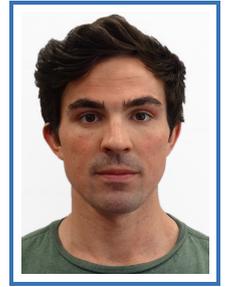


# Andrew Robertson

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## Academic positions

- 2017–present **Institute for Computational Cosmology, Durham, UK**, Postdoctoral Research Associate.
- Running and analysing cosmological simulations of systems ranging in mass from dwarf galaxies up to galaxy clusters, with self-interacting dark matter and hydrodynamical models of galaxy formation.
  - Produced ray-tracing code to produce mock strong and weak lensing data from simulated galaxy clusters.
  - Working on analytical modelling of the density profiles of self-interacting dark matter haloes and how they respond to the presence of baryons.

## Education

- 2013–2017 **Institute for Computational Cosmology, Durham University**, PhD in Astrophysics.
- Incorporated particle physics phenomenology into Cosmological simulations of dark matter.
  - Performed analytical calculations of dark matter self-interaction rates through cosmic time.
  - Simulated Bullet Cluster-like systems with self-interacting dark matter.
  - Cosmological zoom simulations of galaxy clusters with hydrodynamics and self-interacting dark matter.
- 2009–2013 **Selwyn College, University of Cambridge**, Master of Natural Science in Experimental and Theoretical Physics.
- MSci & BA(Hons), Class 1
  - Masters Thesis: Fast Simulation of Atmospheric Phase Screens for Adaptive Optics

## Awards and Prizes

- 2018 Alan Martin Doctoral prize for the best PhD thesis in Physics (Durham University)
- 2010–2013 Academic Scholarship from Selwyn College, Cambridge
- 2013 Siddans Prize for Physics (Selwyn College)
- 2012 Braybrook Prize for Physics (Selwyn College)
- 2010 Tripos Prize for Natural Science (Selwyn College)

## Teaching and Supervision

I currently co-supervise one PhD student, and last year I supervised one other PhD student and a Masters student (who have both now graduated). The PhD students have worked on strong gravitational lensing and the destruction of dark matter substructures in hydrodynamical simulations. The Masters student worked on something quite different – the modelling of a cycling peloton – combining ideas from the field of ‘collective motion’ with a basic model of human physiology. I am not teaching Undergraduates this year, but have previously been a tutor for 1st year undergraduates taking the Foundations of Physics course, as well as a workshop demonstrator for a 3rd and 4th year cosmology course.

## Conference Talks and Seminars

I enjoy attending conferences and discussing my work, and have given submitted talks at a number of large conferences including UK National Astronomy Meetings, and the European Week of Astronomy and Space Science. On top of this I have spoken at a number of smaller events including the annual DEX meeting held jointly by Durham and Edinburgh (where I was awarded the prize for ‘best long talk’ in 2017) and regular meetings of the VIRGO consortium. As well as applying to talk at conferences I have been invited to give the following talks.

## Invited

- Nov 2019 **The First Shanghai Assembly on Cosmology and Galaxy Formation**, Shanghai, China.  
Constraints on self-interacting dark matter from galaxy clusters
- Oct 2019 **Competing Structure Formation Models**, Reykjavik, Iceland.  
Constraints on self-interacting dark matter from galaxy clusters
- Feb 2019 **UCI Seminar**, *UC Irvine*, California, USA.  
Placing constraints on self-interacting dark matter using galaxy clusters
- Oct 2018 **BUFFALO Meeting**, Marseille, France.  
Observable tests of self-interacting dark matter in galaxy clusters
- May 2018 **MSSL Seminar**, Surrey, UK.  
Strong and weak lensing signals from self-interacting dark matter clusters
- Mar 2018 **Unravelling the dark matter mystery**, Durham, UK.  
Simulations (Self-interacting Dark Matter)
- Aug 2017 **SIDM Workshop**, *Niels Bohr Institute*, Copenhagen, Denmark.  
What Does the Bullet Cluster Tell us about Self-Interacting Dark Matter?
- Jun 2015 **Dark Matter UK**, Liverpool, UK.  
Probing Dark Matter Self-Interactions with Cosmological Particle Colliders

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## Journal Referee

- 2019–present Physical Review Letters
- 2019–present Astronomy & Astrophysics
- 2018–present Physical Review X
- 2017–present Monthly Notices of the Royal Astronomical Society
- 2016–present Physical Review D

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## Outreach

I have been heavily involved with outreach since starting my PhD, and have given talks at a number of local schools as well as to non-astrophysics groups within Durham University. I have also presented my work at a Pint of Science event in Durham, as well as Palace of Science in Newcastle. As well as giving talks as an individual, I have been involved with organising and participating in larger outreach events. I helped to build and then demonstrate our 'Galaxy Makers' exhibition at the 2016 Royal Society Summer Science Exhibition, and have subsequently presented the same demonstrations at a number of events, both in Durham and around the country. I also recently organised a cosmology morning as part of the OxNet North East Easter School, which aimed to improve access to competitive universities for young people from the region. As well as these events I have been interviewed on National radio and made simulation videos for (and made cameo appearances in) a couple of TV documentaries, which are listed below.

### Television and radio

- Apr 2018 **The Today Programme**, *BBC Radio 4*, UK.  
Interviewed by John Humphrys
- Apr 2018 **Good Evening Wales**, *BBC Radio Wales*, UK.  
Interviewed by Felicity Evans and Peter Johnson
- Apr 2018 **Good Morning Scotland**, *BBC Radio Scotland*, UK.  
Interviewed by Gary Robertson
- Jan 2018 **The Sky at Night - The Invisible Universe**, *BBC Four*, UK.  
Featured a video of one of my Bullet Cluster simulations
- Apr 2017 **Strip the Cosmos - Mystery of the Hidden Universe**.  
Featured a video of one of my Bullet Cluster simulations