



Matías Vidal

Curriculum Vitae

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Personal Information

Date of Birth: 12th of December 1984

Nationality: Chilean

Civil Status: Single

Languages: Spanish (native), English (fluent).

Research summary

My main research interest is the study of the diffuse polarised Galactic emission as a foreground to the CMB. During my Ph.D., I studied the polarised sky at GHz frequencies using *WMAP* data, focused in the large-scale filamentary features observed at 23, 33 and 41 GHz. I have quantified the observational properties of this emission and its relation with the Galactic interstellar medium (ISM), as well as its contribution to the CMB polarisation power spectra. I have also analysed polarisation data at 43 GHz from the ground-based Q/U Imaging Experiment (QUIET) of two regions on the Galactic plane. A second area of my research is the study of the anomalous microwave emission, a dust-correlated radiation which is observed in the 10–90 GHz frequency range. During my M.Sc. and Ph.D. I have used single-dish and interferometric radio data, together with IR observations to characterise the AME and constrain its polarisation level. By doing this research, I have built expertise in the physics of the ISM and its emission mechanisms, in the analysis of full-sky intensity and polarisation data, in observations and analysis of radio/IR data and in the use of statistical tools for the assessment of the data.

Education

- Mar 2010 - Jun 2014 **Ph.D. Astrophysics**
The University of Manchester (UK)
Title: *Diffuse radio foregrounds: all-sky polarisation and anomalous microwave emission.*
Supervisor: Dr. Clive Dickinson
- Mar 2008 - Sep 2009 **M.Sc. Astronomy & Astrophysics**
Universidad de Chile (Chile)
Title: *Study of anomalous microwave emission on diffuse interstellar clouds.*
Supervisor: Dr. Simon Casassus
- Mar 2003 - Dec 2007 **B.Sc Astronomy & Astrophysics**
Universidad de Chile

Awards & Honors

2016	FONDECYT 2016 Postdoctoral Grant.
2015	Springer Theses Award: Recognizing Outstanding Ph.D. Research.
2010	CONICYT (Chile) Ph.D. Scholarship
2009	Honor award for academic excellence during my M.Sc. at "Universidad de Chile".
2008	FONDAP (Chile) Tuition Scholarship for post-graduate studies at "Universidad de Chile".
2007	Outstanding Student of the Mathematics and Physics Faculty, "Universidad de Chile".

Additional research experience

During my undergrad, I worked studying the massive star formation in the Large and Small Magellanic clouds. We used sub-millimetre observations of molecular lines to study the properties of a number of giant molecular clouds. I participated helping with the observations, data reduction and basic analysis. On a different project, I worked with optical spectra in a study of galaxy clusters using quasar absorption lines. This work lead to a publication that is listed in the adjunct document.

Computing knowledge

OS	Linux, Windows.
Programming	IDL, Python, Perl, C++, C-shell, \LaTeX .
Astronomy tools	HEALPix, CASA, Miriad, Difmap, Ds9, IRAF, MIDAS.

Teaching Experience

2007 - 2010	Teacher Assistant at Universidad de Chile.
Course:	Intergalactic Medium (Prof: Sebastián López).
Course:	Observational Astronomy (Prof: Sebastián López).
Course:	Planetary Sciences (Prof: Patricio Rojo).
Course:	Summer School Program, Yale University (Prof: José Maza).
Course:	General Astronomy (Patricio Rojo).

Publications

- [1] T. M. Ruud, U. Fuskeland, I. K. Wehus, M. Vidal, D. Araujo, C. Bischoff, I. Buder, Y. Chinone, K. Cleary, R. N. Dumoulin, A. Kusaka, R. Monsalve, S. K. Næss, L. B. Newburgh, R. A. Reeves, J. T. L. Zwart, L. Bronfman, R. D. Davies, R. Davis, C. Dickinson, H. K. Eriksen, T. Gaier, J. O. Gundersen, M. Hasegawa, M. Hazumi, K. M. Huffenberger, M. E. Jones, C. R. Lawrence, E. M. Leitch, M. Limon, A. D. Miller, T. J. Pearson, L. Piccirillo, S. J. E. Radford, A. C. S. Readhead, D. Samtleben, M. Seiffert, M. C. Shepherd, S. T. Staggs, O. Tajima, K. L. Thompson, and QUIET Collaboration. The Q/U Imaging Experiment: Polarization Measurements of the Galactic Plane at 43 and 95 GHz. *ApJ*, 811:89, October 2015.
- [2] M. Vidal, C. Dickinson, R. D. Davies, and J. P. Leahy. Polarized radio filaments outside the Galactic plane. *MNRAS*, 452:656–675, September 2015.
- [3] E. Orlando, A. W. Strong, I. V. Moskalenko, C. Dickinson, S. Digel, T. R. Jaffe, G. Johannesson, J. P. Leahy, T. A. Porter, and M. Vidal. Multi-wavelength constraints on cosmic-ray leptons in the Galaxy. *ArXiv e-prints*, July 2015.
- [4] Planck Collaboration, P. A. R. Ade, N. Aghanim, M. I. R. Alves, M. Arnaud, M. Ashdown, J. Aumont, C. Baccigalupi, A. J. Banday, R. B. Barreiro, and et al. Planck 2015 results. XXV. Diffuse low-frequency Galactic foregrounds. *ArXiv e-prints*, June 2015.
- [5] Planck Collaboration, R. Adam, P. A. R. Ade, N. Aghanim, Y. Akrami, M. I. R. Alves, M. Arnaud, F. Arroja, J. Aumont, C. Baccigalupi, and et al. Planck 2015 results. I. Overview of products and scientific results. *ArXiv e-prints*, February 2015.
- [6] C. Dickinson, Y. Ali-Hamoud, R. J. Beswick, S. Casassus, K. Cleary, B. Draine, R. Genova-Santos, K. Grainge, T. C. Hoang, A. Lazarian, E. Murphy, R. Paladini, M. W. Peel, Y. Perrott, J. A. Rubino-Martin, A. Scaife, C. Tibbs, L. Verstraete, M. Vidal, R. A. Watson, and N. Ysard. Studies of Anomalous Microwave Emission (AME) with the SKA. *Advancing Astrophysics with the Square Kilometre Array (AASKA14)*, page 124, 2015.
- [7] M. Vidal, J. P. Leahy, and C. Dickinson. A new polarisation amplitude de-biasing method. *ArXiv e-prints*, October 2014.

- [8] C. Dickinson, M. Peel, and M. Vidal. New constraints on the polarization of anomalous microwave emission in nearby molecular clouds. *MNRAS*, 418:L35–L39, November 2011.
- [9] M. Vidal, S. Casassus, C. Dickinson, A. N. Witt, P. Castellanos, R. D. Davies, R. J. Davis, G. Cabrera, K. Cleary, J. R. Allison, J. R. Bond, L. Bronfman, R. Bustos, M. E. Jones, R. Paladini, T. J. Pearson, A. C. S. Readhead, R. Reeves, J. L. Sievers, and A. C. Taylor. Dust-correlated cm wavelength continuum emission from translucent clouds ζ Oph and LDN 1780. *MNRAS*, 414:2424–2435, July 2011.
- [10] P. Castellanos, S. Casassus, C. Dickinson, M. Vidal, R. Paladini, K. Cleary, R. D. Davies, R. J. Davis, G. J. White, and A. Taylor. Dust-correlated centimetre-wave radiation from the M78 reflection nebula. *MNRAS*, 411:1137–1150, February 2011.
- [11] S. Lopez, L. F. Barrientos, P. Lira, N. Padilla, D. G. Gilbank, M. D. Gladders, J. Maza, N. Tejos, M. Vidal, and H. K. C. Yee. Galaxy Clusters in the Line of Sight to Background Quasars. I. Survey Design and Incidence of Mg II Absorbers at Cluster Redshifts. *ApJ*, 679:1144–1161, June 2008.