

## Prof. Anne M. Green

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### PERSONAL INFORMATION

School of Physics and Astronomy  
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**year of birth:** 1974  
**civil status:** married to Prof. Simon P. Goodwin, <http://sgoodwin.staff.shef.ac.uk/>

### ACADEMIC HISTORY

#### **Professor of Physics**

School of Physics and Astronomy, University of Nottingham, UK  
from Aug 15

#### **Associate Professor and Reader of Physics**

School of Physics and Astronomy, University of Nottingham, UK  
Aug 13 to Aug 15.

#### **Associate Professor of Physics**

School of Physics and Astronomy, University of Nottingham, UK  
Aug 11 to Aug 13.

#### **STFC Advanced Fellow (until Sep 08) and Lecturer in Theoretical Particle Physics**

School of Physics and Astronomy, University of Nottingham, UK  
Oct 05 to Aug 11.

#### **PPARC Advanced Fellow and Lecturer in Physics**

Physics and Astronomy, University of Sheffield, UK  
Apr 04 to Sep 05.

#### **PPARC Advanced Fellow**

Astronomy Centre, University of Sussex, UK  
Sep 03 to Mar 04.

#### **Postdoctoral Research Assistant**

Physics department, Stockholm University, Sweden  
Oct 01 to Sep 03.

#### **PPARC Postdoctoral Fellow**

Astronomy Unit, Queen Mary University of London, UK  
Oct 98 to Sep 01.

### EDUCATION

#### **DPhil Astronomy**

Astronomy Centre, University of Sussex, UK  
Oct 95 to Sep 98  
Thesis title: 'Constraining models of the early Universe: inflation, primordial black holes and cosmic strings'

## **BA Physics** (1st class)

Physics department, University of Oxford, UK

Oct 92 to Jun 95

Placed 3rd in year of  $\sim 175$  students. Awarded Johnson memorial essay prize and Worcester college science prize.

## RESEARCH INTERESTS

Astroparticle physics and early Universe cosmology, including dark matter, primordial black holes, inflation and dark energy.

Currently my main focus is dark matter. I'm particularly interested in the signals expected in WIMP and axion detection experiments and what we can learn about the properties of dark matter. I also have a long standing interest in Primordial Black Holes as a probe of the physics of the early Universe, in particular models of inflation.

## GRANTS

### **CoI STFC Particle Physics consolidated grants**

'Physics of the early and late Universe'

most recent award 2020-2023, value  $\sim \pounds 915k$ .

### **Leverhulme Trust Research Project Grant**

'Towards unambiguous dark matter detection and characterisation'

awarded 11, value,  $\sim \pounds 127k$ .

### **Host for Adam Christopherson's Royal Astronomical Society, Sir Norman Lockyer Fellowship**

awarded 11, value  $\sim \pounds 120k$ .

### **CoI PPARC Particle Physics special project grant**

'Particle Physics and cosmology confronting experiment', University of Sheffield

awarded 04.

### **CoI PPARC Astronomy rolling grant**

'Astrophysics and cosmology at the University of Sussex', University of Sussex

awarded 03.

### **PPARC/STFC 5 year Advanced Fellowship**

'Dark matter detection as a probe of galactic structure and fundamental physics'

awarded 03, value,  $\sim \pounds 180k$ .

### **PPARC 3 year Postdoctoral Fellowship**

awarded 98, value,  $\sim \pounds 85k$ .

## INVITED TALKS (SINCE JAN 07)

- Review talk on 'Primordial black holes as a dark matter candidate' at Invisibles workshop, Jun 19, Valencia, Spain.
- Talk on 'Microlensing constraints on primordial black hole dark matter', at Solvay workshop on 'The dark side of black holes', Apr 19, Brussels, Belgium.
- Review talk on 'Astrophysical constraints on dark matter', at 'International workshop on dark matter and stars', Dec 18, Lisbon, Portugal.

- Review talk on ‘Impact of astrophysical uncertainties on dark matter direct detection’ at ‘Preparing for dark matter particle discovery’, Jun 18, Gothenberg, Sweden.
- Review talk on ‘Are Primordial Black Holes a viable CDM candidate?’ at ‘Dark matter detection and detectability: paradigm confirmation or shift’, May 18 KITP, US.
- Review talk on ‘Primordial black holes as a dark matter candidate’ at UCLA Dark Matter 2018, Feb 18 Los Angeles, US.
- Review talk on ‘Alternatives to WIMPs: primordial black holes and axions’ at The Future of Dark Matter, May 17, Chicheley Hall.
- Review talk on ‘Primordial black hole microlensing constraints’ at ‘The vacuum of the Universe: from cosmology to particle physics’, Jan 17, Barcelona, Spain.
- Review talk on ‘Primordial black holes as dark matter’ at ‘Dark Matter from aeV to ZeV 3rd IBS-Multi Dark-IPP Workshop’, Nov 16, Durham.
- Talk on ‘Impact of astrophysical uncertainties on WIMP direct detection’ at ‘Interpretation for Direct Detection’ workshop, Aug 16. Oxford.
- Review talk on ‘Understanding the nature of WIMPs through DM direct detection’ at Bethe Form program ‘Dark matter beyond supersymmetry’, Jun 16. Bonn, Germany.
- Review talk on ‘Cosmology’ at IOP joint annual HEPP and APP conference, Mar 16, Brighton.
- Talk on ‘Directional dark matter detection’ at 2nd Institute for Basic Science-MultiDark joint workshop on Dark Matter, Nov 15, Madrid, Spain.
- Review talk on ‘Detecting dark matter’ at Royal Society-Institute for Basic Science (South Korea) bilateral meeting, Sep 15, Chicheley Hall.
- Talk on ‘Parameterising the WIMP speed distribution for direct (& indirect) detection experiments’ at ‘What is dark matter?’ workshop, May 14, Stockholm, Sweden.
- Review talk on ‘Galactic DM distributions and their impact on direct DM searches’ at Invisibles 13, July 13, Durham.
- Talk on ‘Parametrizing and probing the WIMP velocity distribution’ at ‘Identifying and Characterizing Dark Matter via Multiple Probes’ workshop, May 13, KITP, US.
- Opening review talk on ‘Particle dark matter: why and what’ in Dark matter focus session, at Dutch FOM meeting, Jan 13, Veldhoven, Netherlands (Dutch equivalent of APS meeting, 1700 participants).
- Review talk on ‘The status of the search for dark matter’, at ‘Final colloquium, international research training group, quantum fields and strongly interacting matter’, Sep 12, Bielefeld, Germany.
- Opening review talk on ‘Overview of dark matter’, at ‘New paths to particle dark matter’, Mar 12, Oxford.
- Review talk on ‘The search for dark matter’, at UK-CTA collaboration meeting, Mar 12, Oxford.
- Review talk on ‘The dark matter distribution on galactic and smaller scales’, at ‘Symmetries and phases in the Universe’ symposium, Feb 12, Irsee, Germany.

- Review talk on ‘Dark matter searches and astrophysical uncertainties’, at ‘Workshop on High Energy Physics Phenomenology XII’, Jan 12, Mahabaleshwar, India.
- Review talk on ‘Astrophysical uncertainties on dark matter direct detection results’, at ‘Dark matter underground and in the heavens’ workshop, Jul 11, CERN.
- Review talk on ‘Primordial black hole formation’, at ‘Black holes in a violent Universe’, Apr 11, Bologna, Italy.
- Review talk on ‘The search for dark matter’, at IOP Nuclear and Particle Physics Division Conference, Apr 11, Glasgow, UK.
- Review talk on ‘Effect of astrophysical uncertainties on extracting information about WIMP properties from direct detection experiments’, at ‘Dark matter in the LHC era: direct and indirect searches’, Jan 11, Kolkata, India.
- Talk on ‘Astrophysical uncertainties in dark matter searches’, at ‘Dark matter all around’, Dec 10, Paris, France.
- Review talk on ‘The particle physics of dark matter’, at ‘The future of gamma-ray astronomy and the CTA’, Oct 10, Leicester, UK.
- Review talk on ‘The search for dark matter’, at ‘Cosmic Enigma Symposium’, Jun 10, London, UK.
- Review talk on ‘Extracting information about WIMP properties from direct detection experiments: astrophysical uncertainties’, at Moriond Electroweak physics, Mar 10, La Thuile, Italy.
- Review talk on ‘Search for dark matter’ at ‘The TeV Universe’, Jan 10, Liverpool, UK.
- Review talk on ‘Dark matter: a status report’ at ‘Fundamental Physics UK’, Nov 09, Cambridge, UK.
- Opening review talk on ‘Optimising directional detectors at ‘CYGNUS 2009, Directional dark matter detection’, Jul 09, MIT, US (chaired writing of theory section of directional detection white paper).
- Talk on ‘WIMP direct detection and the ultra-local dark matter distribution’ at ‘Astroparticle physics’ workshop, Apr 09, NORDITA, Sweden.
- Plenary review talk on ‘Dark matter’ at ‘Cosmology for the next generation’, Jan 09, Los Cabos, Mexico (organised by Berkely/Munich).
- Talk on ‘Determining the WIMP mass from direct detection experiments’ at ‘TeV scale physics and dark matter’ workshop, Jun 08, NORDITA, Sweden.
- Review talk on ‘A review of i) the theoretical input into small scale structure formation ii) what direct detection experiments need to know’ at ‘Small scale structure of dark matter’, Jun 08, Perimeter Institute, Canada.
- Talk on ‘Determining the WIMP mass from direct detection experiments’ at ‘Dark side of the Universe II’ workshop, May 08, Michigan Centre for Theoretical Physics, US.
- Review talk on ‘Dark Matter’ at Royal Society India-UK ‘Frontiers of Science Symposium’, Mar 08, Hyderabad, India (one of three speakers in cosmology session, one of eight sessions spanning the whole of science).

- Review talk on ‘Direct detection and the dark matter distribution’ at IOP-RAS meeting ‘The search for dark matter’, Nov 07, London, UK.
- Plenary review talk on ‘The dark matter distribution on small scales’ at ‘TeV Particle Astrophysics’, Aug 07, Venice, Italy.
- Opening review talk on ‘How to detector capabilities affect the number of events required to detect a directional WIMP signal?’ at ‘CYGNUS 2007, First workshop on directional detection’, Jul 07, Boulby, UK.
- Talk on ‘Determining the WIMP mass’ at ‘The hunt for dark matter’, May 07, Fermilab, US.

LECTURES AT  
SCIENTIFIC  
SCHOOLS

- Lecture on ‘Primordial black holes’ at Invisibles school, CanFranc Lab, Spain, Jun 19.
- Lectures on ‘Primordial black holes as a dark matter candidate’ at UCLA Advanced Training Institute, Los Angeles, US Feb 18.
- Lectures on ‘Dark matter’ at Passo del Tonale Winter School, Italy, Dec 13.
- Masterclass on ‘Dark matter’ at Dutch FOM meeting, Veldhoven, Netherlands, Jan 13.
- Three one hour lectures on ‘Dark matter detection’ at ‘Block course on cosmology’, Bielefeld, Germany, Sep 09.
- Two one hour lectures on ‘The dark matter distribution in the Milky Way’, at ‘Searching for dark matter’ workshop, Les Houches, France, Mar 09.
- Three one hour lectures on ‘Dark matter’, at ‘20th Nordic Particle Physics meeting’, Spaatind, Norway, Jan 08.

SEMINARS (SINCE  
JAN 07)

**UK:**

*Astronomy:* Edinburgh, MSSL (x2), QMUL (x2), Leicester, Glasgow, Sussex, Cambridge, Southampton, Sheffield, Imperial (x2), Oxford, Portsmouth, Cardiff  
*Particle Physics:* Warwick, Oxford (x2), Leeds, Southampton, Kings, Birmingham, RHUL, Imperial, DAMTP, Liverpool.

**International:**

Perimeter Institutite, Canada; NORDITA, Sweden; Katowice, Poland; NIKHEF, Netherlands; Nils Bohr Institute, Denmark; Munich, Germany; Montpellier, France; CERN; MPIK Heidelberg, Germany; Prague, Czech Republic.

PHD STUDENTS

**Emily Tyler**

‘Non-WIMPy dark matter’  
expected submission 21

**Finlay Noble Chamings** (co-supervisor with Dr. Tasos Avgoustidis and Prof. Ed Copeland)

‘Cosmological aspects of coupled quintessence’  
Oct 15 to Sep 19

**Ciaran O'Hare**

'Detecting WIMPs, neutrinos and axions in the next generation of dark matter experiment'

Oct 13 to Mar 17

postdoc in Zaragoza 17-19, postdoc in Sydney 19-

**Bradley Kavanagh**

'Confronting astrophysics uncertainties in the direct detection of dark matter'

Oct 11 to Aug 14

Awarded IOP Astroparticle Physics thesis prize

postdoc at LPTHE Paris 14-17, postdoc at GRAPPA Amsterdam 17-19, postdoc in Santander 19-

**Sophie Morris** (co-supervisor with Dr. Tony Padilla)

'Cosmological effects of coupled dark matter'

Oct 10 to Aug 14

**Ewan Tarrant** (co-supervisor with Prof. Ed Copeland)

'Dark energy'

Oct 09 to Jul 13

postdoc at University of Sussex, 13-15

**Amandeep Josan**

'Constraints on the power spectrum of primordial perturbations from small-scale structure'

Oct 06 to Sep 10

**Daniele Fantin** (co-supervisor with Prof. Mike Merrifield)

'The ultra-fine dark matter distribution'

Oct 06 to Aug 10

postdoc in Venezuela, 10-13

I also worked closely with Ben Morgan, formerly an experimental particle physics PhD student at the University of Sheffield, supervised by Prof. Neil Spooner, now a Research Fellow in the particle physics group at the University of Warwick.

PHD  
EXAMINATIONS

1. Reviewer and member of committee for Martin Stref, 'Dark matter on the Galactic scale: from particle physics and cosmology to local properties', University of Montpellier, Sep 18.
2. Internal examiner for James Stevenson, 'On the detection of dynamically screened scalar fields using atom interferometry', May 17.
3. External examiner for Alexander Leithes, 'Perturbations in Lemaitre-Tolman-Bondi and assisted coupled quintessence cosmologies', Queen Mary University of London, Dec 16.
4. External examiner for Ryan Wilkinson, 'Deciphering dark matter with cosmological observations', Durham University, Jul 16.
5. External examiner for Samuel Young, 'Constraining the early Universe with primordial black holes', University of Sussex, May 16.

6. External examiner for Ernestas Pukartas, ‘Dark matter, inflation and baryogenesis in supersymmetric extensions of the standard model’, Lancaster University, Apr 15.
7. Member of jury for Miguel Peiro, ‘A complementary approach for the identification of dark matter’, University of Milan, Jul 14.
8. Member of jury for Julien Billard, ‘Directional detection of dark matter’, University of Grenoble, Jun 12.
9. Chair of jury for Laurindo Sobrinho, ‘The possibility of primordial black hole direct detection, University of Maderia, Jun 11.
10. External examiner for Carlos Hidalgo, ‘Primordial black holes in non-linear perturbation theory’, Queen Mary, University of London, Apr 09.
11. Internal examiner for Maryam Shaeri, ‘Super-inflation and perturbations in LQC and scaling solutions in curved FRW universes’, Oct 09.
12. Internal examiner for Mitsuo Tsumagari, ‘Physics of Q-balls’, Aug 09.
13. Internal examiner for Chris Short, ‘Large-scale structure formation: a wave-mechanical perspective’, Oct 07.

PUBLICATIONS  
SUMMARY

(discounting CTA consortium publications) I have 60 refereed publications (22 as sole or main author) in high-quality refereed journals, with more than 3000 total citations. My h-cite is 34 and I have seven publications with more than 100 citations and another eighteen with more than 50.

REFEREED  
PUBLICATIONS  
[SPIRES-HEP  
CITATIONS AS OF  
FEB 20]

1. Understanding the suppression of structure formation from dark matter-dark energy coupling, Finlay Noble Chamings, Anastasios Avgoustidis, Edmund J. Copeland, Anne M. Green, Alkistis Pourtsidou, Phys. Rev. D101 043531 (2000) [2]
2. ‘Early dark energy constraints on growing neutrino quintessence cosmologies’, Finlay Noble Chamings, Anastasios Avgoustidis, Edmund J. Copeland, Anne M. Green, Baojiu Li, Phys. Rev. D100 043525 (2019)
3. ‘Pitfalls of a power-law parameterization of the primordial power spectrum for Primordial Black Hole formation’, Anne M. Green, Phys. Rev. D98 023529 (8 pages) (2018) [4]
4. ‘Time-integrated directional detection of dark matter’, Ciaran A. J. O’Hare, Bradley J. Kavanagh and Anne M. Green, Phys. Rev. D96 083011 (15 pages) (2017) [8]
5. ‘Astrophysical uncertainties on stellar microlensing constraints on multi-Solar mass primordial black hole dark matter’, Anne M. Green, Phys. Rev. D96, 043020 (6 pages) (2017) [31]
6. ‘Astrophysical uncertainties on the dark matter distribution and direct detection experiments’, Anne M. Green, J. Phys. G44 084001(13 pages) (2017) [37]. Chosen as a Journal ‘Highlight of 2017’.
7. ‘Axion astronomy with microwave cavity experiments’, Ciaran A. J. O’Hare and Anne M. Green, Phys. Rev. D95 063017 (16 pages) (2017) [26]

8. ‘Microlensing and dynamical constraints on primordial black hole dark matter with an extended mass function’, Anne M. Green, *Phys. Rev. D* 94, 063530 (6 pages) (2016) [96]
9. ‘How to calculate dark matter direct detection exclusion limits that are consistent with gamma rays from annihilation in the Milky Way halo’, David G. Cerdeno, Mattia Fornasa, Anne M. Green and Miguel Peiro, *Phys. Rev. D* 94 043516 (11 pages) (2016) [9]
10. ‘A review of the discovery reach of directional dark matter detection’, Frederic Mayet, Anne M. Green et al., *Physics Reports* 627 1-49 (2016) [99]
11. ‘Readout strategies for directional dark matter detection beyond the neutrino background’, Ciaran A. J. O’Hare, Anne M. Green, Julien Billard, Encetali Figueroa-Feliciano, Louis E. Strigari, *Phys. Rev. D* 92 063518 (2015) (16 pages) [38]
12. ‘Probing WIMP particle physics and astrophysics with direct detection and neutrino telescope data’, Bradley J. Kavanagh, Mattia Fornasa and Anne M. Green, *Phys. Rev. D* 91 103533 (2015) (24 pages) [26]
13. ‘Cosmic microwave background constraints on coupled dark matter’, Sophie C. F. Morris and Anne M. Green, *Phys. Lett. B* 741 (2015) 51-54 [3]
14. ‘Directional detection of dark matter streams’, Ciaran A. J. O’Hare and Anne M. Green, *Phys. Rev. D* 90 123511 (2014) (18 pages) [32]
15. ‘WIMP physics with ensembles of direct-detection experiments’, Annika H. G. Peter, Vera Gluscevic, Anne M. Green, Bradley J. Kavanagh and Samuel K. Lee, *Physics of the Dark Universe* 5-6 (2014) 45-74 [75]
16. ‘A self-consistent phase-space distribution function for the anisotropic Dark Matter halo of the Milky Way’, Mattia Fornasa and Anne M. Green, *Phys. Rev. D* 89 063531 (2014) (18 pages) [38]
17. ‘Cosmological effects of coupled dark matter’, Sophie C. F. Morris, Anne M. Green, Antonio Padilla and Ewan R. M. Tarrant, *Phys. Rev. D* 88, 083522 (2013) (8 pages) [7]
18. ‘Model independent determination of the dark matter mass from direct detection experiments’, Bradley J. Kavanagh and Anne M. Green, *Phys. Rev. Lett.* 111, 031302 (2013) (5 pages) [49]
19. ‘The effect of curvaton decay on the primordial power spectrum’, Hassan Firouzjahi, Anne M. Green, Karim Mailk and Moslem Zarei, *Phys. Rev. D* 87, 103502 (2013) (11 pages) [4]
20. ‘Probing light WIMPs with directional detection experiments’, Ben Morgan and Anne M. Green, *Phys. Rev. D* 86, 083544 (2012) (9 pages) [3]
21. ‘Improved determination of the WIMP mass from direct detection data’, Bradley J. Kavanagh and Anne M. Green, *Phys. Rev. D* 86, 065027 (2012) (15 pages) [35]
22. ‘Primordial black holes as a tool for constraining non-Gaussianity’, Christian T. Byrnes, Edmund J. Copeland and Anne M. Green, *Phys. Rev. D* 86, 043512 (2012) (9 pages) [70]
23. ‘Astrophysical uncertainties on direct detection experiments’, Anne M. Green, *Mod. Phys. Lett. A* 27 1230004 (2012) (20 pages) [114]

24. ‘Coupled quintessence and the halo mass function’, Ewan R. M. Tarrant, Carsten van de Bruck, Edmund J. Copeland, and Anne M. Green, *Phys. Rev. D* **85**, 023503 (2012) (19 pages) [31]
25. ‘Ultra-fine dark matter structure in the solar neighbourhood’, Daniele S. M. Fantin, Anne M. Green and Michael R. Merrifield, *Mon. Not. Roy. Astron. Soc.* **418**, 2648-2655 (2011) [8]
26. ‘Dependence of direct detection signals on the WIMP velocity distribution’, Anne M. Green, *JCAP*10(2010)034 (23 pages) [84]
27. ‘Gamma-rays from ultracompact minihalos: potential constraints on the primordial curvature perturbation’, Amandeep S. Josan and Anne M. Green, *Phys. Rev. D* **82** 083527 (2010) (5 pages) [46]
28. ‘Constraints from primordial black hole formation at the end of inflation’, Amandeep S. Josan and Anne M. Green, *Phys. Rev. D* **82** 047303 (2010) (4 pages) [20]
29. ‘The median recoil direction as a WIMP directional detection signal’, Anne M. Green and Ben Morgan, *Phys. Rev. D* **81** 061301(R) (2010) (4 pages) [40]
30. ‘The case for a directional dark matter detector and the status of current experimental efforts’, S. Ahlen et al., *Int. J. Mod. Phys.* **25** 1-51 (2010) [176]
31. ‘Generalized constraints on the curvature perturbation from Primordial Black Holes’, Amandeep S. Josan, Anne M. Green and Karim A. Malik, *Phys. Rev. D* **79**, 103520 (2009) (10 pages) [136]
32. ‘Modelling ultra-fine structure in dark matter halos’, Daniele S. M. Fantin, Michael R. Merrifield and Anne M. Green, *Mon. Not. Roy. Astron. Soc.* **390**, 1055-1060 (2008) [8]
33. ‘Determining the WIMP mass from a single direct detection experiment, a more detailed study’, Anne M. Green, *JCAP* 0807:005 (2008) (20 pages) [74]
34. ‘Consequences of statistical sense determination for WIMP direct detection experiments’, Anne M. Green and Ben Morgan, *Phys. Rev. D* **77** 027303 (2008) (4 pages) [24]
35. ‘Determining the WIMP mass using direct detection experiments’, Anne M. Green, *JCAP* 0708:022 (2007) (19 pages) [78]
36. ‘Constraints on the primordial curvature perturbation from primordial black holes’, Ignacio Zaballa, Anne M. Green, Karim A. Malik and Misao Sasaki, *JCAP* 0703:010 (2007) (11 pages) [41]
37. ‘Optimizing WIMP directional detectors’, Anne M. Green and Ben Morgan, *Astropart. Phys.* **27**, 142-149 (2007) [76]
38. ‘On mini-halos encounters with stars’, Anne M. Green and Simon P. Goodwin, *Mon. Not. Roy. Astron. Soc.* **375** 1111-1120 (2007) [52]
39. ‘Small scale structure formation in chameleon cosmology’, Philippe Brax, Carsten van de Bruck, Anne-Christine Davis and Anne M. Green, *Phys. Lett. B* **633**, 441-446, (2006) [64]
40. ‘Directional statistics for WIMP direct detection II: 2d read-out’, Ben Morgan, and Anne M. Green, *Phys. Rev. D* **72** 123501 (2005) (10 pages) [43]

41. ‘The first WIMPy halos’, Anne M. Green, Stefan Hofmann and Dominik J, Schwarz, JCAP 0508:003 (2005) (33 pages) [238]
42. ‘Directional statistics for WIMP direct detection’, Ben Morgan, Anne M. Green and Neil Spooner, Phys. Rev. D71 103507 (2005) (14 pages) [128]
43. ‘A new calculation of the mass fraction of primordial black holes’, Anne M. Green, Andrew R. Liddle, Karim A. Malik and Misao Sasaki, Phys. Rev. D70 041502 (2004) (5 pages) [89]
44. ‘The power spectrum of SUSY-CDM on sub-galactic scales’, Anne M. Green, Stefan Hofmann and Dominik J, Schwarz, Mon. Not. Roy. Astron. Soc. 353 L23-27 (2004) [189]
45. ‘Effect of realistic astrophysical inputs on the phase and shape of the WIMP annual modulation signal’, Anne M. Green, Phys. Rev. D68 023004 (2003) (11 pages) [83]
46. ‘Are there MACHOs in the Milky Way halo?’, Anne M. Green and Karsten Jedamzik, Astron. Astrophys, 395, 31-35 (2002) [11]
47. ‘Effect of halo modeling on WIMP exclusion limits’, Anne M. Green, Phys. Rev. D66 083003 (2002) (9 pages) [93]
48. ‘Dynamics of a large extra dimension inspired hybrid inflation model’, Anne M. Green and Anupam Mazumdar, Phys. Rev. D65 105022 (2002) (9 pages) [51]
49. ‘Viability of primordial black holes as short period gamma-ray bursts’, Anne M. Green, Phys. Rev. D65 027301 (2002) (5 pages) [14]
50. ‘Calculating exclusion limits for WIMP direct detection experiments without background subtraction’, Anne M. Green, Phys. Rev. D65 023501 (2002) (6 pages) [16]
51. ‘A potential WIMP signature for the caustic ring halo model’, Anne M. Green, Phys. Rev. D63 043005 (2001) (6 pages) [35]
52. ‘Primordial black hole formation due to preheating’, Anne M. Green and Karim A. Malik, Phys. Rev. D64 021301 (2001) (4 pages) [67]
53. ‘The WIMP annual modulation signal and nonstandard halo models’, Anne M. Green, Phys. Rev. D63 043005 (2001) (8 pages) [59]
54. ‘Generalized compactification and assisted dynamics of multi-scalar field cosmologies’, Anne M. Green and James. E. Lidsey, Phys. Rev. D61 067301 (2000) (4 pages) [46]
55. ‘Probing the mass function of halo dark matter via microlensing’, Anne M. Green, Astrophys. J. 527 708-719 (2000) [10]
56. ‘Supersymmetry and primordial black hole abundance constraints’, Anne M. Green, Phys. Rev. D60 063516 (1999) (8 pages) [34]
57. ‘Critical collapse and the primordial black hole initial mass function’, Anne M. Green and Andrew R. Liddle, Phys. Rev. D60 063509 (1999) (8 pages) [56]
58. ‘Primordial black constraints in cosmologies with early matter domination’, Anne M. Green, Andrew R. Liddle and Antonio Riotto, Phys. Rev. D56 7559-7565 (1997) [21]

59. ‘Constraints on the density perturbation spectrum from primordial black holes’, Anne M. Green and Andrew R. Liddle, Phys. Rev. D56 6166-6174 (1997) [174]
60. ‘Open inflationary universes in the induced gravity theory’, Anne M. Green and Andrew R. Liddle, Phys. Rev. D55 609-617 (1997) [30]
61. ‘Conditions for successful extended inflation’, Anne M. Green and Andrew R. Liddle, Phys. Rev. D54 2557-2563 (1996) [27]

SUBMITTED  
PUBLICATIONS

1. ‘Constraints on the cosmic string loop collapse fraction from Primordial Black Holes’, Chloe James-Turner, Danton P. B. Weil, Anne M. Green and Edmund J. Copeland, arXiv:1911.12658 [1]

CTA CONSORTIUM  
PUBLICATIONS

1. ‘Introducing the CTA concept’, CTA consortium collaboration (B. S. Acharya et al.) Astropart. Phys. 43 3-18 (2013) [26]
2. ‘Design concepts for the Cherenkov Telescope Array CTA: an advanced facility for ground-based high-energy gamma-ray astronomy’, CTA consortium collaboration (M. Actis et al.), Exper. Astron. 32 193-316 (2011) [776]

BOOK CHAPTERS

1. ‘Primordial Black Holes: sirens of the early Universe’, Anne M. Green in ‘Quantum aspects of Black Holes’, Springer (2014) [35]
2. ‘Direct detection of WIMPs’, David. G. Cerdeno and Anne M. Green in ‘Particle Dark Matter’, Cambridge University Press (2010) [92]

OTHER  
PUBLICATIONS

1. ‘Dark Matter: star sign’, Anne M. Green, Nature Physics 7 926 (2011)

TEACHING

**3rd year Introduction to cosmology module**

11 to date.

Excellent student feedback scores ranging from 1.1 to 1.6.

*selected comments:* “great lecture style, able communicator, very open to questions”

“one of the best lecturers I’ve had- or teachers for that matter- carry on!”

“clear logical evolution of subject matter, always asking for and willing to answer questions.”

“Brilliant lecturer. Explains everything well and her enthusiasm makes learning much more enjoyable.

“good notes on board and always ready to answer questions, also good resources on moodle.”

“very clear, concise lectures, very good communicator, very approachable. Good speed, does not rush.”

“very approachable, always very willing to help, good layout of the maths.”

“all resources are easily accessible, lecturer is enthusiastic and is happy to answer questions.”

“she goes through each derivation carefully and not too fast. Speaks very clearly and loudly and shows enthusiasm to keep us interested. Gives lots of worked examples to practice during

the course.”

“Very approachable for questions (no question seems too silly)”

### **2nd year Wave Phenomena module**

Convenor new core module, 09-17.

Excellent student feedback, scores ranging from 1.2 to 1.7, on a scale running from 1(high) to 5.

*selected comments:* “able to balance quantitative and qualitative explanations of the subject rather than making it too hand-wavy or getting us lost in the maths”

“there was a goal with each lecture, a point for doing the maths and calculations unlike other lecturers who write endless maths with no physical explanations”

“lectures were clear and aims stated well- is easily approachable and quick to reply to any questions or problems via e-mail”

“overall great teaching, taught very well, one of best teaching styles across course”

“is in the top few of most helpful enthusiastic and approachable lecturers”

“listens to and encourages feedback and makes students feel important/valued”

“she cares about giving good lectures, puts a lot of effort in and it really shows”

“friendly and passionate about the subject and conveyed the content very well”

“notes very very well ordered and clear, presents the lecture in a fantastic and interesting way, the working through the key derivation points is brilliant, all round brilliant lecturer”

### **4th year synoptic Image Processing module**

Convenor 08-10, member of teaching team 05-07.

09 student feedback, scores ranging from 1.5 to 1.9.

**1st year year leader** 14-19. Duties included organising induction week, attendance monitoring and moderating exam papers.

**3rd and 4th year projects** Supervisor of up to 5 projects annually, 05-.

**1st and 2nd year tutorials** 05-.

## OUTREACH

### **Radio**

Interview on Rony Robinson show Radio Sheffield, 17.

Guest on [Radio 4 In Our Time](#) episode on Dark Matter, 15.

Guest on [University Radio Nottingham Science Show](#), 12.

### **Public lectures**

‘The search for dark matter’, New Scientist Instant Expert, London, Apr 19.

‘Dark matter: the unusual suspects’, Sheffield, Mar 18.

Women in Science seminar, Nottingham Nov 17.

‘Dark matter: the unusual suspects’, Nottingham, Oct 17.

‘WIMP hunting: the search for dark matter’, Derby, May 15.

‘WIMP hunting: the search for dark matter’, Portsmouth, Feb 14.

‘The search for dark matter’, Nottingham, Oct 13.

‘Dark matter’, workshop for science writers at NORDITA, Stockholm, Sweden, May 13.

‘WIMP hunting: the search for dark matter’, Sheffield, Mar 12.

‘WIMP hunting: the search for dark matter’, Liverpool, May 10.

‘WIMP hunting: the search for dark matter’, Nottingham, Mar 10.

‘Non-collider searches for dark matter’ at session for school teachers at European Physical Society, High Energy Physics meeting, Krakow, Poland, Jul 09.

‘The Large Hadron Collider and the search for dark matter’, Helsinki, Finland, Nov 08.

'The Large Hadron Collider and the search for dark matter', Stockholm, Sweden, Jun 08.

### **Quotes in press**

[New Scientist article on primordial black holes](#), 19.

[Inside Science article on dark matter](#), 18.

[APS Physics article on Primordial Black Holes as a dark matter candidate](#), 18.

[New Scientist article on dark matter](#), 15.

[BBC Earth web-site article on dark matter](#), 15.

[BBC news story on dark matter](#), 13.

[Astronomy Now magazine article on primordial black holes](#), 11.

[Cosmos magazine article on dark matter](#), 10.

### **Videos**

Participant in [TestTube project](#), 07-08:

[Meet Anne](#),

[Anne's office](#),

[Lab in a Lorry](#),

[Purple bean bag](#).

### **Sutton Trust Summer School**

Ran astronomy/particle physics session, 13-15.

### **Widening participation masterclasses**

Ran particle physics masterclass as part of 'Seeing the unseeable' program, annually 08-15, and as part of Natural Sciences taster day, 12.

### **Masterclasses**

Organised new masterclass program, including two Autumn masterclasses for sixth formers annually 07-13, and National Particle Physics Masterclass at Nottingham, annually 08-13.

### **Exploring physics sixth form conference**

Organised annually 08-13. Liaised with external organisers, Workshop UK, regarding advertising and speakers. Organise computing practical session and post-conference tour, including co-ordinating research and technical staff and student volunteers. 200+ participants.

**Schools talks** several annually (locally and nationally), including talk at Nottingham University Samworth Academy as part of Hanby and Barrett performance project.

**Astronomy society talks** several annually.

**I'm a scientist** participant, Nov 18; Particle Physics Subject Knowledge Zone, Nov 19.

**Lab in a Lorry** demonstrator, 07 and 08.

ACADEMIC  
SERVICE

**ApPEC Dark Matter committee** member, 20.

**Academy of Finland, Particle and Nuclear physics and Cosmology research project review panel** member, 15, 16 & 19.

**Netherlands Organisation for Scientific Research (NWO), astroparticle physics programme jury member, 14.**

**NASA Hubble Fellowship Programme panel, member.**

**STFC, Dark Matter strategic review panel member, 19-20.**

**STFC, Particle Physics grants panel member, 14-17 (declined 2nd term).**

**STFC, Particle Astrophysics advisory panel member, 12-15.**

**STFC, Education Training and Careers Committee member, 10-12.**

**STFC, Fellowship sifting panel chair of Particle Astrophysics and Cosmology sub-panel 11/12, member, 10/11, 17/18 & 18/19.**

**EPSRC Mathematical Science Infrastructure Panel, 17.**

**Journal editor Journal of Cosmology and Astroparticle Physics, 06-.**

**Conference international advisory committees CYGNUS 07-, IDM 08-.**

**Referee (grants)**

**Finland:** Academy of Finland

**Italy:** CINECA, VQR

**Netherlands:** NWO, FOM

**UK:** STFC (astronomy consolidated grants, astronomy & particle physics fellowship applications), Royal Society

**US:** NSF

**Referee (journals) numerous, including PRL, PRD, JCAP, PLB, MNRAS, A&A, ApJ.**

**University of Nottingham REF Environment Operations Group member 17-.**

**Departmental REF environment co-ordinator 17- responsible for writing departmental Environment template for REF2021.**

**Departmental teaching committee member 15-18.**

**Departmental teaching operations group member 15-18, fortnightly meetings during term-time. Contributed to writing IOP accreditation paperwork 16.**

**Departmental research operations group member 17-, monthly meetings.**

**Departmental senior management group member 15-.**

**Departmental admissions/outreach committee member, 06-14 and 15-16.**

**Departmental postgraduate committee member, 10-16.**

**MPAGS II co-ordinator working with representatives from Birmingham and Warwick to develop Midlands Physics Alliance Graduate School courses in particle physics**

and astronomy, 10-16.

**IOP Astroparticle Physics Group** founding member and treasurer, 06-10.

**IOP Nuclear and Particle Physics Division** member, 06-10.

**Conference session organisation** astroparticle physics session at National Astronomy Meeting 07.