Joshua B. Bostwick

CONTACT INFORMATION

Mechanical Engineering
Clemson University
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Clemson, SC 29634 USA

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CURRENT POSITION

Stanzione Associate Professor — 2021-Current
Assistant Professor — 2016-2021
Department of Mechanical Engineering
Clemson University

PREVIOUS POSITION

Golovin Assistant Professor — 2013-2015
Department of Engineering Science and Applied Mathematics
Northwestern University

Postdoctoral Research Scholar — 2011-2013
Department of Mathematics
North Carolina State University

RESEARCH INTERESTS

theoretical fluid mechanics, surface tension, hydrodynamic instability, wetting, elastocapillarity, soft matter, fracture mechanics, dynamical systems, constrained variational principles, symmetry methods.

EDUCATION

Cornell University, Ithaca, NY USA

Ph.D., Theoretical and Applied Mechanics, May 31, 2011

- Dissertation Title: "Stability of constrained capillary interfaces"

University of Wisconsin-Milwaukee, Milwaukee, WI USA

B.S.E., Civil Engineering and Mechanics, May 2005
B.A., Physics, May 2005

- Minor: Mathematics

PUBLICATIONS

1. S. Tamim and **J.B. Bostwick**, "Shaping capillary solids from statics to dynamics" *Annual Review of Condensed Matter Physics*, **16**, (2025), accepted
2. C. Gabbard, J. Rhoads, J.M. Delhaye, and **J.B. Bostwick** "Scaling analysis for the frequency of Ostwaldian and Newtonian bead-on-fiber flows" *Journal of Fluid Mechanics*, (2025), accepted
3. C. Gabbard, J. Rhoads, and **J.B. Bostwick** "Suppressing capillary instability in falling liquid threads" *Journal of Fluid Mechanics*, **1000**, A77, (2024)
4. C. Gabbard, E. Whitesell, and **J.B. Bostwick** "Coat or collapse?" *Physical Review Fluids*, **9** (11), 110505 (2024) [invited, Milton van Dyke Gallery of Fluid Motion award winner]
5. D. Ding and **J.B. Bostwick** "Model of Faraday waves in a cylindrical container with force detuning" *Physics of Fluids*, **36** (11), 112120, (2024)
6. C. Gabbard and **J.B. Bostwick** "Gravity-driven flow of liquid bridges between vertical fibers" *Journal of Fluid Mechanics*, **997**, A74, (2024)
7. D. Ding, C. Gabbard, and **J.B. Bostwick** "Dip coating of shear-thinning particulate suspensions" *Soft Matter*, **20** (40), 8068-8077, (2024)
8. J. Bentor, C. Gabbard, and **J.B. Bostwick**, and X. Xuan "Nonlinear electrophoresis of microparticles in shear-thinning fluids" *Langmuir*, **40** (38), 2011320119, (2024)

9. D. Ding, M. Sayyari, and **J.B. Bostwick** "Parametric oscillations of the sessile drop" *Journal of Fluid Mechanics*, **995**, A3, (2024)
10. C. Gabbard and **J.B. Bostwick** "Surface-engineered microfibers provide liquid transport flexibility" *Nature Chemical Engineering*, **1**, 31 (2024) [News & Views]
11. C. Gabbard and **J.B. Bostwick** "Thin film flow between fibers: inertial sheets and liquid bridge patterns" *Physical Review Fluids*, **8** (11), 11505 (2023) [invited, Gallery of Fluid Motion award winner]
12. S. Tamim and **J.B. Bostwick** "Spreading of a thin droplet on a soft substrate" *Journal of Fluid Mechanics*, **971**, A32, (2023)
13. J. McCraney, **J.B. Bostwick**, M. Weislogel, and P.H. Steen "Bubble migration in containers with interior corners under microgravity conditions" *Experiments in Fluids*, **64**, 140, (2023)
14. C. Copeland, C. Gabbard, and **J.B. Bostwick** "Dip coating of viscous granular suspensions" *Colloids and Surfaces A*, **674**, 131885, (2023)
15. C. Gabbard and **J.B. Bostwick** "Bead-on-fibre morphology in shear-thinning flow" *Journal of Fluid Mechanics*, **961**, A14, (2023)
16. S. Tamim, T. Nichols, J. Lundbek Hansen, T. Bohr, and **J.B. Bostwick** "Corner universality in polygonal hydraulic jumps" *Physical Review Fluids*, **8** (3), L032001, (2023) [Editor's suggestion]
17. J. McCraney, J. Ludwicki, V. Kern, **J.B. Bostwick**, S. Daniel, and P.H. Steen "Coalescence-induced droplet spreading: experiments aboard the International Space Station" *Physics of Fluids*, **34**, 122110, (2022) [Featured article]
18. V. Kern, C. Jin, **J.B. Bostwick**, and P.H. Steen "Oblique drop impact. Can one infer the angle of impact?" *Journal of Fluid Mechanics*, **948**, A53, (2022) [Undergraduate co-author]
19. J. McCraney, V. Kern, **J.B. Bostwick**, S. Daniel, and P.H. Steen "Oscillations of drops with mobile contact lines on the International Space Station: Elucidation of terrestrial inertial droplet spreading" *Physical Review Letters*, **129** (8), 084501 (2022) [Editor's Suggestion]
20. D. Ding and **J.B. Bostwick** "Oscillations of a partially-wetting bubble" *Journal of Fluid Mechanics*, **945**, A24, (2022)
21. D. Ding and **J.B. Bostwick** "Pressure modes of the oscillating sessile drop" *Journal of Fluid Mechanics*, **944**, R1, (2022)
22. J. Ludwicki, V. Kern, J. McCraney, **J.B. Bostwick**, S. Daniel, and P.H. Steen "Is contact-line mobility a material parameter?" *npj Microgravity*, **8**, 6, (2022)
23. M. Dachus, M. Raihan, M. Baghdady, C. Gabbard, S. Wu, **J.B. Bostwick**, Y. Song, and X. Xuan "Surfactant effects on microfluidic extensional flow of water and polymer solutions" *Physics of Fluids*, **34**, 032006 (2022) [Undergraduate first author]
24. P. Wilson, X. Shao, J.R. Saylor, and **J.B. Bostwick** "Role of edge effects and fluid depth in azimuthal Faraday waves" *Physical Review Fluids*, **7** (1), 014803, (2022)
25. J. Shaffer Brown, C. Wilson, C. Bohlen, H. Choi, L. Thompson, and **J.B. Bostwick** "Failure modes and bonding strength of ultrasonically-soldered glass joints" *Journal of Materials Processing Technology*, **299**, 117385, (2022) [Undergraduate co-author]
26. S. Tamim and **J.B. Bostwick** "Oscillations of a soft viscoelastic drop" *npj Microgravity* **7**, 42, (2021)
27. S. Tamim and **J.B. Bostwick**, "Model of spontaneous droplet transport on a soft viscoelastic substrate with nonuniform thickness" *Physical Review E*, **104**, 034611 (2021)
28. V. Kern, **J.B. Bostwick**, and P.H. Steen "Drop impact on solids surfaces. Contact angle hysteresis filters impact energy into modal vibrations" *Journal of Fluid Mechanics*, **923**, A5 (2021)
29. J. McCraney, **J.B. Bostwick**, and P.H. Steen "Resonant mode scanning to compute the spectrum of capillary surfaces with dynamic wetting effects" *Journal of Engineering Mathematics*, **129**, 10 (2021)
30. M.K. Raihan, P.P. Jagdale, S. Wu, X. Shao, **J.B. Bostwick**, X. Pan, and X. Xuan "Flow of non-Newtonian fluids in a single-cavity microchannel" *Micromachines*, **12** (7), 836 (2021)

31. C. Gabbard and **J.B. Bostwick** "Scaling analysis of the Plateau-Rayleigh instability in thin film flow down a fiber" *Experiments in Fluids*, **62**, 141 (2021)
32. X. Shao, P. Wilson, **J.B. Bostwick**, and J.R. Saylor "Viscoelastic effects in circular edge waves" *Journal of Fluid Mechanics*, **919**, A18 (2021)
33. S. Tamim and **J.B. Bostwick** "Plateau-Rayleigh instability in a soft viscoelastic material" *Soft Matter*, **17**, 4170-4179 (2021)
34. C. Gabbard and **J.B. Bostwick** "Asymmetric instability in thin-film flow down a fiber" *Physical Review Fluids*, **6** (3) 034005 (2021)
35. X. Shao, P. Wilson, J.R. Saylor, and **J.B. Bostwick** "Surface wave pattern formation in a cylindrical container" *Journal of Fluid Mechanics*, **915**, A19 (2021)
36. X. Shao, C. Gabbard, **J.B. Bostwick**, and J.R. Saylor "On the role of meniscus geometry in capillary wave generation" *Experiments in Fluids*, **62**, 59 (2021)
37. S. Wu, M. Raihan, L. Song, X. Shao, **J.B. Bostwick**, L. Yu, X. Pan, and X. Xuan "Polymer effects on viscoelastic fluid flows in a planar constriction microchannel" *Journal of Non-Newtonian Fluid Mechanics*, **290**, 104508 (2021)
38. C. Wilson, L. Thompson, H. Choi, and **J.B. Bostwick** "Enhanced wettability in ultrasonic-assisted soldering to glass substrates" *Journal of Manufacturing Processes* **64**, 276-284 (2021)
39. X. Shao, G. Bevilacqua, P. Ciarletta, J.R. Saylor, and **J.B. Bostwick** "Experimental observation of Faraday waves in soft gels" *Physical Review E*, **102**, 060602(R) (2020)
40. B. Basso and **J.B. Bostwick** "Splashing on soft elastic substrates" *Langmuir*, **36** (49) 15010-15017 (2020)
41. G. Bevilacqua, X. Shao, J.R. Saylor, **J.B. Bostwick**, and P. Ciarletta "Faraday waves in soft elastic solids" *Proceedings of the Royal Society A*, **476** 20200129 (2020)
42. S. Tamim and **J.B. Bostwick** "A dynamic analysis of the Rayleigh-Taylor instability in soft solids" *Extreme Mechanics Letters*, **40** 100940 (2020)
43. T. Nichols and **J.B. Bostwick** "Geometry of polygonal hydraulic jumps and the role of hysteresis" *Physical Review Fluids*, **5** (4) 044005 (2020)
44. X. Shao, S. Fredericks, J.R. Saylor and **J.B. Bostwick** "Determining rheological properties of ultrasonically levitated gel drops" *Journal of Acoustical Society of America*, **147** 2488 (2020)
45. P. Jagdale, D. Li, X. Shao, **J.B. Bostwick**, and X. Xuan "Fluid rheological effects on the flow of polymer solutions in a contraction-expansion microchannel" *Micromachines* **11** (3), 278 (2020) [Special issue on 'Rheology and Complex Fluid Flows in Microfluidics']
46. K. Maassen, J. Shaffer, H. Choi, L.L. Thompson, and **J.B. Bostwick** "Acoustic analysis of ultrasonic assisted soldering for enhanced adhesion" *Ultrasonics* **101**,106003 (2020) [Undergraduate student first author]
47. S. Tamim and **J.B. Bostwick** "The elastic Rayleigh drop" *Soft Matter* **15**, 9244 9252, (2019).
48. X. Shao, S. Fredericks, J.R. Saylor, and **J.B. Bostwick** "Elastocapillary transition in gel drop oscillations" *Physical Review Letters* **123**, 188002 (2019)
49. D. Li, X. Shao, **J.B. Bostwick**, and X. Xuan "Particle separation in xanthan gum solutions" *Microfluidics and Nanofluidics* **23**, 125 (2019)
50. J. Shaffer, K. Maassen, C. Wilson, P. Tilton, L. Thompson, H. Choi and **J.B. Bostwick** "Development of an open-sourced automated ultrasonic-assisted soldering system" *Journal of Manufacturing Processes* **47**, 284-290 (2019) [Undergraduate co-author]
51. J.E. Bergen, B.C. Basso, and **J.B. Bostwick** "Leidenfrost drop dynamics: Exciting dormant modes" *Physical Review Fluids* **4**, 083603 (2019) [Undergraduate co-author]
52. P.H. Steen, C.T. Chang, and **J.B. Bostwick** "Droplet motions fill a periodic table" *Proceedings of the National Academy of Sciences* **116** (11) 4849-4854 (2019)

53. X. Shao, J.R. Saylor, and **J.B. Bostwick** "Extracting the surface tension of soft gels from elastocapillary wave behavior". *Soft Matter* **14**, 7347-7353 (2018) [Back cover image].
54. **J.B. Bostwick** and P.H. Steen, "Instability of static rivulets: varicose and sinuous modes." *Journal of Fluid Mechanics*. **837**, 819-838 (2018).
55. S.J. Park, **J.B. Bostwick** and J.H. Je, "Self-spreading of wetting ridge during stick-slip on viscoelastic surface." *Soft Matter* **13**, 8331-8336 (2017).
56. M. Grezlka, **J.B. Bostwick** and K.E. Daniels "Capillary fracture of ultrasoft gels: variability and delayed nucleation." *Soft Matter* **13**, 2962-2966 (2017). [Back cover image]
57. **J.B. Bostwick**, J.A. Dijksman and M. Shearer, "Wetting dynamics of a collapsing fluid hole." *Physical Review Fluids*, **2**, 014006 (2017).
58. **J.B. Bostwick** and P.H. Steen, "Response of driven sessile drops with contact-line dissipation." *Soft Matter*, **12**, 8919 - 8926 (2016).
59. **J.B. Bostwick**, M.J. Miksis and S.H. Davis, "Elastic membranes in confinement" *Journal of the Royal Society Interface*, **13**(120), (2016).
60. **J.B. Bostwick** and P.H. Steen, "Stability of constrained capillary surfaces" *Annual Review of Fluid Mechanics*, **47**, 539-568, (2015).
61. **J.B. Bostwick** and P.H. Steen, "Liquid bridge shape stability by energy bounding" *IMA Journal of Applied Mathematics*, **80**(6), 1759-1775, (2015)
62. C.T. Chang, **J.B. Bostwick**, S. Daniel and P.H. Steen, "Dynamics of sessile drops. Part 2. Experiment"*Journal of Fluid Mechanics*, **768**, 442-467, (2015).
63. **J.B. Bostwick** and P.H. Steen, "Dynamics of sessile drops. Part 1. Inviscid theory" *Journal of Fluid Mechanics*, **760**, 5-38, (2014).
64. **J.B. Bostwick**, M. Shearer and K.E. Daniels, "Elastocapillary deformations on partially-wetting substrates: rival contact-line models" *Soft Matter*, **10**, 7361-7369, (2014).
65. **J.B. Bostwick** and K.E. Daniels, "Capillary fracture of soft gels" *Physical Review E*, **88**, 042410, (2013).
66. **J.B. Bostwick**, "Spreading and bistability of droplets on differentially heated substrates" *Journal of Fluid Mechanics*, **725**, 566-587, (2013).
67. C.T. Chang, **J.B. Bostwick**, P.H. Steen and S. Daniel, "Substrate constraint modifies the Rayleigh spectrum of vibrating sessile drops" *Physical Review E*, **88**, 023015, (2013).
68. **J.B. Bostwick** and P.H. Steen, "Coupled oscillations of deformable spherical-cap droplets. Part 1. Inviscid motions." *Journal of Fluid Mechanics*, **714**, 312-335, (2013).
69. **J.B. Bostwick** and P.H. Steen, "Coupled oscillations of deformable spherical-cap droplets. Part 2. Viscous motions." *Journal of Fluid Mechanics*, **714**, 336-360, (2013).
70. **J.B. Bostwick** and P.H. Steen, "Stability of constrained cylindrical interfaces and the torus lift of Plateau-Rayleigh." *Journal of Fluid Mechanics*, **647**, 201-219, (2010).
71. **J.B. Bostwick** and P.H. Steen, "Constrained capillary oscillations of a spherical fluid drop." *Physics of Fluids*, **21**, 032108, (2009).

MANUSCRIPTS IN SUBMISSION

1. T.L Chen, M.K. Raihan, S.M. Tabarhoseini, C.T. Gabbard, M.M. Islam, Y.H. Lee, **J.B. Bostwick**, L.M. Fu, and X. Xuan "Electrokinetic flow instabilities in shear-thinning fluids with conductivity gradients" *Soft Matter*

Manuscripts in preparation

1. E. Whitesell, C. Gabbard, and **J.B. Bostwick** "Dynamic destabilization of granular rafts"
2. J. McCraney, D. Ding, P.H. Steen, and **J.B. Bostwick** "Interface oscillations of a partially-wetting liquid in a capillary tube"
3. C. Gabbard and **J.B. Bostwick** "Hysteretic bound states at the absolute-convective transition in bead-on-fibre flows"
4. C. Gabbard and **J.B. Bostwick** "Flow between fibers: self-sustained sheets"
5. M.J. Sayyari and **J.B. Bostwick** "Destabilizing a buoyant multilayer granular raft by heavy grains"
6. C. Gabbard, G. Hunt, and **J.B. Bostwick** "Rivulet meandering on a curved substrate"

Papers in Conference Proceedings

1. C. Papadopoulos, **J.B. Bostwick** and A. Dressel "Promoting Holistic Problem-Solving in Mechanics." *Proceedings of the ASEE Annual Conference and Exposition*, (2007).
2. C. Papadopoulos, A. Rahman and **J.B. Bostwick** "Assessing Critical Thinking in Mechanics in Engineering Education." *Proceedings of the ASEE Annual Conference and Exposition*, (2006).
3. C. Papadopoulos, A. Rahman and **J.B. Bostwick** "Assessing Critical Thinking in Mechanics in Engineering Education." *ASEE North Midwest Conference* (2004) ***Best Paper Award***.

Invited Talks

1. "Elastocapillary instabilities in soft gels" Complex Fluids and Soft Matter Seminar, Virtual, February 2022.
2. "Surface waves on soft gels in a vibrated cylindrical container" *Plenary talk*. AICHE Annual Meeting, Boston, MA, November 2021.
3. "Elastocapillary dynamics in soft gels" *Physics Colloquium*. University of Mississippi, Physics Department, MS, November 2020.
4. "Geometry of wetting ridges" *SES 2016 Conference*. College Park, MD, October 2016.
5. "Sessile drop dynamics" *ME Seminar*. Clemson University, May 2015.
6. "Sessile drop dynamics" *Math Colloquium*. University of British Columbia, February 2015.
7. "Elastocapillarity: soft wetting and fracture" *Seminar*. Exxon Mobil Research Center, December 2014.
8. "Sessile drop oscillations: contact-line dynamics and symmetry breaking" *ME Seminar*. Oklahoma State University, March 2014.
9. "Sessile drop oscillations: contact-line dynamics and symmetry breaking" *Applied Math Seminar*. UC-Merced, February 2014.
10. "Sessile drop oscillations: contact-line dynamics and symmetry breaking" *ME Seminar*. Georgia Tech, February 2014.
11. "Sessile drop oscillations: contact-line dynamics and symmetry breaking" *Math Colloquium*. University of Kentucky, January 2014.
12. "Sessile drop oscillations: contact-line dynamics and symmetry breaking" *Math Colloquium*. University of South Carolina, December 2013.
13. "Capillary fracture of soft gels" *ME Seminar*. University of Rochester, March 2013.
14. "Capillary fracture of soft gels" *ESAM Seminar*. Northwestern University, February 2013.
15. "Capillary fracture of soft gels" *CMB Seminar*. NC State University, February 2013.
16. "Capillary fracture of soft gels" *Workshop on Thin Liquid Films and Fluid Interfaces: Models, Experiments and Applications* . Banff, AB, Canada December 2012.
17. "Spreading and bistability of droplets driven by thermocapillary and centrifugal forces." *Complex Fluid Seminar at Max Planck Institute for Dynamics and Self-Organisation*. Göttingen, Germany April 2012.
18. "Spreading and bistability of droplets driven by thermocapillary and centrifugal forces." *Workshop on Surfactant Driven Thin Film Flows*. Toronto, ON February 2012.

19. "Sessile-drop oscillations: contact line dynamics and symmetry breaking. " *NC State Differential Equations Seminar* Raleigh, NC September 2010.
20. "Constrained capillary oscillations of a spherical fluid drop." *Fluid Mechanics Seminar Dortmund Universität*. Dortmund, Germany September 2007.

CONTRIBUTED PRESENTATIONS

1. "Suppressing the PlateauRayleigh instability between fibers" *APS Division of Fluid Dynamics Meeting.* Washington, DC 2023. [Speaker: C. Gabbard]
2. "The role of the meniscus in determining the temporal response of parametrically-excited surface waves" *APS Division of Fluid Dynamics Meeting.* Washington, DC 2023. [Speaker: D. Ding]
3. "Oscillations of a sessile drop driven by oblique substrate vibrations" *APS Division of Fluid Dynamics Meeting.* Washington, DC 2023. [Speaker: J. Sayyari]
4. "Thin film flow between fibers: inertial sheets and liquid bridge patterns" *APS Division of Fluid Dynamics Meeting.* Indianapolis, IN November 2022. [Speaker: C. Gabbard]
5. "Corner universality in polygonal hydraulic jumps" *APS Division of Fluid Dynamics Meeting.* Indianapolis, IN November 2022. [Speaker: S. Tamim]
6. "Effects of gravity-driven drainage on particle filtration during dip coating" *APS Division of Fluid Dynamics Meeting.* Phoenix, AZ November 2021. [Speaker: C. Copeland]
7. "Linear oscillations of sessile bubbles" *APS Division of Fluid Dynamics Meeting.* Phoenix, AZ November 2021. [Speaker: D. Ding]
8. "Asymmetric instability in shear thinning flow down a fiber" *APS Division of Fluid Dynamics Meeting.* Phoenix, AZ November 2021. [Speaker: C. Gabbard]
9. "Oscillations of a soft viscoelastic drop" *APS Division of Fluid Dynamics Meeting.* Phoenix, AZ November 2021. [Speaker: S. Tamim]
10. "Experimental investigation of Faraday wave onset in viscoelastic materials" *APS Division of Fluid Dynamics Meeting.* Seattle, WA November 2019. [Speaker: X. Shao]
11. "A model of droplet durotaxis driven by elastocapillary response of a soft viscoelastic substrate" *APS Division of Fluid Dynamics Meeting.* Seattle, WA November 2019. [Speaker: S. Tamim]
12. "Low-G inertial-capillary meniscus motions in a channel" *APS Division of Fluid Dynamics Meeting.* Seattle, WA November 2019. [Speaker: J. McCraney]
13. "Asymmetric instabilities in the flow of thin films on fibers" *APS Division of Fluid Dynamics Meeting.* Seattle, WA November 2019. [Speaker: C. Gabbard]
14. "Rheological measurements of gels via ultrasonic levitation of gel drops" *APS Division of Fluid Dynamics Meeting.* Seattle, WA November 2019. [Speaker: J. Saylor]
15. "Gel surface tension measurement via forced drop oscillation in an ultrasonic standing wave field" *APS Division of Fluid Dynamics Meeting.* Atlanta, GA November 2018. [Speaker: X. Shao]
16. "The elastic Rayleigh drop" *APS Division of Fluid Dynamics Meeting.* Atlanta, GA November 2018. [Speaker: S. Tamim]
17. "Dynamics of an ideal fluid in a wedge" *APS Division of Fluid Dynamics Meeting.* Atlanta, GA November 2018. [Speaker: J. McCraney]
18. "Frequency response of edge waves in viscoelastic material" *APS Division of Fluid Dynamics Meeting.* Atlanta, GA November 2018. [Speaker: J. Saylor]
19. "Dynamics of sessile drops: symmetry classes and a minimal model" *APS Division of Fluid Dynamics Meeting.* Atlanta, GA November 2018. [Speaker: E. Wesson]
20. "Mechanically-excited surface waves on soft agarose gels" *APS March Meeting*. Los Angeles, CA March 2018.

21. "Mechanically-excited surface waves on soft agarose gels" *APS Division of Fluid Dynamics Meeting*. Denver, CO November 2017. [Speaker: X. Shao]
22. "Elastic membranes in confinement" *APS Division of Fluid Dynamics Meeting*. San Francisco, CA November 2014.
23. "The walking droplet instability" *APS Division of Fluid Dynamics Meeting*. Pittsburgh, PA November 2013.
24. "Capillary fracture of soft gels" *SIAM Materials*. Philadelphia, PA June 2013.
25. "Surfactant-driven fracture of gels: Initiation" *APS Division of Fluid Dynamics Meeting*. San Diego, CA November 2012.
26. "Contact-line dynamics, bifurcation and bistability of droplets driven by thermal gradients." *APS Division of Fluid Dynamics Meeting*. Baltimore, MD November 2011.
27. "Contact-line dynamics, bifurcation and bistability of spreading droplets." *Thin Fluids Day*. Raleigh, NC June 2011.
28. "Stability of constrained capillary interfaces: contact-line dynamics and symmetry-breaking of the sessile drop." *NC State AMGSS Seminar*. Raleigh, NC January 2011.
29. "Sessile-drop oscillations fill a symmetry-breaking periodic table." *APS Division of Fluid Dynamics Meeting*. Long Beach, CA November 2010.
30. "Oscillations of a viscous drop under spherical-belt constraint." *APS Division of Fluid Dynamics Meeting* Minneapolis, MN November 2009.

Academic Supervision

Ph.D.

Graduated: Xingchen Shao (August 2020), Saiful Tamim (December 2021), Dingqian Ding (May 2024), Chase Gabbard (August 2024)
Current: Mohammadjavad Sayyari (December 2025), Md Nur Alam (May 2026)

M.S.

Graduated: Phillip Wilson (December 2023), Connor Copeland (December 2022), Caleb Wilson (August 2020), Bailey Basso (August 2020), Chase Gabbard (May 2020), Taylor Nichols (August 2019), Jesse Bergen (December 2018)
Current: Plabon Saha Kumar (December 2024), Aimee Sayster (May 2025)

Undergraduate Honor's

Previous: Charlie Bohlen (May 2022), Michael Furgeson (May 2019), Ken Maassen (May 2018)
Current: Ned Whitesell (May 2025), Jake Duttarer (May 2025)

Teaching Experience

- Clemson University (Clemson, SC):
  1. Dynamics (Spring 2023) [Instructor of record]
  2. Asymptotic and Perturbation Methods in Engineering Science (Fall 2022, Fall 2024) [Instructor of record]
  3. Hydrodynamic Stability (Spring 2020) [Instructor of record]
  4. Nonlinear Dynamics and Chaos (Spring 2024, Spring 2023, Spring 2022, Spring 2021, Fall 2019, Spring 2019) [Instructor of record]
  5. Modeling and Analysis of Dynamic Systems (Fall 2024, Fall 2023, Fall 2021, Spring 2021, Fall 2020, Fall 2018, Spring 2018, Fall 2017, Summer 2017, Spring 2017, Spring 2016, Fall 2016) [Instructor of record]
  6. Junior Honor's Seminar (Fall 2024, Spring 2024, Fall 2023, Spring 2023, Fall 2022, Spring 2022, Fall 2021, Spring 2021, Fall 2020) [Instructor of record]

7. Internship in Engineering Design (Fall 2019, Spring 2019, Spring 2018, Spring 2017) [Instructor of record]

- Northwestern University (Evanston, IL):
  1. Vector Calculus (Spring 2015, Winter 2015, Spring 2014, Winter 2014) [Instructor of record]
- North Carolina State University (Raleigh, NC):
  1. Calculus I (Spring 2013) [Instructor of record]
  2. Applied Differential Equations I (Fall 2011) [Instructor of record]
- Cornell University (Ithaca, NY):
  1. Calculus I (Fall 2005) [TA]
  2. Differential Equations (Spring 2009, Spring 2008, Fall 2006, Spring 2006) [TA]
  3. Linear Algebra and Applications (Fall 2008, Spring 2007) [TA]
  4. Academic Excellence Workshop (AEW) Content Liaison (2006-2009)
- Dortmund Universität (Dortmund, Germany):
  1. Advanced Transport Phenomenon (Fall 2007) [TA]
- University of Wisconsin-Milwaukee (Milwaukee, WI):
  1. Statics [Undergraduate grader]
  2. Dynamics [Undergraduate grader]
  3. Strength of Materials [Undergraduate grader]

Sponsored Research

1. "GRF: Tabletop experiments of tsunami generation in ice-choked fjords using poly-disperse granular particles", SC Space Grant
2. "Dynamic destabilization of granular rafts and capillary filtration of particles at oilwater interfaces", ACS Petroleum Research Fund
3. "CAREER: Elastocapillary fluid mechanics: spreading, splashing and instability", NSF CBET-PMP
4. "Dynamic Wetting Effects in the Spectrum of the Sessile Drop: Organizing Principles from the Symmetry-breaking Perspective", NSF CMMI-DCSD
5. "Ultrasonic soldering", L3Harris Corporation
6. "REAP: Quantifying solder joint quality in ultrasonic soldering of dissimilar materials", SC Space Grant
7. NSF INTERN supplement.
8. NSF REU supplement.

Awards and Honors

- APS DFD Milton van Dyke GFM Award, 2023.
- ME Senior Faculty Excellence Award (Clemson University), 2023.
- APS DFD Gallery of Fluid Motion Award, 2022.
- Stanzione professorship, 2022.
- CECAS Junior Faculty Research of the Year Award (Clemson University), 2021.
- Featured on NSF Awesome Discovery Series, 2019.
- Dean's Faculty Fellow (Clemson University), 2018.
- Eastman Award (Clemson University), 2018.
- OPA Professional Development Award (North Carolina State University), 2011.

- H.D. Block Award for teaching excellence (Cornell University), 2010.
- NSF IREE Award, 2007.
- Outstanding Student Award (University of Wisconsin-Milwaukee), 2005.
- ASEE North Midwest Edward F. Mikol best paper award, 2004.
- REU Award (University of Wisconsin-Milwaukee), 2004.

SERVICE

- Editorial Board, *Journal of Engineering Mathematics* (April 2023 - Current)
- Graduate Studies and Research Committee Chair (Fall 2021 - Current)
- Undergraduate Honor's program coordinator (Fall 2020 - Current)
- PhD Qualifying Exam Czar (Fall 2018 - Fall 2021)
- Organizer, Graduate Student Research Seminar (Spring 2017 - Current).
- Organizer, NSF GRFP workshop and working group (Fall 2018).
- Faculty Mentor, EUREKA! program (2 under-represented students) (Summer 2017)

REVIEWER

Nature, Physical Review Letters, Journal of Fluid Mechanics, Physical Review Fluids, Physics of Fluids, Soft Matter, Langmuir, Scientific Reports, npj Microgravity, Nature Chemical Engineering, SIAM Applied Math, Chemical Engineering Science, IMA Applied Math, Physical Review E, Microgravity Science and Technology, Journal of Manufacturing Processes, Journal of Engineering Mathematics, Journal of Fluids and Structures, Physics Letters A, Interfacial Phenomenon and Heat Transfer, Fluid Dynamics Research, Journal of Mathematical Fluid Mechanics, Experimental Thermal and Fluid Science, International Communications in Heat and Mass Transfer, Japanese Journal of Applied Physics, Metallurgical and Materials Transactions B