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Hannay's Hoop Beyond Asymptotics HWAN BAE, NORAH ALI, JOHN F. LINDNER, The College of Wooster — Certain physical systems do not completely return to themselves when moved through a closed circuit in physical or parameter space. A geometric phase, known classically as Hannay's angle and quantum mechanically as Berry's phase, quantifies such anholonomy. We generalize the classical example of a bead sliding frictionlessly on a hoop to arbitrary - not necessarily adiabatic - motions. We elucidate the roles of forces in the inertial frame and pseudo-forces in the rotating frame. We realize the dynamics experimentally with a simple apparatus consisting of wet ice cylinders sliding on a polished metal plate in 3D printed plastic channels. We computationally generalize to a mass sliding on a rotating ellipsoid.

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