

Preparation for the 2010 Senior Review

Rob Petre

Senior Review proposal details

- Due February 1, 2010 (~6 weeks earlier than 2008)
- Competing against: XMM, INTEGRAL, RXTE, Swift, Galex, WMAP, Spitzer, and Chandra (same as 2008)
- Maximum length 15 pages (+ 4 pages for EPO)
- Science and technical sections
- Provide baseline and overguide budgets
- Primary evaluation criterion is “science per dollar”

Proposal Content

- Science section
 - Scientific merit of full proposed program
 - Specific contributions of instruments
 - How the proposed program will discover and communicate new scientific knowledge in line with NASA's goals
 - What has been accomplished to date
- Technical section
 - Technical status of mission components (instruments, spacecraft, ground system)
 - Description of tasks to be performed

Help needed from user committee

- Establish science, project goals for next 2–4 years
- Contribute to science section (~1 page + figure(s) on each topic)
 - How have we addressed the science goals in the last proposal?
 - How can Suzaku's unique attributes be used to produce additional groundbreaking results?
 - In what areas has the US GO program been the most effective?
 - How do Suzaku results fit in the "big picture?"
- Advice on proposal funding strategy

Science Goals from 2008 Proposal

- Initiation of Key Projects
- Determination of the spectra of AGN (and other sources) detected by *Swift* and their contribution to the X-ray background
- Measurements of broad Fe lines to determine neutron star radii and stellar and massive black hole spin
- Determination of the nature of extended Galactic TeV sources
- Determination of cluster properties to the virial radius for accurate mass determination
- Detection of or setting of stringent limits for nonthermal emission in clusters
- Determination of the composition of the ISM in various regions of the Galaxy (star forming, old SNRs) and other galaxies
- Coordinated variability studies of gamma ray sources with GLAST and TeV observatories to determine their emission mechanism and the nature of jets

Suzaku's unique attributes

Attribute	Unique Science Enabled (examples)
Simultaneous broad band energy coverage (0.2–600 keV)	Simultaneous measurement of disk emission, warm absorber composition and velocity, reflection hump and broad Fe lines in X-ray binaries and supermassive black holes
Spectral resolution in 0.2–1.0 keV band	Measurement of C, N, O abundances in ISM and SNRs Determination of properties of geocoronal and heliospheric soft X-ray charge exchange emission
Spectral resolution and sensitivity in 6–10 keV band	Detection and separation of Fe band features in cataclysmic variables, X-ray binaries, AGN, and the Galactic Plane and Ridge Modeling of relativistic effects in broad Fe lines in neutron star binaries and stellar and supermassive black holes
Low background in 0.2–10 keV band	Measurement of cluster temperatures and abundances to virial radius Mapping of low surface brightness sources (e.g., extended HESS Galactic sources)
High sensitivity in 10–50 keV band	Spectroscopy of all AGN detected by Swift – determination of the contribution of absorbed AGN to the CXRB Measurement of the magnetic field strength in XRBs and AXPs through detection of cyclotron features Search for nonthermal emission from clusters and SNRs

Considerations in senior review strategy

- Suzaku's unique capabilities have led to important results, and there are more to come (+)
- New mission synergies - Fermi, SZ surveys, NuSTAR (+)
- Data sharing agreement with JAXA/ISAS; bridge to ASTRO-H (+)
- Evolution to large programs and key projects (+)
 - Potential will not be fulfilled without continued participation
- Suzaku GOF has fulfilled its responsibilities, met its goals
 - with minimal US staff (+)
- Highly cost effective program; huge data return for modest incremental investment (+)
- Ramp up of Suzaku papers has been slower than other missions (-)
 - Can be traced in part to instrument, analysis complexity
 - Ramp up suppressed by reduction of GO funds
 - Fewer observations per year => fewer papers per year
- Little publicity garnered by Suzaku results (-?)

Budget proposal strategy

- IXAS/JAXA has no plan to turn off Suzaku (even after 2014 launch of ASTRO-H)
- In guide budget calls for abrupt cessation of US Suzaku participation after 2011 (no close out period)
 - How do we provide continuity to ASTRO-H?
- At the very least, a “bare bones” budget for 2011–2014 is necessary
- GO funds from other X-ray missions are also drying up
 - XMM GO funding for FT10+ was eliminated by 2008 Senior Review
 - Chandra GO funding is slowly being reduced
 - X-ray astronomy is threatened with starvation!!
- We will propose in overguide for restoration of GO grant funds back to \$1.7M; should we propose more?
 - This still represents substantial underfunding compared with level of effort required to publish a Suzaku result
 - Suzaku data analysis is more challenging than Chandra, XMM