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QUBIC: the Q & U Bolometric Interferometer for Cosmology

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In this contribution we present the Q&U Bolometric Interferometer for Cosmology (QUBIC) experiment. QUBIC is an experiment devoted to the observations of the polarization of the Cosmic Microwave Background radiation with the goal to detect the signature of the Inflationary expansion of the Universe in its very early phase. QUBIC (an international collaboration between laboratories in France, Italy, Argentina, UK, Ireland and USA) will measure the polarized microwave sky with a novel approach: the bolometric interferometry, which combines the sensitivity of state-of-the-art bolometric detectors (2048 cryogenic Transition Edge Sensors), with the systematic effects control typical of interferometers. The observation of the interference fringes is made possible thanks to the use of 400 cryogenic back-to-back horns and switches and the presence of a beam combiner which focuses radiation into the TES arrays. QUBIC has spectro-imaging capabilities allowing us to reconstruct multiple sub-frequency CMB polarization maps within our two wide-band filters centered at 150GHz and 220GHz. End-To-End simulations have shown that QUBIC will reach a sensitivity of $\sigma(r)=0.01$ after two years of integration. After integration in 2018 in Paris, QUBIC is now being calibrated and tested showing behavior and performances in excellent agreement with our expectations and simulations. These results will be presented in this contribution. The instrument will be installed in late 2019 in its observation site near San Antonio de los Cobres on the Puna plateau in Salta, Argentina at 5000m a.s.l. offering incredibly dry atmosphere and clear sky.

Less than 5 years of experience since completion of Ph.D

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Student (Ph.D., M.Sc. or B.Sc.)

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