

CONTACT INFORMATION Mechanical Engineering (302) 831-2150
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 130 Academy Street
 Newark, DE 19716 USA

EDUCATION **University of Rhode Island**, Kingston, Rhode Island, USA
 Ph.D., Mechanical Engineering Applied Mechanics, August 2009
 Advisor: Professor David Chelidze
 Ph.D., Physical Oceanography, December 2009
 Advisor: Dr. Vitalii Sheremet
 Michigan Technological University, Houghton, Michigan, USA
 Bachelor of Science in Physics

CURRENT EMPLOYMENT **Associate Professor** (September 2020 - Present)
University of Delaware, Department of Mechanical Engineering

PREVIOUS EMPLOYMENT **Assistant Professor** (August 2017 - August 2020)
University of Delaware, Department of Mechanical Engineering
Assistant Professor (August 2014 - August 2017)
Baylor University, Mechanical Engineering Department
Assistant Research Scientist (March 2012 - July 2014)
Texas A&M University, Geochemical and Environmental Research Group
Postdoctoral Researcher (September 2009 - May 2014) *Texas A&M University, Department of Aerospace Engineering*

RECOGNITION & AFFILIATIONS Current:
Topics Board Editor: Fluids (https://www.mdpi.com/journal/fluids/topic_editors).
NATO working groups: STO AVT-240 (2015-2018), ET-190 (2019) and STO AVT-346 (2020-2022) Hypersonic Transition.
Adjunct Faculty: University of Delaware College of Earth, Ocean and Environment.
Previous:
National Academy of Sciences, Engineering and Medicine - Gulf Research Program: Committee on Advancing Understanding of the Gulf of Mexico Loop Current Dynamics.
Young Investigator Program awardee Air Force Office of Scientific Research.
Research Associate Professor: Baylor University Center for Spatial Research.
Adjunct Faculty: University of Texas Marine Science Institute (UTMSI).
Fellow: Geophysical Fluid Dynamics Group at Baylor (GFDG)

Advisory Board and Fellow: The Institute of Ecological, Earth and Environmental Science (TIEEES), Baylor University.

Fellow: The Center for Spatial Research (CSR), Baylor University.

Research Scientist: Gulf Integrated Spill Research Consortia. Gulf of Mexico Research Initiative funded consortia. Texas A&M University.

Post Doctoral Fellow: National Center for Hypersonic Laminar-Turbulent Transition Research, Texas A&M University.

STUDENTS
GRADUATED

- Armani Batista (PhD 2029) Thesis: “Fluid Dynamics Numerical Modeling of Second-mode Instability Mechanisms at Mach 6.”
- Charles McMahon (PhD 2020) Thesis: “An Investigation of Oceanic Gap-Traversing Boundary Currents and Shelf-Slope Dynamics Through Analytic and Experimental Models.”
- Marcus Hurtado (Masters 2018) Thesis: “Damage Accumulation of Bovine Bone Under Chaotic and Variable Amplitude Loading.”
- Nic Mosser (Masters 2018) Thesis: “Modal Analysis of Aerospace and Geophysical Boundary Layers.”
- Ruy Ibanez (Masters 2017) Thesis: “Analytic Modeling and Applications of Barotropic Flows over Sloping Topographies Using Similarity Solutions.”
- Jordan Sakakeeny (Masters 2017) Thesis: “Linear Stability Theory Analysis of Mach 10 Nitrogen Flow Over 7-deg Half-Angle Cones.”
- Shelly Cler (Masters 2016) Thesis: “Damage Accumulation of Bovine Bone Under Chaotic Loading.”
- Abbey Campbell (Masters 2015) Thesis: “Damage Accumulation of Bovine Bone under Variable Amplitude Loads.”

AWARDS

“**Competing instability mechanisms in hypersonic boundary layers.**” AFOSR. PI: Dr. Joseph Kuehl. Amount \$397,529.00. 04/01/2020-03/31/2023.

“**Lagrangian Metrics for the Identification and Prediction of Loop Current Eddy Shedding Events.**” NASEM Gulf Research Program. PI Dr. Helga Huntley, Co-PI Dr. Joseph Kuehl, Co-PI Dr. Denny Kirwan. Award amount \$302,287. 01/01/2020 - 06/30/2021.

“**Fluid dynamics investigation of the Flow Garden Banks.**” Texas General Land Office. PI Dr. William Anderson, Co-PI Dr. Joseph Kuehl. Award amount \$50,000 (\$19,637). 09/01/2019 - 08/31/2020.

“**Taking the Pulse of the West Florida Shelf at a Hypothesized Loop Current Control Point.**” NAS. PI Dr. Robert Weisberg, Co-PI Dr. Joseph Kuehl. Award amount \$937,997 (\$173,644). 09/01/2018 - 08/31/2021.

“**Development of In Situ Oyster Setting for Stock Enhancement and Restoration Purposes in Texas.**” NOAA - Texas SeaGrant. PI Dr. John Scarpa, Co-PI Dr. Cecily Steppe and Dr. Joseph Kuehl. Award amount \$279,686 (\$63,000). 02/01/2018 - 01/30/2020.

“Mixing in the Texas coastal zone through coordinated simulations and field measurements: the role of Langmuir cells in sediment suspension and oil-mineral aggregation.” Texas General Land Office, Oil Spill Response. PI Dr. William Anderson, Co-PI Dr. Joseph Kuehl. Award amount \$293,779 (\$120,727). 9/1/2017-8/31/2019

“Global Dynamics Approach to Gap Leaping and Loop Current Systems.” NSF Physical Oceanography. PI Dr. Kuehl. Award Amount \$296,133. 3/1/2017-2/29/2021 (no cost extension granted)

“Bottom Current Monitoring of the Flower Garden Banks National Marine Sanctuary.” Supplemental Award to: Open-Coastal Ocean Connectivity Through Bottom Boundary Layer Observations and LES Modeling. Texas General Land Office, Oil Spill Response. PI Dr. William Anderson, Co-PI Dr. Joseph Kuehl. Award Amount \$27,000. 12/20/2016-8/31/2017

“Liquid Metal Battery Research & Development.” MFB Concepts INC. PI: Dr. Scott James, Co-PI: Dr. Joseph Kuehl. Award amount \$57,449. 6/1/2016-12/31/2016.

“Preliminary Study of Transport Pathways for Blue Crab Megalopae.” Big Twelve Faculty Fellowship Program, Baylor University - University of Texas Marine Science Institute. Dr. Joseph Kuehl, Dr. Edward Buskey. Award Amount \$2,500. Project location: Port Aransas Texas. 8/2015.

“Open Coastal Ocean Connectivity through Bottom Boundary Layer Observations and LES Simulation.” Texas General Land Office, Oil Spill Response. PI Dr. William Anderson, Co-PI Dr. Joseph Kuehl. Award Amount \$285,215 (\$140,098). 9/1/2015-8/31/2017

“The influence of multiple interacting primary modes and mode representation on hypersonic boundary-layer stability and transition prediction.” AFOSR Young Investigator Program, Research Area: Turbulence and Transition. PI: Dr. Joseph Kuehl. Amount \$359,000. 5/1/2015-4/30/2018.

“Reconstruction of Slow-Time (Fatigue Damage) Dynamics in Bone Using Fast-Time (Vibrations) Measurements.” Baylor University Research Committee Small Grant Program. PI: Dr. Carolyn Skurla, Co-PI: Dr. Joseph Kuehl. Award Amount \$3,923. 12/15/2014 - 05/31/2015.

“Reconstruction of Slow-Time (Fatigue Damage) Dynamics in Bone Using Fast-Time (Vibrations) Measurements.” Baylor ECS Faculty Research Grant. PI: Dr. Carolyn Skurla, Co-PI: Dr. Joseph Kuehl. Award Amount \$25,000. 06/01/2014 - 05/31/2015.

PUBLICATIONS **Reviewed Journal Articles**

Khan, A. A., T. Liang, W. Becker, A. Batista and J. Kuehl (2020) “A mech-

anism for energy-frequency-shifting in hypersonic boundary layers and implications for numerical - experimental comparison,” *AIAA Journal*. Under Review

McMahon, C. W., J. Kuehl and V. A. Sheremet (2020). “Dynamics of Gap-leaping Western Boundary Currents with Throughflow Forcing,” *Journal of Physical Oceanography*. Under Review

McMahon, C. W., J. Kuehl and V. A. Sheremet (2020) “Identification and Implications of a Third Gap-Leaping Western Boundary Current State,” *Ocean Modeling* Under Review

H. S. Huntley, C. McMahon, J. Kuehl and A. D. Kirwan, Jr. (2020) “Cross-Shelf Transport Through Interaction Between Coastal Jet, Topographic Wave, and Tides” *Fluids* Under Revision.

Kuehl, J. and V. Sheremet (2020) “Experimental investigation of shelf flow crossing over a strait,” *Journal of Physical Oceanography*, Under Revision.

McMahon, C., J. Kuehl and V. A. Sheremet (2020) “A Viscous, Two-Layer Western Boundary Current Structure Function,” *Fluids*, 5,63, doi:10.3390/fluids5020063.

Kuehl, J. and C. McMahon (2020) “An analytic solution for bottom intensified flow along sloping topography,” *European Journal of Mechanics B: Fluids*, 82, 156-160, <https://doi.org/10.1016/j.euromechflu.2020.03.007>

Batista, A., A. A. Khan and J. Kuehl (2020) “On the Mechanism by Which Nose Bluntness Suppresses Second-mode Instability,” *Theoretical and Applied Mechanics Letters*, doi: 10.1016/j.taml.2020.01.024.

Khan, A. A., J. Kuehl, and D. Chelidze (2020) “Towards a Unified Interpretation of the ‘Proper’/‘Smooth’ Orthogonal Decompositions and ‘State Variable’/‘Dynamic Mode’ Decompositions with Application to Fluid Dynamics,” *AIP Advances*, 10, 3, 035225, doi:10.1063/1.5144429.

Batista, A. and J. Kuehl (2020) “Local Wall Temperature Effects on the Second-mode Instability,” *Journal of Spacecraft and Rockets*, <https://doi.org/10.2514/1.A34620>.

Shrestha, Kalyan; Anderson, William; Kuehl, Joseph; Tejada-Martinez, Andres (2019) “Orientation of coastal-zone Langmuir cells forced by wind, wave, and mean current at variable obliquity,” *Journal of Fluid Mechanics*, vol. 879, pp. 716-743, doi:10.1017/jfm.2019.683.

Cler, M., J. Kuehl, C. Skurla and D. Chelidze (2019) “A novel method for bone fatigue monitoring and prediction,” *Bone Reports*, 11, 100221, doi.org/10.1016/j.bonr.2019.100221.

Chynoweth, B. C., C. Hader, A. Batista, T. J. Juliano, J. Kuehl, B. M. Wheaton, H. F. Fasel, S. P. Schneider (2019) “A history and progress of second mode dominated boundary-layer transition on a Mach 6 flared cone,” *Journal of Spacecraft and Rockets*. <https://doi.org/10.2514/1.A34285>

- Shrestha, K., W. Anderson, J. Kuehl, (2018) “Langmuir turbulence in coastal zones: structure and length scales,” *Journal of Physical Oceanography*, 48 (5), 1089-1115.
- Kuehl, J. (2018) “Thermoacoustic interpretation of second-mode instability,” *AIAA Journal*, 56, 9, pp. 3585-3592, <https://doi.org/10.2514/1.J057015>.
- Ibanez, R., J. Kuehl, K. Shrestha and W. Anderson (2018) “A nonlinear self-similar solution to barotropic flow over rapidly varying topography,” *Nonlinear Processes in Geophysics* 25, 201-205
- Kuehl J. (2017) “Discrete- and Finite-Bandwidth-Frequency Distributions in Nonlinear Stability Applications,” *Physics of Fluids*, 29, 024101 (2017); doi: 10.1063/1.4975158
- Campbell, A., M. L. Cler, C. P. Skurla and J. J. Kuehl (2016). “Damage Accumulation of Bovine Bone under Variable Amplitude Loads,” *Bone Reports*, 5, 320–332.
- Spencer, L. J., S. F. DiMarco, Z. Wang, J. J. Kuehl and D. A. Brooks (2016). “Asymmetric Oceanic Response to a Hurricane: Deepwater Observations during Hurricane Isaac,” *Journal of Geophysical Research: Oceans*, 121, doi:10.1002/2015JC011560.
- Kuehl, J. (2014). “An analytic solution for barotropic flow along a variable slope topography,” *Geophysical Research Letters*, 41. doi: 10.1002/2014GL061188.
- Kuehl, J., S. DiMarco, L. Spencer, and N. Guinasso (2014). “Application of the Smooth Orthogonal Decomposition to oceanographic datasets,” *Geophysical Research Letters*, 41, 3966-3971. doi:10.1002/2014GL060237
- H. L. Reed, E. Perez, J. Kuehl, T. Kocian, and N. Oliviero (2014). “Verification and Validation Issues in Hypersonic Stability and Transition Prediction,” *Journal of Spacecraft and Rockets*, doi: 10.2514/1.A32825.
- Kuehl, J., and V. A. Sheremet, (2014). “Two-Layer Gap-Leaping Oceanic Boundary Currents: Experimental Investigation,” *Journal of Fluid Mechanics*, 740, 97-113.
- Hofferth, J. W., S. W. Saric, J. Kuehl, E. Perez, T. Kocian, H. L. Reed, (2013). “Boundary-Layer Instability & Transition on a Flared Cone in a Mach 6 Quiet Wind Tunnel,” *International Journal of Engineering Systems Modelling and Simulation*, 5 (1/2/3), 109-124.
- Kuehl, J. and D. Chelidze, (2010). “Identifying invariant manifolds using phase space warping and stochastic interrogation,” *International Journal of Nonlinear Mechanics*, 45 (1), 42-55.
- Kuehl, J. and V. A. Sheremet, (2009). “Identification of Cusp Catastrophe in Gap Leaping Western Boundary Current Problem,” *Journal of Marine Research*, 37 (1), 25-42.

Sheremet, V.A., and J. Kuehl, (2007). “Gap leaping western boundary current in a circular tank model,” *Journal of Physical Oceanography*, 37, 1488-1495.

Reviewed Technical Reports

Multiple Authors (2019) “Hypersonic Boundary-Layer Transition Prediction,” NATO STO AVT 240 Final Report (to appear).

Multiple Authors (2018) “2016 Flower Garden Banks Localized Mortality Event Mini-Symposium Report,” NOAA Report, February 27-28, 2018. Flower Garden Banks National Marine Sanctuary, Galveston Texas. *NOAA reviews and archives reports which document the findings of the scientists invited to Symposia such as this one. This mortality event was unexpected and not at all understood at the time of the event. NOAA invited a group of experts with experience working on the Banks to address these unknowns and generate a summary report.*

Multiple Authors (2018) “Understanding and Predicting the Gulf of Mexico Loop Current: Critical Gaps and Recommendations.” National Academies of Sciences, Engineering, and Medicine. Washington, DC: The National Academies Press. doi: <https://doi.org/10.17226/24823>.

Minimally Reviewed Conference Manuscripts

Liang, Tony, A. A. Khan, and J. Kuehl (2021) “Design of a Mach 5 flared cone for first- second-mode mechanisms interactions,” *AIAA 2021-SciTec* Accepted.

Batista, A., A. A. Khan and J. Kuehl (2020) “Variable Frequency Disturbances on a Flared Cone at Mach 6,” *AIAA 2020-0589*.

Khan, A. A., A. Batista, and J. Kuehl (2020) “Nonlinear stability of straight cones with sharp and blunt noses at Mach 6,” *AIAA 2020-1819*.

Sakakeeny, J., A. Batista, and J. Kuehl (2019) “How nose bluntness suppresses second-mode growth,” *AIAA 2019-3083*.

Batista, A. and J. Kuehl (2019) “Implications of Local Wall Temperature Variations on Second-mode Instability,” *AIAA 2019-3084*.

Sousa, V., A. Batista, J. Kuehl, C. Scalo (2018) “Nonlinear Spectral Broadening Dynamics of Second Mode Waves on a Hypersonic Flared Cone,” *AIAA-2018-3852*, doi: 10.2514/6.2018-3852.

Chynoweth, B. C., C. Hader, A. Batista, T. J. Juliano, J. Kuehl, B. M. Wheaton, H. F. Fasel, and S. P. Schneider (2018) “A history and progress of second mode dominated boundary-layer transition on a Mach 6 flared cone,” *AIAA 2018-0060*.

Batista, A. and J. Kuehl (2017) “A Mechanism for Spectral Broadening and Implications for Saturation Amplitude Estimates,” *AIAA-2017-3635*.

- Kuehl J. (2017). “Nonlinear Saturation versus Nonlinear Detuning: Quantification on a Mach 6 Flared Cone,” *AIAA-2017-0763*.
- Kuehl J. and P. Paredes (2016). “Görtler Modified Mack-modes on a Hypersonic Flared Cone,” *AIAA-2016-0849*.
- Kuehl, J., H. L. Reed, T. S. Kocian and N. B. Oliviero (2014). “Bandwidth Effects on Mack-Mode Instability,” *AIAA-2014-2777*.
- H. L. Reed, E. Perez, J. Kuehl, T. Kocian, N. Oliviero (2013). “Hypersonic Stability and Transition Prediction,” *AIAA-2013-2556*.
- Perez, E., H. L. Reed, J. Kuehl, (2013). “Instabilities on a Hypersonic Yawed Straight Cone,” *AIAA-2013-2879*.
- Kocian, T. S., E. Perez, N. B. Oliviero, J. Kuehl, H. L. Reed, (2013). “Hypersonic Stability Analysis of a Flared Cone,” *AIAA-2013-667*.
- Perez, E., T. S. Kocian, J. Kuehl, H. L. Reed, (2012). “Stability of Hypersonic Compression Cones,” *AIAA-2012-2962*.
- Hofferth, J. W., S. W. Saric, J. Kuehl, E. Perez, T. Kocian, H. L. Reed, (2012). “Boundary-Layer Instability & Transition on a Flared Cone in a Mach 6 Quiet Wind Tunnel,” *RTO/AVT Specialists Meeting on Hypersonic Laminar-Turbulent Transition : AVT-200/RSM-030*, San Diego, CA, USA. Paper No. 10.
- Reed, H. L., J. Kuehl, E. Perez, T. Kocian, J. W. Hofferth, S. W. Saric, (2012). “Nonlinear Parabolized Stability Equation Simulations in Hypersonic Flows,” *RTO/AVT Specialists Meeting on Hypersonic Laminar-Turbulent Transition : AVT-200/RSM-030*, San Diego, CA, USA. Paper No. 7.
- Hofferth, J. W., S. W. Saric, J. Kuehl, E. Perez, T. Kocian, H. L. Reed, (2012). “Comparison of Experimental and Computational Boundary-Layer Profiles and Instability Growth on a Flared Cone in a Mach 6 Quiet Flow,” *3AF 47th Inter-national Symposium of Applied Aerodynamics*, Paris, France. Paper No. 37.
- Kuehl, J., E. Perez, and H. L. Reed, (2012). “JoKHeR: NPSE Simulations of Hypersonic Crossflow Instability,” *AIAA-2012-0921*.
- Kuehl, J. and D. Chelidze, (2008). “Invariant Manifold Identification from Phase Space Trajectories,” *ASME International Mechanical Engineering Congress and Exposition*, Boston, MA (11/08) Technical Paper (IMECE2008-67473).

INVITED TALKS

- Notre Dame University**, Institute for Flow Physics and Control (FlowPAC) Seminar (2020), “Modeling the Mechanisms of Hypersonic Boundary Layer Instability.” South Bend, IN (3/2020).
- City College New York**, Mechanical Engineering Seminar Series (2020), “Geophysical Flows Across Straits: A Global Dynamics Perspective.” New York, NY (2/20).

University of Pennsylvania, Mechanical Engineering and Applied Mechanics Seminar (2019), “Dynamical Systems Approach to Geophysical and Aerospace Flows.” Philadelphia, PA (9/19)

Michigan Technological University, Oceanography/Engineering Seminar (2018), “A dynamical systems approach to the predictability of geophysical flows.” Houghton, MI (11/18)

University of Rhode Island, Graduate School of Oceanography, Physical Oceanography Seminar (2018), “Fundamental Factors Affecting Loop Current Predictability.” Narragansett, RI (10/18)

University of Delaware, SMSP Spring 2018 Lewes-Newark Colloquia (2018), “Observations and theory of deep flow along the shelf and slope.” Newark, Delaware (4/18)

University of South Florida, (2018) “What can a Teapot teach us about the Gulf of Mexico?” St. Petersburg, Florida. (3/18)

Flower Garden Banks National Marine Sanctuary: Mini-Symposium on Mortality Event, (2018) “Current observations over the Flower Garden Banks” Galveston, Texas. (2/18)

Skidaway Institute of Oceanography, (2017) “How is the Gulf of Mexico Like a Teapot?” Savannah, Georgia (12/17)

University of Delaware, Mechanical Engineering Seminar, (2017) “On playground swings, teapots and broken bones,” Newark, Delaware (2/17).

Michigan Technological University, Multi-disciplinary Graduate Seminar, (2016) “Problem Solving with the tools of Complex Systems Science,” Houghton, Michigan (4/16).

Baylor University, Physics Colloquium Series, (2016) “Applications of Complex Systems Science,” Waco, Texas (4/16).

University of Rhode Island, Graduate Seminar Series, (2016) “Problem solving with the tools of Complex Systems,” Kingston, Rhode Island (3/16).

Michigan Technological University, Great Lakes Research Center, (2015). “A Region of Deep Accumulation on the Northern Gulf of Mexico Slope,” Houghton, Michigan (4/17/15).

University of Texas Marine Science Institute, (2015). “Bottom Intensified Dynamics on the Northern Gulf of Mexico Slope and their Impact on Fate and Transport Modeling,” Port Aransas, Texas (4/3/15).

Geology Seminar Series, (2015). “The Importance of Boundary and Shear Layers in Geophysical Flows,” Baylor University (2/13/15).

Thermal-fluid Sciences Graduate Seminar, (2015). “Northern Gulf of Mexico Slope Dynamics: Observations and Theory,” University of Texas Dallas (1/15/15).

Seminar Series at the Center for Astrophysics, Space Physics and Engineering Research, (2014). “How is the Gulf of Mexico Like a Teapot (new results!),” Baylor Research and Innovation Collaborative (12/5/14).

Physical Oceanography Science and Engineering (POSE) Seminar, (2013). “Identification of Multiple States in Loop Current Systems: Experimental Investigation,” University of Delaware (11/08/13).

Mechanical Engineering Graduate Seminar Series, (2013). “Nonlinear Coupling in the Parabolized Stability Equations,” Baylor University (10/14/13).

Seminar Series at the Center for Astrophysics, Space Physics and Engineering Research, (2013). “Advances in Hypersonic Boundary Layer Stability,” Baylor University (2/22/13).

Graduate Seminar Series in Mechanical, Industrial and Systems Engineering, (2012). “Hypersonic Boundary Layer Stability and the Nonlinear Parabolized Stability Approach,” University of Rhode Island (9/14/12).

Center of Nonlinear Dynamics, (2012). “How is the Gulf of Mexico like a Teapot?” University of Texas Austin (4/30/12).

Physical Oceanography Seminar Series, (2009). “Laboratory experiments on gap-traversing western boundary currents: identification of multiple steady states with hysteresis,” Texas A&M University, College Station, TX USA (11/16/09).

TALKS AND
POSTERS

Ocean Sciences Meeting (2020) “Dynamics of gap-leaping western boundary currents with throughflow forcing,” San Diego, CA (2/2020).

GoMOSES Meeting (2020) “On the fundamental physics of gap-leaping systems,” Tampa, FL (2/2020).

AIAA SciTech Meeting (2020) “Modes Versus Mechanisms,” Orland, FL (1/2020).

APS DFD (2019) “Shelf flow crossing over a strait: Experimental,” Seattle, WA (11/2019).

AIAA Aviation Meeting (2019). “How nose bluntness suppresses second-mode growth,” Dallas ,TX (6/2019).

NATO STO-ET-190 (2019). “Modulated Second Mode Dynamics,” West Lafayette, IN (4/2019).

Oceanology International, (2019). “Loop Current Predictability,” San Diego, CA, (2/2019).

GoMOSES, (2019). “Coast Langmuir Circulations and Deep Transport Pathways,” (Poster))New Orleans, LA, (2/2019).

Mid Atlantic Bight Physical Oceanography and Meteorology Meeting, (2018). “Modeling flow patterns over the Northeast Channel during Scotian Shelf Water crossover events,” Woods Hole, MA (10/18).

NATO STO-AVT-240 Meeting, (2018). “Nonlinear dynamics of second-mode waves and nonlinear breakdown,” Hampton, Virginia (4/18).

ASLO Ocean Sciences Meeting, (2018). “A framework for understanding Loop Current type systems,” (Poster and lightning session) Portland, Oregon. (2/18)

AIAA Scitech Meeting, (2018). “Second mode breakdown on the Purdue compression cone,” (Open Forum seminar) Kissimmee, Florida. (1/18)

AGU Meeting, (2017). “Multiple states and hysteresis in a two-layer loop current type system,” New Orleans, Louisiana (12/17)

APS DFD Meeting, (2017). “Nonlinear growth and resonance of second-mode waves,” Denver, Colorado (11/17).

AFOSR YIP Meeting, (2017). “Representing the physics of boundary layer disturbances numerically,” Ballston, Virginia (11/17).

NATO STO-AVT-240 Meeting, (2017). “Analysis of second mode instabilities on flared cones,” Utrecht, Netherlands (10/17).

NATO STO-AVT-240 Meeting, (2017). “Accounting for acoustic energy in hypersonic boundary layers,” Tullahoma, Tennessee (4/17).

Mechanical Engineering Graduate Seminar Series, (2017). “Identifying and Working New, Open or Next-Generation Research Problems,” Baylor University (04/17).

Scitech 2017, AIAA Aerospace Sciences Meeting, (2017). “Nonlinear Saturation versus Nonlinear Detuning: Quantification on a Mach 6 Flared Cone,” Dallas, Texas (01/17).

APS DFD Meeting, (2016). “Implications of a wave packet formulation for the nonlinear parabolized stability equations to hypersonic boundary layers,” Portland Oregon (11/16). Session Chair.

NATO STO-AVT-240 Meeting, (2016). “A Wave Packet Formulation of the Parabolized Stability Equations,” Avila, Spain (9/16).

AFOSR Annual Review, (2016). “The Influence of Multiple Interacting Primary Modes and Mode Representation on Hypersonic Boundary-layer Stability and Transition Prediction,” Arlington, Virginia USA (6/16)

NATO STO-AVT-240 Meeting, (2016). “Gortler modified Mack-modes on a hypersonic flared cone,” Notre Dame University, South Bend, Indiana USA (4/16).

Scitech 2016, 54th AIAA Aerospace Sciences Meeting, (2016). “Gortler modified Mack-modes on a hypersonic flared cone,” San Diego, California (01/16).

NATO STO-AVT-240 Meeting, (2015). “The influence of multiple interacting primary modes,” Prague, Czech Republic (10/15).

AFOSR Annual Review, (2015). “The Influence of Multiple Interacting Primary Modes and Mode Representation on Hypersonic Boundary-layer Stability and Transition Prediction” Tullahoma, Tennessee (7/15)

Gulf of Mexico Oil Spill & Ecosystem Science Conference, (2015). “Identification of Bottom Intensified Dynamics on the Northern Gulf of Mexico Slope and their Impact on Fate and Transport Modeling,” Houston, Texas (2/19/15).

AFOSR Annual Young Investigator Meeting, (2015). “Gortler modified Mack-modes on a hypersonic flared cone,” (6/15).

Gordon Conference: Coastal Ocean Modeling, (2015). “Identification of bottom intensified dynamics on the northern Gulf of Mexico slope and impact on fate and transport modeling” (Poster) Biddeford, Maine (06/15).

Gulf of Mexico Oil Spill & Ecosystem Science Conference, (2015). “Experimental Identification of Multiple States with Hysteresis in Loop Current Systems,” Houston, Texas (2/18/15).

Mechanical Engineering Graduate Seminar Series, (2014). “How is the Gulf of Mexico like a Teapot? Latest Updates,” Baylor University (9/9/14).

Aviation 2014, 44th AIAA Fluid Dynamics Conference, (2014). “Non-linear detuning and bandwidth effects on Mack-mode instability,” Atlanta, Georgia (06/14).

Gulf of Mexico Oil Spill and Ecosystem Science Conference: Nearfield Modeling Workshop, (2014). “Deepwater variability as seen by the GISR mooring array” Mobile, Alabama (01/14).

Gulf of Mexico Oil Spill and Ecosystem Science Conference, (2014). “Deepwater variability as seen by the GISR mooring array” (Poster) Mobile,

Alabama (01/14).

Gulf of Mexico Oil Spill and Ecosystem Science Conference, (2014). “GISR Drift Card Program: Surface Transport Observation” (Poster) Mobile, Alabama (01/14).

Gordon Conference: Coastal Ocean Circulation, (2013). “How is the Gulf of Mexico like a Teapot?” (Poster) Biddeford, Maine (06/13).

50th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition, (2012). “JoKHeR: NPSE Simulations of Hypersonic Crossflow Instability,” Nashville, Tennessee (01/12).

International Conference ”Fluxes and Structures in Fluids: Physics of Geospheres”, (2009). “Two-Layer Gap-Traversing Boundary Current Dynamics,” Moscow State University, Moscow, Russia (06/09).

Nonlinear Process in Atmospheric and Oceanic Flows Workshop, (2008). “Identification of cusp catastrophe in gap leaping western boundary current problem,” (Poster) Castro Urdiales, Spain (07/08).

Twelfth Conference On Nonlinear Vibration, Dynamics, and Multi-body Systems, (2008). “Invariant Manifold Identification from Phase Space Trajectories,” Virginia Technological University, Blacksburg, VA USA (06/08).

ADDITIONAL
RESEARCH
EXPERIENCE

Pursuit Cruise TGLO_003a-e, March 2018 - August 2019. Deployment of 6-10 Seahorse TCM bottom current sensors and a bottom mounted ADCP on the Texas shelf, including monthly CTD surveys. Target depths between 15-35m.

Flower Garden Banks Monitoring, September 2016-August 2019. Deployment of 14 Seahorse TCM bottom current sensors, 3 dissolved oxygen sensors and 3 CT sensors on the FGB. This monitoring study is motivated by a mass coral die off, the cause of which has yet to be determined.

Pursuit Cruise TGLO_002a-f, October 2016 - February 2017. Deployment of 9 Seahorse TCM bottom current sensors and a bottom mounted ADCP on the Texas shelf, including CTD sections and C,T profile time series. Target depths between 40-900m.

Pursuit Cruise TGLO_001a-c, May-July 2016. Deployment of 10 Seahorse TCM bottom current sensors on the Texas shelf and shelf break, including CTD sections and C,T profile time series. Target depths between 30-200m.

Osprey Cruise GLRC_001, May 2016. Deployment of eleven Seahorse TCM bottom current sensors in Lake Superior. Targeted cross-slope sections of the Keweenaw current to identify cross-slope transport mechanisms controlling Diporeia populations. Also targeted transport mechanisms of toxic stamp sand off Gay Michigan which appear to be influencing Diporeia populations on the southern Keweenaw coast line.

Pursuit Cruise TGLO_000, January 2016. Trial deployment of six TCM bottom current sensors on the Texas shelf and shelf break. Target depths between 30-100m.

Port Aransas Ship Channel Study, August 2015. Preliminary study of bottom currents in the Port Aransas ship channel. Emphasis was placed on spatial distribution of currents to better understand transport processes.

Lake Waco Observing System, January 2015–Present. This pilot program uses low cost bottom current meters, temperature sensors and pressure gages to

monitor the flow and sediment dynamics of Texas reservoirs.

R/V Pelican Cruise PE-1402, July 2013. GISR mooring turnover cruise. Recovery, turnover and redeployment of 6 moorings around the DeepWater Horizon oil spill site and hydrographic sampling of the surrounding area.

R/V Manta Cruise, June 2013. Slocum Glider test cruise.

R/V Ferrell Cruise, August 2012. Texas Automated Buoy System (TABS) buoy deployment/recovery cruise. TABS I, TABS II and 2.25 meter discus buoys were replaced at part of the TABS scheduled maintenance. In addition, a short test deployment of the Responder buoy was conducted.

R/V Pelican Cruise PE-1301, July 2012. GISR mooring deployment cruise. Deployment of 6 moorings around the DeepWater Horizon oil spill site and hydrographic sampling of the surrounding area.

R/V Endeavor Cruise 440, October 2007. Line W cruise. Hydrographic sampling across the deep western boundary current off the New England coast.

R/V Endeavor Cruise 400, December 2005. Investigation of shelf break front with towed instrument and ADCP.

Research, Woods Hole Oceanographic Institution, Woods Hole, Ma.

Guest Investigator (09/2006 – 10/2007)

Rotating table experiments were conducted to study Scotian Shelf water “crossover” events. During such events Scotian Shelf water leaps the Northeast Channel of the Gulf of Maine from Browns Bank to Georges Bank. Crossover events have important implications for biological productivity on Georges Bank.