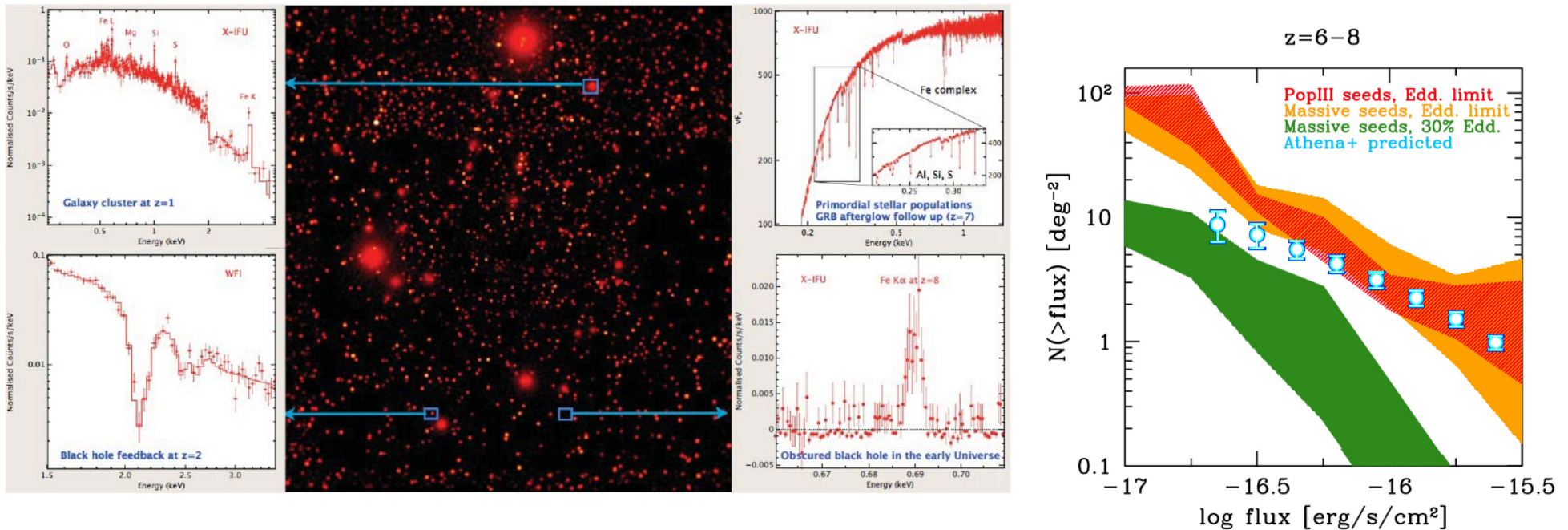


Athena: Goals, Requirements on (Level 3) Data Analysis

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Goals: Missing baryons in ICM, IGM; astrophysics of groups, clusters, AGN etc. Chemical evolution
 Angular resolution OK for all galaxy clusters, galaxy groups, SNR etc.

X-IFU (5' FOV): heritage in software developed for Hitomi – Transition Edge Sensos (TES) energy resolution 2.5eV.
Hitomi lessons learned from spatially and spectrally complex high-resolution spectra (e.g. RIF lines, velocities)

WFI: DEPFET (active pixel sensors) – energy resolution 150eV at 6 keV; high time resolution (not CCD);
 s/w heritage from XMM, CXO
 e.g. mass assembly of groups, clusters; non-gravitational heating processes.

Careful background reduction for detection of extended structures.

Transient sources, taking advantage of high time resolution. Input triggers, output triggers

Notes: XMM GOF GO AO-1 and AO-2 ~220 grants. AO-3 and AO-4 ~170 or so. AO-5 + ~120-130, no subgrants
 2010 (JWST) ~20 grants in AO-10 and AO-11. Restoration of additional GO funds back to ~30-40 grants per year AO-15, 16 ~ 60 . ~2000 US scientist have received funding.

NASA-funded Software: (1) RGS team S/W; (2) Extended Source Analysis: ESAS – Snowden et al

XMM-ESAS was developed at the NASA/GSFC XMM-Newton GOF in cooperation with the XMM-Newton SOC at ESAC and the Background Working Group.

Synergies : JWST, LSST, SKA, Euclid, WFIRST