

Bárbara Cruvinel Santiago

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| Education | Columbia University – New York, NY, USA Physics Ph.D. Student; M.Phil in Physics (May 2021); M.A. in Physics (May 2020) Yale University – New Haven, CT, USA B.S. in Physics (Intensive Track), GPA: 3.68/4.0 Colégio Objetivo (High School) – Santos, SP, Brazil | Aug 2018 – Present Aug 2013 – May 2017 Jan 2010 – Dec 2012 |
| Research Experience | 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. | Jan 2019 – Present Jul 2017 – Jun 2018 Jun 2015 – May 2017 Jun 2014 – Aug 2014 |
| Most Important Honors and Awards | 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. Michele Dufault Memorial Scholarship for Yale Women in STEM – New Haven, USA Academic year scholarship awarded to selected women pursuing STEM majors at Yale. 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. | 2021 2020 2019 2016 and 2015 2016 and 2015 2016 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). | |
| Teaching, Mentoring and Outreach | Introductory Physics Recitations and Labs, TA – Columbia University, New York, USA Responsible for teaching introductory physics recitations and labs to over 140 pre-medical and engineering undergrads over 2 years. Courses: UN1202, UN1401, UN1292, UN1291. | 2018-2020 |

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| | 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 , <i>Portuguese Tutor</i> – New Haven, USA | Mar 2015 – Apr 2017 |
| | Worked as a tutor for Yale students studying Portuguese language. | |
| | Splash at Yale , <i>Teacher</i> – New Haven, USA | Spring 2015 |
| | Co-taught the course <i>The Physics of Interstellar</i> for high school students. | |
| | Brazilian Student Council on Undergraduate Education , <i>Mentor</i> – Brazil | 2014 – 2015 |
| | Mentored 3 Brazilian high school students applying to American colleges. | |
| | Yale Department of Spanish and Portuguese , <i>Portuguese Grader</i> – New Haven, USA | 2013 – 2014 |
| | Worked as a grader of homework assigned in Portuguese classes. | |
| Policy and Lobbying | 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 | 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 – Present |
| | 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. | |
| Extra Coursework and Summer Schools | Princeton School on Science and Global Security – Princeton, NJ, USA | Oct 2022 |
| | Selective 4-days school on nuclear security issues for early-career scientists. | |
| | 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.

Scientific Publications N. Melso, D. Schiminovich, B. Smiley and 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 (accepted on September 2022).

Conferences and Presentations **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*.
EstroGênius: 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 **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
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), *Silver Medal* – 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), *Honorable Mention* – Brazil 2010
 OPF is a state-level physics competition for São Paulo high school students.
IYPT Brasil 2010, *Bronze Medal* – 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), *Silver Medal* – Brazil 2009
 OBA is a national astronomy competition for Brazilian middle and high school students.
XI Brazilian Olympiad on Astronomy and Astronautics (OBA), *Silver Medal* – Brazil 2008
 OBA is a national astronomy competition for Brazilian middle and high school students.

Literary and Magazine Publications 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.