The Newsletter - Volume 13, Issue 1
25 May 2016

Covers events between 1 Nov 2015 to 31 Jan 2016.

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New staff

- XiaoHao Cai – Post doc in Inverse Problems.
- Saeeda Awan – Space Project Systems Engineer

Visitors

The Astrophysics Group hosted, and is hosting:
- Samantha Oates (IAA-CSIC, Granada, Spain).
- Denija Cronjevic (Texas Tech University, USA).
- Alice Bates (Australian National University),
- Luis Alberto Diaz-Garcia (CEFCA/Teruel, Spain),
- Dominik Leier (Bologna),
- Peter Capak (Caltech, USA).

The Solar Group hosted:
- Catherine Burnett, Sophie Murray, Mike Marsh and Francois Bocquet from the Met Office, 18 Nov,
- Mike Kosch from the South African National Space Agency who from 16-20 Nov and gave a seminar,
- Pascal Démoulin from Paris Observatory Meudon, Cristina Mandrini from Instituto de Astronomía y Física del Espacio, and Miho
Janvier from IAS-Orsay who visited from 23-27 Nov,
- Larisza Krista from HAO/CU-CIRES who visited on 6 Jan and gave a seminar.

**Prizes and Awards**
- William Dunn: The Elizabeth Puchnarewicz Award for Outstanding Contribution to Public Outreach,

**Appointments**
- Silvia Zane has been appointed to a panel member of Italian REF (2011 – 2014).

**Grants and Contracts Awarded**
- Ignacio Ferreras has been awarded a Royal Society grant to visit the International Centre for Radio Astronomy Research (ICRAR, Perth, Australia) and a ‘Distinguished Visitor’ fellowship to work at Anglo-Australian Observatory for a few months,
- David Long and David Perez-Suarez were awarded a VarSITI grant to develop a database of global waves in the solar atmosphere,
- David Perez-Suarez was awarded a SSI fellowship.

**Telescope/Satellite Time Awards**
- Paul Kuin has been awarded NASA HST time to observe recent nova V5668 Sgr on 6 Nov. This nova is forming large amounts of dust and its extinction changes as the nova evolves, therefore they obtained higher resolution spectrum using HST to study its physics better,
- MSSL Astrophysics team has been awarded 1.47 M core hours on STFC DiRAC High Performance computer time of Data Analytic Cluster in Cambridge in 2016,
- The James Clerk Maxwell Telescope (JCMT) announced the award of about 2,400 hours of science time to seven Large Programs associated with star formation, nearby galaxies and cosmology. UCL is one of the UK JCMT partner universities and hence we can request to join any of these Programs,
- W.R Dunn, G. Branduardi-Raymont and L. Ray were awarded 22 hours on XMM-Newton to study Jupiter, while NASA’s Juno mission is approaching. This is a unique opportunity to understand the relationship between Jupiter's X-ray emission and the solar wind.

**Proposals submitted**
- David Long and David Pérez-Suárez submitted a proposal to the VarSITI consortium to develop a database of global waves in the solar atmosphere.

**Mission Status and Developments**

**Athena** – MSSL, Leicester and the Open University received grants from UKSA to begin working on Athena.

**Cassini** – Science exploitation continuing.


**Gaia** – In Nov, the MSSL Gaia team delivered on-ground data processing software to the Gaia Radial Velocity Spectrometer (RVS) Data Processing Centre CNES (DPCC, Toulouse). This software will calibrate the RVS spectra in order to be able to derive radial velocities for the brightest ~2 million stars (V < 11) observed by Gaia between Jul 2014 and Sept 2015. These radial velocities will be publicly released in 2017 in Gaia’s second data release.

The MSSL Gaia team attended and presented progress at Gaia’s largest internal meeting of the Data Processing & Analysis Consortium (DPAC) on 16-20 Nov. DPAC has 400 members in total, of which 225 were invited. The MSSL Gaia team also attended the six-monthly Co-ordination Unit 6 Spectroscopic Processing meeting in Paris on 18-20 Jan.

**JUICE** – Design work continuing.

**Mars Express** – Science exploitation continuing.

**QB50** – INMS assembly and testing continues. Delivery of units is scheduled for between May and Jul and launch is scheduled for Dec 2016.

**Rosetta** – Science exploitation continuing.

**SMILE** – In early Nov SMILE was formally selected by the ESA Science Programme Committee. This means that we are now progressing into Phase A study, with the objective of reaching mission
adoption in early 2018. Launch is expected to take place at the end of 2021.

**Solar Orbiter** – There was a team meeting for the full SWA team at the University of Pierre and Marie Curie, Paris (2/3 Nov). Broad discussions on the status and progress of SWA were held. Chris Owen, Chris Brockley and Allan Macneill attended a joint SPICE-SWA-EPD Instrument Team meeting in the Institut d'Astrophysique Spatiale, Orsay, France (4/5 Nov). The primary motivation for the meeting was to discuss how the SPICE measurements and the SWA-HIS measurements might be used together to further the science goals of Solar Orbiter.

Barry Hancock represented SWA at the latest EMC meeting at the Royal Observatory of Brussels, Belgium (19/20 Nov). AIRBUS presented their latest ideas for solving a significant contamination issue for SWA and other instruments, for which we have to assess the overall impact in the coming months.

Chris Owen represented SWA at the Science Activity Planning exercise for Solar Orbiter in ESTEC (16/17 Nov). This was immediately followed by an executive meeting of the SO SWT on 18 Nov, including a meeting with Thomas Passvogel, the senior project manager at ESTEC to discuss progress on the mission.

Chris Owen represented SWA at the latest Modelling and Data Analysis Working Group meeting at the Royal Observatory of Brussels, Belgium (19/20 Nov). Latest developments in modelling in support of the Solar Orbiter mission were discussed, including preliminary plans for a bid for funding under the European Commission H2020 initiative.

The SWA team attended a face-to-face technical interface meeting with engineers from AIRBUS in Stevenage (15 Dec). Wide ranging discussions on open issues between SWA and the spacecraft were held. A further technical interface telecon was held on 19 Jan.

Chris Owen and Chris Brockley Blatt represented the MSSL SWA at a UKSA project management board meeting (8 Jan). The board recommendations for funding of SWA through the operations phase of Solar Orbiter were discussed and we await formal notification of the award level.

A follow-up meeting between the Solar Orbiter PI’s and Thomas Passvogel, the senior project manager at ESTEC was held on 12 Jan, to discuss progress on the mission.

Chris Owen, Khalid Al Janabi, Gethyn Lewis, Jonny Rae and Georgina Graham represented SWA at the 8th Solar Orbiter Science Operations Working Group in ESOC, Madrid (25/28 Jan). A significant portion of the meeting was devoted to a detailed mock-up planning exercise for the scientific payload, in order to test procedures currently under development for this aspect of the mission.

At the end of Nov Barry Hancock formally retired from MSSL (although he plans to return in a part time capacity in 2016). The SWA team acknowledge the very significant contribution Barry has made to the project as SWA Systems Engineer and wholeheartedly thank him for those efforts.

**SWIFT** – A science meeting was held in Clemson, South Carolina from the 18/21 Oct to discuss Swift’s recent findings and the approach to the forthcoming NASA senior review.

**Venus Express** – Science exploitation continuing.

### Publications – Refereed

**Published**


Bruderer, C., ...Ferreras, I. et al, Light versus dark in strong-lens galaxies: dark matter haloes that are rounder than their stars, 2016, MNRAS, 456, 870


Joachimi, B., ..., Kitching, T.D. et al., Galaxy Alignments: An Overview, 2015, SSRv, 193, 1

Kirk, D., ..., Kitching, T.D. et al., Galaxy Alignments: Observations and Impact on Cosmology, 2015, SSRv, 193, 139


Paykari, P. et al, Sparsely sampling the sky: Regular vs. random sampling, 1015, A&A, 581, 113


Rodriguez Castillo, G.A., ..., Turolla, R., Zane, S. et al., The outburst decay of the low magnetic


In press


Turolla, R., Zane, S. et al., Magnetars: the physics behind observations. A review, 2015, RPPh, 78, 6901


PhDs/MPhil Awarded
Susan Hutton has passed her viva successfully.

Invited Talks and Conferences
Graziella Branduardi-Raymont:
• Gave a talk on ‘Memories of Ariel 5’ at ‘Clusters of galaxies and hot baryons’ meeting, MSSL, 6-
8 Oct,
• Gave a talk on ‘SMILE’ at ‘Cluster-Double Star’ workshop, Venice, Italy, 16 Oct,
• Gave a talk on ‘Solar System and Exoplanets requirements and observing plans’ at the ATHENA meeting, MPE, Garching, 18-19 Nov,
• Gave a talk on ‘The SMILE Mission’ at the 8th Astronomical X-ray Optics workshop, Prague, 7/10 Dec.

Chris Brockley-Blatt:
• Gave three one-hour talks on her career as an engineer/project manager and on Solar Orbiter at her old high school Greenshaw High school in Sutton, Surrey, participating as a workshop giver in a careers event, 11 Nov.

Jennifer Chan:
• Gave a talk on ‘Cosmological polarised radiative transfer and diagnostics of large-scale magnetic fields’ at the RAS specialist meeting "Magnetic fields on galactic and extra-galactic scales", 13 Nov.

Mark Cropper:
• Gave a talk on ‘Euclid project status’ at Euclid UK meeting, IFA Edinburgh, 17/18 Dec.

L. van Driel-Gesztelyi:
• Gave a talk on "Women of solar physics" at RAS Discussion Meeting, 8 Jan.

Ignacio Ferreras:
• Gave five talks/posters on ‘A panchromatic view of M82: Dust properties’, ‘The IMF-SFH connection in massive early-type galaxies’, ‘Probing dark matter halos with strong gravitational lensing’, ‘Understanding the size growth of massive galaxies through stellar populations’, ‘IMF variations in unresolved stellar populations’ at XXIX IAU General Assembly, Honolulu, Hawaii, 3/14 Aug,
• Gave a talk on ‘From clusters to the field. Probing the role of environment in early-type galaxies’ at Clusters of galaxies and hot baryons’ meeting, MSSL, 6/8 Oct.

Louise Harra:
• Gave an invited talk at RAS on Hinode EIS,
• Organised, with Harrison, the UK solar missions forum held in Jan,
• Attended a meeting at ISSI in Bern with Magnus Woods.

Jason Hunt:
• Gave a talk on ‘PRIMAL: A particle-by-particle M2M Algorithm’ and gave a tutorial session of PRIMAL and SNAPDRAGONS at Gaia Challenge III workshop, Barcelona, 31 Aug/4 Sept.

Tom Kitching:
• Gave a talk on ‘Using Weak Lensing Clusters for Dark Matter Physics’ at ‘Clusters of galaxies and hot baryons’ meeting, MSSL, 6/8 Oct,
• Organised as a chair ‘Euclid Weak Lensing Autumn 2015’, UCL & Imperial, 4/6 Nov,
• Gave three seminars on ‘Dark Matter’ at Royal Holloway, University of London, Manchester, DAMTP Cambridge in Nov,
• Gave a talk on ‘The Challenge of Weak Lensing’ at the ERCIM International Conference on ‘Computational and Methodological Statistics’, University of London, 12/4 Dec,
• Gave a talk on ‘Euclid Weak Lensing’ at Euclid UK meeting, IFA Edinburgh, 17/18 Dec,

Daisuke Kawata:
• Invited to visit the Earth-Life Science Institute, Tokyo Institute of Technology, 3/14 Aug and gave a talk on ‘Galaxy Modeling in the Gaia era’,
• Led ‘Disc’ working group at Gaia Challenge III workshop, Barcelona, 31 Aug/4 Sept,
• Gave a seminar on ‘Spiral Arm Paradigm in Disk Galaxies’ at GRAPPA (Gravitational AstroParticle Physics Amsterdam) institute, University of Amsterdam, 26 Oct,
• Gave a seminar on ‘Spiral Arm Paradigm in Disk Galaxies’ at Queen’s University Belfast.

David Long:
• Attended the RAS discussion meeting on Modern Techniques in Solar Data Analysis on 8 Jan and gave a contributed talk

David Long, David Pérez-Suárez and Lucie Green:
• Gave talks at the 2nd SEREN meeting on predicting solar Bz in Oxford.
Jason McEwen
- Gave a seminar on ‘Imaging data from next generation radio interferometric telescopes with compressive sensing’ at University of Cambridge, 29 Oct.

Mat Page
- Organized as a chair ‘Clusters of galaxies and hot baryons’ meeting at MSSL, 6/8 Oct,
- Gave a talk on ‘Emission lines from clusters, the legacy of Ariel 5’s discovery’ at ‘Clusters of galaxies and hot baryons’ meeting, MSSL, 6/8 Oct,
- Gave an invited review talk on ‘AGN populations in X-ray surveys’ at the Arches science workshop ‘X-ray surveys with advanced multi-wavelength cross-identification methods’, Paris, France, 3 Nov/2 Dec,
- Gave a talk on ‘PAH measurements of star formation in AGN hosts at z>1.5’ at UK SPICA meeting, the RAS, 22 Jan.

Stefano Pasetto

Paniez Paykari
- Gave a talk on ‘Euclid Power Spectrum Requirements’ at ‘Euclid Weak Lensing Autumn 2015’ meeting, UCL & Imperial, 5/6 Nov.

Licia Ray:
- Gave a seminar to the University of Southampton Astronomy department entitled “Auroral Acceleration at Jupiter” on 2 Dec,
- Led an International Space Science Institute (ISSI) team focused on “Coordinated Numerical Modeling of the Global Jovian and Saturnian Systems”, during the week of 4 Jan. It was the team’s second workshop.

George Seabroke

Myrto Symeonidis:
- Gave a talk on ‘Understanding composite sources: the AGN and star-forming components in SED fitting’ at ‘Modelling galaxies through cosmic times’ meeting, Cambridge, 14/18 Sept,
- Gave a talk on ‘X-rays from star-formation at z~1’ at ‘New Results in X-ray 2015’ meeting, Leicester, 10 Sept,
- Gave a seminar at the University of Leicester in Oct on The AGN/star-formation connection in galaxy evolution.

Kinwah Wu:
- Gave a seminar on ‘Population of X-ray sources in external galaxies’ at National Astronomical Observatories, Chinese Academy of Sciences on 17 Nov,
- Gave an invited talk on ‘Learning and creativity: a dialog with some random thoughts’ at ‘Forum/Workshop on Elite Education in Astrophysics and Space Science’, Nanjing University, China, 21 Nov,
- Gave two seminars on ‘General Relativistic Radiative Transfer’ on 8 Dec and ‘Cosmic Magnetism: Magnetic Fields and Polarised Radio Emission from Galaxy Clusters and Large-Scale Structures’ on 11 Dec at Nanjing University, China,
- Gave an advance short course on “Transport process in astrophysics and beyond astrophysics” (12-hr lectures in total plus tutorial sections) to students and researchers at the School of Astrophysics and Space Science, Nanjing University in Nov and Dec.

Zhonghua Yao:
- Gave a seminar to Imperial College entitled “Substructures within a Dipolarization Front Revealed by High-Resolution Cluster Observations” in Jan.

Silvia Zane
- Gave an invited talk at ‘AGN/NS’ meeting, Como, Italy, 30/31 Sept.
Autumn MIST at the RAS, 27 Nov:

- Nadine Kalmoni, Colin Forsyth and Georgina Graham gave talks entitled ‘The properties of auroral beads observed at substorm onset’, ‘A new technique for determining Substorm Onsets and PHases from Indices of the Electrojet (SOPHIE)’, and ‘Radial evolution of strahl electron pitch angle width: Cassini observations’ respectively. Zhonghua Yao presented a poster entitled ‘Substructures within a dipolarization front revealed by high temporal resolution Cluster observations’.

European Space Weather Week, Ostend, Belgium, 23-27 Nov:

- Coates, A.J., Titan’s plasma interaction and space weather effects,

AGU, San Fransisco, 14-18 Dec:

- Nordheim, T., G.H. Jones, A.J. Coates, A. Wellbrock, K. Hand, J.H. Waite, Detection of negative pickup ions at Saturn’s moon Dione,
- Regoli, L., A. Coates, M. Feyerabend, E. Roussos, G. Jones, N. Krupp, Pickup Ion Signatures in the Vicinity of Titan,
- Jasinski, J., C. Arridge, N. Sergis, A. Coates, G. Jones, Saturn’s Magnetospheric Cusp: Cassini Observations,
- Menietti, D., D. Pisa, O. Santolik, S. Ye, C. Arridge, A. Coates, Source Region and Growth Analysis of Narrowband Z-mode Emission at Saturn,

47th DPS AAS meeting, National Horbor, MD, 8-13 Nov:


The 1st Akon Europa Penetrator Workshop, RAS, 21st Jan:


13th Early Career Planetary Scientists’ Meeting, University of Leicester, 22 Jan:


Outreach

Andrew Coates:

- Talk ‘Rosetta and Philae: unlocking the secrets of comets’ for Sussex Retired Chartered Engineers Association (RCEA), Worthing, 10 Nov,
- Talk on Looking for Life on Mars at UCL Academy, (6th form and younger science students), 12 Nov,
- Talk on Looking for Life on Mars at U3A Cheam, 2 Dec,
- UCL lunch hour lecture on Looking for life on Mars, UCL, (available on YouTube), 19 Nov.

Colin Forsyth:

- Attended the National Space Centre’s CareersFests on 16 Nov and 25 Jan talking to GCSE and A-level students about careers in space science and engineering.

Louise Harra:

- Gave a talk at Ewell Astronomical Society.

Mat Page:

- Gave a talk on Gamma Ray Burst at Hertfordshire Astronomy Society.

Paniez Paykari:

- Gave an invited talk on cosmology at Iranian
Women’s Association on 8 Oct,
• Gave a talk at the Greenwich Observatory on 12 Jan.

Licia Ray:
• Gave an outreach talk to the Sevenoaks Knole University of the 3rd Age entitled “Auroras Abound” on 5 Nov.
• Visited the Capital City Academy to talk to the school astronomy club about life as a scientist on 26 Jan.
• Gave a talk to the UCL Science Centre entitled “The Magnetosphere: Earth’s Bubble shielding us from the Sun’s storms” on 29 Jan. These Friday night sessions focus on sixth formers interested in the physical sciences.

Book launch:

Press releases
• PanCam first hardware (STM) delivery to ESA and industry Airbus was featured on UCL, MSSL (2) and linked from ESA exploration websites, 4-7 Dec.

Media Broadcasts and Features
Andrew Coates
• Article for the Conversation on ‘How did Mars lose its habitable climate? The answer is blowing in the solar wind’ (including MAVEN, Mars Express, ExoMars), also used for Discovery magazine, 5 Nov,
• Interview on Al-Jazeera TV on space debris, 13 Nov.
• PanCam first hardware (STM) delivery to ESA and industry Airbus was featured on UCL, MSSL (2) and linked from ESA exploration websites, 4-7 Dec,
• Interviews on BBC Surrey, BBC education, BBC News Channel on Tim Peake launch – mentioned ExoMars, 15 Dec,
• Article for the Conversation on ‘Dry ice, rather than flowing water, could have sculpted Mars’s mysterious gullies’ (mentioned ExoMars), 21 Dec,
• Interview on BBC World TV on SpaceX Falcon 9 1st stage landing (mentioned ExoMars), 22 Dec,
• Guardian podcast Space 2016: what new frontiers will be explored this year?, on ExoMars, Rosetta, Juno, JUICE etc, (interview 6 Jan), published 8 Jan,
• Interviewed guest on ‘In Our Time’ on Saturn, BBC R4, (mentioned Cassini, JUICE, ExoMars,...) 14 Jan,
• Interviews on BBC radio Surrey/Sussex on Tim Peake spacewalk, mentioned ExoMars, 15 Jan,
• Info for Independent on Planet 9, 22 Jan,
• Article for The Conversation on ‘Claims about new planets that turned out to be wrong – and why ‘planet nine’ may be different’, 22 Jan,
• Daily Mail interview on To Pluto and beyond in 2016: Astronomers reveal the space missions we should get excited about this year - from ExoMars to Jupiter’s Juno and diving into Saturn’s ring, published 28 Jan,
• Interview for Naked Scientists on BBC R5, BBC Cambs and ABC, on Philae/Rosetta 31 Jan /5 Feb.

Other news
Colin Forsyth visited the University of Alberta in Edmonton to take part in the kick-off meeting of the Swarm+ Innovation project entitled “Swarm Investigation of the Role of High-Frequency (0.1-5Hz) ULF Waves in Magnetosphere-Ionosphere Coupling” (1/8 Nov).

Social
A baby son, Samuel Ian Alexander, arrived to join the Rae family on Nov 26. Weighing in at 7lb 5oz and growing rapidly, Samuel, Clare and Jonny thank MSSL colleagues and friends for their best wishes, cards and presents

Next Issue
The next issue of The Newsletter (Volume 13, Issue 2) will be published in Aug. This will cover activities from 1 Feb to 30 Apr 2016.