M. Eberle, E.J. Lunt, S. Liu, **K. Leake**, M.I. Rudenko, A.R. Hawkins, and H. Schmidt, "Dual-color fluorescence cross-correlation spectroscopy on a planar optofluidic chip," Lab on Chip, 11(8), 1502-1506 (2011).

K.D. Leake, B.S. Philips, A.R. Hawkins, and H. Schmidt, "Sized-Based Optical Particle Sorting Using an Orthogonal Beam in Optofluidic Waveguides", CLEO/QELS conference, Baltimore, MD, (2011).

Y. Zhao, M. Jenkins, **K. Leake**, S. Liu, P. Measor, H. Schmidt, and A.R. Hawkins, "Optofluidic Waveguides with Ta₂O₅ Cladding Layers and Low Photoluminescence", CLEO/QELS conference, Baltimore, MD, (2011).

B.S. Phillips, J. Keeley, M. Rudenko, **K. Leake**, P. Measor, A. Chen, S. Liu, E. Lunt, H. Schmidt, and A.R. Hawkins, "Optimizing ARROW Transitions by Selective Deposition of Thin Films", Integrated Photonics Research, Silicon and Nano Photonics (IPR), Monterey, CA, July 25-28, (2010).