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Christina Love, PhD

Education

2013 **Ph.D. Physics**, Temple University, Philadelphia, PA
Thesis: "Design and Analysis for the DarkSide-10 Two-Phase Argon Time Projection Chamber" (Advisor: C.J. Martoff, DarkSide Collaboration)

2010 **M.A. Physics**, Temple University, Philadelphia, PA
Peter Havas Humanitarian Scholarship For Outstanding Physics Graduate Students

2006 **B.S. Physics Education**, West Chester University, West Chester, PA
Cum Laude, Dean's List, The Robert M. Brown Endowed Scholarship for Physics, Sigma Pi Sigma, Michael F. Martens Award for Achievement in Physics

Current Appointments

2014 – Department of Physics, Drexel University (DU), Philadelphia, PA

Associate Teaching Professor (2020 –

- Developing and teaching all levels of introductory physics using evidence-based teaching methods.
- Specializing in relating physics content to different audiences, such as engineering, health sciences, architecture, and media arts.
- Teaching undergraduate physics majors in courses such as statistical mechanics, modern physics, seminar, and senior research.

Assistant Teaching Professor (2014 – 2020)

- Designed eight new courses including introduction to experimental physics for physics majors, computational labs for media art majors, and a community-based learning course.
- Standardized the physics sequence for engineering to include in-class polling and pre-lecture assignments.
- Restructured the physics sequences for non STEM majors by working with multiple colleges, programs, and departments.
- Advised senior research theses and served on graduate student thesis committees.

2020 – IceCube Collaboration, https://icecube.wisc.edu/collaboration/meet-the-collaboration/

Member

- Developing an IceCube Citizen Science Program that will improve upon ongoing analyses and will be a source of significant outreach work.
- Co-directed and designed an IceCube outreach program where high school students were immersed in university-level projects.

Funding Received

7. *Preparing Mathematics and Science Teachers for Middle School*, NSF, 2018. **$1,199,762** over five years. PI: S. Vaidya, Co-PIs: C. Love, D. McEachron, S. Moskow.

6. *Start Talking Science (STS).* Children's Hospital of Philadelphia, 2016. ~**$5,500** in-kind contributions over five years. Director: C. Love.

5. *STS.* CARES Grant, Penn Medicine, 2015. **$3,962** over three years. PI: M. Leary, Co-PI: C. Love.

4. *STS.* Academy of Natural Sciences, 2015. ~**$4,000** in-kind contributions in one year. Director: C. Love.

3. *STS.* Science History Institute, 2014. **$30,000** in-kind contributions over six years. Director: C. Love.

2. *STS.* Department of Physics, DU, 2014. **$1,000** over two years. Director: C. Love.

1. *STS.* Department of Physics, Temple University, 2014. **$1,000** over two years. Director: C. Love.

Submitted Grant Proposals (unfunded)

4. *The Development of a Pre-REU Site for Investigating Physics Outreach Efficacy*, Integrative Activities in Physics, NSF. Co-PIs: C. Love, N. K Neilson, and E. Brewe. Submitted 2016.
3. *Start Talking Science*. COMPASS Outreach Grants, American Society for Cell Biology. PI: C. Kraft, Co-PI: C. Love. Submitted in 2015 and 2016.
2. *Mini IceCube Summer High School Program.* ExCITe Center Seed Proposal. Co-PIs: B. Prefontaine, N. K Neilson, C. Love, J. Silverman, and V. Klein. Submitted August 2016.
1. *Full STEAM Ahead: The Locke Elementary Physics Garden – Conservation of Energy… and Native Species.* ExCITe Center Seed Proposal. Co-PIs: C. Love and M. Togna. Submitted June 2015.

Research Appointments

2013 – 2014 **Visiting Scientist and Postdoctoral Fellow**
Oak Ridge Institute for Science and Education (ORISE)
Transportation Security Laboratory, Department of Homeland Security, Pomona, NJ
- Researched image quality and image reconstruction with X-ray tomography for bulk explosives detection.
- Secured funding for an undergraduate physics major at Rowan University.

2010 **Research Associate**, NASA's Goddard Space Flight Center, Greenbelt, MD
- Simulated the electrostatics of the X-ray detector for the GEMS mission.

2009 – 2013 **Research Assistant**, Physics Department, Temple University, Philadelphia, PA
DarkSide Collaboration, Gran Sasso National Laboratory, Assergi, Italy
- Designed, simulated, and built high voltage systems and electric field configurations.
- Analyzed raw data and refined data cuts for DarkSide-10, a prototype detector.
- Created position reconstruction algorithms using PCA analysis, Monte Carlo simulations, and DarkSide-10 data.
- Searched for funding and assisted in writing and securing the NSF grant: *"Green" Aqueous Liquid Scintillator for Nuclear Materials*. PI: C. J. Martoff, **$377,067**.
- Designed and proposed a vacuum ultraviolet detection experiment.

2009 **Research Associate**, Fermi National Accelerator Laboratory, Batavia, IL
- Engineered muon veto detectors and pursued an aqueous scintillation solution.

Teaching Appointments

2019 – 2021 **Adjunct Professor**, Rider University, Lawrenceville, NJ
- Designed and taught online astronomy for non-STEM majors.

2016 – 2021 **Adjunct Professor**, College of Medicine, DU
- Developed and taught hybrid courses for post baccalaureate pre-med students.

2012 – 2021 **Adjunct Professor**, Rowan University, Glassboro, NJ
- Created labs and taught astrophysics for physics majors.

2012 **Adjunct Instructor**, Burlington County College, Mount Laurel, NJ

2007 – 2009 **Teaching Assistant**, Physics Department, Temple University, Philadelphia, PA

2006 – 2007 **High School Teacher**, Physics, Moorestown High School, Moorestown, NJ
- Designed and taught based on inquiry and diverse learning styles.

2006 **High School Student Teacher**, Octorara Area High School, Atglen, PA

Leadership Appointments

2013 – **Founder and Director**, *Start Talking Science*
- Annually organizing a public outreach event where STEM researchers present non-technical posters to area students and the general public.
- Secured funding for eight years totaling over **$45,000**.

2020 – 2021 **Faculty Fellow**
Center for the Advancement of STEM Teaching and Learning Excellence (CASTLE), DU
- Engaged in cross-curricular discussions, reports, and projects.

2019 **Director**, Drexel Engineering Leadership Transformation Academy (DELTA)
College of Engineering, DU
- Coordinated a program for incoming freshmen from underrepresented groups in STEM.

2015 – 2018 **President-Elect, President, and Past-President**
Association for Women in Science (AWIS), Philadelphia Chapter
- Planned programs and coordinated resources to provide networking, mentoring, and leadership opportunities for women in STEM at all levels.

Awards and Honors

2020 **Barbara G. Hornum Award for Teaching Excellence,** DU
2018 **Evidence Based Teaching Award in STEM Education**, DU
2017 **Teaching and Learning Conference Travel Award**, DU
2016-2018 **AWIS Star Chapter Award**, President of Philadelphia Chapter
2015 **Outstanding Faculty Mentor**, Graduate Student Association, DU
2015 **Sciences & Medicine Alumni Award**, Foundation for Education, Somers Point, NJ
2014 **Interview**, WHYY's *The Pulse*, Philadelphia, PA
2012 **Division of Nuclear Physics Travel Award**, APS, 2012 April Meeting
2009 **Award for Outstanding Teaching**, Graduate Award, Temple University
2008 **Division of Nuclear Physics Travel Award**, APS, 2009 April Meeting

Students Supervised

2021 – Elizabeth Warrick, MS Thesis Research, DU
2019 Selvi Selvaraja, STEM Connections, Community-Based Learning Research, DU
2019 Nora Wurmbach, Start Talking Science 2018, Senior Project, DU
2019 Julianne Davis, Start Talking Science 2018, Outreach Research, University of PA
2018 – 2019 Sarah Coccia, IceCube Outreach, Senior Thesis, DU
2017 – 2018 Ryan Crist, Start Talking Science 2017, Senior Thesis, DU
2017 – 2018 Aaditya Patel, STEM Connections, Community-Based Learning Research, DU
2016 – 2017 Vincent O'Leary, STEM Connections, Community-Based Learning Research, DU
2016 – 2017 Brean Prefontane, IceCube Summer Program, Undergraduate Research, DU
2016 – 2017 Nora Wurmbach, Particle Physics Teaching Toolkit, Undergraduate Research, DU
2014 – 2015 Nicholas Sfiroudis, Particle Physics Teaching Toolkit, Senior Thesis, DU
2013 – 2014 Joseph Iannello, ORISE Undergraduate Research, Rowan University

Outreach and Service

Community:

2020 –	Member-at-Large, Executive Committee Forum on Outreach and Engaging the Public (FOEP), American Physical Society
2020	Speaker, Jordan Road School, Somers Point, NJ
2020	Invited Speaker, Conferences for Undergraduate Women in Physics (CUWiP), Temple University
2019	Speaker, Our Lady of Mercy Academy, Newfield, NJ
2017	Panelist, Career Pathways Panel, AWIS Philadelphia, DU
2016 – 2018	Director, Board of Directors, Challenger Learning Center of Philadelphia
2016	Judge, Student Inventions through Education, Gifted and Talented Services
2016	Panelist, Professional Women in STEM Round Table, Rowan University
2013 – 2015	Scientist, Philadelphia Area Girls Enjoying Science (PAGES) Mini Conference
2014 – 2016	Co-organizer, AWIS Philadelphia Chapter Mentoring Circle
2014	Reviewer, AWIS Travel Awards
2013 – 2015	Mentor, Owl-to-Owl Mentoring Program, Temple University
2013 – 2014	Interviewer, Delaware Valley Science Council
2011 – 2012	Volunteer, Philadelphia Science Festival
2008 – 2011	Science Presenter, The Franklin Institute

Drexel University:

2021 –	Member, Program and Curricular Innovation Team, Experiential Learning in the Classroom Environment Subcommittee
2021	Invited Speaker, Freshman Physics Majors, UNIV 101, Physics Department
2017 – 2021	Member, Undergraduate Committee, Physics Department
2020	Invited Speaker, DELTA program, College of Engineering
2014 – 2020	Member, Kaczmarczik Day Organizing Committee, Physics Department
2019	Panelist, Women in Physics Society, DU
2017	Member, Graduate Common Good and Mentorship Award Committee, College of Arts and Sciences
2016 – 2018	Co-facilitator, Astroparticle Physics Workshops, Masterman High School
2016	Member, Evidence-based Teaching Committee, College of Arts and Sciences
2016	Member, FAR Rubric Committee, Physics Department
2015	Member, Course Assessment Committee, Physics Department
2015	Member, University Health Professions Committee, College of Arts & Sciences
2015	Judge, University Research Day

Non-Technical Publications

11. Christy Martin. “Crystal Clear.” *Chemical Heritage*. Vol. 30. No. 1. 2012.
10. Christy Martin. “Full Boyle.” *Chemical Heritage*. Vol. 30. No. 1. 2012
9. Christy Martin. “Mesmerized.” *Chemical Heritage*. Vol. 29. No. 3. 2011/2012.
8. Christy Martin. “Bridging the Gaps.” *Chemical Heritage*. Vol. 29. No. 3. 2011/2012.
7. Christy Martin et al. “Making the Process.” *Chemical Heritage*. Vol. 29. No. 3. 2011/2012.
6. Christy Martin. “The Platonic Solids.” *Chemical Heritage*. Vol. 29. No. 3. 2011/2012.
5. Christy Martin. “What Teaching Taught Me.” *Periodic Tabloid*, CHF. 2011.
4. Christy Martin. “Current Research by Future Scientists.” *Periodic Tabloid*, CHF. 2011.
3. Christy Martin. “The (Prehistoric) History of the Elements.” *Periodic Tabloid*, CHF. 2011.
2. Christy Martin. “Revealing MRIs.” *Periodic Tabloid*, CHF. 2011.
1. Christy Martin. “Dark Matters and the Periodic Table.” *Periodic Tabloid*, CHF. 2011.

Non-Technical Presentations

13. “Science Communication and More” C. Love. Senior Seminar, Department of Biology, DU. Oct. 2020.
12. “Panel Discussion on Audience Response Mechanisms” C. Love. CASTLE Pedagogical Happy Hour, DU. Oct. 2017.
11. “Development and Assessment of a Particle Physics Summer Program for High School Students” B. Prefontaine et al. Start Talking Science, Chemical Heritage Foundation, Philadelphia, PA. Sept. 2017.
10. “Start Talking Science and STEM Connections” C. Love. CASTLE Pedagogical Happy Hour, DU. 2017.
9. “Dark Matter Matters”. C. Love. IceCube Program for High School Students, DU. Aug. 2016.
8. “Dark Matter Matters”. C. Love. Workshop for High School Students, DU. Sept. 2016.
7. “Join the DarkSide: Dark Matter Matters.” C. Love. Science on Tap, Philadelphia, PA. Jun. 2015.
6. “Women In STEM Careers.” C. Woods, M. Leary, C. Love. STEM Everyday Podcast. Jun. 2015.
5. “Join the DarkSide: Dark Matter Matters.” C. Love. Nerd Nite, Philadelphia, PA. Dec. 2014.
4. “STEM Communication and AWIS.” C. Love. English Language Center, DU. Nov. 2014.
3. “What is Dark Matter?” C. Love. Kaczmarczik Day 2014, Philadelphia, PA. Oct. 2014.
2. “What is Dark Matter and How Can We Detect it?” C. Love. *Start Talking Science*, Aug. 2014.
1. “Explosives Detection for Airport Baggage Scanners.” C. Love et al. *Start Talking Science*, Aug. 2014.

Conferences and Colloquia

16. N. Wurmbach, C. Love, N. Sfiroudis. *Introducing Particle Physics to High School Students.* AAPT Winter Meeting, Atlanta, GA. Feb. 2017.
15. C. Love, B. Prefontaine, N. Kurahashi Neilson, E. Brewe. *An Immersive Research Program for High School Students.* AAPT Winter Meeting, Atlanta, GA. Feb. 2017.
14. B. Prefontaine, N. Kurahashi Neilson, C. Love. *The Development and Assessment of Particle Physics Summer Program for High School Students.* APS April Meeting, Washington D.C. Jan. 2017.
13. B. Prefontaine, N. Kurahashi Neilson, C. Love *The Development and Assessment of Particle Physics Summer Program for High School Students.* 2016 Annual Meeting of the APS Mid-Atlantic Section, Newark, DE. Invited plenary. Oct. 2016.
12. C. Love. *Evidence-based Methods for Teaching and STEM Major Education*. Department of Physics Colloquium, DU. Invited. Apr. 2016.
11. C. Love. *Improving STEM Education: Start Talking Science.* Academic Affairs Assembly Research Fair, DU. Feb. 2016.
10. N. Sfiroudis and C. Love. *Increasing knowledge and interest of high school students by using a complete teaching toolkit for particle physics*. DU Research Day. May 2015.
9. J. Iannello, C. Love, R. Krauss, and R. Klueg. *Modeling System Parameters for Dual-Energy Computed Tomography Contraband Detection.* Rowan University STEM Student Research Symposium. Apr. 2014.
8. C. Love. *Dark Matter and the DarkSide-10 Two-Phase Argon Time Projection Chamber.* Transportation Security Laboratory Seminar. Pomona, NJ. Jan. 2013.
7. C. Martin, for the DarkSide Collaboration. *Preliminary Analysis of Electroluminescence from DarkSide-10 Dark Matter Detector.* APS April Meeting, Atlanta, GA. Apr. 2012.
6. C. Martin, et al. *Preliminary Analysis from DarkSide-10 and Simulations for SCENE.* Temple University Colloquium, Philadelphia, PA. Feb. 2012.
5. C. Martin, et al. *Design of the HHV System for a Prototype Dark Matter Detector.* Temple University Colloquium, Philadelphia, PA. Sept. 2010.
4. Z. Dziembowski, C. Martin, and M. Luehrmann. *Googling for Physics Homework*. AAPT Summer Meeting. University of Michigan, Ann Arbor, MI. Jul. 2009.
3. C. Martin, et al. *Identifying WIMP recoils in Xenon Gas Scintillation.* National Nuclear Physics Summer School, Michigan State University, East Lansing, MI. Jun. 2009.
2. C. Martin, et al. *Measured Nuclear Recoil Discrimination for HPGS, a Proposed Ton-Scale Dark Matter Search in Room Temperature Gas*. APS April Meeting, Denver, CO. May 2009.
1. C. Martin, et al. *LET dependence of Pulse Shape for Xenon Gas Scintillation.* Student Research Poster Symposium. TU, Philadelphia, PA. Mar. 2009.

Refereed Publications

7. P. Agnes, (C. Love) et al., "First Results from the DarkSide-50 Experiment at Laboratori Nazionali del Gran Sasso." *Physics Letters B,* 743, pp. 456-466 (2015).
6. J. Xu, (C. Love) et al., "A study of the trace ^{39}Ar content in argon from deep underground sources." Astroparticle Physics, 66, pp. 53-60 (2015).
5. H. Cao, (C. Love) et al., "Measurement of Scintillation and Ionization Yield and Scintillation Pulse Shape from Nuclear Recoils in Liquid Argon." Phys. Rev. D 91, 092007 (2015).
4. P. Agnes, (C. Love) et al., "The Electronics and Data Acquisition System of the DarkSide Dark Matter Search." arXiv:1412.2969 (2014).
3. T. Alexander, (C. Love) et al., "DarkSide search for dark matter", JINST, 8, pp. C11021 (2013).
2. T. Alexander, (C. Love) et al., "Observation of the Dependence of Scintillation from Nuclear Recoils in Liquid Argon on Drift Field." Phys. Rev. D 88, 092006 (2013).
1. D. Akimov, (C. Love) et al., "Light Yield in DarkSide-10: a Prototype Two-phase Liquid Argon TPC for Dark Matter Searches." Astroparticle Physics 49, pp. 44-51 (2013).