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From the Editor

The Active Galaxies Newsletter is produced monthly. The deadline for contributions is the last day 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.

As always as editor of the newsletter I am very interested to hear any suggestions or feedback regarding the newsletter. So do not hesitate in emailing me your suggestions.

Many thanks for your continued subscription.

Melanie Gendre

Abstracts of recently accepted papers

Hot Graphite Dust and the Infrared Spectral Energy Distribution of Active Galactic Nuclei

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We present a detailed investigation of the near-to-far infrared (IR) spectral energy distribution (SED) of a large sample of Spitzer-observed active galactic nuclei (AGN). We fitted the spectra of 51 narrow line Seyfert 1 galaxies (NLS1s) and 64 broad line Seyfert 1 galaxies (BLS1s) using a three component model: a clumpy torus, a dusty narrow line region (NLR) and hot pure-graphite dust located in the outer part of the broad line region (BLR). The fitting is performed on star formation (SF) subtracted SEDs using SF templates that take into account the entire range of possible host galaxy properties. We find that the mid-IR intrinsic emission of NLS1s and BLS1s are very similar, regardless of the AGN luminosity, with long wavelength downturn at around 20–25 μm. We present a detailed model of the hot dust component that takes into account the distribution of dust temperature within the clouds and their emission line spectrum. The hot dust continuum provides a very good fit to the observed near-IR continuum spectrum. Most line emission in this component is dramatically suppressed, except Mg II λ2798 and He I lines that are still contributing significantly to the total BLR spectrum. We calculate the covering factors of all the AGN components and show that the covering factor of the hot-dust clouds is about 0.15-0.35, similar to the covering factor of the torus, and is anti-correlated with the source luminosity and the normalized accretion rate.

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preprint available atarXiv:1110.5326

Ensemble X-ray variability of Active Galactic Nuclei from serendipitous source catalogs

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The X-ray variability of the Active Galactic Nuclei (AGN) has been most often investigated with studies of individual, nearby, sources, and only a few ensemble analyses have been applied to large samples in wide ranges of luminosity and redshift. We want to determine the ensemble variability properties of two serendipitously selected AGN samples extracted from the catalogs of XMM-Newton and Swift, with redshift between ~ 0.2 and ~ 4.5, and X-ray luminosities, in the 0.5-4.5 keV band, between $\sim 10^{43}$ erg/s and $\sim 10^{46}$ erg/s. We use the structure function (SF), which operates in the time domain, and allows for an ensemble analysis even when only a few observations are available for individual sources and the power spectral density (PSD) cannot be derived. SF is also more appropriate than fractional variability and excess variance, because such parameters are biased by the duration of the monitoring time interval in the rest-frame, and thus by cosmological time dilation. We find statistically consistent results for the two samples, with the SF described by a power law of the time lag, approximately as $SF \propto \tau^{0.1}$. We do not find evidence of the break in the SF, at variance with the case of lower luminosity AGNs. We confirm a strong anti-correlation of the variability with X-ray luminosity, accompanied by a change of the slope of the SF. We find evidence in support of a weak, intrinsic, average increase of X-ray variability with redshift. The change of amplitude and slope of the SF with X-ray luminosity provides new constraints on both single oscillator models and multiple subunits models of variability.

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preprint available at http://arxiv.org/abs/1110.4768

Off-Axis Energy Variability of AGNs: a New Paradigm for Broad-Line- and Continuum-Emitting Regions

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The general picture of how thermal AGNs work has become clearer in recent years but major observational puzzles threaten to undermine this picture. These puzzles include AGNs with extremely asymmetric emission line profiles, inconsistent multi-wavelength variability, rapid apparent changes in the sizes of emitting regions and in the direction of gas flow, a curious insensitivity of gas in some narrow velocity ranges to changes in the ionizing continuum, and differing dependencies of polarization on gas velocity. It is proposed that all these puzzles can readily be explained by off-axis variability.

Baltic Astronomy, Vol. 20, in press. (Invited talk given at 8th SCSLS.)

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Preprint available at *http://adsabs.harvard.edu/abs/2011arXiv1107.5382G*

The Galaxy Zoo survey for giant AGN-ionized clouds: past and present black-hole accretion events

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Some active galactic nuclei (AGN) are surrounded by extended emission-line regions (EELRs), which trace both the illumination pattern of escaping radiation and its history over the light-travel time from the AGN to the gas. From a new set of such EELRs, we present evidence that the AGN in many Seyfert galaxies undergo luminous episodes 0.2–2×10^5 years in duration. Motivated by the discovery of the spectacular nebula known as Hanny's Voorwerp, ionized by a powerful AGN which has apparently faded dramatically within $\approx 10^5$ years, Galaxy Zoo volunteers have carried out both targeted and serendipitous searches for similar emission-line clouds around low-redshift galaxies. We present the resulting list of candidates and describe spectroscopy identifying 19 galaxies with AGN-ionized regions at projected radii $r_{proj} > 10$ kpc. This search recovered known EELRs (such as Mkn 78, Mkn 266, and NGC 5252) and identified additional previously unknown cases, one with detected emission to $r = 37$ kpc. One new Sy 2 was identified. At least 14/19 are in interacting or merging systems, suggesting that tidal tails are a prime source of distant gas out of the galaxy plane to be ionized by an AGN. We see a mix of one- and two-sided structures, with observed cone angles from 23–112°. We consider the energy balance in the ionized clouds, with lower and upper bounds on ionizing luminosity from recombination and ionization-parameter arguments, and estimate the luminosity of the core from the far-infrared data. The implied ratio of ionizing radiation seen by the clouds to that emitted by the nucleus, on the assumption of a nonvariable nuclear source, ranges from 0.02 to > 12; 7/19 exceed unity. Small values fit well with a heavily obscured AGN in which only a small fraction of the ionizing output escapes to be traced by surrounding gas. However, large values may require that the AGN has faded over tens of thousands of years, giving us several examples of systems in which such dramatic long-period variation has occurred; this is the only current technique for addressing these timescales in AGN history. The relative numbers of faded and non-faded objects we infer, and the projected extents of the ionized regions, give our estimate (0.2–2×10^5 years) for the length of individual bright phases.

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