

# Emily E. Richards

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CONTACT INFORMATION	Indiana University Department of Astronomy Swain West 318 727 East 3rd Street Bloomington, IN 47405-7105	<i>Phone:</i> (812) 855-5136 <i>Email:</i> <a href="mailto:er7@indiana.edu">er7@indiana.edu</a>
RESEARCH INTERESTS	Galaxy formation and evolution; galaxy kinematics; radio interferometry	
EDUCATION	<b>Ph.D., Astronomy</b> , Indiana University Minor: Scientific Computing Advisor: Dr. Liese van Zee	Anticipated August 2016
	<b>M.A., Astronomy</b> , Indiana University	2013
	<b>B.S., Physics &amp; Astronomy</b> , University of Iowa Minor: Music Advisor: Dr. Cornelia C. Lang	2011
RESEARCH EXPERIENCE	<b>Research Assistant</b> , Indiana University Advisor: Dr. Liese van Zee Neutral hydrogen kinematic study of galaxies; galaxy structural parameters.	2011-present
	<b>Research Assistant</b> , University of Iowa Advisor: Dr. Cornelia C. Lang Study of the interstellar medium in the Galactic Center; search for massive stellar clusters in the Galaxy.	2008-2011
	<b>REU Student</b> , University of Wisconsin-Madison University of Wisconsin-Madison Research Experience for Undergraduates Advisor: Dr. Sebastian Heinz Spectral analysis of the jet-powered shell from the X-ray binary Cygnus X-1.	Summer 2010
TEACHING EXPERIENCE	<b>Instructor, A100: The Solar System</b> <b>Instructor, A105: Stars and Galaxies</b> Indiana University Introductory astronomy course for non-science majors. Topics include the celestial sphere, seasons and moon phases, properties of light, the sun, history of astronomy, origin of the solar system, properties and exploration of planets and other bodies in the solar system, extrasolar planets, stellar properties and life cycles, Milky Way, galaxy evolution, and cosmology.	Summer 2013, Fall 2014 Summer 2014
	<b>Associate Instructor, Various Courses</b> Indiana University Responsibilities include guest lecturing, holding office hours, grading, running rooftop observing sessions, attending all classes, and teaching telescope observing labs. Courses: General Astronomy I (A221), Stars and Galaxies (A105), Modern Observational Techniques (A305), General Astronomy II (A222), Solar System (A100).	2011-2014

OBSERVING EXPERIENCE	<b>Wisconsin-Indiana-Yale-NOAO (WIYN) 0.9m telescope</b> 2012-2014 Kitt Peak National Observatory 27 nights from three Principal Investigator proposals
	<b>Wisconsin-Indiana-Yale-NOAO (WIYN) 3.5m telescope</b> 2014-2015 10 nights from three co-Principal Investigator proposals
	<b>Very Large Array Radio Interferometer</b> 2012-present 63 hours from one Principal Investigator proposal Archival data processing and analysis
PROFESSIONAL TALKS	<b>Massive Stellar Clusters in the Galaxy: Multiwavelength Observations of New Candidate Clusters</b> Board of Regents State of Iowa May 2011 University of Iowa Astronomy Seminar, Honors Colloquium April 2010
	<b>Spectra of the Jet-Powered Shell of Cygnus X-1</b> July 2010 University of Wisconsin-Madison REU Program
PUBLIC AND COMMUNITY OUTREACH	<b>Kirkwood Observatory Tours</b> 2011-present Indiana University Host evening public observing sessions for the Bloomington, IN community. Give private tours of the observatory for local school and campus groups.
	<b>Physics and Astronomy Open House</b> 2011-present Indiana University Participate in running hands-on astronomy activities for the Physics and Astronomy Open House, an annual public outreach event for children and adults throughout southern Indiana.
	<b>Indiana State Science Olympiad</b> 2011-present Indiana University Assist in writing and grading of the Astronomy exam for the annual Indiana State Science Olympiad Competition for middle and high school students.
	<b>Outreach and Demonstration Shows</b> 2007-2011 University of Iowa Participated in and helped organize various outreach activities and annual Department of Physics & Astronomy Demonstration Show.
	<b>Observatory Volunteer</b> 2007-2011 Cedar Amateur Astronomers, Palisades-Dows Observatory Volunteered for public outreach events for the Iowa City & Cedar Rapids, IA communities.

HONORS AND AWARDS	<b>Dissertation Year Research Fellowship</b>	Fall 2015-Spring 2016
	Indiana University College of Arts and Sciences	
	<b>Indiana Space Grant Consortium Fellowship Award</b>	2014-2016
	<b>Frank and Margaret Edmondson Prize for Teaching</b>	Spring 2015
	Indiana University Department of Astronomy	
	<b>Chambliss Astronomy Achievement Student Award</b>	Summer 2013
	222 <sup>nd</sup> Meeting of the American Astronomical Society	
	<b>Provost's Travel Award for Women in Science</b>	2013-2015
	Indiana University	
	<b>Old Gold Scholarship</b>	2007-2011
	University of Iowa	
	<b>Edward B. Nelson Scholarship</b>	2007
	Department of Physics & Astronomy, University of Iowa	
	<b>Charles Wert Scholarship</b>	2007-2011
	Department of Physics & Astronomy, University of Iowa	
	<b>Horatio Alger Association Scholarship</b>	2007-2011
	Horatio Alger Association for Distinguished Americans, Inc.	
COMPUTER SKILLS	<b>Programming Languages</b>	
	R (limited working proficiency), Python (limited working proficiency), Linux/Unix shell scripting (limited working proficiency), C (elementary proficiency), Fortran (elementary proficiency)	
	<b>Software</b>	
	L <sup>A</sup> T <sub>E</sub> X (full professional proficiency), AIPS (full professional proficiency), CASA (full professional proficiency), GIPSY (full professional proficiency), SuperMongo (full professional proficiency), IRAF (full professional proficiency), Mathematica (limited working proficiency), MatLab (limited working proficiency), IDL (elementary proficiency), Paraview (elementary proficiency)	
PROFESSIONAL MEMBERSHIPS	<b>American Astronomical Society</b>	2013-present
	<b>Society of Physics Students</b>	2008-2011
	Department of Physics & Astronomy, University of Iowa Officer, President	
REFEREED PUBLICATIONS	3. <b>Richards, Emily E.</b> , van Zee, L., Barnes, K. L., Staudaher, S., Dale, D. A., Braun, T. T., Wavle, D. C., Calzetti, D., Dalcanton, J. J., Bullock, J. S., Chandar, R., <i>Baryonic Distributions in the Dark Matter Halo of NGC 5005</i> , 2015, Monthly Notices of the Royal Astronomical Society, 449, 3981	
	2. P. H. Sell, S. Heinz, <b>E. Richards</b> , T. J. Maccarone, D. M. Russell, E. Gallo, R. Fender, S. Markoff, M. Nowak, <i>Shell-Shocked: The Interstellar Medium Near Cygnus X-1</i> , 2015, Monthly Notices of the Royal Astronomical Society, 446, 3579	

1. **E. E. Richards**, C. C. Lang, C. Trombley, and D. F. Figer, *Multiwavelength Observations of Massive Stellar Cluster Candidates in the Galaxy*, 2012, The Astronomical Journal, 144, 89

NON-REFEREED  
PUBLICATIONS

8. Braun, Timothy, van Zee, Liese, **Richards, Emily E.**, McQuinn, Kristen B., Skillman, Evan D., Edges Team, *Detection of an Extended Outflow in NGC 4102*, 2015, American Astronomical Society Meeting Abstracts, 225, #250.27
7. **E. E. Richards**, L. van Zee, D. C. Wavle, K. L. Barnes, S. Staudaher, D. A. Dale, D. Calzetti, J. J. Dalcanton, J. S. Bullock, R. Chandar, *Baryonic Distributions in the Dark Matter Halo of NGC 4088*, 2013, (Structure and Dynamics of Disk Galaxies Conference poster)
6. L. van Zee, D. Wavle, **E. E. Richards**, K. L. Barnes, S. Staudaher, D. A. Dale, D. Calzetti, J. Dalcanton, J. Bullock, R. Chandar, J. L. Hinz, *Structure Formation and Dark Matter Distributions in Dwarf Irregular Galaxies*, 2013, Probes of Dark Matter on Galaxy Scales, 30305
5. **E. E. Richards**, L. van Zee, D. C. Wavle, K. L. Barnes, S. Staudaher, D. A. Dale, D. Calzetti, J. J. Dalcanton, J. S. Bullock, R. Chandar, *Baryonic Distributions in the Dark Matter Halo of NGC 3992*, 2013, American Astronomical Society Meeting Abstracts, 222, #314.04
4. D. Wavle, L. van Zee, **E. E. Richards**, K. L. Barnes, S. Staudaher, D. A. Dale, D. Calzetti, J. Dalcanton, J. Bullock, R. Chandar, J. L. Hinz, *Kinematic Analysis of Nine Low Mass Gas-Rich Galaxies*, 2013, American Astronomical Society Meeting Abstracts, 222, #314.12
3. P. Sell, S. Heinz, **E. E. Richards**, D. Russell, E. Gallo, S. Markoff, R. Fender, M. Nowak, *The Shell-Shocked Interstellar Medium Near Cygnus X-1*, 2013, American Astronomical Society Meeting Abstracts, 222, #214.02
2. **E. E. Richards**, C. C. Lang, C. Trombley, D. F. Figer, HST/NICMOS GC Paschen Alpha Team, *Multiwavelength Observations of the Most Massive Stellar Clusters in the Galaxy*, 2011, Bulletin of the American Astronomical Society, 43, #241.07
1. **E. E. Richards**, T. Zimmermann, C. C. Lang, D. F. Figer, B. Davies, C. Trombley, *Massive Stellar Clusters in the Galaxy: Multiwavelength Observations of New Candidate Clusters*, 2010, (University of Iowa Undergraduate Research Festival poster)