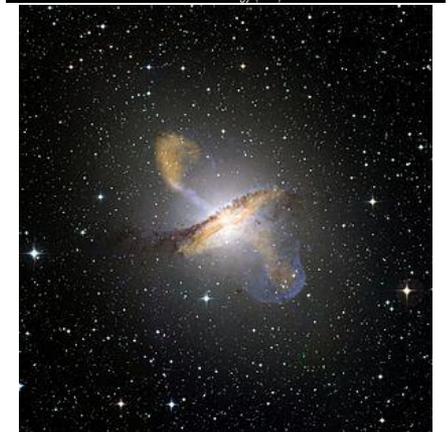
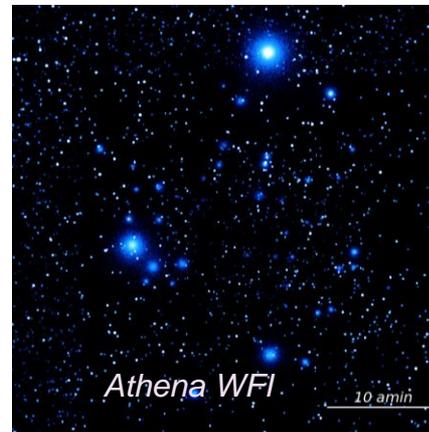
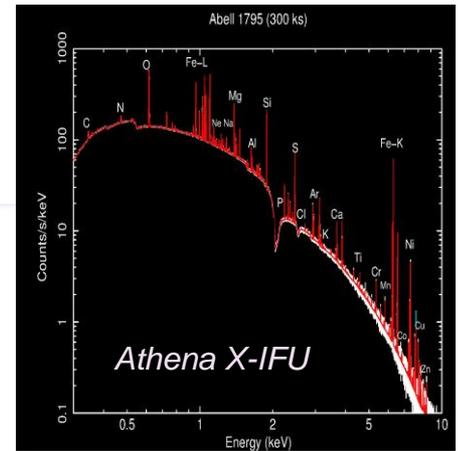


ATHENA

The Advanced Telescope for High Energy Astrophysics: Concluding Remarks



*Exploring the Hot and
Energetic Universe,
Palermo, Sept 2018*

Kirpal Nandra, MPE
On behalf of the Athena
Science Study Team*

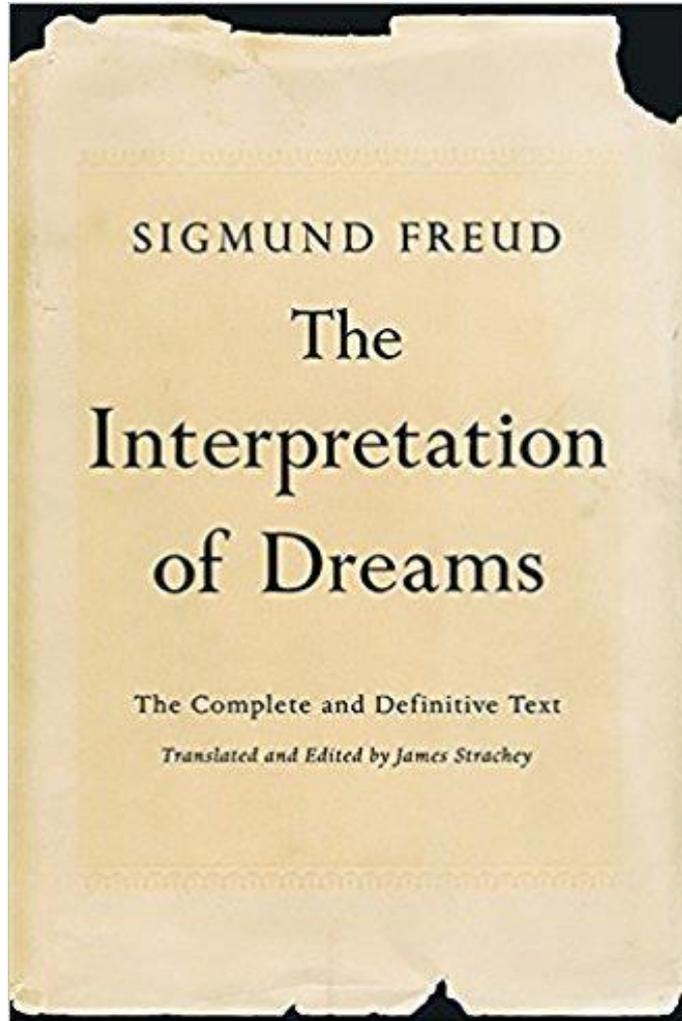


**Didier Barret, Anne Decourchelle, Andy Fabian, Jan-Willem den Herder, Hiro Matsumoto, Luigi Piro, Randall Smith, Dick Willingale + Matteo Guainazzi (ESA Chair)*

FIRST ATHENA CONFERENCE

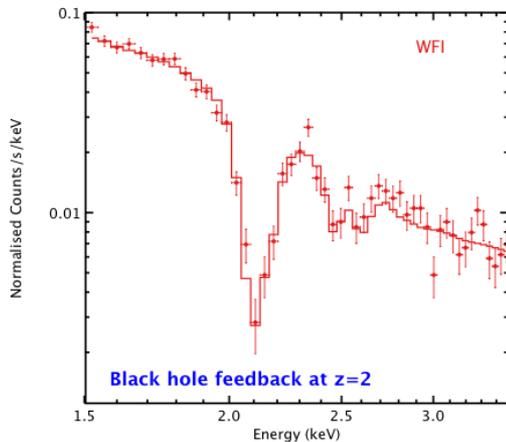
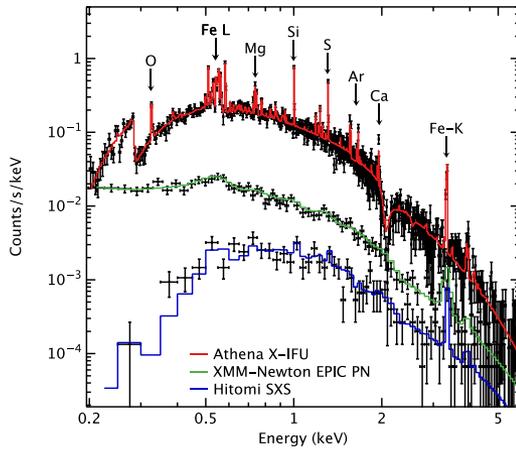


ESAC, Madrid, September 2015

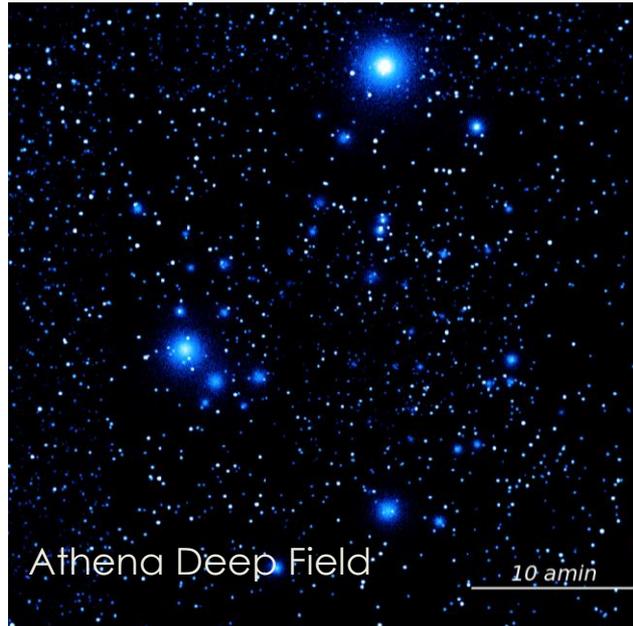


Exploring the Hot and Energetic Universe

Physics of LSS to $z > 2$

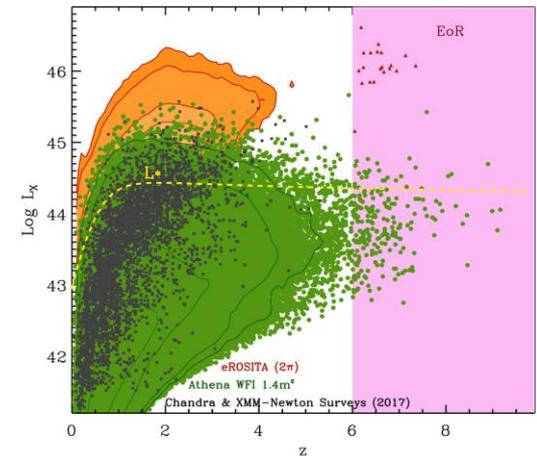
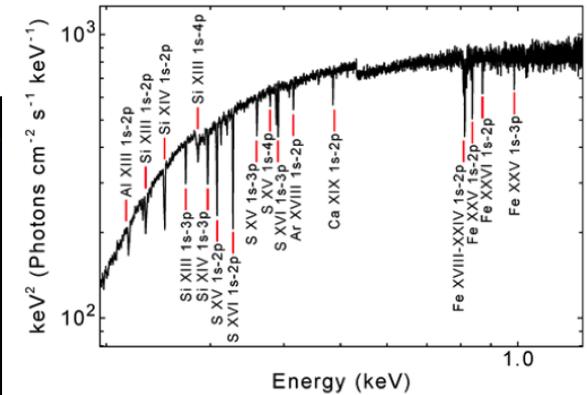


Black hole feedback



Nandra, Barret, Barcons, Fabian, den Herder, Piro, Watson et al. 2013 arXiv 1306.2307

The first stars



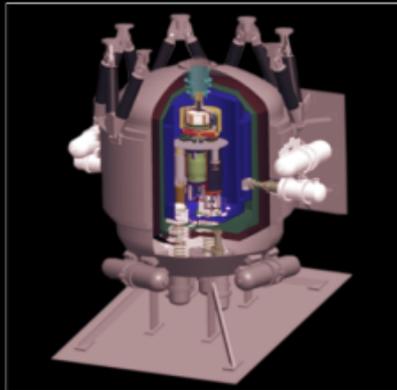
SMBH into the EoR

The Athena Observatory

Willingale et al, 2013
arXiv1308.6785

L2 orbit Ariane V

Mass < 5100 kg
Power 2500 W
5 year mission



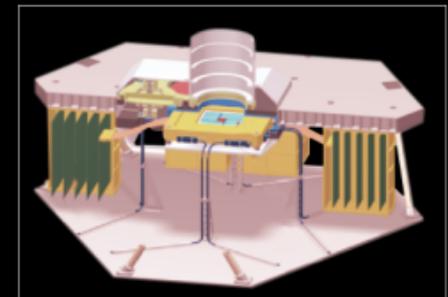
X-ray Integral Field Unit:

ΔE : 2.5 eV
Field of View: 5 arcmin
Operating temp: 50 mk



Silicon Pore Optics:

2 m² at 1 keV
5 arcsec HEW
Focal length: 12 m
Sensitivity: 3 10⁻¹⁷ erg cm⁻²s⁻¹



Wide Field Imager:

ΔE : 125 eV
Field of View: 40 arcmin
High countrate capability



The Athena Observatory

L2 orbit Ariane 64
Mass ~7100 kg
Power ~10,000 W
>4 year mission

Movable mirror array (MMA)

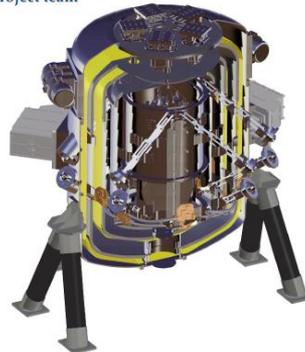
Science Instrument Module (SIM)

CNES project team

X-ray Integral Field Unit:
TES-based calorimeter
 ΔE : 2.5 eV
Field of View: 5 arcmin
Operating temp: 50 mk



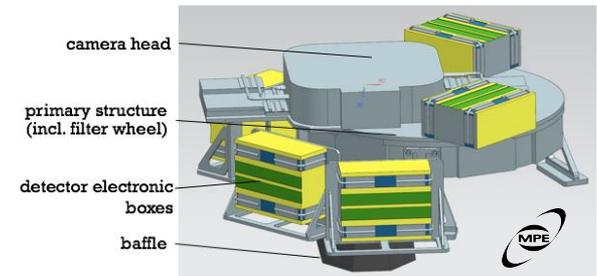
Barret et al., 2016, 2018 SPIE



Willingale et al, 2013
Bavdaz et al. 2016,2018



Silicon Pore Optics:
1.4 m² (goal 2 m²)@ 1 keV
5 arcsec HEW
Focal length: 12 m
Sensitivity: 3 10⁻¹⁷ erg cm⁻² s⁻¹



Wide Field Imager:
Si DEPFET-based detector
 ΔE : 125 eV
Field of View: 40 arcmin
High countrate capability

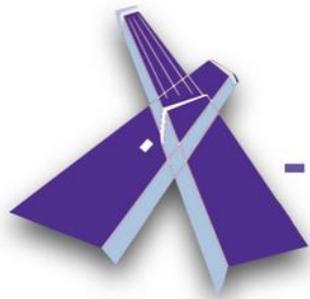
Meidinger et al. 2016, 2018, SPIE

THE
RED BOOK
LIBER NOVUS

C·G·JUNG

EDITED and INTRODUCED by
SONU SHAMDASANI





X-RAY ASTRONOMY 2019

Current Challenges and New Frontiers in the Next Decade

<https://indico.ict.inaf.it/e/XRAY2019>

or just Google "X-ray Astronomy 2019 Bologna"

8-13 September 2019

CNR/INAF Research Area, Bologna



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Pre-registration opens today

THANK YOU

