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Accepted Abstracts - Submitted Abstracts - Thesis Abstracts
Jobs Adverts - Meetings Adverts - Special Announcements

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.

As always as editor of the newsletter I am very interested to hear any suggestions or feedback regarding the newsletter. So do not hesitate in emailing me your suggestions.

Many thanks for your continued subscription.

Rob Beswick

Abstracts of recently accepted papers

Eddington ratio and accretion efficiency in AGN evolution

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The cosmological evolution of Active Galactic Nuclei (AGN) is important for understanding the mechanism of accretion onto supermassive black holes, and the related evolution of the host galaxy. In this work, we include objects with very low Eddington ratio ($10^{-3} - 10^{-2}$) in an evolution scenario, and compare the results with the observed local distribution of black holes. We test several possibilities for the AGN population, considering obscuration and dependence with luminosity, and investigate the role of the Eddington ratio λ and radiative accretion efficiency ϵ on the shape of the evolved mass function. We find that three distinct populations of AGN can evolve with a wider parameter range than is usually considered, and still be consistent with the local mass function. In general, the black holes in our solutions are spinning rapidly. Taking fixed values for ϵ and λ neither provides a full knowledge of the evolution mechanism nor is consistent with the existence of low Eddington ratio objects.

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preprint available at http://uk.arxiv.org/abs/0903.3432

Revealing X-ray obscured quasars in SWIRE sources with extreme mid-IR/optical flux ratios

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Recent works have suggested that selection criteria based on mid-IR properties, i.e. extreme colors and bright flux levels, can be used to reveal a population of dust-enshrouded, extremely-luminous quasars at $z \sim$1–2. However, the X-ray spectral properties of these intriguing objects still remain largely unexplored. We have performed an X-ray study of a large sample of bright mid-IR ($F_{24\mu m} > 1.3$ mJy) galaxies showing an extreme MIR/Optical flux ratio ($F_{24\mu m}/F_R > 2000$) in order to confirm the presence of a luminous active nucleus in these very red objects. Sampling of a large area is required to pick up objects at the highest luminosities given their low surface density. Accordingly, we have applied our selection criteria to an area of $\sim$6 deg^2 covered by *XMM-Newton-Chandra* observations within the $\sim$50 deg^2 SWIRE survey, resulting in a final sample of 44 objects. The vast majority of the source redshifts, both spectroscopic and photometric, are in the range $0.7 \leq z \leq 2.5$. The X-ray coverage of the sample is highly inhomogeneous (from snap-shot 5 ks *Chandra* observations to medium-deep *XMM-Newton* exposures of 70 ks) and, consequently, a sizable fraction of them ($\sim$43%) remains undetected in the 0.5-10 keV band. Using spectral or hardness information we were able to estimate the value of the absorbing column density in 23 sources. 95% of them are consistent with being obscured by neutral gas with an intrinsic column density of $N_H \geq 10^{22}$ cm^{-2}. Remarkably, we also find that $\sim$55% of these sources can be classified as Type 2 quasars on the basis of their absorption properties and X-ray luminosity. Moreover, most of the X-ray undetected sources show extreme mid-IR colors, consistent with being luminous AGN-powered objects, suggesting they might host heavily obscured (possibly Compton-thick) quasars in X-rays. This demonstrates that our selection criteria applied to a wide area survey is very efficient in finding a large number of Type 2 quasars at $z \geq$1. The existence of this class of very powerful, obscured quasars at high z could have important implications in the context of the formation and cosmological evolution of accreting supermassive black holes and their host galaxies.

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preprint available at http://arxiv.org/abs/0902.2517

X-ray Absorption and Reflection in Active Galactic Nuclei

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X-ray spectroscopy offers an opportunity to study the complex mixture of emitting and absorbing components in the circum-nuclear regions of active galactic nuclei (AGN), and to learn about the accretion process that fuels AGN and the feedback of material to their host galaxies. We describe the spectral signatures that may be studied and review the X-ray spectra and spectral variability of active galaxies, concentrating on progress from recent *Chandra*, *XMM-Newton* and *Suzaku* data for local type 1 AGN. We describe the evidence for absorption covering a wide range of column densities, ionization and dynamics, and discuss the growing evidence for partial-covering absorption from data at energies > 10 keV. Such absorption can also explain the observed X-ray spectral curvature and variability in AGN at lower energies and is likely an important factor in shaping the observed properties of this class of source. Consideration of self-consistent models for local AGN indicates that X-ray spectra likely comprise a combination of absorption and reflection effects from material originating within a few light days of the black hole as well as on larger scales. It is likely that AGN X-ray spectra may be strongly affected by the presence of disk-wind outflows that are expected in systems with high accretion rates, and we describe models that attempt to predict the effects of radiative transfer through such winds, and discuss the prospects for new data to test and address these ideas.

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preprint available as arXiv:0902.0651

Suzaku Observation of a Hard Excess in 1H 0419-577: Detection of a Compton-Thick Partial-Covering Absorber

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We present results from a 200 ks *Suzaku* observation of 1H 0419-577 taken during 2007 July. The source shows a strong excess of counts above 10 keV compared to the extrapolation of models based on previous data in the 0.5-10 keV band. The 'hard excess' in 1H 0419-577 can be explained by the presence of a Compton-thick partial-covering absorber that covers $\sim 70\%$ of the source. The Compton-thick gas likely originates from a radius inside of the optical BLR and may form part of a clumpy disk wind. The fluorescent Fe Kα luminosity measured by *Suzaku* is consistent with that expected from an equatorial disk wind.

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AKARI near- and mid-infrared spectroscopy of APM 08279+5255 at $z = 3.91$

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We present rest-frame optical/near-infrared spectra of the gravitationally lense d quasar APM 08279+5255 at $z = 3.91$ that has been taken using the Infrared Camera (IRC) onboard the *AKARI* infrared satellite. The observed continuum consists of two components; a power-law component dominating optical wavelengths which is the direct light from the central source and thermal emission dominating near-infrared wavelengths which is attributed to the emission from hot dust in the circumnuclear region. The thermal emission well represents optically thick emission by hot dust at $T \sim 1300$K with $\tau_{2\mu\mathrm{m}} > 2$ and apparent mass, $M_{\mathrm{hot}} > 10\mathrm{M}_{\odot}$. Thus, our observations directly detected the optically thick region of hot dust in APM 08279+5255. HI recombination lines of Hα(0.656μm), Paα(1.875μm), and Paβ(1.282μm) are clearly detected at 3.2, 6.3, and 9.3 μm. Simulations with the photoionization models suggest that APM 08279+5255 has BLR(Broad Line Region) clouds characterized by $\log n_H \sim 12-14$ for the gas density, $\log U \sim -2--6$ for the ionization parameter, and $E(B-V) \sim 0.3-0.6$ for the broad line region. Thus, optically thick emission of hot dust support an idea on non-spherical distribution of dust near the central source, consistent with the Active Galactic Nuclei model with the dust torus. The temperature of hot dust and flux ratios of these HI lines are similar to those observed in low-redshift quasars. There are significant time-variations in the HI lines, which are probably caused by variations in the brightness of the central source.

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VLBA imaging of radio-loud BAL QSOs

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Broad Absorption Line Quasars (BAL QSOs) have been found to be associated with extremely compact radio sources. These reduced dimensions can be either due to projection effects or these objects might actually be intrinsically small. Exploring these two hypotheses is important to understand the nature and origin of the BAL phenomenon because orientation effects are an important discriminant between the different models proposed to explain this phenomenon. In this work we present VLBA observations of 5 BAL QSOs and discuss their pc-scale morphology

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Long term VLBI imaging and monitoring of the SNR in M82

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We present results from 20 years of global VLBI imaging of the supernova remnants in Messier 82. These observations, along with deep MERLIN 5 GHz observations, have traced the structural evolution of the most compact radio supernova remnants, measuring their source sizes, structures and expansion velocities. Additionally these observations constrain the rate at which these expanding shells are decelerating due to their interaction with the surrounding ISM.

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The Radius–Luminosity Relationship for Active Galactic Nuclei: The Effect of Host-Galaxy Starlight on Luminosity Measurements II. The Full Sample of Reverberation-Mapped AGNs

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We present high-resolution *HST* images of all 35 AGNs with optical reverberation-mapping results, which we have modeled to create a nucleus-free image of each AGN host galaxy. From the nucleus-free images, we determine the host-galaxy contribution to ground-based spectroscopic luminosity measurements at $\lambda5100\,\text{Å}$. After correcting the luminosities of the AGNs for the contribution from starlight, we re-examine the Hβ $R_{\rm BLR}$–L relationship. Our best fit for the relationship gives a powerlaw slope of 0.52 with a range of $0.45 - 0.59$ allowed by the uncertainties. This is consistent with our previous findings, and thus still consistent with the naive assumption that all AGNs are simply luminosity-scaled versions of each other. We discuss various consistency checks relating to the galaxy modeling and starlight contributions, as well as possible systematic errors in the current set of reverberation measurements from which we determine the form of the $R_{\rm BLR}$–L relationship.

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2009 European Radio Interferometry School

Oxford Astrophysics
7 – 11 September 2009

Webpage: http://astrowiki.physics.ox.ac.uk/cgi-bin/twiki/view/ERIS2009/WebHome
Email: eris2009@physics.ox.ac.uk

First Announcement

ERIS will provide a week of lectures and hands-on tutorials on how to get scientific results from radio interferometry. Topics covered include:

- Choosing the right instrument, configuration and observing plan for your project
- Calibration and imaging continuum, spectral line and polarization data
- Extracting and interpreting measurements
- Example data drawn from observations of Galactic and extragalactic sources, the Sun, transient and variable objects. Students will be helped to use their own laptops to install and use the most widely-used packages such as AIPS, CASA and Parseltongue. Most examples will be drawn from cm-wave instruments such as MERLIN and the EVN but experts will be available on arrays from LOFAR to ALMA.

Limited financial support is available from RadioNet.

Please see

http://astrowiki.physics.ox.ac.uk/cgi-bin/twiki/view/ERIS2009/WebHome

for more details including Registration and Accomodation Forms or email eris2009@physics.ox.ac.uk

On behalf of the ERIS SOC (Willem Baan (ASTRON), Rob Beswick (Manchester), Pierre Cox (IRAM), Ian Heywood (Oxford), Karl-Ludwig Klein (Paris), Hans-Rainer Kloeckner (Oxford), Robert Laing (ESO), Anita Richards (Manchester, coordinator),Tiziana Venturi (Bologna)).

Special Announcements

Shape Version 3.0 released

The third mayor public release of the morpho-kinematic 3D modeling software Shape is out now.

Significant structural and conceptual improvements have been implemented. A semi-automatic optimizer module helps to fine tune multiple parameters simultaneously. The most important addition is the ability to physically model wavelength dependent light scattering and absorption from, e.g., dust. Furthermore, a basic implementation of spectral radiation transfer allows the modeling of wavelength dependent absorption due to Doppler shifts like in P-Cygni profiles. More detailed information can be found on the ShapeSite (`http://www.astrosen.unam.mx/shape`) that comes with this release.

Wolfgang Steffen (IA-UNAM, Ensenada, Mexico)

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ShapeMasters

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