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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

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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

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

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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.

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Nuclear 11.3 μm PAH emission in local active galactic nuclei

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We present Gran Telescopio CANARIAS CanariCam 8.7 μm 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 μm polycyclic aromatic hydrocarbon (PAH) feature are destroyed in the close vicinity of an AGN. We detect 11.3 μm 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 μm 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.

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Modeling the [Fe II]λ1.644μm outflow and comparison with H_2 and H^+ kinematics in the inner 200 pc of NGC 1068

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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.

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

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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.

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

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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.

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

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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.

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