

## **ALMA - Scientific Results and Future Developments**

Tetsuo Hasegawa\*

*NAOJ Chile Observatory, National Astronomical Observatory of Japan, Osawa, Mitaka, Tokyo 181-8588 Japan*

\*Contact:tetsuo.hasegawa@nao.ac.jp

Atacama Large Millimeter/submillimeter Array (ALMA) has been built and operated at 5,000-m altitude site in the Andean plateau of northern Chile, as an international collaboration between North America, Europe, East Asia and Chile. It is an aperture synthesis radio telescope with 66 high precision antennas with maximum baseline of 15 km to observe astronomical objects at 30 - 950 GHz with unprecedented sensitivity and angular resolution that represents a state of art of the remote sensing technology at these frequencies. Since its start of early science operations in 2011, it has been providing data that are revolutionizing our view of the universe from the formation of galaxies in the early universe to formation of planetary systems in the Solar neighborhood. In this talk, I present some of these exciting scientific results, as well as the plans of future upgrades of the ALMA system.

ALMA is a partnership of ESO (representing its member states), NSF (USA), and NINS (Japan), together with NRC (Canada), NSC, and ASIAA (Taiwan), in cooperation with the Republic of Chile. The Joint ALMA Observatory is operated by ESO, AUI/NRAO, and NAOJ.