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
Jobs Adverts - Meetings Adverts - Special Announcements

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.

Happy new year, and thanks for your continued subscription.

Megan Argo

Abstracts of recently accepted papers

A Minor Merger Caught In The Act Of Fueling The AGN In Mrk 509

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In recent observations by the Hubble Space Telescope (HST) as part of a campaign to discover locations and kinematics of AGN outflows, we found that Mrk 509 contains a $3''$ ($\sim$2100 pc) linear filament in its central region. Visible in both optical continuum and [OIII] imaging, this feature resembles a ???check mark??? of several knots of emission that travel northwest to southeast before jutting towards the nucleus from the southwest. Space Telescope Imaging Spectrograph (STIS/HST) observations along the inner portion of the filament reveal redshifted velocities, indicating that the filament is inflowing. We present further observations of the nucleus in Mrk 509 using the Gemini Near-Infrared Integral Field Spectrograph (NIFS), from which we conclude that this structure cannot be related to previously studied, typical NLR outflows and instead embodies the remains of an ongoing minor merger with a gas-rich dwarf galaxy, therefore providing a great opportunity to study the fueling of an AGN by a minor merger in progress.

Accepted by The Astrophysical Journal

E-mail contact: fischer@astro.gsu.edu
Preprint available at http://arxiv.org/abs/1412.1444

Compton Thick AGN in the XMM-COSMOS survey

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Heavily obscured, Compton Thick (CT, N_H>10^{24} cm^{-2}) Active Galactic Nuclei (AGN) may represent an important phase in AGN/galaxy co-evolution and are expected to provide a significant contribution to the cosmic X-ray background at its peak. However, unambiguously identifying CT AGN beyond the local Universe is a challenging task even in the deepest X-ray surveys, and given the expected low spatial density of these sources in the 2-10 keV band, large area surveys are needed to collect sizable samples. Through direct X-ray spectra analysis, we selected 39 heavily obscured AGN (N_H>3×10^{23} cm^{-2}) at bright xray fluxes ($F_{2-10} \gtrsim 10^{-14}$ erg s^{-1} cm^{-2}) in the 2 deg^2 XMM-COSMOS survey. After selecting CT AGN based on the fit of a simple absorbed two power law model to the shallow XMM data, the presence of *bona-fide* CT AGN was confirmed in 80% of the sources using deeper Chandra data and more complex models. The final sample comprises 10 CT AGN (6 of them also have a detected Fe Kα line with EW$\sim$ 1 keV), spanning a large range of redshift ($z\sim 0.1-2.5$) and luminosity ($L_{2-10} \sim 10^{43.5}-10^{45}$ ergs) and is complemented by 29 heavily obscured AGN spanning the same redshift and luminosity range. We collected the rich multi-wavelength information available for all these sources, in order to study the distribution of SMBH and host properties, such as BH mass (M_{BH}), Eddington ratio (λ_{Edd}), stellar mass (M_*), specific star formation rate (sSFR) in comparison with a sample of unobscured AGN. We find that highly obscured sources tend to have significantly smaller M_{BH} and higher λ_{Edd} with respect to unobscured sources, while a weaker evolution in M_* is observed. The sSFR of highly obscured sources is consistent with the one observed in the main sequence of star forming galaxies, at all redshift. We also present and briefly discuss optical spectra, broad band spectral energy distribution (SED) and morphology for the sample of 10 CT AGN. Both the optical spectra and SED agree with the classification as highly obscured sources: all the available optical spectra are dominated by the stellar component of the host galaxy, and to reproduce the broad band SED, an highly obscured torus component is needed for all the CT sources. Exploiting the high resolution *Hubble*-ACS images available, we are able to show that these highly obscured sources have a significantly larger merger fraction with respect to other xray selected samples of AGN. Finally we discuss the implications of our findings in the context of AGN/galaxy co-evolutionary models, and compare our results with the predictions of xray background synthesis models.

Accepted by A&A on 25 November 2014.

E-mail contact: giorgio.lanzuisi@oabo.inaf.it
Preprint available at: http://arxiv.org/pdf/1409.1867v2.pdf

Very Large Baseline Array observations of Mrk 6: probing the jet-lobe connection

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We present the results of high-resolution VLBI (very long baseline interferometry) observations at 1.6 and 4.9 GHz of the radio-loud Seyfert galaxy, Mrk 6. These observations are able to detect a compact radio core in this galaxy for the first time. The core has an inverted spectral index ($\alpha^{1.6}_{4.9} = +1.0 \pm 0.2$) and a brightness temperature of 1×10^8 K. Three distinct radio components, which resemble jet elements and/or hotspots, are also detected. The position angles of these elongated jet elements point not only to a curved jet in Mrk 6, but also towards a connection between the AGN and the kpc-scale radio lobes/bubbles in this galaxy. Firmer constraints on the star formation rate provided by new Herschel observations (SFR $< 0.8\ M_\odot\ yr^{-1}$) make the starburst-wind-powered bubble scenario implausible. From plasma speeds, obtained via prior Chandra X-ray observations, and ram pressure balance arguments for the interstellar medium and radio bubbles, the north-south bubbles are expected to take 7.5×10^6 yr to form, and the east-west bubbles 1.4×10^6 yr. We suggest that the jet axis has changed at least once in Mrk 6 within the last $\approx 10^7$ yr. A comparison of the nuclear radio-loudness of Mrk 6 and a small sample of Seyfert galaxies with a subset of low-luminosity FR I radio galaxies reveals a continuum in radio properties.

Accepted by MNRAS

E-mail contact: kharb@iiap.res.in
Preprint available at http://arxiv.org/abs/1402.7174

VLBI Imaging of the Double Peaked Emission Line Seyfert KISSR1494

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We present here the results from dual-frequency phase-referenced VLBI observations of the Seyfert galaxy KISSR1494, which exhibits double peaked emission lines in its SDSS spectrum. We detect a single radio component at 1.6 GHz, but not at 5 GHz implying a spectral index steeper than -1.5 ± 0.5 ($S_\nu \propto \nu^\alpha$). The high brightness temperature of the radio component ($\sim 1.4 \times 10^7$ K) and the steep radio spectrum support a non-thermal synchrotron origin. A crude estimate of the black hole mass derived from the $M_{BH} - \sigma_\star$ relation is $\sim 1.4 \pm 1.0 \times 10^8$ Msun; it is accreting at an Eddington rate of ~ 0.02. The radio data are consistent with either the radio emission coming from the parsec-scale base of a synchrotron wind originating in the magnetised corona above the accretion disk, or from the inner ionised edge of the accretion disk or torus. In the former case, the narrow line region (NLR) clouds may form a part of the broad outflow, while in the latter, the NLR clouds may form a part of an extended disk beyond the torus. The radio and NLR emission may also be decoupled so that the radio emission originates in an outflow while the NLR is in a disk, and vice versa. While with the present data, it is not possible to clearly distinguish between these scenarios, there appears to be greater circumstantial evidence supporting the coronal wind picture in KISSR1494. From the kiloparsec-scale radio emission, the time-averaged kinetic power of this outflow is estimated to be $Q \approx 1.5 \times 10^{42}$ erg s^{-1}, which is typical of radio outflows in low-luminosity AGN. This supports the idea that radio "jets" and outflowing coronal winds are indistinguishable in Seyfert galaxies.

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E-mail contact: kharb@iiap.res.in
Preprint available at: http://arxiv.org/abs/1412.0400

Variability-selected active galactic nuclei in the *VST*-SUDARE/VOICE survey of the COSMOS field

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Active galaxies are characterized by variability at every wavelength, with timescales from hours to years depending on the observing window. Optical variability has proven to be an effective way of detecting AGNs in imaging surveys, lasting from weeks to years. In the present work we test the use of optical variability as a tool to identify active galactic nuclei in the *VST* multiepoch survey of the COSMOS field, originally tailored to detect supernova events. We make use of the multiwavelength data provided by other COSMOS surveys to discuss the reliability of the method and the nature of our AGN candidates. The selection on the basis of optical variability returns a sample of 83 AGN candidates; based on a number of diagnostics, we conclude that 67 of them are confirmed AGNs (81% purity), 12 are classified as supernovae, while the nature of the remaining 4 is unknown. For the subsample of AGNs with some spectroscopic classification, we find that Type 1 are prevalent (89%) compared to Type 2 AGNs (11%). Overall, our approach is able to retrieve on average 15% of all AGNs in the field identified by means of spectroscopic or X-ray classification, with a strong dependence on the source apparent magnitude (completeness ranging from 26% to 5%). In particular, the completeness for Type 1 AGNs is 25%, while it drops to 6% for Type 2 AGNs. The rest of the X-ray selected AGN population presents on average a larger r.m.s. variability than the bulk of non-variable sources, indicating that variability detection for at least some of these objects is prevented only by the photometric accuracy of the data. The low completeness is in part due to the short observing span: we show that increasing the temporal baseline results in larger samples as expected for sources with a red-noise power spectrum. Our results allow us to assess the usefulness of this AGN selection technique in view of future wide-field surveys.

Accepted by A&A

E-mail contact: demetra.decicco@unina.it
Preprint available at http://arxiv.org/abs/1412.1488

Storm in a "Teacup": a radio-quiet quasar with ≈10 kpc radio-emitting bubbles and extreme gas kinematics

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We present multi-frequency (1–8 GHz) VLA data, combined with VIMOS IFU data and *HST* imaging, of a $z = 0.085$ radio-quiet type 2 quasar (with $L_{1.4\,\mathrm{GHz}} \approx 5 \times 10^{23}$ W Hz^{-1} and $L_{\mathrm{AGN}} \approx 2 \times 10^{45}$ erg s^{-1}). Due to the morphology of its emission-line region, the target (J1430+1339) has been referred to as the Teacup AGN in the literature. We identify "bubbles" of radio emission that are extended ≈10–12 kpc to both the east and west of the nucleus. The edge of the brighter eastern bubble is co-spatial with an arc of luminous ionized gas. We also show that the Teacup AGN hosts a compact radio structure, located ≈0.8 kpc from the core position, at the base of the eastern bubble. This radio structure is co-spatial with an ionized outflow with an observed velocity of $v = -740$ km s^{-1}. This is likely to correspond to a jet, or possibly a quasar wind, interacting with the interstellar medium at this position. The large-scale radio bubbles appear to be inflated by the central AGN, which indicates that the AGN can also interact with the gas on $>\sim$ 10 kpc scales. Our study highlights that even when a quasar is formally "radio-quiet" the radio emission can be extremely effective for observing the effects of AGN feedback.

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E-mail contact: c.m.harrison@mail.com
Preprint available at http://adsabs.harvard.edu/abs/2014arXiv1410.4198H

30 YEARS OF PHOTODISSOCIATION REGIONS: A Symposium to Honor David Hollenbachs Lifetime in Science

Asilomar, California, USA
June 28 to July 3rd, 2015

Webpage: `http://pdr30.strw.leidenuniv.nl`
Email: `pdr30@strw.leidenuniv.nl`

The goal of this meeting is to overview the state of the art in theoretical PDR studies, to review the processes that control the physical and chemical conditions in PDRs and their emission characteristics, to compare and contrast these models with recent observations of PDRs obtained with the Spitzer Space Telescope, the Herschel Space Observatory, the Stratospheric Observatory For Infrared Astronomy, and the Atacama Large Millimeter Array, to connect studies of dense PDRs in regions of star formation to the studies of the evolution of the interstellar medium of galaxies over the history of the Universe, and to link and compare and contrast studies of PDRs to those of regions dominated by X-rays, by turbulence, by shocks, and by cosmic rays. In addition, we take this occasion to celebrate the contributions to this field of one of the pioneers, David Hollenbach.

The scientific topics of this meeting include:

- The Physics and Chemistry of PDRs,
- Models of PDRs,
- Observations PDRs in the galactic environment,
- PDRs & star and planet formation,
- PDRs & the ISM of galaxies, and
- PDRs in starburst, (U)LIRG, and high-z environments.

The format of the meeting will consist of invited reviews, invited talks, contributed papers, and poster papers. A list of invited speakers is available on the website.

VENUE

The Asilomar conference center is a California State Park (http://www.visitasilomar.com) beautifully situated on the coast of the Monterey peninsula in a very quiet and serene setting that we hope will be very conducive to a highly interactive meeting.

SOFIA GRANT

SOFIA has generously provided support for deserving students to defer their room and board during the meeting. Students who wish to be considered for a SOFIA travel grant have to send a letter of motivation plus a supporting letter from their supervisor. Details can be found on the website.

REGISTRATION

Registration is now open. Early registration is encouraged, as the number of participants will be limited to approximately 150.

IMPORTANT DATES

Registration and Abstract submission deadline: April 2nd, 2015
Student grant requests: February 20th, 2015

See the website for details.

WEBSITE

For more information, visit our website:

http://pdr30.strw.leidenuniv.nl

We are looking forward to an exciting meeting and hope to welcome you in Asilomar,

On behalf of the Scientific Organizing Committee,

Margaret Meixner & Xander Tielens

Postdoctoral Fellowship in AGN and/or Clusters of Galaxies
Dept of Physics & Astronomy, University of Manitoba
Deadline 28th February 2015

Email contact: christopher.o'dea@umanitoba.ca
Further Information: http://umanitoba.ca/faculties/science/departments/physics/index.html

The Department of Physics and Astronomy at the University of Manitiba invites applications for a postdoctoral fellow working with Profs. Stefi Baum and Chris ODea on multi-wavelength observational studies of Active Galactic Nuclei and/or Clusters of Galaxies.

Candidates must hold a Ph.D. degree in astronomy, physics, or a related subject by the appointment start. The initial appointment will be for one year, renewable for a second and third year upon mutual agreement and availability of funding. The starting date is negotiable between the summer and early fall.

Applicants should submit a cover letter, CV, publication list, and a statement of research interests. Three letters of reference should also be submitted. All information should be emailed to christopher.o'dea@umanitoba.ca. Review of materials will begin Feb 1, 2015.

Winnipeg is the largest city in the Province of Manitoba. The city has a rich cultural environment, including symphony, opera, dance, theatre, and ethnic festivals. The region provides ample opportunities for outdoor recreation in all seasons. Learn more about Winnipeg at http://www.city.winnipeg.mb.ca.

The University of Manitoba is strongly committed to diversity within its community and especially welcomes applications from qualified women and men, visible minority group members, Aboriginal peoples, persons with disabilities, persons of all sexual orientations and genders and others who may contribute to the further diversification of ideas. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. Application materials, including letters of reference, will be handled in accordance with the protection of privacy provisions of The Freedom of Information and Protection of Privacy (Manitoba). Please note that your curriculum vitae may be provided to participating members of the search process.