

# National Radio Science Meeting

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## *Atacama Large Millimeter Array (ALMA) in 2030*

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**Abstract:** 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.



**Biography:** Sean Dougherty is currently the Director of the ALMA Observatory, the world's foremost millimeter/submillimeter interferometer array located at 5000m altitude in the Atacama desert in northern Chile. Previously he was Director at the Dominion Radio Astrophysical Observatory, Canada's national radio astronomy facility and part of the National Research Council's Herzberg Institute for Astrophysics. There he managed NRC's work on the design of the SKA-mid correlator, and managed the production, installation and commissioning of the WIDAR correlator for the Jansky VLA in New Mexico, USA. He has served on a science and engineering advisory committees for a number of projects including the SKA and the ngVLA. He is currently the chair of the ASTRON Science Advisory Committee and a member of the Smithsonian Millimeter Array Advisory Committee. His research interests are related to the circumstellar environments of massive stars, using observations from gamma-ray energies to radio wavelengths, but he is a specialist in radio interferometry.