

DAREN A. WATSON

Fulbright Scholar | Prime Minister's National Award for Excellence | Tau Beta Pi Engineering Honor Society

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EDUCATION

University of Central Florida

Florida, United States of America

Ph.D. Doctor of Philosophy in Mechanical Engineering, August 2017 – December 2020

Activities: American Society of Mechanical Engineers, Fluids and Structures Laboratory

M.S. Master of Science in Mechanical Engineering, August 2017 – December 2019

Activities: Tau Beta Pi Engineering Honor Society, Fulbright Graduate Scholarship, GPA: 3.4

University of the West Indies

Kingston, Jamaica

M.Phil. Master of Philosophy in Physics, September 2013 – January 2016

Activities: Alternative Energy Research Group, UWI Graduate Scholarship

B.S. Bachelor of Science in Environmental Physics and Mathematics, September 2010 – July 2013

Activities: Alternative Energy Research Group, Material Science Research Group, GPA: 4.0

APPOINTMENTS

Florida Polytechnic University

Florida, United States of America

Assistant Professor, January 2021 – Present

Accomplishments: Executed a comprehensive curriculum geared towards educating a semesterly cohort of mechanical engineering students with most achieving their academic and professional goals.

University of Central Florida

Florida, United States of America

Postdoctoral Research Associate, October 2020 – December 2020

Accomplishments: Conceptualized, designed, implemented, and managed various incompressible fluid–flow experiments and projects at the Fluids and Structures Lab. Principal Investigator: Andrew Dickerson.

Graduate Research Assistant, August 2017 – September 2020

Accomplishments: Conceptualized, designed, implemented, and managed various incompressible fluid–flow experiments and projects at the Fluids and Structures Lab. Principal Investigator: Andrew Dickerson.

University of the West Indies

Kingston, Jamaica

Instructor, August 2015 – July 2017

Accomplishments: Executed a comprehensive curriculum geared towards educating a semesterly cohort of physics undergraduate students with most achieving their academic and professional goals.

Adjunct Assistant Lecturer, September 2014 – May 2015

Accomplishments: Executed a comprehensive curriculum geared towards educating a semesterly cohort of engineering undergraduate students with most achieving their academic and professional goals.

Adjunct Tutor, September 2013 – May 2014

Accomplishments: Enhanced course learning outcomes of physics undergraduate students by providing supplemental lessons and interventions throughout the semester.

A. Journal Articles

1. Salas–Sivira, G., Roggero, S., Anzola, S., A., Zeas, F. A., Smith, K. B., and Watson, D. A. [2024] “Compound cavity formation and splash suppression by water entry through floating millimetric microplastics”. Manuscript In-Preparation.
2. Watson, D. A., Thornton, M. R., Khan, H. A., Diamco, R. C., Aydin D. Y., and Dickerson, A. K. [2024] “Water striders are impervious to raindrop collision forces and submerged by collapsing craters”. Proceedings of the National Academy of Sciences of the United States of America, Volume 121, Issue 5, doi:10.1073/pnas.2315667121, January 2024. PDF [Issue Cover]
3. Artman–Breitung, M., Watson, D. A., Dickerson, A. K. [2021] “Simultaneous impact of twin drops on a semi-infinite liquid target”. Physics of Fluids, Volume 33, Issue 10, doi:10.1063/5.0067442, October 2021. PDF
4. Watson, D. A., Bom, M. J., Weinberg, P. M., Souchik, J. C., and Dickerson, A. K. [2021] “Water entry dynamics of spheres with heterogeneous wetting properties”. Physical Review Fluids, Volume 6, Issue 4, doi:10.1103/physrevfluids.6.044003, April 2021. PDF
5. Watson, D. A., Souchik, J. C., Weinberg, P. M., Bom, M. J., and Dickerson, A. K. [2020] “Making a splash with fabrics in hydrophilic sphere entry”. Journal of Fluids and Structures, Volume 94, 102907, doi:10.1016/j.jfluidstructs.2020.102907, March 2020. PDF
6. Watson, D. A., Stephen, J. L., and Dickerson, A. K. [2019] “Impacts of free-falling spheres onto a deep liquid pool with altered fluid and impactor surface conditions”. Journal of Visualized Experiments, Issue 144, e59300, doi:10.3791/59300, February 2019. PDF
7. Watson, D. A., Stephen, J. L., and Dickerson, A. K. [2018] “Jet amplification and cavity formation induced by penetrable fabrics in hydrophilic sphere entry”. Physics of Fluids, Volume 30, Issue 8, doi:10.1063/1.5036655, August 2018. PDF [Issue Cover]
8. Watson, D. A., Binnie, Y., Duncan, K. L., Dorville, J. F. [2017] “Photurgen: The open–source software for the analysis and design of hybrid solar wind energy systems in the Caribbean region: An introduction to its development policy”. Energy Reports, Volume 3, doi:10.1016/j.egy.2017.03.001, November 2017. PDF

B. Conference Papers

1. Alam, E., Smith, N., Watson, D., Hassan, T., and Neupane, K., [2019] “Early screening of DDH using svm classification”. 2019 SoutheastCon, doi:10.1109/SoutheastCon42311.2019.9020565, April 2019. PDF

C. Conference Presentations

1. Cruz, A. A., Smith, K. B., and Watson, D. A. [2023] “Water entry dynamics of hydrophobic spheres near floating debris on a deep liquid pool”. Poster. Presented at the Florida Undergraduate Research Conference, February 17 – 18, 2023, Miami, Florida, United States of America.
2. Cruz, A. A., Smith, K. B., and Watson, D. A. [2022] “Water entry dynamics of hydrophobic spheres near floating debris on a deep liquid pool”. Poster. Presented at the American Physical Society 75th Annual Meeting of the APS Division of Fluid Dynamics, November 20 – 22, 2022, Indianapolis, Indiana, United States of America.

3. Smith, K. B., Cruz, A. A., and Watson, D. A. [2022] "Water entry dynamics of hydrophilic spheres through particle-laden free surfaces". Poster. Presented at the American Physical Society 75th Annual Meeting of the Division of Fluid Dynamics, November 20 – 22, 2022, Indianapolis, Indiana, United States of America.
4. Watson, D. A., and Dickerson, A. K. [2021] "Life on stormy seas: water striders are impervious to raindrop impacts". Presentation. Presented at the American Physical Society 74th Annual Meeting of the Division of Fluid Dynamics, November 21 – 23, 2021, Phoenix, Arizona, United States of America.
5. Dickerson, A. K., Artman-Breitung, M., and Watson, D. A. [2021] "Simultaneous impact of twin drops on a semi-infinite liquid target". Presentation. Presented at the American Physical Society 74th Annual Meeting of the Division of Fluid Dynamics, November 21 – 23, 2021, Phoenix, Arizona, United States of America.
6. Watson, D. A., Bom, M. J., Souchik, J. C., and Dickerson, A. K. [2019] "Underwater acrobatics of partially coated spheres". Presentation. Presented at the American Physical Society 72nd Annual Meeting of the Division of Fluid Dynamics, November 23 – 26, 2019, Seattle, Washington, United States of America.
7. Watson, D. A., Souchik, J. C., Bom, M. J., and Dickerson, A. K. [2019] "Water entry of hydrophilic spheres through fabric-fluid interfaces". Poster. Presented at the American Physical Society 72nd Annual Meeting of the Division of Fluid Dynamics, November 23 – 26, 2019, Seattle, Washington, United States of America.
8. Alam, E., Smith, N., Watson, D. A., Hassan, T., and Neupane, K., [2019] "Early screening of DDH using svm classification". Presentation. Presented at the IEEE SoutheastCon 2019, April 11 – 14, 2019, Huntsville, Alabama, United States of America.
9. Watson, D. A., DiAmco, R. C., Khan, H. A., and Dickerson, A. K. [2019] "Survivability of water striders during raindrop collisions". Poster. Presented at the 16th Annual Graduate Research Forum, April 5, 2019, University of Central Florida, Florida, United States of America.
10. Bom, M. J., Souchik, J. C., Watson, D. A., and Dickerson, A. K. [2019] "Vertical impacts of chemically heterogeneous spheres on a deep liquid pool". Poster. Presented at the Showcase of Undergraduate Research Excellence, April 4, 2019, University of Central Florida, Florida, United States of America.
11. Souchik, J. C., Bom, M. J., Watson, D. A., and Dickerson, A. K. [2019] "Vertical impacts of free-falling hydrophilic spheres onto stratified fluid surfaces". Poster. Presented at the Showcase of Undergraduate Research Excellence, April 4, 2019, University of Central Florida, Florida, United States of America.
12. Watson, D. A., Khan, H. A., DiAmco, R. C., and Dickerson, A. K. [2019] "On the survival of water striders during raindrop impacts". Presentation. Presented at the Society for Integrative & Comparative Biology Annual Meeting, January 3 – 7, 2019, Tampa, Florida, United States of America.
13. Stephen, J. L., Watson, D. A., and Dickerson, A. K. [2018] "Splash regulation of vertical impacts on a liquid surface by alteration of surface conditions". Poster. Presented at the Showcase of Undergraduate Research Excellence, April 4, 2018, University of Central Florida, Florida, United States of America.
14. Watson, D. A., Stephen, J. L., and Dickerson, A. K. [2017] "On the reduction of splash-back". Presentation. Presented by Andrew Dickerson at the American Physical Society 70th Annual Meeting of the Division of Fluid Dynamics, November 19 – 21, 2017, Denver, Colorado, United States of America.
15. Watson, D. A., Binnie, Y., Duncan, K. L., Dorville, J. F. [2017] "Photurgen: The open-source software for the analysis and design of hybrid solar wind energy systems in the Caribbean region". Poster. Presented at the Annual Research Day Symposium, February 1 – 3, 2017, University of the West Indies, Kingston, Jamaica.

16. Watson, D. A., Dorville, J. F., and Duncan, K. L. [2015] "First experimentation of Photurgen: An optimization and management software for hybrid renewable energy systems". Poster. Presented at the Faculty of Science and Technology's 10th Biennial Conference, June 8 – 9, 2015, University of the West Indies, Kingston, Jamaica.

D. Graduate Theses

1. Watson, D. A. [2020] "Interfacial properties modulate water entry dynamics for spherical projectiles". Doctor of Philosophy. University of Central Florida, Florida, United States of America. PDF
2. Watson, D. A. [2016] "Realization of an open-source software of computation for the optimization of hybrid renewable energy systems: application in the Caribbean region". Master of Philosophy. University of the West Indies, Kingston, Jamaica. PDF

E. Invited Talks

1. Water entry dynamics of spherical projectiles with surface debris. Presentation. Presented at the Mechanical Engineering Graduate Seminar, February 13, 2023, Florida Polytechnic University, Florida, United States of America.
2. Water entry dynamics of spherical projectiles. Presentation. Presented at the Physics Colloquium Series, November 18, 2021, University of the West Indies, Kingston, Jamaica.
3. Rainfall impacts on water striders. Presentation. Presented to the Locomotion and Design in Nature undergraduate class, February 16, 2021, University of Central Florida, Florida, United States of America.
4. Duality of STEM: The Scientist and the Engineer. Presentation. Presented at the Undergraduate Career Day, February 9, 2021, Florida Polytechnic University, Florida, United States of America.
5. Being successful in Physics. Presentation. Presented at the Undergraduate Career Seminar, November 17, 2021, University of the West Indies, Kingston, Jamaica.

F. Funded Projects

1. Contributor, [2020 – 2021] "CAREER: Tuning liquid jet and splash dynamics by deformable and heterogeneous boundaries (Award #1941341)". Principal Investigator: Andrew Dickerson. National Science Foundation, United States of America. Award Index

Project Contributions: Experimental design and execution, data analysis, manuscript cultivation, manuscript editing, model generation, and undergraduate mentoring.
2. Contributor, [2013 – 2015] "A feasibility study of renewable energy production in Jamaican communities". Principal Investigators: Keith Duncan and Jean-Francois Dorville. New Initiative Grant, University of the West Indies, Jamaica. Proposal

Project Contributions: Experimental design and execution, data analysis, manuscript cultivation, manuscript editing, and software development. Technical Report

G. Press Coverage

1. This is how water spiders resist the rain. Science & Vie Magazine, April 2024. Press
2. Surviving rainfall. FYFD, March 28, 2024. Press

3. Rainproof water striders. American Physical Society, February 27, 2024. Press
4. Water-bombed insects and carrots that curl. Chemical and Engineering News, February 26, 2024. Press
5. How water spiders resist (or not) raindrops. News in France – republished from Le Monde, January 31, 2024. Press
6. How water spiders resist (or not) raindrops. Le Monde, January 31, 2024. Press
7. How water striders survive raindrop collisions? Proceedings of the National Academy of Sciences of the United States of America, January 30, 2024. Press
8. How pond skaters avoid raindrop drownings. The Naked Scientists, January 26, 2024. Press
9. Retinas reveal future health, and the first cells on Earth. Plus, how do pond skaters avoid raindrops? The Naked Scientists, January 26, 2024. Press
10. Slow-motion shows raindrops hitting insects. ABS-CBN News, January 26, 2024. Press
11. What happens when raindrops land on insects? Herald Sun – republished from Reuters, January 25, 2024. Press
12. What happens when raindrops land on insects? The Advertiser – republished from Reuters, January 25, 2024. Press
13. What happens when raindrops land on insects? Excelsio Media – republished from Reuters, January 25, 2024. Press
14. What happens when raindrops land on insects? The Weekly Times – republished from Reuters, January 25, 2024. Press
15. What happens when raindrops land on insects? Townsville Bulletin – republished from Reuters, January 25, 2024. Press
16. What happens when raindrops land on insects? The Chronicle – republished from Reuters, January 25, 2024. Press
17. What happens when raindrops land on insects? Gold Coast Bulletin – republished from Reuters, January 25, 2024. Press
18. What happens when raindrops land on insects? The Daily Telegraph – republished from Reuters, January 25, 2024. Press
19. What happens when raindrops land on insects? Yahoo News – republished from Reuters, January 25, 2024. Press
20. What happens when raindrops land on insects? Reuters, January 25, 2024. Press
21. Tiny water-walking bugs provide scientists with insights on how microplastics are pushed underwater. Warwick Beacon – republished from The Conversation, January 23, 2024. Press
22. Tiny water-walking bugs provide scientists with insights on how microplastics are pushed underwater. DownToEarth – republished from The Conversation, January 23, 2024. Press

23. Tiny water-walking bugs provide scientists with insights on how microplastics are pushed underwater. Phys.org – republished from The Conversation, January 23, 2024. Press
24. Tiny water-walking bugs provide scientists with insights on how microplastics are pushed underwater. The Purcell Register – republished from The Conversation, January 23, 2024. Press
25. Tiny water-walking bugs provide scientists with insights on how microplastics are pushed underwater. Canadian Manufacturing – republished from The Conversation, January 23, 2024. Press
26. Water-walking bugs provide scientists with insights on how microplastics are pushed underwater. The Eagle Tribune – republished from The Conversation, January 23, 2024. Press
27. Tiny water-walking bugs provide scientists with insights on how microplastics are pushed underwater. The Bradenton Times – republished from The Conversation, January 23, 2024. Press
28. Tiny water-walking bugs provide scientists with insights on how microplastics are pushed underwater. Yahoo News – republished from The Conversation, January 22, 2024. Press
29. Tiny water-walking bugs provide scientists with insights on how microplastics are pushed underwater. The Conversation, January 22, 2024. Press
30. Stunning slo-mo videos show how insects survive raindrop collisions. NewScientist, January 22, 2024. Press
31. The water strider’s rain ballet. DW Science, November 25, 2021. Press
32. Insects resist the rain. EurekAlert, November 16, 2021. Press
33. New research on hydrophobic insects could improve future of robotics. Florida Poly News, November 4, 2021. Press
34. FST alum receives Prime Minister’s 2020 Youth Award for Academics. University of the West Indies, December 21, 2020. Press
35. Thirty receives Prime Minister’s Youth Award. Loop News, December 14, 2020. Press
36. A penetrable fabric, like toilet paper, affects a projectile’s big splash. Newswise – republished from the American Institute of Physics, August 14, 2018. Press
37. A penetrable fabric, like toilet paper, affects a projectile’s big splash. American Institute of Physics, August 14, 2018. Press
38. Mona produces four Fulbright scholars. UWIMONA NOW, July 2, 2017. Press
39. Fulbright awardees 2017–2018 named. Jamaica Observer, July 2, 2017. Press

SERVICE

A. Professional

1. Reviewer, Journal of Fluids and Structures, Elsevier, United States of America, 2021 – Present
📄 Manuscripts Reviewed: 3
2. Reviewer, Physics of Fluids, American Institute of Physics, United States of America, 2021 – Present
📄 Manuscripts Reviewed: 19
3. Mentor, CECS/CREOL Mentorship Program, University of Central Florida, Orlando, Florida, United States of America. 2023 – 2024
4. Judge, Senior Design Showcase, April 15 – April 16, 2024, College of Engineering and Computer Science, University of Central Florida, Orlando, Florida, United States of America. Showcase
5. Judge, Senior Design Showcase, November 27 – November 28, 2023, College of Engineering and Computer Science, University of Central Florida, Orlando, Florida, United States of America. Showcase
6. Judge, Senior Design Showcase, April 17 – April 18, 2023, College of Engineering and Computer Science, University of Central Florida, Orlando, Florida, United States of America. Showcase
7. Judge, Senior Design Showcase, November 29 – December 2, 2022, College of Engineering and Computer Science, University of Central Florida, Orlando, Florida, United States of America. Showcase
8. Judge, Gallery of Fluid Motion, American Physical Society 75th Annual Meeting of the APS Division of Fluid Dynamics, November 20 – 22, 2022, Indianapolis, Indiana, United States of America. Showcase
9. Chair, Session A23: Microscale Flows: Particles, Drops, Bubbles I, American Physical Society 74th Annual Meeting of the APS Division of Fluid Dynamics, November 21 – 23, 2021, Phoenix, Arizona, United States of America. Session Index

B. Institutional

1. Panelist, Engineering Design Senior Capstone Panel Presentations, April 17 – April 19, Florida Polytechnic University, Lakeland, Florida, United States of America.
2. Committee Member, Admissions Appeals Committee, Florida Polytechnic University, Florida, United States of America. Fall 2024 – Present.
3. Faculty Advisor, National Society of Black Engineers, Florida Polytechnic University, Florida, United States of America. Fall 2023 – Present.
4. Instructor, Fundamentals of Engineering Exam Review, Florida Polytechnic University, Florida, United States of America. Spring 2021 – Present.
5. Faculty Advisor, Astronomy Club, Florida Polytechnic University, Florida, United States of America. Spring 2023 – Fall 2023.
6. Committee Member, Faculty Search Committee, Assistant/Associate Professor in Mechanical Engineering, Florida Polytechnic University, Florida, United States of America. Spring 2023.
7. Mentor, Emerging Leaders Lunch and Learn, Florida Polytechnic University, Florida, United States of America. Spring 2023.

8. Committee Member, Phoenix Spirit Award Committee, Florida Polytechnic University, Florida, United States of America. Spring 2022.
9. Committee Member, Academic Review Board, Florida Polytechnic University, Florida, United States of America. Spring 2022.
10. Committee Member, Faculty Search Committee, Assistant/Associate Professor in Mechanical Engineering, Florida Polytechnic University, Florida, United States of America. Spring 2022.
11. Committee Member, Faculty Search Committee, Assistant/Associate Professor in Applied Mathematics, Florida Polytechnic University, Florida, United States of America. Fall 2021.
12. Committee Member, Faculty Search Committee, Assistant Professor in Physics, Florida Polytechnic University, Florida, United States of America. Spring 2021.

MENTORSHIP

Student	Institution	Program	Duration
Madison Ricker	Florida Polytechnic University	Mechanical Engineering	2024 - 2025
Gabriella Salas Sivira	Florida Polytechnic University	Mechanical Engineering	2024 - 2025
Sabrina Roggero	Florida Polytechnic University	Environmental Engineering	2024 - 2025
Zamar Joseph	Florida Polytechnic University	Mechanical Engineering	2024 - 2025
David Vidana-Fuentes	Florida Polytechnic University	Electrical Engineering	2024 - 2025
Sebastian Anzola	Florida Polytechnic University	Mechanical Engineering	2024 - 2025
Freddy Zeas	Florida Polytechnic University	Mechanical Engineering	2024 - 2025
Korrie Smith	Florida Polytechnic University	Mechanical Engineering	2022 - 2024
Anthony Cruz	Florida Polytechnic University	Mechanical Engineering	2022 - 2023
Jonathan Galves	University of Central Florida	Mechanical Engineering	2019 - 2020
Mason Thornton	University of Central Florida	Mechanical Engineering	2019 - 2020
Madison Weinberg	University of Central Florida	Mechanical Engineering	2019 - 2020
Joshua Bom	University of Central Florida	Mechanical Engineering	2018 - 2020
Chris Souchik	University of Central Florida	Mechanical Engineering	2018 - 2020
Hiba Khan	University of Central Florida	Mechanical Engineering	2018 - 2019
Ryan DiAmco	University of Central Florida	Mechanical Engineering	2018 - 2019
Jeremy Stephen	University of Central Florida	Mechanical Engineering	2017 - 2019
Yekini Binnie	University of the West Indies	Energy and Environmental Physics	2016 - 2017

AWARDS

Honors	Granting Institution	Country	Year
Special Award for Academics	University of the West Indies	Jamaica	2022
Prime Minister's National Award for Excellence	Office of the Prime Minister	Jamaica	2020
Fulbright Foreign Student Scholarship	U.S. Department of State	USA	2017 - 2019
UWI Postgraduate Scholarship	University of the West Indies	Jamaica	2013 - 2014
Department of Physics' Honor Society	University of the West Indies	Jamaica	2011 - 2013

Note: The Prime Minister's National Award for Excellence is the highest honor bestowed upon a Jamaican below the age of 30 who has achieved eminent national and international distinction in a specified area.

FUNDING

Grant	Amount	Duration	Funding Agency	Grant Number
Internal Grant	\$12,920.00	2024 – 2025	Florida Polytechnic University	GR-24SUMR-DW
Start-Up Package	\$36,745.00	2021 – 2024	Florida Polytechnic University	GR-21FSU1-DW

TEACHING

Florida Polytechnic University		
EAS 3101	Fundamentals of Aerodynamics ¹	Department of Mechanical Engineering
EGN 1006	Career Design for STEM Disciplines ¹	Department of Mechanical Engineering
EGN 2002C	Engineering Skills and Design II ¹	Department of Mechanical Engineering
EGN 3015C	Mechanical Lab Design I ¹	Department of Mechanical Engineering
EGN 3016C	Mechanical Lab Design II ¹	Department of Mechanical Engineering
EGN 3311	Engineering Mechanics: Statics ¹	Department of Mechanical Engineering
EGN 3321	Engineering Mechanics: Dynamics ¹	Department of Mechanical Engineering
EGN 3343	Engineering Thermodynamics ¹	Department of Mechanical Engineering
EGN 4715	Propulsion and Combustion Systems	Department of Mechanical Engineering
EML 3401	Principles of Turbomachinery ¹	Department of Mechanical Engineering
IDS 1380	Introduction to STEM ¹	Department of Mechanical Engineering
IDS 4941	Professional Experience Internship ¹	Department of Mechanical Engineering

University of Central Florida		
EGN 3343	Thermodynamics	Department of Mechanical and Aerospace Engineering
EML 3701	Fluid Mechanics I	Department of Mechanical and Aerospace Engineering

University of the West Indies		
ECNG 1012	Engineering Thermodynamics ¹	Faculty of Engineering
ELET 3600	Energy System Laboratory ¹	Department of Physics
ELET 3611	Integrating Alternative Energy ¹	Department of Physics
ELNG 1101	Physics for Engineers ¹	Faculty of Engineering
FSCI 6204	Crime Scene Reconstruction ¹	Department of Basic Medical Sciences
PHYS 3681	Wind and Hydro Power ¹	Department of Physics

Note: ¹ denotes courses taught as the Instructor of Record.

REFERENCES

Dr. Andrew Dickerson,
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