For researchers

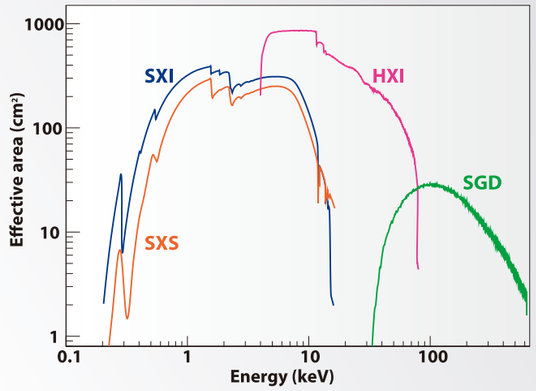
Instrument characteristics

The four types of instruments on board ASTRO-H are characterized by high-energy resolution over a broad energy band, as shown in the table below. In particular, the soft X-ray spectrometer will provide an ($E/\Delta E$) of 1000 or better around the neutral iron fluorescent line, with a large effective area as shown in the plot to the right.
For information about the detectors, and files needed to run simulations are available on the ASTRO-H public website. By using these files together with the standard analysis software package, HEASOFT, provided by NASA/GSFC, users can simulate spectra and images of a variety of objects, and assess the feasibility of observing proposals.

Science topics

- Reveal the complete picture of energy and matter in clusters of galaxies, the largest objects in the universe, and improve our understanding of structure formation in the expanding universe by directly observing the dynamic growth of the clusters
- Observe the hidden supermassive black holes in the distant (and hence, in the cosmological past), with a sensitivity more than 100 times better than that of Suzaku, illuminating their evolution and the role they play in the formation of galaxies.
- Reveal the the relativistic warping of space-time by measuring the motion of matter in the immediate vicinity of black holes.
- Measure the physical conditions in the regions where ultra-high energy cosmic rays are accelerated, leading to an understanding of the processes by which cosmic rays are generated by the energy of gravity, collisions, or explosions.
- Determine the distribution and total mass of dark matter in clusters of galaxies as a function of distance (age), to investigate the role of dark matter and dark energy in the evolution of clusters.

Bandpass and effective area of ASTRO-H



Announcement of opportunity and data rights

As an international observatory, ASTRO-H will start to accept proposals from guest observers following the initial checking and the performance verification phase. Peer review by relevant scientists will take place for selecting astronomical objects for observations. All data will be made publicly available after the proprietary period.

Further details

To learn further details on the performance characteristics of ASTRO-H, viewgraphs presented at international conferences, papers on expected performances, and a "Quick Reference" summarizing the detector characteristics are available at the ASTRO-H website.

ASTRO-H Official Website http://astro-h.isas.jaxa.jp/

■Performance of ASTRO-H instruments

	Soft X-ray Spectrometer (SXS)	Soft X-ray Imager (SXI)	Hard X-ray Imager (HXI)	Soft Gamma-ray Detector (SGD)
Technology	X-ray micro-calorimeter	X-ray CCD	Si/CdTe double-side detector	Si/CdTe Compton Camera
Focal length	5.6 m	5.6 m	12 m	–
Effective area	210 cm^2 @ 6 keV	360 cm^2 @ 6 keV	300 cm^2 @ 30 keV	>20 cm^2 @ 100 keV
Energy band	0.3–12 keV	0.5–12 keV	5–80 keV	40–600 keV
Energy resolution (FWHM)	≤7 eV	150 eV @ 6 keV	2 keV @ 40 keV	2 keV@ 60 keV
Angular resolution	<1.3 arcmin	<1.3 arcmin	<1.7 arcmin	–
Field of view	3 arcmin x 3 arcmin	38 arcmin x 38 arcmin	9 arcmin x 9 arcmin	–

ASTRO-H member institutes as of March 2015

JAXA, NASA, Aichi U. of Edu, Aoyama Gakuin U., U. of Cambridge, CEA/DSM/IRFU, CfA/Harvard, Chubu U., Chuo U., Colombia U., CSA, Dublin Inst. for Advanced Studies, Durham U., Ehime U., ESA, U. of Geneva, Hiroshima U., JHU, Kanazawa U., Kobe U., Kochi U. of Tech., Kwansei Gakuin U., Kyoto U., Kyushu U., LLNL, U. of Manitoba, U. of Maryland, U. of Miami, U. of Michigan, MIT, U. of Miyazaki, Nagoya U., Nara Women's U., Nihon Fukushi U., Osaka U., RIKEN, Rikkyo U., Rutgers U., Saint Mary's U., Saitama U., Shibaura Inst. Tech., Shizuoka U., SRON, Stanford U./KIPAC, STScI, Toho U., Tohoku Gakuin U., U. of Tokyo, Tokyo Inst. Tech., Tokyo Metropolitan U., Tokyo U. of Sci., Tsukuba U., Waseda U., U. of Waterloo, U. of Wisconsin, Yale U., Yamagata U.

This document is prepared by the ASTRO-H Education and Public Outreach team. English version of this document is also available on the ASTRO-H website. ASTRO-H artist's impressions are by Akihiro Ikeshita.

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The ASTRO-H Project http://astro-h.isas.jaxa.jp/

The Space X-ray Observatory
ASTRO-H

Topics

- Reasons for launching an X-ray telescope
- Do black holes emit X-rays?
- Learning the history of the universe through galaxy clusters
- Collaboration with universities across Japan and international research institutes
- Origin of the name "ASTRO-H"
- Information for researchers

ASTRO-H, the 26th science satellite of JAXA/ISAS, is a new generation scientific satellite that is being developed by the combined efforts of the entire Japanese X-ray astronomy community, along with the National Aeronautics and Space Administration (NASA), researchers from the United States, the Netherlands, the Swiss Confederation, the Republic of Ireland, the United Kingdom, the French Republic, Canada, and the European Space Agency.

ASTRO-H will have the most advanced X-ray detectors ever flown in orbit, a suite of sensitive instruments with the highest energy resolution ever achieved at E > 3 keV and a wide energy range spanning four decades in energy from soft X-rays to gamma-rays. The combination will enable X-ray observations over a broad band and with the best spectral resolving power to date. With this capability, we will be able to study, for example, regions in the vicinity of black holes, hot plasma around the remnants of exploded stars, and the vast amounts of hot gas that permeate clusters of galaxies. These are all much brighter in X-rays and gamma-rays than they are in visible light. Studying such high-energy phenomena will enable us to probe the structure and evolution of the universe.

http://astro-h.isas.jaxa.jp/ Japan Aerospace Exploration Agency - Institute of Space and Astronautical Science