

APEX proposals

Proposals are invited for observations with the APEX telescope in 2024.

(For information about proposals for Directors Discretionary Time (DDT): see Onsala's general [proposal web page](#). Calls for proposals for APEX observations are issued only once per year, but proposals for Directors Discretionary Time (DDT) can be submitted at any time.)

Deadline: Friday 23 February 2024 (23:59:59 UTC)

If you are considering submitting close to the deadline, please note that support will only be available during normal office hours. Proposals are to be submitted through the [NorthStar](#) system.

APEX, the Atacama Pathfinder EXperiment, is a 12 m diameter submillimetre telescope at 5100 m altitude on Llano Chajnantor in Chile. Since 2023, the APEX telescope is operated solely by Max-Planck-Institut für Radioastronomie (MPIfR). However, the Onsala Space Observatory continues to support APEX and in return PI:s with a Swedish affiliation have access to APEX observing time for 13 days in 2024 (see details below).

Proposals for Swedish time on APEX must have a **PI with a Swedish affiliation**. Note that **Large Programme proposals** are **not** invited.

The **receivers** offered in this Call are the heterodyne receivers **SEPIA** and **nFLASH** (SEPIA180: 159-211 GHz; SEPIA345: 272-376 GHz; SEPIA660: 578-738 GHz; nFLASH230: 200-270 GHz; nFLASH460: 385-500 GHz). In addition, the 7-pixel heterodyne receiver **LASMA** for 268-375 GHz is available under special conditions (see below).

On this page you will find information about:

- Observing period, operations, etc.
- Telescope
- Receivers
- Proposal preparation and submission
- Further information and useful links

Observing period, operations, etc.:

This Call for proposals is for Swedish time on APEX in **2024**. There will be **two observation blocks**:

1. April 20-26 (7 days)
2. August 25-30 (6 days)

>>> Important: Please **indicate the block(s) when your sources can be observed**. The following 16 h LST intervals are available in the blocks:

1. LST 10-02
2. LST 18-10

These LST intervals correspond to the Chilean nighttime and early morning time when the weather is expected to be best. Observations of sources closer than **30 degrees from the Sun** are not allowed.

Observations will be performed in **service mode**.

Telescope:

- **12 m diameter** telescope for mm and sub-mm waves.
- **Location:** Llano de Chajnantor, 50 km east of San Pedro de Atacama, northern Chile. Latitude: 23°00'20.8" South, longitude: 67°45'33.0" West. Elevation: 5107 m.

Receivers:

*** SEPIA (ALMA bands 5, 7 and 9) ***

The SEPIA instrument is designed to house three ALMA-style receiver cartridges, covering ALMA bands 5, 7 and 9. All three receivers are **dual-polarization sideband-separating** (2SB):

- SEPIA180 (ALMA band 5): 159–211 GHz.
- SEPIA345 (ALMA band 7): 272–376 GHz.
- SEPIA660 (ALMA band 9): 578–738 GHz.

Spectrometer: The SEPIA receivers use a Fast Fourier Transform Spectrometer with an **IF bandwidth** of **4 GHz** (band 5) or **8 GHz** (band 7 and 9; 7.85 GHz in practice). The spectrometer covers 4 or 8 GHz for each polarisation and for each sideband (i.e., 4x4 or 4x8 GHz in total). There is a gap of 8 GHz between the two sidebands. The **channel separation** is 61 kHz.

The offered **observing patterns** are on-off observations, raster maps, and on-the-fly (OTF) mapping. The data will be taken in either beam-switching or position switching mode.

Please use the [online observing time calculator](#) at the APEX web site for observing time estimates. The [instrument setup tool](#) is very useful when planning spectral line observations.

Technical details for the **band 5** receiver can be found in the following publication: Billade, B., et al. "[Performance of the First ALMA Band 5 Production Cartridge](#)", IEEE Trans. Terahertz Science and Technology, Vol. 2, No. 2, March 2012, pp. 208-214. For a technical description of the **band 7** receiver, please see: Meledin, D., et al. "[SEPIA345: A 345 GHz dual polarization heterodyne receiver channel for SEPIA at the APEX telescope](#)", Astronomy & Astrophysics, Vol 668, A2 (December 2022), and for the **band 9** receiver, please see: Baryshev, A. M., et al. "[The ALMA Band 9 receiver. Design, construction, characterization and first light](#)", Astronomy & Astrophysics, Vol 577, A12 (February 2015).

*** nFLASH (ALMA bands 6 and 8) ***

nFLASH is a facility instrument containing two receivers, covering (roughly) ALMA bands 6 and 8. Both receivers are **dual-polarization sideband-separating** (2SB). The dual-colour operation (using the 230 GHz receiver simultaneously with the 460 GHz receiver) is an option.

- nFLASH230 (ALMA band 6): 200–270 GHz.
- nFLASH460 (ALMA band 8): 385–500 GHz.

nFLASH230 has an IF bandwidth coverage of 8 GHz with a gap of 8 GHz between the two sidebands. nFLASH460 has an IF bandwidth coverage of 4 GHz per sideband.

The **spectrometer** is the same as for SEPIA (see above).

The offered **observing patterns** are on-off observations, raster maps, and on-the-fly (OTF) mapping. The data will be taken in either beam-switching or position switching mode.

Please use the [online observing time calculator](#) at the APEX web site for observing time estimates. The [instrument setup tool](#) is very useful when planning spectral line observations.

***** LASMA (ALMA band 7) *****

LASMA is a Max-Planck-Institut für Radioastronomie (MPIfR) PI instrument. It is a 7-pixel heterodyne receiver covering ALMA band 7 (268-375 GHz). The instrument layout is a hexagon of six pixels surrounding a central pixel, with a spacing between the pixels of 40 arcsec. Each pixel consists of a **dual-polarization sideband-separating** (2SB) mixer, which provides an IF bandwidth of 8 GHz for each sideband. LASMA uses the same type of spectrometers as SEPIA and nFLASH (see above).

For more information about the LASMA receiver, see the [APEX](#) and [MPIfR](#) web sites.

Please use the [online observing time calculator](#) at the APEX web site for observing time estimates. The [instrument setup tool](#) is very useful when planning spectral line observations.

>>> **Important:** Observers who want to use LASMA **must** (well in advance of submitting the proposal) contact per.bergman@chalmers.se, who will initiate a request to the MPIfR instrument PI to use LASMA.

Atmospheric transmission:

It is important to consider the atmospheric transmission at the APEX site. The APEX web site provides information on the [weather](#), including atmospheric transmission.

Proposal preparation and submission:

Onsala Space Observatory uses the [NorthStar](#) system for preparation and submission of proposals. NorthStar is used by several radio and optical observatories.

In **NorthStar**, information about applicants, instruments, targets, etc., is to be provided "on-line", and the scientific justification is to be prepared "off-line" and uploaded as a pdf file (also target lists can be uploaded). NorthStar then produces one pdf file with all information. NorthStar includes information on how to use it.

The proposal must contain a proper and concise **scientific justification** including an explanation for how the requested observing time was calculated, in total no more than **two A4 pages** long, plus figures and tables if needed (for a total of maximum six pages). Proposers should mention relevant previous observations with Onsala telescopes, and clearly show preliminary results. Observing time estimates should be made using **on-line observing time calculators**. If observations are for **Ph.D. work**, this should be stated.

In order to **avoid duplicating observations**, please check the [ESO archive](#) for previous observations.

Further information and useful links:

- The [NorthStar](#) proposal submission tool.
- If observing time for the project is also requested from MPIfR or Chile, this must be clearly stated in the proposal.
- Source coordinates (RA, DEC) must be given in **J2000**.
- Give the required weather conditions in terms of **PWV** (precipitable water vapour).

- For further **technical information**, see the [APEX web site](#).
- Please use the [observing time calculators](#) available on the APEX web site.
- The [instrument setup tool](#) is very useful when planning spectral line observations.
- **Questions** about the telescope, receivers, observations, etc.:
per.bergman@chalmers.se.
- In case of problems with **NorthStar**: michael.olberg@chalmers.se.
- General questions about proposals: magnus.thomasson@chalmers.se.