



SAMURAI

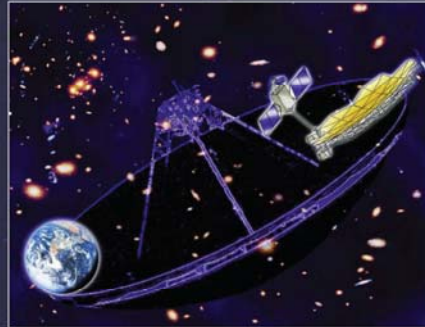
fact sheet

Science of AGNs and Masers with Unprecedented Resolution in Astronomical Imaging

Science

By making the highest resolution images in astronomy SAMURAI will:

- Determine how supermassive black holes generate ultra-relativistic jets
- Constrain the nature of dark energy by making the most accurate measurement of the Hubble constant



Artist's concept of the 'bigger than the Earth' telescope used by SAMURAI

Overview

SAMURAI is a partner mission of opportunity with the Japanese-led VSOP-2 mission and consists of 3 basic elements:

- ISAS/JAXA-developed ASTRO-G space radio telescope
- JPL-developed science telemetry station [+2 others non-JPL]
- NRAO's radio telescopes (10-element VLBA, EVLA, GBT)

Working together these elements create a unique synthetic aperture several Earth diameters in size.

ASTRO-G

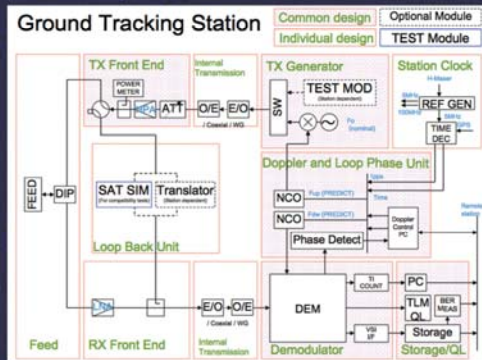
Next in series of ISAS/JAXA astronomy satellites

- 9.3 m diameter antenna
- Operates at 8, 22, and 43 GHz
- 1 Gbps science data rate
- 25,000 km apogee height
- 2012 launch



Model of ASTRO -G

Science Telemetry Station (STS)



Common tracking station design

Common design already developed

- JPL STS to be located at Canberra
- Faster, better, cheaper solution
- 37.5 GHz downlink
- 40 GHz uplink (tone)

Science Team

- Co-Is: US (12), Japan (5), Europe (3), Australia (1)
- Experts in both space and ground radio astronomy

Management

SAMURAI

- PI: David Murphy, JPL
- Project management: JPL
- Ground radio telescope support: NRAO
- Host VSOP-2 mission (including ASTRO-G)
- ISAS/JAXA

NRAO Telescopes



NRAO's 10-element VLBA

NRAO's radio telescopes (VLBA, EVLA, and GBT) are ideally suited to being the ground elements of the SAMURAI space-ground interferometer

- Can observe at 8, 22, and 43 GHz
- Larger telescopes can be used for experiments which require more sensitivity



NRAO's GBT the world's largest steerable Radio telescope (105-m in diameter)

Schedule and Cost

Phase A:	Mar 2008 – Sept 2008	\$0.2 M
Phase B:	Jan 2009 – Sept 2009	\$2.3 M
Phase C/D:	Oct 2009 – July 2012	\$9.8 M
Phase E:	Aug 2012 – July 2015	\$13.7 M
Total (FY2008 \$)		\$33.8 M