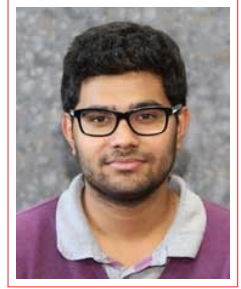


Sownak Bose

Curriculum Vitæ

6 Flass Street
Durham, DH1 4BE
☎ +447 515 496 412
✉ sownak.bose@durham.ac.uk
📁 icc.dur.ac.uk/~hvrn44



Education

- 2013–Present **Institute for Computational Cosmology, University of Durham**, PhD in Astrophysics, supervised by Prof. Carlos Frenk, Dr. Baojiu Li and Prof. Adrian Jenkins.
- Performing and analysing cosmological simulations with cold dark matter and sterile neutrinos using the GADGET code.
 - Comparing galaxy formation in cold dark matter and sterile neutrino cosmologies using semi-analytic models (GALFORM) and hydrodynamical simulations (using the EAGLE code).
 - Creating high resolution ‘zoom-in’ initial conditions and building dark matter merger trees from N -body simulations.
 - Co-developed RAY-RAMSES, an on-the-fly ray tracing algorithm implemented in the RAMSES simulation code.
 - Analysing the statistics of large scale structure in N -body modified gravity simulations.
 - Organiser of two weekly astronomy journal clubs.
 - Postgraduate student representative at the institute’s staff meetings.
- 2009–2013 **St. Catherine’s College, University of Oxford**, Master of Physics (MPhys).
- Master’s thesis titled ‘Gauge theories and *dessins d’enfants*: beyond the torus’ under the supervision of Prof. Yang-Hui He.

Awards and scholarships

- 2013–Present STFC PhD studentship
- 2016 Keith Nicholas postgraduate prize for ‘outstanding overall performance’
 - 2012 College award for undergraduate performance
 - 2012 IoP/Nuffield bursary for undergraduate research
 - 2011 College award for undergraduate performance
 - 2011 Voted ‘best student talk’ at St. Catherine’s College undergraduate physics seminar

Publications

- 1 **Reionisation in sterile neutrino cosmologies.**
Bose, S., Frenk, C. S., Jun, H., Lacey, C. G., & Lovell, M. R. 2016, *ArXiv e-prints*, arXiv:1605.03179.
- 2 **Substructure and galaxy formation in the Copernicus Complexio warm dark matter simulations.**
Bose, S., Hellwing, W. A., Frenk, C. S., Jenkins, A., Lovell, M. R., Helly, J. C., Li, B., & Gao, L., *ArXiv e-prints*, arXiv:1604.07409.
- 3 **The Copernicus Complexio: statistical properties of warm dark matter haloes.**
Bose, S., Hellwing, W. A., Frenk, C. S., Jenkins, A., Lovell, M. R., Helly, J. C., & Li, B., *Monthly Notices of the Royal Astronomical Society*, 455, 318.
- 4 **Testing the quasi-static approximation in $f(R)$ gravity simulations.**

- Bose, S., Hellwing, W. A., & Li, B.** 2015, *Journal of Cosmology and Astro-Particle Physics*, 2, 034.
- 5 **Gauge theories and dessins d'enfants: beyond the torus.**
Bose, S., Gundry, J., & He, Y.-H. 2015, *Journal of High Energy Physics*, 1, 135.
- 6 **Satellite galaxies in semi-analytic models of galaxy formation with sterile neutrino dark matter.**
 Lovell, M. R., **Bose, S.**, Boyarsky, A., Cole, S., Frenk, C. S., Gonzalez-Perez, V., Kennedy, R., Ruchayskiy, O., & Smith, A. 2016, *Monthly Notices of the Royal Astronomical Society*, 461, 60.
- 7 **The mass-concentration-redshift relation of cold and warm dark matter haloes.**
 Ludlow, A. D., **Bose, S.**, Angulo, R. E., Wang, L., Hellwing, W. A., Navarro, J. F., Cole, S., & Frenk, C. S. 2016, *Monthly Notices of the Royal Astronomical Society*, 460, 1214.
- 8 **Weak lensing by galaxy troughs with modified gravity.**
 Barreira, A., **Bose, S.**, Li, B., & Llinares, C. 2016, *ArXiv e-prints*, arXiv:1605.08436.
- 9 **Speeding up N-body simulations of modified gravity: Vainshtein screening models.**
 Barreira, A., **Bose, S.**, & Li, B. 2015, *Journal of Cosmology and Astro-Particle Physics*, 12, 059.
- 10 **Planes of satellite galaxies: when exceptions are the rule.**
 Cautun, M., **Bose, S.**, Frenk, C. S., Guo, Q., Han, J., Hellwing, W. A., Sawala, T., & Wang, W. 2015, *Monthly Notices of the Royal Astronomical Society*, 452, 3838.
- 11 **RAY-RAMES: a code for ray tracing on the fly in N-body simulations.**
 Barreira, A., Llinares, C., **Bose, S.**, & Li, B. 2016, *Journal of Cosmology and Astro-Particle Physics*, 5, 001.
- 12 **The Copernicus Complexio: a high-resolution view of the small-scale Universe.**
 Hellwing, W. A., Frenk, C. S., Cautun, M., **Bose, S.**, Helly, J., Jenkins, A., Sawala, T., & Cytowski, M. 2016, *Monthly Notices of the Royal Astronomical Society*, 457, 3492.
- 13 **Constraints on the identity of the dark matter from strong gravitational lenses.**
 Li, R., Frenk, C. S., Cole, S., Gao, L., **Bose, S.**, & Hellwing, W. A. 2016, *Monthly Notices of the Royal Astronomical Society*, 460, 363.
- 14 **Constraining SN feedback: a tug of war between reionization and the Milky Way satellites.**
 Hou, J., Frenk, C. S., Lacey, C. G., & **Bose, S.** 2016, *Monthly Notices of the Royal Astronomical Society*
- 15 **Modified gravity N-body code comparison project.**
 Winther, H. A., Schmidt, F., Barreira, A., Arnold, C., **Bose, S.**, Llinares, C., Baldi, M., Falck, B., Hellwing, W. A., Koyama, K., Li, B., Mota, D. F., Puchwein, E., Smith, R. E., & Zhao, G.-B. 2015, *Monthly Notices of the Royal Astronomical Society*, 454, 4208.
- 16 **The Extraordinary Amount of Substructure in the Hubble Frontier Fields Cluster Abell 2744.**
 Jauzac, M., Eckert, D., Schwinn, J., Harvey, D., Baugh, C. M., Robertson, A., **Bose, S.**, Massey, R., Owers, M., Ebeling, H., Shan, H. Y., Jullo, E., Kneib, J.-P., Richard, J., Atek, H., Clément, B., Egami, E., Israel, H., Knowles, K., Limousin, M., Natarajan, P., Rexroth, M., Taylor, P., & Tchernin, C. 2016, *ArXiv e-prints*, arXiv:1606.04527.

Journal referee

Since Aug 2016 Referee for the Monthly Notices of the Royal Astronomical Society (MNRAS)

Teaching and supervision

2011–Present Teacher in higher level Physics and Mathematics for Lanterna Education

2015–2016 Co-supervisor of a 4th year student's master's thesis titled 'Astrophysical Constraints on the Nature of Dark Matter'

- 2015–2016 Workshop demonstrator for 2nd year Theoretical Physics course on Classical & Quantum Mechanics
- 2014–2015 Workshop demonstrator for 2nd year Theoretical Physics course on Classical & Quantum Mechanics
- 2013–2014 Marker for 4th year Theoretical Astrophysics course on Large Scale Structure & General Relativity

Conference talks

Invited

- Mar 2016 **Theoretical Cosmology Seminar**, Portsmouth, UK.
Cosmological Simulations & Tests of Gravity

Contributed

- Jun 2016 **National Astronomy Meeting**, Nottingham, UK.
Faster Simulations of Modified Gravity
- Dec 2015 **Virgo Consortium Meeting**, Leiden, The Netherlands.
Structure Formation Near the Free-streaming Scale of Warm Dark Matter
- Sep 2015 **RAMSES Users' Meeting**, Oxford, UK.
A New Ray Tracing Algorithm in RAMSES
- Aug 2015 **1st Roman Juszkiewicz Symposium**, Warsaw, Poland.
Reionisation in Sterile Neutrino Cosmologies
- Jun 2015 **National Astronomy Meeting**, Llandudno, Wales, UK.
Cosmology with Sterile Neutrinos
- Jan 2015 **Beyond Λ CDM**, Oslo, Norway.
The Copernicus Complexio: The Warm Dark Matter Universe
- Dec 2014 **Virgo Consortium Meeting**, Munich, Germany.
The Copernicus Complexio: The Warm Dark Matter Universe
- Jul 2014 **ν MSM workshop**, Amsterdam, The Netherlands.
The Copernicus Complexio: The Warm Dark Matter Universe
- Apr 2014 **Modified Gravity workshop**, Munich, Germany.
Testing the Quasi-static Approximation in $f(R)$ Gravity Simulations

Programming skills

Python, Fortran90, C, UNIX, \LaTeX , Mathematica

Outreach

- Jul 2016 **Royal Society Summer Exhibition**, London, UK.
Co-developer of the Oculus Rift fly-through of the simulated universe
- Jan 2016 **Durham University Space Day**, Durham, UK.
Team leader for a group of schoolchildren
- Nov 2015 **Lumiere Light Festival**, Durham, UK.
Core team member responsible for projecting the EAGLE cosmological simulations on Durham Cathedral
- Oct 2015 **Celebrate Science**, Durham, UK.
Demonstrator for gravitational lensing demo
- Apr 2015 **Schools' Science Festival**, Durham, UK.
Demonstrator for 'How to build a spectrograph'
- Oct 2014 **Celebrate Science**, Durham, UK.
Demonstrator for gravitational lensing demo
- Dec 2013 **Stockholm Science Event**, Stockholm, Sweden.

Invited by the British Council to talk about dark matter in Stockholm Central Station
Oct 2013 **Celebrate Science**, Durham, UK.
Demonstrator for gravitational lensing demo

References

Prof. Carlos S. Frenk
Ogden Professor of Fundamental Physics
Institute for Computational Cosmology, University of Durham
c.s.frenk@durham.ac.uk

Dr. Baojiu Li
Reader in Physics
Institute for Computational Cosmology, University of Durham
baojiu.li@durham.ac.uk

Prof. Adrian R. Jenkins
Professor of Physics
Institute for Computational Cosmology, University of Durham
a.r.jenkins@durham.ac.uk