
Survey response

Candidate statements and CV/resume

Please enter your name and email address below. [First Name]

Laura

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Trouille

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What do you feel are the major concerns facing the citizen science community?

- Trust.
 - o There is a lack of trust, valuing, and participation in science by the public. Participation in citizen science offers a transformative opportunity to gain insight into and trust in the processes of science. With the rapid increase in citizen science opportunities, there is a critical need to share knowledge and best practices in order to help lift all in providing a quality experience that continues to build this trust.
 - o In building public trust, it is key that each citizen science program ensures that its participants efforts are valued and worthwhile, that participation will not be used against its participants (e.g., in Flint there was concern that participation would nullify access to legal support), that the public has access to participation in strategic planning and decision making about the citizen science projects in which they are participating, and that their opinions are taken seriously.
 - o In some research disciplines, there is a high degree of trust that citizen science tools produce valid and reliable results, and that these can be used in respected, peer-reviewed publications. This trust has been built through pioneering projects thoughtful in understanding and documenting data reliability and validity. In other disciplines, we are in the early stages of building trust. There remains a critical need to improve researcher's awareness of citizen science as a tool for research and to educate about best practices around data validity and reliability.
- Access and Inclusion.
 - o Students in underserved areas are left behind in education and in access to opportunities. Within our Adler Teen Programs, we have the most impact on teens' lives through long-term, deep engagement opportunities paired with mentoring and cohort building, teen-led programming (ideally within their community spaces), etc. This approach requires long-term, intensive investment in communities and has been possible at the Adler only because of strong institutional support in this mission and success securing long-term funding. What can we do on a national level to help incorporate these types of intensive, community-focused best practices around access and inclusion into citizen science programs, particularly when funding is tight and programs are under-resourced?
 - o Similarly, researchers at under-resourced institutions often do not have the same ability to access citizen science as a tool for research as researchers at well-resourced institutions. The Zooniverse's free project builder is one solution, though it is not a complete solution nor one that addresses all needs. There is a need for a comprehensive strategy for ensuring access to citizen science as a research tool for all.
 - o Open data and access to publications: There is a critical need for citizen science to be a leading voice in the open data movement and public access to research publications. There should be no barrier to citizen scientists in accessing the data or the results.

What skills and what types of experience would you bring to the CSA board?

It would be an honor to serve on the CSA board, and an amazing opportunity to grow. In its 10 years, Zooniverse has gained a breadth of knowledge and expertise around engaging researchers and the public in citizen science. We also are clear on our shortcomings, and that it is only one approach among many. Through Zooniverse and the Adler Teen Programs efforts, I think I could bring a useful perspective and experience to the CSA board.

Since July 2015 I have been the Director of Citizen Science at the Adler Planetarium and co-I for Zooniverse. Zooniverse is a leader in online citizen science, supporting over 50 active projects and engaging 1.5 million registered volunteers. Since Galaxy Zoo in 2007, Zooniverse has supported over 80 projects across the disciplines, partnering with hundreds of researchers around the world, resulting in over 100 peer-reviewed publications to date.

In this role, I've led the Adler-Zooniverse team of six web developers, a designer, an educator, and a digital humanities postdoc and the Adler Teen Programs team of five educators. The Adler-Zooniverse group collaborates closely with Chris Lintott, PI for Zooniverse, and the Zooniverse web developers and researchers at Oxford. Our group is fully grant supported, except for Lintott's role and my own. Key aspects of my role are strategic planning for Zooniverse initiatives and securing funding for our Zooniverse team.

In July 2015 we launched our DIY Project Builder. This browser-based tool allows anyone to build their own Zooniverse project for free, with no need for technical expertise. This was a key step in democratizing access to online citizen science as a research tool. To date, 500 people have built projects, 50 have been submitted for review, and 24 have been launched and promoted through Zooniverse.org. Our 'best practices' document (<https://www.zooniverse.org/lab-best-practices>) guides researchers in engaging with their volunteers through the discussion forum, advanced research efforts, etc. Ten years of experience culminating in a 2-day workshop with researchers, volunteers, and developers lay the foundation for this guide. As part of my role, I lead DIY Zooniverse Project Builder workshops and training for researchers.

While earning my Ph.D. in astronomy in 2010 (my thesis was on supermassive black holes), I also earned the UW-Madison Center for the Integration of Research, Teaching, and Learning (CIRTL) Delta certificate for STEM education research. As a CIERA Postdoctoral Fellow at Northwestern University, I continued my research on active galaxies as well as co-led the NSF-funded CT-STEM project, working with high school teachers and STEM researchers to develop computational thinking curricular materials for high school classrooms. I also served on the American Astronomical Society Committee on the Status of Women in Astronomy. As lead of the Adler Teen Programs group, I continue to be active in diversity in STEM initiatives (see CV).

Resume

Dr. Laura Trouille, Director of Citizen Science at the Adler Planetarium, co-I for Zooniverse
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A. PROFESSIONAL PREPARATION

<u>College/University</u>	<u>Location</u>	<u>Major</u>	<u>Degree & Year</u>
Dartmouth College	Hanover, NH	Physics	B.A., 2003
University of Wisconsin – Madison	Madison, WI	Astronomy	Ph.D., 2010
Northwestern University (NU)	Evanston, IL	Astronomy	Postdoc, 2010-2013

B. ACADEMIC/PROFESSIONAL APPOINTMENTS

- Director of Citizen Science at the Adler Planetarium; co-I for Zooniverse, 2015-present

In close collaboration with the Zooniverse team at the University of Oxford and the Citizen Science Alliance, lead for the Adler Zooniverse team of 9 staff (6 web developers, designer, researcher, and educator). Zooniverse supports over 50 active online citizen science research projects, with 1.5 million registered users around the world making over 100,000 classifications each day. Zooniverse projects, spanning astronomy through zoology, have led to over 100 published papers. Also lead for the Adler Teen Programs group; 5 educators focused on STEM skills for Chicago's underserved teen populations.

- NU CIERA Postdoctoral Fellow & Astronomer at the Adler Planetarium (joint appointment), 2013-2015
- CIERA Postdoctoral Fellow, Northwestern University, 2010-2013
- Astronomy Adjunct Faculty, Chicago State University, Spring 2011
- Research Assistant, UW-Madison, Ph.D. Thesis Advisor: Dr. A. Barger, 2004-2010
- National Science Foundation Graduate Research Fellow, UW-Madison, 2006-2009
- CIRTDL DELTA Education Research Intern, UW-Madison, 2009-2010
- NASA International Year of Astronomy Outreach Ambassador, 2009
- Instructor for Undergraduate Intro to Astronomy, UW-Madison, 2007
- Computer & ESL Secondary School Teacher, Czech Republic & India, 2003-2004
- Research Assistant (Senior Thesis), SwRI, Advisor: Dr. E. Young, 2002-2003
- Research Assistant, L'Observatoire de Paris, Advisor: Dr. J. P. Zahn, 2002

C. SELECTED GRANTS/AWARDS

- Institute for Museum and Library Services (IMLS), Transforming Libraries and Archives through Crowdsourcing, 12/1/16-11/30/19, \$1.2M, PI, Collaboration with GLAM bespoke project partners
- Google Global Impact Award, Zooniverse: Live Science Development, 10/1/13-5/30/17, \$450K, co-I
- NSF-ABI, Notes from Nature: Advancing a Next Generation Citizen Science Platform for Biocollection Transcription, 7/15/15-6/30/18, \$145K, co-I, Collaboration with UFlorida, UC-Boulder
- NSF-IUSE, Engaging Introductory Astronomy Students in Authentic Research through Citizen Science, 10/1/15-9/30/17, \$140K, PI, Collaboration with Northwestern Univ., Oakland Community College, UPitt
- NSF-INSPIRE, Teaming Citizen Science with Machine Learning to Deepen LIGO View of the Cosmos, 10/1/15-9/30/18, \$196K, co-I, Collaboration with Northwestern Univ., UC-Fullerton, Syracuse, LIGO
- NSF-CHS, Optimizing Human Machine System for Citizen Science, 7/1/16-6/30/18, \$139K, co-I, Collaboration with University of Minnesota
- NOAA, StellerWatch: Developing a Crowdsourcing Web Interface for Image Analysis, 8/22/16-9/30/17, \$70K, PI, Collaboration with NOAA/National Marine Mammal Lab
- NASA-ROSES, Using Citizen Science to Understand Thirty Years of Global Kelp Cover using NASA Satellite Imagery, 12/1/16-11/30/17, \$292K, PI; Collaboration with UMass-Boston, UCLA
- Northwestern University CIERA Postdoctoral Fellowship, 2010-2012
- National Science Foundation Graduate Research Fellowship, 2006-2009

D. SELECTED PEER-REVIEWED PUBLICATIONS

- Zevin, M., Trouille, L. et. al., Gravity Spy: Integrating Advanced LIGO Detector Characterization, Machine Learning, and Citizen Science, Classical and Quantum Gravity IOP, in press
- Wright, D., Trouille, L. et al., A Transient Search using Combined Human and Machine Classifications, MNRAS, in press
- Weintrop, D., Beheshti, E., Horn, M.S., Orton, K., Jona, K., Trouille, L., & Wilensky, U., Defining Computational Thinking for Math and Science Classrooms. Journal of Science Education and Technology, 25(1), 127–147, 2016
- Weintrop, D., Beheshti, E., Horn, M.S., Orton, K., Trouille, L., Jona, K., & Wilensky, U. Interactive Assessment Tools for Computational Thinking in High School STEM Classrooms. INTETAIN 2014, Springer International Publishing, 22-25, 2014
- Morscher, M. & Trouille, L. Astrostatistics: Probabilities - The Drake Equation and Life on Other Worlds. The Classroom Astronomer, 2, 31-35. 2013
- Coble, K., Camarillo, C., Trouille, L., Bailey, J., Cochran, G., Cominsky, L. Investigating Student Ideas about Cosmology I: Distances and Structure. Astronomy Education Review, 12, 1, 2013
- Farr, B., Mathias, G., & Trouille, L., Gravitational Wave Science in the High School Classroom, American Journal of Physics, 80, 10, 898, 2012
- Trouille, L., Barger, A. J., & Tremonti, C. The OPTX Project V: Identifying AGNs, ApJ, 742, 46, 2011

D. EDUCATION AND OUTREACH ACTIVITIES

- *Zooniverse*. In leading the development of the Zooniverse citizen science platform, in collaboration with PI Chris Lintott, Trouille has concentrated not only on the scientific outputs but also on volunteer content learning, understanding of the processes of science, and attitudinal shifts. Evidence suggests that participants not only learn, but develop more positive attitudes to science as well. 2015-present
- *Adler Teen Programs*. Leading the way in innovation and impact on teen engagement in STEM and tech experiences in the Chicago area. Through web and video game making workshops, hack labs, after-school hangouts, the Citizen Science Ambassadors program, Far Horizons high altitude balloon launches, Scopes in the City, Teen Leadership Council and more, teens build their STEM and leadership skills and grow their interest in STEM careers. 2015-present
- *Teaching Certificate through the UW-Madison Center for the Integration of Research, Teaching, and Learning (CIRTL) DELTA Program*. Pedagogy coursework and internships; developing and assessing STEM curricular materials for the undergraduate and K-12 level. Also attended a semester-long seminar on how to be an effective, supportive, and responsible research mentor, 2004-2010
- *Research Mentor*, mentor for three postdocs, three graduate students, five undergraduate students, and four high school students in citizen science, astronomy, and learning sciences research projects, 2006+
Note: Trouille’s mentees have won \$20K college scholarships for 3rd place in the 2012 SIEMENS Team Talent Competition and first place in the 2014 Northeastern Science and Engineering Fair.
- *Former member of the American Astronomical Society Committee on the Status of Women in Astronomy and liaison to the AAS Employment Committee*. Developing and disseminating resources to the community to provide an inclusive culture/climate and supportive practices for women and minorities at all levels (undergraduates, graduate students, postdocs, researchers, faculty, and staff), 2010-2014