1025-58-21 **Miguel Abreu** (mabreu@math.ist.utl.pt), Departamento de Matemática, Instituto Superior Técnico, Av. Rovisco Pais, 1049-001 Lisboa, Portugal, **Emily B. Dryden*** (ed012@bucknell.edu), Department of Mathematics, Bucknell University, Lewisburg, PA 17837, **Pedro Freitas** (freitas@cii.fc.ul.pt), Mathematical Physics Group, Complexo Interdisciplinar, Av. Prof. Gama Pinto 2, 1649-003 Lisboa, Portugal, and **Leonor Godinho** (lgodin@math.ist.utl.pt), Departamento de Matemática, Instituto Superior Técnico, Av. Rovisco Pais, 1049-001 Lisboa, Portugal. *Hearing the weights of weighted projective planes.*

Which properties of an orbifold can we "hear," i.e., which topological and geometric properties of an orbifold are determined by its Laplace spectrum? We consider this question for a class of four-dimensional orbifolds: weighted projective planes with three isolated singularities. By combining calculations of heat invariants with information obtained via equivariant cohomology, we are able to hear the weights associated to the singularities. Knowledge of the weights then enables us to hear whether our orbifold is endowed with an extremal Kähler metric. (Received December 21, 2006)