

# APEX : current status and outlook

Amélie Saintonge, Karl Menten (PIs)  
Bernd Klein (Project manager)  
Friedrich Wyrowski (Project scientist)

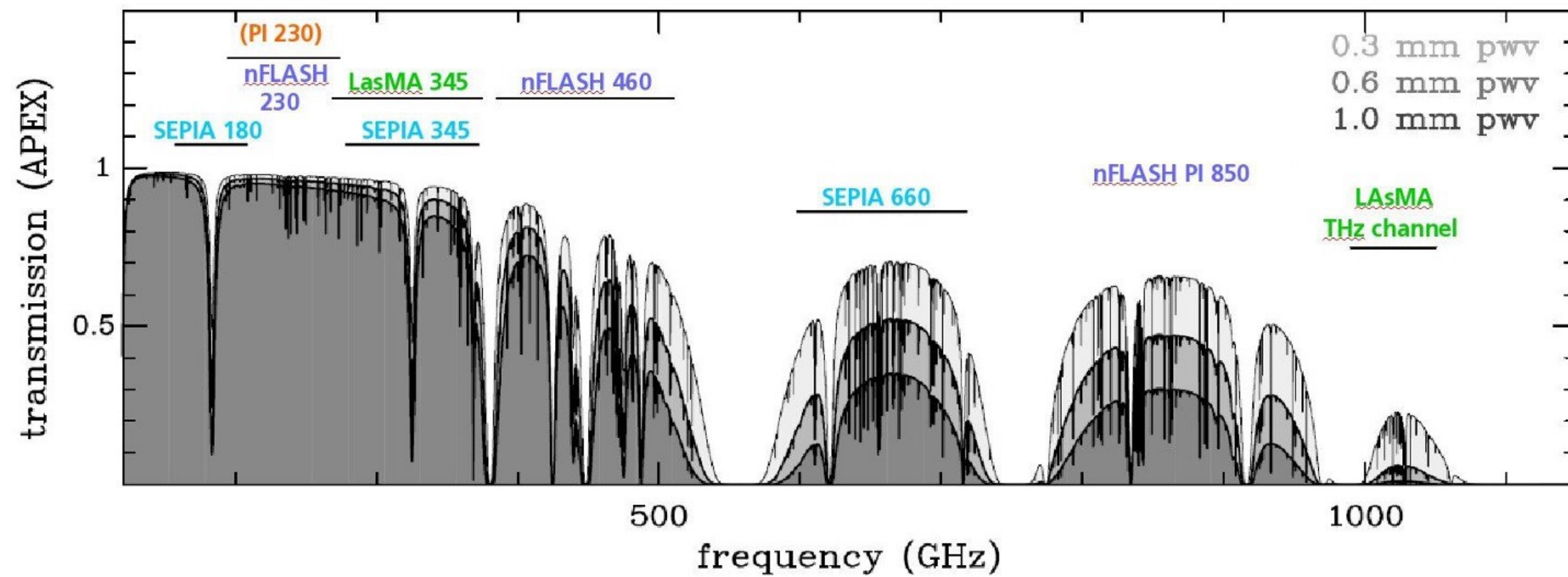


**MAX PLANCK INSTITUTE**  
FOR RADIO ASTRONOMY



# APEX overview: facility and instruments

- 12m, modified version of ALMA prototype antenna
- 5100m elev. on Chajnantor Plateau
- Surface accuracy  $\sim 12\mu\text{m}$
- Wobbling secondary
- Significant upgrade of key components in 2017: the telescope is in better shape than ever!



- heterodyne receivers covering all frequency windows from 160 to 720 GHz
  - nFLASH (single pixel, 240 and 460 GHz)
  - SEPIA (single pixel, 180, 340 and 660 GHz)
  - LAsMA (7 pixels, 270 – 370 GHz)
- various FFTS backends
- integration into mm-VLBI operations (EHT and GMVA)

## new / upcoming!

- N3AR, 3mm receiver. Commissioned Oct. 24, enables participation in GMVA.
- AMKID, dual color, KID-based camera with 3520 and 21600 pixels at 870 and 350 microns
- nFLASH extension to 780 – 950 GHz RF range, 4-12GHz IF. In construction.



# APEX as a pathfinder towards carbon-neutral Astronomy

New photovoltaic plant, fully integrated into APEX operations since October 2024

- 190 PV modules (total capacity of 103 kW) with 274 kWh of energy storage
- APEX operates without the diesel generators for 10 hours / day
- saves ~220 liters of diesel/day, corresponding to a reduction in emissions by >200 tons CO<sub>2</sub> / year (~40% compared to previous levels)

Working as part of the AtLAST design study to develop and test new renewable energy solutions at altitude to support current and future facilities





# APEX overview: operations

**Current operation model:** hosting and operations through ESO until end-2025

- observing 16 hours/day, 9 months of the year (20 March - 20 December)
- night/morning observing, afternoon observations only when additional, certified observers are on-site

**Beyond 2025:** funding from MPG secured until end-2028

- observing model similar to current, but with some shift to remote observations where possible
- new operations model with MPG directly managing the facility: site-use agreement with ESO/ALMA, staff-hiring agreement with Pontificia Universita Catolica de Chile (PUC)
- exploitation of new instruments (mostly AMKID and nFLASH850), participation in mm-VLBI
- APEX to be used as pathfinder as part of the AtLAST Horizon-funded design study

**Beyond 2028:** looking for new partners / operations model



# Coming soon at APEX

## Ringberg meeting: Science with the Atacama Pathfinder Experiment, 19-22 January 2025

Registration open now! <https://events.mpifr-bonn.mpg.de/indico/event/420/>

**Next proposal deadline:** February, for the March-August 2025 observing period

- online briefing session ahead of deadline for latest on capabilities and instrumentation available

### Science with the Atacama Pathfinder Experiment (APEX)

19-22 January 2025  
Schloss Ringberg  
Europe/Berlin timezone

#### Overview

Scientific Programme

Timetable

Registration

└ Registration Form

Participant List

Logistics

The **Atacama Pathfinder Experiment (APEX)** 12 m submillimeter telescope has significantly contributed to a wide variety of astronomy science areas, ranging from the discoveries of new molecules to large-scale and deep imaging of the submillimeter sky.

Since 2012, every other year, the Ringberg APEX workshops bring together APEX users and other interested scientists working on a wide range of exciting results covering the Solar System to distance galaxies in the early universe. APEX2025 aims at presenting new science results and to looking into new science opportunities for the next few years.

In the last years, APEX has been significantly improved by upgrades of the antenna itself as well as new heterodyne instruments highly complementary to ALMA. A new large-format, dual frequency continuum camera is in commissioning as well as a new 3mm heterodyne receiver for APEX. Furthermore, a receiver for the 350 micron atmospheric window is being prepared. Therefore the workshop aims also at discussing ambitious new large science programs with the telescope.

[Home](#) > [APEX](#) > [Proposals](#)

## Max Planck Society Call for APEX Proposals

APEX

The **Atacama Pathfinder Experiment (APEX)** is a project under the scientific leadership of the MPIfR, hosted and operated by ESO. Half of its observing time will be made available to the Max Planck Society (MPS) community, including MPIfR, and also to German universities and research institutes, all on a competitive basis.

In this call, proposals for APEX observing requests for the period from **9 September to 19 December 2024** are solicited.

