Active Galaxies Newsletter	*An electronic publication dedicated to the observation and theory of active galaxies*
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From the Editor

Dear all,

This newsletter has been formed following the success of similar publications such as the Star Formation Newsletter and AGB Newsletter. It aims to deliver a rapid communication of the abstracts of accepted papers, in a more cost effective and easier fashion than preprints. The abstracts may list contact details to request copies of preprints or their availability on the internet. This newsletter will provide a useful reference to those working in the field to keep up to date with the latest research.

The subject area covered will be that of all aspects of active galaxies, both observation and theory. As an addition to the preprint list, details of upcoming meetings or job offers will be included.

Of course, this venture will only succeed if the newsletter reaches a large enough fraction of the community and people take the time and effort to contribute. To this end I would be grateful if you would pass on this first edition of the newsletter to your colleagues or preferentially send me their e-mail addresses to be added to the mailing list. I am grateful to Brad Peterson for allowing me to use the IAU 159 conference and AGN watch mailing lists for this initial posting. Thanks also to Bo Reipurth of the Star Formation Newsletter for his LaTeX macros.

Equally, if you do not wish to be kept on this mailing list then please reply and I will remove you, and accept my apologies for this mail.

Following the first edition of the newsletter will follow the LaTeX template for abstract submissions. It is VERY simple and requires no knowledge of LaTeX to fill out. The deadline for the next edition of the newsletter will be the 24^{th} of November.

I hope you like the idea and this trial issue which contains only a few recent preprints received here at the University of Manchester. I look forward to hearing from you with details of your new papers!

Cheers,

Anthony Holloway

Abstracts of recently accepted papers

Helical Strands in the Jet-like Narrow Line Region of ESO 428-G14

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We present HST/WFPC2 images of the narrow line region (NLR) of the Seyfert 2 galaxy ESO 428-G14 (0714-2914, M4-1). The NLR consists of many individual, thin strands, which are very closely related to the radio jet and produce a highly complex yet ordered structure. We find that the jet is two-sided with a double-helix of emission line gas apparently wrapped around the NW side. To the SE, the jet seems to be deflected at a ridge of highly excited gas. The strands to the SE may also wrap around the radio jet, but here complete helices are not seen. The overall structure is reminiscent of the jet seen in NGC 4258. Faint symmetric features aligned with the nucleus could indicate the presence of a highly collimated beam of photons or plasma from the center.

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To appear in the Astrophysical Journal Letters, 470, L31

A one-sided ionization cone in the Seyfert 2 galaxy NGC 5643

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We present high-resolution (0.1") observations of the Seyfert 2 galaxy NGC 5643 taken with the WFPC2 on board the Hubble Space Telescope. Images taken in the light of [O III] λ5007 and Hα reveal a halo of emission centered on the nucleus and high-excitation extranuclear emission which extends eastward for at least 1.8 kpc. An excitation map of [O III]/Hα reveals the high-excitation gas to be distributed within a well-defined V-shaped structure, presumably the projection of a 3-dimensional cone. The apex of the cone is coincident with the peak of the red continuum emission and shows a low [O III]/Hα ratio, which is probably a result of foreground reddening. There is evidence that the fine scale structure of the ionized gas is related to the radio ejecta, which share the same axis as the cone. We detect a dust lane straddling the nucleus and oriented perpendicular to the radio axis, and an unusually blue region of 90 pc extent to the east of the nucleus. Our data strongly support the unified model for Seyfert galaxies, in which an optically thick structure perpendicular to the radio axis blocks the nucleus from direct view and allows the optical and ultraviolet radiation to escape preferentially along and around this axis.

To appear in the 1 January 1997 issue of the Astrophysical Journal

EVN+MERLIN Observations of Radio-Intermediate Quasars: Evidence for Boosted Radio-Weak Quasars

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We present VLBI (EVN+MERLIN) observations of a sample of three low-redshift radio-intermediate PG quasars (RIQ) with flat and variable radio spectrum (III Zw 2, PG 1309+355, PG 2209+184). Their radio-to-optical flux ratio (R) is slightly lower than the average R for steep-spectrum quasars, but their radio spectral properties are those of core-dominated quasars. It was proposed previously that these sources might be relativistically boosted jets in radio-weak quasars. Our VLBI observations now indeed confirm the presence of a high brightness temperature core in all three of these objects two of them have lower limits on TB well in excess of 1010 Kelvin. Moreover, we find no "missing-flux" which means that basically all the flux of these quasars is concentrated in the compact radio core. As the total radio flux is already at the low end for radio-loud quasars, we can place a strong limit on the presence of any extended emission. This limit is consistent with the extended emission in radio-weak quasars, but excludes that the flat-spectrum RIQ reside in typical radic-loud quasars. The observations therefore strongly support the idea that relativistic jets are present in radic-weak quasars and hence that radic-loud and radic-weak quasars have very similar central engines.

The Astrophysical Journal Letters, in press

A Dynamical Model for the Twisted Gas Disk in Centaurus A

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The prominent minor-axis dust lane across the radio galaxy Centaurus A has been extensively mapped in the emission lines of Hα, HI and CO, revealing an ordered velocity field which has been interpreted as that of a warped and twisted disk of gas seen nearly edge-on. Here, it is shown that the geometry of this disk can be explained as that of a near-polar structure precessing about the symmetry axis of an approximately oblate galaxy potential which, like the stellar body, is nearly round at the center, becoming flattened further out. Both freely-precessing models and those taking account of the self-gravity of the gas are presented. The broken elliptical ring of HI gas recently found to be associated with the faint outer shells of Centaurus A can be explained naturally as a continuation of the same precessing disk. This precessing model for the gas disk assumes that the gravitational potential of Centaurus A is close to axisymmetric; precession should be qualitatively similar if the figure is triaxial and tumbling about its short axis in the same sense as the rotation of the stars.

Astrophysical Journal, in press: June 19, 1996

The B3-VLA Quasar Sample

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A new low frequency radlo selected Sample of 125 Quasars complete down to lOOmJy at 408 MHz is presented in this paper. The sample is a part of the B3-VLA sample: 1050 radlosources selected from the B3 catalogue at 408 Mhz and observed at the VLA (1485 Mhz, C and A configurations). Out of the 352 sources, identified on the P0SS-I down to m_r 20.0, 172 are quasar candidates. In this paper we give the final assessment of the quasar sample from spectroscopic observations of the candidates. The final complete quasar sample consists of 125 objects. Furthermore 3 Bl Lac objects have been identified and two Bl Lac candidates.

To appear in Astronomy and Astrophysics Supplement Series

VLBI Observations of a Complete Sample of Radio Galaxies. VII-Study of the FR-I Sources 3C31, 4C35.03, and 3C264

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We present global VLBI and VLA observations of three Fanaroff-Riley type I radio galaxies, 3C31, 4C35.03, and 3C264, at a frequency of 5 GHz. In all three cases, we observe asymmetric parsec-scale structures consisting of a compact core and a single jet pointing in the direction of the more prominent kiloparsec jet. We interpret such alignment as evidence for the relativistic nature of FR-I radio jets at parsec scales. Comparing the VLBI and VLA images of these sources, we find a progressive deceleration of the plasma flow from parsec to kiloparsec scales. We consider another five FR-I radio galaxies previously studied by us and obtain that, in a set of eight FR-I objects, the estimated jet bulk velocities and orientation angles with respect to the observer are consistent with the requirements of the unification model for low power radio sources.

To appear in the Astrophysical Journal

ROSAT soft X-Ray properties of the Large Bright Quasar Survey: modeling of stacked X-Ray spectra

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We develop and apply a novel method of analysis to study the X-ray spectral properties of 908 QSOs in the Large Bright Quasar Survey (LBQS) that were observed during the soft X-ray ROSAT All-Sky Survey (RASS). Due to the relatively short ($\leq$ 600 s) RASS exposure times only 10% of the QSOs are detected in X-rays, so X-ray spectral model fits for individual QSOs are precluded by poor photon statistics. Spectral stacking provides effectively much more sensitive X-ray observations for an average QSO in bins of redshift, and for several classes of QSOs. We model the stacked X-ray spectra in a way that obviates both the distinction between detections and non- detections, and the need to stack together only those objects observed through similar Galactic column densities N_H. In application to the LBQS/RASS sample, we marginally confirm a flattening of the X-ray spectral index of QSOs toward higher redshifts. Radio-loud QSOs show flatter X-ray photon indices, in agreement with previous work. We show that the apparent flattening of the photon index with redshift is not due to an increasing fractional contribution from the radio-loud class of QSOs.

Accepted by MNRAS.

Thesis Abstracts

Jobs

Meetings

The Active Galaxies Newsletter is available on the World Wide Web. You can access it via the University of Manchester home page :- http://axp2.ast.man.ac.uk:8000/~ajh/agn/