

Andrew Robertson

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Academic positions

- 2017–present **Institute for Computational Cosmology, Durham, UK**, Postdoctoral Research Associate.
- Running and analysing simulations of systems ranging in mass from Milky Way analogues up to galaxy clusters, with self-interacting dark matter and EAGLE galaxy formation physics.
 - Running and analysing simulations of large cosmological boxes, with self-interacting dark matter and BAHAMAS galaxy formation physics.
 - Produced ray-tracing code to produce mock strong and weak lensing data from simulated galaxy clusters.
 - Developing a strategy to find the optical counterparts to gravitationally-lensed gravitational waves.

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 (University of Cambridge)
- 2012 Braybrook Prize for Physics (University of Cambridge)
- 2010 Tripos Prize for Natural Science (University of Cambridge)

Teaching and Supervision

- 2018–present Co-supervisor with Vincent Eke of a Masters thesis on modelling the flow of cyclists using fluid equations
- 2018–present Co-supervisor with Baojiu Li and Christian Arnold of a PhD student using combined gravitational lensing and stellar dynamics to constrain modified gravity theories
- 2018–present Co-supervisor with Shaun Cole and Carlos Frenk of a PhD student using galaxy–galaxy lensing to detect dark matter subhaloes
- 2017–present Co-supervisor with Adrian Jenkins and Carlos Frenk of a PhD student investigating the destruction of dark matter substructures in hydrodynamical simulations
- 2017–present Tutor for 1st year Foundations of Physics course
- 2016–2017 Workshop demonstrator for 3rd year course on Planets and Cosmology
- 2014–2016 Tutor for 1st year Foundations of Physics course
- 2013–2015 Marker for 1st year Introduction to Astronomy course

Conference Talks and Seminars

Invited

- Dec 2018 **VIRGO Meeting**, Leiden, Netherlands.
Self-interacting dark matter simulations within VIRGO
- 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

Submitted

- Apr 2018 **EWASS 2018**, Liverpool, UK.
Strong lensing signals from self-interacting dark matter clusters
- Dec 2017 **VIRGO Workshop**, MPA, Garching, Germany.
The diverse density profiles of galaxy clusters with SIDM+baryons
- Jan 2017 **DEX XIII**, Edinburgh, UK.
Why the Bullet Cluster tells us less about Self-Interacting Dark Matter than we had hoped
- Dec 2016 **VIRGO Workshop**, Durham, UK.
What Does the Bullet Cluster Tell us about Self-Interacting Dark Matter?
- Dec 2016 **VIRGO Workshop**, Durham, UK.
EAGLE with SIDM (or a Tale of Dark Forces II)
- Nov 2016 **Dark Matter from aeV to ZeV**, Lumley Castle, UK.
What Does the Bullet Cluster Tell us about Self-Interacting Dark Matter?
- Jan 2016 **DEX XII**, Durham, UK.
Constraining Dark Matter's Self-Interaction Cross-Section with Colliding Clusters
- Dec 2015 **VIRGO Workshop**, Leiden, Netherlands.
Constraining Dark Matter's Self-Interaction Cross-Section with Colliding Clusters
- Aug 2015 **1st Roman Juszkiewicz Symposium**, Warsaw, Poland.
(Non-)Cosmological Simulations with Self-Interacting Dark Matter
- Jul 2015 **National Astronomy Meeting**, Llandudno, UK.
Cosmological Simulations with Self-Interacting Dark Matter
- Jan 2015 **DEX XI**, Edinburgh, UK.
Dark Matter Self-Interactions Through Cosmic Time
- Jun 2014 **National Astronomy Meeting**, Portsmouth, UK.
Simulating Self-Interacting Dark Matter
- Jun 2014 **Dark Matter UK**, Durham, UK.
Simulating Self-Interacting Dark Matter
- Jun 2014 **2nd Observational Cosmology Summer School**, Azores, Portugal.
Simulating Self-Interacting Dark Matter
- Jan 2014 **VIRGO Workshop**, Leiden, Netherlands.
Simulating Self-Interacting Dark Matter

Journal Referee

- 2018–present Physical Review X
2017–present Monthly Notices of the Royal Astronomical Society
2016–present Physical Review D

Outreach

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

Talks

- May 2017 **Pint of Science**, Durham, UK.
Cosmic Particle Colliders
- Oct 2016 **Durham University Physics Society**, Durham, UK.
Shining a Light on Dark Matter
- Jun 2016 **Three Minute Thesis Regional Finals**, Newcastle University, UK.
Sticky Dark Matter
- Nov 2015 **Southmoor Academy**, Sunderland, UK.
Shining a Light on Dark Matter
- Oct 2015 **Hatfield College Research Symposium**, Durham, UK.
Shining a Light on Dark Matter
- Dec 2014 **Whitley Bay High School**, Whitley Bay, UK.
A Journey Through the Cosmos

Events

- June 2017 **Cosmic Collisions**, Sanquar, UK.
Galaxy Makers
- Nov 2016 **This is Durham, Place of Light**, Durham Cathedral, UK.
Galaxy Makers
- Jul 2016 **Royal Society Summer Science Exhibition**, London, UK.
Galaxy Makers
- Apr 2016 **School Science Festival**, Durham, UK.
Beyond the Rainbow
- Jan 2016 **Durham University Space Day**, Durham, UK.
Building a Mars Lander
- Nov 2015 **Music of Light Exhibition**, *Trevelyan College*, Durham, UK.
Gravitational Lensing Demonstration
- Oct 2015 **Celebrate Science**, *Palace Green*, Durham, UK.
Bend it Like Einstein