

Boryana Hadzhiyska

PhD Candidate, Center for Astrophysics, Harvard University

Education

- 2018–now **Doctor of Philosophy (PhD candidate)**, *Harvard University*, GPA: 4.0/4.0.
Astrophysics and Astronomy
- 2017–2018 **Master of Advanced Study (MASt)**, *Cambridge University*, Pass with distinction.
Applied Mathematics
- 2013–2017 **Bachelor of Arts (BA)**, *Princeton University*, GPA: 3.924/4.0.
Astrophysical Sciences; Certificate in Linguistics; Phi Beta Kappa member

Tutoring and Mentoring Experience

- 2020–now Research mentor, *Comparing semi-analytical models with IllustrisTNG* – Polygence
- 2018–now Non-resident Tutor at Pforzheimer House – Harvard University
 - 2020 Tutor, *Introduction to Astronomy* – Tutors against COVID
- 2019–2020 Research mentor, *Exploring the Behavior of the FoF and Rockstar Halo Finders* ([visit our website](#)) – SRMP program, Harvard and MIT
- 2019–2020 Teaching Fellow, *Life as a planetary phenomenon* – Harvard University
 - 2019 Teaching Fellow, *Introduction to astronomy* – Harvard University
- 2017–2018 Applicants Mentor, Vice President of CantaBulgarian – Cambridge University
- 2016–2017 Prison Teaching Initiative, Tutor in Mathematics – New Jersey
 - 2016 SPLASH, Teacher of Cosmology – Princeton University
- 2014, 2018 Summer Schools, Mathematics Tutor – Plainsboro, NJ and Panitsite, Bulgaria
- 2014 Wintersession Courses, Bulgarian Teacher – Princeton University

Research Topics

- 2018–now *PhD Thesis: Unraveling the galaxy-halo connection through simulations of the Universe* – Harvard University
Supervised by Daniel Eisenstein and Lars Hernquist
- 2019–2020 *Marginalization of photometric redshift uncertainties*
Supervised by Anze Slosar, David Alonso and Andrina Nicola
- 2017–2018 *Improvements on Small-Scale CMB Lensing* – Cambridge University
Supervised by Blake Sherwin
- 2016–2017 *Exploring Non-Standard Models of the Universe* – Princeton University
Supervised by David Spergel and Joanna Dunkley

- 2016 *Baryon Acoustic Oscillation Peak Modelling* – Tokyo University
Supervised by David Spergel and Masahiro Takada
- 2015 *Tidal Tensor Field Reconstruction* – Oxford University
Supervised by David Alonso
- 2015 *Accommodation towards Foreign Accents* – Princeton University
Supervised by Carina Bauman
- 2014 *Constraining the Primordial Tilt* – Princeton University
Supervised by Daniel Meerburg and Renee Hlozek

Publications

1. “The galaxy-halo connection of ELGs in IllustrisTNG”, (B. Hadzhiyska et al.), in prep.
2. “CompaSO: A new halo finder for competitive assignment to spherical overdensities”, (B. Hadzhiyska et al.), in prep.
3. “Environment Assembly bias”, (S. Yuan, B. Hadzhiyska et al.), in prep.
4. “Extensions to empirical galaxy population models”, (B. Hadzhiyska et al.), arXiv: 2008.04913.
5. “Analytic marginalization of $N(z)$ uncertainties in tomographic galaxy surveys”, (B. Hadzhiyska et al.), arXiv: 2007.14989.
6. “Limitations to the ‘basic’ HOD model”, (B. Hadzhiyska et al.), arXiv: 1911.02610.
7. “Improving Small-Scale CMB Lensing Reconstruction”, (B. Hadzhiyska et al.), arXiv: 1905.04217.
8. “ Λ CDM or self-interacting neutrinos? - how CMB data can tell the two models apart”, (M. Park et al.), arXiv: 1904.02625.
9. “Measuring the Duration of Last Scattering”, (B. Hadzhiyska and D. Spergel), arXiv: 1808.04083.
10. “A Small-Scale Modification to the Lensing Kernel”, (B. Hadzhiyska et al.), arXiv: 1711.03168.
11. “Recovering the Tidal Field in the Projected Galaxy Distribution”, (D. Alonso et al.), arXiv: 1512.03402
12. “Multi-wavelength constraints on the inflationary consistency relation”, (D. Meerburg et al.), arXiv: 1502.00302

Publications outside astronomy

1. “Grapheme-level errors in reading words and pseudo-words by children and adolescents with Autism Spectrum Disorder”, (K. Shtereva et al.), in prep.
2. “Adapting and Implementing a Multilingual Computer Program Using the Wuggy Method for Generating Pseudo-Words in Bulgarian”, (K. Shtereva, B. Hadzhiyska et al.), in prep.

Awards and Conferences

60 Garden Street, MS 10, Cambridge, MA 02138

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- 2020 LGBTQ+ in Academia, presentation – Harvard University
- 2020 Limitations to the basic HOD model, presentation – Berkeley and University of Santa Cruz
- 2019 Cosmic Web Workshop, presentation – Edinburgh, UK
- 2019 Small-scale CMB lensing, presentation – Boston University
- 2019 Extracting galaxy distribution information from TNG – Barcelona University
- 2018 Ashford Fellowship Stipend – Harvard University
- 2018 Peirce Fellowship Stipend – Harvard University
- 2018 Meeting of the European Astronomical Society – Liverpool, UK
- 2017 Phi Beta Kappa Society Ceremony – Princeton University
- 2017 Sigma Xi Society Invitation – Princeton University
- 2016 Meeting of the American Astronomical Society – Kissimmee, Florida
- 2016 Japanese Speech Contest, First Place – Princeton University
- 2015 Shapiro Prize for Academic Excellence – Princeton University
- 2013 International Linguistics Olympiads, Silver Medal – Manchester, UK

Working Skills

Computing

Python (advanced), C/C++ (intermediate), Java (intermediate), Mathematica (intermediate), MATLAB (intermediate), Fortran (basic)

Languages

Bulgarian (native), English (fluent), Japanese (intermediate), German (advanced), Spanish (intermediate)

Interests

Community Service

- 2019 Volunteer at the organization Family Meals – Cambridge, MA
- 2017–2018 Volunteer at the organization FoodCycle – Cambridge, UK
- 2018 Fundraising organizer for CantaBulgarian – Cambridge, UK

Socially oriented work

- 2019–2020 Member of the faculty-student mental health committee – Harvard University
- 2020 Active member of the diversity and equity alliance at the Center for Astrophysics (APS-IDEA)
- 2020 Co-chair of the grievance committee at the Harvard graduate student union

Popularizing Science

- 2013–now Mentoring high-school applicants in STEM fields from Eastern Europe who want to study abroad
- 2017 Organizing monthly meetings for undergraduates with an academic focus – Princeton University

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Music

2018–now Alto and social chair at Dudley Choir – Harvard University; playing the guitar and singing

Sports and Hobbies

Avid fan of cycling, fencing, soccer, swimming, ultimate frisbee, linguistics, and animation