# CHRISTOPHER CLARK

CURRICULUM VITÆ

## CONTACT INFORMATION

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## ACADEMIC HISTORY

2014–PRESENT | **Postdoctoral Research Associate** | CARDIFF UNIVERSITY
Part of the EU DustPedia project; responsible for reducing *Herschel* data, assembling ancillary data, and performing multiwavelength photometry, to construct a database with fluxes and imagery of 876 galaxies in 43 UV-submm bands. Simultaneously conducting independent research on the nature and evolution of the ISM in low-z galaxies, and on the properties of dusty stars in the Milky Way, along with carrying out management roles in JINGLE large program.
REFERENCE: PROF JONATHAN DAVIES | (+44)2920 875255 | Jonathan.Davies@astro.cf.ac.uk

2011–2015 | **PhD Astronomy** | CARDIFF UNIVERSITY
Thesis: *The Origins and Evolution of Cosmic Dust in Galaxies with the Herschel Space Observatory*
PhD consisted of two main investigations. Firstly, using *Herschel* data to determine if recent Milky Way supernovæ manufactured large quantities of dust; whilst Type-II supernovæ did, Type-Ia did not. Secondly, exploiting *Herschel*-ATLAS to perform the first blind, dust-selected, volume-limited survey of local galaxies, revealing that dust selection is a very effective way of identifying immature galaxies with a host of unusual properties. Thesis Link |
REFERENCE: PROF HALEY GOMEZ | (+44)2920 874058 | Haley.Gomez@astro.cf.ac.uk

2011 | **Research Assistant** | CARDIFF UNIVERSITY
Employed to continue 4th-year undergraduate project work for publication.

2007–2011 | **MPhys Astrophysics 2:1** | CARDIFF UNIVERSITY
4th-year project: *Searching with Herschel for Dust Created by Kepler's Supernova*
SUPERVISORS: DR PETER HARGRAVE & PROF HALEY GOMEZ
3rd-year project: *Stacking Submillimetre-Undetected Elliptical Galaxies in BLAST Observations*
SUPERVISOR: DR ENZO PASCALE

2003–2007 | **A-Levels & GCSEs** | HELSTON SCHOOL
Recieved 4 A-Levels (Maths, Physics, History, and Theology) and 11 GCSEs (including 9 A/A*)

## TEACHING

2014–2016 | **Project student supervision**
Primary supervisor of a Master's student, co-supervisor of three 3rd-year undergraduates
2015–2017 | **Undergraduate teaching** | *Computational Skills for Problem Solving*
In charge of teaching weekly 1st-year Python class

## Grants & Awards

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| 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 | |
| 2012 | **€550** \| European Space Agency | |
| | Competitive ESA Conference Sponsorship | |
| 2007 | **£4000** \| Institute of Physics | |
| | IoP Undergraduate Bursary | |

## Successful Telescope Proposals

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| IRAM NIKA2 | A pilot study for nearby galaxy observations with NIKA2, mapping continuum emission of IC 342 at 1.2 & 2 mm \| **Principal Investigator** |
| JCMT SCUBA2/RxA | JINGLE (Jcmt dust & gas In Nearby Galaxies Legacy Exploration) statistical 850 $\mu$m & $^{12}$CO(2-1) local-Universe survey of gas and dust \| **Executive Team of Large Program** |
| IRAM NIKA2 | IMEGIN (Interpreting Millimetre Emission of Galaxies with Iram & Nika2) 1.2 & 2 mm survey of nearby galaxies with new instrument \| **Executive Team of Large Program** |
| ALMA | CO and dust continuum observations of nearby galaxies to uncover 'the secret lives of BADGRS' \| Co-Author |
| JCMT HARP-B | MALATANG (MApping the dense moLecular gAs in the sTrongest stAr-formiNg Galaxies) large program mapping HCN & HCO+ in nearby galaxies with FTS \| Co-Author |
| GMRT | Hi mapping of dust-rich local galaxies \| Second Author |
| JCMT SCUBA2 | 850 $\mu$m photometry of local galaxies containing very cold dust \| Second Author |
| VLA | Hi mapping of passive late-type 'zombie' galaxies \| Co-Author |
| IRAM EMIR | $^{12}$CO(1-0) spectroscopy of local galaxies with low dust-to-gas ratios \| Co-Author |
| VLA | Hi mapping of immature gas-dominated nearby galaxies \| Co-Author |

## Observing Experience

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| Millimetre Photometry | NIKA2 \| 5 Nights at Telescope (2017) |
| | 1 & 2 mm continuum observations of M 99 for NIKA2 science verification. |
| Millimetre Spectroscopy | RxA, James Clark Maxwell Telescope \| 5 Nights at Telescope (2016) |
| | $^{12}$CO(2-1) spectroscopy of low-redshift galaxies for the JINGLE large program. |
| Submillimetre Photometry | SCUBA2, James Clark Maxwell Telescope \| 8 Nights at Telescope (2014) |
| | 850 $\mu$m photometry of local galaxies containing very cold dust. |
| Millimetre Spectroscopy | Mopra 22m Antenna \| 7 Nights at Telescope (2012) |
| | $^{12}$CO(1-0) spectroscopy of *Herschel*-detected galaxies in the Fornax Cluster. |

## Programming Skills

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| Python | **Primary language** \| Highly capable; especially proficient in, statistical methods, image processing, data visualisation, and general observational astronomical use. Also run 1$^{st}$-year undergraduate Python course. |
| IDL | **Seconday language** \| Adept in general numerical and astronomical applications. |
| R | Versed in data-analysis and statistical use. |
| FORTRAN90 | Undergraduate-level ability in basic use. |
| LaTeX | Competent in the creation of high-quality scientific and academic documents. |
| Git | Version control for all code development, made freely available on GitHub. GitHub Link \| |

## Scholarly Presentations

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| 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 | |
| 2016 | **Poster** \| *DustPedia: A Definitive Study of Dust in the Local Universe* | |
| | RAS Specialist Meeting: Multiwavelength Extragalactic Surveys \| London | |
| 2015 | **Talk & Local Organising Committee** \| *Truths for a PhD in Astronomy* | |
| | Science & Technology Facilities Council Summer School in Astronomy \| Cardiff | |
| 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 | |
| 2013 | **Poster** \| *Herschel-ATLAS: A Blind Local Universe Survey Reveals Cold Immature Galaxies* | |
| | The Life Cycle of Dust in the Universe \| Taipei | |
| 2013 | **Talk** \| *A Blind Survey of the Local Dusty Universe with Herschel-ATLAS* | |
| | The Universe Explored By Herschel \| Noordwijk | |
| 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 | |
| 2012 | **Poster** \| *Dusty Stars in Herschel-ATLAS* | |
| | RAS Specialist Meeting: Origins of Dust in the Herschel & ALMA Era \| London | |

## Other Experience

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| Science Outreach | >150 hours engaged in science outreach activities with the general public; including public talks, science fairs, school events, agricultural shows, writing articles for university media, and radio interviews. |
| Scout Association | 5 years volunteering as an assistant leader at 1$^{st}$ Helston Scout Troop, 2004–2009; attained Chief Scout's Award (equivalent to Duke of Edinburgh's Award). |
| University Challenge | Bested 90% of teams to reach the televised stage of the BBC competition, representing Cardiff University as an undergraduate. |

## Publications

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| First Author | Clark C. J. R., et al., 2017, *DustPedia: Multiwavelength Photometry and Imagery of 876 Nearby Galaxies in 42 Ultraviolet–Microwave Bands*, accepted for publication in A&A ADS Link \| |
| | Clark C. J. R., et al., 2016, *An Empirical Determination of the Dust Mass Absorption Coefficient, $\kappa_d$, Using the Herschel Reference Survey*, MNRAS 459 1646 ADS Link \| |
| | Clark C. J. R., et al., 2015, *Herschel-ATLAS: The Surprising Diversity of Dust-Selected Galaxies in the Local Submillimetre Universe*, MNRAS 452 397 ADS Link \| |
| | Clark C. J. R., 2015, *On the Origins of Cosmic Dust and the Evolution of Nearby Galaxies with the Herschel Space Observatory*, PhD Thesis ADS Link \| |
| | Clark C. J. R., et al., 2014, *A Blind Survey of the Local Dusty Universe with Herschel-ATLAS*, in proceedings of 'The Life Cycle of Dust in the Universe', PoS LCDU2013 073 ADS Link \| |

Co-Author | Casasola V., et al., 2017, *Radial Distribution of Dust, Stars, Gas, and Star-Formation Rate in DustPedia Face-On Galaxies*, accepted by A&A                                                ADS Link |

Rho J., et al., 2017, *A Dust Twin of Cas A: Cool Dust and Pre-Solar Grains of Silica Revealed in the Supernova Remnant G54.1+0.3*, submitted to MNRAS                                        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*, accepted for publication in MNRAS                        ADS Link |

Davies J. I., et al., 2016, *DustPedia - A Definitive Study of Cosmic Dust in the Local Universe*, PASP 129 044102                                                                          ADS Link |

Bianchi S., et al., 2016, *The Herschel Virgo Cluster Survey. XX. Dust and Gas in the Foreground Galactic Cirrus*, A&A 597 A130 25                                                          ADS Link |

de Vis P., et al., 2016, *Herschel-ATLAS: Revealing Dust Build-Pp and Decline Across Gas-, Dust- and Stellar-Mass Selected Samples: I. Scaling Relations*, MNRAS 464 4680                    ADS Link |

Eales A., et al., 2015, *H-ATLAS/GAMA: Quantifying the Morphological Eolution 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 |

Peason E. A., et al., 2013, *Herschel-ATLAS: estimating redshifts of Herschel sources from sub-mm fluxes*, MNRAS 435 2753                                                                    ADS Link |

Bourne N., et al., 2013, *Herschel-ATLAS: correlations between dust and gas in local submm-selected galaxies*, MNRAS 436 479                                                                ADS Link |

Agius N. K., et al., 2013, *GAMA/H-ATLAS: linking the properties of submm detected and undetected early-type galaxies: I. z≤ 0.06 sample*, MNRAS 431 1929                                     ADS Link |

López-Caniego M., et al., 2013, *Mining the Herschel-ATLAS: 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. & Clark C. J. R., et al., 2012, *Dust in Historical Galactic Type-Ia Supernova Remnants with Herschel*, MNRAS 420 3557                                                          ADS Link |