Active Galaxies Newsletter	*An electronic publication dedicated to the observation and theory of active galaxies*
No. 17 — August 1998	Editor: Matt Redman (mpr@ast.man.ac.uk)

Abstracts - Thesis Abstracts - Jobs - Meetings

From the Editor

The Active Galaxies Newsletter is produced monthly. The deadline for contributions is (usually) 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.
Matt Redman

Abstracts of recently accepted papers

LINERs as Low-Luminosity Active Galactic Nuclei

Luis C. Ho[1,2]

[1]Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138, USA

[2]Carnegie Observatories, 813 Santa Barbara St. Pasadena, CA 91101-1292, USA

Many nearby galaxies contain optical signatures of nuclear activity in the form of LINER nuclei. LINERs may be the weakest and most common manifestation of the quasar phenomenon. The physical origin of this class of objects, however, has been ambiguous. I draw upon a number of recent observations to argue that a significant fraction of LINERs are low-luminosity active galactic nuclei.

Invited review to appear in *The 32nd COSPAR Meeting, The AGN-Galaxy Connection* (Advances in Space Research).

Preprint can be retrieved from http://xxx.lanl.gov/find/astro-ph (astro-ph/9807273)

The nature of the optical—radio correlations for powerful radio galaxies

C.N. Tadhunter[1], **R. Morganti**[2,3], **A. Robinson**[4], **R. Dickson**[1], **M. Villar-Martin**[1] **& R.A.E. Fosbury**[5]

[1] Department of Physics, University of Sheffield, Sheffield S3 7RH
[2] Australia Telescope National Facility, CSIRO, PO Box 76, Epping, NSW2121, Australia
[3] Instituto di Radioastronomia, CNR, via Gobetti 101, I-40129 Bologna, Italy
[4] Division of Physical Sciences, University of Hertfordshire, College Lane, Hatfield, Herts AL10 9AB
[5] ST-ECF, European Southern Observatory, Karl-Schwarzschild-Strasse 2, D85748 Garching bei Munchen, Germany

The nature of the optical–radio correlations for powerful radio galaxies is investigated using spectroscopic observations of a complete sample of southern 2Jy radio sources. In line with previous work, we find that significant correlations exist between the luminosities of the [OIII]λ5007, [OII]λ3727 and Hβ emission lines and the radio luminosity. However, our observations are not easily reconciled with the idea that these correlations are caused by the increase in the power of the photoionizing quasar as the jet power increases, with average ISM properties not changing appreciably with redshift or radio power: not only do we find that the scatter in the $L_{[OIII]}$ vs. L_{radio} correlation is significantly larger than in $L_{[OII]}$ vs. L_{radio} and $L_{H\beta}$ vs. L_{radio} correlations, but the ionization state deduced from the emission lines does not increase with radio power as predicted by the

simple, constant ISM, photionization model. We conclude that: (a) there exists a considerable range in the quasar ionizing luminosity at a given redshift; and (b) that the mean density of the emission line clouds is larger in the high redshift/high power radio sources. The latter density enhancement may either be a consequence of the increased importance of jet-cloud interactions or, alternatively, due to a higher pressure in the confining hot ISM, in the high redshift objects.

Apart from the general scatter in the correlations, we identify a distinct group of objects with [OIII]λ5007 luminosities which are more than order of magnitude lower than in the general population radio galaxies at similar redshift. These weak line radio galaxies (WLRG) are likely to be sources in which the central ionizing quasars are particularly feeble.

Deep spectra show that many of the sources in our sample are broad line radio galaxies (BLRG). The fact that the BLRG are observed out the redshift limit of the survey, overlapping in redshift with the quasars, argues against the idea that BLRG are simply the low radio power counterparts of high power, high redshift quasars. Either there exists a considerable range in the intrinsic luminosities of the broad-line AGN for a given redshift or radio power, or the BLRG represent partially obscured quasars. The degree of scatter present in the $L_{[OIII]}$ vs. L_{radio} correlation supports the former possibility.

Accepted by MNRAS

E-mail contact: c.tadhunter@sheffield.ac.uk,
preprint available at astro-ph/9807238

Does Every Quasar Harbor A Blazar?

Feng Ma and Beverley J. Wills

McDonald Observatory, University of Texas, Austin, TX 78712

Assuming there is a blazar type continuum in every radio-loud quasar, we find that the free-free heating due to the beamed infrared continuum can greatly enhance collisionally excited lines, and thus explain the stronger CIV λ1549 line emission observed in radio loud quasars. We further predict that the CIV line should show variability *not* associated with observed continuum or Lyα variability.

Accepted by Astrophys. J. Lett.

E-mail contact: feng@astro.as.utexas.edu,
preprint available at http://panda.as.utexas.edu:8080/~feng/psIR.ps

Properties of warm absorbers in active galaxies

Stefanie Komossa[1] and Henner Fink†

[1] Max-Planck-Institut für extraterrestrische Physik, Giessenbachstrasse, 85740 Garching, Germany

We present a study of the nature of warm absorbers on the basis of *ROSAT* X-ray observations and photoionization calculations carried out with the code *Cloudy*. We focus on 'non-standard' warm absorbers: (i) the proposed *dusty* warm absorbers in IRAS 13349+2438 and IRAS 17020+4544, and possibly in 4C +74.26, (ii) we explore several scenarios to account for the recently observed peculiar absorption features around ~1.1 keV on the basis of detailed photoionization models, and apply these to PG 1404+226.

4 pages, to appear in the proceedings of *Highlights in X-ray Astronomy*, Garching, June 1998, B. Aschenbach et al. (eds)

E-mail contact: skomossa@xray.mpe.mpg.de

The Disks of Galaxies with Seyfert and Starburst Nuclei: II. Near-Infrared Structural Properties

L.K. Hunt[1], M.A. Malkan[2], G. Moriondo[3], and M. Salvati[4]

[1] C.A.I.S.M.I. - C.N.R., Largo E. Fermi 5, I-50125 Firenze, Italy
[2] University of California, Department of Astronomy, 405 Hilgard Ave., Los Angeles, CA, U.S.A.
[3] University of Florence, Insitute of Astronomy, Largo E. Fermi 5, I-50125 Firenze, Italy [4] Osservatorio Astrofisico di Arcetri, Largo E. Fermi 5, I-50125 Firenze, Italy

We have derived the near-infrared structural components of a sample of Seyfert and starburst (SBN) host galaxies by fitting the images of Hunt et al. (1997, ApJS, 108, 229) with a new two-dimensional decomposition algorithm. An analysis of the fitted parameters shows that Seyfert 1 and SBN bulges resemble normal early-type bulges in structure and color, with $(J-K)^c_b$ about 0.1 mag redder than disk $(J-K)^c_d$. Seyfert 2 bulges, instead, are bluer than normal with $(J-K)^c_b \sim (J-K)^c_d$. Seyfert disks (especially Type 1), but not those of SBNs, are abnormally bright (in surface brightness), significantly more so than even the brightest normal disks. Seyfert disks are also compact, but similar to those in normal early-type spirals. For a given mass, Seyferts and especially SBNs are abnormally rich in neutral hydrogen, and there is strong, albeit indirect, evidence for lower mass-to-light (M/L) ratios in Seyfert and SBN *disks*, but for normal M/Ls in their bulges. In Seyferts and SBNs, HI mass fractions and M/L ratios are anticorrelated, and we attribute the high gas mass fractions and low M/Ls in SBNs and several Seyferts to ongoing star formation. Such abundant gas in Seyferts would be expected to inhibit bar formation, which may explain why active galaxies are not always barred.

Accepted by Ap. J.

E-mail contact: hunt@arcetri.astro.it,
Preprints will be available through the preprint server http://xxx.sissa.it or by contacting the authors.

Thesis Abstract

Numerical Simulations of Jet-Cloud Collisions and the Structure of Extragalactic Radio Sources

Stephen Higgins

Thesis work conducted at: Liverpool John Moores University, UK

Current address: Dept. of Electrical Engineering and Electronics, Main Building, UMIST, Sackvillle St, PO Box 88, Manchester

Electronic mail: swh@sn1.ee.ac.uk

Ph.D dissertation directed by: T.J. O'Brien

Ph.D degree awarded: May 1998

This thesis is available as a postscript file at anonymous ftp: staru1.livjm.ac.uk, in outgoing/swh/thesis.ps.gz.

I have investigated the proposal that bends in extragalactic jets are caused by collisions with cool, dense clouds in the surrounding medium which deflect the flow. Such collisions are often suggested to explain the distorted structures of some radio jets, sometimes involving bends of more than 90 deg. However, theoretical studies of this mechanism are in conflict over whether it is physically possible to bend jets by this much. In some previous numerical simulations the jet is decelerated by the cloud, and the cloud is subsequently destroyed (De Young 1991). In others the jet appears to be re-collimated (Norman 1993). I have developed and tested two- and three-dimensional hydrodynamic codes, which track jet and ambient material separately. This allows me to estimate synchrotron emission from the jet and so to construct synthetic radio images for comparison with observations. The results confirm De Young's results, but the synthetic radio maps suggest his interpretation and conclusions may not be generally applicable.

I have investigated how varying several parameters affects the results of a collision. The parameters are: Mach number, and the density contrasts between of the jet and the cloud with the ambient medium. These show that a variety of structures may be produced from simple jet-cloud collisions. This clarifies the conflict between theoretical studies, as conclusions were based on different sets of parameters. Only jets with moderate Mach numbers and density contrasts ($M \sim 2, \eta \sim 0.2$) produce large bend angles and extensive tails. These tails are widely dispersed, and do reproduce the appearance of bent radio sources, but only if it is assumed that the sources lie in the plane of the sky.

More complex structures, including multiple-hotspot systems, can be produced. Some of the disrupted structures produced are similar to structures seen in radio observations. Shocks are produced in the cloud that might reproduce the observed alignment in the extended emission line regions of high redshift radio sources.