

**Abstract:** The ambitious speaker will give two separate sub-talks introducing two unrelated subjects: The birational geometry of Calabi-Yau threefolds and the Clifford group in Quantum Computing.

The birational geometry of Calabi-Yau threefolds is intricate even with many advances in modern higher-dimensional geometry. In this talk, we report a recent joint work with Atsushi Ito (Okayama) and Sz-Sheng Wang (Academia Sinica at Taiwan), in which we describe explicitly the birational geometry of a class of Calabi-Yau threefolds. These examples are related to Reid's fantasy and the Morrison-Kawamata cone conjecture. (DOI:10.1016/j.jpaa.2021.106841, 10.1016/j.geomphys.2023.105053)

The Clifford group  $C_n$  is the normalizer of the Pauli group  $P_n$  in the unitary group  $U_n$ , which plays an important role in gate-based quantum computing and has applications in quantum error correction, unitary  $t$ -designs, etc. However, its group representation property is not fully understood due to its rapidly growing size as  $n$  increases. We report a recent joint work with Chin-Yen Lee (National Central University), Wei-Hsuan Yu (National Central University), Yung-Ning Peng (National Cheng Kung University) on the character table of  $C_n$  for  $n < 4$ . (arXiv:2309.14850v2)