Christopher T. Tibbs, PhD

Contact Information

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Citizenship British

Research Interests

My research interests are focused on the physical properties and radiation mechanisms of the gas and dust in the interstellar medium. I am particularly interested in spinning dust emission: electric dipole emission from small, spinning dust grains. This relatively new emission mechanism, which occurs at cm wavelengths, has the potential to provide a new probe with which to study the interstellar medium. I am also interested in the life cycle of interstellar dust and how it evolves from diffuse to dense environments and the role played by gas and dust in the star formation process.

Education

PhD, Astronomy and Astrophysics November 2010
Jodrell Bank Centre for Astrophysics
The University of Manchester
Thesis: *A Multi-wavelength Study of the Microwave Emission in the Perseus Molecular Cloud*
Advisor: Professor Richard J. Davis OBE

MPhys, Physics with Astrophysics (First Class with Honours) June 2007
The University of Manchester

Academic Employment

ESA Research Fellow October 2014 – present
European Space Research and Technology Centre
European Space Agency

Postdoctoral Research Scholar February 2011 – August 2014
Infrared Processing and Analysis Center
California Institute of Technology

Short-term Postdoctoral Research Associate November 2010 – February 2011
Jodrell Bank Centre for Astrophysics
The University of Manchester

Honours & Awards

ESA Research Fellowship in Space Science, ESTEC October 2014
Awarded to young researchers to perform research in fields related to the ESA Science Programme

Short-listed for best PhD Thesis at The University of Manchester January 2011
My PhD Thesis was selected to represent the School of Physics and Astronomy in the award for the best PhD Thesis for 2010

Spitzer Visiting Graduate Student Research Fellowship, Caltech July 2008
Selected, and fully funded, to spend 6 months working at the Spitzer Science Center

STFC PhD Studentship September 2007
Selected to be funded for the duration of my PhD

Lipson Prize, The University of Manchester July 2007
Awarded to the best undergraduate student in their final year

Physics with Astrophysics Course Prize, The University of Manchester July 2005
Awarded to the best undergraduate student in their second year

Physics with Astrophysics Course Prize, The University of Manchester July 2004
Awarded to the best undergraduate student in their first year

Entrance Scholarship, The University of Manchester September 2003
Awarded to students with exceptional incoming grades (£1,000)

Successful Observing Proposals

Palomar Observatory – 200 inch Hale Telescope (Co-I) June 2016
Spectroscopy of candidate Young Stellar Objects associated with sources of Anomalous Microwave Emission (3 nights; PI R. Paladini)

The Stratospheric Observatory for Infrared Astronomy Cycle 4 (PI) July 2015
Exploring The Role Of CII In Current Spinning Dust Models (4 hours)

Institut de Radioastronomie Millimétrique – 30m Telescope (Co-I) March 2015
Gas Properties Toward Prestellar Cores Associated With Dust Grain Growth (36 hours; PI I. Ristorcelli)

The Stratospheric Observatory for Infrared Astronomy Cycle 3 (PI) July 2014
Exploring The Role Of CII In Current Spinning Dust Models (2.5 hours; $10,500)

Caltech Submillimeter Observatory (PI) July 2014
Using MUSIC to Constrain Dust Grain Coagulation in a Sample of Cold Cores Observed at 1cm (32 hours)

Institut de Radioastronomie Millimétrique – 30m Telescope (Co-I) April 2014
NIKA Insight Into The Evolution Of Dust In Pre-stellar Cores: Grain Optical Properties And Grain Growth (24 hours; PI I. Ristorcelli)

National Radio Astronomy Observatory – EVLA (PI) August 2013
Locating Spinning Dust Grains Within HII Regions (14.5 hours)

Institut de Radioastronomie Millimétrique – 30m Telescope (Co-I) September 2012
On The Reconstruction Of Extended Emission With GISMO/CRUSH (16.5 hours; PI N. Billot)

The Stratospheric Observatory for Infrared Astronomy Cycle 1 (PI) August 2012
Exploring The Role Of CII In Current Spinning Dust Models (2 hours; $8,000)

Australia Telescope National Facility – Parkes (Co-I) August 2012
Characterizing The Structure Of An Unusually Cold High Latitude Cloud (5 hours; PI M. Veneziani)

The Combined Array for Research in Millimeter-wave Astronomy (Co-I) May 2012
High Resolution Observations Of Anomalous Microwave Emission In RCW175 (6 hours; PI J. Villadsen)

The Combined Array for Research in Millimeter-wave Astronomy (Co-I) May 2012
Grain Growth In Planck Cold Cores (80 hours; PI M. Stevenson)

The Combined Array for Research in Millimeter-wave Astronomy (Co-I) December 2011
Spectral Index Of Anomalous Emission Regions (53 hours; PI J. Villadsen)

The Combined Array for Research in Millimeter-wave Astronomy (Co-I) December 2011
Anomalous Emission In Planck Cold Cores (40 hours; PI M. Stevenson)

The Herschel Space Observatory Open Time 2 (PI) September 2011
Exploring The Role Of CII In Current Spinning Dust Models (2 hours)

The Herschel Space Observatory Open Time 2 (Co-I) September 2011
Unveiling The Mysterious Case Of RCW49: A Powerful HII Region With Associated Anomalous Microwave Emission (1.7 hours; PI R. Paladini)

The Herschel Space Observatory Open Time 2 (Co-I) September 2011
SABER: Spectral Analysis Of The Bowshock Emission In A Runaway (6.2 hours; PI A. Noriega-Crespo)

The Arcminute MicroKelvin Imager (PI) September 2010
Constraining Anomalous Microwave Emission Using The AMI Small Array (48 hours)

The Herschel Space Observatory Open Time 1 (Co-I) July 2010
PACS And SPIRE Observations Of Galactic Anomalous Emission Sources (13 hours; PI R. Paladini)

National Radio Astronomy Observatory – EVLA (Co-I) October 2009
C/K Band EVLA Imaging Of Anomalous Dust (12 hours; PI C. Dickinson)

National Radio Astronomy Observatory – Green Bank Telescope (PI) February 2009
Constraining The Anomalous Emission In The Perseus Region On Arcminute Scales (15 hours)

Selected Talks & Conferences

Spectroscopy with SOFIA — 5^{th} – 8^{th} March 2017
Schloss Ringberg, Germany (*Talk*)

The Milky Way as a Star Formation Engine — 26^{th} – 30^{th} September 2016
Rome, Italy (*Poster*)

Anomalous Microwave Emission Workshop III — 22^{nd} – 23^{rd} June 2016
ESA, Noordwijk, The Netherlands (*Talk*)

Conditions and Impact of Star Formation — 7^{th} – 11^{th} September 2015
Zermatt, Switzerland (*Poster*)

Cosmic Dust — 17^{th} – 21^{st} August 2015
Tokyo, Japan (*Talk*)

RAS National Astronomy Meeting — 5^{th} – 9^{th} July 2015
Llandudno, UK (*Talk*)

Leiden Observatory Lunch Seminar — 15^{th} April 2015
Leiden University, Leiden, The Netherlands (*Talk*)

Scientific Support Office Seminar — 6^{th} March 2015
ESA, Noordwijk, The Netherlands (*Talk*)

Planck: The Microwave Sky in Temperature and Polarization — 1^{st} – 5^{th} December 2014
Ferrara, Italy (*Poster*)

Dense Cores: Origin, Evolution, and Collapse — 27^{th} – 30^{th} July 2014
Monterey, USA (*Talk*)

The Life Cycle of Dust in the Universe — 18^{th} – 22^{nd} November 2013
Taipei, Taiwan (*Poster*)

SOFIA Community Teletalk Series — 11^{th} September 2013
Caltech, Pasadena, USA (*Talk*)

Anomalous Microwave Emission Workshop II — 22^{nd} August 2013
Caltech, Pasadena, USA (*Talk*)

221^{st} Meeting of the American Astronomical Society — 6^{th} – 10^{th} January 2013
Long Beach, USA (*Poster*)

Anomalous Microwave Emission Workshop I — 2^{nd} – 4^{th} July 2012
The University of Manchester, Manchester, UK (*2 Talks*)

Star Formation Seminar Series — 17^{th} April 2012
JPL, Pasadena, USA (*Talk*)

RAS National Astronomy Meeting — 27^{th} – 30^{th} March 2012
The University of Manchester, Manchester, UK (*Talk and Poster*)

Planck: Astrophysics from the Radio to the Sub-millimetre — 13^{th} – 17^{th} February 2012
Bologna, Italy (*Talk*)

Understanding Galactic and Extragalactic Foregrounds — 22^{nd} – 27^{th} May 2011
Zadar, Croatia (*Talk*)

The Life Cycle of Matter Seminar Series — 18^{th} October 2010
The University of Manchester, Manchester, UK (*Talk*)

Twelfth Synthesis Imaging Workshop — 8^{th} – 15^{th} June 2010
NRAO, Socorro, USA

Science at Q-Band Workshop — 14^{th} – 15^{th} September 2009
The University of Manchester, Manchester, UK

RAS National Astronomy Meeting — 20^{th} – 23^{rd} April 2009
University of Hertfordshire, Hatfield, UK (*Talk*)

Component Separation and the Physics of Foregrounds — 14^{th} – 18^{th} July 2008
Pasadena, USA (*Poster*)

Professional Memberships

Royal Astronomical Society - *Fellow*

Institute of Physics - *Member*

Academic Service

Weekly Science Seminar Co-Organiser November 2014 – November 2016
ESA/ESTEC

Anomalous Microwave Emission Workshop III Organiser June 2016
ESA/ESTEC

Journal Referee February 2016
MNRAS

Anomalous Microwave Emission Workshop II Co-Organiser August 2013
Caltech

Academic Advising & Teaching

Summer Student Supervisor June 2015 – August 2015
Leiden/ESA Astrophysics Program for Summer Students (LEAPS)

Laboratory Demonstrator September 2007 – June 2008
The University of Manchester

Public Outreach

To help get the general public excited about science, I have volunteered for a variety of outreach events, including the following:

Meet the Scientist, Manchester Museum of Science and Industry
Ask an Astronomer, Manchester Museum of Science and Industry
The Big Bang Fair, Manchester Central
The Jodcast, Astronomy Podcast
JPL Open House, NASA Jet Propulsion Laboratory
SpaceFest, California Science Center
NITARP, NASA IPAC Teacher Archive Research Program
ESTEC Open Day, European Space Research and Technology Centre

Refereed Publications

17. **C. T. Tibbs**, R. Paladini, K. Cleary, S. J. C. Muchovej, A. M. M. Scaife, M. A. Stevenson, R. J. Laureijs, N. Ysard, K. J. B. Grainge, Y. C. Perrott, C. Rumsey, and J. Villadsen. *Using cm Observations to Constrain the Abundance of Very Small Dust Grains in Galactic Cold Cores*, MNRAS, 456, 2290 (2016)

16. R. Paladini, A. Ingallinera, C. Agliozzo, **C. T. Tibbs**, A. Noriega-Crespo, G. Umana, C. Dickinson, and C. Trigilio. *Anomalous Microwave Emission in HII Regions: Is It Really Anomalous? The Case of RCW49*, ApJ, 813, 24 (2015)

15. **C. T. Tibbs**, R. Paladini, K. Cleary, S. J. C. Muchovej, A. M. M. Scaife, M. A. Stevenson, R. J. Laureijs, N. Ysard, K. J. B. Grainge, Y. C. Perrott, C. Rumsey, and J. Villadsen. *CARMA Observations of Galactic Cold Cores: Searching for Spinning Dust Emission*, MNRAS, 453, 3356 (2015)

14. Planck Collaboration, including **C. T. Tibbs**. *Planck Intermediate Results. XXIII: Galactic plane emission components derived from Planck with ancillary data*, A&A, 580, A13 (2015)

13. E. S. Battistelli, E. Carretti, A. Cruciani, P. de Bernardis, R. Génova-Santos, S. Masi, A. Naldi, R. Paladini, F. Piacentini, **C. T. Tibbs**, L. Verstraete, and N. Ysard. *New Radio Observations of Anomalous Microwave Emission in the HII Region RCW175*, ApJ, 801, 111 (2015)

12. Planck Collaboration, including **C. T. Tibbs**. *Planck Intermediate Results. XV: A study of anomalous microwave emission in Galactic clouds*, A&A, 565, A103 (2014)

11. A. Traficante, R. Paladini, M. Compiègne, M. I. R. Alves, L. Cambrèsy, S. J. Gibson, **C. T. Tibbs**, A. Noriega-Crespo, S. Molinari, S. J. Carey, J. G. Ingalls, P. Natoli, R. D. Davies, R. J. Davis, C. Dickinson, and G. A. Fuller. *The pros and cons of the inversion method approach to derive 3D dust emission properties in the ISM: the Hi-Gal field centred on (l,b)=(30°,0°)*, MNRAS, 440, 3588 (2014)

10. Planck Collaboration, including **C. T. Tibbs**. *Planck Intermediate Results. XII: Diffuse Galactic components in the Gould Belt system*, A&A, 557, A53 (2013)

9. **C. T. Tibbs**, R. Paladini, C. Dickinson, B. S. Mason, S. Casassus, K. Cleary, R. D. Davies, R. J. Davis, and R. A. Watson. *Constraints on Free-free Emission from Anomalous Microwave Emission Sources in the Perseus Molecular Cloud*, ApJ, 770, 122 (2013)

8. **C. T. Tibbs**, A. M. M. Scaife, C. Dickinson, R. Paladini, R. D. Davies, R. J. Davis, K. J. B. Grainge, and R. A. Watson. *AMI Observations of the Anomalous Microwave Emission in the Perseus Molecular Cloud*, ApJ, 768, 98 (2013)

7. M. Veneziani, D. Elia, A. Noriega-Crespo, R. Paladini, S. Carey, A. Faimali, S. Molinari, M. Pestalozzi, F. Piacentini, E. Schisano, and **C. T. Tibbs**. *An analysis of star formation with Herschel in the Hi-Gal Survey. I. The science demonstration phase fields*, A&A, 549, 130 (2013)

6. **C. T. Tibbs**, R. Paladini, and C. Dickinson. *On the Limitations of the Anomalous Microwave Emission Emissivity*, Advances in Astronomy Special Issue: Anomalous Microwave Emission: Theory, Modeling and Observations, Vol 2012, Article ID 124931, (2012)

5. R. Paladini, G. Umana, M. Veneziani, A. Noriega-Crespo, L. D. Anderson, F. Piacentini, D. Pinheiro-Goncalves, D. Paradis, **C. T. Tibbs**, J. -P. Bernard, and P. Natoli. *Spitzer and Herschel Multiwavelength Characterization of the Dust Content of Evolved HII Regions*, ApJ, 760, 149 (2012)

4. **C. T. Tibbs**, R. Paladini, M. Compiègne, C. Dickinson, M. I. R. Alves, N. Flagey, S. Shenoy, A. Noriega-Crespo, S. Carey, S. Casassus, R. D. Davies, R. J. Davis, S. Molinari, D. Elia, M. Pestalozzi, and E. Schisano. *A Multi-wavelength Investigation of RCW175: An HII Region Harboring Spinning Dust Emission*, ApJ, 754, 94 (2012)

3. **C. T. Tibbs**, N. Flagey, R. Paladini, M. Compiègne, S. Shenoy, S. Carey, A. Noriega-Crespo, C. Dickinson, Y. Ali-Haïmoud, S. Casassus, K. Cleary, R. D. Davies, R. J. Davis, C. M. Hirata, and R. A. Watson. *Spitzer characterization of dust in an anomalous emission region: the Perseus cloud*, MNRAS, 418, 1889 (2011)

2. C. Dickinson, S. Casassus, R. D. Davies, J. R. Allison, R. Bustos, K. Cleary, R. J. Davis, M. E. Jones, T. J. Pearson, A. C. S. Readhead, R. Reeves, A. C. Taylor, **C. T. Tibbs**, and R. A. Watson. *Infrared-correlated 31-GHz radio emission from Orion East*, MNRAS, 407, 2223 (2010)

1. **C. T. Tibbs**, R. A. Watson, C. Dickinson, R. D. Davies, R. J. Davis, S. Buckmaster, C. del Burgo, T. M. O. Franzen, R. Génova-Santos, K. Grainge, M. P. Hobson, C. P. Padilla-Torres, R. Rebolo, J. A. Rubiño-Martín, R. D. E. Saunders, A. M. M. Scaife, and P. Scott. *Very Small Array observations of the anomalous microwave emission in the Perseus region*, MNRAS, 402, 1969 (2010)

References

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