

# BLAIR ANNE JOHNSON

---

Assistant Professor  
Department of Civil, Architectural & Environmental Engineering  
Cockrell School of Engineering  
The University of Texas at Austin  
310 E. Dean Keeton St. Stop C1700  
Austin, TX 78712-2100  
Email: blairjohnson@utexas.edu  
Phone: 512-232-1863

## **EDUCATION**

Ph.D. in Civil & Environmental Engineering, Cornell University	2016
Ph.D. minor, Mechanical Engineering, Cornell University	2016
M.S. in Civil & Environmental Engineering, Cornell University	2012
B.S. in Civil Engineering, Minor: Piano, Johns Hopkins University	2008

## **PROFESSIONAL POSITIONS**

Assistant Professor, Department of Civil, Architectural and Environmental Engineering, The University of Texas at Austin	2018-present
Postdoctoral Research Associate, Arizona State University	2016-2017
Visiting Graduate Student Researcher, Instituto de Hidráulica Ambiental	2012

## **PUBLICATIONS**

Johnson, B.A. and Cowen, E.A. "Turbulent boundary layers absent mean shear." *Journal of Fluid Mechanics*. 2018.

Johnson, B.A. and Cowen, E.A. "Sediment suspension and bed morphology in a mean shear free turbulent boundary layer." *Journal of Fluid Mechanics*. 2020.

Johnson, B.A., Ding, L., Zunino, H.A., Adrian, R.J., and Clarke, A.B. "Velocity Measurements of Gas Escaping a Particle Bed during Shock-driven Expansion." Under review at *Experiments in Fluids*.

## **GRANTS**

TxDOT 19-2 (0-6976) "Concrete Median Barrier for Flood-Prone Areas," 2018-2020. Total project \$446K, joint with Texas A&M Transportation Institute. (UT Austin share \$120K)

SERDP "Exhuming Munitions via Turbulence-Induced Bed Fluidization," 2020-2021. Total project \$198,324.

TxDOT 21-169 (0-7087) "Develop Standards for Temporary Concrete Median Barrier in Flood-Prone Areas," 2020-2022. Total project \$485K, joint with Texas A&M Transportation Institute. (UT Austin share \$198K)

## **TEACHING EXPERIENCE**

UNIVERSITY OF TEXAS AT AUSTIN  
CE 397 Experimental Methods in Fluid Mechanics (graduate)  
CE 319F Elementary Fluid Mechanics (undergraduate)

## ARIZONA STATE UNIVERSITY

MAE 504 Experimental Methods in Thermal and Fluid Processes  
Co-Instructor with Ron Adrian Spring 2017

## CORNELL UNIVERSITY

CEE 3310 Fluid Mechanics, Visiting Instructor Summer 2017  
CEE 3310 Fluid Mechanics, Guest Lecturer Fall 2014  
CEE 3310 Fluid Mechanics, Teaching Assistant  
Instructors: Edwin A. (Todd) Cowen, Rafael Tinoco Fall 2009, 2010, 2011  
Instructors: Kuang-An Chang, Rafael Tinoco Summer 2009, 2014

## UNIVERSIDAD DE NARIÑO, PASTO, COLOMBIA

CienciAmerica: Renewable Energy and Environmental Fluid Mechanics August 2015

## JOHNS HOPKINS UNIVERSITY

500.200 Computing for Engineers & Scientists, Teaching Assistant Fall 2007

**WORKSHOPS ATTENDED**

NSF Funded Leverage Institute for Early Career Engineering Faculty, Dallas, TX 2018  
2<sup>nd</sup> International Workshop on Swash-Zone Process, University of Delaware 2014  
Fluid-Mediated Particle Transport in Geophysical Flows 2013  
Kavli Institute for Theoretical Physics, University of California, Santa Barbara

**INVITED TALKS**

“Mixing and Transport in a Mean Shear Free Turbulent Boundary Layer,” Applied Research Laboratory, University of Texas at Austin, January 2020  
“Mixing and Transport in a Mean Shear Free Turbulent Boundary Layer,” Simon Fraser University, November 2019  
“Mixing and Transport in a Mean Shear Free Turbulent Boundary Layer,” University of British Columbia, November 2019  
“Mixing and Transport in a Mean Shear Free Turbulent Boundary Layer,” University of Illinois Urbana-Champaign, October 2019  
“Mixing and Transport in a Mean Shear Free Turbulent Boundary Layer,” Texas A&M University, April 2019  
“Particle Bearing Turbulent Flows,” University of Arizona, September 2017  
“The Interaction of Homogeneous Isotropic Turbulence with Solid and Sediment Boundaries: an Experimental Investigation,” Arizona State University, June 2016  
“The Interaction of Homogeneous Isotropic Turbulence with Solid and Sediment Boundaries: an Experimental Investigation,” University of Delaware, April 2016  
“The Interaction of Homogeneous Isotropic Turbulence with Solid and Sediment Boundaries: an Experimental Investigation,” Stanford University, January 2016  
“An Experimental Investigation of Sediment Suspension and Ripple Evolution due to Turbulence in the Absence of Mean Shear,” Pontificia Universidad Javeriana, Bogotá, Colombia, August 2015  
“An Experimental Investigation of Sediment Suspension and Ripple Evolution due to Turbulence in the Absence of Mean Shear,” Stennis Space Center Naval Research Laboratory, Stennis, MS, September 2014

**CONFERENCE PRESENTATIONS**

\* denotes graduate student under my supervision

# denotes presenting author (default first author)

- Lagade, J.A.\* and **Johnson, B.A.** # “Turbulent Erosion of a Sharp Density Interface,” 2020. *Ocean Sciences Meeting*, San Diego, CA, oral presentation
- Florez, L.P.\* and **Johnson, B.A.** “Quantifying Large Scale Visual Structures in a Turbulent Buoyant Plume,” 2019. *American Geophysical Union*, San Francisco, CA, e-lighting presentation
- Florez, L.P.\* and **Johnson, B.A.** “Correlating Entrainment Mechanisms and Turbulence in a Buoyant Plume to Large Scale Visual Structures,” 2019. *American Geophysical Union*, San Francisco, CA, poster
- Hendrickson, G.R.\* and **Johnson, B.A.** “Poster: In-Situ Determination of Volumetric Flow Rate via Surface Imaging Techniques,” 2019. *American Geophysical Union*, San Francisco, CA, poster
- McCutchan, A.L.\* and **Johnson, B.A.** “Designing an Experimental Apparatus for Measurements of Ice Melting Rates in Homogeneous Isotropic Turbulence,” 2019. *American Geophysical Union*, San Francisco, CA, e-lighting presentation
- McCutchan, A.L.\* and **Johnson, B.A.** “Enhancement of Ice Melting Rates via Homogeneous Isotropic Turbulence,” 2019. *American Geophysical Union*, San Francisco, CA, oral presentation
- Knaup, H.M.\* and **Johnson, B.A.** # Exploring the role of bed fluidization on ripple formation in highly turbulent flows. 2019. *American Geophysical Union*, San Francisco, CA, e-lighting presentation
- Lagade, J.A.\* and **Johnson, B.A.** # “Turbulent Erosion of a Sharp Density Interface,” 2019. *American Physical Society Division of Fluid Dynamics Meeting*, Seattle, WA, flash presentation with poster
- Knaup, H.M.\* and **Johnson, B.A.** Exploring the role of bed fluidization on ripple formation in highly turbulent flows. 2019. *THESIS 2019*, Newark, DE, flash presentation with poster
- Lagade, J.A.\* and **Johnson, B.A.** # “Turbulent Erosion of a Sharp Density Interface,” 2019. *THESIS 2019*, Newark, DE, oral presentation
- Florez, L.P.\* and **Johnson, B.A.** “Correlating Entrainment Mechanisms and Turbulence in a Buoyant Plume to Large-Scale Visual Structures,” 2018. *American Geophysical Union*, Washington, DC, poster
- Johnson, B.A.**, Zunino, H.A., Ding, L., Adrian, R.J., and Clarke, A. “Gas and Particle Motions in a Rapidly Decompressed Flow,” 2018. *American Geophysical Union*, Washington, DC, poster
- Lagade, J.A.\* and **Johnson, B.A.** “Turbulent Erosion of a Sharp Density Interface by Homogeneous Isotropic Turbulence,” 2018. *American Geophysical Union*, Washington, D.C., poster
- Johnson, B.A.** and Cowen, E.A. “Sediment Suspension and Bed Morphology in a Mean Shear Free Turbulent Boundary Layer,” 2018. *Association for the Sciences of Limnology and Oceanography Summer Meeting*, Victoria, BC, Canada, oral presentation
- Johnson, B.A.** and Cowen, E.A. “Sediment Suspension and Bed Morphology in a Mean Shear Free Turbulent Boundary Layer,” 2018. *The 8<sup>th</sup> International Symposium on Environmental Hydraulics*, South Bend, IN, oral presentation
- Florez, L.P.\* and **Johnson, B.A.** “Entrainment Mechanisms and Turbulence in a Buoyant Plume,” 2018. *Bluebonnet Symposium on Thermal Fluid Sciences*, Dallas, TX, oral presentation
- Johnson, B.A.** “Sediment Suspension and Bed Morphology in a Mean Shear Free Turbulent Boundary Layer,” 2018. *Bluebonnet Symposium on Thermal Fluid Sciences*, Dallas, TX, oral presentation
- Lagade, J.A.\* and **Johnson, B.A.** “Turbulent Erosion of a Sharp Density Interface,” 2018. *Bluebonnet Symposium on Thermal Fluid Sciences*, Dallas, TX, oral presentation
- Johnson, B.A.**, Zunino, H.A., Adrian, R.J., and Clarke, A. “Gas and Particle Motions in a Rapidly Decompressed Flow,” 2017. *American Physical Society Division of Fluid Dynamics Meeting*, Denver, CO, oral presentation
- Johnson, B.A.** and Cowen, E.A. “Turbulent Boundary Layers and Sediment Suspension Absent Mean Flow-Induced Shear: An Experimental Study,” 2016. *American Geophysical Union*, San Francisco, CA, poster

- Johnson, B.A.** and Cowen, E.A. "Turbulent Boundary Layers and Sediment Suspension Absent Mean Flow-Induced Shear: An Experimental Study," 2016. *American Physical Society Division of Fluid Dynamics Meeting*, Portland, OR, oral presentation
- Johnson, B.A.** and Cowen, E.A. "The Interaction of Homogeneous Isotropic Turbulence with Solid and Sediment Boundaries: an Experimental Investigation," 2016. *Ocean Sciences Meeting*, New Orleans, LA, oral presentation
- Johnson, B.A.** and Cowen, E.A. "The Effect of a Solid Boundary on Homogeneous Isotropic Turbulence: an Experimental Investigation," 2015. *American Physical Society Division of Fluid Dynamics Meeting*, Boston, MA, oral presentation
- Johnson, B.A.** and Cowen, E.A. "The Effect of a Solid Boundary on Homogeneous Isotropic Turbulence: an Experimental Investigation," 2015. *Binghamton Geomorphology Symposium on Laboratory Experiments in Geomorphology*, Buffalo, NY, poster
- Johnson, B.A.** and Cowen, E.A. "Turbulent Sediment Suspension and Induced Ripple Dynamics Absent Mean Shear," 2014. *American Geophysical Union Conference*, San Francisco, CA, poster
- Johnson, B.A.** and Cowen, E.A. "An Experimental Investigation of Sediment Suspension and Ripple Evolution due to Turbulence in the Absence of Mean Shear," 2014. *Ocean Sciences Meeting*, Honolulu, HI, oral presentation
- Johnson, B.A.** and Cowen, E.A. "Sediment Resuspension and Bed Morphology in Highly Turbulent Flows," 2012. *International Conference on Coastal Engineering*, Santander, Spain, oral presentation
- Johnson, B.A.** and Cowen, E.A. "Turbulent Boundary Layers Absent Mean Shear," 2011. *American Physical Society Division of Fluid Dynamics Meeting*, Baltimore, MD, oral presentation
- Johnson, B.A.** and Cowen, E.A. "Interaction of Turbulent Structures with a Mobile Sediment Bed," 2011. *Coherent Flow Structures II Conference*, Burnaby, BC, Canada, oral presentation
- Johnson, B.A.** and Cowen, E.A. "Sediment Resuspension and Bed Morphology in Highly Turbulent Flows," 2011. *NortekUSA Technical Symposium*, Newport, RI, oral presentation
- Johnson, B.A.** and Cowen, E.A. "Sediment Resuspension and Bed Morphology in Highly Turbulent Flows," 2010. *American Geophysical Union Conference*, San Francisco, CA, oral presentation
- Johnson, B.A.** and Cowen, E.A. "Turbulent Sediment Resuspension Absent Mean Shear," 2009. *International Association of Hydraulic Engineering and Research Congress*, Vancouver, BC, Canada, oral presentation

### AWARDS AND HONORS

Lowell TILT meter equipment grant recipient	2019
Graduate School Research Travel Grant, Cornell University	Fall 2013
Graduate School Conference Grant, Cornell University	2009-2016
Perry Teaching Assistant Prize (granted to 3 Teaching Assistants annually in the School of Civil & Environmental Engineering)	2010, 2011
National Science Foundation Graduate Research Fellowship Honorable Mention	2009, 2010
Nortek Student Equipment Grant	2010
Joseph H. DeFrees Fellowship, Cornell University	2009-2011
Cornell University College of Engineering Fellowship	2008-2009
Charles R. Westgate Scholarship in Engineering, Johns Hopkins University	2004-2008
Vredenburg Summer Engineering Travel Scholarship, Johns Hopkins University	2007

### REVIEWER

Journal of Fluid Mechanics  
 Journal of Atmospheric and Oceanic Technology  
 Journal of Engineering Mechanics

Journal of Geophysical Research – Oceans  
Journal of Hydraulic Engineering

### **PROFESSIONAL AFFILIATIONS**

Association for the Sciences of Limnology and Oceanography, since 2018  
International Association for Hydro-Environment Engineering and Research, since 2018  
American Physical Society, since 2012  
American Geophysical Union, since 2010

### **SERVICE ACTIVITIES**

Kappa Kappa Gamma, Career Panelist	2020
UT Austin CAEE Student Experience Committee	2019-present
UT Austin Cockrell School of Engineering Graduate Student Career Panelist	2019
GeoFORCE laboratory demonstrator, Jackson School of Geosciences	2019
UT Austin Graduate SWE invited speaker	2019
UT Austin Women in Engineering (WEP) program guide	2019
ASCE Continuing Education program guide	2019
UT Austin School of Engineering Diversity and Inclusion Study Group	2019-present
Kappa Kappa Gamma, Diversity and Inclusion Committee member	2019
UT Austin CAEE Sustainable Doghouse Challenge, Judge	2018, 2019
UT Austin CAEE Distinguished Lecturer Series Committee member	2018-present
Explore UT: Watch Water Flow Uphill and Visualize Flow Around an Object, Volunteer Demonstrator	2018
Panelist for “Progressing Toward Completion & Beyond: Strategies for Sustaining Motivation,” Cornell University	2017
Kappa Kappa Gamma, Diversity and Inclusion Task Force member	2017
Cornell University CATALYST Academy, Project assistant	2017
Arizona State University Fluid Mechanics Seminar Series Founder	2016-2017
Kappa Kappa Gamma, Standards Advisor, Arizona State University	2017
Cornell University School of Civil & Environmental Engineering Environmental Fluid Mechanics & Hydrology, Seminar Coordinator	2014, 2015
Kappa Kappa Gamma, Chapter Council Advisor, Cornell University	2009-2015
Cornell University Research Initiatives in Engineering (CURIE) Academy Volunteer coordinator, Project leader	2013
Cornell University American Society of Civil Engineering (ASCE) Concrete Canoe Team, Assistant Paddling Coach	2012-2014
Cornell University School of Civil & Environmental Engineering Graduate Student Association, President	2011
Expanding Your Horizons (EYH), Workshop Co-coordinator, Cornell University	2011

### **STUDENTS SUPERVISED**

Aubrey McCutchan (M.S./Ph.D. in Civil Engineering, UT Austin, expected Spring 2023)  
Arefe Ghazi (Ph.D. in Civil Engineering, UT Austin, expected Spring 2022)  
Julio Chavez (M.S. in Civil Engineering, UT Austin, expected Spring 2021)  
Greg Hendrickson (M.S. in Civil Engineering, UT Austin, May 2020)  
Hannah Knaup (M.S. in Civil Engineering, UT Austin, May 2020)

Luisa Florez (M.S. in Environmental & Water Resources Engineering, UT Austin, December 2019)

Andrew Jaeger (M.S. in Civil Engineering, UT Austin, December 2019)

Joel Lagade, Jr. (M.S. in Environmental & Water Resources Engineering, UT Austin, May 2019)

Yongsik Kim (Ph.D. in Civil Engineering, UT Austin, May 2019, co-supervised with Ben Hodges)

Bonnie Powell (B.S. in Mechanical Engineering, Cornell University, May 2018)

Claire DeVoe (B.S. in Civil & Environmental Engineering, Cornell University, May 2016)

Zoe Shiveley (B.S. in Landscape Architecture, Cornell University, May 2015)

### **SKILLS**

Programming: Matlab, Arduino

Languages: English – native, Spanish – professional proficiency