

Ryan Kozlowski, Ph.D.

Assistant Professor of Physics, College of the Holy Cross

Haberlin 110, 1 College St, Worcester, MA 01610 | rkozlows@holycross.edu

Education:

Ph.D. in Physics, 2021, Duke University

Dissertation - *Mesoscale forces and grain motion in granular media exhibiting stick-slip dynamics: effects of friction and grain shape* (Advisors – Joshua E. S. Socolar and Karen E. Daniels)

BS in Physics with Honors, 2016, Davidson College, *Summa cum laude*

TEACHING EXPERIENCE

Instructor of Record

College of the Holy Cross

PHYS 116: Introductory Physics II	Spring 2023, Spring 2024
PHYS 225: Modern Physics Lab	Spring 2023, Spring 2024
PHYS 115: Introductory Physics I	Fall 2022, Fall 2023
PHYS 344: Thermal Physics	Fall 2022, Fall 2023

Berea College

GSTR 332: Scientific Origins	Spring 2022
PHY 127: General Physics I with Algebra + lab	Fall 2021, Spring 2022
PHY 341: Advanced General Laboratory	Fall 2021
PHY 481: Classical Mechanics	Fall 2021

Duke University

Physics 264L: Optics and Modern Physics	Fall 2021 Spring 2020
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Teaching/pedagogy training and development

College of the Holy Cross

HHMI workshop on inclusive excellence in STEM	July 18 – 20, 2023
Physics department discussions of electives in curriculum (Hewlett-Mellon)	June 5 & 7, 2023
New Faculty Orientation	August 9, 2022

Berea College

Student-Faculty Partnership with student Amy Sutter	Spring 2022
New faculty seminar / discussions	Fall 2021 – Spring 2022
American Association of Physics Teachers (AAPT) Winter Meeting 2022	Jan. 6 – 8, 2022
New Faculty Orientation	August 5 – 6, 2021
AAPT New Faculty Workshop	June 28 – July 1, 2021

Duke University

Certificate in College Teaching, Duke Graduate School	Fall 2021 2018 – 2021
Preparing Future Faculty with Kyle Altmann of Elon University	Fall 2020 – Spring 2021
Duke University Bass Instructor of Record Fellowship	Spring 2020

UNDERGRADUATE RESEARCH ADVISING

College of the Holy Cross

- “Granular flow within a quasi-2D hopper with asymmetric orifice boundaries,” Levi Cass. Spring 2024
- “Analyzing flow fields and discharge rates of granular materials flowing out of a tilted silo,” Christine Xiao and Trevor Wallace (volunteer student from Tufts University). Funded by the *Weiss Summer Research* program. Summer 2023

Berea College

- “Granular flow from a tilted hopper,” Carter Luketich and Elijah Oshatz. Funded by the *Undergraduate Research and Creative Projects Program*. Summer 2022
- “Drag of a granular material on conical and spheroidal impactors,” Faisal Kimbugwe. Capstone research project in physics department. Spring 2022

PUBLICATIONS AND PRESENTATIONS

Publications

- C. M. Carlevaro, **R. Kozlowski**, and L. A. Pugnaloni, “[Flow rate in 2D silo discharge of binary granular mixtures: the role of ordering in monosized systems](#),” *Front. Soft Matter* 4:1340744 (2024).
- R. Basak, **R. Kozlowski**, L. A. Pugnaloni, M. Kramar, J. E. S. Socolar, C. M. Carlevaro, and L. Kondic, “[Evolution of force networks during stick-slip motion of an intruder in a granular material: Topological measures extracted from experimental data](#),” *Phys. Rev. E* **108**, 054903 (2023).
- **R. Kozlowski**, J. C. Luketich, E. Oshatz, D. J. Durian, and L. A. Pugnaloni, “[Average outpouring velocity and flow rate of grains discharged from a tilted quasi-2D silo](#),” *Granul. Matter* **25**, 19 (2023).
- **R. Kozlowski**, H. Zheng, K. E. Daniels, and J. E. S. Socolar, “[Stick-slip in a granular material with varying grain angularity](#),” *Front. Phys.* **10**, 916190 (2022).
- L. A. Pugnaloni, C. M. Carlevaro, **R. Kozlowski**, H. Zheng, L. Kondic, and J. E. S. Socolar, “[Universal features of the stick-slip dynamics of an intruder moving through a confined granular medium](#),” *Phys. Rev. E* **105**, L042902 (2022).
- **R. Kozlowski**, H. Zheng, K. E. Daniels, and J. E. S. Socolar, “[Stress propagation in locally loaded packings of disks and pentagons](#),” *Soft Matter* **17**, 10120 (2021).
- R. Basak, C. M. Carlevaro, **R. Kozlowski**, C. Cheng, L. A. Pugnaloni, M. Kramár, H. Zheng, J. E. S. Socolar, and L. Kondic, “[Two approaches to quantification of force networks in particulate systems](#),” *J. Eng. Mech.* **147**, 11 (2021).
- **R. Kozlowski**, H. Zheng, K. E. Daniels, and J. E. S. Socolar, “[Particle dynamics in two-dimensional point-loaded granular media composed of circular or pentagonal grains](#),” *EPJ Web Conf.* **249**, 06010 (2021).
- C. M. Carlevaro, **R. Kozlowski**, L. A. Pugnaloni, H. Zheng, J. E. S. Socolar, and L. Kondic, “[Intruder in a two-dimensional granular system: Effects of dynamic and static basal friction on stick-slip and clogging dynamics](#),” *Phys. Rev. E* **101**, 012909 (2020).

- **R. Kozlowski**, C. M. Carlevaro, K. E. Daniels, L. Kondic, L. A. Pagnaloni, J. E. S. Socolar, H. Zheng, and R. P. Behringer, “[Dynamics of a grain-scale intruder in a two-dimensional granular medium with and without basal friction](#),” *Phys. Rev. E* **100**, 032905 (2019). *Editor’s Suggestion*.

Seminars

- “Stick-slip dynamics in granular materials: the role of grain shape and friction,” Mount Holyoke College April 2024
- “Stick-slip dynamics of granular materials: the role of grain shape,” Clark University November 2023
- “Stick-slip dynamics of granular materials: the role of grain shape,” Universidad Nacional de La Pampa August 2023

Conference presentations

- “Flow rate in 2D silo discharge of binary granular mixtures: The role of ordering in monosized systems”
 - American Physical Society March Meeting 2024, **contributed talk** 2024
- “Average outpouring velocity and flow rate of grains discharged from a tilted quasi-2D silo”
 - 19th Annual Northeastern Granular Materials Workshop, **contributed talk** 2023
 - APS NES 2023 Fall Meeting, **contributed talk** 2023
- “Stick-slip dynamics generated by granular materials with varying grain angularity”
 - American Physical Society March Meeting 2021, **virtual contributed talk** 2021
 - Sand and Sound Symposium 2021, **virtual contributed talk** 2021
- “Stick-slip dynamics in point-loaded granular media comprised of disks or polygonal grains”
 - American Physical Society March Meeting 2022, **virtual contributed talk** 2022
 - Powders and Grains 2021, **proceeding & virtual poster** 2021
 - American Physical Society Division of Fluid Dynamics, **virtual contributed talk** 2020
- “Dynamics of a grain-scale intruder with and without basal friction”
 - American Physical Society March Meeting 2020, **virtual contributed talk** 2020
 - 91st Annual Meeting of the Society of Rheology, **poster** 2019
 - 11th Northeastern Complex Fluids and Soft Matter Workshop, **contributed talk** 2019
 - American Physical Society March Meeting 2019, **contributed talk** 2019
 - Granular Materials Gordon Research Conference, **poster** 2018
 - American Physical Society March Meeting 2018, **contributed talk** 2018
- “Shear jamming and cyclic shear response in a 3D granular medium in microgravity”
 - American Physical Society March Meeting 2019, **contributed talk** 2019

PROFESSIONAL AND COLLEGE SERVICE

- Committee on Distinguished Fellowships and Graduate Studies AY 2023-24 – present
 - Conducted 23 interviews with potential Fulbright applicants from Holy Cross; worked closely with 5 mentors on their application essays and wrote endorsements for each.
- Crompton gold medal award selection committee Spring 2023
- Professional service: referee of 1 article for AIP journal *Physics of Fluids* Fall 2022
- Physics department web-master AY 2023-24
- Physics department digital signage, lab safety committee 2022 – present
- College service: Crompton gold medal award selection committee Spring 2023

AWARDS & HONORS

- Weiss Summer Research Grant, Holy Cross 2023
- Undergraduate Research & Creative Projects Program (URCPP) grant, Berea 2022
- Preparing Future Faculty Fellow, Duke 2020 – 2021
- Anne T. and Robert M. Bass Instructional Fellow, Duke 2019 – 2020
- Mary Creason Memorial Award for Undergraduate Teaching, Duke 2017
- James B. Duke Fellowship, Duke 2016 – 2020

PROFESSIONAL ASSOCIATIONS

American Physical Society: Division of Soft Matter, Division of Fluid Dynamics, Forum on Education, Topical Group on Physics Education Research

American Association of Physics Teachers

Honor Societies: *Sigma Pi Sigma, Phi Beta Kappa, Omicron Delta Kappa*