
Curriculum Vitae

Huw Morgan

Post-doctoral Research Fellow

1st Employer address: Institute for Astronomy, University of Hawaii, 2680 Woodlawn Drive,
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2nd Employer & Correspondence address: Institute for Maths. and Physical Sciences, Aberystwyth
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Education and Employment History

October 2007 - present: Lecturer at IMAPS, Aberystwyth University, Wales (joint affiliation with IfA)

March 2005 - present: Post-doctoral Research Fellow, Institute for Astronomy (IfA), University of Hawaii

Feb. 2005: PhD, Inst. of Math. and Phys. Sciences (IMAPS), Aberystwyth University, Wales

Dec. 2001: B. Sc. in Physics, Open University, Milton Keynes, UK, Grade achieved: 1st with distinction

Prizes

2005: Studentship Award, Solar Physics Division of the American Astronomical Society.

2004: Sir Granville Beynon award for Postgraduate Research, University of Wales, Aberystwyth

Teaching Activities

March 2008 - Thermodynamics, 1st year undergraduates.

November 2007 - Stellar Evolution, 2nd year undergraduates.

May - Sep 2006: Supervision of the research projects of two students from the NSF-supported Research Experience for Undergraduates program, IfA Hawaii.

Sep 2005: Seminar on Solar Physics for the IfAs postgraduate students, IfA Hawaii.

Jan-May 2004: Mathematics supervisor for undergraduates, IMAPS Aberystwyth.

Sep-Dec 2003: Laboratory supervisor for undergraduates, IMAPS Aberystwyth.

Grant Proposals

I have a prominent co-investigative role in the following successful proposals:

2008: CME structure, evolution and interaction with the ambient corona (NASA SR&T, ~\$500K)

2007: Image processing for the STEREO COR 1 & 2 Coronagraphs (unsolicited proposal, ~\$25K)

2007: Large- and fine-scale density structures of the quiescent and dynamic solar corona (NASA SR&T, ~\$500K)

Public Outreach

I am committed to engaging the public's interest in Astronomy, and Solar Physics in particular. I am the subject of a hour-long Welsh television documentary, concentrating on my research in Hawaii and the Libyan eclipse expedition of March 2006. I have given several interviews for television and radio regarding the record-breaking solar flares of October 2003, the Venus transit of June 2004, the total solar eclipse of March 2006 and first 3D images from STEREO in April 2007. I made an extensive television interview for HTV's 'Wild Welsh Weather' series.

During my PhD years, I made several visits to secondary schools in the Aberystwyth area. These visits included talks on the Sun and Space Weather, and the organisation and supervision of projects such as sunspot observing and solar poster competitions. During my Post-doc years, I have played an active and enthusiastic role in open day type activities.

Current Research Interests

Solar Tomography - Development of new technique based on Fourier backprojection tomography to calculate the distribution of structure in the corona.

Coronal Image Processing - development and application of new tools for revealing the large and fine scale structure of the quiescent and dynamic corona.

Coronal seismology - detection of waves and disturbances in UVCS observations of spectral lines in the extended corona.

3D Structure of the Quiescent Corona - exploiting the wealth of current coronal observations to constrain empirical models of the large- and fine- scale structure.

Structure of CMEs - application of the new image processing tools to the SOHO CME database, providing new insights into their internal structure and evolution.

UV observations and empirical modeling - analysis and empirical modeling of UV Coronagraph Spectrometer (UVCS) observations.

Other - UV observations of molecular Hydrogen in sunspots, eclipse observations in the visible and near-IR, F-corona characteristics, presence of silicon nano-particles in interplanetary dust.

Collaborations

Dr. S. Habbal (IfA, Uni. of Hawaii) & Dr. R. Woo (JPL, California), coronal structure and image processing.

Dr. J. Davila & Dr. J. McAteer (Goddard SFC, Maryland), application of NRGF to STEREO images.

Dr. I. Scholl (Int. Space Uni., Strasbourg) & Dr. S. Habbal (IfA, Uni. of Hawaii), database of CME images and movies.

Dr. N. Labrosse (Physics, Uni. of Glasgow), H₂ lines from sunspots, interaction with coronal oxygen.

Dr. A. Breen, Dr. R. Fallows & G. Dorrian (IMAPS, Aberystwyth Uni.), preparation of tomographical density maps for use with IPS measurements.

Dr. Silvano Fineschi (Osservatorio Astro. di Torino, Italy), Dr. S. Habbal (IfA, Uni. of Hawaii) & Dr. B. Li (IMAPS, Aberystwyth Uni.), modeling of coronal UV lines for a proposed spectrometer for Solar Probe (2005, 2007).

Dr. J. Kuhn (IfA, Uni. of Hawaii), H₂ lines from sunspots, and implications for flow dynamics within sunspots (2005).

Dr. X. Li (IMAPS, Aberystwyth Uni.) & Dr. S. Habbal (IfA, Uni. of Hawaii), detection of coronal density waves with UVCS/SOHO (2004).

Professional Affiliations - American Geophysical Union, American Astronomical Society

Personal

Languages: Fluent in Welsh and English

I play the guitar and violin. I sing in a rock band, have recorded two albums and made several radio and television appearances. I support Llanelli Rugby Club and enjoy walking in Hawaii and North Wales.

Referees

Dr. Shadia R. Habbal
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PhD Thesis

Probing the Acceleration Region of the Solar Wind Using UltraViolet Spectroscopy

Analysis of UltraViolet Coronagraph Spectrometer data and spectroscopic modelling to determine the evolution of plasma parameters from the inner corona to the solar wind.

University of Wales, Aberystwyth, February 2005

Refereed Publications

R.A. Frazin, M. Jacob, W.B. Manchester, Huw Morgan and M.B. Watkin

Reconstruction of CME Density from Only 3 Points of View

Astrophysical Journal Letters, submitted March 2007

Huw Morgan

Mapping Coronal Density Structures Using Fourier Backprojection Tomography

Astronomy & Astrophysics, submitted December 2007

Huw Morgan, Silvano Fineschi, S. Rifai Habbal and Bo Li

In Situ Spectroscopy of the Solar Corona

Astronomy & Astrophysics, accepted February 2007

A.R.Breen, G.D. Dorrian, R.A. Fallows, M.M. Bisi, Huw Morgan, P. Thomasson and G. Wannberg

Super-radial expansion in the fast solar wind at interplanetary distances

Astrophysical Journal Letters, submitted 2007

Huw Morgan and S. Rifai Habbal

The Long-term Stability of the Visible F Corona at Heights of 3-6 R_{\odot}

Astronomy & Astrophysics, 471 (2), L47, 2007

S. Rifai Habbal, Huw Morgan, *et al.*

Localized Enhancements of Fe^{+10} density in the Corona as Observed in Fe XI 789.2 nm during the 29 March 2006 Total Solar Eclipse

Astrophysical Journal 663, 598, 2007

Huw Morgan and S. Rifai Habbal

Are solar maximum fan streamers a consequence of twisting sheet structures?

Astronomy & Astrophysics, 465, L47, 2007

Huw Morgan and S. Rifai Habbal

An Empirical 3D Model of the Large-scale Coronal Structure Based on the Distribution of H α Filaments on the Solar Disk

Astronomy & Astrophysics, 464, 357, 2007

Huw Morgan, S. Rifai Habbal and R. Woo

The Depiction of Coronal Structures in White-Light Images

Solar Physics, 236, 263, 2006

Huw Morgan and S. Rifai Habbal

The Impact of Sunspots on the Interpretation of Coronal Observations of the O VI Doublet

Huw Morgan, S. Rifai Habbal and X. Li

Hydrogen Ly- α Intensity Oscillations Observed by UVCS/SOHO

Astrophysical Journal, 605, 521, 2004

Recent Conference Presentations (P = poster, T = talk)

May 2007: AAS/SPD Honolulu, Hawaii, *Maps of the Coronal Electron Density Distribution at Solar Maximum - Estimates Based on LASCO Observations* (T)

April 2007: UKSP/NAM Preston, England, *Heavy ion doldrums in the solar corona* (P) ; *Twisted Sheet Structures & the Appearance of Coronal Streamers at Solar Maximum* (P)

December 2006: AGU San Fransisco, *Twisted Sheet Structures and the Appearance of Coronal Streamers at Solar Maximum* (P)

October 2006: Second Solar Orbiter Workshop, Athens, *Viewing Structure in Coronal Images* (T)

April 2006: UKSP, Aberystwyth, Wales, *The Structure of Streamers During Solar Maximum* (T)

March 2006: International Symposium on Solar Physics and Eclipses, Waw an Namos, Lybia, *The Structure of Streamers During Solar Maximum* (T)

November 2005: STEREO/Solar-B Science Planning Workshop, Turtle Bay, HI, USA, *The Accurate Depiction of Large Scale Structures and Coronal Mass Ejections in White Light Coronal Images* (P & T)

May 2005: AGU Joint Assembly, New Orleans, LA, USA, Dissertation talk: *The Impact of Sunspots on Modelling Coronal UV Observations* (T)

May 2005: AGU Joint Assembly, New Orleans, LA, USA, *Solar Probe's Inside-Out UV Spectrography of the Solar Wind* (T)

June 2004: 203rd AAS meeting, Denver, CO. USA, *A New Diagnostic Tool for Solar Wind Flow from the Quiet Sun: the Linewidth Ratio of the O VI 1032 and 1037 Doublet* (T)

April 2004: UKSP, Edinburgh, Scotland, *Oscillations in H Ly- α Intensity Observed by UVCS/SoHO* (T)

January 2004: RAS Waves in Solar and Magnetospheric Plasmas, London, England, *Oscillations in Hydrogen Ly- α Intensity Observed by UVCS/SoHO* (P)

Non-refereed Publications

Nicolas Labrosse, Huw Morgan, Shadia R. Habbal and Daniel Brown - *O VI and H2 Lines in Sunspots*
The Physics of Chromospheric Plasmas, ASP Conference Series, Heinzel, Dorotovic and Rutten, 2006,
eprint arXiv:astro-ph/0611490v2

Huw Morgan, Shadia R. Habbal and Silvano Fineschi - *Viewing Structure in Coronal Images*
ESA Conference Proceedings, Special Publication SP-641, 2006

J.R. Kuhn and Huw Morgan - *Osmotically Driven Neutral Sunspot Winds*
Solar MHD Theory and Observations: A High Spatial Resolution Perspective, ASP Conference Series Vol. 354, Uitenbroek, Leibacher, and Stein, 2006

Huw Morgan and S. Rifai Habbal - *Solar Maximum Streamers as Thin Twisting Sheets*
International Symposium on Solar Physics and Eclipses, Conference Proceedings, 2006

S. Rifai Habbal, J.R. Kuhn, D. Mickey, S. Jaeggli, Huw Morgan, I. Roussev, J. Johnson, M. Arndt, A. Daw, and M. Nayfeh - *Using Polarimetric Imaging and Spectroscopy of the Corona from 400-1800nm for Exploring the Near-Sun Plasma.*
International Symposium on Solar Physics and Eclipses, Conference Proceedings, 2006

J.R. Kuhn, H. Lin and Huw Morgan
Are Neutral Sunspot Winds Important For Penumbra Dynamics and the First Ionization Potential Effect?
eprint arXiv:astro-ph/0509862, 2005