

Superconducting Detectors and Mixers: A Brief History

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Abstract — Although superconducting bolometers were proposed and already being developed by the late 1930s, 40 years would elapse before superconductivity finally found application in astronomy, when Tom Phillips and David Woody installed the first superconducting tunnel junction (SIS) receiver at Caltech's Owens Valley Radio Observatory in 1979. The steady advancement of SIS technology over the next 30 years ultimately enabled ALMA and the HIFI instrument on the Herschel Space Observatory. At Caltech/JPL, the work on SIS mixers also led to a number of spinoffs, including antenna-coupled, polarization-sensitive focal planes for microwave background experiments such as BICEP2, Keck Array, and SPIDER; kinetic inductance detectors and imaging arrays; integrated millimeter-wave chip spectrometers; and broadband parametric amplifiers. I will describe the history of these developments from a personal perspective.