Active Galaxies Newsletter	*An electronic publication dedicated to the observation and theory of active galaxies*
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Abstracts - Thesis Abstracts - Jobs - Meetings

From the Editor

The Active Galaxies Newsletter is produced monthly. The deadline for contributions is the last friday of the month. 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.

Rob Beswick

Determining Central Black Hole Masses in Distant Active Galaxies and Quasars. II. Improved Optical and UV Scaling Relationships.

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We present four improved empirical relationships useful for estimating the central black hole mass in nearby AGNs and distant luminous quasars alike using either optical or UV single-epoch spectroscopy. These mass-scaling relationships between line widths and luminosity are based on recently improved empirical relationships between the broad-line region size and luminosities in various energy bands and are calibrated to the improved mass measurements of nearby AGNs based on emission-line reverberation mapping. The mass-scaling relationship based on the Hβ line luminosity allows mass estimates for low-redshift sources with strong contamination of the optical continuum luminosity by stellar or non-thermal emission, while that based on the C IV λ1549 line dispersion allows mass estimates in cases where only the line dispersion (as opposed to the FWHM) can be reliably determined. We estimate that the absolute uncertainties in masses given by these mass-scaling relationships are typically around a factor of 4. We include in an Appendix mass estimates for all the Bright Quasar Survey (PG) quasars for which direct reverberation-based mass measurements are not available.

Accepted by Astroph. J.

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preprint available at http://arxiv.org/abs/astro-ph/0601303

Chandra and XMM-Newton Observations of a Sample of Low-Redshift FRI and FRII Radio-Galaxy Nuclei

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We present spectral results, from *Chandra* and *XMM-Newton* observations, of a sample of 22 low-redshift ($z < 0.1$) radio galaxies, and consider whether the core emission originates from the base of a relativistic jet, an accretion flow, or contains contributions from both. We find correlations between the unabsorbed X-ray, radio, and optical fluxes and luminosities of FRI-type radio-galaxy cores, implying a common origin in the form of a jet. On the other hand, we find that the X-ray spectra of FRII-type radio-galaxy cores is dominated by absorbed emission, with $N_{\rm H} > 10^{23}$ atoms cm^{-2}, that is likely to originate in an accretion flow. We discuss several models which may account for the different nuclear properties of FRI- and FRII-type cores, and also demonstrate that both heavily obscured, accretion-related, and unobscured, jet-related components may be present in all radio-galaxy nuclei. Any absorbed, accretion-related, components in FRI-type galaxies have low radiative efficiencies.

Accepted by Astrophysical Journal

E-mail contact: devans@cfa.harvard.edu,
preprint available at http://arxiv.org/abs/astro-ph/0512600

Radio Linear and Circular Polarization from M81*

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We present results from archival Very Large Array (VLA) data and new VLA observations to investigate the long term behavior of the circular polarization of M81*, the nuclear radio source in the nearby galaxy M81. We also used the Berkeley-Illinois-Maryland Association (BIMA) array to observe M81* at 86 and 230 GHz. M81* is unpolarized in the linear sense at a frequency as high as 86 GHz and shows variable circular polarization at a frequency as high as 15 GHz. The spectrum of the fractional circular polarization is inverted in most of our observations. The sign of circular polarization is constant over frequency and time. The absence of linear polarization sets a lower limit to the accretion rate of $10^{-7} M_{\odot} y^{-1}$. The polarization properties are strikingly similar to the properties of Sgr A*, the central radio source in the Milky Way. This supports the hypothesis that M81* is a scaled up version of Sgr A*. On the other hand, the broad band total intensity spectrum declines towards milimeter wavelengths which differs from previous observations of M81* and also from Sgr A*.

Accepted by A&A

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preprint available at http://www.mpifr-bonn.mpg.de/staff/abrunthaler/pub.shtml or http://arxiv.org/abs/astro-ph/0601474

Star formation in hosts of young radio galaxies

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We present near ultraviolet imaging with the Hubble Space Telescope Advanced Camera for Surveys, targeting young radio galaxies (Gigahertz Peaked Spectrum and Compact Steep Spectrum sources), in search for star formation regions in their hosts. We find possible traces of recent star formation in eight of the nine observed sources. However, observations at other wavelengths and colors are needed to further asses the nature of the observed UV properties. CSS sources 1443+77 and 1814–637 show star format ion enhanced by the expansion of the radio lobes through the host.

Accepted by New Astronomy Reviews

E-mail contact: labiano@astro.rug.nl,
preprint available at http://xxx.lanl.gov/abs/astro-ph/0512057

The infrared jet in Centaurus A: multiwavelength constraints on emission mechanisms and particle acceleration

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We report on *Spitzer* and Gemini observations of the jet of Centaurus A in the infrared, which we combine with radio, ultraviolet and X-ray data. *Spitzer* detects jet emission from about 2 arcmin from the nucleus, becoming particularly bright after the jet flare point at ~ 3.4 arcmin. Where X-ray and infrared emission are seen together the broad-band data strongly support a synchrotron origin for the X-rays. The jet flare point is marked by a broad, diffuse region of X-rays which may be associated with a shock: we discuss possible physical mechanisms for this. The infrared jet persists after the flare point region although X-ray emission is absent; it is plausible that here we are seeing the effects of particle acceleration followed by downstream advection with synchrotron losses. Gemini data probe the inner regions of the jet, putting limits on the mid-infrared flux of jet knots.

Accepted by MNRAS (Letters)

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preprint available at http://xxx.soton.ac.uk/abs/astro-ph/0601421

The Warped Nuclear Disk of Radio Galaxy 3C 449

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Among radio galaxies containing nuclear dust disks, the bipolar jet axis is generally observed to be perpendicular to the disk major axis. The FR I radio source 3C 449 is an outlier to this statistical majority, as it possesses a nearly parallel jet/disk orientation on the sky. We examine the 600 pc dusty disk in this galaxy with images from the *Hubble Space Telescope*. We find that a 1.6 μm/0.7 μm colormap of the disk exhibits a twist in its isocolor contours (isochromes). We model the colormap by integrating galactic starlight through an absorptive disk, and find that the anomalous twist in the isochromes can be reproduced in the model with a vertically thin, warped disk. The model predicts that the disk is nearly perpendicular to the jet axis within 100 pc of the nucleus. We discuss physical mechanisms capable of causing such a warp. We show that precessional models or a torque on the disk arising from a possible binary black hole in the AGN causes precession on a timescale that is too long to account for the predicted disk morphology. However, we estimate that the pressure in the X-ray emitting interstellar medium is large enough to perturb the disk, and argue that jet-driven anisotropy in the excited ISM may be the cause of the warp. In this way, the warped disk in 3C 449 may be a new manifestation of feedback from an active galactic nucleus.

Accepted by ApJ

E-mail contact: grant@pas.rochester.edu,
preprint available at http://arxiv.org/abs/astro-ph/0510650

FIRST-based survey of Compact Steep Spectrum sources IV. Multifrequency VLBA observations of very compact objects

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Evidence has been mounting recently that activity in some radio loud AGNs (RLAGNs) can cease shortly after ignition and that perhaps even a majority of very compact sources may be short-lived phenomena because of a lack of stable fuelling from the black hole. Thus, they can fade out before having evolved to large, extended objects. Re-ignition of the activity in such objects is not ruled out. With the aim of finding more examples of these objects and to investigate if they could be RLAGNs switched off at very early stages of their evolution, multifrequency VLBA observations of six sources with angular sizes significantly less than an arcsecond, yet having steep spectra, have been made. Observations were initially made at 1.65 GHz using the VLBA with the inclusion of Effelsberg telescope. The sources were then re-observed with the VLBA at 5, 8.4 and 15.4 GHz. All the observations were carried out in a snapshot mode with phase referencing. One of the sources studied, 0809+404, is dominated by a compact component but also has diffuse, arcsecond-scale emission visible in VLA images. The VLBI observations of the "core" structure have revealed that this is also diffuse and fading away at higher frequencies. Thus, the inner component of 0809+404 could be a compact fading object. The remaining five sources presented here show either core-jet or edge-brightened

double-lobed structures indicating that they are in an active phase. The above result is an indication that the activity of the host galaxy of 0809+404 may be intermittent. Previous observations obtained from the literature and those presented here indicate that activity had ceased once in the past, then restarted, and has recently switched off again.

Accepted by Astronomy & Astrophysics

E-mail contact: amr@astro.uni.torun.pl, preprint available at http://arxiv.org/abs/astro-ph/0601288

Observations of Magnetic Fields and Relativistic Beaming in Four Quasar Jets

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We discuss the physical properties of four quasar jets imaged with the *Chandra* X-ray Observatory in the course of a survey for X-ray emission from radio jets (Marshall et al. 2005). These objects have sufficient counts to study their spatially resolved properties, even in the 5 ks survey observations. We have acquired Australia Telescope Compact Array data with resolution matching *Chandra*. We have searched for optical emission with Magellan, with sub-arcsecond resolution. The radio to X-ray spectral energy distribution for most of the individual regions indicates against synchrotron radiation from a single-component electron spectrum. We therefore explore the consequences of assuming that the X-ray emission is the result of inverse Compton scattering on the cosmic microwave background. If particles and magnetic fields are near minimum energy density in the jet rest frames, then the emitting regions must be relativistically beamed, even at distances of order 500 kpc from the quasar. We estimate the magnetic field strengths, relativistic Doppler factors, and kinetic energy flux as a function of distance from the quasar core for two or three distinct regions along each jet. We develop, for the first time, estimates in the uncertainties in these parameters, recognizing that they are dominated by our assumptions in applying the standard synchrotron minimum energy conditions. The kinetic power is comparable with, or exceeds, the quasar radiative luminosity, implying that the jets are a significant factor in the energetics of the accretion process powering the central black hole. The measured radiative efficiencies of the jets are of order 10^{-4}.

Accepted by Ap. J. Part 1

E-mail contact: das@head-cfa.harvard.edu, preprint available at http://arxiv.org/abs/astro-ph/0601632

The near-infrared spectrum of Mrk 1239: direct evidence of the dusty torus?

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We report 0.8−4.5 μm SpeX spectroscopy of the narrow-line Seyfert 1 galaxy Mrk 1239. The spectrum is outstanding because the nuclear continuum emission in the near-infrared is dominated by a strong bump of emission peaking at 2.2 μm, with a strength not reported before in an AGN. A comparison of the Mrk 1239 spectrum to that of Ark 564 allowed us to conclude that the continuum is strongly reddened by E(B-V)=0.54. The excess of emission, confirmed by aperture photometry and additional NIR spectroscopy, follows a simple blackbody curve at T$\sim$1200 K. This suggest that we may be observing direct evidence of dust heated near to the sublimation temperature, likely produced by the putative torus of the unification model. Although other alternatives are also plausible, the lack of star formation, the strong polarization and low extinction derived for the emission lines support the scenario where the hot dust is located between the narrow line region and the broad line region.

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E-mail contact: aardila@lna.br, preprint available at http://arxiv.org/abs/astro-ph/0601313

Jobs

Postdoctoral Research Position, University of Kentucky

Physics & Astronomy Department, University of Kentucky, Lexington, KY 40506-0055, USA

with Prof. Moshe Elitzur

Applications are invited for a postdoctoral research position in theoretical astrophysics to work with Prof. Moshe Elitzur at the University of Kentucky. **The start date is around September 2006.** Interest in radiative processes and AGN is advantageous. Applicants should send curriculum vita, bibliography and a statement of research interests by e-mail to `moshe@pa.uky.edu` and arrange for three letters of recommendation to be sent the same way. The initial appointment is for one year, with an expected extension for another year. The review of applications will start at the end of February, and will be continued until the position is filled.

For further details contact Prof. Moshe Elitzur (moshe@pa.uky.edu)

Meetings

First Announcement

THE CENTRAL ENGINE OF ACTIVE GALACTIC NUCLEI

October 16-21, 2006; Xi'an, China

Webpage: http://agn06.ihep.ac.cn/

Dear Colleagues,

An international conference on AGNs will be held in X'ian, China, during **October 16-21, 2006**. This meeting will focus on the classical components of the central engine of AGNs: the black hole, accretion disk, jet, outflow/wind, absorbers, broad-line region, torus, and narrow-line region, along with topics related to dust grains and stellar processes in galactic nuclei. Whenever possible we will attempt to address the physical properties of these components, and their associated physical processes, rather than on phenomenology alone. It is hoped that quantitative studies of the central engine will ultimately lead not only to a better understanding of the AGN phenomenon but also to deeper insights into the manner in which AGNs affect their host galaxies and their larger cosmic habitat.

SOC members:
S. Wagner (Germany)
L. C. Ho (Co-Chair, USA),
D. M. Crenshaw (USA)
B. Czerny (Poland)
K. Leighly (USA)
G. Matt (Italy)
S. Minishige (Japan)
H. Netzer (Israel)
B. M. Peterson (USA)
D. Proga (USA)
D. Lutz (Germany)
J. C. Shields (USA)
J.-M. Wang (Co-Chair, China)
T.-G. Wang (China),
X.-B. Wu (China)
S. N. Zhang (China)

Tentative invited speakers include: Arav, Barth, Blaes, Boettcher, Chelouche, Crenshaw, Czerny, Eracleous, Fabian, Gallagher, Groves, Hamann, Kaspi, Korista, Laor, Levenson, Maiolino, Matt, Minishige, Nayakshin, Netzer, Peterson, Proga, Reeves, Shields, Sturm, Turner, Uttley, Wagner, Wang, Whittle, Yaqoob, Yuan, Zhang.

More information and updates on the meeting will be posted at `http://agn06.ihep.ac.cn/`. A first announcement will be sent out on January 25, 2006.

We hope you find the meeting exciting. Please feel free to disseminate this information to your colleagues.

Luis C. Ho
Carnegie Observatories

First Announcement

AT THE EDGE OF THE UNIVERSE: LATEST RESULTS FROM THE DEEPEST ASTRONOMICAL SURVEYS

October 9-13, 2006, Sintra, Portugal

The Astronomical Observatory of Lisbon and the Centre for Astronomy and Astrophysics of the University of Lisbon are pleased to announce the International Astronomy Conference

Webpage: http://www.oal.ul.pt/deep06
Email: deep06@oal.ul.pt

Dear colleagues,

This is the first announcement of the conference **"At the Edge of the Universe: latest results from the deepest astronomical surveys"** organised by the Astronomical Observatory of Lisbon and the Centre for Astronomy and Astrophysics of the University of Lisbon. This conference will be held on 2006 October 9-13, in Sintra, a beautiful region just 30 km to the west of central Lisbon classified by UNESCO as a World Heritage Site (see `http://whc.unesco.org/en/list/723`).

Please notify this event to all your colleagues, and kindly upload this conference information on any of the relevant Web(s) and/or Board(s).

Conference Rationale:
The capabilities of astronomical observation have dramatically increased over the last few years. New and powerful telescopes have boosted our ability to detect and study the primordial Universe. The largest ground-based observatories, ranging from 8-10m class optical telescopes to radio interferometers with baselines of several kilometers, as well as many space facilities, covering the optical, X-ray and infrared domains, are now largely dedicated to explore the distant Universe, in search of the primordial sources of light and how they have shaped the surrounding environment and evolved to the present day. Large international teams have been set-up in an unprecedented effort to realize extremely deep observations at essentially all wavelengths, from the X-rays to the radio. The era of the Deep Fields has truly arrived, and now is the right time to compare results from the different teams, analysing different fields at different wavelengths, in order to form a coherent picture of galaxy formation and evolution and to identify the intriguing puzzles that will require the next generation of telescopes to be solved.

To aid in this effort, the Astronomical Observatory of Lisbon and the Centre for Astronomy and Astrophysics of the University of Lisbon are organising an international conference, aimed at discussing galaxy formation and evolution in the light of the deepest astronomical surveys. The focus is on the latest observational results, and how they can be interpreted using the latest theoretical framework.

Main Topics:

- Galaxy formation, the first billion years
- Reionization
- High-redshift star-forming galaxies
- Early AGN activity
- Galaxy merger rates
- Galaxy morphological evolution
- Galaxy mass assembly
- Star-formation History
- Obscured galaxies
- Extragalactic backgrounds
- The next generation of deep surveys

Scientific Organising Committee:
Jose Afonso (co-chair, OAL), Carlos de Breuck (ESO), Andrea Cimatti (Arcetri), Mark Dickinson (NOAO), James Dunlop (ROE), Henry Ferguson (STScI), Mauro Giavalisco (STScI), Ken Kellermann (NRAO), Bahram Mobasher (co-chair, STScI), Ray Norris (ATNF), Piero Rosati (ESO).

Local Organising Committee:
Jose Afonso (chair, OAL), Gisela Oliveira (FCUL), Eugenia Carvalho (OAL), Halima Naimova (OAL), David Sobral (FCUL), Joao Retre (FCUL).

Location:
The conference will be held in the Hotel Tivoli Sintra, at the very center of one of the most beautiful villages in the world, Sintra. Just 30 km away from central Lisbon, the "Cultural Landscape of Sintra" is part of the World Heritage List, displaying a unique mixture of nature and architectural treasures. Sintra, with its fairytale palaces and luxuriant vegetation resulting from a unique microclimate, has inspired many great writers and poets: Lord Byron called it a "Glorious Eden", while Robert Southley longed to spend his last days here.

For the sea lovers, the extensive Sintra's coastline offers many opportunities for surf and windsurf (Guincho, a renowned windsurfing Mecca, is just minutes away). Cabo da Roca, the westernmost point in continental Europe is also nearby, hosting spectacular coastline views all the way to Lisbon.

We hope you can attend the "At the Edge of the Universe" conference. If you are coming, we strongly advise you to take a couple of extra days to explore this beautiful place. On the conference webpages you will find more information on Sintra, so that you can enjoy your Sintra experience to the fullest.

IMPORTANT DATES:

- January 30 2006: First announcement; registration opens
- March 1 2006: Second announcement
- June 1 2006: Third and Final announcement
- June 15 2006: Registration and Abstract submission deadline
- July 15 2006: Final Conference Programme
- October 09 2006: Conference Starts

REGISTRATION:
If you are interested in receiving further announcements, please send a blank email to `deep06@oal.ul.pt` with "more info" in the subject line. Registration and abstract submission can be made through the conference webpages.

PROGRAM:
In addition to invited talks, contributed papers (oral or poster) can be presented. The SOC will select a limited number of contributions for oral presentation on the basis of the submitted abstracts.

PROCEEDINGS:
The contributions will be published as proceedings. Details will be given soon.

CONTACT INFORMATION:
For inquiries concerning travel, accommodation, and other logistic details, please consult the conference webpage or contact the LOC members.

webpage: http://www.oal.ul.pt/deep06
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Fax: +351 21 361 67 52

Please feel free to disseminate this information among your colleagues.

We are looking forward to meeting you in Sintra.

On behalf of the SOC and LOC,
Jose Afonso