
CONTACT INFORMATION Harvard Smithsonian Center for Astrophysics ana-roxana.pop@cfa.harvard.edu
60 Garden St, MS 10
Cambridge, MA 02138, USA

ACADEMIC TRAINING **Harvard University**
Ph.D. Candidate., Astronomy & Astrophysics, September 2015 - present
Adviser: Professor Lars Hernquist
Secondary Field: Computational Science and Engineering

Princeton University

A.B., Physics, Summa Cum Laude, June 2015

- Senior Thesis: *Polarized Foregrounds the Cosmic Microwave Background*
Adviser: Professor Lyman Page
- Spring Junior Paper: *False Vacuum Decay near Black Holes*
Adviser: Professor Paul J. Steinhardt
- Fall Junior Paper: *Particle Acceleration in Astrophysical Collisionless Shocks*
Adviser: Professor Anatoly Spitkovsky

Tudor Vianu National High School of Computer Science, Romania

Profile: Mathematics and Computer Science, September 2007 - June 2011

HONORS AND AWARDS

- **Philip Putnam Chase Fellowship**, Harvard University **2015-2016**
- **Peirce Fellowship**, Harvard University **2015**
- Elected to Membership in the **Phi Beta Kappa Society** **2015**
- Elected to Membership in the **Society of Sigma Xi** **2015**
- **Kusaka Memorial Prize in Physics**, Princeton University **2015**
- **Allen G. Shenstone Prize in Physics**, Princeton University **2014**
- **Bershadsky Research Fellowship in Physics** **2014**
- **Kusaka Memorial Prize in Physics**, Princeton University **2013**
Award citation: “for excellence in course work and promise in independent research.”
- **Shapiro Prize for Academic Excellence**, Princeton University **2013**
Award citation: “for outstanding academic achievement.”
- **Bell Burnell Award in Physics**, Princeton University **2013**
- **Treiman Fellowship in Physics**, Princeton University **2012**
- **Gold Medal - International Physics Olympiad (IPhO)**, Thailand **2011**
- **Prize Leprince Ringuet offered by École Polytechnique**, France **2011**
- **Silver Medal - International Olympiad Astr.&Astrophy. (IOAA)**, China **2010**
- **Silver Medal - International Astronomy Olympiad (IAO)**, Ukraine **2010**

JOURNAL
PUBLICATIONS

1. **Pop, A. R.**, Pillepich, A., Amorisco, N. C., and Hernquist, L. (2017) "*Formation and Incidence of Shell Galaxies in the Illustris Simulation*" - submitted to MNRAS (06/19/2017); arXiv:1706.06102
2. **Pop, A. R.**, Pillepich, A., Amorisco, N. C., and Hernquist, L. (2017) "*Shell Galaxies in Illustris: Metallicity Signatures*" - Galaxies 5(3), 34 (2017); arXiv:1708.01615
3. Marsh, D. J. E. and **Pop, A. R.** (2015) "*Axion dark matter, solitons, and the cusp-core problem*" - MNRAS 451 (2015), no. 3 2479-2492; arXiv:1502.03456
4. Caprioli, D., **Pop, A. R.**, and Spitkovsky, A. (2014). "*Simulations and Theory of Ion Injection at Non-relativistic Collisionless Shocks*" - ApJ 798, 28 (2015); arXiv:1409.8291
5. Cen, R., **Pop, A. R.**, and Bahcall, N. A. (2014). "*Gas Loss in Simulated Galaxies as They Fall into Clusters*" - PNAS 111.22 (2014) 7914-7919; arXiv:1405.0537

RESEARCH
EXPERIENCE

2016-2017 PhD Project supervised by Prof. Lars Hernquist

- Studied the formation and incidence of shell galaxies in the Illustris simulation. We develop stellar history catalogs to trace the history of each individual star particle inside these low surface brightness tidal substructures. We find an order-zero recipe for the formation of shell galaxies and the fraction of shells is in agreement with observations. We also study the metallicity signatures of shells. Main paper submitted to MNRAS (arXiv:1706.06102) and metallicity paper published in Galaxies MDPI (arXiv:1708.01615).

2014 - 2015 Senior Thesis supervised by Prof. Lyman Page

- Analyzed the levels of foreground emission in the region of sky investigated by the BICEP2 Collaboration.

Summer 2014 Research Assistant supervised by Dr. David J. E. Marsh
Perimeter Institute for Theoretical Physics, Waterloo, Canada

- Studied the Schrödinger picture for ultra-light axions (ULAs), developed a theoretical model explaining the presence of flat cores, and investigated the gravitational collapse of ULAs by numerically solving the non-linear self-gravitating Schrödinger-Poisson system. Paper accepted in MNRAS (arXiv:1502.03456).

Spring 2014 Junior Research Project supervised by Prof. Paul J. Steinhardt

- Analyzed how metric effects due to the presence of black holes can catalyze the decay of the electroweak vacuum.

Fall 2013 Junior Research Project supervised by Prof. Anatoly Spitkovsky,

- Studied particle acceleration at astrophysical collisionless shocks. We investigated the shock structure using a hybrid simulation and developed a theoretical model for ion injection into diffusive shock acceleration. Paper accepted for ApJ Letter (arXiv:1409.8291).

Summer 2013 Research Assistant for Prof. A. Spitkovsky and Dr. D. Caprioli,
REU at Princeton University, Department of Astrophysical Sciences

- Studied particle acceleration in collisionless plasma shocks. Found new results on the interplay between diffusive shock acceleration and shock drift acceleration.

Summer 2012 Research Assistant for Prof. Neta Bahcall and Dr. Renyue Cen,
REU at Princeton University, Department of Astrophysical Sciences

- Studied how galaxies lose their cold gas at low redshifts using high-resolution cosmological hydrodynamic simulations.
Paper published in PNAS (arXiv:1405.0537).

ADVISING,
TEACHING,
OUTREACH

- Research Adviser for Angela A. G. Twum
- part of the [Banneker & Aztlán Institute Summer Program](#) 2017
- Team Leader of the [US Team - International Astron.&Astrophy. Olympiad 2017](#)
- in collaboration with Ioana Zelko, wrote and graded selection tests, taught lectures during the MIT training camp and held weekly training telecons
- [ComSciCon National Workshop](#) - Member of Local Organizing Committee 2017
- leadership workshop series for graduate student leaders in STEM communication and outreach
- Teaching Assistant for AST 200: Radiative Astrophysics, Harvard U. Fall 2016
- awarded the Derek Bok Certificate of Teaching Excellence
- Teaching Assistant for PHY 104: General Physics II, Princeton U. Spring 2014
- Tutor in Physics and Mathematics, Princeton University 2011 - 2014
- Co-President of Princeton Astrobiology Club 2012 - 2013
- Social Chair of Princeton Astrobiology Club 2011 - 2012