
The Galactic Ecology science case on CCAT-prime/FYST

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Abstract

The CCAT-prime collaboration is building the Fred Young Submillimeter Telescope (FYST), a wide-field, 6 m aperture submillimeter telescope which will start operation in late 2023 at 5600 m altitude on the exceptionally dry Cerro Chajnantor site in northern Chile. CCAT-prime is operated by a consortium including Cornell University, the Universities of Cologne and Bonn, the MPA Heidelberg, the Canadian Atacama Telescope Consortium (CATC).

As one of the various science cases for FYST, we will present here the GEco (Galactic Ecology) project that focusses on the star formation ISM cycle in galaxies. We will study the formation, growth, evolution and dispersal of molecular clouds in the Milky Way, the Magellanic clouds, and other nearby galaxies through submm spectroscopy. For this purpose, University of Cologne is building the CCAT Heterodyne 8x8 pixel Array Instrument (CHAI). CHAI will start to operate in the frequency range 455 – 495 GHz, enabling observations of the atomic carbon CI 1-0 line and CO 4-3. The second channel will become available later and cover the range from 800 to 820 GHz, including the CO 7-6 and CI 2-1 lines. We present an overview of the GEco science cases and goals and how these will be addressed with dedicated surveys.

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