Astronomy at sub-millimetre wavelengths.
An overview of the forthcoming projects and their scientific goals.

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The sub-millimetre part of the electromagnetic spectrum is one of the last to be opened up for astronomy, partly because of the Earth's atmospheric opacity and partly because of the technical difficulties of building radio astronomy receivers at these wavelengths. However, recognition of the astronomical importance of the Teraherz bands has driven the engineering effort to build space-borne submm telescopes and, after relatively simple beginnings with, for example, the 1.1m ODIN telescope project, we can look forward to the Herschel mission and the Sophia high altitude aeroplane in the next few years. We have even found high altitude sites where the atmospheric transparency is sufficiently high to allow observations at frequencies up to 1.5 THz and already the James Clerk Maxwell telescope and the Smithsonian Submillimetre Array are operational on Hawaii and the APEX telescope and the ALMA array are underway on the Andean site of Llano Chajnantor at 5 km altitude.

The scientific rewards for this effort will be spectacular. At submm wavelengths we will observe the cold, dust enshrouded regions of space where the cosmic molecules are concentrated. At submm wavelengths we will see, with more and more clarity, what is behind the dust and with that clarity will emerge a picture of protostars and early stellar evolution as well as further understanding of galaxy formation in the distant (early) Universe.

In this presentation I will review these new projects and their scientific motivation, with special reference to the APEX project, a collaboration between the Max-Planck-Institüt für Radioastronomie, Bonn, ESO and Sweden (Onsala).