ECOGAL: Testing and characterization of the Band 2 production cartridges

Progetto di Ricerca - Research Project

The objective of the ERC Synergy project ECOGAL is to build a unifying predictive model of star and planet formation in the Milky Way. Based on a unique combination of theoretical modeling and multi-wavelengths observations, we will trace the properties of planet-forming disks back to their environment in different parts of the Galaxy, determine the physical processes that regulate the birth to stars and determine their key parameters, deliver a well calibrated galaxy template which can be used to study systems in the distant Universe. To reach these goals, ECOGAL unites out four research groups (at CEA, University of Bologna, Heidelberg University and INAF, in partnership with ESO, CNRS, Manchester University, and soon IRAM) to combine our unique expertise in observational astronomy, numerical astrophysics, instrument development, and astroinformatics, whose synergy will enable transformative progress in our understanding of our Galaxy.

One of the responsibilities of the Department of Physics and Astronomy of the University of Bologna (in short DIFA) within ECOGAL is the enhancement of the ALMA Band 2 receiver performance, in collaboration with the Manchester University (member of the ECOGAL collaboration), the INAF-OAS (member of the Band 2 consortium), as well as the other Band 2 consortium members and ESO. In this context, a postdoc at DIFA will carry out design, assembly, validation and commissioning of parts of the Band 2 ALMA receiver cartridges test setups and measurements of the performance of critical components. The activities of the postdoc will be carried out in close collaboration with the INAF-OAS Cryowaves laboratory group and ESO in Garching bei Muenchen (Germany), where the postdoc will be expected to spend about 50% of their time.

The Band 2 production will started in fall 2023 and the completion of the project is expected by the end of 2026. The postdoc will be involved in designing, calibrating and executing test procedures for components of the Band 2 receiver in the Bologna and ESO laboratories. The work may require to execute work visits to and laboratory tests at the Band 2 consortium partners (NOVA, GARD), ESO and the ALMA partners (NAOJ, NRAO), as well as the ALMA observatory sites in Chile.

Description of activities - Piano delle attività

The postdoc will work at DIFA in tight collaboration with the INAF-OAS Cryowaves laboratory staff, with frequent work travels to the ESO headquarters in Garching bei Muenchen, Germany. The responsibilities of the postdoc will include:

- Collaborate to the design and setup of laboratory equipment to test Band 2 production components (specifically the Low Noise Amplifiers and the passive optical components)
- Execute and support testing campaigns at ESO and Bologna for the critical components of the Band 2 receiver
- Participate to system tests in Bologna, ESO or ALMA of the complete receivers to characterize their astronomical performance.

The postdoc contract will be initially for one year, renewable to a second year depending on performance and funding.