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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

# Abstracts of recently accepted papers

## Evidence for a multizone warm absorber in the *XMM-Newton* spectrum of Markarian 304

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We present a *XMM-Newton* observation of Markarian 304, a Seyfert 1 galaxy at $z = 0.066$. The *EPIC* data show that MKN 304 is affected by heavy ($N_H \approx 10^{23}$ cm$^{-2}$) obscuration due to ionized gas. A two–phase warm absorber provides an adequate parameterization of this gas. The ionization parameter of the two components is $\xi \approx 6$ erg cm$^{-2}$ s$^{-1}$ and $\xi \approx 90$ erg cm$^{-2}$ s$^{-1}$, respectively. The observed continuum photon index ($\Gamma \approx 1.9$) is typical for Seyfert 1 galaxies. Two significant emission lines are detected at 0.57 keV and 6.4 keV, respectively. The former is mostly likely due to He–like oxygen triplet emission arising from an ionized plasma (maybe the warm absorber itself). The latter is due to fluorescent emission of K–shell iron in a low–ionization state (FeI–XV). The upper limit for the line width of $\sigma_{K\alpha} < 0.18$ keV most likely rules out an origin in the inner parts of the accretion disk. Interestingly, the strength of such line is consistent with the possibility that the emission is produced in the warm absorber itself. However, a substantial contribution from the torus is plausible too. We have also found a weak (4% of the primary continuum) soft excess emission component. The presence of this excess could be explained by either emission/scattering from a warm gas or partial covering, or a combination of them.

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preprint available at http://es.arxiv.org/abs/astro-ph/0404263

## ISOCAM survey and dust models of 3CR radio galaxies and quasars

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We present a survey of all 3CR sources imaged with ISOCAM onboard the *Infrared Space Observatory (ISO)*. The sample consists mostly of radio–loud active galactic nuclei (AGN). For each source, we present spatially integrated mid–infrared (MIR, $5-18\mu$m) fluxes measured from newly calibrated ISOCAM images. In total, we detected 68 objects of the 3CR catalogue, at redshifts $z \leq 2.5$, and obtained upper limits for 17 objects. In addition, we detected 10 galaxies not listed in the 3CR catalogue. The one with the highest redshift is 4C+72.26 at $z = 3.53$. ISOCAM data are combined with other photometric measurements to construct the spectral energy distribution (SED) from optical to radio wavelengths. The MIR emission may include synchrotron radiation of the AGN, stars of the host galaxy or dust. Extrapolation of radio core fluxes to the MIR show that the synchrotron contribution is in most cases negligible. In order to describe dust emission we apply new radiative transfer models. In the models the dust is heated by a central source which emits photons up to energies of 1keV. By varying three parameters, luminosity, effective size and extinction, we obtain a fit to the SED for our objects. Our models contain also dust at large (several kpc) distance from the AGN. Such a cold dust component was neglected in previous computations which therefore underestimated the AGN contribution to the far infrared (FIR). In 53 cases ($\sim 75\,\%$ of our detected 3CR sources), the MIR emission can be attributed to dust. The *hot dust* component is mainly due to small grains and PAHs. The modelling demonstrates that an AGN heating suffices to explain the ISO broad band data, starburst activity is not necessary. In the models, a type 1 AGN is represented by a compact dust distribution, the dust is therefore very warm and emission of PAHs is weak because of photo–destruction. In AGNs of type 2, the dust is relatively colder but PAH bands are strong.

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E-mail contact: rsiebenm@eso.org
preprint available at astro-ph/0404040 and in high print quality at:
http://www.eso.org/~rsiebenm/FTP/3CRisocam.pdf
http://www.eso.org/~rsiebenm/FTP/3CRisocam.ps.gz

## XMM-Newton EPIC observations of 21 low-redshift PG quasars

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We present an X-ray spectral analysis of 21 low redshift quasars observed with *XMM-Newton* EPIC. All the sources are Palomar Green quasars with redshifts between 0.05 and 0.4 and have low Galactic absorption along the line-of-sight. A large majority of quasars in the sample (19/21) exhibit a significant soft excess below $\sim 1$–1.5 keV, whilst two objects (PG 1114+445 and I Zw1) show a deficit of soft X-ray flux due to the presence of a strong warm absorber. Indeed, contrary to previous studies with *ASCA* and *ROSAT*, we find that the presence of absorption features near 0.6–1.0 keV is common in our sample. At least half of the objects appear to harbor a warm absorber, as found previously in Seyfert 1 galaxies. We find significant detections of Fe K$\alpha$ emission lines in at least twelve objects, whilst there is evidence for some broadening of the line profile, compared to the EPIC-pn resolution, in five of these quasars. The determination of the nature of this broadening (e.g., Keplerian motion, a blend of lines, relativistic effects) is not possible with the present data and requires either higher S/N or higher resolution spectra. In seven objects the line is located between 6.7–7 keV, corresponding to highly ionized iron, whereas in the other five objects the line energy is consistent with 6.4 keV, i.e. corresponding to near neutral iron. The ionized lines tend to be found in the quasars with the steepest X-ray spectra. We also find a correlation between the continuum power law index $\Gamma$ and the optical H$\beta$ width, in both the soft and hard X-ray bands, whereby the steepest X-ray spectra are found in objects with narrow H$\beta$ widths, which confirms previous *ROSAT* and *ASCA* results. The soft and hard band X-ray photon indices are also strongly correlated, i.e. the steepest soft X-ray spectra correspond the steepest hard X-ray spectra. We propose that a high accretion rate and a smaller black hole mass is likely to be the physical driver responsible for these trends, with the steep spectrum objects likely to have smaller black hole masses accreting near the Eddington rate.

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## ROSAT and ASCA observations of a narrow-line Seyfert 1 galaxy RXJ0136.9-3510 : blueshifted Fe K$\alpha$ line Nan Nextended sof X- ray emission

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RX J0136.9-3510 is an unusual Narrow-line Seyfert 1 galaxy (NLS1). We have detected extended ($\sim$12$''$ or $\sim$54 kpc at the source frame) soft X-ray emission in the ROSAT HRI image, accounting for 20% of the total emission. We have also detected a highly blueshifted (7.6 keV in the source frame) Fe K$\alpha$ line in the ASCA SIS spectrum. This is the first detection of such a highly blueshifted emission line in a NLS1. Near-IR and FIR studies indicate the presence of a possible starburst component in this NLS1. Physical models of the accretion and/or outflow and the evolution of this NLS1 are discussed in the context of these results.

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## Black Hole Masses from Reverberation Measurements

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We have reanalyzed in a consistent way existing reverberation data for 35 AGNs for the purpose of refining the black hole masses derived from these data. We find that the precision (or random component of the error) of reverberation-based black hole mass measurements is typically around 30%, comparable to the precision attained in measurement of black hole masses in quiescent galaxies by gas or stellar dynamical methods. As discussed in this volume by Onken et al., we have established an absolute calibration for AGN reverberation-based masses by assuming that AGNs and quiescent galaxies follow an identical relationship between black hole mass and host-galaxy bulge velocity dispersion. The scatter around this relationship implies that the typical systematic uncertainties in reverberation-based black hole masses are smaller than a factor of three. We present a preliminary version of a mass–luminosity relationship that is much better defined than any previous attempt. Scatter about the mass–luminosity relationship for these AGNs appears to be real and could be correlated with either Eddington ratio or source inclination.

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preprint available at http://arxiv.org/abs/astro-ph/0404539

## High resolution observations of the neutral hydrogen absorption and jets in 3C293

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We present results from new high angular resolution observations of the neutral hydrogen absorption using global VLBI, MERLIN, & VLA observations of the peculiar radio galaxy 3C 293. These results reveal extensive HI absorption against the inner kiloparsec of the radio jet in this source over a wide range of angular scales. In additional to these sub-arcsecond resolution radio observations we also present infrared imaging of the jet.

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## A possible radio supernova in the outer part of NGC3310

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As part of an on-going radio supernova monitoring program, we have discovered a variable, compact steep spectrum radio source ∼65 arcsec (∼4 kpc) from the centre of the starburst galaxy NGC 3310. If the source is at the distance of NGC 3310, then its 5 GHz luminosity is $\sim 3 \times 10^{19}$ W Hz$^{-1}$. The source luminosity, together with its variability characteristics, compact structure (<17 mas) and its association with a group of HII regions, leads us to propose that it is a previously uncatalogued type II radio supernova. A search of archival data also shows an associated X-ray source with a luminosity similar to known radio supernova.

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preprint available at http://www.jb.man.ac.uk/∼rbeswick/papers/papers.html

## Growth of massive black holes by super-Eddington accretion

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Narrow-Line Seyfert 1 galaxies (NLS1s) and Narrow-Line quasars (NLQs) seem to amount to $\sim 10 - 30\%$ of active galactic nuclei (AGNs) in the local universe. Together with their average accretion rate, we argue that the black hole (BH) growth by factor of $8 - 800$ happens in these super-Eddington accretion phase of AGNs. Moreover, there is a possible, systematic underestimation of accretion rates (in the Eddington unit) due to an overestimation of BH mass by massive accretion discs for super-Eddington objects. If it is true, the factor of BH growth above may be larger by order(s) of magnitude. In contrast, the growth factor expected in sub-Eddington phase is only $\sim 2$. Therefore, the cosmic BH growth by accretion is likely dominated by super-Eddington phase, rather than sub-Eddington phase which is the majority among AGNs.

This analysis is based on the fraction and the average accretion rate of NLS1s and NLQs obtained for $z \gtrsim 0.5$. If those numbers are larger at higher redshift (where BHs were probably less grown), super-Eddington accretion would be even more important in the context of cosmic BH growth history.

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