Active Galaxies Newsletter	*An electronic publication dedicated to the observation and theory of active galaxies*
No. 10 — January 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 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

The Anatomy of a Radio Source Hotspot: VLBA Imaging of 3C 205

Colin J. Lonsdale[1] **and Peter D. Barthel**[2]

[1] MIT Haystack Observatory, Westford, MA 01886, USA
[2] Kapteyn Astronomical Institute, University of Groningen, P.O. Box 800, 9700 AV Groningen, The Netherlands

Total intensity and linear polarization VLBA images of the high-redshift quasar 3C 205 at a wavelength of 18cm reveal a complex curved hotspot structure with polarization percentages frequently as high as 70%. A one-sided jet is detected emerging from the central component of the radio source. The VLBA images, in conjunction with images from connected-element instruments, are interpreted within the context of a "bent jet" model of the hotspot, in which the flow is assumed to be continous around the observed bend. The data can be understood in terms of a collision between the incoming jet and a dense gaseous obstacle, most probably a galaxy belonging to the cluster of which 3C 205 is a part, and it is postulated that these bending phenomena occur frequently at high redshift.

Accepted by Astronomical Journal

E-mail contact: cjl@dopey.haystack.edu, pdb@astro.rug.nl

The knotty structure of the HII dwarf galaxy F 348

P. Rafanelli[1], **S. Roi**[1], **A. Tegon**[1], **H. Schulz**[3,4], **St. Komossa**[5], **G. Richter**[6], **J. Vennik**[7]

[1] Department of Astronomy, University of Padova, I-35122 Padova
[3] Astronomisches Institut der Ruhr-Universität, D-44780 Bochum
[4] Dept. of Physics and Astronomy, Dartmouth College, Hanover, USA
[5] Max-Planck-Institut für extraterrestrische Physik, D-85740 Garching
[6] Astrophysikalisches Institut Potsdam, D-14482 Potsdam
[7] Tartu Observatory, Tartu, EE-2444, Estonia

[OIII] images and blue spectra of the emission-line dwarf galaxy F 348 are presented. In [OIII] light, the object contains two knots about $9''$ NE of the nucleus and one large extended knot $11''$ to the SW. The nuclear region is hundred times less

luminous in emission-line light than the knots. Despite the presence of line intensity ratios [OIII]λ5007/H$\beta > 3$ the prior classification as a Seyfert-2 object cannot be upheld. This clinches an earlier suggestion by Veron-Cetty & Veron (1986). In particular, we show that the line spectra can be modeled with photoionization models employing *stellar* input continua. Also, the line luminosities of the extranuclear knots are typical for giant HII regions. There is neither evidence for tidal tails nor for high velocity differences between the knots. In addition, the linear arrangement of the knots does not support interaction. It rather suggests self-propagating starformation. In this picture, the faintness of the nuclear region can be understood by an edge-on view.In addition, the nuclear starburst appears to be fading in contrast to the young extranuclear starformation regions. Within the scheme of Melnick (1978), F 348 has to be classified as a multiple-system HII galaxy.

To appear in *Astronomische Nachrichten* 318, 319-327, 1997

ASCA detection of the Fe K edge in the spectrum of the Seyfert 2 galaxy IRAS 04575-7537: a sign of a complex absorber

C. Vignali[1], A. Comastri[2], G.M. Stirpe[2], M. Cappi[3,4], G.G.C. Palumbo[1,3], M. Matsuoka[4], G. Malaguti[3] and L. Bassani[3]

[1] Dipartimento di Astronomia, Università di Bologna, Via Zamboni 33, I–40126 Bologna, Italy

[2] Osservatorio Astronomico di Bologna, Via Zamboni 33, I–40126 Bologna, Italy

[3] Istituto per le Tecnologie e Studio Radiazioni Extraterrestri, ITeSRE/CNR, via Gobetti 101, I–40129 Bologna, Italy

4 The Institute of Physical and Chemical Research (*RIKEN*), 2-1, Hirosawa, Wako, Saitama, 351-01, Japan

ASCA X-ray spectral analysis of the Seyfert 2 galaxy IRAS 04575−7537 is presented. The main result is the presence of a significant iron edge at a rest energy of $7.13^{+0.21}_{-0.16}$ keV. The spectrum is flat ($\Gamma \sim 1.5$) with a substantial absorption $N_H \sim 10^{22}$ cm^{-2} and does not require any reflection component. There is also evidence of a narrow Fe Kα emission line, whose rest energy ($E = 6.35^{+0.08}_{-0.03}$ keV) and equivalent width (EW $\simeq 130\pm50$ eV) suggest that the line originates from thick and cold matter. The intensity of the line and, in particular, the depth of the iron edge are too strong to be explained by simple transmission through the measured absorption column density. This strongly suggests that a model more complex than a single absorbed power law is needed. We propose an absorption model that we call "leaky-total absorber" which can explain the spectrum flatness, the iron emission line and the edge absorption feature and has also the advantage of having a straightforward physical interpretation in the framework of Unified models. In this model a thick absorber ($N_H \sim 10^{23}$ cm^{-2}), possibly associated with broad line region (BLR) clouds, partially ($\sim 36\%$) covers the source continuum with Γ fixed to 1.9 as observed in Sey 1 galaxies. The escaping radiation is then absorbed by a column density $N_H \sim 10^{22}$ cm^{-2}, which can be attributed to the torus, seen through its rim.

Accepted by Astronomy and Astrophysics main journal

E-mail contact: l_vignali@astbo3.bo.astro.it, preprint available at astro-ph/9712250

Probing the extremes of Seyfert activity: BeppoSAX observations of Narrow-Line Seyfert 1 galaxies

A. Comastri[1], W.N. Brandt[2], K.M. Leighly[3], F. Fiore[4], M. Guainazzi[5], G. Matt[6], and G.M. Stirpe[1]

[1] Osservatorio Astronomico di Bologna, Via Zamboni 33, I–40126 Bologna, Italy

[2] Dept. of Astr. and Astroph., The Pennsylvania State University, 525 Davey Lab, University Park, PA 16802, USA

[3] Department of Astronomy, Columbia University, 538 West 120th Street, New York, NY 10027, USA

[4] Osservatorio Astronomico di Roma, Via dell'Osservatorio, I–00040 Monteporzio–Catone, Italy

[5] SAX–Science Data Center, Nuova Telespazio, Via Corcolle 19, I–00131 Roma, Italy

[6] Dipartimento di Fisica "E. Amaldi", Università degli Studi "Roma Tre", Via della Vasca Navale 84, I–00146 Roma, Italy

Results are presented for the first year of observations of a selected sample of Narrow-Line Seyfert 1 galaxies (Ton S 180, RE J1034+396, Ark 564) obtained with the imaging instruments onboard BeppoSAX. These are the first simultaneous broad band (0.1–10 keV) spectra so far obtained for this class of objects.

Contributed talk, to appear in: "The Active X-ray Sky: Results from BeppoSAX and Rossi-XTE", Nuclear Physics B Proceedings Supplements

E-mail contact: comastri@astbo3.bo.astro.it, preprint available at astro-ph/9712278

BeppoSAX observations of Narrow-line Seyfert 1 galaxies: I. Ton S 180

A. Comastri[1], F. Fiore[2,3], M. Guainazzi[3], G. Matt[4], G.M. Stirpe[1], G. Zamorani[1], W.N. Brandt[5], K.M. Leighly[6], L. Piro[7], S. Molendi[8], A.N. Parmar[9], A. Siemiginowska[10], and E.M. Puchnarewicz[11]

[1] Osservatorio Astronomico di Bologna, Via Zamboni 33, I–40126 Bologna, Italy
[2] Osservatorio Astronomico di Roma, Via dell'Osservatorio, I–00040 Monteporzio–Catone, Italy
[3] SAX–Science Data Center, Nuova Telespazio, Via Corcolle 19, I–00131 Roma, Italy
[4] Dipartimento di Fisica "E. Amaldi", Università degli Studi "Roma Tre", Via della Vasca Navale 84, I–00146 Roma, Italy
[5] Dept. of Astronomy and Astroph., The Pennsylvania State University, 525 Davey Lab, University Park, PA 16802, USA
[6] Department of Astronomy, Columbia University, 538 West 120th Street, New York, NY 10027, USA
[7] Istituto di Astrofisica Spaziale – C.N.R., via E. Fermi 21, I–00044 Frascati, Italy
[8] Istituto di Fisica Cosmica e Tecnologie Relative – C.N.R., via Bassini 15, I–20133 Milano, Italy
[9] Astrophysics Division, Space Science Dept. of ESA ESTEC/SA, NL–2200 AG Noordwijk, The Netherlands
[10] Harvard–Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138, USA
[11] Mullard Space Science Laboratory, University College London, Holmbury St. Mary, Dorking, Surrey RH5 6NT, UK

We report on the first spectrum up to 10 keV of the bright narrow-line Seyfert 1 galaxy Ton S 180, obtained with the imaging instruments onboard BeppoSAX. This is the first observed source in a sample of a dozen narrow-line Seyfert 1 galaxies in the BeppoSAX Core Program. We also present and discuss a high quality optical spectrum taken at the 1.5 m telescope at La Silla two months before the BeppoSAX observation.

The X–ray spectrum shows a clear hardening above about 2 keV, where a power law with $\Gamma \simeq 2.3$ plus an iron line provide a good description of the data. This slope is significantly steeper than the typical one for classical Seyfert 1's and quasars. The best fit line energy is suggestive of highly ionized iron, which would support the idea that the high accretion rate is (one of) the fundamental parameter(s) characterizing the Narrow Line Seyfert 1 phenomenon.

Accepted by Astronomy and Astrophysics main journal

E-mail contact: comastri@astbo3.bo.astro.it, preprint available at astro-ph/9712182

On the nature of the X–ray absorption in the Seyfert 2 galaxy NGC 4507

A. Comastri[1], C. Vignali[2], M. Cappi[3,4], G. Matt[5], R. Audano[2], H. Awaki[6], and S. Ueno[7]

[1] Osservatorio Astronomico di Bologna, Via Zamboni 33, I–40126 Bologna, Italy
[2] Dipartimento di Astronomia, Università di Bologna, Via Zamboni 33, I–40126 Bologna, Italy
[3] Istituto per le Tecnologie e Studio Radiazioni Extraterrestri, ITeSRE/CNR, via Gobetti 101, I–40129 Bologna, Italy
[4] The Institute of Physical and Chemical Research (*RIKEN*), 2-1, Hirosawa, Wako, Saitama, 351-01, Japan
[5] Dipartimento di Fisica, Università degli Studi "Roma Tre", via della Vasca Navale 84, I-00146 Roma, Italy
[6] Department of Physics, Faculty of Science, Kyoto University, Sakyo–ku, Kyoto 606–01, Japan
[7] X-ray Astronomy Group, Department of Physics & Astronomy, University of Leicester, Leicester, LE1 7RH, U.K.

We present results of the *ASCA* observation of the Seyfert 2 galaxy NGC 4507. The 0.5–10 keV spectrum is rather complex and consists of several components: (1) a hard X–ray power law heavily absorbed by a column density of about 3×10^{23} cm^{-2}, (2) a narrow Fe Kα line at 6.4 keV, (3) soft continuum emission well above the extrapolation of the absorbed hard power law, (4) a narrow emission line at ~ 0.9 keV. The line energy, consistent with highly ionized Neon (Ne IX), may indicate that the soft X-ray emission derives from a combination of resonant scattering and fluorescence in a photoionized gas. Some contribution to the soft X-ray spectrum from thermal emission, as a blend of Fe L lines, by a starburst component in the host galaxy cannot be ruled out with the present data.

Accepted by MNRAS

E-mail contact: comastri@astbo3.bo.astro.it, preprint available at astro-ph/9710320

Meetings

Structure and Kinematics of Quasar Broad Line Regions

Lincoln, Nebraska
Monday March 23 – Thursday March 26, 1998

Please note that the deadline for submission of titles and abstracts and for pre-registration has been changed to January 16.

Check the conference home page (http://www.unl.edu/physics/blr_conf.html) for the on-line pre-registration form and for hotel information.

Those without web access should e-mail titles and abstracts (250 words or less) to snedden@unlinfo.unl.edu

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/