

Bárbara Cruvinel Santiago, Ph.D.

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Education	Columbia University – New York, NY, USA Ph.D. in Physics (Jul 2023); M.Phil in Physics (May 2021); M.A. in Physics (May 2020) Yale University – New Haven, CT, USA B.S. in Physics (Intensive Track) Colégio Objetivo (High School) – Santos, SP, Brazil	Aug 2018 – Jul 2023 Aug 2013 – May 2017 Jan 2010 – Dec 2012
Research Experience	Post-Doctoral Research at Stanford (CISAC) – New York, NY, USA Independent study examining dual-purpose technical research in order to aid in nuclear non-proliferation. Graduate Research at Columbia (Schiminovich Group) – New York, NY, USA Work in Prof. Schiminovich group on the development of spectrographs for the study of intergalactic and circumgalactic media emission, and on the analysis of observational data. Post-Bacc Research at MIT-LIGO (Mavalvala Group) – Cambridge, MA, USA Work in Prof. Nergis Mavalvala’s LIGO group on a optomechanical light squeezing experiment. Focus on noise characterization and on the development of a light intensity stabilization servo. Undergraduate Research at Yale (DeMille Group) – New Haven, CT, USA Work in Prof. David DeMille’s group on the development and upgrade of hardware for his experiments. Undergraduate Research at CERN (Demers Group) – Meyrin, Switzerland Work in Prof. Sarah Demers’ group at the ATLAS Experiment in the search for W,Z associated Higgs production.	Sep 2023 – Present Jan 2019 – Jul 2023 Jul 2017 – Jun 2018 Jun 2015 – May 2017 Jun 2014 – Aug 2014
Most Important Honors and Awards	Stanton Nuclear Security Fellowship – USA Fellowship to pursue a post-doc at the Stanford Center for International Security and Cooperation. Five Sigma Physicist Award – USA American Physical Society Government Affairs award for outstanding advocacy. Physicists Coalition’s Next-Generation Fellowship – USA One of 4 fellows in the year-long program sponsored by the American Physical Society and the Princeton Science & Global Security Program to train early-career scientists in nuclear threat reduction policymaking. Future Investigators in NASA Earth and Space Science and Technology Fellowship – USA NASA’s 3-year graduate student fellowship awarded to student-designed research projects that contribute to NASA’s exploration goals; formerly known as NESSF. Yale College Dean’s Research Fellowship in the Sciences – New Haven, USA Summer award to do research at Yale and start senior thesis. Pierson College Richter Summer Fellowship – New Haven, USA Summer award to do research at Yale and start senior thesis. Tetelman Fellowship for International Research in the Sciences – New Haven, USA Summer award to do research at CERN. Science, Technology and Research Scholars Program I (STARS I) – New Haven, USA Selective mentoring program for minority students interested in STEM at Yale in their freshman year. Fundação Estudar Scholarship – São Paulo, Brazil Merit-based scholarship awarded to 27 out of 11,000 applicants based on academic excellence and students’ potential to lead and leave a positive legacy in Brazil. 25th International Young Physicists’ Tournament (IYPT), Bronze Medal – Germany IYPT is considered the Physics World Cup for high school students. Teams of 5 students selected in national competitions in each country work on open-ended problems and debate about them. 24th International Young Physicists’ Tournament (IYPT), 15th place – Iran IYPT is considered the Physics World Cup for high school students. Teams of 5 students selected in national competitions in each country work on open-ended problems and debate about them.	2023 2021 2020 2019 2016 and 2015 2016 and 2015 2014 2014 2013 2012 2011
Skills	<i>Programming:</i> Matlab, Mathematica, Python, C/C++ and HTML. <i>Languages:</i> Portuguese (native), English (fluent), German (intermediate) and Spanish (read).	

Congressional Action	APS-led Congressional Action, <i>Physicists Coalition Delegation Member</i> Summer 2021 Met with congressional offices to advocate for “no first use” of nuclear weapons.
	NAGPS Legislative Action Days (LAD), <i>Columbia Delegation Member</i> Mar 2020 I was a part of Columbia’s delegation to NAGPS’s LAD and met with HR and Senate staff about issues and bills that affect grad students (online because of COVID-19).
	Lobbying against ICE removal of SEVP exemption, <i>Initiative Organizer</i> Jul 2020 After ICE removed the exemption permitting international students to maintain their status taking online courses, I led a group of physics students who met (virtually) with House Reps. and congressional staff.
Leadership Positions	Science Policy for Scientists Lecture Series, <i>Co-Organizer</i> Spring 2023 Lecture series with experts in different policy areas targeting Columbia STEM grad students.
	SU(5) Peer Mentoring, <i>Founding Member & Mentor/Facilitator</i> 2020-Present SU(5) provides a network and a mentor to incoming astronomy and physics graduate students nationwide.
	Columbia Physics Grad Council, <i>President & Diversity Liaison</i> – New York, USA 2019 – 2021 Served as President (2020-2021) and as Climate and Diversity Liaison (2019-2020). Addressed students’ quality of life and academic issues alongside the dept.’s chair and committees, and other student groups.
	Columbia Spectra, <i>Graduate Coordinator</i> – New York, USA 2018 – 2020 Formerly the Columbia Society for Women in Physics. I coordinated events targeting current and prospective grad students, and advised female and underrepresented undergrads in physics.
	Yale Physics Climate and Diversity Committee, <i>Undergrad Rep.</i> – New Haven, USA 2015 – 2017 Represented the interest of Yale physics undergrads with respect to the climate of the department.
	Yale Women in Physics, <i>Co-President & Co-Coordinator</i> – New Haven, USA 2014 – 2016 Served as President (2015-2016) and as Conference Co-Coordinator (2014-2015). Responsible for organizing a national conference, panels and social events for the Yale physics community.
	Brazil Club at Yale, <i>President & Vice-President</i> – New Haven, USA 2014 – 2016 Served as President (2015-2016) and Vice-President (2014-2015). Responsible for organizing social events, talks and meals for people interested in Brazil at Yale.
	Yale Admissions Office, <i>Science Tour Guide</i> – New Haven, USA Summer 2015 Worked part-time as a tour guide of Yale’s science facilities.
	Princeton School on Science and Global Security – Princeton, NJ, USA Oct 2022 Selective 4-days school on nuclear security issues for early-career scientists.
Extra Coursework and Summer Schools	George Washington University Nuclear Security Boot Camp – Online Jun 2020 Selective week-long course on nuclear security taught by science/policy experts and policymakers.
	Dunlap Institute Introduction to Astronomical Instrumentation – Toronto, Canada Aug 2016 Selective week-long theoretical/experimental summer school at the Dunlap Institute for Astronomy and Astrophysics at the University of Toronto for college seniors and graduate students.
	Course of General Astronomy – Brazil Nov 2011 – May 2012 Course for the top 120 in the Brazilian Astronomy Olympiad competing to represent Brazil internationally.
	IV Advanced School of Nuclear Energy (EAEN) – São Paulo, Brazil Jul 2011 Selective week-long school for high schoolers at the Institute for Nuclear Energy Research at USP.
Teaching, Mentoring and Outreach	Introductory Physics Recitations and Labs, <i>TA</i> – Columbia University, New York, USA 2018-2020 Responsible for teaching introductory physics recitations and labs to over 140 pre-medical and engineering undergrads over 2 years. Courses: UN1202, UN1401, UN1292, UN1291.
	National Selection Tournament of US IYPT, <i>Juror</i> – New Haven, USA Spring 2018 Judged selection of high school team to represent the US at the International Young Physicists’ Tournament.
	New Haven Science Fair, <i>Mentor</i> – New Haven, USA Spring 2017 Mentored a New Haven public school 9th grader on a thermodynamics project. She won 2nd place in the entire fair and an award for science communication.
	Yale College Dean’s Office, <i>STARS Peer Mentor</i> – New Haven, USA 2016 – 2017 Worked as Peer Mentor for incoming minority students interested in pursuing STEM majors at Yale who participate in the Science, Technology and Research Scholars Program I.
	Yale Girls Science Investigations, <i>Volunteer</i> – New Haven, USA Fall 2016 Volunteered to help GSI, which brings elementary school girls to Yale to do fun experiments for a day.
	Yale Office of International Students and Scholars, <i>Peer Liaison</i> – New Haven, USA 2015 – 2016

Worked as a Peer Liaison to help incoming international freshmen adjusting to the Yale environment.
Yale Center for Language Studies, *Portuguese Tutor* – New Haven, USA Mar 2015 – Apr 2017
 Worked as a tutor for Yale students studying Portuguese language.
Splash at Yale, *Teacher* – New Haven, USA Spring 2015
 Co-taught the course *The Physics of Interstellar* for high school students.
Brazilian Student Council on Undergraduate Education, *Mentor* – Brazil 2014 – 2015
 Mentored 3 Brazilian high school students applying to American colleges.
Yale Department of Spanish and Portuguese, *Portuguese Grader* – New Haven, USA 2013 – 2014
 Worked as a grader of homework assigned in Portuguese classes.

Scientific Publications

(*In preparation*) B. Cruvinel Santiago, N. Melso, I Cevallos Aleman, H. R. Ong, D. Schiminovich. *Kinematics of the Fireworks Galaxy: Processing and Analysis of NGC 6946 Images Obtained with the Circumgalactic Hydrogen-Alpha Spectrograph*. 2023.
 (*In preparation*) B. Cruvinel Santiago, N. Melso, I Cevallos Aleman, H. R. Ong, D. Schiminovich. *The Little Dumbbell Case: Using the Circumgalactic Hydrogen-Alpha Spectrograph to Analyze Kinematics in Nebulae*. 2023.
 N. Melso, D. Schiminovich, B. Smiley, H. R. Ong, B. Cruvinel Santiago, M. Sitaram, I. Cevallos Aleman, S. Graber, M. Murillo, M. Rosenthal, and I. Stelea. *The Circumgalactic H α Spectrograph (CH α S) I. Design, Engineering, and Early Commissioning*. *Astrophysical Journal* (2022).

Conferences and Presentations

IEEE Ethics – IEEE, Online, May 2023, *Invited Panelist*, Panel: *The Ethics of Weapons Technology Development*.
Princeton School on Science and Global Security, Princeton, NJ, USA, Oct. 2022, *Oral Presentation*.
 B. Cruvinel Santiago, *Brazil Shouldn't Let Bolsonaro Get in the Way of the Ban Treaty*.
EstroGênias: Meninas na Ciência – Tecnologia Educacional (Grupo Positivo), Online, Mar. 2021, *Invited Panelist*, Panel: *How Schools Should Promote STEM Education*.
I Congresso Nacional de Inovação e Popularização da Ciência – Federal University of Minas Gerais (UFMG), Online, Oct. 2020, *Invited Panelist*, Panel: *Science, Innovation and Market after COVID-19*.
235th American Astronomical Society Meeting – Honolulu, HI, USA, Jan. 2020, *Poster Presentation*.
 B. Cruvinel Santiago, N. Melso, H. R. Ong, B. Smiley, M. Rosenthal, M. Murillo, S. Graber, and D. Schiminovich, *Circumgalactic H-alpha Spectrograph: Initial Results from the First Engineering Runs*.
MIT Physics Exploration Day – Cambridge, MA, USA, Apr. 2018, *Poster Presentation*. B. Cruvinel Santiago, and I. Phinney, *Overview of Advanced LIGO and future methods of noise reduction*.
Scientista Symposium – New York, NY, USA, Apr. 2017, *Poster Presentation*. B. Cruvinel Santiago, and D. DeMille, *Evaluating and Upgrading a Fast Compact Laser Shutter Prototype*.
Pierson College Mellon Forum at Yale – New Haven, CT, USA, Feb. 2017, *Oral Presentation*. B. Cruvinel Santiago, *Development of Hardware for Atomic Physics Experiments*.
APS Conference for Undergraduate Women in Physics (CUWiP) at Yale – New Haven, CT, USA, Jan. 2015, *Conference Co-Coordinator*.

Other Honors and Awards

Michele Dufault Memorial Scholarship for Yale Women in STEM – New Haven, USA 2016
 Academic year scholarship awarded to selected women pursuing STEM majors at Yale.
Physics Olympiad of the State of São Paulo 2012 (OPF), *Bronze Medal* – Brazil 2012
 OPF is a state-level physics competition for São Paulo high school students.
3rd Brazilian Linguistics Olympiad (OBL), *Honorable Mention* – Brazil 2012
 OBL is a national linguistics competition for Brazilian high school students.
Rio Leadership Institute (ILRIO) Prep Program, *Mentee* – Brazil 2012
 Mentoring program that selects 30 out of ~1000 Brazilian high school students based on academic merit.
IYPT Brasil 2012, *Silver Medal, Selected for national delegation* – Brazil 2012
 National competition that selects 5 high school students to go to represent Brazil at the IYPT.
XV Brazilian Olympiad on Astronomy and Astronautics (OBA), *Gold Medal* – Brazil 2012
 OBA is a national astronomy competition for Brazilian middle and high school students.
Regional Tournament of Exact Sciences (TEX), *1st place* – Santos, Brazil 2012
 TEX is a competition on physics, chemistry and math for students in the Baixada Santista region.
IYPT Brasil 2011, *Silver Medal, Selected for national delegation* – Brazil 2011
 National competition that selects 5 high school students to go to represent Brazil at the IYPT.

XIV Brazilian Olympiad on Astronomy and Astronautics (OBA), <i>Silver Medal</i> – Brazil	2011
OBA is a national astronomy competition for Brazilian middle and high school students.	
Physics Olympiad of the State of São Paulo 2012 (OPF), <i>Honorable Mention</i> – Brazil	2010
OPF is a state-level physics competition for São Paulo high school students.	
IYPT Brasil 2010, <i>Bronze Medal</i> – Brazil	2010
National competition that selects 5 high school students to go to represent Brazil at the IYPT.	
XII Brazilian Olympiad on Astronomy and Astronautics (OBA), <i>Silver Medal</i> – Brazil	2009
OBA is a national astronomy competition for Brazilian middle and high school students.	
XI Brazilian Olympiad on Astronomy and Astronautics (OBA), <i>Silver Medal</i> – Brazil	2008
OBA is a national astronomy competition for Brazilian middle and high school students.	
Objetivo Scholarship Exam, <i>Full-Ride Scholarship</i> – Brazil	2008
Merit-based scholarship for 5 years of school at Colégio Objetivo.	

Op-Eds and Articles

- B. Cruvinel Santiago, *Why Brazil shouldn't let Bolsonaro stand in the way of ratifying the nuclear ban treaty*, Bulletin of the Atomic Scientists, April 2022.
- B. Cruvinel Santiago, *A female Ph.D. student's cautionary tale and the need for peer mentorship*, Women in Astronomy, Summer 2020.
- B. Cruvinel Santiago, *Undergraduate Profile Katie Melbourne (SY '19): From Yale to NASA*, Yale Scientific Magazine, Spring 2017.
- B. Cruvinel Santiago, *Caro fantasma do preconceito inconsciente... (Dear ghost of implicit bias...)*, Accent (The Undergraduate Multilingual Magazine at Yale), Fall 2016.
- B. Cruvinel Santiago, *Em trânsito: navegando entre dois mundos (In Transit: Navigating Between Two Worlds)*, Accent (The Undergraduate Multilingual Magazine at Yale), Spring 2016.
- B. Cruvinel Santiago, *Agressividade infundada: o novo vício do eleitor brasileiro (Non-sense aggression: the new addiction of the Brazilian voter)*, Accent (The Undergraduate Multilingual Magazine at Yale), Fall 2014.
- B. Cruvinel Santiago, *O Brasil e o império da ciência (Brazil and the science empire)*, Accent (The Undergraduate Multilingual Magazine at Yale), Spring 2014.