

# Atacama Submillimeter Telescope Experiment

Project status and prospects

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on behalf of the ASTE Team

ASTE Project HP: <http://aste.nao.ac.jp/>

# Atacama Submillimeter Telescope Experiment

Subaru 1999-  
VERA 2001-

- 10-m submm telescope located at Pampa La Bola within the ALMA concession (2002-)
  - Surface accuracy:  $19 \mu\text{m} \rightarrow \sim 45 \mu\text{m}$   **Deformation correction may be made**
  - Pointing accuracy:  $\sim 2''$  (rms)
  - Receivers: DASH345 (321-376 GHz);
    - Band8  $\rightarrow$   **Wide-IF-bandwidth Band 8** (387-498 GHz, IFBW=16 GHz);
    - Band10 (790-940 GHz)
  - Backend: WHSF  $\rightarrow$   **XFFTS**
  - Control and data reduction software:
    - COSMOS3, NEWSTAR/NOSTAR  $\rightarrow$   **CASA**
- Site infrastructure
  - Diesel generator (150 kW-220 V  $\times 2$ )
  - Fuel tank (15 kL  $\times 2$ , consumption 300 L/d)
  - Satellite network (1 Mbps)  $\rightarrow$   **FO (100 Mbps)**
  - Monitor (weather station, web cameras, etc.)



# Change of project organization

Name	Position	Effort	Note
Seiichi Sakamoto	阪本成一	Director; Prof	<b>50%</b> +50% for other managerial roles
<b>Rei Enokiya</b>	榎谷玲衣	Specially App Assoc Prof	<b>45%</b> <b>+45% for TIFUUN</b>
Tetsuhiro Minamidani	南谷哲宏	Assoc Prof	20% Main: ALMA Engineering
Takeshi Kamazaki	鎌崎 剛	Assoc Prof	10% Main: ALMA WSU
Hiroyuki Nishitani	西谷洋之	Engineer	70%
Toshihiko Kobiki	木挽俊彦	Engineer	80%
Javier Aguilera		Site Coordinator	50% +50% for ALMA Engineering
Javier Zenteno		Site Coordinator	50% +50% for ALMA Engineering
Shared support by admin, computing, safety, product assurance, EPO, etc.			

**Collaboration is welcome** in both science and engineering fields.

- Remote operation from Japan (and EA countries) is easy.
- Bilingual operation/maintenance manuals are available.

# 3-cartridge heterodyne RXs and XFFTS

RX	$F_{RF}$ (GHz)	HPBW (")	$N_{pix}$	$N_{pol}$	SB	$F_{IF}$ (GHz)	$T_{rx}$ (K)	$T_{sys}$ (SSB) (K)	Status	
DASH345	321–376	22	1	2	2SB	4–8	100–120	~250	Available	2015–
<b>CAT8W</b>	<b>387–498</b>	<b>17</b>	1	2	2SB	4–18	150–250	600–1000	Available	2021–
CAT10	787–950	8	1	2	DSB	4–12	200–350	1500–4000	(Available)	2019–

## DASH345

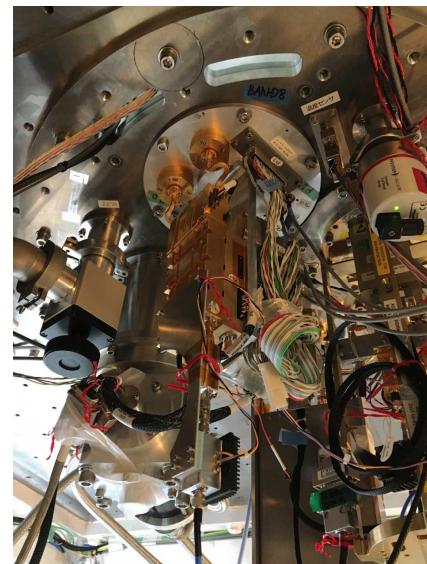
- ✓ CO  $J=3-2$ /HCO $^+$   $J=4-3$  simultaneous obs
- ✓ (CO  $J=3-2$ / $^{13}\text{CO}$   $J=3-2$  simultaneous obs)

## CAT8W

- ✓ [CI]  $^3\text{P}_1 - ^3\text{P}_0$ /CO  $J=4-3$  simultaneous obs  
w/ the same resolution to NRO 45m CO  $J=1-0$   
and JCMT CO  $J=3-2$

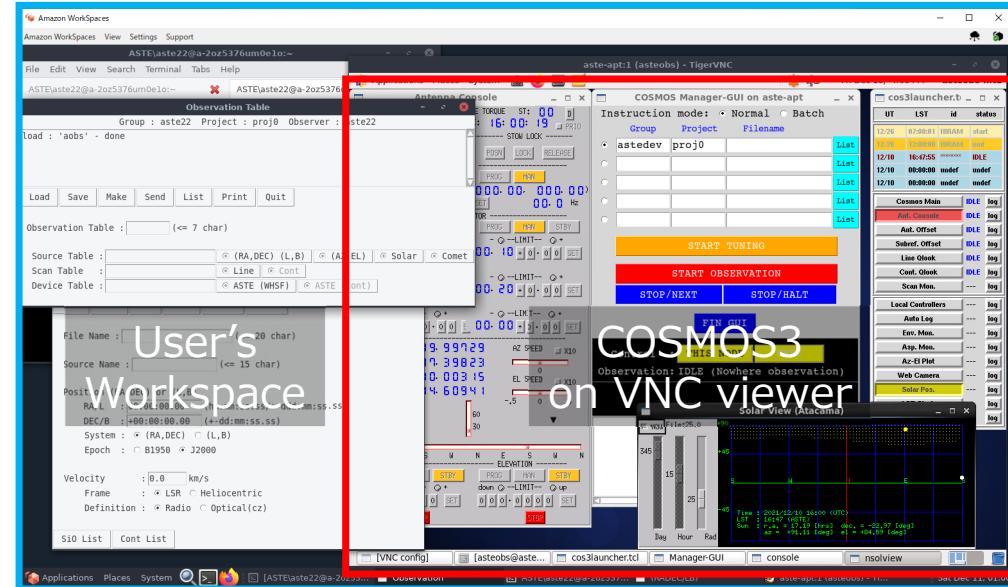
A backup observation plan in the 345 GHz band is highly recommended

Spectrometer	XFFTS
IF bandwidth	2.5 GHz
channels/IF	32,768
IFs	4



# Remote telescope control via AWS

- A workspace is provided for a user
  - Observation preparation
  - VNC viewer to access the remote-control virtual PC (on Amazon WebServices)
- A user can connect its own workspace using AWS client (Win, Mac, Linux, ...) from user's institute (even from home)



# Data reduction with CASA

- XFFTS data are **reduced with CASA**.
  - Debugging is ongoing w/ support from user groups.
- These CASA MSv2 format data will be delivered and **distributed through NRO/ASTE archive**. (Collaboration with ALMA-J computing team)



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## Nobeyama-45m / ASTE Science Data Archive

**Minamidani's talk**

### Overview

This site, Nobeyama 45m and ASTE Science Data Archive, provides public science data obtained at the Nobeyama 45m radio telescope at Nagano, Japan and the ASTE telescope at Atacama, Chile.

[See more »](#)



### News

2021/1/4

The service was resumed. Thank you for your cooperation.

2020/12/15

Due to server maintenance, you cannot login, search or download data from this archive since 9 (Wed) December 2020. The service will be resumed in late-December. Sorry for inconvenience.

2020/10/12

We're planning to release MS2 data (data format for CASA) and pipeline-processed calibrated products (FITS cubes) for Nobeyama-45m. Firstly these data observed in two observation seasons 2018-2019 and 2019-2020 will be released in January 2021, and the other seasons data will follow. The pipeline processing is now on-going. Please stay tuned!

2019/7/26

This site has been expanded into "Nobeyama-45m / ASTE Science Data Archive" from previous "Nobeyama 45m Science Data Archive". Now the NOSTAR or

### To use all functions

User ID:

Password:

**Login**

You can search public data but cannot download them unless you do not have user account.

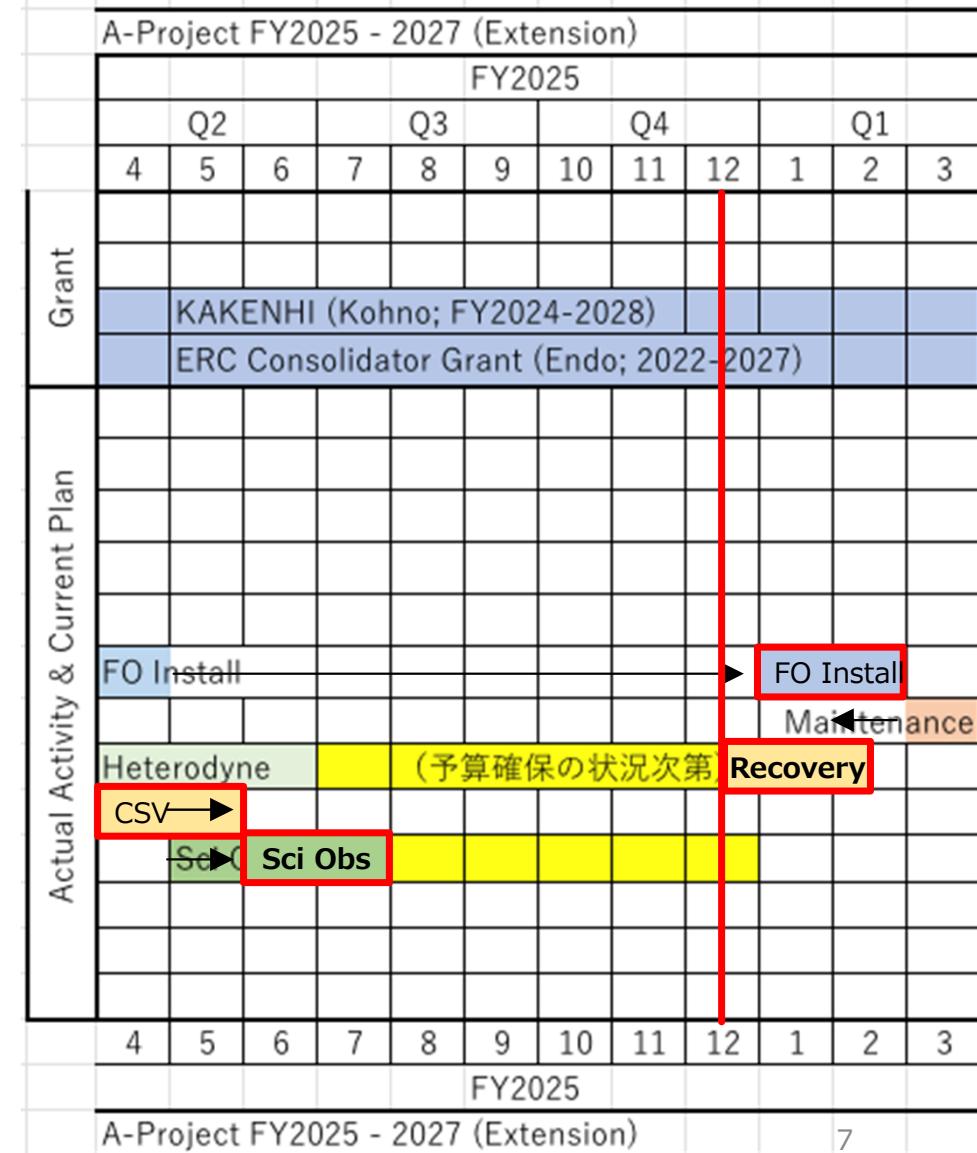
[Sign Up](#), if you do not have user account yet.

[Reset Password](#), if you forgot your password.

Contact [Helpdesk](#), if you need more help.

# Status and prospects for FY2025

- CSV: Done
  - Science obs (Jun 06-~~Oct 01~~ Jul 31)
    - Backlogs from 2020 **Enokiya+**  
**Makita's talk**
    - External fund projects
    - Chilean time (Fast Track)
  - Re-certification of tanks (Nov)
  - Fiber optics installation (Jan-Feb)
  - Regular maintenance done by NAOJ staff (Feb-Mar)



## Thefts at the high site

- On **2025-07-13**, around 05:00 Chilean time, the ASTE/NANTEN2 site was vandalized by external intruders.
- On **2025-07-22**, around 03:00 Chilean time, the ASTE/NANTEN2 site was vandalized again.
- 14 out of 16 ASTE containers were intruded.
- Hand tools, small electric tools, cameras, etc., were lost.
- The surveillance cameras have been functioning, but could not capture images of the intruders.
- There was no noticeable damage to the telescope.

# Power outage and resulting telescope failure

- On **2025-07-31**, a power outage occurred (possibly due to lightning strikes). After completing snow removal, we attempted to restart the site, but we found the telescope system is inoperable due to:
  - Errors of the servo motor drives for all AZ-A/B and EL-A/B axes.
  - Possible failure of an R/D converter (no spare available)
  - The telescope control PC won't start → Reconfiguring a spare
  - The subref control PC won't start → Reconfiguring a spare
  - The RX control PC won't start → Reconfiguring a spare
  - The compressor for the cryocooler won't start → Checking the power supply module
  - One of the two generators won't start due to low AC voltage → Investigation will resume soon; waiting for technical support by Komatsu
  - One of the PDBs has a short circuit → **SOLVED** by replacing the failed terminal blocks
  - Bad network in the Meeting Room Container → **SOLVED** by replacing the failed network switch

Under investigation  
with MELCO's support

## Plans in FY2025-2026

- Restoration of the telescope (Dec-Feb)
- Fuel tank inspection after site restart (Jan)
- Optical fiber connection work (Jan-Feb)
- Routine antenna maintenance by NAOJ staff (Feb)
- Further cost reduction...
- We aim to provide observation time for the completion of pending scientific observations and tests, as well as for Chilean time and contributions to operations (May-)
- No regular domestic call for proposals is planned for FY2026
- We welcome external funding and in-kind contributions for CSV etc.
  - ~3 MJPY/month for regular operation (~ $\times 3$  of NRO 45m)
- TIFUUN (3rd generation DESHIMA) will be coming in 2027.