BRADLEY J KAVANAGH

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Date of Birth	15th March 1989	Nationality	British

Academic History

September 2017 - present: **GRAPPA, University of Amsterdam**
GRAPPA Post-doctoral Position
Supervisors: Dr. Gianfranco Bertone & Dr. Christoph Weniger

October 2014 - August 2017: **LPTHE, Paris & IPhT, CEA/Saclay**
NewDark ERC Post-doctoral Fellowship
Supervisor: Dr. Marco Cirelli

September 2011 - September 2014: **University of Nottingham, UK**
PhD, Particle Theory Group
PhD Thesis: "Confronting Astrophysical Uncertainties in the Direct Detection of Dark Matter"
Supervisor: Dr. Anne M. Green

September 2010 - June 2011: **University of Cambridge, UK**
Master of Science (MSci): Theoretical Physics
Master's thesis: "Wavepacket scattering simulations using GPGPU"
Modules in quantum field theory, particle astrophysics and cosmology.

June 2010 - September 2010: **University of York, UK**
Transit Scholarship, York Centre for Complex Systems Analysis (YCCSA)
Project: "Voter models on complex and dynamic networks"
Supervisor: Dr. Jamie Wood

September 2007 - June 2010: **University of Cambridge, UK**
Bachelor of Arts (BA): Natural Sciences (Physical)
First class honours degree (ranked 13 out of 578).

Research Interests

My main research interest is in the phenomenology of *particle dark matter* (DM). My primary focus has been on the direct detection of particle DM in underground laboratory experiments. I have previously demonstrated how the astrophysics and particle physics properties of a new DM particle could be robustly determined in the event of a discovery. Ongoing research includes the study of novel signatures and new approaches in the direct search for DM. With the advent of gravitational wave (GW) astronomy, I have begun focusing on the effects of DM on GW signals from compact object mergers. In particular, I am interested in whether dense DM halos around black holes can be detected through their influence on observed merger rates and gravitational waveforms.

Publications (list online)

30 publications (23 peer-reviewed). These include 5 single-author papers, 13 first-author papers and 2 papers published in *Physical Review Letters*.

Selected Talks (slides online)

Invited Talk, SLAP 2018, King's College London, 18 December 2018
Title: "Black Holes' Dark Dress: Merging Black Holes and the Dark Matter around them"

PRISMA Colloquium, University of Mainz, 17 October 2018
Title: "Can we directly measure the local distribution of Dark Matter from Earth?"

Invited Overview Talk, Dark Side of the Universe 2018, Annecy, 25 June 2018
Title: "Signal Diversity and EFT in Dark Matter Direct Detection"

[Video] Invited Overview Talk, DM-Stat Workshop, Banff, 26 February 2018
Title: "An Introduction to Dark Matter"

[Video] LAW Physics Webinar, 17 January 2018
Title: "Can we determine the particle/antiparticle nature of Dark Matter?"

Teaching

Astroparticle Physics Course for bachelor's students (14 weeks; lectures, TA sessions & grading; Amsterdam University College, 2019).

Theory Workshop for third-year bachelor's students (4 weeks; lectures & examples classes in astroparticle physics; Institute for Theoretical Physics Amsterdam, 2018 & 2019).

GRAPPA Student Seminar series for first-year MSc students (4 weeks; lectures & project supervision in astroparticle physics; University of Amsterdam, 2018).

Supervision of Erasmus Student Project (Elena Pinetti, University of Turin, 2016).

Awards & Prizes

Institute of Physics (IOP) Astroparticle Physics Thesis prize, 2016

2nd Place, Physics Postgraduate Poster Competition, University of Nottingham, UK, 6 February 2013

Foundation Scholarship (for achieving a First class mark in all papers), University of Cambridge, UK, 2009, 2010, 2011

David Thompson Scholarship (for achieving a First class mark), University of Cambridge, UK, 2008

Computer Skills (code online)

Languages & Software: C/C++, CUDA (GPGPU programming), Fortran, Python, MATLAB, Mathematica, Git, high-performance computing.
Operating Systems: Windows, Linux, Mac OS X.

Conference Organisation

7th Amsterdam-Paris-Stockholm meeting (2017).

NewDark mini-workshops: 'LCDM, Modified Gravity or new Dark Matter models?' (2017), 'Dark Matter and Stars' (2016) and 'Axion Theory and Searches' (2015) in Paris, France.

Young Experimentalists and Theorists Institute (YETI) 2014, Durham, UK.

Other Relevant Experience

Referee for PRL, PRD, JCAP, EPJC and Physics of the Dark Universe.

Coordinating and editing publication of outreach article on the NewDark research group: 'Dark is the new black' (Scientia, 2016).

Outreach talks at undergraduate physics open days at University of Nottingham (2012, 2013) and at University of Cambridge Part III research day (2012).

Journal Club organiser and chair at University of Nottingham and at GRAPPA, University of Amsterdam.