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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 May 2018. 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.

Awards and Honors

- 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 Metzger Prize in Astronomy, Alfred University
- 2000 Outstanding Senior Nominee, Alfred University

Grants

- 2014 NSF EPSCoR Wyoming Women in Science and Engineering WWISE / NSF Grant EPS # 1208909 travel grant to AAS Meeting 224 (\$1,000)
- 2015 NSF EPSCoR Wyoming Women in Science and Engineering WWISE / NSF Grant EPS # 1208909 travel grant to AAS meeting 225 (\$1,000)
- 2008 QCC Externship (at Harvard-Smithsonian Center for Astrophysics, with Dr. Robert Gutermuth, \$2,500)
- 2008 Massachusetts Department of Elementary and Secondary Education (MADESE) Perkins Grant for Career and Technical Education (CTE) Programs (\$2,108 for classroom equipment)
- 2016 MADESE Perkins Grant for CTE (\$3,750 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

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

College Service and Committee Work

National Organizations

American Astronomical Society

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

Quinsigamond Community College

Departmental Committees / Meetings

2004-2012, 2015-present	Natural Sciences Department Meetings
2015-present	Physics Curriculum Development Meetings
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

2004-2017	QCC Professional Association Member, 2004-2006, 2008-2010, 2012-present
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	President, 2010-2012 Secretary, 2006-2008
2016	QCC Faculty Innovations and Best Practices Showcase Presentation
2009-2012	Governance Review Team
2009-2010	Academic Affairs
2009-2010	Diversity Caucus
2006-2010	QCC Chorale
2009	Outcomes Assessment Committee
2005-present	Faculty Senate By-Laws Committee, 2005-2009
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
2007-2009	Search Committee: Physical Science Faculty

Presentations at Professional Development Workshops

2018	QCC Using Technology in the Classroom Conference: <i>Social Media as Professional Development; Disability and Accessibility in the Classroom</i>
2017	QCC Faculty and Professional Staff Retreat: <i>Moving Beyond Reflective Practice: Mentoring Partnerships with Students</i>
2016	QCC Faculty Innovations and Best Practices Showcase: <i>Data Mining with Google Spreadsheets</i>
2011	QCC Faculty and Professional Staff Retreat: <i>Social Networking as a Teaching Tool</i>
2011	National Education Association, Higher Education Conference: <i>Social Media</i>
2010	Massachusetts Community College Council Fall Conference: <i>Social Media Tools</i>

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

2006 South Berkshires Elementary School Presentation

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)

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)

ASTR 1050 – Survey of Astronomy

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

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

University of Massachusetts Amherst (2000-2002)

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/>

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

- 2017 American Association of Physics Teachers Regional Meeting
- 2017 American Physical Society Regional Meeting
- 2010, 2017 QCC Faculty Senate Retreat
- 2016 QCC Faculty Innovations and Best Practices Showcase
- 2006, 2015 New England Section American Association of Physics Teachers / American Physical Society Joint Regional Meeting
- 2011 American Association of Physics Teachers Winter Meeting
- 1998, 1999, 2003, 2011, 2015
American Astronomical Society Meetings
Diversity Workshop, 2011
- 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, S. Katie Guffey (University of Wyoming).

Expert vs. Novice differences in processing large databases in astronomy, 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).

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

Using educational computer simulations for introductory astronomy courses, 2013-2014.

Developing new methods of using computer simulations to enhance student learning. AAS Meeting 224 (Boston June 2014) Chambliss Astronomy Achievement Award Honorable Mention. Collaborator: Dr. Timothy F. Slater (University of Wyoming).

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, Dr. Michael DiPompeo, Sarah Eftekharzadeh (University of Wyoming).

Low surface brightness galaxies, 2002-2004. The search for high mass optically faint galaxies, using the Nancay 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. (In prep for 2018 submission.) Using STEM Datasets: The Who and How of Expert/Novice Levels.

Schwartz, A.C.; Burrows, A.C. (In prep for 2018 submission.) Dataset Use in Undergraduate Astronomy Students. *Physical Review Physics Education Research*.

Schwartz, A.C.; Burrows, A.C. (In prep for 2018 submission.) Qualitative Analysis of Dataset Use: Post-Secondary Expert and Novice Characteristics. *Journal of Research in Science Teaching*.

Schwartz, A.C.; Eftekhazadeh, S.; Myers, A.D.; Shen, Y. (In prep for 2018 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*.

Invited Guest Editorials

Schwartz, A.C. (In press for February 2018.) Guest Editorial: Should You Consider a Community College Career? *American Journal of Physics*. MS #30177.

Other Scholarly Works

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.

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.; Eftekhazadeh, 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.
- Schwartz, A.C.** (2011.) A Comparison of Online and On-Ground Student Performance in Calculus-based Physics I. American Astronomical Society Meeting 218.
- 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.
- 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.
- Schwartz, A.C.;** Schneider, S. E. (2003.) Stellar and Gas Content of Dwarf and Low Surface Brightness Galaxies. American Astronomical Society Meeting 202.
- 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.
- 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.
- Schwartz, A.C.;** Ladd, E.F. (1998.) The Pre-Stellar Content of the I04181 Star Forming Region in Taurus. American Astronomical Society Meeting 193.
- 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.*