

Laura Trouille

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Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA)

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Professional Preparation:

Dartmouth College	Summa Cum Laude; Physics High Honors	B.A. 2003
U. of Wisconsin - Madison	Major; Astronomy; Minor: Physics	Ph.D. 2010
Northwestern University	CIERA Postdoctoral Fellow	Sept 2010+

Research Appointments:

CIERA Postdoctoral Fellow, Astrophysics & Science Ed. Research, Northwestern Univ.	Sept 2010+
National Science Foundation Graduate Research Fellow, Astrophysics, UW-Madison	2006-2009
CIRTL-DELTA Intern, Astronomy Education Research, UW-Madison	2008-2010
Research Assistant, UW-Madison, Astrophysics Ph.D. Thesis Advisor: Dr. A. Barger	2004-2010
Research Assistant, SwRI-Boulder, Senior Thesis Advisor: Dr. E. Young	2002-2003
Research Assistant, L'Observatoire de Paris, Advisor: Dr. J. P. Zahn	Spring 2002
Research Assistant, Dartmouth College, Advisor: Dr. B. Chaboyer	1999-2002

Teaching Appointments:

Astronomy Adjunct Faculty, Chicago State University, Mentor: Dr. Kim Coble	Winter/Spring 2011
Pedagogy Seminar Instructor, Northwestern University GK12 Program	Sept 2010+
Online Astronomy Course Instructor, Northwestern University Gifted Learning Links	Fall 2011
CT-STEM Teacher Training Workshop Instructor, Northwestern University	Summer 2011
Tutor, UW-Madison	2004-2009
Teaching Assistant, UW-Madison, Mentors: Drs. Matt Haffner & Bob Mathieu	Spring 2006
Computer Literacy & ESL High School Teacher, Czech Republic & India	2003-2004

Grants/Awards:

- Co-PI for newly NSF-funded \$1 million, 3-year Computing Education in the 21st century grant to develop computational thinking curricula for the high-school STEM classroom, 2011-2014
- Northwestern University CIERA Postdoctoral Fellowship, 2010-present
- Mentor for H.S. students, 3rd place in the Siemens Talent Competition, \$20,000 college scholarship each, 2011
- National Science Foundation Graduate Research Fellowship, 2006-2009
- Wisconsin Space Grant Graduate Research Fellowship, 2005-2006
- Co-PI for American Physical Society Grant for 'Flip4Physics': physics lab video interview project, 2011-2012
- Co-PI for Illinois Space Grant for 'Teacher Training Workshop: STEM in the 21st Century', 2010-2011
- NASA International Year of Astronomy Graduate Student Ambassador Grant to build and display the 'From Earth to the Universe' astronomy image exhibit across Wisconsin, 2009
- Co-PI for NSF WISELI grants: campus visits of women astronomers for research & diversity talks, 2008-2010
- Co-PI for 5 Wisconsin Space Grants for UW-Madison after-school astronomy enrichment programs, 2007-2010
- Chambliss Astronomy Achievement Award, Honorable Mention, winter AAS, 2008
- Summa Cum Laude, Phi Beta Kappa, & Physics Chair's Prize, Dartmouth College, 2003
- *Travel grants*: AAS International Travel Grant for Workshop in Madrid, 2011; AAS travel grant for Arecibo Single Dish Radio School, 2009; NRAO travel grant for Taiwan ALMA conference, 2009; Vilas Travel Grant for IAU GA in Brazil, 2009; Wisconsin Space Grant to attend UC-Santa Cruz inquiry-learning PDW, 2006

Publications:

AGN & Galaxy Evolution-

- The OPTX Project I: Flux and Redshift Catalogs for the CLANS, CLASXS, and CDF-N Fields. **Trouille, L.**, Barger, A. J., Cowie, L. L., Yang, Y. & Mushotzky, R. F. 2008, ApJS, 179, 1
- The OPTX Project II: Hard X-ray Luminosity Functions of Active Galactic Nuclei for $z < 5$. Yencho, B., Barger, A. J., **Trouille, L.** & Winter, L. M. 2009, ApJ, 698, 380
- The OPTX Project III: X-ray versus Optical Spectral Type for AGNs. **Trouille, L.**, Barger, A. J., Cowie, L. L., Yang, Y. & Mushotzky, R. F. 2009, ApJ, 703, 2160
- The OPTX Project IV: How Reliable is [OIII] as a Measure of AGN Activity? **Trouille, L.** & Barger, A. J. 2010, ApJ, 722, 212
- The OPTX Project V: Identifying Distant AGNs. **Trouille, L.**, Barger, A. J., & Tremonti, C. 2011, ApJ, 742, 46
- Measuring Sources of Intergalactic Ionizing Flux. Cowie, L., Barger, A., & **Trouille, L.** 2009, ApJ, 692, 1476
- Dependence of X-ray Spectral Slope on AGN Accretion Rate, **Trouille, L.** & Hickox, R., in prep.
- Quenching Star Formation in Post-Starburst Galaxies, **Trouille, L.**, Tremonti, C., Chen, Y., et al. in prep.

Local Void-

- Testing for a Large Local Void by Investigating the Normalization of the Near-Infrared Galaxy Luminosity Function, Keenan R. Barger, A. J., Cowie, L., Wang, W., Wold, I., & **Trouille, L.** 2011, in referee process
- An Extremely Deep Wide-Field Near-Infrared Survey. Keenan, R., **Trouille, L.**, Barger, A. J., Cowie, L. L. & Wang, W.-H. 2010, ApJS, 186, 94

Science Education Research-

- Gravitational Wave Science in the High School Classroom, Farr, B., Mathias, G., & **Trouille, L.**, 2011, American Journal of Physics, accepted pending final revision
- Impact of Computational Thinking Curricula in the High-School STEM Classroom, **Trouille, L.**, Jona, K., Wilensky, U., Horn, M., & Weintrop, D., in prep
- Student Ideas and ‘Alternate Conceptions’ in Cosmology: Results from Pre-Course Surveys, Bailey, J., Coble, K., **Trouille, L.**, et al., in prep.
- Student Ideas and ‘Alternate Conceptions’ in Cosmology: Results from Formal Assessment Measures and In-Depth Interviews, Coble, K., **Trouille, L.**, Bailey, J., et al., in prep.

Selected Talks:

- Disentangling Dominance: Obscured AGN Activity versus Star Formation in BPT-Composites, High Energy Views of Galaxies and their Nuclei, Mexico, Nov. 2011
- The Monster’s Fiery Breath: The Role of AGN in Galaxy Evolution, DePaul Physics Colloquium, Oct. 2011
- Further Evidence for a Time Delay?, Galaxy Mergers in an Evolving Universe, Taiwan, Oct. 2011
- Disentangling Dominance: Obscured AGN Activity versus Star Formation in BPT-Composites, The Starburst-AGN Connection, ESAC Science Workshop, Madrid, Spain, Sept. 2011
- X-ray/IR Stacking Analyses: Investigating the Reliability of Optical Selection of AGN, Fellows at the Frontiers of Science, Northwestern University, August 2011
- Building Up the Red-Sequence: The AGN-Starburst Connection, AAS Conference, 43, 123.03, Spring 2011
- The Monster’s Fiery Breath: Role of AGN in Galaxy Evolution, CSU Science Colloquium Series, May 2011
- Pushing the Limit: A New & Reliable High-Redshift Emission Line Diagnostic for Separating AGNs from Star Formers, AAS Conference, 43, 326.03, Winter 2011
- The OPTX Project: Optical Spectroscopy And X-ray Properties of Obscured and Unobscured AGNs, AAS Conference, Thesis presentation, 42, 353.03, Winter 2010

Session Chair:

- Transforming Cultural Norms: Mentoring and Networking Groups for Women and Minorities, Committee on the Status of Women, American Astronomical Society Conference, Boston, May 2011
- Black Hole/Galaxy Co-evolution Session, AGN-Starburst Connection Conference, Durham, England, July 2011
- Fellows at the Frontiers of Astronomy Conference, Northwestern University, August 2011

Department and Professional Society Service:

- American Astronomical Society (AAS) Committee on the Status of Women in Astronomy. With D. Charbonneau, leading effort to identify and promote best practices for institutions and national fellowships with regards to parental leave policies for graduate students and postdoctoral fellows, 2010-2013
- Co-organized CIERA conference (ciera.northwestern.edu/frontiers/) for postdoctoral fellows, 2011
- Co-founder of WOWSA (Women of Wisconsin Strengthening Astronomy) mentoring and networking group for U. of Wisconsin physics and astronomy students, postdocs, and early-career faculty, 2008-2010
- Organized UW-Madison Astronomy Department weekly extragalactic discussion group, 2007-2010
- Referee for Astrophysical Journal articles, 2010-present

Science Education Research:

- Author and co-PI for newly NSF-funded 3-year \$1million Computing Education for the 21st Century (CE21) grant. In collaboration with Northwestern learning sciences and computer science faculty, developing computational thinking curricula for the STEM classroom and providing teacher-training workshops for high-school teachers to use these materials in their classrooms, 2011-2014
- Investigating student ideas and ‘alternate conceptions’ in cosmology using interviews, pre/post-surveys, and course materials, in collaboration with astronomy education researchers at Chicago State, etc. Also designing problem-based cosmology curricular materials for undergraduate astronomy courses, Spring 2011-present
- Attended Science Education Research workshop, AAS Conference, Winter 2011
- Attended UC-Santa Cruz CfAO inquiry-based lab professional development workshop, 2006
- CIRTL-DELTA Certificate. Through the UW-Madison Center for the Integration of Research, Teaching, and Learning (CIRTL) center, completed ‘Teaching-as-Research’ coursework, mentoring seminar, and internship; designed, implemented, and assessed 1) an undergraduate inquiry-based lab on light and color and 2) astronomy problem-based learning modules geared for middle/high-school students in out-of-school setting, 2004-2010

Teaching and Teacher-Training:

- Taught the astronomy course at Chicago State University; developed and assessed learning activities for students in small groups to use real data to address questions in astronomy and construct their knowledge, Spring 2011
- Created and taught an online astronomy enrichment course for the Gifted Learning Links program through Northwestern University’s Center for Talent Development, flip.ciera.northwestern.edu/CTD_2011, Fall 2011
- Designed and implemented two-day teacher training workshop for CT-STEM pilot teachers, August 2011
- Lead weekly pedagogy seminar for the STEM graduate student NSF-GK12 fellows, 2010-present
- Teaching Assistant for Dr. Haffner’s introductory astronomy course at UW-Madison; led 6 discussion sections per week for which I designed problem-based learning activities, Spring Semester 2006
- Tutor for undergraduate students in both the lecture and lab astronomy courses, 2004-2009
- Co-founder, curriculum developer, and teacher for weekly after-school science enrichment sessions for Boys ‘N Girls Clubs middle-school students, 2006-2008
- Co-leader for annual ‘Expanding your Horizons’ astronomy enrichment session for middle-school girls on the UW-Madison campus (ex., created ‘Where in the Universe is Sally Ride’s Spacesuit?’, an online astro-detective game, <http://www.astro.wisc.edu/~trouille/EYH/>), 2004-2010
- Earned my ESL teaching certificate and taught ESL in the Czech Republic during the fall semester to high school students needing to improve their college entrance exam scores. Then taught computer literacy courses and ESL to high school students in India for the winter and spring semester, 2003-2004

Mentoring:

- Attended weekly UW-Madison CIRTL mentoring seminar, Spring 2007
- Mentor for William Rice (Northwestern University) identifying probable merger histories for post-starburst galaxies via simulations, Fall 2011+. W. Rice will present this work at NU’s Undergrad Research Symposium.
- Mentor for Julia Crowley & Patrick Loftus (Evanston Township High School) investigating quenching of star formation in SDSS post-starburst galaxies via visual morphological classification, Summer 2011. Their submission to the Siemens Talent Competition (out of >1900) earned them 3rd place and a \$20K scholarship, each.

- Co-mentor for David Weintrop & Elham Beheshtizavareh (Northwestern University learning sciences graduate students) to develop our CT-STEM skills assessment test and curriculum design, Fall 2011-present
- Co-mentor for Virginia Hayes, Melissa Nickerson, and Carmen Camarillo (Chicago State University students in the teacher credential program) to identify common ‘alternate conceptions’ in cosmology, Spring 2011-present
- Mentor for Tom Finzell (UW-Madison) improving Perl-script data reduction of Subaru SUPRIME-Cam images, 2008-2009. Tom is now a graduate student in astronomy at Michigan State University.
- Mentor for Abby Cariker & Tim Larsen (UW-Madison) identifying high-redshift galaxies via color selection and constraining the size of the local void via near-infrared number counts, 2006-2008. This work formed A. Cariker’s senior thesis, presented as a poster at the AAS winter conference. A. Cariker is now a high-school physics teacher. T. Larsen worked as a software programmer and is now applying for grad programs in physics.

Public Outreach:

- Organizer for APS-funded Flip4Physics: HS student-created videos of local physics labs, 2010-present
- Adler Planetarium consultant for updating the Deep Space Adventure ‘We are Stardust’ exhibit, Winter 2011
- NASA graduate student ambassador to the 2009 International Year of Astronomy. Created and exhibited the ‘From Earth to the Universe’ exhibit (forty 4’x3’ astronomy images with captions in English, Spanish, and Hmong + scavenger hunt + website for further astronomy enrichment, www.astro.wisc.edu/~trouille/IYA09) at community centers, museums, planetariums, and observatories across Wisconsin, January 2009-2010
- Created and organized the PEOPLE ‘Party with the Stars’ night sky show and public lecture led by UW undergraduate students from groups traditionally under-represented in the sciences, Fall 2008
- Provided dozens of public lectures and night sky shows (through the Adler Planetarium ‘Conversations with an Astronomer’, Northwestern University’s ‘Brown Bag Lunches’, the Universe in the Park Program bringing telescopes to state parks, Washburn Observatory public observing nights, etc.), 2004-present

Collaborations:

- *Astronomy Education Research:* Bailey, J. (Univ. of Nevada – Las Vegas); Camarillo, C. (Chicago State University); Coble, K. (Chicago State University); Cochran, G. (Florida International University); Hayes, V. (Chicago State University); Nickerson, M. (Chicago State University)
- *Northwestern University NSF CE21 CT-STEM Research:* Jona, K. (Computer Science & Office of STEM Education Partnerships); Wilensky, U. (Computer Science); Horn, M. (Learning Sciences); Weintrop, D. (Learning Sciences); Beheshtizavareh, E. (Computer Science); Kalogera, V. (CIERA – Physics & Astronomy)
- *Astrophysics Research:* Barger, A. (UW-Madison; U. of Hawaii); Chen, Y. (UW-Madison); Cowie, L. (U. of Hawaii); Greenhill, L. (Harvard-CfA); Haggard, D. (Northwestern University); Hickox, R. (Durham University & Dartmouth College); Hu, E. (U. of Hawaii); Keenan, R. (CTIO-Chile); Mushotzky, R. (NASA-GSFC; University of Maryland); Taam R. (Northwestern University); Tremonti, C. (UW-Madison); Wang, W. (ASIAA-Taiwan); Winter, L. (UC-Boulder); Wold, I (UW-Madison); Yang, Y. (U-Illinois)
- Membership to LSST AGN Science Team, submitted 10/11

Observing & Data Reduction

- ***X-ray:*** *Chandra X-ray Satellite* imaging and spectral analysis
- ***Optical:*** Subaru Suprime-Cam; CFHT MegaCam photometry
- ***IR:*** U.H. 88 inch ULBCam *J* and *H*-band; UKIRT WFCam *K*-band photometry
- ***Spectroscopy:*** Keck DEIMOS; WIYN HYDRA optical spectra