

Research Interests: physics of the early universe, dark energy, dark matter, LSS and CMB cosmology, galaxy clusters

Education

- Princeton University**, Princeton, NJ Expected Graduation May 2020
Bachelor of Arts – Major: Physics
- Current GPA: 3.75
 - Coursework includes: Classical & Quantum Mechanics; Adv. Electromagnetism; Experimental Physics; Contemporary Cosmology; Quantum Field Theory; General Relativity; Mathematical Methods in Physics
 - Independent Work: “The DarkSide-Low Mass Experiment and its physics potential” (Junior Paper); “Properties of Galaxy Clusters with the Atacama Cosmology Telescope” (Senior Thesis)
 - Publications: “Dark Energy, Extra Dimensions, the Swampland, and NEC violation” (<https://arxiv.org/abs/2005.01143>)
 - Honor: 2018 & 2019 A. G. Shenstone Prize Winner in Physics (excellence in course work; promise in independent research)
- Liceo Scientifico Statale Augusto Righi**, Rome, Italy May 2015
Scientific High School Diploma; Score: 93/100
- Landau Forte Academy Sixth Form**, Tamworth, UK December 2013
- 1 Semester- Student Exchange Program

Work and Research Experience

- Oxford Summer Internship Program**, *Research Intern*, Oxford University, Oxford, UK Summer 2019
- Selected as a Research Intern for the Oxford Summer Internship Programme 2019 of the Astrophysics Department.
 - My work centered around the development of CMB analysis methods effective in discerning the CMB from non-cosmological noise and the B-modes hidden within it. Specifically, I worked on a novel machine learning in-painting approach using PCNNs in order to reconstruct the CMB map eliminating the foreground noise. Results will be derived from existing evidence and simulated models. (more info at: <https://github.com/GabrieleMonte/CoMBInE>)
 - Reference: Doctor Abitbol maximilian.abitbol@physics.ox.ac.uk
 - Research Paper: “In-painting CMB maps using machine learning” (publication in progress)
- DarkSide**, *Research Assistant*, Gran Sasso National Laboratories (LNGS), Assergi, Italy Summer 2018
- Selected as Intern for the summer 2018 at LNGS to collaborate in the DarkSide-20k experiment, a 20-ton liquid argon detector to search for WIMP dark matter particles held at LNGS.
 - My work included testing and analyzing different Silicon PhotoMultipliers (SiPMs) variants and their integrated electronics. Specifically, I was in charge of extrapolating plots that described the change in signal amplitude, noise and average waveform of the SiPM variants, for different values of over-voltage. Finally, I used these plots to produce short reports that provided guidance for the optimization of the SiPMs and boosting of the photon detection efficiency.
 - References: Professor Galbiati galbiati@Princeton.EDU; Researcher Razeto alessandro.razeto@lngs.infn.it
- The McGraw Center for Teaching & Learning**, *Learning Consultant*, Princeton University, Princeton, NJ AY 2017-20
- Consulted undergraduate and graduate students from a variety of disciplines to develop an individualized and strategic approach to learning that enables the student to make the most of lectures, precepts, readings, manage time, and achieve their goals while maintaining a healthy balance. <https://mcgraw.princeton.edu/people/gab-montefalcone>
 - Held both individual tutoring lessons and study hall sessions for several PU courses in Math, Physics and Economics
 - Contributed to learning strategies for the above courses on <https://principedia.princeton.edu/>.
 - Reference: Nic Voge, Senior Associate Director, nvoge@princeton.edu

Leadership and Member Organizations

- Men’s Varsity Track & Field**, *Captain*, Princeton University, Princeton, NJ AYs 2017-20
- Double Ivy League Championship Triple Crown Winner (2018-2019)
 - Italian U20 & U18 400hs Champion & 500m Indoor U23 National Record Holder
 - World U20 400hs Championship Semifinalist
- The Italian Society**, *President*, Princeton University, Princeton, NJ AYs 2017-20
- Founded a student organization which aims at disseminating Italian culture and history within the Princeton community, with emphasis on the culinary, cinematic, musical, and literary traditions of Italy.
 - Coordinated the organization and management of the events and kept contacts with the university officials
- PU Physics Competition ’18 by Physics Unlimited**, *Co-Director*, Princeton University, Princeton, NJ Fall 2018/19
- Directed the organizing committees and designed both onsite and online exams with challenging physics problems
 - Writing the onsite and online exam for the international competitions organized by Physics Unlimited

Special Skills and Interests

Languages: Native Italian; Proficient English; Intermediate Spanish

Digital Competence: Data Analysis in Python, Mathematica and C++; Machine Learning with Keras; Proficient user in LaTeX

Interests: Acoustic Guitar; Italian Cooking; Motorcycle Riding; Backpacking