



# FEEDBACK IN ACTION IN A $z \sim 1.6$ OBSCURED QSO

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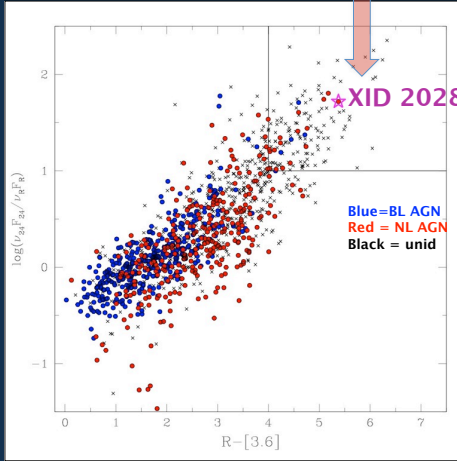
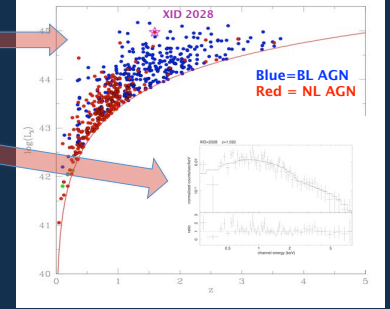
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## ABSTRACT

The most recent models of AGN galaxy coevolution, at least for the most luminous QSO population, predict an enhancement in the bolometric luminosity and column density, coupled with a low B-band luminosity (and therefore red optical to near infrared colors, and high X/O and MIPS/O flux ratios) for objects that are experiencing a transition from being starburst dominated to AGN dominated by (see e.g. Menci et al. 2008, Hopkins et al. 2008). The same models predict also strong outflows from AGN and/or stellar winds. We present the X-ray, optical and NIR properties of the XMM-COSMOS source XID2028, a high- $z$  ( $z=1.592$ ) obscured QSO possibly caught in such a peculiar, transition phase.

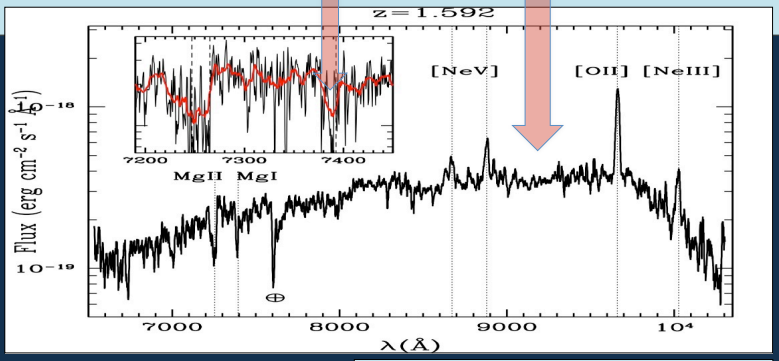
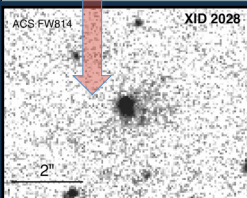
### 1) SELECTION of XID 2028

- the brightest XMM-COSMOS source,  $L_X \sim 10^{45}$  erg/s, spectroscopically identified with a narrow line object ( $z=1.592$ ) in Brusa et al. (2010) with  $N_H \sim 10^{22}$  cm $^{-2}$ , see also
- Further classified as an Extremely Red Object (ERO,  $R-K=6.5$ ) and Dust Obscured Galaxy (DOG,  $MIPS/O > 1000$ ), fulfilling the criteria for the selection of obscured quasars presented by, e.g. Fiore et al. (2009). Classified as HyLIRG ( $L_{IR} > 10^{13} L_\odot$ )



### 2) OPTICAL SPECTRUM & MORPHOLOGY

- Keck/DEIMOS spectrum: red, early type continuum plus strong AGN emission lines ([NeV] doublet) and SF features (OII,  $SFR \sim 10^3 M_\odot / yr$ )
- Evidence of outflowing material ( $\sim 300$  km/s) from the blueshifted MgI and MgII complex absorption.
- HST/ACS disturbed morphology (point-like nucleus + extended component)

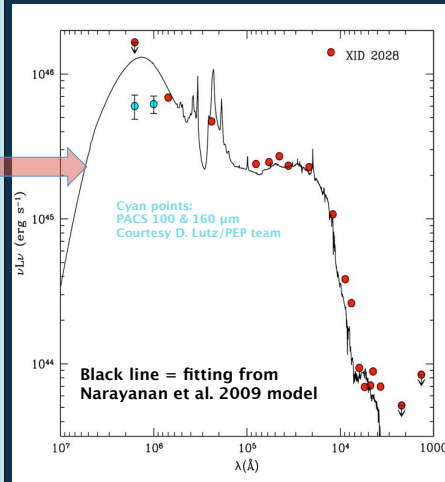


### 3) SED FITTING

- Stellar mass  $M_* \sim 5 \times 10^{11} M_\odot$  from two components (galaxy+AGN) SED fitting on more than 15 photometric datapoints from far infrared to GALEX (red circles)

Overall SED amazingly well fit by numerical templates resulting from theoretical models for AGN and galaxy co-evolution developed for  $z \sim 2$  DOGs (from Narayanan et al. 2009) but... Herschel/PACS data points suggest a weaker FIR emission than expected!

complete SED sampling for large obscured AGN samples, and more modeling needed!



Very short phase ( $\ll 1$  Gyr), rare objects: large and bright samples needed!

expected few thousands (even more luminous than this prototype) in eROSITA all-sky survey!

Isolated using only 3 bands! (X-opt-IR) !!

Unprecedented physics laboratories for QSO feedback studies

All figures and material from: Brusa et al. (2010), ApJ, 716, 348 Questions/comments: [marcella@mpe.mpg.de](mailto:marcella@mpe.mpg.de)  
Other references: Fiore et al. 2009, ApJ, 693, 447; Hopkins et al. 2006, ApJS, 163, 1; Menci et al. 2008, ApJ, 686, 219; Merloni et al. 2010, ApJ, 708, 137; Narayanan et al. 2009, MNRAS, 400, 1919