Active Galaxies Newsletter	*An electronic publication dedicated to the observation and theory of active galaxies*
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Accepted Abstracts - Submitted Abstracts - Thesis Abstracts
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From the Editor

Welcome to all the new subscribers, and thanks to everyone who contributed to this issue of the Active Galaxies Newsletter. This newsletter is intended to disseminate paper abstracts, meeting announcements, job adverts and other information which may be of interest to the active galaxies community. It is produced monthly and, whilst the deadline for contributions is the last day of the month, contributions may be submitted at any time.

The Latex macros for submitting abstracts and dissertation abstracts are appended to each issue of the newsletter and are also available on the web page. Please note that the editor may reject submissions which do not use the template. As always, any suggestions or feedback regarding the newsletter are welcome.

Thanks for your continued subscription.

Megan Argo

Abstracts of recently accepted papers

Ultraviolet/X-ray variability and the extended X-ray emission of the radio-loud broad absorption line quasar PG 1004+130

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We present the results of recent *Chandra*, *XMM-Newton*, and *Hubble Space Telescope* observations of the radio-loud (RL), broad absorption line (BAL) quasar PG 1004+130. We compare our new observations to archival X-ray and UV data, creating the most comprehensive, high signal-to-noise, multi-epoch, spectral monitoring campaign of a RL BAL quasar to date. We probe for variability of the X-ray absorption, the UV BAL, and the X-ray jet, on month–year timescales. The X-ray absorber has a low column density of $N_{\rm H} = 8 \times 10^{20} - 4 \times 10^{21}$ cm^{-2} when it is assumed to be fully covering the X-ray emitting region, and its properties do not vary significantly between the 4 observations. This suggests the observed absorption is not related to the typical "shielding gas" commonly invoked in BAL quasar models, but is likely due to material further from the central black hole. In contrast, the C IV BAL shows strong variability. The equivalent width (EW) in 2014 is $EW = 11.24 \pm 0.56$ Å, showing a fractional increase of $\Delta EW/\langle EW \rangle = 1.16 \pm 0.11$ from the 2003 observation, 3183 days earlier in the rest-frame. This places PG 1004+130 among the most highly variable BAL quasars. By combining *Chandra* observations we create an exposure 2.5× deeper than studied previously, with which to investigate the nature of the X-ray jet and extended diffuse X-ray emission. An X-ray knot, likely with a synchrotron origin, is detected in the radio jet $\sim 8''$ (30 kpc) from the central X-ray source with a spatial extent of $\sim 4''$ (15 kpc). No similar X-ray counterpart to the counterjet is detected. Asymmetric, non-thermal diffuse X-ray emission, likely due to inverse Compton scattering of Cosmic Microwave Background photons, is also detected.

Accepted for publication in ApJ.

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Preprint available at http://arxiv.org/abs/1505.01161

SUDARE-VOICE variability-selection of Active Galaxies in the Chandra Deep Field South and the SERVS/SWIRE region

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One of the most peculiar characteristics of Active Galactic Nuclei (AGN) is their variability over all wavelengths. This property has been used in the past to select AGN samples and is foreseen to be one of the detection techniques applied in future multi-epoch surveys, complementing photometric and spectroscopic methods.
In this paper, we aim to construct and characterise an AGN sample using a multi-epoch dataset in the r band from the SUDARE-VOICE survey. Our work makes use of the VST monitoring program of an area surrounding the Chandra Deep Field South to select variable sources. We use data spanning a six month period over an area of 2 square degrees, to identify AGN based on their photometric variability.
The selected sample includes 175 AGN candidates with magnitude r $<$ 23 mag. We distinguish different classes of variable sources through their lightcurves, as well as X-ray, spectroscopic, SED, optical and IR information overlapping with our survey. We find that 12% of the sample (21/175) is represented by SN. Of the remaining sources, 4% (6/154) are stars, while 66% (102/154) are likely AGNs based on the available diagnostics. We estimate an upper limit to the contamination of the variability selected AGN sample of about 34%, but we point out that restricting the analysis to the sources with available multi-wavelength ancillary information, the purity of our sample is close to 80% (102 AGN out of 128 non-SN sources with multi-wavelength diagnostics). Our work thus confirms the efficiency of the variability selection method in agreement with our previous work on the COSMOS field; in addition we show that the variability approach is roughly consistent with the infrared selection.

Accepted by Astronomy & Astrophysics

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Preprint available at http://arxiv.org/abs/1505.02668

Rest-frame Optical Emission Lines in Far-Infrared Selected Galaxies at $z < 1.7$ from the FMOS-COSMOS Survey

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We have used FMOS on Subaru to obtain near-infrared spectroscopy of 123 far-infrared selected galaxies in COSMOS and obtain the key rest-frame optical emission lines. This is the largest sample of infrared galaxies with near-infrared spectroscopy at these redshifts. The far-infrared selection results in a sample of galaxies that are massive systems that span a range of metallicities in comparison with previous optically selected surveys, and thus has a higher AGN fraction and better samples the AGN branch. We establish the presence of AGN and starbursts in this sample of (U)LIRGs selected as *Herschel*-PACS and *Spitzer*-MIPS detections in two redshift bins ($z \sim 0.7$ and $z \sim 1.5$) and test the redshift dependence of diagnostics used to separate AGN from star-formation dominated galaxies. In addition, we construct a low redshift ($z \sim 0.1$) comparison sample of infrared selected galaxies and find that the evolution from $z \sim 1.5$ to today is consistent with an evolving AGN selection line and a range of ISM conditions and metallicities from the models of Kewley et al. 2013. We find that a large fraction of (U)LIRGs are BPT-selected AGN using their new, redshift-dependent classification line. We compare the position of known X-ray detected AGN (67 in total) with the BPT selection and find that the new classification line accurately selects most of these objects ($> 70\%$). Furthermore, we identify 35 new (likely obscured) AGN not selected as such by their X-ray emission. Our results have direct implications for AGN selection at higher redshift with either current (MOSFIRE, KMOS) or future (PFS, MOONS) spectroscopic efforts with near-infrared spectral coverage.

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Preprint available at http://arxiv.org/abs/1505.03527

The most obscured AGN in the COSMOS field

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Highly obscured active galactic nuclei (AGN) are common in nearby galaxies, but are difficult to observe beyond the local Universe, where they are expected to significantly contribute to the black hole accretion rate density. Furthermore, Compton-thick (CT) absorbers ($N_H \gtrsim 10^{24}$ cm^{-2}) suppress even the hard X-ray (2-10 keV) AGN nuclear emission, and therefore the column density distribution above 10^{24} cm^{-2} is largely unknown. We present the identification and multi-wavelength properties of a heavily obscured ($N_H \gtrsim 10^{25}$ cm^{-2}), intrinsically luminous ($L_{2-10}> 10^{44}$ erg s^{-1}) AGN at $z = 0.353$ in the COSMOS field. Several independent indicators, such as the shape of the X-ray spectrum, the decomposition of the spectral energy distribution and X-ray/[NeV] and X-ray/6μm luminosity ratios, agree on the fact that the nuclear emission must be suppressed by a $\gtrsim 10^{25}$ cm^{-2} column density. The host galaxy properties show that this highly obscured AGN is hosted in a massive star-forming galaxy, showing a barred morphology, which is known to correlate with the presence of CT absorbers. Finally, asymmetric and blueshifted components in several optical high-ionization emission lines indicate the presence of a galactic outflow, possibly driven by the intense AGN activity ($L_{\rm Bol}/L_{Edd} = 0.3 - 0.5$). Such highly obscured, highly accreting AGN are intrinsically very rare at low redshift, whereas they are expected to be much more common at the peak of the star formation and BH accretion history, at $z \sim 2 - 3$. We demonstrate that a fully multi-wavelength approach can recover a sizable sample of such peculiar sources in large and deep surveys such as COSMOS.

A&A accepted.

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TWO e-MERLIN Support Scientist roles
Manchester, UK
Deadline: 10th July 2015

Email contact: simon.garrington@manchester.ac.uk
Further Information: https://www.jobs.manchester.ac.uk/displayjob.aspx?jobid=9427

Employment type : Fixed Term
Duration : Available immediately until 1st April 2017
Location : Jodrell Bank, Cheshire
Salary : £30,434 to £37,394 per annum
Hours per week : Full time

Applications are invited to join the scientific support teams for Jodrell Bank Observatory and the e-MERLIN / VLBI National Facility.

Jodrell Bank Observatory (JBO) is part of the University of Manchesters School of Physics and Astronomy and operates the 76-m Lovell Telescope and other large radio telescopes for astronomical research.

e-MERLIN is a network of seven large radio telescopes across the UK linked to a central operations and processing hub at Jodrell Bank in Cheshire.

These two roles will join the existing JBO / e-MERLIN scientific support teams who are responsible for the scientific operations of the telescopes and the e-MERLIN array. The roles will involve scheduling and operations of the array, quality control of the data, software and data processing pipeline development, data analysis, and scientific interaction with users of the facility.

You will carry out support duties for approximately 70% of your time, and will be expected and encouraged to pursue your own research, either independently or in collaboration with staff and students at JBO / Jodrell Bank Centre for Astrophysics (JBCA), becoming an active member of the scientific community at JBO / JBCA.

The e-MERLIN array has recently become operational to the scientific community and is the premier instrument in the world for very high sensitivity (microJansky) radio imaging at sub-arcsecond resolutions. The e-MERLIN upgrade increases the sensitivity of MERLIN by more than an order of magnitude, using new receivers and telescope electronics together with a dedicated optical fibre network to connect each telescope at a bandwidth of 30 Gb/s to a new correlator at JBO. The e-MERLIN / VLBI National Facility is operated by the Science and Technology Research Council and the University of Manchester for use by scientists world-wide.