Atacama Large Millimeter Array (ALMA) in 2030

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The Atacama Large Millimeter Array (ALMA) located at 5000m altitude in northern Chile is an extraordinary achievement of innovation and construction. This (sub)millimeter interferometer comprises 66 elements (54 12-m elements + 12 7-m elements) each designed with a surface and stiffness to operate up to 950 GHz in a high wind environment, while also being moveable between configurations as compact as 150m diameter out to maximum separations of 16km. Each telescope is equipped to house up to 10 cryo-cooled receiver systems spanning 30 to 950 GHz that have sensitivity performance approaching the quantum limit. The total collecting area and sensitive receiver systems, combined with the long baselines and a high-altitude site confer unprecedented performance capabilities for exploration of the Universe. This talk will introduce the ALMA telescope system and the remote, high-altitude site, and describe some of the ground-breaking results that have been produced over the first five years of operation, including high-resolution images of proto-planetary systems in nearby stars to the detection of atomic species in some of the earliest galaxies formed in the Universe.