Lydia Tonani-Penha, BS, PhD

PhD in Mechanical Engineering

Why did you choose to study at WPI?

I chose to transfer to WPI during my time as an undergraduate student because I believed WPI's mechanical engineering program would be well-suited to prepare me for a career in engineering. During my undergraduate years, my project experiences during my Interactive Qualifying Project (IQP) and Major Qualifying Project (MQP) corroborated my desire to use my knowledge and technical skills in research, thus leading me to apply and be accepted into the PhD program at WPI.

How are you involved with the WPI community?

I'm a member of the Women in STEM book club and the Material Advantage chapter at WPI, which allows me to form connections and learn more about graduate students and post-doctoral fellows in various STEM fields on campus. Furthermore, I serve as communications director in the Central Massachusetts chapter of the Association of Women in Science (AWIS) to aid other women in STEM during their careers, regardless of the stage or season they are in. I also am a senior SWEET fellow at the SWEET Center

Hometown
Clinton, MA

Mentor/Advisor

- Robert Hyers
- Anne Ogilvie

Achievements
Graduate school:

- Massachusetts Space Grant Consortium Graduate Fellowship
- Women's Impact Network Grant Co-Recipient for the Women in STEM Book Club
- Massachusetts Space Grant Consortium Travel Award
- TMS Student Travel Grant from the TMS Extraction and Processing Division

to provide team consultations to WPI students working on their IQP, MQP, GPS (Great Problems Seminar), and undergraduate and graduate class projects.

What's your favorite thing about WPI?

One of my favorite things about WPI is the project-based learning opportunities in undergraduate and graduate school. To me, WPI's project experiences were very insightful and helped inform my career decisions regarding graduate school and my current field of research.

Do you have a faculty or staff mentor?

Professor Robert W. Hyers has been an invaluable mentor and advisor during my graduate studies. He has guided me through fellowship applications, class scheduling, conference participation, and my development as a researcher. I am truly grateful for all his help during my studies and I strive to pass on what I have learned from him as I help other STEM students in my career.

I'm also grateful to Anne Ogilvie in the SWEET Center for teaching me about effective and equitable teamwork and how to best support group operations on projects. Her knowledge and support during my undergraduate and graduate studies have been exceptional and opened my eyes to numerous aspects of team coordination that have made me a more efficient researcher and team player.

What projects are you working on?

I've been researching electromagnetic levitation experiments on the International Space Station (ISS). The ISS's Electromagnetic Levitator (ISS-EML) uses electromagnetic fields to levitate and heat spherical metallic samples in reduced gravity, thus allowing researchers to observe the sample's undercooled regime in a containerless environment. However, once the samples liquify, the sample's internal temperature

- SWEET Fellowship Program (2022-2024) – Undergraduate in first year, Graduate during second year

Undergraduate:

- Massachusetts Space Grant Consortium Travel Award (February 2023)
- Carl Koontz Award (Spring 2023)
- Dean's List (Spring 2022)
- Exxon Mobil Scholarship Program (May 2022)
- Civil, Environmental, and Architectural Engineering Advisory Board MQP Award (2022)
- Society of American Military Engineers' Boston Post Scholarship (2021)
- NSF Renewable Energy Materials Scholars STEM (REMS-STEM) Scholarship (2020-2022)

Interests

- Writing historical fiction and fantasy novels
- Reading fiction and non-fiction
- Playing violin, bass, guitar, and piano
- Singing
- Composing music
- Cooking
- Baking

Campus Activities

- Women in STEM Book Club
- Material Advantage chapter member
- Communications Director in the Central Massachusetts chapter of the Association of Women in Science

distribution is affected by both magnetohydrodynamic convection and thermal conduction through the metal. To aid in data analysis, I use a computational fluid dynamics model in ANSYS Fluent to account for the samples' conduction and internal fluid flow within the ISS-EML. The study's results are used to obtain new thermal conductivity and specific heat capacity measurements for liquid metals and contribute to future NASA and ESA missions.

- Senior SWEET Fellow at SWEET Center (**S**upporting **W**PI through **E**ffective and **E**quitable **T**eamwork)

> **“ WPI's project experiences were very insightful and helped inform my career decisions regarding graduate school and my current field of research. ”**

9AM	10AM - 10:50AM	11AM - 12PM
Drive to campus	Attend the Mechanical Engineering Graduate Seminar	Host my weekly consultation hour at the SWEET Center

Learn more about Lydia's research

She is addressing the challenge of extracting drinkable water from Mars' subsurface. As a NASA Space Technology Graduate Research Opportunity fellow, she aims to develop solutions for future Mars explorers.

READ MORE IN THE WPI JOURNAL

Lydia's Research in the News

Read the Space Weekly article

Discover more about WPI students

Check out other Student Voices here.