

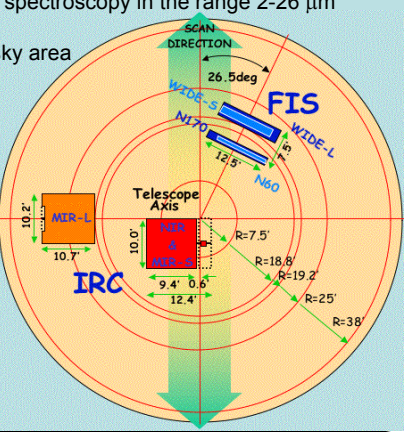
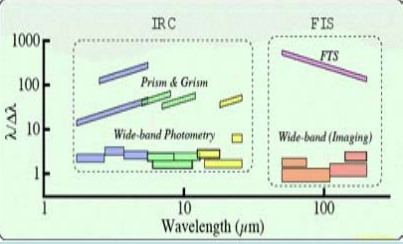
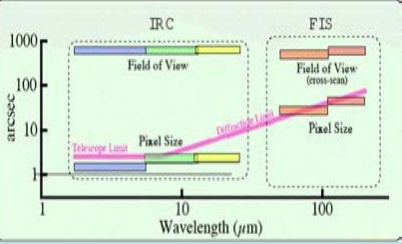
ASTRO-F SATELLITE & MISSION

ASTRO-F is an infrared survey mission from the Institute of Space and Astronautical Science (ISAS) of the Japan Aerospace eXploration Agency (JAXA) with the participation of the European Space Agency (ESA).

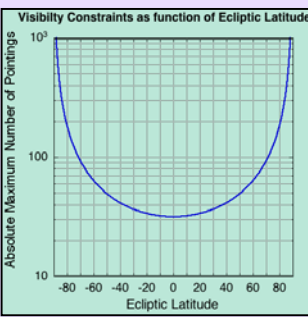
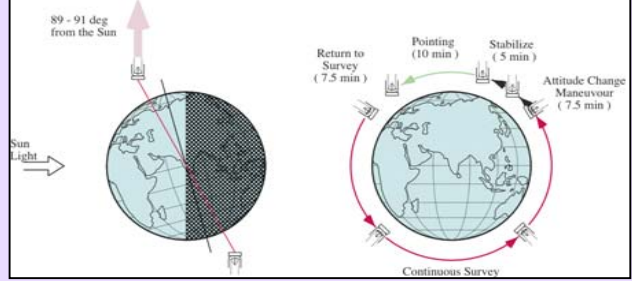
ISAS/JAXA's **ASTRO-F Satellite**, due for launch in early 2006, will perform an all-sky survey in six wavebands between 6 and 180 μm , at higher sensitivity, spatial resolution and larger wavelength coverage than IRAS. The resulting catalogues are expected to contain more than a million sources. Deep imaging and spectroscopic surveys with pointed observations will also be performed in selected areas of the sky.

Launch	January-February 2006
Orbit	Sun-synchronous polar Altitude: 745 km Period: 100 min
Telescope Diameter	68.5 cm
Telescope Temperature	5.8 K
Wavelength Coverage	1.7 - 26 μm (IRC) 50 - 180 μm (FIS)
Cryogenic Lifetime	1.5 years Near-IR observations possible after cryogen loss

- Focal Plane Configuration:**
2 Focal Plane Instruments (13 photometric bands +6 spectroscopy elements)
- Far Infrared Surveyor (FIS)**
- 4 photometric filters covering 50-180 μm in 2 short & 2 long wavelength bands
 - Fourier Transform Spectrometer (FTS) covering the range 50-180 μm
 - The FIS channels share the same sky area
- Infrared Camera (IRC)**
- 3 Cameras (NIR, MIR-S, MIR-L) x 3 = 9 NIR-MIR bands covering 2-26 μm
 - Dispersion elements on cameras for spectroscopy in the range 2-26 μm
 - Wide FoV ($\sim 10^\circ \times 10^\circ$)
 - NIR & MIR-S cameras share same sky area
 - MIR-L camera offset by 20°



Observation Modes: ASTRO-F operates either in survey mode or pointed mode. In survey mode, a continuous scan of the sky is performed while the satellite orbits around the Earth. The whole sky is thus covered in half a year. In pointed mode, ASTRO-F stares or scans at a **single** defined target, for an **effective observation time of 10 min**, at a cost of 30 min operation including maneuver and stabilisation. The observation parameters are specified in predefined Astronomical Observation Templates (AOTs). One pointed observation corresponds to 1 AOT.



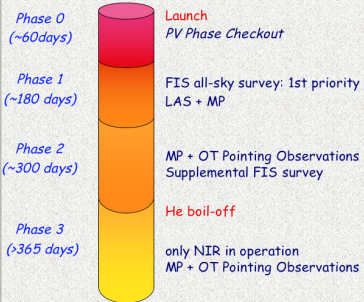
Visibility Constraints: ASTRO-F's orbit is sun-synchronous polar with the telescope always pointed in a plane perpendicular to the Sun, with an **offset control** allowance of only two degrees. Thus the visibility is a function of ecliptic latitude. Targets near the ecliptic poles are observable on a large number of orbits. Targets on the ecliptic plane are visible only on a limited number of orbits.

(Figure above shows visibility constraints with offset control of +/- 1 degree assuming a detector size of 10arcmins pointed. This is the absolute maximum visibility and in reality will be lower)

Visibility Tool <http://www.ir.isas.jaxa.jp/ASTRO-F/Observation/vi/>

Mission Phases: The main objectives of the ASTRO-F Mission are legacy observations in the form of **Large Area Surveys (LAS)** and the conduction of large **mission programs (MP)**. In addition, a significant phase of the mission will be dedicated to pointed observations of astronomical targets. 30% of these opportunities are available to the general astronomical community as **Open Time (OT)**, via the traditional route of Call for Proposals, followed by peer-review. Resulting from ESA's collaboration in this mission, 10% are open to European users, the other 20% are for Japanese and Korean astronomers. These OT observations will be scheduled after the survey prioritised part of the mission, starting at about eight months after launch. Note that OT proposals may not duplicate MP proposals. In addition, European & Japanese proposals may not duplicate each other.

ASTRO-F Operation Schedule



Observers Manual : <http://astro-f.esac.esa.int/docs/afobsman31.pdf>
Duplication check tool : <http://astro-f.esac.esa.int/tools/duplcheck.shtml>

- ASTRO-F Data Products:**
Survey Data Products: several catalogues sequentially produced with incremental contents that will become public around one year after they are internally released.
- All Sky Survey FIS/IRAS Catalogue (Known IRAS Sources Catalogue)
 - All Sky Survey Bright Source Catalogue (BSC)
 - All Sky Survey Faint Source Catalogue
- Pointed Legacy Programs: have a one year proprietary period from receipt of data.
- Large Area Surveys
 - Mission Programs
- Open Time Programs: have a one year proprietary period from end of Phase 2.

ASTRO-F Optimized Observations (Recommended):

- Observations that take one ~ few pointings over single/few FoV
 - Observations that require multiband coverage without gaps
 - FIR observations of bright regions requiring high saturation limit
 - Observations at high ecliptic latitudes
 - Near-infrared spectroscopy
- ASTRO-F Non-Optimized Observations (Not Recommended):**
- Targets of Opportunity
 - Time Critical Observations and chained observations
 - Tracking Moving Objects