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Physics & Astronomy, Dept. 3905
University of Wyoming
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Department of Natural Sciences
Quinsigamond Community College
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Education and Awards

Ph.D., M.S. Physics, University of Wyoming (Laramie, WY). M.S. May 2014, Ph.D. expected 2019-2020. Thesis title: "*Astronomical Databases: Novice/Expert Characteristics in Learners, and Quasar Clustering.*" Additional graduate course work in Science Education (research methods).

M.S. Astronomy, University of Massachusetts (Amherst, MA). May 2003. Additional graduate course work in Science Education (pedagogy).

B.A. Physics and Math, Astronomy minor, Alfred University (Alfred, NY). May 2000. Magna cum laude; Alfred University Honors Society; Honors within the field of specialization: Mathematics, Physics; Alpha Lambda Delta GPA.

Professional Experience

2016-present	Professor of Integrated Science, Quinsigamond Community College
2009-2012, 2015	Associate Professor of Integrated Science, Quinsigamond Community College
2007-2009	Assistant Professor of Integrated Science, Quinsigamond Community College
2004-2006	Instructor of Integrated Science, Quinsigamond Community College

Awards and Honors

2018	QCC Gateway to College Student Choice Award
2018	National Institute for Staff and Organizational Development (NISOD) Excellence Award
2015	UW Physics Department Outstanding Teaching Assistant Award
2015	National Technology Leadership Initiative Award Finalist, Association of Science Teacher Education Meeting. Schwartz, A.C.; Burrows, A.C. 2015. "Novice and Expert Characteristics in Teacher Professional Development in Astronomy Databases."
2014	Chambliss Astronomy Achievement Award Honorable Mention, American Astronomical Society (AAS) Meeting 224. Schwartz, A.C.; et al. "Initial Development and Pilot Study Design of Interactive Lecture Demonstrations for ASTRO 101."
2000	Honors Society graduate, Alfred University
2000	Honors in Physics, Alfred University
2000	Honors in Math, Alfred University
2000	Metzger Prize in Astronomy, Alfred University
2000	Outstanding Senior Nominee, Alfred University

Grants

- 2018 Gordon Research Conferences – Physics Research and Education (\$1,015 for conference registration fee, room, and board)
- 2016 Massachusetts Department of Elementary and Secondary Education (MADESE) Perkins Grant for Career and Technical Education (CTE) Programs (\$3,750 for classroom equipment)
- 2015 NSF EPSCoR Wyoming Women in Science and Engineering WWISE / NSF Grant EPS # 1208909 – Travel Grant (\$1,000 partial funding for AAS meeting 225 registration and hotel)
- 2014 UW Summer Graduate Research / Graduate Student Enhancement Grant (\$4,927.05 for research equipment, services, and training)
- 2014 NSF EPSCoR Wyoming Women in Science and Engineering WWISE / NSF Grant EPS # 1208909 – Travel Grant (\$1,000 partial funding for AAS meeting 224 registration and hotel)
- 2008 QCC Externship (at Harvard-Smithsonian Center for Astrophysics, with Dr. Robert Gutermuth, \$2,500)
- 2008 MADESE Perkins Grant for CTE (\$2,108 for classroom equipment)
- 2005 MADESE Perkins Grant for CTE (\$8,000 for classroom equipment)

Scholarships and Fellowships

- 2013 Wyoming Department of Education, Mathematics and Science Partnership Grant
- 2012-2013 UW Presidential Fellowship (tuition and fee waiver; stipend \$22,500 for 3 semesters)
- 2002-2004 NSF GK-12 Crosscutting Teaching Fellowship, UMass Amherst
- 1996-2004 Alfred University Scholar / National Merit Scholarship (full tuition, room, and board)
- 1996 National Merit Scholarship Finalist

College Service and Committee Work

National Organizations

American Astronomical Society

- 2017-present Full Member
- 2016-2019 Sustainability Committee Member
- 2012-2017, Junior Member
2000-2004
- 2004-2012 Education Affiliate Member

Quinsigamond Community College

Departmental Committees / Meetings

- 2015-present Physics Curriculum Development Meetings

2015-present, Natural Sciences Department Meetings
2004-2012

2009 Physics Lab Management

2006 Natural Sciences Safety Committee

Division / College Meetings

2015-present College of Math and Natural Sciences Meetings

2005-2012 Division of Healthcare and Human Services Meetings

2004 Division of Business and Technology Meetings

Academic Committees / Meetings

2004-present QCC Professional Association
Member: 2004-2006, 2008-2010, 2012-present
President: 2010-2012
Secretary: 2006-2008

2009-2012 Governance Review Team

2005-2012 Faculty Senate
By-Laws Committee: 2005-2009

2009-2010 Academic Affairs

2009-2010 Diversity Caucus

2006-2010 QCC Chorale

2009 Outcomes Assessment Committee

2007-2009 Search Committee: Physical Science Faculty

2006-2008 Sustainability Committee / President's Climate Commitment Committee,
Education & Research Subcommittee

2006-2008 Technology Committee

2005 Quinsigamond Engineering, Science, and Technology Center Development
Committee

2005 Search Committee: Network Services / Systems Administrator

Presentations at Professional Development Workshops

2018 QCC Using Technology in the Classroom Conference: *Social Media as
Professional Development; Disability and Accessibility in the Classroom*

2017 QCC Faculty and Professional Staff Retreat: *Moving Beyond Reflective Practice:
Mentoring Partnerships with Students*

2016 QCC Faculty Innovations and Best Practices Showcase: *Data Mining with Google
Spreadsheets*

2011 QCC Faculty and Professional Staff Retreat: *Social Networking as a Teaching Tool*

2011 National Education Association, Higher Education Conference: *Social Media*

2010 Massachusetts Community College Council Fall Conference: *Social Media Tools*

Community and Professional Outreach

Organization of Events and Speakers at QCC

- 2017 Hidden Figures Panel Discussion Guest: Dr. Suzanne Weeks, Worcester Polytechnic Institute
- 2016-2017 Aldrich Astronomical Society
- 2016 Guest Speaker: Dr. Ryan Hickox, Dartmouth University
- 2016 Liberal Arts Distinguished Lecturer: Dr. Anne Jaskot, Smith College
- 2011 Liberal Arts Distinguished Lecturer: Dr. Robert Gutermuth, UMass Amherst

Regional Conference Organization

- 2016-2017 Spring 2017 American Association of Physics Teachers New England Section Organizer

Presentations for Other Institutions

- 2018 College of the Holy Cross, Worcester, MA
- 2015 Seattle Pacific University, Seattle, WA
- 2006 South Berkshires Elementary School Presentation, Sheffield, MA

Teaching Experience

Teaching – Undergraduate Courses

Quinsigamond Community College (2004-present; modalities: traditional, online, and hybrid; lecture and lab; 15-week and 6-week)

- MAT 090 – Basic Mathematics Skills (developmental)
- PHY 101 – Physics I (trigonometry-based mechanics)
- PHY 102 – Physics II (trigonometry-based electromagnetism)
- PHY 105 – General Physics I (calculus-based mechanics)
- PHY 106 – General Physics II (calculus-based waves and thermo)
- SCI 103 – Earth Science
- SCI 104 – Climate & Weather: Causes & Effects
- SCI 105 – Integrated Science Earth & Space
- SCI 111 – Physical Science I
- SCI 112 – Physical Science II
- SCI 135 – Introductory Astronomy
- SCI 140 – Astronomy I: Close to Home

University of Wyoming (2012)

- ASTR 101 – Introductory Astronomy

Curriculum Development – Undergraduate Courses

Quinsigamond Community College (2004-present)

SCI 105 – Integrated Science Earth & Space

SCI 107 – Science of Technology: Vision and Light

SCI 108 – Science of Technology: Hearing and Sound

SCI 135 – Introductory Astronomy

SCI 140 – Astronomy I: Close to Home

PHY 101 – Physics I (trigonometry-based mechanics)

PHY 102 – Physics II (trigonometry-based electricity and magnetism)

PHY 105 – General Physics I (calculus-based mechanics)

PHY 106 – General Physics II (calculus-based waves and thermo)

PHY 205 – General Physics III (differential equations-based electricity and magnetism, optics, and modern physics)

Teaching Assistant – Graduate Courses

University of Wyoming (2015)

EDCI 5959 – Enrichment Studies (astronomy content and inquiry pedagogy)

Teaching Assistant – Undergraduate Courses

University of Wyoming (2013-2014; modality: lab, discussion, studio; group and individual tutoring)

ASTR 1050 – Survey of Astronomy

PHYS 1110 – General Physics I (trigonometry-based mechanics)

PHYS 1210 – Engineering Physics I (trigonometry-based mechanics)

PHYS 1220 – Engineering Physics II (trigonometry-based electricity and magnetism)

University of Massachusetts Amherst (2000-2002; group and individual tutoring)

ASTR 100 – Exploring the Universe

ASTR 103 – Observational Astronomy Lab

Supplemental Instructor – Undergraduate Teaching Assistant and Tutor

Alfred University (1997-2000)

AST 107 – Elementary Astronomy Laboratory

PHY 125 – Physics I (calculus-based mechanics)

PHY 126 – Physics II (calculus-based electricity and magnetism)

K-12 Education and Public Outreach Experience

Teacher Preparation and Professional Development

Quinsigamond Community College (2004-present)

SCI 105 – Integrated Science Earth & Space (for early childhood education majors)

University of Wyoming (2014-2015)

Instructor; “Astronomy Days” – 3-day workshop for in-service teachers from Wyoming and New Hampshire (NSF AST Grant #1211112)

Grant Coordinator; “Launching Astronomy: Standards and STEM Integration (LASSI)” year-long program for Wyoming in-service teachers (Wyoming DOE grant #WY140202).

<http://uwpd.org/LASSI/>

Teaching Assistant for EDCI 5959 – Enrichment Studies (astronomy content and inquiry pedagogy)

University of Massachusetts Amherst (2002-2004)

Graduate Fellowship; NSF GK-12 program for in-service science teachers from Springfield, MA, area.

“Astrocamp” Summer Programs

University of Wyoming (2013-2015)

Instructor; Launch Pad Astronomy Workshop – one-week summer program for published science-fiction writers, journalists, and editors.

Alfred University (2000, 2006)

Instructor; Summer astronomy program for underprivileged high school students

Johns Hopkins Center for Talented Youth, Lancaster, PA (2004-2005)

Instructor; Summer astronomy course for gifted middle and high school students

Volunteer and Docent

University of Wyoming (2013-2015)

Volunteer and docent for Physics and Astronomy department; sessions for high school students and Homecoming visitors; using Meade telescopes, permanently mounted telescopes, and the Wyoming Infrared Observatory (WIRO) research telescope.

UMass Amherst (2000-2004)

Docent for Astronomy Department Observatory

Springfield Museum of Science (2004)

Volunteer, development of events

Alfred University (1997-2002)

Docent, Stull Observatory

Massachusetts Teaching Certification

HS Physics Preliminary License #386452 (2003)

Workshops and Professional Development Participation

2018 Fitchburg State University Science Symposium

2018 Gordon Research Conferences – Physics Research and Education

2018 Mental Health First Aid USA – 8-hour course and certification

2017 American Association of Physics Teachers – New England Section Regional Meeting

2017 American Physical Society – New England Section Regional Meeting

2010, 2017 QCC Faculty Senate Retreat

2016	QCC Faculty Innovations and Best Practices Showcase
2006, 2015	American Association of Physics Teachers / American Physical Society – Joint New England Section Regional Meeting
1998, 1999, 2003, 2011, 2015	American Astronomical Society Meetings Diversity Workshop, 2011
2011	American Association of Physics Teachers Winter Meeting
2009-2010	NASA Tweetups / Socials Washington, DC, 2009 World Science Festival, New York, NY, 2010
2009	QCC Lab Safety Workshop
2009	QCC Advisor Training in Science
2008	Science Education for New Civic Engagements and Responsibilities, New England Regional Meeting
2008	New England Biology Association of Two-Year Colleges Conference
2004-2005	QCC New Faculty Orientation
2000	Astronomical Society of New York

Astronomy and Physics Education Research Projects

Mentorship in studio physics (action research), 2014-present. Studying the use of the studio setting (class sizes under 40 students, mixed lecture, discussion, lab) as a social justice tool to engage and empower all students of physics. Collaborators: Dr. Andrea Burrows (University of Wyoming), Dr. S. Katie Guffey (University of South Alabama).

Authentic STEM experiences: Using large astronomy databases, 2014-present. Characterizing the work of Astronomy 101 students and in-service STEM teachers on the novice/expert spectrum when working with 200-entry databases about quasars. Collaborator: Dr. Andrea Burrows (University of Wyoming).

Thermal energy in physics and astronomy, 2018-present. Developing classroom materials for lab and lecture in thermal energy, including a multiple-choice assessment, a worksheet, and a lab, and assessing their effectiveness. Collaborator: Dr. Jason E. Ybarra (Bridgewater University, Virginia).

Authentic STEM experiences: Student visualization of molecular cloud emission using Python, 2018-present. Developing web-based tools for students to use Jupyter (Python) to explore molecular emission line data (from the IRAM 30m telescope) from Milky Way clouds, and piloting it in the classroom. Collaborator: Dr. Jens Kauffmann (Haystack Observatory, MIT).

Online physics and astronomy education, 2009-present. Developing effective teaching methods and assessing student learning as compared to traditional on-ground classes.

Spatial reasoning skills, 2008-present. Determining the role of spatial reasoning in science learning.

Astronomy Research Projects

Quasar clustering, 2014–present. Characterizing the 3D clustering properties of radio-loud, radio-quiet, and “radio quiet radio-loud” quasars in SDSS. Collaborators: Dr. Adam Myers (University of Wyoming), Dr. Michael DiPompeo (Dartmouth College), Dr. Sarah Eftekharzadeh (University of Wyoming).

Low surface brightness galaxies, 2002–2004. The search for high mass optically faint galaxies, using the Nançay Radio Telescope (H-I). Collaborators: Dr. Stephen E. Schneider (UMass Amherst), Dr. Wim vanDriel (Observatoire de Paris).

Dwarf galaxies, 2002–2004. Characterizing the gas and stellar content of extreme late type galaxies, using the 2 Micron All Sky Survey (2MASS). Collaborator: Dr. Stephen E. Schneider (UMass Amherst).

Star formation, 2001–2002. Collimated jets and low velocity forbidden line emission from T Tauri stars, using Hubble Space Telescope STIS slitless spectra. Collaborator: Dr. Suzan Edwards (Smith College).

Asteroid rotation, 1999–2000. Rotation rates of asteroids using light curves from the Austin-Fellows 32in Newtonian Reflector. Supervisor: Dr. David Degraff (Alfred University).

Peer Reviewed Journal Articles

Schwartz, A.C.; Burrows, A.C.; Guffey, S.K. (2017.) Mentoring Partnerships in Science Education. *Educational Action Research*, 25(4): 630-649. DOI:10.1080/09650792.2016.1221838.

Burrows, A.; DiPompeo, M.; Myers, A.; Hickox, R.; Borowczak, M.; French, D.; & **Schwartz, A.** (2016.) Authentic science experiences: Pre-collegiate science teachers’ successes and challenges during professional development. *Problems of Education in the 21st Century*, 70(70): 59-73.

Peer Reviewed Journal Articles In Prep

Schwartz, A.C.; Burrows, A.C. (Major revisions and resubmit, due November, 2018.) Authentic Science Experiences: Expert/Novice Traits in Undergraduates Using STEM Datasets. *Research in Science and Technological Education*. (Submission ID: CRST-2018-0048.)

Schwartz, A.C.; Burrows, A.C. (In prep for 2019 submission.) Authentic Science Experiences: Professional Development for K-12 STEM Teachers. *Journal of Research in Science Teaching*.

Schwartz, A.C.; Burrows, A.C. (In prep for 2019 submission.) Qualitative Analysis of Dataset Use: Post-Secondary Expert and Novice Characteristics.

Schwartz, A.C.; Eftekharzadeh, S.; Myers, A.D.; Shen, Y. (In prep for 2019 submission.) Quasar Clustering from SDSS DR10: Dependencies on FIRST Radio Magnitudes. *Monthly Notices of the Royal Astronomical Society*.

Award Winning Conference Presentations

Schwartz, A.C.; Burrows, A. (2015.) Novice and Expert Characteristics in Teacher Professional Development in Astronomy Databases. Association of Science Teacher Education 2015 Meeting. *National Technology Leadership Initiative (NTLI) Award finalist*.

Schwartz, A.C.; et al. (2014.) Initial Development and Pilot Study Design of Interactive Lecture Demonstrations for ASTRO 101. American Astronomical Society Meeting 224. *Chambliss Astronomy Achievement Award Honorable Mention.*

Peer Reviewed Conference Presentations

Schwartz, A.C.; Burrows, A.; Guffey, S. K. (2019.) Mentoring Partnerships in Science Education. American Educational Research Association.

Invited Guest Editorials

Schwartz, A.C. (February 2018.) Guest Editorial: Should You Consider a Community College Career? *American Journal of Physics*, 86(2): 85.

Other Scholarly Works

Schwartz, A.C.; Burrows, A.C. (2018.) Dataset Learning in Astronomy. *Fitchburg State University Science Symposium*. Poster.

Schwartz, A.C. (2018.) Math as a Description of Reality: Guiding Students to Identifying Quantities. *Gordon Research Conferences – Physics Research and Education*. Poster.

Schwartz, A.C.; Burrows, A.C. (2017.) Mentoring Partnerships in Undergraduate Physics and Astronomy Education. *New England Section – American Physical Society, Spring Meeting*. Poster.

Schwartz, A.C.; Burrows, A.C. (2017.) What Can I do with All These Numbers?: Exploring STEM Dataset Use. *New England Section – American Association of Physics Teachers, Spring Meeting*. Presentation.

Schwartz, A.C.; Burrows, A. (2015.) Quantitative Analysis of Database Use: Post-Secondary Expert and Novice Characteristics. *New England Section – American Physical Society / American Association of Physics Teachers, Joint Regional Fall Meeting*. Poster.

Burrows, A.; **et al.** (2015.) Partnerships: A Systematic Study of Two Professional Developments. *National Science Teachers Association / Association for Science Teacher Education Joint Regional Meeting*.

Schwartz, A.C.; Burrows, A.C.; & Myers, A. (2015.) Learning to Work with Databases in Astronomy: Quantitative Analysis of Science Educators' and Students' Pre-/Post-Tests. *American Astronomical Society Meeting 225*. Poster.

Schwartz, A.C.; Eftekharzadeh, S.; Myers, A.D.; & Shen, Y. (2015.) Quasar Clustering from SDSS DR7: Dependencies on FIRST Radio Magnitudes. *American Astronomical Society Meeting 225*. Poster.

Schwartz, A.C.; et al. (2014.) A Review of Educational Computer Simulations for Interactive Lecture. *New England Section of the American Association of Physics Teachers, Spring Meeting*. Poster.

Schwartz, A.C. (2011.) A Comparison of Online and On-Ground Student Performance in Calculus-based Physics I. *American Association of Physics Teachers, Winter Meeting*. Poster.

Schwartz, A.C. (2011.) A Comparison of Online and On-Ground Student Performance in Calculus-based Physics I. *American Astronomical Society Meeting 218*. Poster.

Schwartz, A.C. (2008.) How Much Math Do They Need?: Determining Math Prerequisites for Science Courses. *New England Association of Biology at Two Year Colleges*. Presentation.

- Schwartz, A.C.** (2006.) *New England Section – American Physical Society / American Association of Physics Teachers, Joint Regional Fall Meeting.*
- Schwartz, A.C.;** et al. (2003.) Scientists in School: UMass Amherst STEM Connections and the NSF GK-12 Program. *American Astronomical Society Meeting 203.* Poster.
- Schwartz, A.C.;** Schneider, S. E. (2003.) Stellar and Gas Content of Dwarf and Low Surface Brightness Galaxies. *American Astronomical Society Meeting 202.* Poster.
- Schwartz, A.C.** (2000.) Using Rotational Transitions of Methyl Cyanide as a Temperature Indicator in Molecular Clouds. *News Letter of the Astronomical Society of New York 5.* Presentation.
- Schwartz, A.C.;** Mangum, J. G. (1999.) Using Rotational Transitions of Methyl Cyanide (CH₃CN) as a Temperature Indicator in Molecular Clouds. *American Astronomical Society Meeting 195.* Poster
- Schwartz, A.C.;** Ladd, E.F. (1998.) The Pre-Stellar Content of the I04181 Star Forming Region in Taurus. *American Astronomical Society Meeting 193.* Poster
- Nakano, S.; Degraff, D.; **Schwartz, A.C.;** & Marsden, B.G. (1998.) Comet P/1998 G1 (Linear). *IAU Circ.*
- Offutt, W.B.; **et al.** (1998.) Comet C/1998 G1 (Linear). *IAU Circ.*
- Tichy, M.; **et al.** (1998.) 1998 HL3. *Minor Planet Electronic Circ.*