ISABEL BARRIO SANCHEZ

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EDUCATION

University of Pittsburgh. **Ongoing, expected completion May 2026**
Ph.D. in Mathematics.
Research area: Numerical Analysis and Scientific Computing.
Areas of Interest: Numerical PDEs, Fluid Structure Interaction, Computational Fluid Dynamics.

West Virginia University Institute of Technology **2017-2021**
Bachelor of Science in Mathematics.
Cumulative GPA: 4.0/4.0.
Minors: Computer Science, Economics.

COMPUTER SKILLS

Languages: Python, MatLab, Java, C++, R.
Research: FreeFem++, AMReX.
Other: HTML/CSS, UNIX.

EXPERIENCE

Graduate Teaching Assistant - University of Pittsburgh **2021-present**

- Led recitations and held office hours for various courses in the Mathematics department.
- Was the main instructor for Business Calculus in Summer 2022.
- Graded upper-level undergraduate courses: ODEs, Numerical Mathematical Analysis and Modeling in Applied Math.

Graduate Student Mentor for Girls Math Camp – University of Pittsburgh **Summer 2024**

- Mentored high school female students at a girls camp organized by the Math Department.
- Helped the campers with math projects that they would present at the end of the camp.

Math-to-Industry Bootcamp – University of Minnesota **Summer 2024**

- 6-week summer program providing graduate students with training and experience that is valuable for employment outside of academia
- Learned fundamentals of data science, machine learning, and optimization, using R and

Python.

- Collaborated on a final project with General Electric on CT image reconstruction and denoising algorithms.
- Delivered a white paper, a presentation, and a GitHub page for the final project.

Intern – Lawrence Berkeley National Lab **Summer 2023**

- 10-week research internship under Dr. Ann Almgren and Dr. John Bell at the Applied Mathematics and Computational Science Division of the Lawrence Berkeley National Lab.
- Culminated with a research paper "A New Re-redistribution Scheme for Weighted State Redistribution with Adaptive Mesh Refinement". Published in the Journal of Computational Physics.
- Contributed to the repository AMREX-Fluids/CAMR.

Assistant for the Computer Science Department – WVU Tech **2018-2021**

- Developed and led STEM camps and after-school programs for rural and high-poverty girls in Southern West Virginia. Presented my work at the 2020 ASEE Conference.
- Received grants from NCWIT to develop these programs.
- Assisted Dr Afrin Naz on her Computer Science classes and labs.

TRIO Peer Tutor – WVU Tech **2018-2020**

- Tutored math courses to low-income and first-generation college students.
- Courses tutored: College Algebra, Trigonometry, Calculus 1, 2, and 3, Differential Equations, and Probability and Statistics.
- Included online tutoring through Spring 2020.

Fall Orientation Leader – WVU Tech **2018, 2019,2020**

- Lead Orientation Leader the two last years (led the other OLs).
- Included virtual orientation in Fall 2020 having to manage big groups and events online.

RESEARCH

- I. Barrio Sanchez, A. S. Almgren, J. B. Bell, M.T. Henry de Frahan, W. Zhang, "A new Re-redistribution Scheme for Weighted State Redistribution with Adaptive Mesh Refinement", 2024, Journal of Computational Physics.
- Working on a project on partitioned methods for two-domain problems with Dr. Catalin Trenchea and Dr. Rebecca Durst.
- Working on a project on the long term stability of NSE using Cauchy's method.

- A. Naz, M. Lu, C. Broyles, I. Barrio Sanchez, "Competition of VEX Educational Robotics to Advance Girl's Education (COVERAGE)", June 2020, 2020 ASEE Virtual Annual Conference.

PRESENTATIONS

- "Long-term H^1-Stability of Cauchy's Method for the Navier-Stokes Equations." The 42nd Southeastern-Atlantic Regional Conference on Differential Equations. November 9th, 2024. (SEARCDE 2024).
- "Second-order partitioned algorithms with subiterations." 11th Graduate Student Conference, Clemson University, April 20th, 2024. (Conference page).
- "A new Re-redistribution Scheme for Weighted State Redistribution with Adaptive Mesh Refinement." AWM Student Seminar, November 10, 2023. (Link to talk).
- "A new Re-redistribution Scheme for Weighted State Redistribution with Adaptive Mesh Refinement." Computing Sciences Summer Program Poster Session, August 10, 2023.
- "Competition of VEX Educational Robotics to Advance Girl's Education (COVERAGE)." 2020 ASEE Virtual Annual Conference, Computers in Education Division Technical Session 10: STEM Outreach, June 2020.

TEACHING

University of Pittsburgh

Year	Term	Type	Class
2024	Fall	Recitation	Calculus 1 (28 students)
		Recitation	Calculus 1 (26 students)
		Recitation	Calculus 1 (25 students)
	Spring	Grading	Numerical Linear Algebra (20 students)
		Grading	Numerical Linear Algebra (14 students)
		Grading	Ordinary Differential Equations 2 (17 students)
2023	Fall	Grading	Numerical Mathematical Analysis (29 students)
		Grading	Numerical Mathematical Analysis (11 students)
		Grading	Modeling in Applied Math 1 (20 students)
	Spring	Recitation	Calculus 1 (32 students)
		Recitation	Calculus 2 (25 students each) x2

2022	Fall	Recitation	Business Calculus (25 students)
		Recitation	Calculus 2 (22 students)
		Recitation	Calculus 2 (18 students)
	Summer	Lecture	Business Calculus (15 students)
2021	Fall	Recitation	Calculus 1 (25 students)
		Recitation	Calculus 1 (22 students)
		Recitation	Calculus 2 (24 students)

HONORS AND ACTIVITIES

2024-now Attending the Discipline-Based Science Education Research weekly discussions.

2024-now Officer for the SIAM student chapter at Pitt.

2023-now Officer for the AWM student chapter at Pitt.

2021 Graduated Summa Cum Laude.

2018-2021 Outstanding Freshman, Sophomore, Junior, and Senior for the Mathematics Department.

2017-2021 Intercollegiate women's basketball student-athlete at WVU Tech.

Four-time Conference Champions and three National Appearances.

River States Conference scholar-athlete award every semester.

2019 Successful Participant – The Interdisciplinary Contest in Modeling, COMAP.

2018 Successful Participant – The Mathematical Contest in Modeling, COMAP.

PROFESSIONAL ORGANIZATIONS

- Society for Industrial and Applied Mathematics.
- American Mathematical Society.
- Association for Women in Mathematics.