

UCL – DEPARTMENT OF SPACE AND CLIMATE PHYSICS

MULLARD SPACE SCIENCE LABORATORY



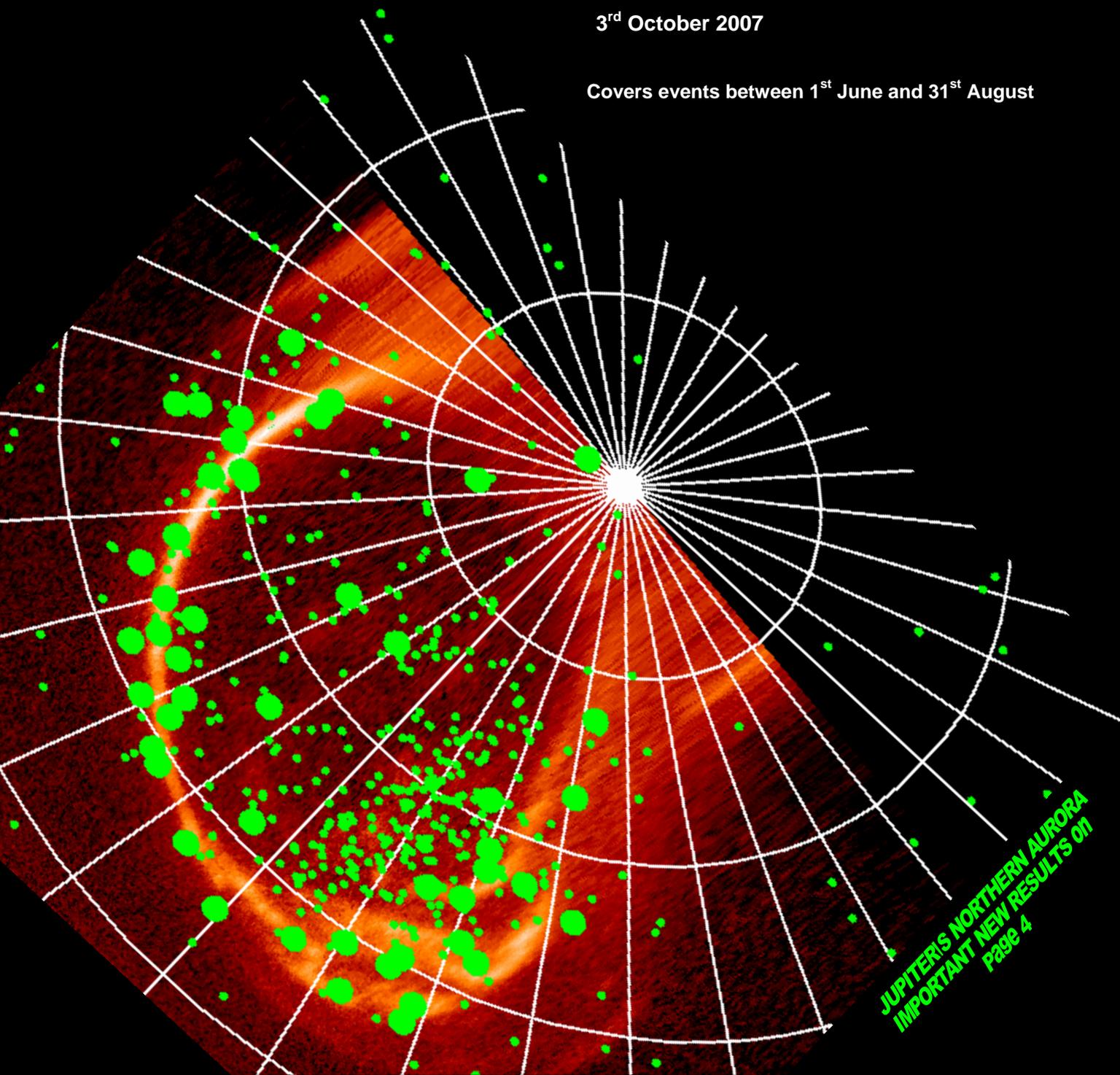
# UCL

**The Newsletter**

**Volume 5, Issue 2**

**3<sup>rd</sup> October 2007**

**Covers events between 1<sup>st</sup> June and 31<sup>st</sup> August**



**JUPITER'S NORTHERN AURORA  
IMPORTANT NEW RESULTS on  
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## General

We are pleased to welcome eight new PhD research students. They are Thomas Barclay (currently located at Armagh Observatory), Segheen Beyene, Sheila Kanani, Svetlana Korunoska, Alison Newell, Sharon Tsang, Alison Wallace, Shane Weatherstone and Anne Wellbrock.

The Alumni Day, held to celebrate MSSL's 40<sup>th</sup> anniversary on 15<sup>th</sup> September, was a great success. There will be more about this in the next newsletter.

## Promotions

Andrew Coates and Mark Cropper have been appointed Deputy Directors of MSSL for an initial term of two years.

## Visitors

Dr. Richard Rijnbeek from University of Sussex visited on 11 June, and gave a seminar entitled Petschek-type Reconnection at the Magnetopause.

The Dean's Summer Student, Renyu Hu, visited us from École Centrale Paris. He worked for two months on a project entitled, "Reconnection geometries during Northward IMF", under the supervision of Yulia Bogdanova, Chris Owen and Claire Foullon.

Scott Blunden, a summer student from the University of Reading, worked under the supervision of Claire Foullon on 'Multi-spacecraft conjunctions near the Earth's magnetopause', 16 July - 10 Aug.

## Prizes and Awards

Yulia Bogdanova - travel grant from UCL Graduate School (Staff Conference Fund).

Claire Foullon - travel grants from SHINE and UCL Staff Conference Fund.

Roberto Soria was awarded a Sydney University Visiting Grant, to spend 3 months (Dec 07-Feb 08) at their School of Physics, collaborating with Dr Zdenka Kuncic on accretion studies. He was also awarded a Research Fellowship from the UK Dept of Innovation, Universities and Skills, to conduct a four-month research project at Tsinghua University (Beijing), with Prof Shuang-Nan Zhang. He will take up this grant later in 2008.

## New Staff Members

Julia Wehrle has joined the General Office where she is "job sharing" with Sue Russell and Nick Smith is MSSL's new driver.

## Appointments (e.g. Editorial Boards or Committees)

Andrew Fazakerley has started on a new STFC Astronomy Grants Panel committee reviewing Rolling Grants.

## Telescope/Satellite time awards/proposals

Roberto Soria

- Co-I of a successful Chandra proposal to observe the old X-ray population of the Local-Group dwarf galaxy Draco (PI: Prof Rosanne DiStefano, Harvard-CfA).
- Co-I in a successful INTEGRAL proposal to monitor a few X-ray binaries with jets in the Galactic Centre region and Cygnus region (PI: John Tomsick, Berkeley).
- Obtained 20 hours on VLT/FORS1 to take phase-resolved optical spectra of the ultraluminous X-ray source NGC1313 X-2.

## Grants and Contracts Awarded

CRYOSAT Simulator (CRYMPS) contract: A CCN to an existing contract was agreed with ESA for activities in 2007/8. Value £ 112K (FEC). Steve Baker is PI.

## Proposals

Three ESA Cosmic Vision proposals were submitted involving penetrator missions to the Moon, Europa and Titan respectively, with MSSL leading the LunarEX proposal.

## Mission Status and Developments

Cassini – Operating well. Science continues to be very productive.

Cluster – All four PEACE instruments are in good condition and returning good data.

CAA review - The PEACE team was praised for their calibrations improvement.

Cosmic Visions Candidates – Proposals are being evaluated.

Cross-Scale – The proposal for the Cross-Scale mission, in response to the AO for Cosmic Visions 2015+, has been submitted.

Double Star – The PEACE instrument on the TC1 satellite continues to work well. Connection to the Double Star TC-2 satellite was lost in early August.

ExoMars – The next 6 months' funding (including optics contract) is under discussion.

FP7 - Titan analysis proposal submitted (as part of a consortium).

Solar Orbiter – Work on the Solar Orbiter PRD is continuing in anticipation of the AO in September. Chris Owen and Dhiren Kataria attended a meeting with the ESA project team and industrial contractors, 5-6 June.

UCL Centre for Planetary Sciences - a new "virtual" research centre begins operations in September 2007. The Centre's activities will encompass planetary science research performed at MSSL and in the departments of Physics & Astronomy and Earth Sciences. Geraint Jones will be the director of the CPS for the 2007-2008 period.

Venus Express and Mars Express – Generally operating well.

## Publications - Refereed

S & CP authors are shown in upper case.

### A. Published

Andre, N., Persoon, A.M., Goldstein, J., Burch, J.L., Louarn, P., LEWIS, G.R., Rymer, A.M., COATES, A.J., Kurth, W.S., Sittler, E.C., Thomsen, M.F., Crary, F.J., Dougherty, M.K., Gurnett, D.A. & Young, D.T., Magnetic signatures of plasma-depleted flux tubes in the Saturnian inner magnetosphere, *Geophysical Research Letters*, **34**, 14, L14108, 2007. [10.1029/2007GL030374](https://doi.org/10.1029/2007GL030374)

- Baumjohann, W., Roux, A., Le Contel, O., Nakamura, R., Birn, J., Hoshino, M., Lui, A.T.Y., OWEN, C.J., Sauvaud, J.-A., Vaivads, A., Fontaine, D. & Runov, A., Dynamics of thin current sheets: Cluster observations, *Ann. Geophysicae*, **25**, 1365-1389, 2007.
- BOGDANOVA, Y.V., OWEN, C.J., Siscoe, G., FAZAKERLEY, A.N., Dandouras, I., Marghito, O., Kaymaz, Z., Reme, H. & Lucek, E.A., Cluster Observations of the Magnetospheric Low-Latitude Boundary Layer and Cusp During Extreme Solar Wind and Interplanetary Magnetic Field Conditions: 1. 10th November 2004 ICME, *Solar Phys.*, 2007. [10.1007/s11207-007-0417-1](https://doi.org/10.1007/s11207-007-0417-1)
- BOGDANOVA, Y.V., OWEN, C.J., Siscoe, G., FAZAKERLEY, A.N., Dandouras, I., Marghito, O., Kaymaz, Z., Reme, H. & Lucek, E.A., Cluster Observations of the Magnetospheric Low-Latitude Boundary Layer and Cusp During Extreme Solar Wind and Interplanetary Magnetic Field Conditions: 2. 07th November 2004 ICME and Statistical Survey, *Solar Phys.*, 2007. [10.1007/s11207-007-0418-0](https://doi.org/10.1007/s11207-007-0418-0)
- Fear, R.C., Milan, S.E., FAZAKERLEY, A.N., OWEN, C.J., Aiskainen, T., Taylor, M.G.G.T., Lucek, E., Reme, H., Dandouras, I. & Daly, P.W., Motion of Flux Transfer Events: A Test of the Cooling Model, *Ann. Geophysicae*, **25**, 1669-1690, 2007.
- FOULLON, C., OWEN, C.J., Dasso, S., GREEN, L.M., Dandouras, I., Elliott, H.A., FAZAKERLEY, A.N., BOGDANOVA, Y.V. & Crooker, N.U., Multi-Spacecraft Study of the 21 January 2005 ICME: Evidence of Current Sheet Substructure Near the Periphery of a Strongly Expanding, Fast Magnetic Cloud, *Solar Phys.*, 2007. We report on a study of an interplanetary CME observed near Earth, associated with a solar event that was spectacular and historic in many ways. The implications of those observations for the dynamics and structure of the solar coronal region that produced it can provide powerful constraints for ongoing efforts to model this event. [10.1007/s11207-007-0355-y](https://doi.org/10.1007/s11207-007-0355-y)
- Grocott, A., Yeoman, T.K., Milan, S.E., Amm, O., Frey, H.U., Juusola, L., Nakamura, R., OWEN, C.J., Reme, H. & Takada, T., Multi-scale observations of magnetotail flux transport during IMF-northward non-substorm intervals, *Ann. Geophysicae*, **25**, 2007.
- Hedman, M.M., Burns, J.A., Tiscareno, M.S., Porco, C.C., JONES, G.H., Roussos, E., Krupp, N., Paranicas, C. & Kempf, S., The source of Saturn's G ring, *Science*, **317**, 5838, 653-656, 2007. [10.1126/science.1143964](https://doi.org/10.1126/science.1143964)
- Jackman, C.M., Russell, C.T., Southwood, D.J., ARRIDGE, C.S., Achilleos, N. & Dougherty, M.K., Strong rapid dipolarizations in Saturn's magnetotail: In situ evidence of reconnection, *Geophysical Research Letters*, **34**, 11, L11203, 2007. [10.1029/2007GL029764](https://doi.org/10.1029/2007GL029764)
- Lavraud, B., Borovsky, J.E., Ridley, A.J., Pogue, E.W., Thomsen, M.F., Reme, H., FAZAKERLEY, A.N. & Lucek, E.A., Strong bulk plasma acceleration in Earth's magnetosheath: A magnetic slingshot effect? *Geophysical Research Letters*, **34**, L14102, 2007. [10.1029/2007GL030024](https://doi.org/10.1029/2007GL030024)
- Rea, N., Torres, M.A.P., Jonker, P., MIGNANI, R., ZANE, S., Burgay, M., Kaplan, D., TUROLLA, R., Israel, G.L. & Steeghs, D., Accurate X-ray position and multiwavelength observations of the isolated neutron star RBS 1774, *Mon. Not. R. astr. Soc.*, **379**, 4, 1484-1490, 2007. [10.1111/j.1365-2966.2007.12029.x](https://doi.org/10.1111/j.1365-2966.2007.12029.x)
- Rea, N., Turolla, R., ZANE, S., Tramacere, A., Stella, L., Israel, G.L. & Campana, R., Spectral modelling of the high energy emission of the magnetar 4U 0142+614, *Astrophys. J. Lett.*, **661**, 1 L65-L68, 2007. [10.1086/518434](https://doi.org/10.1086/518434)
- Rousson, E., JONES, G.H., Krupp, N., Paranicas, C., Mitchell, D.G., Lagg, A., Woch, J., Motschmann, U., Krimigis, S.M. & Dougherty, M.K., Electron microdiffusion in the Saturnian radiation belts: Cassini MIMI/LEMMS observations of energetic electron absorption by the icy moons, *J. Geophys. Res. - Space Physics*, **112**, A6, A06214, 2007. [10.1029/2006JA012027](https://doi.org/10.1029/2006JA012027)
- WALSH, A.P., FAZAKERLEY, A.N., Wilson, R.J., ALEXEEV, I.V., HENDERSON, P.D., OWEN, C.J., Lucek, E., Carr, C. & Dandouras, I., Near-simultaneous magnetotail flux rope observations with Cluster and Double Star, *Ann. Geophysicae*, **25**, 1887-1897, 2007.
- Zhang, Y.C., Liu, Z.X., Shen, C., FAZAKERLEY, A.N., Dunlop, M., Reme, H., Lucek, E., WALSH, A.P. & Yao, L., The magnetic structure of an Earthward-moving flux rope observed by Cluster in the near-tail, *Ann. Geophysicae*, **25**, 7, 1471-1476, 2007.

## In Press

“Spectral morphology of the X-ray emission from *Jupiter's aurorae*”, (see front cover)

Branduardi-Raymont, G., Elsner, R.F., Galand, M., Grodent, D., Cravens, T. E., Ford, P., Gladstone, G.R., Waite, J.H. Jr.

We have re-examined simultaneous Chandra X-ray and Hubble Space Telescope FUV observations of Jupiter's aurorae obtained in 2003 and found that in the Northern aurora >2 keV X-ray events (big

green dots on the cover page) are located at the periphery of those with energy <2 keV (small green dots) and coincide with FUV bright features (like the auroral oval - orange in the picture). Recent XMM-Newton observations have shown that the >2 keV events are most likely due to bremsstrahlung from precipitating energetic electrons. Since the FUV emission of the aurorae is attributed to the interaction of energetic electrons with Hydrogen molecules in Jupiter's atmosphere, we suggest that the same population of electrons is responsible for the emissions in the two bands. This is supported by the observed luminosities, which are consistent with model predictions.

## **Publications - Non-refereed**

### **A. Published**

Marchaudon, A., Cerisier, J.-C., Bosqued, J.-M., BOGDANOVA, Y.V. & OWEN, C.J., [Dayside magnetic reconnection: properties and impact on the magnetosphere-ionosphere system](#), in Rapport Quadriennal du CNFGG 2003-2006, 209-238, D. Schertzer and I. Tchiguirinskaia (Eds.), CERVE, France, 2007.

### **Invited Talks and Lectures**

Graziella Branduardi-Raymont gave an invited talk on "X-ray spectroscopy of solar system objects" at the "X-ray Grating Spectroscopy" workshop in Cambridge, Mass. (12 July 2007) and an invited talk on "Comparative X-ray studies of planetary aurorae" at the Asia Oceania Geosciences Society 2007 meeting in Bangkok (2 Aug 2007).

Coates, A. J., Crary, F.J., Young, D.T. and Waite, J.H. Jr., Negative Ions in Titan's Upper Atmosphere: Status of Observations and Theory (Invited), presented at Magnetospheres of the Outer Planets, San Antonio, TX, 25-29 June 2007.

Coates, A.J., "Ionospheric photoelectrons and negative ions, as observed by CAPS" (Invited), presented at ISSI international team meeting on Titan aeronomy, 27-31 Aug 2007.

Claire Foullon gave an invited talk in the Special Session on the 20 January 2005 Solar Event at the SHINE workshop (Whistler, Canada), on the multi-spacecraft analysis of the ICME that accompanied this event (30 July): "Multi-spacecraft study of the January 21st 2005 ICME: Evidence of Current Sheet Substructure at the Periphery of a Strongly Expanding, Fast, Magnetic Cloud".

### **Conferences and Workshops (National and International)**

*The Planetary Science group were represented at 3 international conferences.*

*15 papers were presented at Magnetospheres of the Outer Planets, San Antonio, TX, 25-29 June 2007, including AJC invited talk (above) and two other MSSSL-led presentations:*

**Arridge, C. S.**, E. C. Sittler, N. Andre, **A. J. Coates**, M. K. Dougherty, K. K. Khurana, **G. R. Lewis**, H. J. McAndrews, and C. T. Russell, Plasma Electrons in Saturn's Magnetotail.

**Arridge, C.S.**, N. Achilleos, E. J. Bunce **A. J. Coates**, S. W. H. Cowley, M. K. Dougherty, T. W. Hill, **G. H. Jones**, K. K. Khurana, H. J. McAndrews, C. T. Russell, D. S. Talboys, and R. J. Wilson, Cassini CAPS Observations in Saturn's Polar Magnetosphere.

#### **Other presentations:**

Bunce, E. J., S.W.H. Cowley, D.L. Talboys, **C.S. Arridge**, **A.J. Coates**, J.T. Clarke, M.K. Dougherty, J.-C. Gérard, N. Krupp, W.S. Kurth, C.T. Russell, and D.J. Southwood, Evidence of Upward Field-Aligned Currents at the Open-Closed Field Line Boundary in Saturn's Noon Magnetosphere: Observations and Theory.

Achilleos, N., **C. S. Arridge**, C. Bertucci, H. J. McAndrews, M. K. Dougherty, **A. J. Coates**, and Cassini Magnetometer Team, A Survey of Magnetopause Structure at Saturn Observed By Cassini.

Goldstein, J., J. L. Burch, W. S. Lewis, D. T. Young, **A. J. Coates**, C. T. Russell, N. André, and J. S. Leisner, Spatial Distribution and Dependence of Saturnian Injection Events, and Implications for Equatorial Current Sheet.

Masters, A., M. K. Dougherty, N. Achilleos, C. Bertucci, **C. S. Arridge**, **A. J. Coates**, and G. B. Hospodarsky, Kronian Bow Shock Survey: Results from the First Five Orbits of the Cassini Spacecraft.

Menietti, J. D., A. M. Rymer, D. A. Gurnett, O. Santolik, D. T. Young, and **A. J. Coates**, Analysis of Plasma Waves Observed within Local Plasma Injections within Saturn's Magnetosphere.

Masters, A., M. K. Dougherty, **C. S. Arridge**, L. Billingham, Z. Bebesi, **A. J. Coates**, and G. B. Hospodarsky, Cassini Observations of Hot Flow Anomalies at Saturn's Bow Shock.

McAndrews, H. J., **C. J. Owen**, M. F. Thomsen, **A. J. Coates**, **C. S. Arridge**, M. K. Dougherty, and D. T. Young, Detection and Frequency of Reconnection at Saturn's Magnetopause.

Sittler Jr., E. C., **C. Arridge**, A. Rymer, **A. Coates**, N. Krupp, M. Blanc, J. Richardson, N. Andre, M. Thomsen, Mike Henderson, J. F. Cooper, M. Burger, D. Simpson, K. K. Khurana, M. Dougherty, and D. T. Young, Cassini Observations of Saturn's Dawn-Magnetotail Region: Preliminary results.

Hill, T. W., M. G. Henderson, M. F. Thomsen, R. L. Tokar, M. K. Dougherty, C. M. Jackman, D. G. Mitchell, F. J. Crary, D. T. Young **A. J. Coates**, and C. T. Russell, Plasmoids in Saturn's Magnetotail.

Jackman, C. M., N. Achilleos, **C. S. Arridge**, H. J. McAndrews, D. G. Mitchell, W. S. Kurth, T. W. Hill, N. Krupp, C. T. Russell, M. K. Dougherty, E. J. Bunce, and **A. J. Coates**, A Multi-Instrument View of Tail Reconnection at Saturn.

Eviatar, A., R. Goldstein, **C. Arridge**, **A.J.Coates** and D. T. Young, Comparison of Voyager PLS and CAPS Observations around Titan: Plumes Versus Blobs.

Najib, D., Y.-J. Ma, A. Nagy, G. Toth, T. E. Cravens, F. Crary, **A. Coates**, C. Bertucci, F. Neubauer, C. Russell, J. H. Waite, and J.-E. Wahlund, A Comparison of MHD Model Calculations with Observations for the T18 Flyby of Titan by Cassini.

Rymer, A. M., B. H. Mauk, C. P. Paranicas, T. W. Hill, **A. J.Coates**, and D. T.Young, Electron Circulation in Saturn's Magnetosphere.

*5 abstracts were presented at IAGA, Perugia, 2-13 July 2007.*

**Soobiah Y.**, **A.J. Coates**, D. Winningham, R.A. Frahm, R. Lundin, S. Barabash. New results from Mars on crustal field electron signatures and on Venus-like electron holes.

**Coates A.**, **Y. Soobiah**, **C. Arridge**, R. Frahm, D. Winningham, D. Young, S. Barabash, R. Lundin, E. Sittler, K. Szego, D. Hartle, Aspera-4 Team, Aspera-3 Team, Caps Team. Plasma interaction with Venus, Mars and Titan: similarities and differences.

Sauvaud J-A, C. Ferrier, C. Mazelle, A. Fedorov, S., Barabash, R. Lundin, T.L. Zhang, **A. Coates**. VEX Insight on the Boundary Separating Solar and Planetary Plasmas Around Venus.

Bertucci Cesar, Nicholas Achilleos, Karol y Szego, **Andrew J. Coates**, Jan-Erik Wahlund, **Christopher S. Arridge**, Fritz M. Neubauer, Christian Mazelle, Ronan Modolo, Michele K. Dougherty, David Young, William Kurth., The structure and variability of Titan's magnetic environment.

Fraenz Markus, E. Dubinin, E. Roussos, C. Martinecz, J. Woch, R. Frahm, D. Winningham, **A.J. Coates**, **Y. Soobiah**, S. Barabash, R. Lundin, The Ionopause at Mars and Venus.

*11 abstracts were presented at Europlanet – the European Planetary Science Congress, Potsdam, 20-24 Aug 2007.*

Fraenz, M.; Dubinin, E.; Martinecz, C.; Roussos, E.; Woch, J.; Barabash, S.; **Coates, A.**; Fedorov, A.; Frahm, R.; Lundin, R., Plasma Moments in the Environment of Mars and Venus.

Bebesi, Z; Erdos, G; Szego, K; **Arridge, C**; **Coates, A**; Bertucci, C; Dougherty, M; Thomsen, M; Young, D, Particle dynamics at SLAMS observed at the Kronian bow shock.

Hospodarsky, G. B.; Menietti, J. D.; Averkamp, T. F.; Kurth, W. S.; Gurnett, D. A.; Dougherty, M. K.; Rymer, A. M.; **Coates, A.**; Young, D. T.; Santolik, O., Chorus Observations at Saturn.

**Jones, G. H.**; Roussos, E. ; Krupp, N. ; **Coates, A. J.**; Dougherty, M. K.; Krimigis, S. M.; McAndrews, H. J.; Mitchell, D. G.; Paranicas, C. ; Young, D. T., Rhea's magnetospheric environment as determined by Cassini MIMI and CAPS electron observations.

Szego, K.; Bebesi, Z.; Bertucci, C.; **Coates, A. J.**; Crary, F.; Erdos, G.; Hartle, R.; Sittler, E. C.; Young, D. T., Investigation of ion distributions in the plasma mantle of Titan.

**Arridge, CS**; Sittler, EC; **Gilbert, L**; Khurana, KK; **Lewis, GR**; Russell, CT; Andre, N; **Coates, AJ**; Dougherty, MK; McAndrews, HJ, Thermal electrons in Saturn's magnetotail.

Bebesi, Z; Erdos, G; Szego, K; **Arridge, C**; **Coates, A**; Bertucci, C; Dougherty, M; Thomsen, M; Young, D, Particle dynamics at SLAMS observed at the Kronian bow shock.

Hospodarsky, G. B.; Menietti, J. D.; Averkamp, T. F.; Kurth, W. S.; Gurnett, D. A.; Dougherty, M. K.; Rymer, A. M.; **Coates, A.**; Young, D. T.; Santolik, O., Chorus Observations at Saturn.

Dubin, E.; Fraenz, M.; Woch, J.; Roussos, E.; Winningham, J. D.; Frahm, R.; Chanteur, G.; **Coates, A.**; Lundin, R.; Barabash, S., Electrons as Tracers of Physical Processes within the Martian Magnetosphere.

Roussos, E., **JONES, G.H.**, Krupp, N., Paranicas, C., Mitchell, D.G., Hedman, M.M., Burns, J.A., Motschmann, U., Detection and physical characterization of dust structures at Saturn, through energetic charged particle data: new results from Cassini.

Roussos, E.; Krupp, N., **JONES, G. H.**; Paranicas, C.; Mitchell, D. G.; Krimigis, S. M.; Motschmann, U.; Lagg, A.; Woch, J. Energetic charged particle absorption by Saturn's icy moons: future studies and new applications.

#### *Software Engineering Group*

Rob Gowen presented a paper on micro-penetrators for Solar System exploration at the Bordeaux planetary microprobes workshop at the end of June, followed in August by a presentation on Lunar Penetrators to NASA for the British delegation. Alan Smith gave a presentation in Bangkok for Lunar penetrators.

#### *Members of the Space Plasma Physics Group attended the following meetings:*

Chris Owen, Claire Foullon and Yulia Bogdanova attended the IUGG general assembly, Perugia, Italy, 02-08 June 2007. A number of papers which included MSSL authors were presented. Yulia Bogdanova gave one talk and Claire Foullon gave two talks:

BOGDANOVA, Y.V., C.J. OWEN, G. Siscoe, O. Marghita, I. Dandouras, Z. Kaymaz, H. Reme, E.A. Lucek, A.N. FAZAKERLEY, The Magnetospheric Low-Latitude Boundary Layer and Cusp Dynamics during Interplanetary Coronal Mass Ejection Events.

FOULLON, C., C.J. OWEN, S. Dasso, L.M. Green, I. Dandouras, H.A. Elliott, A.N. FAZAKERLEY, Y.V. BOGDANOVA, N.U. Crooker, Multi-spacecraft study of the January 21st 2005 ICME: Evidence of Current Sheet Substructure at the Periphery of a Strongly Expanding, Fast, Magnetic Cloud.

FOULLON, C., C.J. Farrugia, F.T. Gratton, C.J. OWEN, R.B. Torbert, A.N. FAZAKERLEY, Evolution of Kelvin-Helmoltz Activity along the Dusk Flank Magnetopause from Two-point Distant Observations

In addition Chris Owen convened the session 'Magnetopause and magnetosheath processes: reconnection, diffusion and boundary dynamics'.

Kimberley Steed attended the SOHO 20 conference in Belgium during 27-31 Aug and presented a poster and a talk.

K. STEED and G. Del Zanna Measurements of Significant Plasma Flows in the Regions of Blinkers with SOHO/CDS

K. STEED, C.J. OWEN and L.K. Harra Interplanetary Evolution of 10 April 2006 CME and its Associated Magnetic Cloud.

Andrew Fazakerley and Andrew Walsh attended the ISSI meeting on 15-18 July. Andrew Walsh presented a talk:

WALSH, A.P., A.N. FAZAKERLEY, and the ISSI team, Cluster PEACE observations of reverse flows at a BBF.

#### *Astrophysics Group*

Roberto Soria

Talk at the workshop "New Results in X-ray Astronomy", Leicester, 18 July.

Talk at the conference "X-ray surveys: evolution of accretion, star-formation and large scale structure", Rhodes (Greece), 2-6 July.

Talk at the workshop "X-rays from Nearby Galaxies", ESAC (Villafranca, Spain), 5-7 Sept

## **Media Broadcasts and Features**

Andrew Coates:

Guardian on Pluto, 15 June 2007.

BBC News 24, 22 June 07, on shuttle landing; 11 July 2007, on observations of early Universe; 8 Aug 2007, on large, low density extrasolar planet discovery.

BBC R2 Chris Evans/John Inverdale programme, interview on space exploration, 13 Aug 2007.

702 news radio (South Africa), Interview on space exploration (shuttle, ISS, Cassini, MEX, VEX) for Middy report on 14 Aug 2007.

BBC World TV, BBC News 24, BBC World Service (Newshour), 21 Interviews on shuttle landing and space exploration, 21 Aug 2007.

BBC R4 6 o'clock news, Interview on empty region of space and expanding universe, 24 Aug 2007.

## **Outreach**

Ian Hepburn, Dhiren Kataria, Julia Gaudelli and Yulia Bogdanova provided space activities at the Horsham Weald Scout centenary camp, Dial post, West Sussex. 700 children from 6 to 14 years old attended of which approximately 300 took part in space activities provided by MSSL, 26-27 May.

Andrew Coates gave a talk on 'Venus Express and Mars Express' at Castle Point Astronomical Society, 6 June.

Chris Arridge talked on Sun-planet connections to the ASE Teacher training day at MSSL, 13 June and gave a talk, "Propulsion for the Cassini mission to Saturn" at the Ideas Foundation/Queen Mary University of London Space School on 11/12 July. He also helped out with interactive activities (rocket launching), and was a "Fields and Particles" mentor for the "Cassini mission planning" event.

Roberto Soria gave a talk at Collyer's School, Horsham, June 2007.

London International Youth Science Forum visited MSSL – thank you to all the speakers and guides who helped with this, 31 July.

World Scout Jamboree, Essex. Ian Hepburn with help from Chris Brockley-Blatt and Kimberley Steed provided activities and posters. Ian Hepburn was a member of the Jamboree delivery team. Kimberley prepared two posters on the Sun-Earth Connection and Space. The event was attended by more than 40,000 scouts from all over the world, 28 July to 10 Aug.

Ian Hepburn provided a day's space activities at the New Addington Baptist Church summer playclub. 44 children over the age range 6 to 11 years attended, 6 Aug.

Laura Pickard was one of the organisers for the XXII International Conference of Physics Students (ICPS), held at UCL from 10-16 Aug. ICPS 2007 was organised by Nexus (the student branch of the Institute of Physics and IAPS National Committee for the UK and Ireland), marking the first time the event has been held in the UK. 360 delegates attended from over 30 different countries. Chris Arridge, Andy Fenny, Roberto Soria and Peter Yuen attended on 14 and 15 Aug to talk about research at MSSL. The ICPS team would like to thank them for their contribution, which received many positive comments from delegates.

Ian Hepburn and Chris Brockley-Blatt provided space activities at the Woking West Girl Guide summer camp at Lyndhurst, New Forest. 24 girls attended, 24 Aug.

## Sports events

### Croquet

Jenny Barnes organised “The MSSL Croquet Tournament 2007”. This was a great success and enjoyed by all involved, whether “novice” or “pro”. Ten teams of two (plus substitutes!) battled it out on the MSSL Croquet Lawn over the 8 week period in the hope of winning the glorious Croquet Trophies for their group. Climate Extremes and OPS were the winning teams from their respective pools. The final was very exciting to watch and produced the overall winners of the tournament: Mark Saunders and Adam Lea, with Chandrasekhar Auekallu and Andrew Lahiff as runners up – our congratulations go to them all! If you missed out this time then make sure you join in next summer when it will start all over again!



### Cricket

The MSSL Cricket Match was played in fine weather and in the splendid surroundings at Holmbury St Mary. Although it was held as part of the 40h anniversary celebration it was enjoyed so much that we may well hold another MSSL match next year.

The scores were as follows:

40 & Under Team: 125 for 4 wickets in 20 overs

Over 40 Team: 117 for 8 wickets in 20 overs

Man-of-the-match: Alan Muir (score of 60).

## Other News

Matt Whyndham has taken over from Ian Mason as Graduate Tutor for MSSL’s taught programmes.

## Next Issue

The next issue of the Department of Space and Climate Physics Newsletter (Volume 5, Issue 3) will be published in December 2007. This will cover activities from 1 September 2007 to 30 November 2007.