

# CHRISTOPHER CLARK

CURRICULUM VITÆ (JANUARY 2020)

## CONTACT INFORMATION

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## ACADEMIC HISTORY

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- 2018–PRESENT | **Postdoctoral Fellow** | SPACE TELESCOPE SCIENCE INSTITUTE  
Performing a resolved exploration of the variation in dust properties within nearby galaxies, incorporating all-sky surveys to constrain emission missed by previous investigations.  
SUPERVISOR: DR JULIA ROMAN-DUVAL | (+1) 410 338 4351 | [duval@stsci.edu](mailto:duval@stsci.edu)
- 2014–2018 | **Postdoctoral Research Associate** | CARDIFF UNIVERSITY  
Part of the EU DustPedia project. Responsible for reducing data and performing multiwavelength photometry, constructing a database with fluxes and imagery of 875 galaxies in 42 bands. Used database to study the ISM in low-z galaxies, whilst also conducting independent research.  
SUPERVISOR: PROF JONATHAN DAVIES | (+44) 29 2087 5255 | [jonathan.davies@astro.cf.ac.uk](mailto:jonathan.davies@astro.cf.ac.uk)
- 2011–2015 | **PhD Astronomy** | CARDIFF UNIVERSITY  
Thesis: *On the Origins of Cosmic Dust and the Evolution of Nearby Galaxies with Herschel*  
PhD consisted of two main projects. Firstly, determining if historical type-Ia and type-II Milky Way supernovæ were significant dust factories. Secondly, creating and studying the first blind, dust-selected, volume-limited survey of local galaxies. [ADS Link to Thesis](#) |  
SUPERVISOR: PROF HALEY GOMEZ | (+44) 29 2087 4058 | [haley.gomez@astro.cf.ac.uk](mailto:haley.gomez@astro.cf.ac.uk)
- 2011 | **Research Assistant** | CARDIFF UNIVERSITY  
Employed to continue 4<sup>th</sup>-year undergraduate project work for publication.
- 2007–2011 | **MPhys Astrophysics** (with honours, 2<sup>nd</sup> class, upper division) | CARDIFF UNIVERSITY  
4<sup>th</sup>-year project: *Searching with Herschel for Dust Created by Kepler's Supernova*  
3<sup>rd</sup>-year project: *Stacking Submillimetre-Undetected Elliptical Galaxies in BLAST Observations*

## TEACHING & MENTORING

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### COURSES TAUGHT

- 2016–2017 | *Computational Skills for Problem Solving* | Lab teacher, Cardiff University  
2011–2014 | *Observational Techniques in Astronomy* | Lab assistant, Cardiff University  
2013 | *Planetary Physics* | Teaching assistant, Cardiff University  
2011–2012 | *Mathematics for Physical Scientists* | Teaching assistant, Cardiff University

### STUDENTS MENTORED

- 2015–2016 | **Jennifer Millard** | Master's project primary supervisor, Cardiff University  
*Stacking Far-Infrared Observations of High Galactic Latitude Stars*
- 2015–2016 | **Franziska Zaunig** | Master's project co-supervisor, Cardiff University  
*Mapping Star Formation in the Galactic Plane*
- 2014–2015 | **Rhian Miles** | Undergraduate project co-supervisor, Cardiff University  
*Evolved Stars in Herschel-ATLAS*

- 2014–2015 **Lewyse Lee** | Undergraduate project co-supervisor, Cardiff University  
*Evolved Stars in Herschel-ATLAS*
- 2014–2015 **Jennifer Millard** | Undergraduate project co-supervisor, Cardiff University  
*Evolved Stars in Herschel-ATLAS*

## GRANTS & AWARDS

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- 2019 **\$680** | NATIONAL SCIENCE FOUNDATION  
Stated value of computing time awarded by NSF's XSEDE supercomputing facility
- 2017 **€2 100** | EUROPEAN RESEARCH COUNCIL  
Travel funds to attend summer school in astrostatistics
- 2016 **£12 205** | DATA INNOVATION RESEARCH INSTITUTE  
Seedcorn Fund | *Astronomical Oncology – Astronomical Image Analysis Techniques for Cancer Microscopy*
- 2013 **£400** | CARDIFF UNIVERSITY  
Bessie Jones Prize for Most Outstanding Research Student
- 2013 **€550** | EUROPEAN SPACE AGENCY  
Competitive ESA conference sponsorship
- 2007 **£4 000** | INSTITUTE OF PHYSICS  
IoP Undergraduate Bursary

## SELECTED OBSERVING PROGRAMMES

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- IRAM 30 M PI: 19 hours | Co-I: 215 hours | Nights at telescope: 6  
2018–present *IMEGIN: Interpreting the Millimetre Emission of Galaxies with IRAM and NIKA2*  
2017 *A Pilot Study for Nearby Galaxy Observations with NIKA2*  
2014 *A New Population of Dust-Rich Galaxies with Extreme H<sub>2</sub>/Dust Ratios?*
- JCMT Architect: 780 hours | Co-I: 1000+ hours | Nights at telescope: 22  
2017–present *NESS: the Nearby Evolved Stars Survey*  
2016–present *JINGLE: JCMT dust and gas In Nearby Galaxies Legacy Exploration*  
2013 *A New Population of Dusty Blue Galaxies*
- Hubble Co-I: 577 orbits  
2019 *Scylla: A Parallel Multi-Headed Attack on Dust Evolution in ULLYSES Galaxies*  
2019 *METAL-Z: Metal Evolution, Transport, and Abundance at Low metallicity (Z)*
- ALMA Co-I: 7 hours  
2016 *The Secret Lives of BADGRS*
- MOPRA 22 M Co-I: 150 hours | Nights at telescope: 7  
2012 *Mapping Molecular Gas in Fornax Cluster Galaxies*

## SELECTED SCHOLARLY PRESENTATIONS

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- 2019 **Seminar** | *The Quest For The Missing Flux*  
EAST ASIAN OBSERVATORY | Hilo
- 2019 **Talk** | *The First Maps of  $\kappa_d$  in Nearby Galaxies*  
LINKING THE MILKY WAY AND NEARBY GALAXIES | Helsinki
- 2019 **Seminar** | *The First Maps of  $\kappa_d$  in Nearby Galaxies*  
UNIVERSITY COLLEGE LONDON | London
- 2018 **Talk** | *The First Maps of  $\kappa_d$  in Nearby Galaxies*  
COSMIC DUST: ORIGIN, APPLICATIONS & IMPLICATIONS | Copenhagen
- 2018 **Symposium Chair** | *The ISM as a Window onto Galaxy Evolution*  
EUROPEAN WEEK OF SPACE SCIENCE 2018 | Liverpool
- 2017 **Seminar** | *The Guilty Secrets of Dust in Nearby Galaxies*  
EAST ASIAN OBSERVATORY | Hilo
- 2015 **Talk** | *Young, Blue, and Cold: Blind Surveys of Nearby Galaxies with Herschel-ATLAS*  
RAS NATIONAL ASTRONOMICAL MEETING | Llandudno

- 2015 **Talk** | *Young, Blue, and Cold: Blind Surveys of Nearby Galaxies with Herschel-ATLAS*  
GAS, DUST, AND STAR-FORMATION IN GALAXIES FROM THE LOCAL TO FAR UNIVERSE | Crete
- 2014 **Talk** | *One Aperture Forward, Two Apertures Back: Multiwavelength Photometry of Nearby Galaxies*  
BBECss 2015 | Exeter
- 2013 **Talk** | *A Blind Survey of the Local Dusty Universe with Herschel-ATLAS*  
THE UNIVERSE EXPLORED BY HERSCHEL | Noordwijk
- 2013 **Talk** | *Smoking Supernovæ*  
BBECss 2015 | Bristol
- 2013 **Talk** | *A Blind Survey of the Local Dusty Universe with Herschel-ATLAS*  
RAS NATIONAL ASTRONOMY MEETING | St Andrews
- 2013 **Talk** | *Dust in Historical Supernova Remnants with Herschel*  
RAS NATIONAL ASTRONOMY MEETING | St Andrews

## TECHNICAL SKILLS

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PROGRAMMING LANGUAGES	Python, IDL, R, FORTRAN90
OTHER COMPUTING	Git, Bash, Slurm, L <sup>A</sup> T <sub>E</sub> X, XSEDE, TFLearn
ASTRONOMICAL TOOLS	HIPE, T <sup>O</sup> pCaT, SWarp, Montage, DS9, Glue, SIAP/STAP, Kappa, STILTS, SPLAT
DATA EXPERIENCE	GALEX, <i>Hubble</i> , SDSS, SkyMapper, DSS, VISTA, UKIRT, 2MASS, COBE, WISE, <i>Spitzer</i> , IRAS, <i>Herschel</i> , JCMT, ALMA, <i>Planck</i> , Mopra, IRAM, VLA

## SELECTED COMMUNITY SERVICE

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- 2019–PRESENT Co-organiser, JWST Proposal Planning Workshop, University of Maryland
- 2019–PRESENT Referee, Astronomy & Astrophysics
- 2018–PRESENT Organiser, Galaxies Journal Club & Talk Series, STScI
- 2018–PRESENT Organiser, Friday Science Coffee, STScI
- 2017–PRESENT External reviewer, time allocation committee, James Clerk Maxwell Telescope
- 2015–PRESENT Referee, Monthly Notices of the Royal Astronomical Society
- 2018 Chair of organising committee, EWASS 2018 symposium *The ISM as a Window onto Galaxy Evolution*
- 2016–2017 Organiser, astronomy colloquia, Cardiff University
- 2015–2016 Postdoc representative, departmental re-housing committee, Cardiff University
- 2015 Local organising committee, *Science & Technology Facilities Council Summer School in Astronomy 2015*
- 2014–2015 Organising committee, *Bristol-Bath-Exeter-Cardiff Student Seminars*
- 2007–2009 Organising committee, physics department student society, Cardiff University

## SELECTED PUBLIC OUTREACH

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- 2019–PRESENT Coordinator of science education activities, *Soaring Eagles Learning Camp*, Baltimore
- 2019–PRESENT Co-organiser, *Astronomy on Tap*, Baltimore
- 2017–2018 Volunteer, *Physics In A Field* @ The Royal Welsh Show, Institute of Physics
- 2017 Public talk, *Herschel: Revealing the Dusty Universe Near & Far*, Manchester Students' Union Astronomy Society
- 2016 Public talk, *The Origins of Stardust*, Monmouth Astronomical Research Society
- 2015 Volunteer, *Science After Hours* @ Techniquet, Institute of Physics
- 2015 Public talk, *The Origins of Stardust*, Society for Popular Astronomy
- 2014 Interviewee, *Science Cafe*, BBC Radio Wales
- 2012–2014 Volunteer, *BBC Stargazing Live*, National Museum of Wales
- 2012–2013 Volunteer, *The Christmas Lectures*, Cardiff University
- 2013 Volunteer, *The Big Bang Fair*, *Herschel* Space Observatory
- 2012 Volunteer, *Discover Club*, Cardiff University
- 2012 Public talk, *Smoking Supernovæ*, Bridgend Astronomical Society
- 2012 Science writer, Cardiff University Students' Union newspaper *Gair Rhydd*

## PUBLICATIONS

FIRST AUTHOR	<p>Clark, C. J. R., et al., 2019, <i>The First Maps of <math>\kappa_d</math> – the Dust Mass Absorption Coefficient – in Nearby Galaxies, with DustPedia</i>, MNRAS 489 5256 <a href="#">ADS Link</a>  </p> <p>Clark, C. J. R., et al., 2018, <i>DustPedia: Multiwavelength Photometry and Imagery of 875 Nearby Galaxies in 42 Ultraviolet–Microwave Bands</i>, A&amp;A 609 A37 <a href="#">ADS Link</a>  </p> <p>Clark, C. J. R., et al., 2016, <i>An Empirical Determination of the Dust Mass Absorption Coefficient, <math>\kappa_d</math>, Using the Herschel Reference Survey</i>, MNRAS 459 1646 <a href="#">ADS Link</a>  </p> <p>Clark, C. J. R., et al., 2015, <i>Herschel-ATLAS: The Surprising Diversity of Dust-Selected Galaxies in the Local Submillimetre Universe</i>, MNRAS 452 397 <a href="#">ADS Link</a>  </p> <p>Clark, C. J. R., 2015, <i>On the Origins of Cosmic Dust and the Evolution of Nearby Galaxies with the Herschel Space Observatory</i>, PhD Thesis <a href="#">ADS Link</a>  </p>
NON-PEER-REVIEWED	<p>Clark, C. J. R., et al., 2019, <i>Astro2020: Unleashing the Potential of Dust Emission as a Window onto Galaxy Evolution</i>, Science white paper, Astro2020 Decadal Survey on Astronomy &amp; Astrophysics <a href="#">ADS Link</a>  </p> <p>Clark, C. J. R., et al., 2014, <i>A Blind Survey of the Local Dusty Universe with Herschel-ATLAS</i>, in proceedings of ‘The Life Cycle of Dust in the Universe’, PoS LCDU2013 073 <a href="#">ADS Link</a>  </p>
CO-AUTHOR	<p>De Looze, I., et al., <i>JINGLE: IV. Dust, HI gas and metal scaling laws in the local Universe</i>, submitted for publication in MNRAS <a href="#">ADS Link</a>  </p> <p>Viaene, S., et al., <i>High-resolution, 3D radiative transfer modelling IV. AGN-powered dust heating in NGC 1068&lt;</i>, submitted for publication in A&amp;A <a href="#">ADS Link</a>  </p> <p>Verstocken, S., et al., <i>High-resolution, 3D radiative transfer modelling II. The early-type spiral galaxy M81 and a modelling framework</i>, submitted for publication in A&amp;A <a href="#">ADS Link</a>  </p> <p>Lamperti, I., et al., 2019, <i>JINGLE - V. Dust properties of nearby galaxies derived from hierarchical Bayesian SED fitting</i>, MNRAS 489 4389 <a href="#">ADS Link</a>  </p> <p>Casasola, V., et al., 2019, <i>The ISM scaling relations in DustPedia late-type galaxies: a benchmark study for the Local Universe</i>, arXiv:1911.09187 <a href="#">ADS Link</a>  </p> <p>Gao, Y., et al., 2019, <i>Estimating the molecular gas mass of low-redshift galaxies from a combination of mid-infrared luminosity and optical properties</i>, arXiv:1911.02795 <a href="#">ADS Link</a>  </p> <p>Dobbels, W., et al., 2019, <i>Predicting the global far-infrared SED of galaxies via machine learning techniques</i>, arXiv:1910.06330 <a href="#">ADS Link</a>  </p> <p>Bianchi, S., et al., 2019, <i>Dust emissivity and absorption cross section in DustPedia late-type galaxies</i>, arXiv:1909.12692 <a href="#">ADS Link</a>  </p> <p>Smith, M. W. L., et al., 2019, <i>JINGLE, a JCMT legacy survey of dust and gas for galaxy evolution studies: II. SCUBA-2 850 <math>\mu\text{m}</math> data reduction and dust flux density catalogues</i>, MNRAS 486 4166 <a href="#">ADS Link</a>  </p>

- Davies, J. I., et al., 2019, *DustPedia: the relationships between stars, gas, and dust for galaxies residing in different environments*, A&A 626 A63 [ADS Link](#) |
- Nersesian, A., et al., 2019, *Old and young stellar populations in DustPedia galaxies and their role in dust heating*, A&A 624 A80 [ADS Link](#) |
- De Vis, P., et al., 2019, *A systematic metallicity study of DustPedia galaxies reveals evolution in the dust-to-metal ratios*, A&A 623 A5 [ADS Link](#) |
- Mosenkov, A. V., et al., 2019, *Dust emission profiles of DustPedia galaxies*, A&A 622 A132 [ADS Link](#) |
- Bianchi, S., et al., 2018, *Fraction of bolometric luminosity absorbed by dust in DustPedia galaxies*, A&A 620 A112 [ADS Link](#) |
- Saintonge Ame, , et al., 2018, *JINGLE, a JCMT legacy survey of dust and gas for galaxy evolution studies - I. Survey overview and first results*, MNRAS 481 3497 [ADS Link](#) |
- Eales, S. A., et al., 2018, *The causes of the red sequence, the blue cloud, the green valley, and the green mountain*, MNRAS 481 1183 [ADS Link](#) |
- Rho, J., et al., 2018, *A dust twin of Cas A: cool dust and 21  $\mu\text{m}$  silicate dust feature in the supernova remnant G54.1+0.3*, MNRAS 479 5101 [ADS Link](#) |
- Beeston, R. A., et al., 2018, *GAMA/H-ATLAS: the local dust mass function and cosmic density as a function of galaxy type - a benchmark for models of galaxy evolution*, MNRAS 479 1077 [ADS Link](#) |
- Dunne, L., et al., 2018, *The unusual ISM in blue and dusty gas-rich galaxies (BADGRS)*, MNRAS 479 1221 [ADS Link](#) |
- Mosenkov, A. V., et al., 2018, *HERschel Observations of Edge-on Spirals (HEROES). IV. Dust energy balance problem*, A&A 616 A120 [ADS Link](#) |
- Rigby, A. J., et al., 2018, *A NIKA view of two star-forming infrared dark clouds: Dust emissivity variations and mass concentration*, A&A 615 A18 [ADS Link](#) |
- De Vis, P., et al., 2017, *Using dust, gas and stellar mass-selected samples to probe dust sources and sinks in low-metallicity galaxies*, MNRAS 471 1743 [ADS Link](#) |
- Casasola, V., et al., 2017, *Radial distribution of dust, stars, gas, and star-formation rate in DustPedia face-on galaxies*, A&A 605 A18 [ADS Link](#) |
- Davies, J. I., et al., 2017, *DustPedia: A Definitive Study of Cosmic Dust in the Local Universe*, PASP 129 044102 [ADS Link](#) |
- De Vis, P., et al., 2017, *Herschel -ATLAS: revealing dust build-up and decline across gas, dust and stellar mass selected samples - I. Scaling relations*, MNRAS 464 4680 [ADS Link](#) |
- Bianchi, S., et al., 2017, *The Herschel Virgo Cluster Survey. XX. Dust and gas in the foreground Galactic cirrus*, A&A 597 A130 [ADS Link](#) |

- Eales, S., et al., 2015, *H-ATLAS/GAMA: quantifying the morphological evolution of the galaxy population using cosmic calorimetry*, MNRAS 452 3489 [ADS Link](#) |
- Rowlands, K., et al., 2014, *Herschel-ATLAS: properties of dusty massive galaxies at low and high redshifts*, MNRAS 441 1017 [ADS Link](#) |
- Bourne, N., et al., 2013, *Herschel-ATLAS: correlations between dust and gas in local submm-selected galaxies*, MNRAS 436 479 [ADS Link](#) |
- Pearson, E. A., et al., 2013, *H-ATLAS: estimating redshifts of Herschel sources from sub-mm fluxes*, MNRAS 435 2753 [ADS Link](#) |
- Agius, N. K., et al., 2013, *GAMA/H-ATLAS: linking the properties of submm detected and undetected early-type galaxies - I.  $z \leq 0.06$  sample*, MNRAS 431 1929 [ADS Link](#) |
- Lopez-Caniego, M., et al., 2013, *Mining the Herschel-Astrophysical Terahertz Large Area Survey: submillimetre-selected blazars in equatorial fields*, MNRAS 430 1566 [ADS Link](#) |
- Gomez, H. L., et al., 2012, *A Cool Dust Factory in the Crab Nebula: A Herschel Study of the Filaments*, ApJ 760 96 [ADS Link](#) |
- Gomez, H. L., et al., 2012, *Dust in historical Galactic Type Ia supernova remnants with Herschel*, MNRAS 420 3557 [ADS Link](#) |