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**Supercongruences for rigid hypergeometric Calabi–Yau threefolds**

**Abstract:** I will consider the 14 one-parameter families of Calabi–Yau threefolds defined over  $\mathbf{Q}$ , which are realized as mirrors of another one-parameter families of Calabi–Yau threefolds with the Hodge number  $h^{1,1} = 1$ . The Picard–Fuchs differential equations of these mirror families are of order 4 of hypergeometric type. At a special fiber, these mirror Calabi–Yau threefolds will become rigid, i.e.,  $h^{2,1} = 0$ . These are the 14 rigid hypergeometric Calabi–Yau threefolds in the title. In this talk, I will present proof to the supercongruences for the 14 rigid hypergeometric Calabi–Yau threefolds defined over  $\mathbf{Q}$ . The existence of such supercongruences has been conjectured (based on numerical evidence) by F. Rodriguez-Villegas in 2003.

This is a joint work with Ling Long, Fang-Ting Tu and Wadim Zudilin.