Athena Splinter Meeting: Agenda

- Athena Splinter Meeting, Thursday Jan 5, 2017, 229th AAS
- 2:00pm - Garcia: NASA Partnership on Athena (10m+5 Q/A):
- 2:15pm – Pajot: Athena Status and X-ray Integral Field Unit (X-IFU) (15min + 5 Q/A)
- 2:35pm – Bandler: NASA contribution to X-IFU (15 min + 5 Q/A)
- 2:55pm – Burrows: NASA contribution to WFI (15min + 5 Q/A)
- 3:15 - Open Discussion, starting with US Data Center needs and S/W
- Starting with single slides from: Donahue, Bregman, Ballantyne, Griffiths, Plucinsky
- 4:00 – Adjourn
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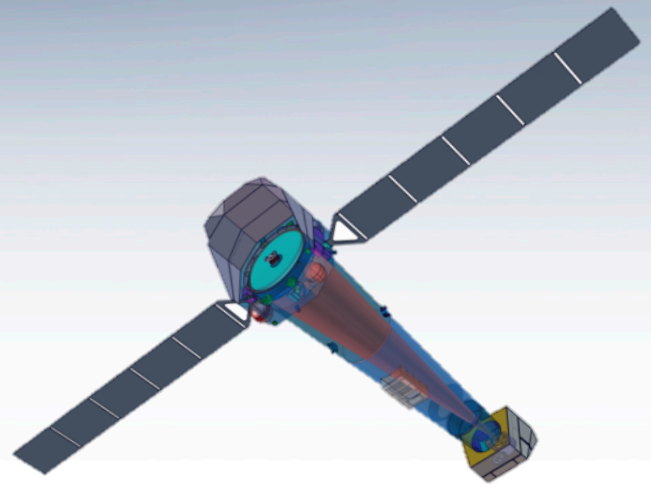
Athena

Advanced **T**elescope for **H**igh **En**ergy **A**strophysics



Second ESA Cosmic Vision Large mission

- L-class with NASA/JAXA participation
- Decadal Survey recommendation
- Large X-ray mirror, X-ray Integral Field Unit (X-IFU) and Wide Field Imager (WFI) instruments

Launch Date: 2028

Breakthrough Capabilities:

- High Throughput, High spectral resolution X-ray Astronomy, Wide FOV
- 10x Chandra area, 100x improved non-dispersive spectral resolution, 5x FOV.

Enabling Technologies: Silicon pore optics, 3000+ pixel μ-calorimeter(X-IFU), large DEPFET array(WFI)

Science Objectives: The Hot and Energetic Universe: How does ordinary matter assemble into the large scale structures that we see today? How do black holes grow and shape the Universe?

CURRENT STATUS:

- Selected as second Large mission in ESA Cosmic Visions Program.
- Currently in 2-year Study Phase.
- NASA budgeting for a $100M-$150M hardware contribution, plus a U.S. GO program and a U.S. data center.
- NASA will contribute to both the X-IFU and the WFI.
- NASA and ESA are discussing other possible NASA contributions to the observatory.
- NASA and U.S. community involvement in Athena Science Study Team (including its SWG) and Instruments facilitated via series of RFI and CAs.
- Athena team will expand at Adoption in 2020; NASA anticipates this will provide an opportunity to expand U.S. community involvement.

www.the-athena-x-ray-observatory.eu

NASA Partnership on Athena (timeline)

- 2013: NASA announces intent to partner on ESA large X-ray mission
- 2014: ESA selects Athena mission for the L2 opportunity as the 2nd large mission in the Cosmic Vision Programme, launching in 2028.
  - Formulation of the mission by ESA is underway, and the MCR is nearing completion. ESA plans an instrument AO in CY2017.
  - NASA appointed a US scientist to the Athena Science Study Team (Randall Smith) and US scientists to the Athena Science Working Groups.
  - Approximately 85 US scientists on SWG, membership re-opened Dec 21, closes Jan 31 – **apply now if interested!**
- 2014: NASA issued RFI to assess interest by U.S. organizations in providing hardware for the Athena mission. There was interest in providing hardware for both Athena focal plane instruments. As only one science team interested in each instrument, there was no need for a competitive AO.
- 2015: GSFC (Rich Kelly) joins the X-IFU team, Penn State (David Burrows) joins the WFI team. Additional co-Is subsequently added.
- 2020: 'Adoption' by ESA (phase B), Athena Science Team formed; anticipate opportunity to expand US community involvement.

NASA Partnership on Athena

- NASA is pursuing a partnership with ESA to provide up to $100-150M in hardware for the two instruments and/or the observatory.
  - NASA will provide the sensor array for the X-ray Integral Field Unit (microcalorimeter), including early devices for the DM and EM. (GSFC)
  - NASA will provide ASIC design support, focal plane structure, and is studying an on-board Science Products Module for the Wide Field Imager. (Penn State)
  - NASA is working with ESA to identify possible contributions to the ESA provided observatory.
  - NASA also plans for funding US members of the Athena science team, a US science data center, and US general observers during operation.
- NASA is budgeting for participation in the Athena mission, but such budgets come at an “opportunity cost” from other Astrophysics budget lines within a constrained budget.
- Mid-Decadal Recommendation: “NASA should proceed with its current plan to participate in Athena, with primary contributions directed toward enhancing the scientific capabilities of the mission.”

Possible Additional NASA Contributions

- These are in addition to the instrument contributions, but subject to same cost cap. Depending on details and cost, ~2 of these may be possible.

- (parts of) ESA provided cooling system for X-IFU
- Science Ground System and Data Center Support
- Ground Stations Support
- Mirror Assembly – Mirror housing, Thermal Control System (TCS), Instrument Switching Mechanism (ISM)
- Optics Module - SC optics section of structural tube, Fixed Metering Structure (FMS), the deployable sunshield and Mirror Cover
- Onboard Metrology system (ala FID light system)
- Spacecraft components

- Use of XRCF and/or other test and calibration facilities

- Ongoing discussion at NASA/ESA bilateral level.

- Save next slide for start of discussion.

Draft Science Ground System