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# 国台学术报告 NAOC COLLOQUIUM

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**Time: Wednesday 2:30 PM, May.29th Location: A601, NAOC**

### Concept study of a small Compton polarimeter to fly on a cubesat

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Prof. Hsiang-Kuang Chang is a Full Professor of Astronomy and Physics at National Tsing Hua University, Taiwan. He received the M.S. degree in Physics from National Taiwan University in 1991. In 1994, he got the PhD degree in Astronomy from Bonn University, Germany. He was the director of the Institute of Astronomy and the Chair of the Department of Physics at the National Tsing Hua University since 2008. He previously held the position of the President of Astronomical Society of the Republic of China (Taiwan). He is the ROC National Committee member

for the ICSU Committee on Space Research (COSPAR). His work focused on Pulsars, Compact Stars, High-Energy Astrophysics and Trans-Neptunian Objects.

### Abstract

Application of cubesats in astronomical observations has been getting more and more mature in recent years. Here we report a concept study of a small Compton polarimeter to fly on a cubesat for observing polarization of soft gamma-rays from a black-hole X-ray binary, Cygnus X-1. Polarization states

provide very useful diagnostics on the emission mechanism and the origin of those gamma rays. In our study, we conducted Monte Carlo simulations to decide the basic design of this small polarimeter. Silicon detectors and cerium bromide scintillators were employed in this study. We estimated its on-axis effective area at different energies and its data telemetry requirement when flying in a low earth orbit. Based on this study, we will proceed to have a more realistic design and look for opportunities of a cubesat space mission.

