



**The Newsletter - Volume 10, Issue 2**  
**3 October 2012**

**Covers events between 1 June 2012 and 31 August 2012**

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**Stop Press**

We are pleased to welcome 8 new PhD research students:

- Kim Birkett – Planetary Science
- Jack Carlyle – Solar Physics
- Richelle de Bokx – Astrophysics
- Marianna Felici and Alice Foster - Plasma Physics Group;
- Luyi Sun and Josh Veitch-Michaelis - Imaging Group;
- Robert Wacholc - Instrumentation

**New Staff Member**

Sabrina Pottinger has joined the Astrophysics Group as EUCLID Project Manager.

**Appointments**

Chris Arridge was appointed to the STFC Solar System Advisory Panel.

Lidia van Driel Gesztelyi has been elected President of IAU Division E - Sun and Heliosphere during the IAU XXVIII General Assembly held in Beijing, 20-31 August.

Mat Page has been promoted to Professor and Sarah Matthews has been promoted to Reader;

Chris Arridge, Lucie Green and Dave Williams have been appointed as lecturers.

## Visitors

The Planetary Science group were visited by:

- Dr Sarah Badman (JAXA) who gave a seminar on "Cassini VIMS insights into solar wind magnetosphere-ionosphere coupling at Saturn", 19 June;
- Dr Karen Aplin (Univ. Oxford). She gave a seminar on "Electrical processes in planetary atmospheres", 3 July;
- Dr Marissa Vogt (Univ. Leicester) who gave a seminar on "The Structure and Dynamics of Jupiter's Magnetosphere", 7 August;
- Dr Adam Masters (JAXA). Adam gave a seminar on "Spacecraft observations of relativistic electron production at a very strong quasi-parallel shock wave", 21 August.

## Grants and Contracts

L-CAM study (ESA) – contract to study a camera system for ESA's proposed Lunar Lander.

The UKSA grants for the Solar Orbiter build phase for SWA and EU1 were finally awarded in July (for a 1 April 2012 start).

## PhDs Awarded

Awat Rahimi and Sheila Kanani have both been successful in defending their PhD theses.

## Mission Status and Developments

**Cassini** - CAPS has been off since 2 June. The scientific output from CAPS at MSSL continues to be excellent (see publications and presentation lists).

**Cluster** - All four Cluster spacecraft and all four PEACE instruments continue to operate well.

Special operations were performed in August for Guest Investigator studies (Retino magnetotail) and to support investigations of intermittent electromagnetic wave interference seen by WBD and WHI in certain plasma environments.

Cluster passed the Mission Extension Operations Technical Review held on 27 June as part of the process of deciding whether the mission will be extended through to December 2014.

**ExoMars** - Discussions continue on Russian collaboration at mission and instrument level. PanCam work continuing including leading team and agency interactions and building a simulator "flatcam". Outreach talks continuing (see list).

Adaptation for lunar lander also being studied. PSS paper now in press and ESA study started, letter of interest submitted for PI role on L-CAM.

**JUICE** - Following the approval of the JUICE mission by ESA in early May and the AO which was released in late June, we are continuing to work on proposals for instrumentation as PI and Co-I on the mission.

**KuaFu** - ESA are considering redefining the proposed ESA component of KuaFu to be lead from the Space Situational Awareness programme (which has an interest in developing an operational space weather capability) supported by the Science Programme, rather than the Science Programme alone.

**L-Depp** - The MSSL L-DEPP team continued to make progress towards the final L-DEPP presentations to ESA, scheduled for early September. It is hoped that successful completion of the study will lead to the Lunar Lander technology demonstration mission being approved by the ESA Ministerial meeting in November and place the lab in a good position to respond, with our international partners, to a possible instrument AO in the New Year.

**Solar Orbiter** - The Solar Orbiter SWA PDR process produced a number of "RIDs" on 1 June requiring initial response by the team with a deadline of 8 June. These were then discussed in detail at the co-location meeting in ESTEC on 12-13 June in which the MSSL team and several international partner representatives agreed action items with the ESA project team. We have been working on these AI's over the summer.

The SO EMC working group met in Stevenage on 20-21 June. The latest progress on achieving the required electromagnetic and electrostatic cleanliness for the spacecraft was discussed.

The SO Boom working group, chaired by Chris Owen, held several meetings and telecons over the summer to address a number of problematic issues that have emerged now that a boom industrial subcontractor has been confirmed and an initial design "released". We continue to work on the acceptable accommodation of sensors on the boom and on the routing of harness cables past electromagnetically sensitive instruments. ESA is investigating whether it would be possible to accommodate a slightly longer boom to help solve the former issue.

The MSSL team continues to be engaged with the wider SWA team in fortnightly telecons, and with the project during regular telecons and progress meetings.

**Venus Express and Mars Express** - Operations and scientific output continue.

## **Publications – Refereed**

### **Published**

Carbary, J.F., N. Achilleos, C.S. Arridge, Statistical ring current of Saturn, *Geophys. Res. Lett.*, 117, A06223, [doi:10.1029/2011JA017472](https://doi.org/10.1029/2011JA017472), published June 2012.

Fisher, D. and Muller, J.-P. 2012. 'Global warping coefficients for improving ATSR co-registration'. *Remote Sensing Letters*, 4(2).

Grand R. J. J., Kawata D., Cropper M., Dynamics of stars around spiral arms in an N-body/SPH simulated barred-spiral galaxy, *MNRAS* 426, 167, 2012.

Taylor, M.G.G.T., H. Hasegawa, B. Lavraud, T. Phan, C. P. Escoubet, M. W. Dunlop, Y. V. Bogdanova, A. L. Borg, M. Volwerk, J. Berchem, O. D. Constantinescu, J. P. Eastwood, A. Masson, H. Laakso, J. Soucek, A. N. Fazakerley, H. U. Frey, E. V. Panov, C. Shen, J. K. Shi, D. G. Sibeck, Z. Y. Pu, J. Wang, and J. A. Wild, Spatial distribution of rolled up Kelvin-Helmholtz vortices at Earth's dayside and flank magnetopause, *Annales Geophysicae*, 30, Issue 6, pp.1025-1035, DOI:10.5194/angeo-30-1025-2012, 06/2012.

Zhang, Q.-H., M. W. Dunlop, M. Lockwood, B. Lavraud, Y. V. Bogdanova, H. Hasegawa, H.-G. Yang, R.-Y. Liu, H.-Q. Hu, B.-C. Zhang, Z.-Y. Pu, Z.-W. Yang, J. Wang, M. G. G. T. Taylor, J. Berchem, D. Constantinescu, M. Volwerk, H. Frey, A. N. Fazakerley, C. Shen, J.-K. Shi, D. Sibeck, P. Escoubet, and J. A. Wild, Inner plasma structure of the low-latitude reconnection layer, *Journal of Geophysical Research*, 117, Issue A8, CitelD A08205, DOI:10.1029/2012JA017622, 08/2012.

### **Papers in press**

Coates, A.J., A.D.Griffiths, C.E. Leff, N. Schmitz, D.P. Barnes, J.-L. Josset, B.K. Hancock, C.R. Cousins, R. Jaumann, I.A. Crawford, G. Paar, A. Bauer, and the PanCam team, Lunar PanCam: adapting ExoMars PanCam for the ESA Lunar Lander, *Planetary and Space Science*, in press, 2012.

Cousins, C., M Gunn, B Prosser, D Barnes, I Crawford, A Griffiths, L Davis, A Coates, Selecting the geology filter wavelengths for the ExoMars Panoramic Camera instrument, *Planetary and Space Science*, in press, Jul 2012.

Galand, M., A.J. Coates, T.E. Cravens and J.-E. Wahlund, Titan's ionosphere, submitted to *Titan: Surface, Atmosphere and*

*Magnetosphere*" for Cambridge University Press (Cambridge Planetary Science Series), eds. I. Mueller-Wodarg, C. Griffith, E. Lellouch and T. Cravens, in press, 2012.

Garnier, P., J.-E. Wahlund, M.K.G. Holmberg, M. Morooka, S. Grimald, A. Eriksson, D.A. Gurnett, S.M. Krimigis, N. Krupp, A. Coates, F. Cray, G. Gustafsson, The detection of energetic electrons with the Cassini Langmuir probe at Saturn, *J. Geophys. Res.*, in press, Aug 2012.

Ozak, N., T. E. Cravens, G. H. Jones, A. J. Coates and I.P. Robertson, Modeling of Electron Fluxes in the Enceladus Plume, *J. Geophys. Res.*, DOI:10.1029/2011JA017497, in press, Apr 2012.

Thomsen, M.F., E. Roussos, M. Andriopoulou, P. Kollman, C.S. Arridge, C.P. Paranicas, D.A. Gurnett, R.L. Powell, R.L. Tokar, D.T. Young, Saturn's inner magnetospheric convection pattern: Further evidence, *J. Geophys. Res.*, in press, DOI:10.1029/2011JA017482, accepted 17 July 2012.

Wahlund, J.-E., R.Modolo, C.Bertucci and A.Coates, Titan's magnetospheric and plasma environment, submitted to *Titan: Surface, Atmosphere and Magnetosphere*" for Cambridge University Press (Cambridge Planetary Science Series), eds. I. Mueller-Wodarg, C. Griffith, E. Lellouch and T. Cravens, in press, 2012.

Wei, Y., M. Fraenz, E. Dubinin, A. J. Coates, T. L. Zhang, W. Wan, L. Feng, A. Angsmann, A. Opitz, J. Woch, S. Barabash, R. Lundin, A teardrop-shaped ionosphere at Venus in tenuous solar wind, *Planetary Space Sci.*, in press, Aug 2012.

### **Publications - Non-Refereed:**

Green, L. M., Wallace, A. J., Kliem, B., Hinode Observations of an Eruption from a Sigmoidal Active Region, *ASP Conf. Ser.*, Vol. 454, 391, <http://aspbooks.org/custom/publications/paper/454-0391.html>

Pick, M., Kliem, B., CME development in the corona and interplanetary medium: A multi-wavelength approach, *EAS Publ. Ser.*, Vol. 55, 299, <http://dx.doi.org/10.1051/eas/1255042>

### **Invited Talks and Conferences**

Andrew Coates attended the Magnetospheric Interactions of Dusty Plasma, Plumes, and Moons workshop, Cassini PSG meeting, Cagliari, 12-14 June:

- Coates, A.J., A. Wellbrock, G.H. Jones, D.T. Young, C.S. Arridge, and the CAPS team, Photoelectrons in the plume of Enceladus: CAPS ELS results.

Geraint Jones (invited), Andrew Coates and Tom Nordheim attended the 46<sup>th</sup> ESLAB symposium on Formation and Evolution of Moons, ESTEC, 25-28 June. They presented 3 talks and were involved in other presentations:

- Jones, G., (Invited) Satellite-Magnetosphere Interactions;
- Coates, A.J., A. Wellbrock, G.H. Jones, F. Crary, D.T. Young, M. Thomsen, D. Reisenfeld, R.E. Johnson, T.E. Hill, Plasma interactions at Titan and icy moons: evolving ionospheres;
- Nordheim, T., K. Hand, C. Paranicas, P. Kollmann, G. Jones, A. Coates, N. Krupp, Surface radiation environment of Saturn's icy moon Mimas;
- Dougherty, M.K., O. Grasset, D. Titov, C. Erd, E. Bunce, A. Coustenis, M. Blanc, A. Coates, P. Drossart, L. Fletcher, T. van Hoolst, H. Hussmann, R. Jaumann, N. Krupp, O. Prieto-Ballesteros, P. Tortora, F. Tosi, and A. Wielders, JUICE: an ESA L-class mission to the Jupiter system;
- Jones, G.H., A.J. Coates and F.J. Crary, Charged nanograins in the Enceladus plume.

Andrew Coates attended the 39th COSPAR scientific assembly at Mysore, India, 14-22 July. He presented 2 invited talks as well as other presentations:

- Coates, A.J., E. Bunce, N. Krupp, Dougherty, M., O. Grasset, A. Coustenis, M. Blanc, A. Coradini, P. Drossart, L. Fletcher, H. Hussmann, R. Jaumann, O. Prieto-Ballesteros, P. Tortora, F. Tosi, T. Van Hoolst, D. Titov, C. Erd, Plasma interactions with Ganymede, Europa, Callisto and Jupiter: the prospects for ESA's JUICE mission (solicited);
- Fletcher, L., A. Coates, M.K. Dougherty, O. Grasset, C. Erd, D. Titov, E. Bunce, A. Coustenis, M. Blanc, P. Drossart, A. Coradini, P. Drossart, L. Fletcher, H. Hussmann, R. Jaumann, N. Krupp, O. Prieto-Ballesteros, P. Tortora, F. Tosi, T. van Hoolst, A. Wielders, Jupiter Science from ESA's Jupiter Icy Moons Explorer (JUICE) (solicited);
- Coates, A.J., A. Wellbrock, G.R. Lewis, C.S. Arridge, F.J. Crary, D.T. Young, M.F. Thomsen, D.B. Reisenfeld, E.C. Sittler Jr, R.E. Johnson, A. Woodson, K. Szego, Z. Bebesi, G.H. Jones, Cassini in Titan's tail: CAPS observations of plasma escape;
- Arridge, C.S., H. Hargrave, N. Achilleos, S.V. Badman, E. Bunce, P. Schippers, A. Coates, M.K. Dougherty, Plasma populations in Saturn's high latitude magnetosphere and their mapping into the ionosphere;

- Edberg, N.J.T., H. Nilsson, J.-E. Wahlund, K. Ågren, S. Barabash, M. Lester, J.G. Luhmann, T. McEnulty, A. Coates, T. Zhang, Sporadic loss of plasma from Mars, Venus and Titan caused by upstream variability.

Andrew Coates and Dhiren Kataria attended the International Symposium on Atmospheres of Terrestrial Planets: Observations and Modelling held at Physical Research Laboratory, Ahmedabad, India, 22-24 July. Presentations were given on:

- Coates, A.J., Ion pickup and plasma escape at solar system bodies (solicited);
- Kataria, D., A.J. Coates, C.J. Owen, Advanced instrumentation for planetary surfaces and atmospheres.

Dr Chris Arridge, Jamie Jasinski and Tom Nordheim (see below) attended the "Summer School Alpach 2012" "Exploration of the Giant Planets and their Systems" in Austria, 24 July – 2 Aug.



Bernhard Kliem gave invited seminars:

- "Instabilities and Reverse Pinch Effect in Solar Coronal Mass Ejections" at the University of Warwick, Centre for Fusion, Space and Astrophysics, 18 June;
- "Flare Modelling - Recent Results and Challenges from Hinode and SDO" at the Hinode-6 Meeting, St Andrews, 14-17 Aug.

Bernard also gave an invited review "Energy Storage and Release in the Solar Atmosphere - Key SDO Results" at the COSPAR Assembly.

## Outreach

Andrew Coates talked on:

- "What can we learn from space programmes?" for BP Subsea and Floating Systems Team, 28 June;
- "The ExoMars mission" at Probus Club, Crawley, 3 July.

Chris Arridge:

Talked at:

- The Royal Astronomical Society on "Strangers and Giants," 12 June;
- Highbury Grove School on careers and space exploration as part of the Islington Space Festival, 28 June;
- Howard of Effingham School on "Exploring the Solar System with Robots", 3 July;
- East Sussex Astronomical Society on "The Cassini-Huygens Mission to Saturn", 5 July;
- the London International Young Science Forum during their visit to MSSL "The Plumes of Enceladus," 22 August;
- Newbury and District Amateur Radio Society on the links between space weather and radio propagation, 22 Aug;

Attended:

- a luncheon at the House of Lords exploring links between parliament and scientists, 26 June;
- an event on 29 June at MSSL, to forge links between the new UCL Academy and MSSL staff;
- the Summer Meeting of the British Astronomical Society where he gave a talk titled "Europe Goes to Jupiter: The Jupiter Icy Moon Explorer Mission," 7 July;

Gave:

- a UCL Masterclass titled "Flowing Fluids: From Rivers to Stars and Planets" to A-level students, 9 July.

Andrew Walsh and Colin Forsyth, along with colleagues from Imperial College, Lancaster University and University of Leicester, exhibited the *Cluster: Aurora Explorer* stand at the Cheltenham Science Festival in June. Approximately 1000 members of the public were treated to discussions on Cluster, space weather and the aurora.

## Media Broadcasts and Features

Andrew Coates gave the following interviews:

- CNN International, on Venus transit, 6 June;
- "[Space boffins](#)/Naked Scientists" podcast on JUICE mission, 6 June;
- [Sunday Times](#) on JUICE mission, appeared 10 June;
- BBC World Service, Newshour, on Chinese space programme and ambitions, 18 and 24 June;
- [Sat TV week](#), on the JUICE mission, 4 July;
- Sky News. 5 Aug, Channel 5 news, BBC World and BBC News Channel, 6 Aug on Curiosity landing and prospects for ExoMars.

## Next Issue

The next issue of The Newsletter (Volume 10, Issue 3) will be published in December 2012. This will cover activities from 1 September to 30 November 2012.