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

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
Science Telemetry Station (STS)

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

NRAO Telescopes

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

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

Schedule and Cost

<table>
<thead>
<tr>
<th>Phase</th>
<th>Time Frame</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Mar 2008 – Sept 2008</td>
<td>$0.2 M</td>
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<tr>
<td>B</td>
<td>Jan 2009 – Sept 2009</td>
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<td>E</td>
<td>Aug 2012 – July 2015</td>
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<tr>
<td>Total</td>
<td>FY2008 $</td>
<td>$33.8 M</td>
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