Active Galaxies Newsletter	*An electronic publication dedicated to the observation and theory of active galaxies*
No. 203 — September 2014	Editor: Megan Argo (agnews@manchester.ac.uk)

Accepted Abstracts - Submitted Abstracts - Thesis Abstracts
Jobs Adverts - Meetings Adverts - Special Announcements

From the Editor

Welcome to all the new subscribers, and thanks to everyone who contributed to this issue of the Active Galaxies Newsletter. This newsletter is intended to disseminate paper abstracts, meeting announcements, job adverts and other information which may be of interest to the active galaxies community. It is produced monthly and, whilst the deadline for contributions is the last day of the month, contributions may be submitted at any time.

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. Please note that the editor may reject submissions which do not use the template. As always, any suggestions or feedback regarding the newsletter are welcome.

Many thanks for your continued subscription.

Megan Argo

Abstracts of recently accepted papers

Herschel Far-Infrared Photometry of the Swift Burst Alert Telescope Active Galactic Nuclei Sample of the Local Universe. I. PACS Observations

M. Meléndez[1], R. F. Mushotzky[1], T. T. Shimizu[1], A. J. Barger[2,3,4] and L. L. Cowie[3]

[1]Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD, 21218, USA
[2]Department of Astronomy, University of Wisconsin-Madison, 475 N. Charter Street, Madison, WI 53706, USA
[3]Institute for Astronomy, University of Hawaii, 2680 Woodlawn Drive, Honolulu, HI 96822, USA
[4]Department of Physics and Astronomy, University of Hawaii, 2505 Correa Road, Honolulu, HI 96822, USA

Far-Infrared (FIR) photometry from the the Photodetector Array Camera and Spectrometer (PACS) on the *Herschel* Space Observatory is presented for 313 nearby, hard X-ray selected galaxies from the 58-month *Swift* Burst Alert Telescope (BAT) Active Galactic catalog. The present data do not distinguish between the FIR luminosity distributions at 70 and 160 μm for Seyfert 1 and Seyfert 2 galaxies. This result suggests that if the FIR emission is from the nuclear obscuring material surrounding the accretion disk, then it emits isotropically, independent of orientation. Alternatively, a significant fraction of the 70 and 160 μm could be from star formation, independent of AGN type. Using a non-parametric test for partial correlation with censored data, we find a statistically significant correlation between the AGN intrinsic power (in the 14-195 keV band) and the FIR emission at 70 and 160 μm for Seyfert 1 galaxies. We find no correlation between the 14-195 keV and FIR luminosities in Seyfert 2 galaxies. The observed correlations suggest two possible scenarios: (i) if we assume that the FIR luminosity is a good tracer of star formation, then there is a connection between star formation and the AGN at sub-kiloparsec scales, or (ii) dust heated by the AGN has a statistically significant contribution to the FIR emission. Using a Spearman rank-order analysis, the 14-195 keV luminosities for the Seyfert 1 and 2 galaxies are weakly statistically correlated with the F_{70}/F_{160} ratios.

Accepted for publication in The Astrophysical Journal. 10 Figures, 6 Tables

E-mail contact: marcio@astro.umd.edu
Preprint available at http://arxiv.org/abs/1408.5889

Weak Hard X-ray Emission from Broad Absorption Line Quasars: Evidence for Intrinsic X-ray Weakness

B. Luo[1,2], W. N. Brandt[1,2], D. M. Alexander[3], D. Stern[4], S. H. Teng[5], P. Arévalo[6,7], F. E. Bauer[6,8,9], S. E. Boggs[10], F. E. Christensen[11], A. Comastri[12], W. W. Craig[13,10], D. Farrah[14], P. Gandhi[3], C. J. Hailey[15], F. A. Harrison[16], M. Koss[17], P. Ogle[18], S. Puccetti[19,20], C. Saez[21], A. E. Scott[1,2], D. J. Walton[16], and W. W. Zhang[22]

[1] Department of Astronomy & Astrophysics, 525 Davey Lab, The Pennsylvania State University, University Park, PA 16802, USA
[2] Institute for Gravitation and the Cosmos, The Pennsylvania State University, University Park, PA 16802, USA
[3] Department of Physics, Durham University, South Road, Durham DH1 3LE, UK
[4] Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109, USA
[5] Observational Cosmology Laboratory, NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA
[6] Instituto de Astrofísica, Facultad de Física, Pontificia Universidad Católica de Chile, 306, Santiago 22, Chile
[7] Instituto de Física y Astronomía, Facultad de Ciencias, Universidad de Valparaíso, Gran Bretana 1111, Playa Ancha, Valparaíso, Chile
[8] Millennium Institute of Astrophysics, Vicuña Mackenna 4860, 7820436 Macul, Santiago, Chile
[9] Space Science Institute, 4750 Walnut Street, Suite 205, Boulder, CO 80301, USA
[10] Space Sciences Laboratory, University of California, Berkeley, CA 94720, USA
[11] DTU Space - National Space Institute, Technical University of Denmark, Elektrovej 327, 2800 Lyngby, Denmark
[12] INAF—Osservatorio Astronomico di Bologna, Via Ranzani 1, Bologna, Italy
[13] Lawrence Livermore National Laboratory, Livermore, CA 94550, USA
[14] Department of Physics, Virginia Tech, Blacksburg, VA 24061, USA
[15] Columbia Astrophysics Laboratory, Columbia University, New York, NY 10027, USA
[16] Cahill Center for Astronomy and Astrophysics, California Institute of Technology, Pasadena, CA 91125, USA
[17] Institute for Astronomy, Department of Physics, ETH Zurich, Wolfgang-Pauli-Strasse 27, CH-8093 Zurich, Switzerland
[18] IPAC, California Institute of Technology, Mail Code 220-6, Pasadena, CA 91125, USA
[19] ASDC—ASI, Via del Politecnico, 00133 Roma, Italy
[20] INAF—Osservatorio Astronomico di Roma, via Frascati 33, 00040 Monte Porzio Catone (RM), Italy
[21] Department of Astronomy, University of Maryland, College Park, MD 20742, USA
[22] NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA

We report *NuSTAR* observations of a sample of six X-ray weak broad absorption line (BAL) quasars. These targets, at $z = 0.148$–1.223, are among the optically brightest and most luminous BAL quasars known at $z < 1.3$. However, their rest-frame ≈ 2 keV luminosities are 14 to > 330 times weaker than expected for typical quasars. Our results from a pilot *NuSTAR* study of two low-redshift BAL quasars, a *Chandra* stacking analysis of a sample of high-redshift BAL quasars, and a *NuSTAR* spectral analysis of the local BAL quasar Mrk 231 have already suggested the existence of intrinsically X-ray weak BAL quasars, i.e., quasars not emitting X-rays at the level expected from their optical UV emission. The aim of the current program is to extend the search for such extraordinary objects. Three of the six new targets are weakly detected by *NuSTAR* with < 45 counts in the 3–24 keV band, and the other three are not detected. The hard X-ray (8–24 keV) weakness observed by *NuSTAR* requires Compton-thick absorption if these objects have nominal underlying X-ray emission. However, a soft stacked effective photon index ($\Gamma_{\rm eff} \approx 1.8$) for this sample disfavors Compton-thick absorption in general. The uniform hard X-ray weakness observed by *NuSTAR* for this and the pilot samples selected with < 10 keV weakness also suggests that the X-ray weakness is intrinsic in at least some of the targets. We conclude that the *NuSTAR* observations have likely discovered a significant population ($> 33\%$) of intrinsically X-ray weak objects among the BAL quasars with significantly weak < 10 keV emission. We suggest that intrinsically X-ray weak quasars might be preferentially observed as BAL quasars.

Accepted by ApJ

E-mail contact: lbin@astro.psu.edu
Preprint available at http://arxiv.org/abs/1408.3633

Nuclear $11.3\,\mu$m PAH emission in local active galactic nuclei

A. Alonso-Herrero[1], C. Ramos Almeida[2,3], P. Esquej[4], P. F. Roche[5], A. Hernán-Caballero[1], S. F. Hönig[6], O. González-Martín[2,3], I. Aretxaga[7], R. E. Mason[8], C. Packham[9], N. A. Levenson[10], J. M. Rodríguez Espinosa[2,3], R. Siebenmorgen[11], M. Pereira-Santaella[12,13], T. Díaz-Santos[14], L. Colina[13], C. Alvarez[2,3], and C. M. Telesco[15]

[1]Instituto de Física de Cantabria, CSIC-UC, E-39005 Santander, Spain
[2]Instituto de Astrofísica de Canarias (IAC), E-38205 La Laguna, Tenerife, Spain
[3]Departamento de Astrofísica, Universidad de la Laguna (ULL), E-38206 La Laguna, Tenerife, Spain
[4]Departamento de Astrofísica, Universidad Complutense de Madrid, E-28040 Madrid, Spain
[5]Department of Physics, University of Oxford, Oxford OX1 3RH, UK
[6]Dark Cosmology Centre, Niels-Bohr-Institute, University of Copenhagen, DK-2100 Copenhagen Ø, Denmark
[7]Instituto Nacional de Astrofísica, Optica y Electrónica (INAOE), 72000 Puebla, Mexico
[8]Gemini Observatory, Northern Operations Center, Hilo, HI 96720, USA
[9]Department of Physics and Astronomy, University of Texas at San Antonio, San Antonio, TX 78249, USA
[10]Gemini Observatory, Casilla 603, La Serena, Chile
[11]European Southern Observatory, D-85748 Garching b. München, Germany
[12]Istituto di Astrofisica e Planetologia Spaziali, INAF, I-00133 Roma, Italy
[13]Centro de Astrobiología, CSIC-INTA, E-28850 Torrejón de Ardoz, Madrid, Spain
[14]Spitzer Science Center, Caltech, Pasadena, CA 91125, USA
[15]Department of Astronomy, University of Florida, Gainesville, FL 32611, USA

We present Gran Telescopio CANARIAS CanariCam $8.7\,\mu$m imaging and $7.5-13\,\mu$m spectroscopy of six local systems known to host an active galactic nucleus (AGN) and have nuclear star formation. Our main goal is to investigate whether the molecules responsible for the $11.3\,\mu$m polycyclic aromatic hydrocarbon (PAH) feature are destroyed in the close vicinity of an AGN. We detect $11.3\,\mu$m PAH feature emission in the nuclear regions of the galaxies as well as extended PAH emission over a few hundred parsecs. The equivalent width (EW) of the feature shows a minimum at the nucleus but increases with increasing radial distances, reaching typical star-forming values a few hundred parsecs away from the nucleus. The reduced nuclear EW are interpreted as due to increased dilution from the AGN continuum rather than destruction of the PAH molecules. We conclude that at least those molecules responsible for the $11.3\,\mu$m PAH feature survive in the nuclear environments as close as 10 pc from the AGN and for Seyfert-like AGN luminosities. We propose that material in the dusty tori, nuclear gas disks, and/or host galaxies of AGN is likely to provide the column densities necessary to protect the PAH molecules from the AGN radiation field.

Accepted by MNRAS

E-mail contact: aalonso@ifca.unican.es
Paper available at http://mnras.oxfordjournals.org/content/443/3/2766

Modeling the [Fe II]$\lambda 1.644\mu$m outflow and comparison with H_2 and H^+ kinematics in the inner 200 pc of NGC 1068

F. K. B. Barbosa[1], T. Storchi-Bergmann[2], P. McGregor[3], T. B. Vale[4] and Rogemar A. Riffel[5]

[1] IFRS – Campus Restinga, Rua 7121, n. 285 Lote 16, Quadra F, Restinga, CEP 91791-508, Porto Alegre, RS, Brazil
[2] Instituto de Física – UFRGS, Caixa Postal 15051, CEP 91501-970, Porto Alegre, RS, Brazil
[3] Research School of Astronomy and Astrophysics, Australian National University, Cotter Road, Weston Creek, ACT 2611, Australia
[4] INFES – UFF, Rua João Jasbick, s/n, Bairro Aeroporto, CEP 28470-000 Santo Antônio de Pádua, RJ, Brazil
[5] Universidade Federal de Santa Maria, Departamento de Física, CCNE, 97105-900, Santa Maria, RS, Brazil

We map the kinematics of the inner (200 pc) narrow-line region (NLR) of the Seyfert 2 galaxy NGC 1068 using the instrument NIFS and adaptative optics at the Gemini North Telescope. Channel maps and position-velocity diagrams are presented at a spatial resolution of $\cong 10$ pc and spectral resolution ~ 5300 in the emission lines [Fe II] $\lambda\,1.644\,\mu$m, $H_2\,\lambda\,2.122\,\mu$m and Brγ. The [Fe II] emission line provides a better coverage of the NLR outflow than the previously used [O III] $\lambda\,5007$ emission line, extending beyond the area of the bi-polar cone observed in Brγ and [O III]. This is mainly due to the contribution of the redshifted channels to the NE of the nucleus, supporting its origin in a partial ionized zone with additional contribution from shocks of the outflowing gas with the galactic disc. We modeled the kinematics and geometry of the [Fe II] emitting gas finding good agreement with the data for outflow models with conical and lemniscate (or hourglass) geometry. We calculate a mass outflow rate of $1.9^{+1.9}_{-0.7}\,M_{\odot}\,yr^{-1}$ but a power for the outflow of only 0.08% L_{Bol}. The molecular (H_2) gas kinematics is completely distinct from that of [Fe II] and Brγ, showing radial expansion in an off-centered ~ 100 pc radius ring in the galaxy plane. The expansion velocity decelerates from $\approx 200\,km\,s^{-1}$ in the inner border of the ring to approximately zero at the outer border where our previous studies found a 10 Myr stellar population.

Accepted by MNRAS

E-mail contact: fausto.barbosa@restinga.ifrs.edu.br
Preprint available at http://arxiv.org/abs/1408.4750

The NuSTAR View of Nearby Compton-thick AGN: The Cases of NGC 424, NGC 1320 and IC 2560

M. Baloković[1], A. Comastri[2], F. A. Harrison[1], D. M. Alexander[3], D. R. Ballantyne[4], F. E. Bauer[5,6], S. E. Boggs[7], W. N. Brandt[8,9], M. Brightman[10], F. E. Christensen[11], W. W. Craig[7,12], A. Del Moro[3], P. Gandhi[3], C. J. Hailey[13], M. Koss[14,15], G. B. Lansbury[3], B. Luo[8,9], G. M. Madejski[16], A. Marinucci[17], G. Matt[17], C. B. Markwardt[18], S. Puccetti[19,20], C. S. Reynolds[21,22], G. Risaliti[23,24], E. Rivers[1], D. Stern[25], D. J. Walton[1], W. W. Zhang[18]

[1] Cahill Center for Astronomy and Astrophysics, Caltech, Pasadena, CA 91125, USA;
[2] INAF Osservatorio Astronomico di Bologna, via Ranzani 1, I-40127, Bologna, Italy;
[3] Department of Physics, Durham University, Durham DH1 3LE, UK;
[4] Center for Relativistic Astrophysics, School of Physics, Georgia Institute of Technology, Atlanta, GA 30332, USA;
[5] Instituto de Astrofísica, Facultad de Física, Pontificia Universidad Católica de Chile 306, Santiago 22, Chile;
[6] Space Science Institute, 4750 Walnut Street, Suite 205, Boulder, CO 80301, USA;
[7] Space Sciences Laboratory, University of California, Berkeley, CA 94720, USA;
[8] Department of Astronomy and Astrophysics, The Pennsylvania State University, 525 Davey Lab, University Park, PA 16802, USA;
[9] Institute for Gravitation and the Cosmos, The Pennsylvania State University, University Park, PA 16802, USA;
[10] Max-Planck-Institut für extraterrestrische Physik, Giessenbachstrasse 1, D-85748 Garching bei München, Germany;
[11] DTU Space, National Space Institute, Technical University of Denmark, Elektrovej 327, DK-2800 Lyngby, Denmark;
[12] Lawrence Livermore National Laboratory, Livermore, CA 94550, USA;
[13] Columbia Astrophysics Laboratory, Columbia University, New York, New York 10027, USA;
[14] Institute for Astronomy, University of Hawaii, 2680 Woodlawn Drive, Honolulu, HI 96822, USA;
[15] Institute for Astronomy, Department of Physics, ETH Zurich, Wolfgang-Pauli-Strasse 27, CH-8093 Zurich, Switzerland;
[16] Kavli Institute for Particle Astrophysics and Cosmology, SLAC National Accelerator Laboratory, Menlo Park, CA 94025, USA;
[17] Dipartimento di Matematica e Fisica, Università degli Studi Roma Tre, via della Vasca Navale 84, I-00146 Roma, Italy;
[18] NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA;
[19] ASI-Science Data Center, via Galileo Galilei, I-00044 Frascati, Italy;
[20] INAF Osservatorio Astronomico di Roma, via Frascati 33, I-00040 Monteporzio Catone, Italy;
[21] Department of Astronomy, University of Maryland, College Park, MD, USA;
[22] Joint Space-Science Institute, University of Maryland, College Park, MD, USA;
[23] INAF Osservatorio Astrofisico di Arcetri, Largo E. Fermi 5, I-50125 Firenze, Italy;
[24] Harvard-Smithsonian Center for Astrophysics, 60 Garden St., Cambridge, MA 02138, USA;
[25] Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109, USA

We present X-ray spectral analyses for three Seyfert 2 active galactic nuclei, NGC 424, NGC 1320, and IC 2560, observed by *NuSTAR* in the 3–79 keV band. The high quality hard X-ray spectra allow detailed modeling of the Compton reflection component for the first time in these sources. Using quasi-simultaneous *NuSTAR* and *Swift*/XRT data, as well as archival *XMM-Newton* data, we find that all three nuclei are obscured by Compton-thick material with column densities in excess of $\sim 5 \times 10^{24}$ cm^{-2}, and that their X-ray spectra above 3 keV are dominated by reflection of the intrinsic continuum on Compton-thick material. Due to the very high obscuration, absorbed intrinsic continuum components are not formally required by the data in any of the sources. We constrain the intrinsic photon indices and the column density of the reflecting medium through the shape of the reflection spectra. Using archival multi-wavelength data we recover the intrinsic X-ray luminosities consistent with the broadband spectral energy distributions. Our results are consistent with the reflecting medium being an edge-on clumpy torus with a relatively large global covering factor and overall reflection efficiency of the order of 1%. Given the unambiguous confirmation of the Compton-thick nature of the sources, we investigate whether similar sources are likely to be missed by commonly used selection criteria for Compton-thick AGN, and explore the possibility of finding their high-redshift counterparts.

Accepted by ApJ.

E-mail contact: mislavb@astro.caltech.edu
Preprint available at http://arxiv.org/abs/1408.5414

The XMM-*Newton* Bright Survey sample of absorbed quasars: X-ray and accretion properties

L. Ballo[1], P. Severgnini[1], R. Della Ceca[1], A. Caccianiga[1], C. Vignali[2,3], F.J. Carrera[4], A. Corral[5], and S. Mateos[4]

[1] Osservatorio Astronomico di Brera (INAF), via Brera 28, I-20121, Milano (Italy)
[2] Dipartimento di Fisica e Astronomia, Università degli Studi di Bologna, viale Berti Pichat 6/2, I-40127, Bologna (Italy)
[3] Osservatorio Astronomico di Bologna (INAF), Via Ranzani 1, I-40127, Bologna (Italy)
[4] Instituto de Física de Cantabria (CSIC-UC), Avenida de los Castros, E-39005 Santander (Spain)
[5] Institute for Astronomy, Astrophysics, Space Applications & Remote Sensing, National Observatory of Athens, Lofos Nymfon, Thiseio, P.O. Box 20048 GR-11810 Athens (Greece)

Although absorbed quasars are extremely important for our understanding of the energetics of the Universe, the main physical parameters of their central engines are still poorly known. In this work we present and study a complete sample of 14 quasars (QSOs) that are absorbed in the X-rays (column density $N_{\rm H} > 4 \times 10^{21}$ cm^{-2} and X-ray luminosity $L_{\rm 2\text{-}10\,keV} > 10^{44}$ ergs s^{-1}; XQSO2) belonging to the XMM-*Newton* Bright Serendipitous Survey (XBS). From the analysis of their ultraviolet-to-mid-infrared spectral energy distribution we can separate the nuclear emission from the host galaxy contribution, obtaining a measurement of the fundamental nuclear parameters, like the mass of the central supermassive black hole and the value of Eddington ratio, $\lambda_{\rm Edd}$.

Comparing the properties of XQSO2s with those previously obtained for the X-ray unabsorbed QSOs in the XBS, we do not find any evidence that the two samples are drawn from different populations. In particular, the two samples span the same range in Eddington ratios, up to $\lambda_{\rm Edd} \sim 0.5$; this implies that our XQSO2s populate the "forbidden region" in the so-called "effective Eddington limit paradigm". A combination of low grain abundance, presence of stars inwards of the absorber, and/or anisotropy of the disk emission, can explain this result.

Accepted by MNRAS

E-mail contact: lucia.ballo@brera.inaf.it (LB)
Preprint available at http://arxiv.org/abs/1408.7037

S7 : Probing the physics of Seyfert Galaxies through their ENLR & HII Regions

Michael A. Dopita[1,2], Prajval Shastri[3], Julia Scharwachter[4], Lisa J. Kewley[1,5], Rebecca Davies[1], Ralph Sutherland[1], Preeti Kharb[3], Jessy Jose[3], Elise Hampton[1], Chichuan Jin[6], Julie Banfield[7], Ingyin Zaw[8], and Bethan James[9]

[1] 1RSAA, Australian National University, Cotter Road, Weston Creek, ACT 2611, Australia
[2] Astronomy Department, King Abdulaziz University, P.O. Box 80203, Jeddah, Saudi Arabia
[3] Indian Institute of Astrophysics, Koramangala 2B Block, Bangalore 560034, India
[4] LERMA, Observatoire de Paris, 61 Avenue de lObservatoire, 75014 Paris, France
[5] Institute for Astronomy, University of Hawaii, 2680 Woodlawn Drive, Honolulu, HI, USA
[6] Department of Physics, University of Durham, South Road, Durham DH1 3LE, UK
[7] CSIRO Astronomy & Space Science, P.O. Box 76, Epping NSW, 1710 Australia
[8] New York University (Abu Dhabi) , 70 Washington Sq. S, New York, NY 10012, USA
[9] Institute of Astronomy, Cambridge University, Madingley Road, Cambridge CB3 0HA, UK

Here we present the first results from the *Siding Spring Southern Seyfert Spectroscopic Snapshot Survey* (S7) which aims to investigate the physics of ~ 140 radio-detected southern active Galaxies with $z < 0.02$ through Integral Field Spectroscopy using the Wide Field Spectrograph (WiFeS). This instrument provides data cubes of the central 38×25 arc sec. of the target galaxies in the waveband $340 - 710$nm with the unusually high resolution of $R = 7000$ in the red ($530 - 710$nm), and $R = 3000$ in the blue ($340 - 560$nm). These data provide the morphology, kinematics and the excitation structure of the extended narrow-line region, probe relationships with the black hole characteristics and the host galaxy, measures host galaxy abundance gradients and the determination of nuclear abundances from the HII regions. From photoionisation modelling, we may determine the shape of the ionising spectrum of the AGN, discover whether AGN metallicities differ from nuclear abundances determined from HII regions, and probe grain destruction in the vicinity of the AGN. Here we present some preliminary results and modelling of both Seyfert galaxies observed as part of the survey.

To appear in Proceedings of IAU Symposium No. 309, 2014

E-mail contact: Michael.Dopita@anu.edu.au
Preprint available at http://arxiv.org/abs/1408.4549