

# Robynne M. Lock

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## EDUCATION

- **University of Colorado at Boulder**, Boulder, CO  
Ph.D., Physics, May 2011  
Advisors: Drs. Margaret Murnane and Henry Kapteyn
- **University of Texas at Austin**, Austin, TX  
B.S., Physics, May 2005  
Cumulative GPA: 4.0/4.0

## ACADEMIC APPOINTMENTS

- **Associate Professor**, Department of Physics & Astronomy, Texas A&M University-Commerce, 2020-present
- **Assistant Professor**, Department of Physics & Astronomy, Texas A&M University-Commerce, 2014-2020

**Research summary:** I study discipline-based identity development in high school and college physics classes with a focus on encouraging more students, especially women, to pursue physics careers. Additionally, I seek to improve elementary science education through studying the identity development of students enrolled in science inquiry courses. I examine group interactions in studio physics courses with the goal of improving students' conceptual understanding, problem-solving skills, teamwork abilities, and physics identities. Furthermore, I am engaged in improving physics teacher preparation and STEM teacher preparation more broadly.

### Teaching:

*Courses taught* (2014 – present):

PHYS 2425 University Physics I (calculus-based introductory physics)  
IS 351 Science Inquiry I (for pre-service elementary and middle school teachers)  
IS 352 Science Inquiry II (for pre-service elementary and middle school teachers)  
PHYS 530 Physics Mathematical Methods for Educators (Master's program for in-service high school teachers)  
PHYS 531 Classical Mechanics for Educators (Master's program for in-service high school teachers)  
PHYS 532 Electricity and Magnetism for Educators (Master's program for in-service high school teachers)  
PHYS 371 Science and Math Education Theory and Practice (pedagogy course for Learning Assistants)  
PHYS 270 Science Education Theory and Practice (pedagogy course for Learning Assistants)  
PHYS 345 Teaching and Learning Physics (physics education research course)

*Director of Learning Assistant Program*, 2014-present

Created learning assistant program; recruit learning assistants; coordinate hiring of learning assistants; conduct weekly preparation meetings; teach learning assistant pedagogy course; supervise Learning Assistant Program Manager.

## PREVIOUS POSITIONS

- **Postdoctoral Researcher**, Department of Engineering and Science Education, Clemson University, 2011-2013  
Dr. Zahra Hazari  
Studied students' career intentions and physics identities at the end of high school and beginning of college; conducted national survey of first year college students about career intentions, high school science experiences, and sustainability; conducted case studies of high school physics teachers; analyzed both quantitative and qualitative data using an identity framework with an emphasis on gender issues
- **Teaching Assistant and Co-Instructor**, Department of Physics, Clemson University, Clemson, SC.  
*Teaching Assistant* (Spring 2013): PHYS 207 General Physics I (algebra-based physics)  
*Co-instructor* (Fall 2012): PHYS 207 General Physics I (algebra-based physics)

- **Graduate Research Assistant, JILA, University of Colorado at Boulder, 2006-2011**  
Drs. Margaret Murnane and Henry Kapteyn  
Measured properties of high harmonic generation in order to study molecular structure and dynamics; modeled high harmonic generation using a two-center interference model; calculated molecular alignment of rotational wavepackets in small linear molecules
- **Teaching Assistant and Guest Lecturer, Physics Department, University of Colorado at Boulder, Boulder CO.**  
*Guest Lecturer* (Spring 2011):  
PHYS 1230 Light and Color for Nonscientists: Taught one lecture on the subject of optics and anatomy of the eye.  
*Teaching Assistant* (Fall 2005):  
PHYS 1120 General Physics 2: Electricity, Magnetism, & Optics: Taught four recitation sections using University of Washington tutorials

## STUDENT MENTORING

- **Graduate Thesis Advisor, Fall 2017-present**  
**Department of Physics & Astronomy, Texas A&M University-Commerce, Commerce, TX**  
*Conner Kelley*: Conner successfully defended his thesis in October 2021. Conner presented his work at the 2020 AAPT Summer Meeting. Keely Scott presented their joint work at the 2019 AAPT Summer Meeting.  
*Thomas Blake Head*: Blake successfully defended his thesis in June 2019. He presented his work at the 2018 and 2019 AAPT Summer Meetings and PERCs.
- **Undergraduate Honors Thesis Advisor, Spring 2016-present**  
**Department of Physics & Astronomy, Texas A&M University-Commerce, Commerce, TX**  
*Grace Koone*: Grace is currently preparing her thesis proposal.  
*Madison Smith*: Madison successfully defended her thesis proposal in Fall 2020.  
*Keely Scott*: Keely successfully defended her thesis in May 2022. Keely presented her work at the 2019 AAPT Summer Meeting.  
*Melanie Schroers*: Melanie successfully defended her thesis proposal in Spring 2018. Melanie presented her results at the APS/AAPT Texas Regional Meeting Fall 2017 and at the Pathways Symposium, Fall 2017. RL presented results at 2017 PERC. RL and T. Bench presented results at 2018 AAPT Summer Meeting and PERC.
- **Graduate Student co-advisor, Spring 2017**  
**Department of Physics & Astronomy, Texas A&M University-Commerce, Commerce, TX**  
*Matthew Witt*: RL presented results at 2017 AAPT Summer Meeting.
- **Undergraduate student researcher advisor, Summer 2016-present**  
**Department of Physics & Astronomy, Texas A&M University-Commerce, Commerce, TX**  
*Jacob Ward*: Jacob worked on STEP UP data.  
*David Williamson*: David analyzed studio physics quantitative data.  
*Tessa Bench*: Tessa presented results at 2018 AAPT Summer Meeting. RL presented results at 2018 PERC.  
*Nicole Gentry*: RL and T. Bench presented results at 2018 AAPT Summer Meeting and PERC.  
*Allan Teer*: RL presented results at 2017 AAPT Summer Meeting.  
*Deanna Rogers*: RL presented results at 2017 AAPT Summer Meeting.  
*Tyrone Sheehan*: Tyrone worked on studio physics data.
- **Research Experience for Undergraduates, Summer 2014, Summer 2015, Summer 2016**  
**Department of Physics & Astronomy, Texas A&M University-Commerce, Commerce, TX**  
*Zackary Hutchens*: RL presented his work at the 2016 AAPT Summer Meeting. Zack presented his work at the 2016 Quadrennial Physics Congress (PhysCon), the 2017 AAPT Winter Meeting, and the 2017 North Carolina section APS/AAPT regional meeting 2017. He continued to work on his project remotely through Spring 2018.  
*Jordan Castillo*: Jordan is a co-author on Lock et al. (2015). RL presented results at PERC 2017.  
*Stephen Milburn*
- **Group of Dr. Zahra Hazari, 2012-2013**  
**Department of Engineering and Science Education, Clemson University, Clemson, SC**  
Trained one junior graduate student in coding qualitative video and interview data and one undergraduate student in conducting interviews and analyzing video data. Trained three junior graduate students in conducting school site visits, including collecting video data, writing field notes, and conducting interviews.
- **Laboratory of Drs. Margaret Murnane and Henry Kapteyn, 2009-2010**  
**JILA and University of Colorado at Boulder, Boulder, CO**  
Trained two junior graduate students in laboratory safety, laser alignment, vacuum system maintenance; supervised one undergraduate student in adapting a pulsed gas jet for use in a specific vacuum chamber

## ACADEMIC SERVICE – University, College and Department

- **Advisor for M.S. in Physics with Teaching Emphasis and M.S. in Physics with Teaching Certification programs, 2020-present**  
Advise graduate students on course selection and program requirements and advise prospective graduate students
- **Honors thesis committee member, 2019**  
P. Flint Morgan, Alex Westbrook, Madeline Phillips
- **Master’s thesis committee member, 2019**  
Brianna Douglas, Josilyn Valencia
- **University Studies Council, 2018-2021**  
Reviewed changes to the university core curriculum
- **Physics & Astronomy Search Committee, 2018**  
Served on the search committee for Department Head for Physics & Astronomy. Evaluated applicants according to rubric.
- **Physics & Astronomy Search Committee, Chair, 2018**  
Chaired the Department of Physics & Astronomy Search Committee for an Assistant Professor in the area of Physics Education Research. I assisted in writing the job description, collated applicants’ rankings, conducted phone and face-to-face interviews.
- **Physics & Astronomy search committee, 2015-2016,**  
Served on the Department of Physics & Astronomy Search Committee. I assisted in revising the job description and the hiring matrix. I emailed the advertisement to my contacts and had the advertisement posted on the PER jobs blog. Participated in phone interviews and on campus interviews.
- **Biological & Environmental Sciences search committee, 2015-2016**  
Served on the Biological & Environmental Sciences search committee for hiring an environmental scientist. I reviewed the hiring matrix and participated in on campus interviews.
- **Organizer of Department of Physics & Astronomy Mentoring Program, 2015-2017**  
Created mentoring program; assigned every freshmen, sophomore, and new physics major a faculty mentor; organized a mentoring meet-up; collaborated with Society of Physics Students to transition to student led program.
- **Assessment Committee, Chair 2014-present**  
Wrote the Department of Physics & Astronomy Institutional Effectiveness Academic Program Plans and Results documents annually.
- **Doubling Committee, 2015-present**  
Charged with doubling the number of physics majors graduating from the department
- **College Curriculum Committee, 2015-2019**  
Reviewed curriculum changes in College of Science and Engineering.
- **Department Curriculum Committee, Chair 2016-2020**  
Revise physics teacher preparation program, review changes in physics major and minor, and enter changes into CourseLeaf.
- **Department Curriculum Committee, 2014-2016**  
Revised physics teacher preparation program, learning assistant pedagogy course, and reviewed changes in physics major and minor.

## ACADEMIC SERVICE – Community Outreach

- **Speaker at Chavez High School, 2021**  
Presented physics career opportunities and my own career path to 2 classes of high school physics students
- **STEP UP Ambassador Summit, Summer 2019**  
Co-organized and presented at a 2 day workshop for ~50 high school teachers who are serving as ambassadors for the STEP UP project. Trained teachers on the Women in Physics lesson and presented project overview.
- **Community of Science Instructors of North East Texas (COSINE TX) workshops, Fall 2019, Spring 2020, Summer 2020, Fall 2020, Spring 2021, Summer 2021, Fall 2021, Spring 2022, Summer 2022**  
Co-organized and ran workshops for high school physics, math, chemistry, and biology teachers. Fall and Spring workshops are half-day and Summer workshops are 2.5 days. Topics include online instruction and culturally sensitive teaching and focus on lesson plan development.

- **PhysTEC Workshop**, Summer 2020, 2021, 2022  
Co-organized and ran 1.5 day workshop for high school physics teachers with emphasis on lab instruction for remote learning.
- **Noyce Workshop**, Summer 2019  
Co-organized and ran a 2.5 day workshops for high school physics, math, chemistry, and biology teachers; Noyce scholars; and learning assistants. Workshop focused on 5E lesson plan development with emphasis on modern research connections.
- **Speaker at Design, Connect, Create Physics Camps for Young Women**, 2018-2019  
Presented physics career opportunities and my own career path to four groups of ~20 students in a summer camp for young women about to take their first high school physics class.
- **LeoTeach Colloquium**, 2018  
Presented a workshop on studio physics to ~ 15 teachers and students
- **Community for the Advancement of Physics Education (CAPE) Teacher Workshops**, Summer 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019  
Co-organized and ran workshops for high school physics teachers beginning as part of Noyce Capacity Building grant. Workshops focused on lab development and other physics topics.
- **Speaker at Southwest High School**, 2017  
Presented physics career opportunities and my own career path to 2 classes of high school physics students
- **Region X Physics Panel Meeting**, 2016  
Attended two meetings of high school physics teachers; Summer meeting involved roundtable discussions of issues relevant to teaching high school physics; Fall meeting involved presentations on electricity and magnetism topics; LAs presented; distributed information about M.S. in Physics with Teaching Emphasis
- **LeoTeach Colloquium**, 2016  
Co-presented a workshop on studio physics to ~ 40 teachers and students
- **Physics Day Speaker**, Texas A&M University-Commerce, 2015-2018  
Presented talks about physics career opportunities and served on panels about career experiences.
- **Career Day Speaker**, L.V. Stockard Middle School, Dallas, TX, Spring 2015  
Presented physics career opportunities and my own career path to 4 classrooms of middle school students.
- **Partnerships for Informal Science Education in the Community**, Spring 2010, Fall 2010  
**JILA and University of Colorado at Boulder**, Boulder, CO  
Worked with middle school (sixth and eighth grade) students on inquiry-based activities about circuits and kinematics
- **Middle School Outreach**, April 2010  
**Vikan Middle School**, Brighton, CO  
Gave a presentation about lasers and supervised laser activities for four class periods of eighth graders

## ACADEMIC SERVICE – Professional Organizations

- **Texas PhysTEC Regional Network Meeting**, May 2022  
Organized and facilitated meeting of Texas physics teacher educators
- **Steering Committee for the 2023 Graduate Education Conference**, 2021-present  
Give feedback on NSF proposal, suggest speakers, provide feedback on conference agenda, advertise, lead sessions and discussion groups
- **Vice President of Texas Section of the American Association of Physics Teachers (AAPT)**, 2021-present  
Support Texas Section of AAPT activities, including hosting regional meetings
- **Reviewer for Journal of Pre-College Engineering Education Research (J-PEER)**, 2019-present  
Reviewed journal articles for publication.
- **Society for College Science Teachers Outstanding Undergraduate Science Teaching Award Committee**, 2017 and 2019  
Evaluated and ranked nominees for award.
- **Reviewer for Physics Education Research Conference Proceedings**, 2012-present  
Reviewed conference papers for publication.

- **Reviewer for Physical Review Physics Education Research**, 2015-present  
Reviewed journal articles for publication.

## PROFESSIONAL AFFILIATIONS

- American Association for the Advancement of Science (AAAS), 2016-present
- American Association of Physics Teachers (AAPT), 2011-present
- American Physical Society (APS), 2001-present
- National Association for Research in Science Teaching (NARST), 2012-2013
- Optical Society of America (OSA), 2007-2011

## PROFESSIONAL DEVELOPMENT

- **2021 Mastery Grading – University Conference**, Virtual  
Attended sessions on standards-based grading and specifications-based grading
- **2018 Building Thriving Programs Workshop**, College Park, MD  
Attended sessions on increasing enrollment of physics majors
- **2018 PhysTEC Conference**, College Park, MD  
Attended sessions on physics teacher preparation
- **Next Gen Physical Science and Everyday Thinking (PET) Workshop**, Covington, KY, July 2017  
Participated in workshop for pilot instructors of the Next Gen PET curriculum
- **2017 Western Regional Noyce Conference**, Fresno, CA  
Attended sessions on STEM teaching, managing current Noyce grants, and applying for Noyce grants
- **2016 APS National Mentoring Community Conference**, Houston, TX  
Attended workshops on mentoring students with special attention to underrepresented minorities
- **Proposal Development Workshop**, A&M-Commerce, Spring 2015  
Attended weekly meetings at ORSP to learn more about writing a successful grant proposal; prepared a logic model
- **AAPT New Faculty Workshop**, College Park, MD, Fall 2014  
Attended sessions on practical details of teaching using techniques grounded in physics education research and on grant proposal preparation
- **2014 PhysTEC Conference**, Austin, TX  
Attended sessions on physics teacher preparation
- **Southwest Regional Learning Assistant Workshop**, San Marcos, TX, 2014  
Participated in workshop on how to best to implement a learning assistant program

## GRANTS

- “Texas Regional PhysTEC Network”  
PhysTEC Regional Network  
PI: W.G. Newton; Co-PIs: **R.M. Lock**; B. Modir; M. Fields  
Award amount: \$15,000  
Support period: 8/1/2020-7/31/2022
- “Physics Teacher Preparation at Texas A&M University-Commerce”  
PhysTEC Comprehensive Site  
PI: **R.M. Lock**; Co-PIs: W.G. Newton, M. Fields  
Award amount: \$288,397  
Support period: 9/1/2019-8/30/2022
- “Noyce STEM Scholars at Texas A&M University-Commerce”  
National Science Foundation – Noyce Track 1  
PI: W.G. Newton; Co-PIs: **R.M. Lock**, R. Dibbs, J. Delgado-Acevedo, M. Fields, S. Starnes  
Award #1758395  
Award amount: \$1,199,473  
Support period: 7/1/2018-6/30/2023
- “Collaborative Research: Mobilizing Teachers to Increase Capacity and Broaden Women’s Participation in Physics”  
National Science Foundation – Discovery Research PreK-12 (DRK-12)  
PI (at A&M-Commerce): **R.M. Lock**; Florida International University (PI: Z. Hazari) is the lead institution.

AAPT (PI: R. Vieyra) and APS (PI: T. Hodapp) are collaborating institutions.

Award #1720917

Award amount: \$2,999,435

Support period: 5/15/17-5/14/21

- “A Community-Based Approach to Building the Capacity of Physics Teacher Preparation at Texas A&M University-Commerce”  
National Science Foundation Division of Undergraduate Education – Noyce Capacity Building  
PI: W.G. Newton; Co-PIs: **R.M. Lock**, G. Naizer  
Award #DUE-1557398  
Award amount: \$74,941  
Support period: 7/15/2016-12/31/2017

## AWARDS

- **Chancellor’s Academy of Teacher Educators of the Texas A&M University System 2021 Inductee A&M Commerce STEM Education Alliance Team: W.G. Newton, R.M. Lock, B. Modir, and M. Fields**  
Award to recognize and honor both individuals and university teams who are making noteworthy and exemplary contributions to quality, innovation, and continuous improvement in teacher preparation.
- **2021 Texas A&M University-Commerce Paul W. Barrus Distinguished Faculty Award for Teaching**  
Award for tenure-track/tenured faculty members who have performed in an outstanding manner in teaching
- **Faculty Senate Award for Professional Excellence: Teaching – Innovation, 2019-2020**  
Award for faculty for excellence in teaching innovation at Texas A&M University-Commerce
- **Augustine “Chuck” Arize Junior Faculty Award, 2019**  
Award for tenure-track faculty members for outstanding teaching, research, and service at Texas A&M University-Commerce
- **PhysTEC fellow, 2017-2019**  
Recognized as leader in physics teacher preparation.
- **Finalist for 2017 Tech Titans of the Future – University Level Award**  
For the implementation of studio physics in University Physics
- **2017 Texas A&M University-Commerce Paul W. Barrus Distinguished Faculty Award for Teaching**  
Award for tenure-track/tenured faculty members who have performed in an outstanding manner in teaching
- **2015-2016 Center for Faculty Excellence & Innovation (CFEI) Faculty Fellow for Teaching & Learning, Texas A&M University-Commerce**  
“Development of Studio Mode in Physics”  
Led Transformation of University Physics I and II to studio mode, a student-centered, active-learning environment

## PEER-REVIEWED PUBLICATIONS

1. Robynne M. Lock, Zahra Hazari, and Geoff Potvin, “Impact of Out-of-Class Science and Engineering Activities on Physics Identity and Career Intentions,” *Physical Review Physics Education Research* 15, 020137 (2019).
2. Jianlan Wang, Zahra Hazari, Cheryl Cass, and Robynne Lock, “Episodic memories and the longitudinal impact of high school physics on female students’ physics identity,” *International Journal of Science Education* (2018). DOI: 10.1080/09500693.2018.1486522
3. Robynne M. Lock and Zahra Hazari, “Discussing underrepresentation as a means to facilitating female students’ physics identity development,” *Physical Review Physics Education Research* 12, 020101 (2016). *Featured in M. McCartney, “The physics of a gender gap,” in S. Vignieri and J. Smith (Eds.), “In Other Journals,” Science* 353, 787 (2016).
4. Allison Godwin, Geoff Potvin, Zahra Hazari, and Robynne Lock, “Identity, Critical Agency, and Engineering: An Affective Model for Predicting Engineering as a Career Choice,” *Journal of Engineering Education* 105, 312 (2016).
5. Zahra Hazari, Geoff Potvin, Robynne M. Lock, Florin Lung, Gerhard Sonnert, and Philip M. Sadler, “Factors that Affect the Physical Science Career Interest of Female Students: Testing Five Common Hypotheses,” *Physical Review Special Topics – Physics Education Research* 9, 020115 (2013).

6. R.M. Lock, S. Ramakrishna, X. Zhou, H.C. Kapteyn, M.M. Murnane, and T. Seideman, “Extracting Continuum Electron Dynamics from High Harmonic Emission from Molecules,” *Physical Review Letters* **108**, 133901 (2012).
7. Robynne M. Lock, Xibin Zhou, Wen Li, Henry C. Kapteyn, and Margaret M. Murnane, “Measuring the Intensity and Phase of High-Order Harmonic Emission from Aligned Molecules,” *Chemical Physics* **366**, 22 (2009).
8. Xibin Zhou, Robynne Lock, Nick Wagner, Wen Li, Henry C. Kapteyn, and Margaret M. Murnane, “Elliptically Polarized High-Order Harmonic Emission from Molecules in Linearly Polarized Laser Fields,” *Physical Review Letters* **102**, 073902 (2009).
9. Wen Li, Xibin Zhou, Robynne Lock, Henry Kapteyn, Margaret Murnane, Serguei Patchkovskii, and Albert Stolow, “Time-Resolved Dynamics in N<sub>2</sub>O<sub>4</sub> Probed Using High Harmonic Generation,” *Science* **322**, 1207 (2008).
10. Isabell Thomann, Robynne Lock, Vandana Sharma, Etienne Gagnon, Stephen T. Pratt, Henry C. Kapteyn, Margaret M. Murnane, and Wen Li, “Direct Measurement of the Angular Dependence of the Single-Photon Ionization of Aligned N<sub>2</sub> and CO<sub>2</sub>,” *Journal of Physical Chemistry A* **112**, 9382 (2008).
11. Xibin Zhou, Robynne Lock, Wen Li, Nick Wagner, Margaret M. Murnane, and Henry C. Kapteyn, “Molecular Recollision Interferometry in High Harmonic Generation,” *Physical Review Letters* **100**, 073902 (2008).
12. Nicholas Wagner, Xibin Zhou, Robynne Lock, Wen Li, Andrea Wüest, Margaret Murnane, and Henry Kapteyn, “Extracting the Phase of High-Order Harmonic Emission from a Molecule Using Transient Alignment in Mixed Samples,” *Physical Review A* **76**, 061403 (2007).

## PEER-REVIEWED CONFERENCE PROCEEDINGS PAPERS

1. G.D. Dunford, B. Modir, R.M. Lock, and W.G. Newton, “Categorization and framing teaching discussions in an online physics classroom,” *International Conference of the Learning Sciences Proceedings* 2235 (2022).
2. M. Fields, B. Modir, W. G. Newton, R. M. Lock, and J. C. Stanfield, The transition to online teaching during the COVID-19 pandemic at a regional, rural university: The experience of learning assistants, 2020 PERC Proceedings [Virtual Conference, July 22-23, 2020], edited by S. Wolf, M. B. Bennett, and B. W. Frank, doi:10.1119/perc.2020.pr.Fields.
3. M. Nadeau, B. Modir, R. M. Lock, and W. G. Newton, Participation in an online community of high school physics teachers, 2020 PERC Proceedings [Virtual Conference, July 22-23, 2020], edited by S. Wolf, M. B. Bennett, and B. W. Frank, doi:10.1119/perc.2020.pr.Nadeau.
4. T. B. Head, R. Khatri, Z. Hazari, G. Potvin, and R. M. Lock, Believe that they can achieve: How Teacher Attitudes Toward Physics Impact Student Outcomes, 2020 PERC Proceedings [Virtual Conference, July 22-23, 2020], edited by S. Wolf, M. B. Bennett, and B. W. Frank, doi:10.1119/perc.2020.pr.Head.
5. Robynne M. Lock, Ben Van Dusen, Steven Maier, and Liang Zeng, Impact of the Next Gen PET curriculum on Science Identity, 2019 PERC Proceedings [Provo, UT, July 24-25], edited by Y. Cao, S. Wolf, and M. Bennett.
6. T. Blake Head, Robynne M. Lock, Raina Khatri, Zahra Hazari, and Geoff Potvin, Student response to a careers in physics lesson, 2019 PERC Proceedings [Provo, UT, July 24-25], edited by Y. Cao, S. Wolf, and M. Bennett.
7. Hemeng Cheng, Geoff Potvin, Raina Khatri, Laird H. Kramer, Robynne M. Lock, and Zahra Hazari, Examining physics identity development through two high school interventions, 2018 PERC Proceedings [Washington, DC, August 1-2, 2018], edited by A. Traxler, Y. Cao, and S. Wolf.
8. Robynne M. Lock, Melanie Schroers, and William G. Newton, Examining the factors that impact group work effectiveness in studio physics, 2017 PERC Proceedings [Cincinnati, OH, July 26-27, 2017], edited by Lin Ding, Adrienne Traxler, and Ying Cao.
9. Robynne M. Lock, Jordan Castillo, Zahra Hazari, and Geoff Potvin, Determining Strategies that Predict Physics Identity: Emphasizing Recognition and Interest, 2015 PERC Proceedings [College Park, MD, July 29-30, 2015], edited by A.D. Churkian, D.L. Jones, and Lin Ding.
10. Robynne M. Lock, Zahra Hazari, and Geoff Potvin, “Physics Career Intentions: The Effect of Physics Identity, Math Identity, and Gender,” *AIP Conference Proceedings* 1513, 262 (2013). *Finalist for 2012 PERC Proceedings Paper Award.*
11. Geoff Potvin, Zahra Hazari, Leidy Klotz, Allison Godwin, Robynne M. Lock, Jennifer Dawn Cribbs, and Nicole Barclay, “Disciplinary Differences in Engineering Students' Aspirations and Self-Perceptions,” 2013 American Society for Engineering Education Conference Proceedings (2013).

12. Allison Godwin, Geoff Potvin, Zahra Hazari, and Robynne Lock, "Understanding Engineering Identity Through Structural Equation Modeling," 2013 IEEE Frontiers in Education Conference, IEEE Press (2013).
13. Robynne M. Lock, Xibin Zhou, Margaret M. Murnane, and Henry C. Kapteyn, "Elliptical Dichroism of High Harmonics Emitted from Aligned Molecules," in *Ultrafast Phenomena XVII: Proceedings of the 17th International Conference*, The Silvertree Hotel and Snowmass Conference Center, Snowmass, Colorado, United States, July 2010. M. Chergui, D. Jonas, E. Riedle, R. Schoenlein, A. Taylor Eds., Oxford University Press, 2011. pp. 53-55.
14. Xibin Zhou, Robynne Lock, Henry C. Kapteyn, and Margaret M. Murnane, "Observation of Elliptically Polarized High Harmonic Emission from Molecules Driven by Linearly Polarized Light," in *Ultrafast Phenomena XVI: Proceedings of the 16th International Conference on Ultrafast Phenomena*, Stresa Italy, June 2008. P. Corkum, S. Silvestri, K.A. Nelson, E. Riedle, R.W. Schoenlein Eds., Springer Series in Chemical Physics Vol. 92, 2009. pp. 21-23.
15. I. Thomann, R. Lock, C. La-O-Vorakiat, E. Gagnon, A. Sandhu, H. C. Kapteyn, M. M. Murnane, and W. Li, "Direct Measurement of the Angular-Dependence of Molecular Ionization Cross-Sections by Time-Resolved Extreme-Ultraviolet Spectroscopy," in *Ultrafast Phenomena XVI: Proceedings of the 16th International Conference on Ultrafast Phenomena*, Stresa Italy, June 2008. P. Corkum, S. Silvestri, K.A. Nelson, E. Riedle, R.W. Schoenlein Eds., Springer Series in Chemical Physics Vol. 92, 2009. pp. 72-74.
16. W. Li, X. B. Zhou, R. Lock, S. Patchkovskii, O. Smirnova, A. Stolow, M. Murnane, and H. Kapteyn, "Probing Dynamics in Polyatomic Molecules Using High Harmonic Generation: the Role of Ionization Continua," in *Ultrafast Phenomena XVI: Proceedings of the 16th International Conference on Ultrafast Phenomena*, Stresa Italy, June 2008. P. Corkum, S. Silvestri, K.A. Nelson, E. Riedle, R.W. Schoenlein Eds., Springer Series in Chemical Physics Vol. 92, 2009. pp. 63-65.
17. Xibin Zhou, Robynne Lock, Nick Wagner, Wen Li, Henry C. Kapteyn, and Margaret M. Murnane, "Molecular Recollision Interferometry in High Harmonic Generation," in *Ultrafast Phenomena XVI: Proceedings of the 16th International Conference on Ultrafast Phenomena*, Stresa Italy, June 2008. P. Corkum, S. Silvestri, K.A. Nelson, E. Riedle, R.W. Schoenlein Eds., Springer Series in Chemical Physics Vol. 92, 2009. pp. 87-89.

## NON-PEER-REVIEWED PUBLICATIONS

1. Robynne Lock and William Newton, "In-service physics teacher education through an online Master of Physics Degree," APS Forum on Education Newsletter (Fall 2021).
2. Robynne Lock, "Physics together: Engaging young women in physics with STEP UP," APS Forum on Education Summer Newsletter (2019).
3. Rodolfo Valdes-Vasquez, Leidy Klotz, Tripp Shealy, Jennifer Cribbs, Allison Godwin, Robynne Lock, Geoff Potvin, and Zahra Hazari, "College students who exhibit pro-sustainability attitudes and behaviors," *Journal of College Admission* **Fall 2014**, 17 (2014).

## NON-PEER-REVIEWED CONFERENCE PROCEEDINGS PAPERS

1. Zahra Hazari, Robynne M. Lock, Cheryl A.P. Cass, and Carrie Beattie, *Obscuring Power Structures in the Physics Classroom: Implications for Student Engagement and Physics Identity Development*, 2013 PERC Proceedings [Portland, OR, July 17-18, 2013], edited by P. V. Engelhardt, A. D. Churukian, and D. L. Jones.

## PRESENTATIONS BY RL

1. **Poster**, Robynne M. Lock, Bahar Modir, and William G. Newton, "Reimagining graduate physics: Electricity and magnetism for educators," AAPT Summer Meeting (2022).
2. **Panel**, Robynne Lock, Abby Noble, and Josh Veazey, "What could reassessments look like?" The Grading Conference: Higher Ed STEM Focus (2022).
3. **Contributed** talk, Robynne M. Lock, "STEP UP: Engaging students in discussion of the underrepresentation of women," Joint Spring 2022 Meeting of the Texas Sections of APPT, APS, and SPS Zone 13 (2022).
4. **Contributed** talk, Robynne Lock, "An alternative to alternative physics teacher certification in Texas," AAPT Summer Meeting (2021).
5. **Invited** talk, Robynne Lock, "Physics Together: Engaging young women in physics with STEP UP," APS March Meeting (2021).
6. **Plenary** panel, Robynne Lock, William Newton, Eugenia Etkina, Jennifer Porter, "New online teaching strategies for physics teacher education," PhysTEC conference (2021).



7. **Poster**, “STEP UP: Engaging students in discussion of the underrepresentation of women in physics,” PhysTEC Conference (2021).
8. **Poster**, Robynne M. Lock, “Physics Together: Engaging young women in physics with STEP UP.” PhysTEC Conference (2020).
9. **Contributed talk**, Robynne M. Lock, “Impact of the Next Gen PET Curriculum on Science Identity,” Virtual conference, Next Gen PET FOLC Virtual Conference (2020).
10. **Workshop**, Robynne M. Lock and Nicole Harvey, “Physics Together: Engaging young women in physics with STEP UP,” Conference for the Advancement of Science Teaching (2019).
11. **Colloquium**, Robynne M. Lock, “Physics Together: Engaging young women in physics with STEP UP,” Kansas State University Colloquium Series (2019).
12. **Poster**, Robynne M. Lock, Ben Van Dusen, Steven Maier, and Liang Zeng, “Impact of the Next GEN PET curriculum on science identity,” Physics Education Research Conference (2019).
13. **Contributed talk**, Robynne M. Lock, Ben Van Dusen, Steven Maier, and Liang Zeng, “Impact of the Next GEN PET curriculum on science identity,” American Association of Physics Teachers Summer Meeting (2019).
14. **Workshop**, Robynne M. Lock and John Metzler, “STEP UP: Take action to engage women in physics,” American Association of Physics Teachers Summer Meeting (2019).
15. **Workshop**, Robynne M. Lock, “STEP UP 4 Women: Supporting Teachers to Encourage the Pursuit of Undergraduate Physics for Women,” PhysTEC Conference (2019).
16. **Poster**, Robynne M. Lock, William G. Newton, Melanie Schroers, and Zackary Hutchens, “Transforming introductory physics: The impact of studio mode and the learning assistant program,” PhysTEC Conference (2019).
17. **Invited talk**, Robynne M. Lock, Zahra Hazari, Theodore Hodapp, Rebecca Vieyra, and Raina Khatri, “STEP UP 4 Women: Supporting Teachers to Encourage the Pursuit of Undergraduate Physics for Women,” American Association of Physics Teachers Winter Meeting (2019).
18. **Workshop**, Robynne M. Lock and T. Blake Head, “STEP UP 4 Women,” American Association of Physics Teachers Winter Meeting (2019).
19. **Seminar**, Robynne M. Lock, “Using physics identity to understand students’ experiences in high school and introductory university physics courses,” Michigan State University Physics Education Research Seminar Series (2019).
20. **Workshop**, Robynne M. Lock and Kristin Cotton, “STEP UP 4 Women: Ignite the future of physics,” Conference for the Advancement of Science Teaching (2018).
21. **Workshop**, William G. Newton and Robynne M. Lock, “Bringing high school physics into the modern world,” Conference for the Advancement of Science Teaching (2018).
22. **Contributed talk**, Robynne M. Lock, Melanie Schroers, Trever Bench, Nicole Gentry, and William G. Newton, “Evidence for effective group work in studio physics”, American Association of Physics Teachers Summer Meeting (2018).
23. **Poster presentation**, Robynne M. Lock, Melanie Schroers, Trever Bench, Nicole Gentry, and William G. Newton, “Evidence for effective group work in studio physics,” Physics Education Research Conference (2018).
24. **Contributed talk**, Robynne M. Lock, Allan Teer, Matthew Witt, Deanna Rogers, and Zahra Hazari, “Physics identity in high school: Impact of discussing women’s underrepresentation,” American Association of Physics Teachers Summer Meeting (2017).
25. **Poster presentation**, Robynne M. Lock, Melanie Schroers, and William G. Newton, “Examining the factors that impact group work effectiveness in studio physics,” Physics Education Research Conference (2017).
26. **Contributed talk**, Robynne M. Lock, William G. Newton, Melanie Schroers, and Zachary Hutchens, “Implementing studio physics: The effect on Physics Identity Development,” American Association of Physics Teachers Summer Meeting (2016).
27. **Invited poster presentation**, Robynne M. Lock, Zahra Hazari, Geoff Potvin, and Jennifer Cribbs, “Using structural equation modeling to test the physics identity framework,” Physics Education Research Conference (2016).
28. **Invited talk**, “The Role of Recognition and Interest in Physics Identity Development,” American Physical Society April Meeting (2016).

29. **Seminar**, Robynne M. Lock, “Understanding Physics Career Choice through Identity,” Biology seminar series, Texas A&M University-Commerce (2015).
30. **Contributed talk**, Robynne M. Lock, Zahra Hazari, and Geoff Potvin, “Determining Strategies that Predict Physics Identity: Emphasizing Recognition and Interest,” American Association of Physics Teachers Summer Meeting (2015).
31. **Poster presentation**, Robynne M. Lock, Zahra Hazari, and Geoff Potvin, “Determining Strategies that Predict Physics Identity: Emphasizing Recognition and Interest,” Physics Education Research Conference (2015).
32. **Contributed talk**, Robynne M. Lock and Zahra Hazari, “Discussing Underrepresentation as a Means to Increasing Female Physics Identity,” American Association of Physics Teachers Summer Meeting (2014).
33. **Poster presentation**, Robynne M. Lock and Zahra Hazari, “Discussing Underrepresentation as a Means to Increasing Female Physics Identity,” Physics Education Research Conference (2014).
34. **Contributed talk**, Robynne M. Lock, Reganne Tompkins, and Zahra Hazari, “Examining How Discussing Underrepresentation May Mediate Female Engagement in Physics,” American Physical Society April Meeting (2013).
35. **Poster presentation**, Robynne M. Lock, Zahra Hazari, and Geoff Potvin, “Physics Career Intentions: The Effect of Physics Identity, Math Identity, and Gender,” Physics Education Research Conference (2012).
36. **Invited talk**, Robynne Lock, “Development of a Physics Identity in High School,” STEM Think Tank and Conference (2012).
37. **Contributed talk**, Robynne M. Lock, Zahra Hazari, Philip M. Sadler, and Gerhard Sonnert, “Examining Physics Career Interests: Recruitment and Persistence into College,” American Physical Society April Meeting (2012).
38. **Poster presentation**, Robynne M. Lock, Xibin Zhou, Margaret M. Murnane, and Henry C. Kapteyn, “Elliptical Dichroism of High Harmonics Emitted from Aligned Molecules,” 17<sup>th</sup> International Conference on Ultrafast Phenomena (2010).
39. **Poster presentation**, Robynne Lock, Xibin Zhou, Margaret Murnane, and Henry Kapteyn, “Polarization-Resolved Measurements of High Harmonic Emission from Aligned Molecules”, Multiphoton Processes Gordon Research Conference (2010).
40. **Seminar**, Robynne Lock, Xibin Zhou, Margaret Murnane, and Henry Kapteyn, “Probing Molecular Structure and Dynamics Using High Harmonic Generation,” Eric Cornell/Debbie Jin Bi-group seminar (2010).
41. **Contributed talk**, Robynne Lock, Xibin Zhou, Wen Li, Margaret Murnane, and Henry Kapteyn, “Polarization Measurements of High-Order Harmonics from Transiently Aligned Molecules,” Conference on Lasers and Electro-Optics/ Quantum Electronics and Laser Science Conference (2009).
42. **Invited talk**, Robynne Lock, Xibin Zhou, Margaret Murnane, and Henry Kapteyn, “Probing Molecular Structure and Dynamics Using High Harmonic Generation,” Workshop on Studies of Atoms and Molecules with “New Light Sources” (2009).
43. **Poster presentation**, Robynne Lock, Xibin Zhou, Wen Li, Nicholas Wagner, Margaret Murnane, and Henry Kapteyn, “Molecular Recollision Interferometry in High Harmonic Generation,” 16<sup>th</sup> International Conference on Ultrafast Phenomena (2008).
44. **Contributed talk**, Robynne Lock, Wen Li, Xibin Zhou, Margaret Murnane and Henry Kapteyn, Serguei Patchkovskii and Albert Stolow, “Understanding High-Order Harmonic Generation from Polyatomic Molecules Undergoing Large Dynamic Structural Changes,” 16<sup>th</sup> International Conference on Ultrafast Phenomena (2008).
45. **Contributed talk**, Robynne Hooper, Nick Wagner, Xibin Zhou, Wen Li, Margaret Murnane and Henry Kapteyn, “Extracting the Phase of HHG Emission from Aligned Molecules using Gas Mixtures,” American Physical Society Division of Atomic, Molecular, and Optical Physics Annual Meeting (2007).

## PRESENTATIONS BY STUDENTS

1. **Contributed talk**, Madison Smith and Robynne Lock, “An intersectional analysis on the impact of a summer physics camp on high school girls,” American Association of Physics Teachers Summer Meeting (2022).
2. **Contributed talk**, Madison Smith, “An intersectional analysis on the impact of a summer physics camp on high school girls,” A&M-Commerce Annual Research Symposium (2022). *College of Science and Engineering Undergraduate Oral Presentation Award*

3. **Contributed poster**, Keely Scott, Conner Kelley, Robynne M. Lock, Zahra Hazari, and Geoff Potvin, "STEP UP: The impact of a women in physics lesson on students' figured worlds," A&M-Commerce Annual Research Symposium (2022).
4. **Contributed talk**, Keely Scott, Robynne M. Lock, Zahra Hazari, and Geoff Potvin, "STEP UP: Engaging students in discussion of the underrepresentation of women in physics," Joint Fall 2021 Meeting of the Texas Sections of APS, AAPT, and SPS Zone 13 (2021).
5. **Contributed talk**, Conner Kelley, Keely Scott, Robynne Lock, Zahra Hazari, and Geoff Potvin, "Impact of women in physics lesson on students' bias perceptions," American Association of Physics Teachers Summer Meeting (2020).
6. **Poster**, Keely Scott, Conner Kelley, Robynne M. Lock, Zahra Hazari, and Geoff Potvin, "STEP UP: The impact of a women in physics lesson students' figured worlds," Pathways Student Research Symposium (2019).
7. **Poster**, Keely Scott, Conner Kelley, Robynne M. Lock, Zahra Hazari, and Geoff Potvin, "STEP UP: The impact of a women in physics lesson on students' figured worlds," Physics Education Research Conference (2019).
8. **Poster**, Thomas Blake Head, Robynne M. Lock, Raina Khatri, Allan Teer, Zahra Hazari, and Geoff Potvin, "STEP UP: Analyzing student perceptions of physics following a career in physics lesson," Physics Education Research Conference (2019).
9. **Contributed talk**, Thomas Blake Head, Robynne M. Lock, Raina Khatri, Allan Teer, Zahra Hazari, and Geoff Potvin, "STEP UP: Analyzing student perceptions of physics following a career in physics lesson," American Association of Physics Teachers Summer Meeting (2019).
10. **Contributed talk**, Thomas Blake Head and Robynne M. Lock, "Impact on young women's career goals," 2018 Joint Fall Meeting of the Texas Sections of APS, AAPT, and Zone 13 of the SPS (2018).
11. **Poster presentation**, Tessa Bench, Robynne M. Lock, Melanie Schroers, Nicole Gentry, and William G. Newton, "Evidence for effective group work in studio physics," American Association of Physics Teachers Summer Meeting (2018).
12. **Contributed talk**, Thomas Blake Head, Allan Teer, Robynne M. Lock, and Zahra Hazari, "Examining students' responses to a career exploration lesson," American Association of Physics Teachers Summer Meeting (2018).
13. **Poster presentation**, Thomas Blake Head, Robynne M. Lock, Allan Teer, Tessa Bench, Zahra Hazari, and Geoff Potvin, "STEP UP 4 Women: Examining students' responses to lesson interventions," Physics Education Research Conference (2018).
14. **Poster presentation**, Melanie Schroers, Robynne M. Lock, William G. Newton, and Zackary Hutchens, "Examining the factors that impact group work in studio physics," Pathways Symposium (2017).
15. **Contributed talk**, Melanie Schroers, Robynne M. Lock, and William G. Newton, "Examining the factors that impact group work in studio physics," Joint Fall 2017 Meeting of the Texas Section of the APS, Texas Section of AAPT, and Zone13 of the Society of Physics Students (2017).
16. **Poster presentation**, Zackary Hutchens and Robynne Lock, "The impact of studio mode on conceptual understanding and physics identity development," North Carolina AAPT Section Meeting (2017).
17. **Poster presentation**, Zackary Hutchens and Robynne Lock, "The impact of studio mode on conceptual understanding and physics identity development," AAPT Winter Meeting (2017).
18. **Poster presentation**, Zackary Hutchens and Robynne Lock, "The impact of studio mode on conceptual understanding and physics identity development," 2016 Quadrennial Physics Congress (PhysCon) (2016).