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Jeffrey D Achter* (achter@math.colostate.edu), Department of Mathematics, Colorado State University, Fort Collins, CO 80523-1874. *Arithmetic Torelli maps for cubic surfaces and threefolds*. Preliminary report.

It has long been known that to a complex cubic surface or threefold one can canonically associate a principally polarized abelian variety. I'll explain a construction which works for cubics over an arithmetic base. This answers, away from the prime 2, an old question of Deligne and a recent question of Kudla and Rapoport. (Received September 18, 2011)