# Department of Space and Climate Physics Newsletter

## Volume 2, Issue 1

**30th June 2004**

Covers events between 1st March 2004 and 31st May 2004

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## General News

- Sarah Matthews gave birth to a healthy baby boy (5lbs) on Thursday 10th June. He is called Matthew Thomas Blackman and both mother and baby are doing well!
- Sarah Szita has returned from maternity leave.

## Visitors

We welcomed the following visitors:

Sir Paul Beresford, the MP for Mole Valley, visited the lab and spent two hours touring the facilities and familiarizing himself with some of the work we do. He was genuinely interested and enthusiastic, and made a number of valuable suggesting for how we might increase our public profile, to the benefit of the programme. Sir Paul, a practicing dentist, also brought along some inspection equipment that he uses in his surgery. His requirements are very similar to that of our electronics assembly team, and he had a very constructive discussion with Gary Davison & co that will probably lead to us acquiring similar kit.

Jim Slavin and Guan Le (NASA-GSFC) visited for 2 days (Cluster)

Dave Winningham and Rudy Frahm (SwRI) visited for 2 days (Cluster and Mars Express)

Andrew Willes (U.Sydney) visited Astro and Space Plasma/Planetary groups, 25-28 May

Peter Cargill and Elizabeth Lucek (IC), 6 May (Cluster)

## Prizes and Awards

Lidia van Driel-Gesztelyi successfully defended her DrSci thesis entitled, “Solar activity in three-dimensions” at the Hungarian Academy of Sciences in Budapest on 10 May.

Ilya Alexeev won the prize for the best oral presentation at the 7th International Conference on Substorms, 21-27 March 2004, Levi, Lapland, Finland.

Mark Saunders and Frank Roberts have been short listed (final 4) for a British Insurance Award 2004 in the London Market Innovation of the Year category for their new Tropical Storm Tracker.

Roberto Soria - has been awarded a Marie Curie Outgoing International Fellowship from the European Union.

## Appointments

Andrew Coates - PPARC panel on Aurora science drivers, March-May 2004.

Chris Owen - Solar System Sub-panel of the PPARC Astronomy Grants Panel 2004-2007.

Gill Watson - project manager for Cluster and Double Star.

## Grants and Contracts Awarded

- Climate Physics - £10k from May 2004 for 7 months. To develop a Global Drought Monitor for Humanitarian Relief. The product will improve drought awareness and assist warnings of potential food, water and health problems worldwide. Funded by the UCL Friends Programme 2003/4. Mark Saunders PI

## Telescope/Satellite Time Awards

*Ground-based telescope time:*

Mat Page - awarded time on Gemini North: 17.8 hours and Gemini South: 3.5 hours

*Space-based telescope time*:

Roberto Soria, Mark Cropper and Kinwah Wu - awarded 10 HST orbits to observe two ultra-luminous X-ray sources and the nucleus of the spiral galaxy NGC 4559. (Instrument: ACS/HRC).

Silvia Zane - awarded 2 Primary Spacecraft Hubble Space Telescope Orbits in Cycle 13, to observe the isolated neutron star RX J1605.3+3249 and to measure its proper motion - 2 April 2004.

## Mission Status and Developments

Beagle 2 - we were successful with our bid to maintain Beagle operations funds partly in preparation for future mission proposals.

Cassini-Huygens - the spacecraft is approaching Phoebe flyby on 11 June, and Saturn Orbit Insertion on 1 July. Andrew Coates presented an overview of Cassini-Huygens, mentioning our involvement, at a PPARC press conference on 3 June.

Cassini - CAPS temporary on-board real time interrupt problems recently solved by a reset - ELS now getting good data again.

Cluster - PEACE operating well (all 4!).

Double Star TC-1 (equatorial satellite) - PEACE operating well.

Double Star TC-2 (polar satellite) - launch planned late July.

European Grid of Solar Observations (EGSO) - a Grid testbed - funded under the IST thematic priority of the EC's Fifth Framework Programme - it involves 12 groups in five countries and is led by MSSL. The objectives of the project are to create enhanced access to solar and related data scattered around the world. In this, it addresses the generic problems of a distributed and heterogeneous dataset and a scattered user community.

EGSO had a very successful demonstration of its search capability at the American Astronomical Society (AAS) meeting in Denver in June. The demonstration involved computers and databases at nearly a dozen sites in Italy, France, Switzerland, the UK and US and provided access to data based on a search related to flaring activity on the Sun. (http://www.egso.org)

Exomars Pasteur - PICS (Panoramic Imaging Camera System) studies underway (see Beagle 2)

Magnetospheric MultiScale Mission (MMS) - Phase A study underway - report due soon

Mars Express - electron results so far show evidence of magnetic anomalies and photoelectrons in Martian ionosphere.

MOSES – following problems with the flight computer at Montana, the launch for this proof-of-concept rocket flight has now moved from 18 August 2004 to July 2005.

RGO plates digitization - In December 2003, an 11-month project started at MSSL to digitize the Royal Greenwich Observatory (RGO) solar photospheric plates archive (about 22,000 plates). These plates, taken between 1918 and 1976, cover five solar cycles and represent a unique data set which will be a great asset to the solar community. The project is sponsored by JST (Japan Science and Technology Agency) with Professor Hirokasu Yoshimura of Tokyo University as PI. By the end of May, more than 11000 plates had been processed.

Rosetta - science planning activities are starting.

Solar-B EIS - the instrument suffered from a contamination event during the acceptance vibration tests. A recovery plan was put into effect and we are now back on schedule to meet the delivery to Japan later this summer. Many thanks to the team for getting the project back on track again.

Venus Express - at IRF awaiting delivery.

XMM Newton: RGS and OM instrument operations - Mission functionality is not considered fixed at launch and astronauts are not required to maintain or upgrade functionality. Under contract from ESA, we have just defined improvements to flight software for the RGS and OM instruments both of which still operate successfully after 4 years in space.

## Publications - Refereed

S & CP authors are shown in upper case.

### A. Published

André, M., Vaivads, A., Buchert, S.C. & FAZAKERLEY, A.N., Thin electron scale layers at the magnetopause, *Geophys. Res. Let.*, **31,** Issue 3, 2004. http://dx.doi.org/doi:10.1029/2003GL018137

Caccianiga, A., Severgnini, P., Braito, V., Della Ceca, R., Maccacaro, T., Wolter, A., Barcons, X., Carrera, F.J., Lehmann, I., PAGE, M.J., Saxton, R. & Webb, N.A., The XMM-Newton HBS28 sample: Studying the obscuration in hard X-ray selected AGNs, *Astron. & Astrophys.*, **416**, 901-915, 2004. A study of the first significant complete sample of AGN to be selected at X-ray energies above 5 keV using XMM-Newton

Carrera, F.J., PAGE, M.J. & Mittaz, J.P.D., XMM-Newton spectra of hard spectrum Rosat AGN: X-ray absorption and optical reddening, *Astron. & Astrophys.*, **420**, 163-172, 2004.

Evans, P.A., Hellier, C., RAMSAY, G. & CROPPER, M., Twisted accretion curtains in the intermediate polar FO Aqr, *Mon. Not. R. astr. Soc.*, **349**, 715-721, 2004. XMM-Newton observations are presented of the weakly magnetic binary FO Aqr concentrating on the X-ray and UV light-curves. We determine the geometry of its accretion curtains and find they differ with PQ Gem - a system which has similar characteristics - and discuss the implications.

Hakala, P. & RAMSAY, G., XMM-Newton observations of OY Car III: OM light curve modelling, X-ray timing and spectral studies, *Astron. & Astrophys.*, **416**, 1047-1055, 2004. We re-examine XMM-Newton X-ray and UV light curves of the disc accreting binary system OY Car. We find evidence for the presence of a

magnetic accretion curtain and we model the light curves with a new technique which maps the extent of the accretion disc using a swarm of fire-flies.

McComas, D.J., Schwadron, N.A., Crary, F.J., Elliott, H.A., Young, D.T., Gosling, J.T., Thomsen, M.F., Sittler, E., Berthelier, J.-J., Szego, K. & COATES, A.J., The interstellar hydrogen shadow: observations of interstellar pickup ions beyond Jupiter, *J. Geophys. Res.*, **109(A2)**, 2004. http://dx.doi.org/doi:10.1029/2003JA010217

MEREDITH, N.P., Horne, R.B., Thorne, R.M., Summers, D. & Anderson, R.R., Substorm dependence of plasmaspheric hiss, *J. Geophys. Res. - Space Physics*, **109**, A06209, 2004. The amplitudes of plasmaspheric hiss are found to be substorm-dependent and show a strong day-night asymmetry with two distinct latitudinal zones of peak wave activity primarily on the dayside. The enhanced hiss emissions are associated with electron flux enhancements in the energy range of tens to hundreds of keV, suggesting that these electrons are the most likely source of plasmaspheric hiss. http://msslhx.mssl.ucl.ac.uk/~npm/papers/meredith_JGR_2004.pdf

Morooka, M., André, M., Wahlund, J.-E., Buchert, S.C., FAZAKERLEY, A.N., Winningham, J.D., Rème, H., Dandouras, I., Lavraud, B., Balogh, A. & Igenbergs, K., Cluster observations of ULF waves with pulsating electron beams above the high latitude dusk-side auroral region, *Geophys. Res. Let.*, **31, Issue 5**, 2004. http://dx.doi.org/doi:10.1029/2003GL017714

Myers, A.D., Outram, P.J., Shanks, T., Boyle, B.J., Croom, S.M., LOARING, N.S., Miller, L. & Smith, R.J., The 2dF QSO redshift survey - X. Lensing of background QSOs by galaxy groups, *Mon. Not. R. astr. Soc.*, **342**, 467-482, 2003. http://dx.doi.org/doi:10.1046/j.1365-8711.2003.06584.x

Nakamura, R., Baumjohann, W., Nagai, T., Fujimoto, M., Mukai, T., Klecker, B., Treumann, R., Balogh, A., Reme, H., Sauvaud, J.A., Kistler, L., Mouikis, C., OWEN, C.J., FAZAKERLEY, A.N., DEWHURST, J.P. & BOGDANOVA, Y., Flow shear near the boundary of the plasma sheet observed by Cluster and Geotail, *J. Geophys. Res.*, **109**, 2004. http://dx.doi.org/doi:10.1029/2003JA01074.

OWEN, C.J., Taylor, M.G.G.T., KRAUKLIS, I.C., FAZAKERLEY, A.N., Dunlop, M.W. & Bosqued, J.M., Cluster observations of surface waves on the dawn flank magnetopause, *Ann. Geophys.*, **22**, 971-983, 2004.

RYMER, A., Analysis of Cassini plasma and magnetic field measurements from 1-7 AU, PhD Thesis, 2004.

SAUNDERS, M.A., Hurricane forecasting successes, *Catastrophe Risk Management*, 17-18, 2004.

Stevens, J.A., PAGE, M.J., Ivison, R.J., Smail, I. & Carrera, F.J., A Filamentary Structure of Massive Star-forming Galaxies Associated with an X-Ray-absorbed QSO at z=1.8, *Astrophys. J. Lett.*, **604**, 17-20, 2004. The most exciting submm image ever (perhaps!) showing a proto-cluster of galaxies forming around a quasar. http://xxx.sissa.it/pdf/astro-ph/0402098

Thompson, S.M., Kivelson, M.G., Khurana, K.K., Balogh, A., Reme, H., FAZAKERLEY, A.N. & Kistler, L., Cluster observations of quasi-periodic impulsive signatures in the dayside northern lobe: High latitude flux transfer

events?, *J. Geophys. Res. - Space Physics*, 2004. http://dx.doi.org/doi:10.1029/2003JA010138

Turolla, R., ZANE, S. & Drake, J., Bare quark stars or naked neutron stars? The case of RX J1856.5-3754, *Astrophys. J.*, **603**, 256-282, 2004.

Vaivads, A., André, M., Buchert, S.C., Wahlund, J.-E., FAZAKERLEY, A.N. & Cornilleau-Wehrlin, N., Cluster observations of lower hybrid turbulence within thin layers at the magnetopause, *Geophys. Res. Let.*, **31,** Issue 3, 2004. http://dx.doi.org/doi:10.1029/2003GL018142

ZANE, S., RAMSAY, G., Jimenez-Garate, M.A., den Herder, J.W. & Hailey, C.J., XMM-Newton EPIC and OM observations of Her X-1 over the 35-day beat period, Mon. Not. R. astr. Soc., 350, 506-516, 2004. We present the results of EPIC and OM XMM-Newton observations of Her X-1 spread over its 35-day precession period. We report the detection of a line near 7 keV in 10 of the 15 observations - the first time that such a line has been detected: the line normalisation is such that its equivalent width is so low during the main on state it is swamped by continuum emission.

**B. In Press**

Abel, G.A., Smith, A.J., MEREDITH, N.P., A. & Anderson, R.R. The temporal evolution of substorm enhanced whistler-mode waves; the relationship between space based observations, ground based observations and energetic electrons, J. Geophys. Res. - Space Physics, 2004. We examine 22 case studies of CRRES observations of substorm-enhanced whistler mode waves. We show that the frequency dispersion seen in substorm chorus events on the ground is most likely due to the inward motion of whistler ducts under the influence of the substorm-enhanced westward electric field.

BRANDUARDI-RAYMONT, G., Elsner, R.F., Gladstone, G.R., RAMSAY, G., Rodriguez, P., SORIA, R. & Waite, J.H. Jr., First observation of Jupiter by XMM-Newton, Astron. & Astrophys., 2004. The paper presents the first X-ray observation of Jupiter by XMM-Newton. Images from the EPIC cameras show prominent emission from the planet's auroral spots; their spectra are modelled with a combination of unresolved emission lines, the strongest of which are from highly ionised oxygen (OVII and OVIII). The OVII identification is confirmed by the RGS, which provides the first high resolution spectral detection of X-rays from a planet. The data support the idea that Jupiter's auroral emissions originate from the capture and acceleration of solar wind ions in the planet's magnetosphere, followed by X-ray production by charge exchange.

CROPPER, M., Haberl, F., ZANE, S. & Zavlin, V.F., Timing analysis of the isolated neutron star RX J0720.4-3125 revisited, Mon. Not. R. astr. Soc., 2004.

Haberl, F., Motch, C., Zavlin, V.E., Reinsch, K., Gansicke, B.T., CROPPER, M., Schwope, A.D., Turolla, R. & ZANE, S., The isolated neutron star X-ray pulsars RXJ0420.0-5022 and RXJ0806.4-4123: New X-ray and optical observations, Astron. & Astrophys., 2004.

Haerendel, G., Georgescu, E., Glassmeier, K.H., Klecker, B., BOGDANOVA, Y.V., Reme, H. & Frey, H., CLUSTER observes formation of high-beta plasma blobs, Ann. Geophysicae, 2004.

HARRA, L.K., Mandrini, C. & MATTHEWS, S.A., What causes active regions to exist at transition region temperatures?, Solar Phys., 2004. This paper explains the origin of highly dynamic cool loops seen in active regions on the Sun. We found that although they are short-lived, complex and have strong flows, that they are due to cooling from low-level flaring.

ILES, R.H.A., JONES, J.B.L., Taylor, G.C., Blake, J.B., BENTLEY, R.D., HUNTER, R., HARRA, L.K. & COATES, A.J., The effect of Solar Energetic Particle (SEP) events on the radiation exposure levels to aircraft passengers and crew: Case study of 14th July 2000 SEP event, J. Geophys. Res., 2004.

LLOYD-HUGHES, B., SAUNDERS, M.A. & Rockett, P., A consolidation CLIPER model for improved August-September ENSO prediction skill, Wea. Forecasting, 2004. We present the first example of a statistical ensemble model for predicting boreal summer El Niño Southern Oscillation (ENSO). Skill is assessed over a 100-year period for all ENSO indices and the model is shown to provide a 10-20% skill improvement over the standard ENSO-CLIPER model. http://forecast.mssl.ucl.ac.uk/docs/BLH+MAS+PR2004.pdf

Mereghetti, S., Tiengo, A., Stella, L., Israel, G.L., Rea, N., ZANE, S. & Oosterbroek, T., Pronounced long term flux variability of the anomalous X-ray pulsar 1E1048.1-5937, Astrophys. J., 2004.

Nykyri, K., Cargill, P.J., Lucek, E., Holmbury, T., Lavraud, B., Balogh, A., Dunlop, M.W., BOGDANOVA, A., FAZAKERLEY, A. & Dandouras, I., Cluster observations of magnetic field fluctuations in the high-altitude cusp, Ann. Geophysicae, 2004.

PAGE, M.J., SORIA , R., ZANE , S., WU , K., & Starling , R. , Highly ionized Fe K emission lines from the LINER galaxy M 81, Astron. & Astrophys., 2004.

Smoker, J.V., Lynn, B.B., Rolleston, W.R.J., KAY, H.R.M., Bajaja, E., Poppel, W.G.L., Keenan, F.P., Kalberla, P.M.W., Mooney, C.J., Dufton, P.L. & Ryans, R.S.I., Ca II K interstellar observations towards early-type disc and halo stars - distances to intermediate and high-velocity clouds, Mon. Not. R. astr. Soc., 2004. Spectroscopic observations of early-type stars can be used to trace the properties of the interstellar medium. In this paper, we use Ca II K measurements to determine the distances to intermediate and high-velocity clouds.

SORIA, R. & Motch, C., A variable ultra-luminous X-ray source in the colliding galaxy NGC7714, Astron. & Astrophys., 2004.

SORIA, R., Motch, C., Read, A.M. & Stevens, I.R., X-ray flares from the ultra-luminous X-ray source in NGC5408, Astron. & Astrophys., 2004.

Svenes, K.R., Narheim, B.T., COATES, A.J., LINDER, D.R. & Young, D.T., Cassini plasma spectrometer electron measurements close to the magnetopause of Jupiter, J. Geophys. Res., 2004.

## Publications – Non-refereed

### A. Published

COATES, A.J., Ion pickup at comets, Adv. Space Res., 33. issue 11, 1977-1988, 2004.

COATES, A.J., Book Review of "The space environment: implications for spacecraft design", by A.C. Tribble, The Observatory, 2004.

COATES, A.J., The Martian planetary wind revealed, Frontiers, 19, 2004.

COATES, A.J., Planetary science, Space Science, 73-109, 2004.

Corbett, E., Croom, S., Boyle, B., Netzer, H., LOARING, N., Miller, L., Outram, P., Shanks, T. & Smith, R., The correlation of line strength with QSO luminosity and redshift from composite spectra, in Active galactic nuclei: from central engine to host galaxy, Meudon, France, 23-27 July 2002, 290, 489, S. Collin, F. Combes and I. Shlosman (Eds.), ASP, 2003.

De Groof, A., Berghmans, D., VAN DRIEL-GESZTELYI, L. & Poedts, S., Intensity Variations in EIT Shutterless Mode: Waves or Flows? in SOHO 13 - Waves, Oscillations and Small-Scale Transient events in the Solar Atmosphere: the Joint View from SOHO and TRACE, Palma de Mallorca, 2003, 547, 245-250, H. Lacoste (Eds.), ESA-SP, 2004.

GOWEN, R.A., WALTON, D. & GUTTRIDGE, P., A system engineering study of the Eddington onboard science data processing chain, in Proceedings of the 21st Eddington Workshop: Stellar structure and habitable planet finding, Palermo, Italy, 09-11 April 2003, SP-538, 321-329, F.Favata, S.Agrain, A.Wilson. (Eds.), ESA-SP, 2003. Addresses a wide range of hardware and processing issues important in developing a practical solution to this mission to search for new Earth-like planets around other stars and to study stellar oscillations

LEA, A.S. & SAUNDERS, M.A., August-September ENSO prediction skill 1957-2001: a comparison between four new state-of-the-art season models, in Proceedings of the American Meteorological Society 26th Conference on Hurricanes and Tropical Meteorology, 431-432, (Eds.), 2004.
http://ams.confex.com/ams/pdfpapers/75508.pdf

LEA, A.S. & SAUNDERS, M.A., Seasonal prediction of accumulated cyclone energy in the North Atlantic, in Proceedings of the American Meteorological Society 26th Conference on Hurricanes and Tropical Meteorology, 419-420, (Eds.), 2004.
http://ams.confex.com/ams/pdfpapers/75504.pdf

LEA, A.S. & SAUNDERS, M.A., Verification of North Atlantic oscillation forecast for winter 2003/4, 2pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/NAO2003=4Verification.pdf

LEA, A.S. & SAUNDERS, M.A., Verification of North Atlantic storminess forecast for winter 2003/4, 1pp, 2003.
http://forecast.mssl.ucl.ac.uk/docs/StorminessVerificat2003-4.pdf

LEA, A.S. & SAUNDERS, M.A., Extended range forecast for Northwest Pacific typhoon activity in 2004, 2pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRNWPForecastMar2004.pdf

LEA, A.S. & SAUNDERS, M.A., April forecast update for Northwest Pacific typhoon activity in 2004, 2pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRNWPForecastMar2004.pdf

LEA, A.S. & SAUNDERS, M.A., May forecast update for Northwest Pacific typhoon activity in 2004, 2pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRNWPForecastMay2004.pdf

LEA, A.S. & SAUNDERS, M.A., May forecast update for Australian region tropical storm activity in 2004/5, 3pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRNWPForecastMay2004.pdf

LEA, A. & SAUNDERS, M.A., Extended range forecast for Australian region tropical storm activity in 2004/5, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRAUSForecastApr2004.pdf

OWEN, C.J., Space plasma physics, Space Science, 111-155, 2004.

SAUNDERS, M.A. & FLETCHER, C.G., Seasonal forecast for Spring 2004 UK city temperatures, 3pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/Spring2004Temperature.pdf

SAUNDERS, M.A. & LEA, A.S., Summary of the 2003/4 Australian region tropical storm season and verification of authors' seasonal forecasts, 3pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRAUS2003Verification.pdf

SAUNDERS, M.A. & LEA, A.S., March forecast update for Atlantic hurricane activity in 2004, 3pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRATLForecastMar2004.pdf

SAUNDERS, M.A. & LEA, A.S., April forecast update for Atlantic hurricane activity in 2004, 4pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRATLForecastApr2004.pdf

SAUNDERS, M.A. & LEA, A.S., May forecast update for Atlantic hurricane activity in 2004, 3pp, 2004.
http://forecast.mssl.ucl.ac.uk/docs/TSRATLForecastMay2004.pdf

SAUNDERS, M.A. & LEA, A.S., Seasonal prediction of US landfalling hurricane wind energy from 1 August, in Proceedings of the American Meteorological Society 26th Conference on Hurricanes and Tropical Meteorology, 441-442, 2004.
http://ams.confex.com/ams/pdfpapers/75503.pdf

Trautner, R., Manaud, N., Michael, G., Koschny, D., GRIFFITHS, A., COATES, A., Josset, J-L. & Beauvivre, S., Determination of the Beagle-2 landing site, in Proceedings of International Workshop on Planetary Probe Atmospheric Entry and Descent Trajectory, Lisbon, Portugal, 6-9 Oct 2003, **ESA SP-544**, 175-181, A. Wilson (Eds.), ESA, 2004.

**B. In Press**

BOGDANOVA, Y.V., Klecker, B., Paschmann, G., Kistler, L.M., Mouikis, C., Moebius, E., Reme, H., Bosqued, J.-M., Dandouras, I., Sauvaud, J.A., Cornilleau-Wehrlin, N., Laakso, H., Korth, A., Bavassano-Cataneo, M.B., Phan, T., Carlson, C., Parks, G., McFadden, J.P., McCarthy, M. & Lundin, R., Investigation of the source region of ionospheric oxygen outflow in the cusp using multi-spacecraft observations by CIS onboard Cluster, *Adv. Space Res.*, 2004.

COATES, A.J., Our solar system, *Advances in Astronomy: from Big Bang to the Solar System, Vol. 1*, 2004.

Kong, A.K.H., SORIA, R., & Di Stefano, R., XMM-Newton observations of the spiral galaxy NGC300, in HEAD meeting #35, #10.20, 2004.

SORIA, R., CROPPER, M. & Pakull, M., A ULX in NGC4559: a "mini-cartwheel" scenario?, in IAU Colloquium 194: Compact binaries in the galaxy and beyond, 2004.

VAN DRIEL-GESZTELYI, L., Coronal mass ejections and magnetic helicity, *Solar Magnetic Phenomena*, 2004.

WU, K. & SORIA, R., X-ray emission and star formation in spiral galaxies, in Proceedings of the IAU symposium No. 217, 2004.

ZANE, S., Spectral signature of advective accretion flows, in Proceedings of the Tenth Marcel Grossmann Meeting on General Relativity, 2004.

ZANE, S., RAMSAY, G., Jimenez, M., den Herder, J.W. & Hailey, C.J., XMM observations of Her X-1, in Proceedings of the Tenth Marcel Grossmann Meeting on General Relativity, 2004.

Ziaeepour, H., Quest for Fats: Roles for a Fat Dark Matter, *Progress in dark matter research*, 2004. A decaying ultra heavy Dark Matter can solve 3 puzzles: Origin of Dark Matter, Origin of Ultra High Energy Cosmic Rays, and Origin of Dark Energy. In this paper we discus the model, characteristics of the particles and compare them with observations.

## PhDs Awarded

- Abi Rymer successfully defended her in her PhD thesis on “Analysis of Cassini plasma and magnetic field measurements from 1-7 AU”.

## Invited Talks and Lectures (National and International)

*Andrew Coates* -

- Talk ‘Introduction to CAPS – and expectations for Titan’ at London Titan Seminar Series, 26 March 2004.
- Talk for Society for Popular Astronomy, (national) 24 April 2004, on New results from Mars.
- University of Sussex Astronomy seminar, on Mars: where has the water gone? 14 May 2004.

*Mark Saunders* -

- The business benefit of seasonal US landfalling hurricane forecasts from 1 August, Benfield team leaders, London, 16 March 2004.
- TSR tropical storm tracker, Benfield Investors Day, London, 28 April 2004.

*Silvia Zane* -

- Invited talk entitled, “GRBs: temporal/ spectral features and role of the future missions” at The Institute of Cosmology & Gravitation (ICG), Southampton

## Conference and Workshop Presentations (National and International)

- 7th International Conference on Substorms, Levi, Lapland, Finland, 21-27 March 2004 – Papers presented by Ilya Alexeev, Chris Owen and Jason Dewhurst.

- National Astronomy Meeting, OU, 31 March 2004 – Paper presented by Andrew Coates.
- Edinburgh MIST/UKSP meeting, 20 March–1 April 2004 - Papers presented by Nigel Meredith (2), Rob Fear, Chris Owen and Len Culhane.
- UK Cluster/Ground Based Cusp Workshop, 20 April 2004, Leicester – Papers presented by Aurelie Marchaudon and Yulia Bogdanova.
- European Geosciences Union 1st General Assembly, Nice, France, 26-30 April 2004 – Papers presented by Chris Fletcher (2), Fiona Parton, Andrew Griffiths and Andrew Orr (2).
- American Meteorological Society 26th Conference on Hurricanes and Tropical Meteorology, Miami, USA, 3-7 May 2004 - Papers presented by Mark Saunders (3) and Adam Lea (2).
- 17th Scottish Fluid Mechanics Meeting, University of Strathclyde, 19 May 2004 – Paper presented by Andrew Orr.
- AGU 2004 Joint Assembly, Montreal, 17-21 May 2004 – Four MSSL papers presented.
- Mesoscale Meteorology and Climate Interaction Conference, Iceland Meteorology Institute, Reykjavik, 24-27 May 2004 – Papers presented by Andrew Orr.
- Cluster Workshop, MSSL, Paper presented by Ilya Alexeev.

**Press Releases**

- National science week 8 March 2004 (Andrew Coates)
- RAS press briefing on Venus transit, Andrew Coates spoke on Venus, Venus Express and extrasolar planet transit measurements, 11 May 2004
- Transit of Venus at MSSL 25 May 2004 (also similar UCL release) (Andrew Coates)
- Typhoon activity in 2004 forecasted to be average by TSR consortium, 10 March 2004 (Mark Saunders). (http://forecast.mssl.ucl.ac.uk/docs/100304TSRNWPacRelease.pdf)
- TSR feeds live storm warnings to Reuters Alertnet, 24 March 2004 (Mark Saunders). (http://forecast.mssl.ucl.ac.uk/docs/240304TSRReutersAlertNet.pdf)
- Australian cyclone season in 2004/5 forecast to be most active in 4 years, 19 April 2004 (Mark Saunders). (http://forecast.mssl.ucl.ac.uk/docs/140404TSR_AUSRelease.pdf)
- Higher-than-normal 2004 Atlantic hurricane season predicted by TSR consortium, 28 May 2004 (Mark Saunders). (http://forecast.mssl.ucl.ac.uk/docs/TSRAtlantic_Pre-Season.pdf)

**Media Broadcasts and Features**

Andrew Coates -

- Interview for BBC1 1 O'Clock News, on Rosetta, 2 March 2004.

- Interview for BBC1 10 O'clock News, on Mars water result from Opportunity (flowing water 4by ago), 2 March 2004.
- Interview on BBC News 24, on Rosetta, 2 March 2004.
- Interview on Sky News, on Rosetta, 2 March 2004.
- Interviews on BBC 3 Counties Radio, on Beagle, 9 March 2004.
- Interview for BBC R4, The Material World on Rosetta, transmitted 11 March 2004.
- Interview on BBC Southern Counties Radio, on new 'planet' Sedna, 15 March 2004.
- Interview on Sky News, on new 'planet' Sedna, 15 March 2004.
- Interview for BBC R4, 'Cosmic Ocean', on Mars and Rosetta, transmitted 25 March 2004.
- Interview on ITN Channel 5 news, on methane in Martian atmosphere, 29 March 2004.
- Interview for British Council 'Selector' radio programme on solar system exploration, 2 April 2004.
- Interview on Sky News, on Gravity Probe B, 19 April 2004.
- Interview for Science Museum, Antenna exhibition, on Cassini, Mars Express, Venus Express and Rosetta, 29 April 2004
- Interview for BBC R4 and World Service 'Venus across the Sun' programme 1 on transit, 4 May 2004 (used 26 May 2004).
- Interview on BBC R4 'The Material World', on Cassini-Huygens, 13 May 2004.
- Interview on Venus Express and transits for BBC R4 Today programme, 25 May 2004 (used 5 June 2004)
- Interviews on <1 million year old planet in dust disk around Co Ku Tau 4 in RCW49 nebula, on BBC News 24, 27 May 2004.

**Proposals Submitted**

Nigel Meredith/Andrew Coates – submitted an application in response to the ESA ITT "Nano-satellite beacons for space weather monitoring" both at the prime contractor and sub-contractor levels. The primary objective of this activity is to investigate the possible role of nano-satellites and micro/nano technologies for the space weather monitoring of geospace.

Roberto Soria - submitted a Gemini proposal for the ULX in NGC7714. [optical]

Roberto Soria - submitted an Australia Telescope Compact Array proposal for the observation of a ULX in NGC5408. [radio]

Roberto Soria - submitted two Chandra proposals to study the X-ray properties of barred galaxies and galaxies in tidally interacting systems.

Silvia Zane (with C. Motch of Strasbourg Observatory et al) - submitted a proposal to ESO entitled, "Deep optical Imaging of X-ray bright and radio quiet isolated neutron stars"- May 2004.

**Other News Items/Activities**

- MSSL hosted a highly successful (57 participants) international Cluster tail data workshop March 3-5 2004, also the Cluster Science Working Team meeting (March 2) and Science Operations Working Group (March 1 and 2).

- 17/3/04 - 19/3/04 - Science Week 2004 at Howard of Effingham School. 750 children of all ages enjoyed lectures, demonstrations, static displays and competitions. This year's innovation for the sixth-form day - a forum with questions and answers from the floor to MSSL students and employees, was very successful. Sir Paul Beresford, MP attended and spent a couple of hours with MSSL personnel and students attending the event. This contact resulted in Sir Paul's visit to MSSL in June. A major highlight of the week was the evening lecture by Loren Acton.
- 22/3/04 – Chris Goff and Tracey Poole gave a Mars Lander Workshop at the Raleigh School. This was part of the Schools Science Week.
- 6/5/04 – Alice Breeveld and Tracey Poole talked to year 5 at the Duke of Kent School about Comets and Impact Craters.
- Andrew Coates gave talks to Breckland, Cardiff, Guildford, Hampshire and Torbay, Astronomical Societies
- Louise Harra gave a talk to Croydon Astronomical Society.

**Acknowledgements**

The success of Science Week was due to the unstinting enthusiasm and hard work of many at MSSL. In particular, Judy, Tracey, Andy Fenney and Chris Goff deserve a special mention.

Thanks to all the Cluster-related RA's and students, particularly Jason and Ros, and the Office, who really carried the day on the organization front both before and during the Cluster workshop. (Planetary and Plasma Physics Group)

We wish Paul Carter well in his new job at ATC (Edinburgh). He made key contributions to the Cluster and Double Star projects on onboard software and project management. (Planetary and Plasma Physics Group)

**Next Issue**

The next issue of the Department of Space and Climate Physics Newsletter (Volume 2, Issue 2) will be published in mid-September 2004. This will cover activities from 1st June 2004 to 31st August 2004.