Supranta Sarma Boruah

Contact

Steward Observatory, University of Arizona
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Employment

Steward Observatory, University of Arizona

Postdoctoral Research Associate — *Sep 2020-present*

Education

University of Waterloo

Ph.D., Department of Applied Mathematics — *Sep 2016-Aug 2020*
Thesis title: *Topics in early and late Universe cosmology*
Advisors: Ghazal Geshnizjani and Michael Hudson

Indian Institute of Technology (IIT) Kanpur — *Jul 11-May 16*

B.S-M.S dual degree, Department of Physics

Publications and Preprints

1. B. Stahl, T. de Jaeger, **S. S. Boruah**, W. Zheng, A. Filippenko and M. Hudson, *Peculiar-velocity cosmology with Types Ia and II supernovae*. Submitted to MNRAS
2. **S. S. Boruah**, M. Hudson and G. Lavaux, *Peculiar velocities in the local Universe: comparison of different models and the implications for H_0 and dark matter*. Submitted to MNRAS [arXiv:2010.01119]
3. **S. S. Boruah**, M. Hudson and G. Lavaux, *Cosmic flows in the nearby Universe: new peculiar velocities from SNe and cosmological constraints*. MNRAS, 498, 2703, [arXiv:1912.09383]
4. T. Charnock, G. Lavaux, B. Wandelt, **S. S. Boruah**, J. Jasche and M. Hudson, *Neural physical engines for inferring the halo mass distribution function*. MNRAS, 494, 50, [arXiv:1909.06379]
5. T. Yang, **S. S. Boruah**, and N. Afshordi, *Gravitational Potential from small-scale clustering in action space: Application to Gaia DR2*. MNRAS, 493, 3061, [arXiv:1908.02336]
6. **S. S. Boruah**, H. J. Kim, M. Rouben and G. Geshnizjani. *Cuscuton Bounce*. JCAP 08, 031 (2018), [arXiv:1802.06818]
7. **S. S. Boruah**, H. J. Kim and G. Geshnizjani, *Theory of Cosmological Perturbations with Cuscuton*. JCAP 07, 022 (2017), [arXiv:1704.01131]

Talks

1. Invited seminar, TIFR, Mumbai — *November 2020*
2. Invited seminar, IAP, Paris — *Apr 2020*
3. Invited seminar, Duke University — *Feb 2020*
4. Invited seminar, MPA, Garching — *Jan 2020*
5. Contributed talk, Theory Canada 12, York University, Toronto — *May 2017*
6. Graduate student colloquium, Department of Applied Mathematics, University of Waterloo — *Jul 2017*
7. Poster presentation, Testing Gravity 2017, Vancouver — *Jan 2017*
8. Talk, Cosmology group meeting, PITP, Waterloo — *Oct 2016*

Service

Referee for MNRAS

Collaboration

Member of the LSST-DESC and the Aquila consortium

Mentoring

1. Charles Prior, graduate student at Duke University,
   Project: *Impact of Supernovae systematics on peculiar velocity estimates*
2. William Gregory Dallaway, undergraduate student at University of Waterloo
   Project: *Cross-correlation of standard sirens and galaxy surveys to measure H_0*
3. Michelle Xu, summer undergraduate student at Perimeter Institute
   Project: *Iso-curvature modes in reheating*

Conferences / Summer schools Attended

Analytics, Inference and Computation in Cosmology conference, Paris	*Sep-Nov 2018*
Analytics, Inference and Computation in Cosmology school, Corsica	*Sep 2018*
Summer Institute in Philosophy of Cosmology, London	*Jun 2018*
Large-Scale Astrophysics: galaxies and beyond, Montreal	*Jun 2018*
TRISEP school, PITP, Waterloo	*Jul 2018*
Testing Gravity 2017, Simon Fraser University, Vancouver	*Jan 2017*
Theory Canada 12, York University, Toronto	*May 2017*
Bounce Scenarios in Cosmology, PITP, Waterloo	*Jun 2017*

Awards and Achievements

MITACS Globalink Research Award 2018

Research travel assistantship worth CAD 6000 awarded to conduct research under the guidance of Dr. Guilhem Lavaux at Institut d'Astrophysique de Paris for 12 weeks

KVPY Fellowship 2011

Awarded to approximately 200 top students by Department of Science and Technology, India based on a competitive examination to study basic sciences.

IIT-JEE 2011

Ranked 974 among 400000 students in the nationwide IIT-JEE entrance examination

Olympiads 2009-2011

Was among the 300 students selected for the Indian National Physics Olympiad (INPhO), 2011.
Represented the state of Assam in the Indian National Mathematics Olympiad (INMO) in the years 2009-2011

Computational Skills

Computer Languages: Python, Julia, C++

Packages and Softwares: MATHEMATICA, JAX, TensorFlow

Teaching

A lecture series on Markov Chain Monte Carlo (MCMC) methods at University of Waterloo *M*ay 2020

Teaching Assistant at University of Waterloo for various mathematics and physics courses (a total of 12 terms)

References

Guilhem Lavaux email: guilhem.lavaux@iap.fr

Institut d'Astrophysique de Paris
Paris

Michael J. Hudson email: mike.hudson@uwaterloo.ca

Deparment of Physics and Astronomy
University of Waterloo

Ghazal Geshnizjani e-mail: ggeshniz@uwaterloo.ca

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