

# Curriculum Vitae

**Family name, First name:** Mayne, Nathan, **Date of Birth:** 28/12/79

**ORCID:** <https://orcid.org/0000-0001-6707-4563>, **Group URL:** <http://exoclimatology.com/>

**Current Institute:** University of Exeter, College of Engineering, Mathematics and Physical Sciences.

## Academic Career: Summary

The main goal of my current research is both to understand the controlling factors behind the observed diversity of exoplanets (planets orbiting distant stars), and to place them in context with the planets of our solar system. I aim to build interpretive and predictive models (both simple & complex) & develop theories to exploit cutting-edge observations and, crucially, create a two-way knowledge transfer link with scientists studying the Earth's climate.

The research programme I lead is focussed on developing a state-of-the-art theoretical framework to study both gas giant and terrestrial planets, linked, via a *real-time* shared development environment with the internationally recognised UK weather and climate prediction institute the Met Office. My work has been recognised by invitation to present at 7 conferences and deliver 18 seminars. I have solely organised and delivered a ~30 delegate workshop, and sit on the UK Exoplanet Community Meeting SOC. I have been awarded a total of four secondments of staff from the Met Office and resources equivalent to ~£500,000 and over ~£11 Million as PI & Co-I, respectively (gross totals). Finally, my work has enhanced interactions between the astrophysics, and Earth science communities at Exeter, and more widely in the UK. For example, I am currently working on a 'white paper' describing the state of exoplanet modeling in the UK, and an invited review for the journal "Living Reviews in Computational Astrophysics" detailing numerical techniques used in exoplanet atmosphere modeling. I have also contributed important work to the observational and theoretical understanding of stellar evolution.

Throughout my career I have contributed extensively to undergraduate teaching. I am a Fellow of the Higher Education Academy, and have been nominated for a teaching award. I have constructed and co-delivered an astrophysics laboratory module, computing module and practical lab-based module for final year Physics & Astronomy students. I have also led tutorials for final year undergraduates, and led on various 'skills' based courses. Finally, I have supervised 10 undergraduate research projects, and am currently supervising an additional 8. I also oversee all facets of the student experience in our undergraduate first year, as Stage One Coordinator, incl. developing and reviewing module content. In addition to this, I oversee the entirety of our admissions process dealing with applications, interviews, offers etc. as Admissions Tutor.

Finally, I have worked as part of our 'inclusivity committee', within the discipline of Physics and Astronomy, for over 6 years. Within this role I have developed initiatives such as "promotion workshops" for postdoctoral researchers, and co-authored submissions to the Institute of Physics: Juno and Athena Swan gender equality programmes.

## Academic Career: Positions

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Senior Lecturer	Univ. of Exeter	Apr. 2015–Present
Lecturer ( <i>proleptic</i> )	Univ. of Exeter	Jan. 2014–Apr. 2015
Research Fellow ( <i>Supvr:</i> Prof. I. Baraffe)	Univ. of Exeter	Jul. 2011–Jan. 2014
Assoc. Research Fellow ( <i>Supvr:</i> Prof. T. Harries)	Univ. of Exeter	Jul. 2008–Jul. 2011

## Academic Career: Qualifications

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<b>PCAP</b>	Univ. of Exeter	Nov. 2017
Postgraduate Certificate in Academic Practice		
<b>PhD</b>	Univ. of Exeter ( <i>Supvr:</i> Prof. T. Naylor)	Sep. 2004–Jun. 2008
<i>Title: Using colour–magnitude diagrams to study the evolution of young stellar populations</i>		
<b>MPHYS (hons), 1<sup>st</sup> Class</b>	Univ. of Exeter ( <i>Supvr:</i> Prof. W. Barnes)	Sep. 1999–Jun. 2003
<i>Dissertation subject: surface plasmon resonance</i>		
Two Dean's commendations & school prize for outstanding results		
<b>A–Levels</b>	Pool School & Community College	Sep. 1996–Jul. 1998
Mathematics <b>A</b> , Further Mathematics <b>A</b> , Physics <b>A</b> & Chemistry <b>C</b>		

## Research: Funding & Resource Awards

Funded PI Proposals:		Est. Value
2017	<i>Impact fund, IIB and CEMPS (Internal)</i> “Exoplanet Explorer” (visualisation with At-Bristol & Engine House)	~£21 000
2017	<i>Met Office Academic Partnership (MOAP)</i> , two staff one-day-per-week	~£20 000
2016	<i>QR Small equipment fund (Internal)</i> : Atmospheric Modelling Server	~£6 000
2016	<i>Leverhulme Research Project Grant</i> (I. Baraffe, J. Manners, D. Apai) “Examining cloud induced variability in Brown Dwarfs”	~£250 000
2016	<i>Met Office Academic Partnership (MOAP)</i> , two staff one-day-per-week	~£20 000
2016	<i>MOAP</i> , one staff two-days-per-week (6mths)	~£10 000
2015	<i>MOAP</i> , one staff one-day-per-week	~£10 000
2015	<i>Univ. Exeter PhD Studentship (Internal)</i>	~£80 000
2014	<i>MOAP</i> , two staff one-day-per-week	~£20 000
2013	<i>MOAP</i> , two staff one day per week	~£20 000
2011	<i>William Herschel Telescope (WHT)</i> , multi-fibre spectroscopy	~£51 000
Nominal PI Total		~£508 000
Funded Co-I Proposals:		Est. Value
2017	<i>STFC Consolidated Grant</i>	PI: I. Baraffe ~£1 800 000
	<i>Sub project co-I</i>	PI: H. F. Lambert [~£300 000]
	<i>Sub project co-I<sup>1</sup></i>	PI: D. K. Sing [~£300 000]
	<i>Sub project co-I<sup>1</sup></i>	PI: E. Hébrard [~£300 000]
2017	<i>Spitzer</i> 80 hours phase curve, DDT	PI: Dr. T. Evans ~£1 800 000
2017	<i>International Excellence Scholarship (Internal)</i>	PI: M. Rice ( <b>Declined</b> ) [~£131 000]
2017	<i>DiRaC</i> , ~75 million CPU hours	PI: Prof. M. Bate ~£3 000 000
2016	<i>ESO SPHERE</i> , imaging 11 hrs	PI: E. Matthews ~£35 000
2016	<i>ESO FORS2</i> , Large prog., spectroscopy ~13 nght	PI: Dr. N. Nikolov ~£400 000
2016	<i>ESO SPHERE</i> , polarisation 1 night	PI: Dr. S. Hinkley ~£30 000
2016	<i>ESO SPHERE</i> , <i>NACO DDT</i> , imaging 8 hrs	PI: Dr. S. Hinkley ~£25 000
2015	<i>ESO SPHERE</i> , imaging 16 hrs	PI: Dr. S. Hinkley ~£50 000
2015	<i>ESO SPHERE</i> , imaging 16 hrs	PI: Dr. S. Hinkley ~£50 000
2015	<i>Terra Hunting Experiment</i> , ( <b>pending</b> )	PI: Prof. D. Queloz [~£5,000,000]
2015	<i>DiRaC</i> , ~75 million CPU hours	PI: Prof. M. Bate ~£3 000 000
2015	<i>MONSooN</i> , ~320 000 CPU hours/year (rolling)	PI: Prof. P. Palmer ~£14 000
2015	<i>MONSooN</i> , ~160 000 CPU hours/year (rolling)	PI: Dr. J. Manners ~£7 000
2014	<i>ESO SPHERE</i> , imaging 18 hrs	PI: Dr. S. Hinkley ~£55 000
2012	<i>DiRaC</i> , ~26 million CPU hours	PI: Prof. M. Bate ~£1 000 000
2012	<i>Isaac Newton Telescope (INT)</i> , photometry	PI: Prof. T. Naylor ~£25 000
2010	<i>Liverpool Telescope (LT)</i> , photometry	PI: Prof. T. Naylor ~£8 500
2009	<i>Gemini</i> , multi-object spectroscopy	PI: Prof. T. Naylor ~£51 000
2008	<i>WHT</i> , multi-fibre spectroscopy	PI: Prof. T. Harries ~£17 000
2008	<i>WHT</i> , multi-fibre spectroscopy	PI: Prof. T. Naylor ~£51 000
2008	<i>INT</i> , photometry	PI: Prof. T. Naylor ~£30 000
2008	<i>INT</i> , photometry	PI: Prof. T. Naylor ~£5 000
2007	<i>INT</i> , photometry	PI: Prof. T. Naylor ~£30 000
2007	<i>WHT</i> , multi-fibre spectroscopy	PI: Prof. T. Harries ~£17 000
2006	<i>WHT</i> , multi-fibre spectroscopy	PI: Prof. T. Naylor ~£102 000
2005	<i>WHT</i> , multi-fibre spectroscopy	PI: Prof. T. Naylor ~£51 000
2005	<i>Gemini</i> , multi-object spectroscopy	PI: Prof. R. D. Jeffries ~£51 000
Nominal (gross) Co-I Total		~£11 404 500

(1) Unlisted Co-I, but contribution vital, & recognised internally. [] denotes items not in gross totals.

## Research: Publication Metrics (NASA ADS: 15/02/18)

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Refereed Journal Articles: 30 with 789 citations, Primary/Lead author: 15 with 276 citations.

**h factor: 14**

Refereed journal articles published/yr	Notes/Milestones
2007	2
2008	1 (PhD awarded: 16/06/2008)
2009	1
2010	3
2011	2
2012	3
2013	3
2014	4
2015	- (Appointed Senior Lecturer)
2016	3 (Admissions Tutor, Stage 1 Coord. & Ass. Dir. Ed.)
2017	4
2018	- (4 accepted, 2 in review, 1 submitted & 2 in draft)

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## Research: Publications

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### Refereed Publications in Major Journals (reverse date ordered)

- 35 In draft:  
Debras, F.; **Mayne, N.**; Baraffe, I.; Goffrey, T.; & Thuburn, J.  
(abridged) *Algorithm for studying linear instabilities.*
- 34 In draft:  
Debras, F.; **Mayne, N.**; Baraffe, I.; Mourier, P.; Chabrier, G.; Laibbe, G. & Venaille, A.  
*Super rotation on hot Jupiters: robustness of a Matsuno-Gill acceleration*
- 33 Submitted for publication in A&A:  
Lines, S.; A.; Manners, J.; **Mayne, N. J.**; Goyal, J.; Carter, A.; Boutle, I.; Lee, G.; et al.  
(abridged) *Exo-nephology: a transmission spectrum of a simulated cloudy HD 209458b.*
- 32 Under review (minor revisions-resubmitted) for publication in A&A:  
Lines, S.; **Mayne, N. J.**; Boutle, I. A.; Manners, J.; Lee, G.; Helling, Ch.; Drummond, B.; et al.  
*Simulating the cloudy atmospheres of HD 209458b and HD 189733b with the 3D Met Office GCM.*
- 31 Under review (minor revisions-resubmitted) for publication in ApJ Letters:  
Drummond, B.; **Mayne, N. J.**; Manners, J.; Boutle, I. Baraffe, I.; Tremblin, P.; Sing, D. K.; et al.  
(abridged) *Signatures of wind-driven chemistry with a fully consistent 3D model of HD209458b.*
- 30 Accepted for publication in Nature:  
Nikolov, N.; Sing, D.; Fortney, J.; Goyal, J.; Drummond, B.; Evans, T.; et al. incl. **Mayne, N. J.**;  
*A precise sodium abundance for a cloud-free exoplanet.*
- 29 2018arXiv180200378L:  
Lewis, N. T.; Lambert, F. H.; Boutle, .I A.; **Mayne, N. J.**; Manners, J.; Acreman, D. M.  
*The influence of a sub-stellar continent on the climate of a tidally-locked exoplanet.*
- 28 2018arXiv180101045D:  
Drummond, B.; **Mayne, N. J.**; Baraffe, I.; Tremblin, P.; Manners, J.; Amundsen, D. S.; et al.  
(abridged) *The effect of metallicity on the atmospheres of exoplanets.*
- 27 2018MNRAS.474.5158G: **1 citations**  
Goyal, J. M.; **Mayne, N. J.**; Sing, D.; Drummond, B.; Tremblin, P.; Amundsen, D. S.; et al.  
*A library of ATMO forward model transmission spectra for hot Jupiter exoplanets.*
- 26 2017ApJ...841...30T: **10 citations**  
P. Tremblin.; G. Chabrier.; **N. J. Mayne.**; Amundsen, D. S.; I. Baraffe.; F. Debras.; et al..  
(abridged) *Advection of potential temperature in the atmosphere of irradiated exoplanets.*
- 25 2017A&A...604A..79M: **1 citations**

- N. J. Mayne**; F. Debras; I. Baraffe; John Thuburn; David S. Amundsen; David M. Acreman; et al.  
*Results from a set of three-dimensional numerical experiments of a hot Jupiter atmosphere.*
- 24 2017A&A...601A.120B: **9 citations**  
I. A. Boutle.; **Nathan J. Mayne**; Benjamin Drummond; James Manners; Jayesh Goyal; et al.  
*Exploring the climate of Proxima Centauri B with the Met Office Unified Model.*
- 23 2017A&A...598A..97A: **13 citations**  
Amundsen, D. S.; Pascal Tremblin.; James Manners.; Isabelle Baraffe.; & **N. J. Mayne.**  
*(abridged) Treatment of overlapping gaseous absorption with the correlated-k method.*
- 22 2016A&A...595A..36A: **14 citations**  
Amundsen, D. S.; **N. J. Mayne.**; Isabelle Baraffe.; James Manners.; Pascal Tremblin.; et al.  
*(abridged) UK Met Office GCM with a sophisticated radiation scheme applied to HD 209458b*
- 21 2016A&A...594A..69D: **14 citations**  
B. Drummond.; P. Tremblin.; I. Baraffe.; D. S. Amundsen.; **N. J. Mayne.**; O. Venot.; J. Goyal.  
*(abridged) Effects of Consistent Chemical Kinetics on PT profiles & Emission of Hot Jupiters*
- 20 2016MNRAS.460..855H: **15 citations**  
Helling, CH.; Lee, G.; Dobbs-Dixon, I.; **Mayne N.**; Amundsen, D. S.; Khaimova, J.; et al.  
*The mineral clouds on HD 209458b and HD 189733b.*
- 19 2014MNRAS.445.3496B: **21 citations**  
Bell, Cameron P. M.; Rees, Jon M.; Naylor, Tim; **Mayne, N. J.**; et al.  
*Pre-main-sequence isochrones – III. The Cluster Collaboration isochrone server.*
- 18 2014GMD.....7.3059M: **8 citations**  
**Mayne, N. J.**; Baraffe, I.; Acreman, D. M.; Smith, C.; Wood, N.; Skålid Amundsen; et al.  
*Using the UM dynamical cores to reproduce idealised 3-D flows.*
- 17 2014A&A...564A..59A: **40 citations**  
Amundsen, David S.; Baraffe, I; Tremblin, P; Manners, J; Hayek, W; **Mayne, N. J.**; et al.  
*Accuracy tests of radiation schemes used in hot Jupiter global circulation models.*
- 16 2014A&A...561A...1M: **43 citations**  
**Mayne, Nathan J.**; Baraffe, Isabelle; Acreman, David M.; Smith, Chris; et al.  
*(abridged) The unified model, applied to hot Jupiters. ENDGame for a HD 209458b test case.*
- 15 2013MNRAS.434.2438J: **13 citations**  
Jeffries, R. D.; Naylor, Tim; **Mayne, N. J.**; Bell, Cameron P. M.; Littlefair, S. P.  
*A lithium depletion boundary age of 22 Myr for NGC 1960.*
- 14 2013MNRAS.434..966S: **14 citations**  
Sergison, Darryl J.; **Mayne, N. J.**; Naylor, Tim; Jeffries, R. D.; Bell, Cameron P. M.  
*No evidence for intense, cold accretion on to YSOs from measurements of Li in T-Tauri stars.*
- 13 2013MNRAS.434..806B: **116 citations**  
Bell, Cameron P. M.; Naylor, Tim; **Mayne, N. J.**; Jeffries, R. D.; Littlefair, S. P.  
*Pre-main-sequence isochrones - II. Revising star and planet formation time-scales.*
- 12 2012MNRAS.424.3178B: **37 citations**  
Bell, Cameron P. M.; Naylor, Tim; **Mayne, N. J.**; Jeffries, R. D.; Littlefair, S. P.  
*Pre-main-sequence isochrones - I. The Pleiades benchmark.*
- 11 2012ApJ...755...97G: **89 citations**  
Gregory, S. G.; Donati, J.-F.; Morin, J.; Hussain, G. A. J.; **Mayne, N. J.**; et al.  
*(abridged) Can We Predict Global Magnetic Topology of PMS Star from HR Diagram?*
- 10 2012MNRAS.423.1775M: **6 citations**  
**Mayne, N. J.**; Harries, Tim J.; Rowe, John; Acreman, David M.  
*Bayesian fitting of Taurus brown dwarf spectral energy distributions.*
- 9 2011MNRAS.418.1948J: **64 citations**  
Jeffries, R. D.; Littlefair, S. P.; Naylor, Tim; **Mayne, N. J.**  
*No wide spread of stellar ages in the Orion Nebula Cluster.*
- 8 2011MNRAS.413L..56L: **24 citations**

- Littlefair, S. P.; Naylor, Tim; **Mayne, N. J.**; Saunders, Eric; Jeffries, R. D.  
*Accretion-induced luminosity spreads in young clusters: evidence from stellar rotation.*
- 7 2010MNRAS.409.1307M: **9 citations**  
**Mayne, Nathan J.**; Harries, Tim J.  
*On the properties of discs around accreting brown dwarfs.*
- 6 2010MNRAS.408.1409M: **6 citations**  
**Mayne, N. J.**  
*Observational indicators of the transition from fully convective stars to stars with radiative cores.*
- 5 2010MNRAS.403..545L: **24 citations**  
Littlefair, S. P.; Naylor, Tim; **Mayne, N. J.**; Saunders, Eric S.; Jeffries, R. D.  
*Rotation of young stars in Cepheus OB3b.*
- 4 2009MNRAS.397..405S: **6 citations**  
Saunders, Eric S.; Naylor, Tim; **Mayne, Nathan**; Littlefair, S. P.  
*Pre-main-sequence variability across the radiative-convective gap.*
- 3 2008MNRAS.386..261M: **93 citations**  
**Mayne, N. J.**; Naylor, Tim.  
*Fitting the young main sequence; distances, ages and age spreads.*
- 2 2007MNRAS.376..580J: **32 citations**  
Jeffries, R. D.; Oliveira, J. M.; Naylor, Tim; **Mayne, N. J.**; Littlefair, S. P.  
*The Keele-Exeter young cluster survey - I. Low-mass pre-main-sequence stars in NGC 2169.*
- 1 2007MNRAS.375.1220M: **66 citations**  
**Mayne, N. J.**; Naylor, Tim; Littlefair, S. P.; Saunders, Eric S.; Jeffries, R. D.  
*Empirical Isochrones and relative ages for young stars and the radiative-convective gap.*

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**Conference Proceedings (reverse date ordered)**

- 8 2017EGUGA..19.3635B:  
Boutle, Ian; Lines, Stefan; Mayne, Nathan; Lee, Graham; Helling, Christiane; et al.  
*Exoplanet modelling with the Met Office Unified Model*
- 7 2014spih.confE..37T:  
Tremblin, P.; Drummond, B.; Mourier, P.; Amundsen, D.; **Mayne, N.** et al.  
*Modeling UV photo-chemistry and clouds in the atmosphere of exoplanets*
- 6 2014IAUS..302...40G: **5 citations**  
Gregory, S. G.; Donati, J.-F.; Morin, J.; Hussain, G. A. J.; **Mayne, N. J.** et al.  
*Can we predict the magnetic properties of PMS stars from their H-R diagram location?*
- 5 2013EPSC....8...12M:  
**Mayne, N. J.**; Baraffe, I.; Acreman, D. M.; Smith, C.; Amundsen, D. S.  
*(abridged) A critical analysis of standard approximations in modeling exoplanet atmospheres.*
- 4 2013prpl.conf1K018B:  
Bell, Cameron P. M.; Naylor, Tim; **Mayne, N. J.**; Jeffries, R. D.; Littlefair, S. P.  
*Revising Star and Planet Formation Timescales.*
- 3 2013prpl.conf1B076S:  
Sergison, Darryl J.; **Mayne, N. J.**; Naylor, Tim; Jeffries, R. D.; Bell, Cameron P. M.  
*No evidence for intense, cold accretion on to YSOs from measurements of Li in T-Tauri stars.*
- 2 2010HiA....15..763N: **3 citations**  
Naylor, Tim; **Mayne, N. J.**  
*Are pre-MS stars older than we thought?*
- 1 2009IAUS..258..103N: **3 citations**  
Naylor, Tim; **Mayne, N. J.**; Jeffries, R. D.; Littlefair, S. P.; Saunders, Eric S.  
*New methods for determining the ages of PMS stars.*

**Notes:** left column: running total, primary/lead author underlined (in REF unit of assessment), submitted or very close to submission in *italics*. Due to publisher error citations for 2014GMD.....7.3059M incorrectly recorded. Lewis et al., (2018): undergraduate first author.

## Research Impact: Case Studies

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**“Exoplanet Explorer”:** is an effort to produce a computer animated short movie, similar to the “Wanderers” produced by Erik Wernquist which has been viewed almost 6 million times, but featuring exoplanet exploration. I am also working to combine this with a game platform allowing the introduction of elements of our world leading exoplanet research with an in-built measure of the impact we are having. This proposal was assessed by members of the University of Exeter IIB (Innovation, Impact and Business) impact team, and rated as potentially 3\*/4\*, and has been awarded £15 000 from the IIB fund (as well as ~£6 000 contribution from the College of Engineering, Mathematics and Physical Sciences, CEMPS). I am currently working with colleagues across IIB and external organisations (e.g. Engine House, Kalieder, At-Bristol) to realise this.

Current outputs include:

- NASA & Univ. of Exeter press release viewed over 70,000 times in the first week.
- 360° immersive animations of a young Jupiter-type planet, an evaporating hot Jupiter, a view within the cloud deck of a hot Jupiter, a super-Earth waterworld, a lava planet, 55 Cancri e and Trappist 1e (8K) (Trappist 1e (4K))
- A mini-documentary in 360° on exoplanets, viewed ~770,000 times in the first 4 months.

**Outreach:** I am also a key member of the astrophysics group’s outreach focused impact case monitoring the effect of our activities both directly through feedback etc., and indirectly through the higher education access database (HEAT). Recent key contributions I have made to this case are the development of several short concept videos, and the co-creation of a Physics youtube channel. It is anticipated that many of my engagement activities will be included in this case.

## Research Impact: Engagement

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- Talk at National Space Centre, Space Late event, *Jun. 2018*
- Pint of Science talk, Exeter *May. 2018*
- Talk at St Johns International School, Sidmouth *Mar. 2018*
- Promotional video for Centre for Intermedia and Creative Technology (CITC), *Feb. 2018*
- Story in CITC Newsletter, *Feb. 2018*
- Article in University of Exeter Alumni Magazine, *Feb. 2018*
- Physics Progression Programme lecture, Jan. 2018
- Presentation at Withycombe Raleigh CoffE School, Exmouth, Oct. 2017
- Presentation at New Scientist Live! Event, Sep. 2017<sup>1</sup>
- Presentation at Eden Project “Journey into Space” exhibition, Cornwall, Aug. 2017
- Presentation to U3A (University of the Third Age), Exeter, Jul. 2017
- Judge of Ogden Trust Science Essay Competition, Falmouth, Jul. 2017
- Presentation at “Year 7 Space Day” (Exeter College & Surrounding Schools), Exeter, Jun. 2017
- Invited talk at National Student Space Conference, University of Exeter Mar. 2017
- Evening Lecture, Thomas Hardye School Dorchester, Dec. 2016
- Presentation at Kaleider collaborative studio, Nov. 2016
- Presentation at Communication Skills Course, Oct. 2016
- Evening Lecture, Camborne Science and International Academy, Sep. 2016
- Mock Interviews for A-Level Students Sep. 2016
- Short Concept Videos for Astrophysics outreach, Aug. 2016
- Part of team which set up, and contributes to “Physics at Exeter” youtube channel, Aug. 2016
- Presentation and workshop for schools and public, Penryn Campus, Univ. of Exeter, Jul. 2016
- Plymouth Astronomical Society, Feb. 2016.

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<sup>1</sup><https://live.newscientist.com/talks> ~30,000 visitors

- Public Presentation for Stargazing Live! event, Univ. of Exeter, Jan. 2016
- Public Christmas Lecture, Devonport High School for boys (attendance from several school throughout Plymouth), Dec. 2015.
- Stoke Hill Junior School, Nov. 2015.
- Torbay Astronomical Society, Oct. 2015.
- Britain Needs Scientists, Plenary Presentation Jul. 2015, Jul. 2016
- School Physicist of the Year, Presentation Jul. 2015, Jun. 2017
- Pint of Science talk, Exeter May. 2015
- Presentation at Norman Lockyer Observatory, Sidmouth Apr. 2015
- Disney Futures Workshop, Feb. 2015
- Stoke Hill Junior School, Feb. 2015
- Cornwall Amateur Astronomy Society, Mabe, Jan. 2015
- Christmas Lecture, University of Exeter, Dec. 2014
- Presentation to Senior Physics Society, Charterhouse School, Nov. 2014
- Britain Needs Scientists, presentation to A-Level students on research, 2013, 2014.
- TED-style talk for St Luke's Science week, 2014
- Hosted Tavistock school visit, 2013, 2014.
- Talk to home educated, and behavioural problem group, Redruth, 2014.
- Careers in physics at Truro College, 2014, 2015, 2016.
- 3-minute wonder competition at Festival of Science. *invited heat finals:declined.*, 2013
- Presentation to A-Level students on research, 2013
- Presentation to Exwick heights school reach group, 2013
- Presentation at national dark skies reserve, 2013.
- Badminton School, seminar, 2012.
- Cafe Scientifique, Sidmouth, 2012.
- Cornwall Astronomy Society, seminar, Penryn, 2011.
- Astronomy Society, seminar, Callington, 2011.
- Astronomy Society, seminar, Tiverton, 2011.
- Brannell Astronomy Society, seminar, Callington, 2010.
- Open evening, international year of astronomy, organisation & overview presentation, University of Exeter, 2010.
- School visit, seminar & workshop, Uffculme, 2010.
- Open evening, international year of astronomy, organisation & support, Univ. of Exeter, 2009.
- International School, seminar, Dubai, 2009.
- Yeovil College, 'Meet the Scientist', poster & workshop, 2008.

## Education

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- **Fellow of the Higher Education Academy (F-HEA)**, 2017
- Nominated for teaching award, Univ. Exeter 2010

Third year tutorials, 4 groups (1 hr/week each), 20 students (Bsc & Mphys)	2015–2016
Lead teaching assistant: general problem class (lectures & tuition)	2011
Teaching assistant: astrophysics lab (2 <sup>nd</sup> year) (preparation, marking & delivery)	2008
Lead teaching assistant: C-programming lab (preparation, marking & delivery)	2008
Teaching assistant: astrophysics lab (1 <sup>st</sup> year), (marking, delivery)	2007
Lead teaching assistant: practical physics lab (preparation, marking & delivery)	2005–2011
Communication skills course (organisation and lectures)	2004–2016
Pre-University physics course (organisation and/or lectures)	2004–2016

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### Undergraduate Supervision:

#### *Primary Current:*

Jake Eager & David Reichalt	MPhys: Masters Project (Exo)Planet climatology	2018– <u>Jul. 2019</u>
Scott Larcombe, Harry McCrea	MPhys: Masters Project	2016– <u>Jul. 2018</u>

Duncan Lyster & Calum Smith (Exo)Planet climatology

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*Co-supervision Current:*

Stephanie O'Neill & Daniel Gymer NatSci, Masters Project: Earth-Like exoplanets 2018  
*co-supervisor: Dr F. H. Lambert*

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*All Completed:*

Liam Crossling & Dan Barlow NatSci, Masters Project: Early-Mars 2016–2017  
*co-supervisor: Dr F. H. Lamberts*

Nestor Arsenov Summer Studentship: Exoplanets & chemistry 2017  
*co-supervisor: Dr E. Hebrard*

Max Kerslake Summer Studentship: Exoplanets & clouds 2017  
*co-supervisor: Dr S. Lines*

Neil Lewis Summer Studentship: convection in exoplanets 2017  
*co-supervisor: Dr F. H. Lambert*

Neil Lewis\*\* Summer Studentship: convection schemes 2016  
*co-supervisor: Dr F. H. Lambert*

Matthew Read & Lewis Ireland\*\* EPSRC summer students 2013 (8 weeks)  
Brown Dwarfs: radiative transfer

Tom Wilson & Sam Horaib MPhys: ages of young stars 2011–2013  
*co-supervisor: Prof. T. Naylor*

\* & \*\* Article published in JUST (<http://emps.exeter.ac.uk/just/>)

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## Postgraduate Supervision

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*Postdoctoral Current:*

Dr. Stefan Lines Postdoctoral: exoplanet modelling 2016–Apr. 2019  
Clouds in Brown Dwarfs, & gas giants

Dr. Ian Boutle Expert Scientist, Met Office Secondment 2016–present  
Atmospheric modelling: clouds

Dr. James Manners Senior Research Scientist, Met Office Secondment 2013–present  
Atmospheric modelling: radiative transfer

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Dr. Ben Drummond Postdoctoral: exoplanet modelling 2017–Nov. 2018

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*PhD Current:*

Jayesh Goyal PhD: exoplanet modelling 2015–Apr. 2019  
Hot Jupiter atmospheres: synthetic observations  
*co-supervisor: Prof. D. Sing*

Florian Debras PhD: exoplanet modelling 2016–Jun. 2019  
*co-supervisor: Prof. G. Chabrier*

Mark Phillips PhD: chemistry in (exo)planet atmospheres 2016–Jun. 2019  
*co-supervisor: Prof. I. Baraffe*

Jessica Spake PhD: hot Jupiter Atmospheres 2015–Jun. 2019  
*co-supervisor: Prof. D. Sing*

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*Postdoctoral Completed:*

Dr. Paul Cresswell Systems scientist, Met Office Secondment 2016–2017  
Restructuring the idealised UM

Dr. Chris Smith Senior Research Scientist, Met Office Secondment 2013–2015  
Atmospheric modelling: dynamics

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*PhD Completed:*

Dr. Darryl Sergison PhD: Spectral indicators of stellar age 2013–2016  
*co-supervisor: Prof. T. Naylor*

Dr. David S. Amundsen PhD: exoplanet modelling 2012–2015  
*co-supervisor: Prof. I. Baraffe* (moved to postdoc: Columbia Univ.)

Dr. Ben Drummond	PhD: atmospheric chemistry <i>co-supervisor: Prof. I. Baraffe</i> (moved to postdoc: Univ. Exeter)	2013–2017
Dr. Cameron Bell	PhD: Ages of young clusters <i>co-supervisor: Prof. T. Naylor</i> (moved to postdoc: ETH, Zurich)	2009–2012

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*MSc Completed:*

Charlie Sweetland	MSc: Advanced Mathematics Climates of Earth-Like exoplanets	2015
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*(Graduated PhD/MSc student's current academic institute given where student continued in academia)*

## Leadership & Management: Institutional Responsibilities

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Global Systems Institute, Academic Working Group ( <i>deputy for Prof. I. Baraffe</i> )	Jan. 2018–present
Member of Centre for Intermedia and Creative Technology Network, Univ. Exeter	Jan. 2018–present
Admissions Tutor, Physics & Astronomy, Univ. of Exeter	Sep. 2016–present
<b>Awarded: “Above &amp; Beyond” Bronze award (£500).</b>	
<b>Implemented cut at AAB+, returned highest tariff entrant cohort, 2017/2018</b>	
Stage One Coordinator, Physics & Astronomy, Univ. of Exeter	Sep. 2016–present
Assistant Director of Education, Physics & Astronomy, Univ. of Exeter	Sep. 2016–present
Inclusivity Strategy/Writing Group, Physics & Astronomy, Univ. of Exeter	Sep. 2013–present
Inclusivity Working Groups, Physics & Astronomy, Univ. of Exeter	Sep. 2012–present
<b>Discipline Awarded: Juno Champion Status (2018)</b>	
<b>Discipline Awarded: Athena Swan Bronze (2015)</b>	
Postdoctoral Secondary Facilitator, CEMPS, Univ. of Exeter	Sep. 2010-Apr. 2014

## Leadership & Management: Initiatives & Contributions

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“Alumni Talent Network”, Univ. of Exeter	In development
UCAS Open Day Sample Lecture, Univ. of Exeter	Jun. 2016
Pre-University Physics Course Sample Lecture, Univ. of Exeter	Jul. 2015, Jul. 2016
Athena Swan: Engagement & Awareness day, Univ. of Exeter	Mar. 2015, 2016
Institute of Physics Unconscious Bias Workshop, Loughborough Univ.	2015
Promotion Workshops Series (organiser & presenter), Univ. of Exeter	2014–2017
UCAS Open Day, Physics & Astronomy, Univ. of Exeter	2014–present
<i>Interaction &amp; discussion sessions</i>	
UCAS Admissions, Physics & Astronomy, Univ. of Exeter	2014–present
<i>Interviews, presentations &amp; discussions sessions</i>	
Natural Sciences Offer-Holder visit day, Univ. of Exeter	2014
<i>Presentation and discussion sessions</i>	
Research Interactive (undergraduates), CEMPS, Univ. of Exeter	2013
Research Showcase (under- & post-graduates), CEMPS, Univ. of Exeter	2013, 2014, 2015
Research Speed-Updating (staff), Univ. of Exeter	2013
UCAS <i>general</i> , Physics & Astronomy, Univ. of Exeter	1997–present
<i>Tours, hosting and external visits</i>	

## Institutional Responsibilities: Panels & Reviewing

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Interview panel for PDRA positions, Physics & Astronomy, Univ. of Exeter	2017
Interviewer for group PhD positions, Physics & Astronomy, Univ. of Exeter	2016
Interview panel for PDRA positions, Physics & Astronomy, Univ. of Exeter	2016
Internal referee: CEMPS, Univ. of Exeter	-
<i>Leverhulme RPG, STFC Rutherford fellowship &amp; Royal Society URF proposals</i>	

## External Recognition: Media

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- Press Release on “Exoplanet Explorer” animations, Oct. 2017
- Produced Animations with Engine House<sup>2</sup> and At-Bristol<sup>3</sup> for joint NASA & University of Exeter press release. Featured in e.g., Express, Verge, Sci News, Daily Star, IB Times, Telegraph, New Scientist, Science Alert, Science Daily, Sky at Night, Sky and Telescope, IFL Science, Forbes, NBC, Wired, Mirror, Phys Org, Inverse, Physics World, Astronomy Now etc. Aug. 2017
- Interviews for WIRED, IFLScience, International Business Times, Financial Times, VICE, BBC World Service & BBC Radio Devon, Jun. 2017
- Press release on research, University of Exeter, May. 2017
- Interview for “Research Fortnight”, Dec. 2016
- Article for “The Conversation”, Oct. 2016.
- RadioEXE interview on Searching for life on exoplanets, Oct. 2016
- TED<sup>x</sup> Truro, presentation Sep. 2016
- Coordinated NASA/University of Exeter press release on Research publication, Sep. 2016
- Interviews with Radio Devon & Western Morning News, Perseid Meteor Shower, Aug. 2016
- Radio Exe interview (Perseid Meteor Shower), Aug. 2015, Aug. 2016.
- BBC Breakfast News interview & special comments (partial eclipse), Mar. 2015
- Appearance on BBC Stargazing Live! Programme, filmed segment, Jan. 2014.
- News article, Met Office research news, 2014
- News article, University of Exeter research news, 2014.
- News article, Express and Echo, 2014.
- Interview for Devon Life magazine, 2014.
- Interview for BBC Radio Cornwall, 2014.
- Interview for BBC Radio Devon, 2014.
- Research image as front cover of Astronomy & Astrophysics Vol 561, Jan. 2014.
- News article, Daily Mail, 2012

## External Recognition: Presentations

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### Invited Talks: Conferences

- Jul. 2018* Spectroscopy of Exoplanets, Cumberland Lodge (University College London)
- Feb. 2018* Met Office Academic Partnership Poster & Presentation Event, Met Office
- Jan. 2018* Dynamics of Rotating Fluids: ‘Dynamics of giant planets’  
University College London
- Jun. 2017* Planetary atmospheres: on Earth, in the solar system, and on exoplanets  
Wenner-Gren Center, Stockholm
- May 2017* Climate science, atmospheres and life: from the Earth and beyond  
University of Cambridge
- Apr. 2017* Atmospheres of Disks and Planets 2017: Chemistry, Dynamics and Observations  
Ringberg (MPIA), Germany
- Jul. 2016* **Plenary** “CliMathNet” International Conference, University of Exeter

### Invited Talks: Seminars (*exoplanet atmospheres, unless stated*)

- Apr. 2018* Fluids & MHD seminars, University of Leeds
- Oct. 2016* Astrophysics Research Institute, Liverpool John Moores University
- Jun. 2016* Department of Physics and Astronomy, University of Leicester
- May. 2016* Centre for Atmospheric Science, University of Cambridge
- Dec. 2015* Met Office, Exeter. *Delivered by PhD student Ben Drummond*
- Oct. 2015* Institute for Astronomy, The University of Edinburgh, Royal Observatory

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<sup>2</sup><http://www.engine-house.co.uk/>

<sup>3</sup><https://www.at-bristol.org.uk/>

Feb. 2015 Atmospheric, Oceanic and Planetary Physics, Oxford University  
 Dec. 2014 Planetary Science, Department, Caltech  
 Dec. 2014 Institute for Planets and Exoplanets, UCLA  
 Dec. 2014 LCOGT, Santa Barbara  
 Dec. 2014 Department of Astronomy and Astrophysics, UC Santa Cruz  
 Dec. 2014 NASA Ames  
 Nov. 2014 Lunar and Planetary Lab, University of Arizona  
 May. 2014 School of Physics and Astronomy, University of St. Andrews  
 May. 2014 Geophysical and Astrophysical Fluids Department, University of Exeter  
 Jun. 2012 Applied Mathematics Department, University of Exeter  
 Jul. 2012 Met Office, Exeter  
 Aug. 2009 (*star formation*) Astrophysics Group, University of Keele

#### Posters (conferences and workshops)

Jan. 2012 “Exoclimes II”, Aspen Center for Physics  
 Oct. 2010 “Constellation Meeting” (*star formation*), Tenerife  
 Jul. 2006 “Planet-Disc Connection” (*star formation*), Cambridge University

#### Contributed Talks (*exoplanet atmospheres, unless stated*)

Apr. 2016 “Exoplanet UK community meeting”, Univ. of Exeter  
 Mar. 2015 “Met Office/Univ. of Exeter Space Weather day”, Univ. of Exeter  
 Apr. 2014 “Exoplanet UK community meeting”, Cambridge Univ.  
 Feb. 2014 “Exoclimes, international conference”, Davos Congress Centre  
 Sep. 2013 “European Planetary Science Congress”, international conference, Univ. College London  
 Sep. 2013 “Mind the gap”, international conference (*invited by organiser*), Hertfordshire Univ.  
 May. 2013 “Rotational fluid dynamics: planetary & stellar applications”, workshop, Univ. of Exeter  
 Dec. 2011 “GCM & Exoplanets”, workshop, University of Exeter  
 Oct. 2010 “Constellation Meeting”, international conference (*star formation*), Tenerife  
 Apr. 2008 “National Astronomical Meeting” (*star formation*), Belfast

#### Selective Meeting Attendance

Mar. 2012 Royal Society Discussion Meeting, London:  
 “Characterising exoplanets: detection, formation, interiors, atmospheres and habitability”  
 Feb. 2012 Royal Society Discussion Meeting, London:  
 “Dust, Haze and Clouds in Exoplanet Atmospheres”

## External Recognition: Duties

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#### *Organisation of Scientific Meetings:*

- Workshop: “Idealised Planetary Modelling”, ~30 delegates, Univ. Exeter, Feb. 2016
  - Discussion Session: “Exoplanet Modelling”, UKEXOM, ~30 delegates, St Andrews, Mar. 2017
  - SOC (Scientific Organising Committee): EWASS symposium (*Liverpool, Apr. 2018*), UKEXOM (*Oxford, Mar. 2018*), UKEXOM (Univ. Exeter Apr. 2016), GCM workshop (Exeter 2011)
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#### *Commissions of Trust:*

- **‘White Paper’: UK Exoplanet Modelling author (in –prep).**
- **Invited to write review article for “Living Reviews in Computational Astrophysics (LRCA)”, 2017-2018**
- Panel member for discussion session: “Learning from Exoplanets”, CliMathNet, Jul. 2016
- ESO OPC Panel Co-Chair (P97-C4, P98-C2) 2015/2016 (requested P99-declined)
- Referee: ApJ, MNRAS, PASA, Royal Society (URF), Swiss National Supercomputing Centre (CSCS), NASA (NSPIRES), NWO (Vidi)