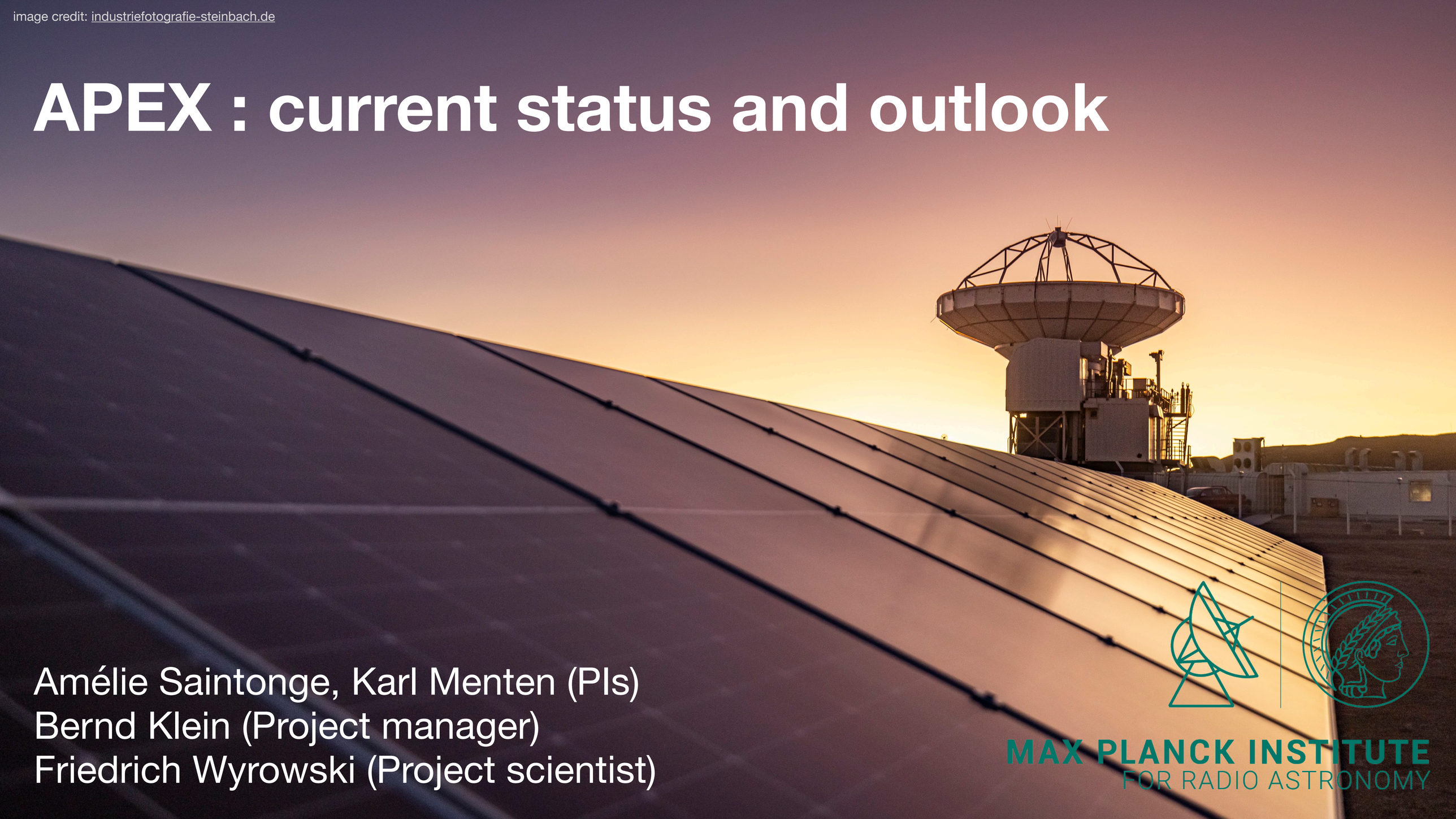
image credit: industriefotografie-steinbach.de

APEX : current status and outlook

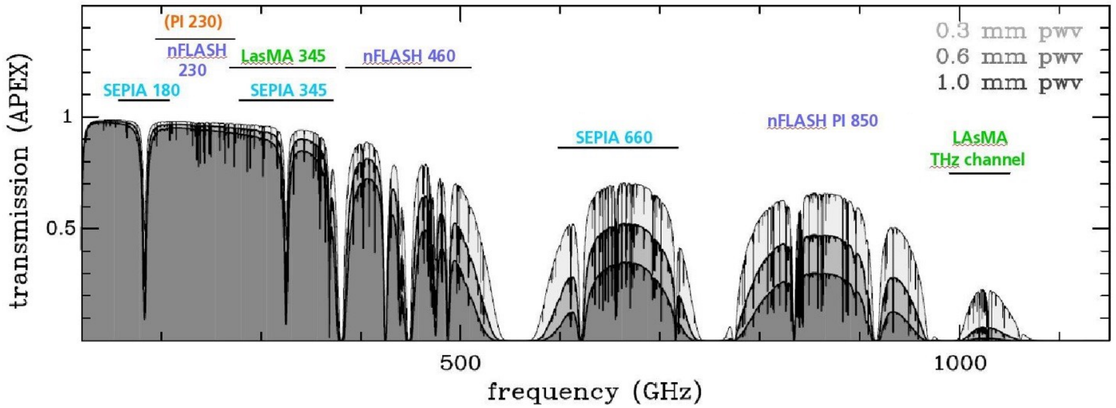


Amélie Saintonge, Karl Menten (PIs)
Bernd Klein (Project manager)
Friedrich Wyrowski (Project scientist)

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 ~12um
- 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_2 / 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

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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

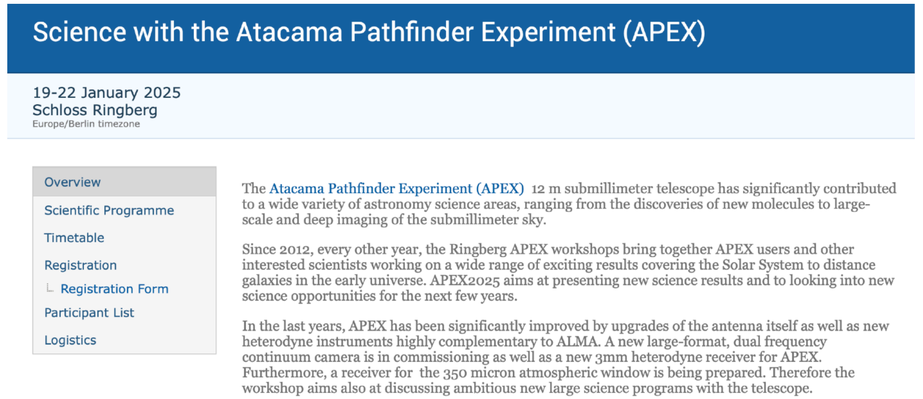
- observing model similar to current, but with some shift to remote observations where possible
- new operations model with MPG directly managing the facility: site-use agreement with ESO/ALMA, staff-hiring agreement with Pontificia Universita Catolica de Chile (PUC)
- exploitation of new instruments (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

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