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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.

Happy New Year

Rob Beswick

Abstracts of recently accepted papers

IR Emission from AGNs

Moshe Elitzur[1]

[1] Physics & Astronomy Dept., University of Kentucky, Lexington, KY 40506, USA, and LAOG, BP 53, F-38041 Grenoble, France

Unified schemes of active galactic nuclei (AGN) require an obscuring dusty torus around the central engine. Torus sizes of hundreds of parsecs were deduced from early theoretical modeling efforts, but high-resolution IR observations now show that the torus size is no more than a few parsecs. This conflict is resolved when the clumpy nature of the torus is taken into account. The compact torus may be best understood when identified with the dusty, optically thick region of the wind coming off the central accretion disk.

To appear in the proceedings of “QSO Hosts: Evolution and Environment”, Leiden, August 2005

E-mail contact: moshe@pa.uky.edu,
preprint available at http://arxiv.org/abs/astro-ph/0512025

A search for periodicity in the light curves of selected blazars

N.A. Kudryavtseva[1], **T.B. Pyatunina**[2]

[1] Astronomy Institute, St. Petersburg State University, Universitetskiy pr. 28, 198504, St. Petersburg, Russia
[2] Institute of Applied Astronomy, Zhdanovskaya ul. 8, 197110, St. Petersburg, Russia

We present an analysis of multifrequency light curves of the sources 2223-052 (3C 446), 2230+114 (CTA 102), and 2251+158 (3C 454.3), which had shown evidence of quasi-periodic activity. The analysis made use of data from the University of Michican Radio Astronomy Observatory (USA) at 4.8, 8, and 14.5 GHz, as well as the Metsahovi Radio Astronomy Observatory (Finland) at 22 and 37 GHz. Application of two different methods (the discrete autocorrelation function and the method of Jurkevich) both revealed evidence for periodicity in the flux variations of these sources at essentially all frequencies. The periods derived for at least two of the sources – 2223-052 and 2251+158– are in good agreement with the time interval between the appearance

of successive VLBI components. The derived periods for 2251+158 ($P = 12.4$ yr and 2223-052 ($P = 5.8$ yr) coincide with the periods found earlier by other authors based on optical light curves.

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E-mail contact: nadia@gong.astro.spbu.ru,
preprint available at http://arxiv.org/abs/astro-ph/0511707

A prominent relativistic iron line in the Seyfert 1 MCG-02-14-009

D. Porquet[1]

[1] Max-Plank-Institut für extraterrestrische Physik, Postfach 1312, D-85741, Garching, Germany

I report the discovery of a prominent broad and asymmetrical feature near 6.4 keV in the Seyfert 1 MCG-02-14-009 (z=0.028) with *XMM-Newton*/EPIC. The present short X-ray observation (PN net exposure time $\sim$5 ks) is the first one above 2 keV for MCG-02-14-009. The feature can be explained by either a relativistic iron line around either a Schwarzschild (non-rotating) or a Kerr (rotating) black hole. If the feature is a relativistic iron line around a Schwarzschild black hole, the line energy is $6.51^{+0.21}_{-0.12}$ keV with an equivalent width of 631^{+259}_{-243} eV and that the inclination angle of the accretion disc should be less than 43°. A relativistically blurred photoionized disc model gives a very good spectral fit over the broad band 0.2–12 keV energy range. The spectrum is reflection dominated and this would indicate that the primary source in MCG-02-14-009 is located very close to the black hole, where gravitational light bending effect is important (about 3–4 $\mathrm{R_g}$), and that the black hole may rapidly rotate.

Accepted by A&A Letters

E-mail contact: dporquet@mpe.mpg.de,
[astro-ph/0511387]

The radio properties of the cD galaxy of Abell 2390

Pedro Augusto,[1,2] **Alastair C. Edge,**[3] **& Claire J. Chandler**[4]

[1] Centro de Astrofísica da Universidade do Porto, Rua do Campo Alegre, 823, 4150 Porto, Portugal
[2] Universidade da Madeira, Centro de Ciências Matemáticas, Caminho da Penteada, 9050 Funchal, Portugal
[3] University of Durham, Dep. of Physics, South Road, Durham DH1 3LE, UK
[4] National Radio Astronomy Observatory, P.O. Box O, Socorro, NM 87801,USA

We present multi-frequency, multi-epoch radio imaging of the complex radio source B2151+174 in the core of the cluster, Abell 2390 ($z \simeq 0.23$). From new and literature data we conclude that the FRII-powerful radio source is the combination of a compact, core-dominated 'medium-symmetric object' (MSO) with a more extended, steeper spectrum mini-halo. B2151+174 is unusual in a number of important aspects: i) it is one of the most compact and flat spectrum sources in a cluster core known; ii) it shows a complex, compact twin-jet structure in a north-south orientation; iii) the orientation of the jets is 45°misaligned with apparent structure (ionization cones and dust disk) of the host galaxy on larger scales. Since the twin-jet of the MSO has its northern half with an apparent 'twist', it might be that precession of the central supermassive black hole explains this misalignement. B2151+174 may be an example of the early stage (10^{3-4}yrs duration) of a 'bubble' being blown into the ICM where the plasma has yet to expand.

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E-mail contact: augusto@uma.pt,
preprint available at http://arxiv.org/abs/astro-ph/0512250

FIRST-based survey of Compact Steep Spectrum sources
III. MERLIN and VLBI observations of subarcsecond-scale objects

A. Marecki[1], **M. Kunert-Bajraszewska**[1] **and R. E. Spencer**[2]

[1] Toruń Centre for Astronomy, N. Copernicus University, PL-87-100 Toruń, Poland
[2] Jodrell Bank Observatory, The University of Manchester, Macclesfield, Cheshire, SK11 9DL, UK

According to a generally accepted paradigm, small intrinsic sizes of Compact Steep Spectrum (CSS) radio sources are a direct consequence of their youth, but in later stages of their evolution they are believed to become large-scale sources. However, this notion was established mainly for strong CSS sources. In this series of papers we test this paradigm on 60 weaker objects

selected from the VLA FIRST survey. They have 5-GHz flux densities in the range $150 < S_{5\mathrm{GHz}} < 550\,\mathrm{mJy}$ and steep spectra in the range $0.365 \leq \nu \leq 5\,\mathrm{GHz}$. The present paper is focused on sources that fulfill the above criteria and have angular sizes in the range $\sim 0\farcs2 - 1''$. Observations of 19 such sources were obtained using MERLIN in "snapshot" mode at 5 GHz. They are presented along with 1.7-GHz VLBA and 5-GHz EVN follow-up snapshot observations made for the majority of them. For one of the sources in this subsample, 1123+340, a full-track 5-GHz EVN observation was also carried out. This study provides an important element to the standard theory of CSS sources, namely that in a number of them the activity of their host galaxies probably switched off quite recently and their further growth has been stopped because of that. In the case of 1123+340, the relic of a compact "dead source" is particularly well preserved by the presence of intracluster medium of the putative cluster of galaxies surrounding it. The observed overabundance of compact sources can readily be explained in the framework of the scenario of "premature" cessation of the activity of the host galaxy nucleus. It could also explain the relatively low radio flux densities of many such sources and, in a few cases, their peculiar, asymmetric morphologies. We propose a new interpretation of such asymmetries based on the light-travel time argument.

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E-mail contact: amr@astro.uni.torun.pl,
preprint available at http://arxiv.org/abs/astro-ph/0512034

Radiatively Inefficient Accretion Flow in the Nucleus of NGC 1097

Rodrigo S. Nemmen[1], Thaisa Storchi-Bergmann[1], Feng Yuan[2], Michael Eracleous[3], Yuichi Terashima[4] and Andrew S. Wilson[5]

[1] Instituto de Física, Universidade Federal do Rio Grande do Sul, Campus do Vale, Porto Alegre, RS, Brasil
[2] Shanghai Astronomical Observatory, Chinese Academy of Sciences, 80 Nandan Road, Shanghai 200030, China
[3] Department of Astronomy and Astrophysics, The Pennsylvania State University, USA
[4] Institute of Space and Astronautical Science, Japan
[5] Astronomy Department, University of Maryland, USA

We present a model for the accretion flow around the supermassive black hole in the LINER nucleus of NGC 1097 which fits the optical to X-ray spectral energy distribution (SED). The X-ray segment of the SED is based on observations with the *Chandra X-Ray Observatory*, which are reported here for the first time. The inner part of the flow is modeled as a radiatively inefficient accretion flow (RIAF) and the outer part as a standard thin disk. The value of the transition radius ($r_{tr} \approx 225\,R_S$, where $R_S = 2GM/c^2$) between the RIAF and outer thin disk was obtained from our previous fitting of the double-peaked Balmer emission line profile, which originates in the thin disk. The black hole mass was inferred from measurements of the stellar velocity dispersion in the host galaxy. When these parameters are used in the accretion flow model, the SED can be successfully reproduced, which shows that the line profile model and the accretion flow model are consistent with each other. A small remaining excess in the near-UV is accounted by the contribution of an obscured starburst located within 9 pc from the nucleus, as we reported in an earlier paper. The radio flux is consistent with synchrotron emission of a relativistic jet modeled by means of the internal shock scenario. In an appendix we also analyze the *Chandra* X-ray observations of the ~ 1 kpc circumnuclear star-forming ring and of an ultraluminous compact X-ray source located outside the ring.

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E-mail contact: rodrigo.nemmen@ufrgs.br,
preprint available at http://arxiv.org/abs/astro-ph/0512540

PG 0844+349 revisited - is there an outflow ?

W. Brinkmann[1], T. Wang[2], D. Grupe[3], C. Raeth[1]

[1] Max–Planck–Institut für extraterrestrische Physik, Postfach 1312, D-85741 Garching, FRG
[2] University of Science and Technology of China, HeFei, Anhui, 230026, China
[3] Astronomy Department, Pennsylvania State University, 525 Davey Lab, University Park, PA 16802, USA

The detection of high velocity absorption lines from highly ionized material was reported recently from the X-ray spectrum of the narrow line Seyfert 1 galaxy PG 0844+349, indicating a relativistic outflow from the source. The presence of such an outflow would have important implications for our understanding of narrow line Seyfert 1 galaxies. To address the reality of these absorption features we analyzed a long XMM observation with the MOS cameras of this object. We do not detect the absorption lines claimed by Pounds et al. nor does a re-analysis of the previous data set with the most recent detector calibrations confirm their results. The X-ray spectra can be well modeled with a power law plus a bremsstrahlung component. With this description, the soft and the harder 2−10 keV X-ray flux changed by a similar fraction ($\simeq 25\%$) between the two observations with only small changes of the spectral form. An analysis of the hardness ratio variations within a single observation

does not show any strong correlation between the hardness ratio and the continuum luminosity nor do we detect substantial lags between the hard and soft band fluxes.

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E-mail contact: wpb@mpe.mpg.de

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