

## V114a Update on ALMA Operations and Development Program - Spring 2019

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In this presentation, we will offer an update on ALMA Operations and Development Program.

Operations: Cycle 6 observations started in early October 2018, just after the end of Cycle 5, with a near flawless transition between cycles, and the important milestone of having all antennas (66) available simultaneously for science observations. Data delivery continues to improve and approaches the target of 90% of data within 30 days of observations. In terms of published papers, ALMA has passed the milestone of 1000 publications.

Development: NAOJ is collaborating in the development of receivers for bands 1 (led by ASIAA) and 2 (led by ESO), and the ACA spectrometer (led by KASI), together with support to the integration of band 5 receivers (EU project). Around 15 units of band 1 receivers have been produced towards the MRR meeting in 2019. For band 2 (67-116 GHz), the receiver optics components designed and fabricated by NAOJ show good performance and the fine tuning of the receiver noise temperature continues towards the target of holding the CDR in 2019. The ACA spectrometer is also progressing towards CDMR in Spring 2019.

Future Planning: ALMA is already planning important upgrades towards improved performance in the 2020s. Receivers with wider IF bandwidth and better sensitivity, longer baselines or multipixel receivers will allow to pursue new exciting science cases. Improvements in the archive will make the use of existing public data easier and more productive.