

# Sownak Bose

## Curriculum Vitæ

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British

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📄 [sownakbose.github.io/](https://sownakbose.github.io/)

### Employment

Sept 2017–Present **Harvard-Smithsonian Center for Astrophysics, Harvard University**, ITC Fellow.

### Education

2013–2017 **Institute for Computational Cosmology, University of Durham**, PhD in Astrophysics, supervised by Prof. Carlos Frenk, Dr. Baojiu Li and Prof. Adrian Jenkins.

2009–2013 **St. Catherine's College, University of Oxford**, Master of Physics (MPhys).

### Awards and scholarships

2017–Present **ITC Fellowship** (Harvard University)

2018 **Royal Astronomical Society Michael Penston Prize** for 'best doctoral thesis in astronomy or astrophysics in the UK'

2018 **Springer Thesis Prize** – annual award recognising 'outstanding PhD research' internationally. Thesis published as a book by Springer

2018 **Winton Doctoral Prize** for 'best PhD in Physics using computational methods'

2013–2017 STFC PhD studentship

2016 **Keith Nicholas Postgraduate Prize** for 'outstanding overall performance' by a postgraduate student in the Physics department

2012 Master's Book Prize (college award for undergraduate performance)

2012 IoP/Nuffield bursary for undergraduate research

2011 Master's Book Prize

2011 Voted 'best student talk' at St. Catherine's College undergraduate physics seminar

### Professional service

Since May 2018 Referee for the Journal of Cosmology and Astroparticle Physics (JCAP)

Nov 2017 Member of the ITC Fellowship Selection Committee

Since May 2017 Referee for the International Journal of Modern Physics, D. (IJMPD)

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

### In the press

Aug 2018 Research on the identification of pre- and post-reionisation populations of dwarf galaxies [arXiv:1802.10096] reported extensively in world media (TV, radio, print and Internet), including coverage on the [BBC](#), Sky News, The Independent, The New Scientist, [USA Today](#), [Popular Mechanics](#), [Gizmodo](#) and more than 100 other media outlets.

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## Talks (contributed and invited)

- Sep 2018 **IGM2018: Revealing Cosmology and Reionization History with the Intergalactic Medium**, Tokyo, Japan.  
*How the Present-day Distribution of Dwarf Galaxies Encodes the Physics of Reionisation*
- Apr 2018 **KITP Workshop On Cold Dark Matter**, Santa Barbara, California, USA.  
*The Small(est) Scale Structure In Cold Dark Matter*
- Apr 2018 **ITC luncheon**, Cambridge, MA, USA.  
*How the Present-day Distribution of Dwarf Galaxies Encodes the Physics of Reionisation*
- Mar 2018 **Columbia University Astronomy Seminar**, New York, NY, USA, (invited).  
*How the Present-day Distribution of Dwarf Galaxies Encodes the Physics of Reionisation*
- Mar 2018 **Supercomputing Frontiers Europe 2018**, Warsaw, Poland, (invited).  
*Simulating the Formation of Structure on Supercomputers*
- Feb 2018 **Sterile Neutrino Dark Matter workshop**, Leiden, The Netherlands, (invited).  
*Reionising the Universe with Sterile Neutrinos*
- Nov 2017 **ITC luncheon**, Cambridge, MA, USA.  
*The Small-Scale Structure of Cold Dark Matter*
- Nov 2017 **CosmoFest**, Cambridge, MA, USA.  
*On-the-fly Ray Tracing in  $N$ -body Simulations*
- Jan 2017 **MPA Special Cosmology Seminar**, Munich, Germany, (invited).  
*Cosmology with Sterile Neutrinos*
- Oct 2016 **Towards Accurate Lightcones for Cosmology**, Munich, Germany.  
*On-the-fly Ray Tracing in  $N$ -body Simulations*
- Jun 2016 **National Astronomy Meeting**, Nottingham, UK.  
*Faster Simulations of Modified Gravity*
- Mar 2016 **Theoretical Cosmology Seminar**, Portsmouth, UK, (invited).  
*Cosmological Simulations & Tests of 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 **1<sup>st</sup> 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  $\Lambda$ 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  **$\nu$ 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*

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## Programming skills

Python, Fortran90, C, UNIX,  $\text{\LaTeX}$ , Mathematica

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## Teaching and supervision

- 2011–Present Teacher in higher level Physics and Mathematics for Lanterna Education
- Summer 2018 Co-supervisor (with Dr. Idan Ginsburg) of REU Summer research student Thomas M. Boudreaux on 'The Effects of Primordial Binary Fraction on Globular Cluster Evolution'
- 2016–2017 Workshop demonstrator for 3rd year course on Planets & Cosmology
- 2015–2016 Co-supervisor of a 4th year student's master's (equivalent to MSc.) 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

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## Media & outreach

- 2015–Present **Söderberg & Partners Summer Camp**, Sigtuna, Sweden.  
Popular science lectures in Physics & Astronomy
- Apr 2018 **Cambridge Explores The Universe**, Harvard College Observatory, Cambridge, MA, USA.  
Interactive activity demonstrator, 'Ask an Astronomer'
- Mar 2017 **Gravity And Me: The Force That Shapes Our Lives**, BBC4.  
Contributor to BBC science programme on the nature of gravity in our Universe
- Feb 2017 **This is Durham: Place of Light**, House of Commons, Westminster, UK.  
Represented the Institute for Computational Cosmology at the invitation of MP Kevan Jones
- Oct 2016 **Celebrate Science**, Durham, UK.  
Demonstrator for the 'Galaxy Makers' exhibit
- 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