# Thomas Blake Head

## Education

2021–Present **PhD in Physics (Currently ABD)**, *Florida International University*, Miami, *FL*
Emphasis on Physics Education Research
Dissertation Title: *Goal Congruity and Physics Identity: Barriers for Women in Physics* [Working title]

2019-2021 **Master's of Physics**, *Florida International University*, Miami, *FL*
Emphasis on Physics Education Research

2017–2019 **Master's of Physics**, *Texas A&M University - Commerce*, Commerce, *TX*
Emphasis in Physics Education Research
Thesis Title: *Agentic and Communal Goal Endorsement: Student Response to a Careers in Physics Lesson*

2012–2017 **Bachelor's of Physics**, *Texas Tech University*, Lubbock, *TX*
Emphasis in Astrophysics

2010–2012 **Associate's of Applied Science**, *Johnson and Wales University*, Charlotte, *NC*
Culinary Arts

## Research Summary

My research has been centered around education initiatives within the physics community. Specifically, my work has been focused on the ideas of goal congruity theory and identity development within physics and how those barriers can be navigated or removed and how those concepts impact one another. I am interested in using the results of my work to identify barriers to success in physics and how those barriers can be navigated or removed, especially in regards to underrepresented groups.

## Research Experience

2019–Present **Graduate Research Assistant**, *Florida International University*, Miami, FL
Conducted research on the topic of underrepresentation in physics, specifically in regards to goal congruity and identity development.
Utilized many analytical techniques including linear regression, multiple imputation of data, cluster analysis, and more.
Was a member of a large team of collaborators, providing assistance with other colleague's projects.
Large national project with a considerable amount of student data.

2017–2019 **Graduate Research Assistant**, *Texas A&M - Commerce*, Commerce, TX
Conducted a qualitative study on the relationship between goal endorsement and physics identity in high school students.
Personally sought out and recruited participants for a research project in Texas. During the study I served as a primary contact and handled payment at the study's conclusion.
Was involved with the development of lesson materials for research purposes.
Assisted another professor with writing an automation script for calculating equation of state parameters of neutron stars in Python.

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2013–2017 **Undergraduate Research Assistant**, *Texas Tech University*, Lubbock, TX

Worked on three separate research projects during undergraduate.
Collected and analyzed photometric data of binary stars. Data was then used to 3D model certain WUMA binaries from our observations.
Retrieved data from Hubble Legacy Archive as well as NOAO and Chandra. Data was analyzed for evidence of Ultra Luminous X-ray sources (ULXs) by way of large H$\alpha$ regions in space measuring over 100 parces in diameter.
Worked with collaborators on the LIGO project to rewrite some of their pipeline code from Perl into Python.

## Teaching Experience

2022–Present **Adjunct Physics Faculty**, *Texarkana College*, Texarkana, TX

Taught Physical Science Lecture / Lab, Physics I & II, Foundations of Mathematical Reasoning, as well as a helper NCBO course attached to Math for Liberal Arts.

2019–2020 **Graduate Teaching Assistant**, *Florida International University*, Miami, FL

Co-instructor for modeling physics
Held office hours for students, handled all grading and provided extra assistance to students where needed.
Adapted teaching strategies to account for virtual learning during the COVID-19 pandemic.

2018 **Graduate Teaching Assistant**, *Texas A&M - Commerce*, Commerce, TX

Summer lab instructor for calculus-based introductory physics.

2016-2017, 2013 **Undergraduate Teaching Assistant**, *Texas Tech University*, Lubbock, TX

Taught lab section of undergraduate astronomy.
Telescope Operator. Co-led outdoor astronomy labs.
Assisted in the installation and set-up of new telescopes in newly constructed observatory.

## Presentations

**Contributed Talk**, *American Association of Physics Teachers Summer Meeting 2021*

"How Goals Drive Physics Identity"

**Poster Presentation**, *Physics Education Research Conference 2020*

"Believe that they can achieve: How Teacher Attitudes Toward Physics Impact Student Outcomes"

**Contributed Talk**, *American Association of Physics Teachers Summer Meeting 2020*

"Understanding the Local Contexts for the Implementation of STEP UP Lessons"

**Contributed Talk**, *American Association of Physics Teachers Winter Meeting 2020*

"STEP UP: Connecting Student Goals to Physics"

**Workshop**, *American Association of Physics Teachers Winter Meeting 2020*

"STEP UP"

**Poster Presentation**, *Physics Education Research Conference 2019*

"STEP UP: Analyzing student perceptions of physics following a career in physics lesson"

**Contributed Talk**, *American Association of Physics TeachersSummer Meeting 2019*

"STEP UP: Analyzing Student Perceptions of Physics Following a Career in Physics Lesson"

**Workshop**, *American Association of Physics Teachers Summer Meeting 2019*
"STEP UP – Take Action to Engage Women in Physics"

**Contributed Talk**, *2019 Annual Research Symposium, Texas A&M University - Commerce*
"Examining Student Response to a Career Exploration Lesson"

**Workshop**, *American Association of Physics Teachers Winter Meeting 2019*
"STEP UP 4 Women"

**Contributed Talk**, *2018 Joint Fall Meeting of the Texas Sections of APS, AAPT, and Zone 13 of the SPS*
"Impact on young women's career goals"

**Poster Presentation**, *Physics Education Research Conference 2018*
"STEP UP 4 Women: Examining students' responses to lesson interventions"

**Contributed Talk**, *American Association of Physics Teachers Summer Meeting 2018*
"Examining Student Response to a Career Exploration Lesson"

## Publications

- **Head, TB**,. Hazari, Z., Taylor, J., Potvin, G. (2022, In Review). Examining the Associations Between Physics Identity and the Endorsement of Communal or Agentic Goals.
- Newton, WG., Balliet, L., Budimir, S., Crocombe, G., B. Douglas, **Head, TB.**, Langford, Z., Rivera, L., Sandford, J. (2021). Ensembles of unified crust and core equations of state in a nuclear-multimessenger astrophysics environment. https://doi.org/10.1140/epja/s10050-022-00710-0
- **Head, TB.**, Khatri, R., Hazari, Z., Potvin, G., Lock, RM. (2020). Believe that they can Achieve: How Teacher Attitudes Toward Physics Impact Student Outcomes. Physics Education Research Conference Proceedings. 10.1119/perc.2020.pr.Head
- **Head, TB.**, Lock, RM., Khatri, R., Hazari, Z., Potvin, G. (2019). Student Response to a Careers in Physics Lesson. Physics Education Research Conference Proceedings 10.1119/perc.2019.pr.Head

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