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. The last couple of editions have been rather lean - please keep the abstracts coming in!
Matt Redman

Abstracts of recently accepted papers

Properties of *dusty* warm absorbers and the case of IRAS 17020+4544

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We present a study of the properties of *dusty* warm absorbers and point to some important consequences for the resulting X-ray absorption spectra of AGN. Pronounced effects of the presence of *dust* in *warm* material are (i) an apparent 'flattening' of the observed X-ray spectrum in the *ROSAT* band due to a sequence of absorption edges and a shift to lower gas ionization, (ii) the presence of a strong carbon edge at 0.28 keV, and (iii) the expectation of increased time variability of the warm absorber parameters. The first two effects can be drastic and may completely hamper an X-ray spectral fit with a dusty warm absorber even if a dust-*free* one was successfully applied to the data. In order to demonstrate facets of the dusty warm absorber model and test the recently reported important, albeit indirect, evidence for dusty warm material in the Narrow-Line Seyfert 1 galaxy IRAS 17020+4544 we have analyzed *ROSAT* PSPC and HRI observations of this galaxy. The X-ray spectrum can be successfully described by a single powerlaw with index Γ_x =−2.4 plus small excess cold absorption, or alternatively by a steeper intrinsic powerlaw ($\Gamma_x \simeq -2.8$) absorbed by a *dusty* warm absorber. The findings are discussed in light of the NLSy1 character of IRAS 17020 and consequences for NLSy1s in general are pointed out. In particular, the presence of dusty warm gas results in a steeper intrinsic powerlaw than observed, thus exaggerating the 'FeII problem'. It also implies weaker potential warm-absorber contribution to high-ionization Fe coronal lines.

Letter, to appear in Astronomy & Astrophysics (scheduled for Feb. 1998)

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Emission line – Ultraviolet to X-Ray Continuum Correlations: Constraints on the Anisotropy of the Ionized Continuum in Active Galactic Nuclei

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Anisotropic emission of the ionizing continuum is a general prediction of the accretion disk models. In this paper, we present the results of correlation analysis of the UV emission line and UV to X-ray continuum properties for a large sample of broad emission line AGNs observed with ROSAT, IUE and HST. We find strong correlations between the CIV/$Ly\alpha$ ratio, the equivalent width of CIV, and the UV to soft X-ray spectral slope. The results are in good agreement with the photoionization calculation, suggesting that the overall ionizing continuum can well match the observed UV to soft X-ray spectrum. These results are consistent with the assumption of isotropic ionizing continuum shape. Our analysis suggests a small range for the "big blue bump" cutoff energy for the objects in this sample, consistent with the similar results of Laor et al. (1997) and Walter & Fink (1993) based on the continuum properties . The mean UV-to-X-ray spectral slope is similar to the soft X-ray spectral slope. This similarity also holds for radio-loud and radio-quiet objects separately. This suggests that the two might be drawn from the same distribution. The two spectral slopes are only weakly correlated. The UV to X-ray spectral index is correlated with absolute optical magnitude. This result confirms the earlier suggestion that the ionizing continua are softer for higher luminosity objects.

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Markarian 501 in X-ray bright state – RXTE observations

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Mrk 501 has been in a state of very high flux in X-rays and VHE γ-rays during 1997. In July 1997 near its hitherto maximum X-ray brightness intense multifrequency observations of Mrk 501 have been performed at radio, near infrared, optical, X-ray, and VHE γ-ray frequencies.

Here we report on *Rossi X-ray Timing Explorer* (RXTE) observations carried out in 1997 between July 11 and July 16. The X-ray spectrum has been well detected up to 100 keV and is best described by a broken power law with spectral indices $\alpha_1 = 0.70$ and $\alpha_2 = 0.94$ below and above the break energy of $E_{\rm break} = 5.8$ keV.

The X-ray flux from Mrk 501 declined and flared by $\sim 30\%$ within about 3 days each, showing an unusual anti-correlation between flux and spectral hardening of both power law components. The break energy remained constant.

The observed broad band and X-ray spectra confirm recent observations, that the synchrotron component in Mrk 501 can extend up to energies of 100 keV with the maximum power being emitted at hard X-rays. On longer time-scales the cut-off frequency of the synchrotron spectrum changes by more than two orders of magnitude.

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preprint available at http://www.lsw.uni-heidelberg.de/projects/extragalactic/bl_lac.html

Structures Produced by the Collision of Extragalactic Jets with Dense Clouds

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We have investigated how varying several parameters affects the results of a collision between an extragalactic jet and a dense, intergalactic cloud, through a series of hydrodynamic simulations. Such collisions are often suggested to explain the distorted structures of some radio jets. However, theoretical studies of this mechanism are in conflict over whether it can actually reproduce the observations.

The parameters are the Mach number, and the relative densities of the jet and the cloud to the ambient medium. Using a simple prescription we have produced synthetic radio images for comparison with observations. These show that a variety of structures may be produced from simple jet-cloud collisions. We illustrate this with a few examples, and examine the details in one case. In most cases we do not see a clear, sustained deflection. Lighter jets are completely disrupted. The most powerful jets produce a hotspot at the impact which outshines any jet emission and erode the cloud too quickly to develop a deflected arm. This explains the apparent conflict between theoretical studies, as conclusions were based on different values of these parameters. It also suggests that moderate Mach numbers and density contrasts are needed to produce bends in the radio structure. Shocks are produced in the ambient medium that might plausibly reproduce the observed alignment of the extended emission line regions with the radio axis.

Accepted by M.N.R.A.S.

E-mail contact: swh@sn1.ee.umist.ac.uk,
preprint available via anonymous ftp at staru1.livjm.ac.uk/software/ftp/outgoing/swh/jcpaper.ps.gz

Meetings

Second Announcement and Call for Abstracts
Quasars as Standard Candles for Cosmology

La Serena, Chile

18-22 May 1998

This is the second and final general announcement of the workshop "Quasars as Standard Candles for Cosmology". Quasars' spectra depend on their luminosities. Can this be calibrated well enough at any wavelength, in either fixed or relative terms, to use them as standard candles in cosmological tests? The workshop will explore this question at a relaxed pace, allowing ample time for one-on-one discussions.

Full information and a registration form will be found on our web site:

http://nimbus.pa.uky.edu/QuasarLuminosity

quasar@ctio.noao.edu

Participants should furnish abstracts and hotel reservation requests by FEBRUARY 15. Please use the e-mail form provided on the web site.

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