

Abstract Submitted
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Building the BICEP3 Test Cryostat SAMANTHA WALKER, Fordham University, CHAO-LIN KUO, KEITH L. THOMPSON, JAMES GRAYSON, ETHAN KARPEL, VAL MONTICUE, Stanford University, KUO GROUP/BICEP3 COLLABORATION TEAM — BICEP3, a ground-based telescope stationed in the South Pole, currently employs a cryostat to observe the polarization of the Cosmic Microwave Background, the earliest light in the Universe, by using devices that take advantage of the superconductivity transition of titanium. The cryostat consists of staggered temperature stages at 300 K, 50 K, 4 K, 2 K, 350 mK, and 250 mK that are maintained by both a pulse tube and three stage helium (He^4 - He^3 - He^3) sorption refrigerator. However, currently the helium refrigerator is experiencing unanticipated heat loading which is decreasing the fridge cycle hold time and thus the number of hours that BICEP3 can observe for in a given period of time. To address this issue, this past summer I worked at Stanford University to construct a thermally-similar cryostat that will be used to test the thermal conductivities of its various internal components at subKelvin temperatures and determine the source of this heat loading.

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