A Reeb flow is Besse when all its orbits are closed, and Zoll when they have the same minimal period. In this talk, based on a joint work with Basak Gurel and Marco Mazzucchelli, we discuss a characterization of Besse and Zoll star-shaped hypersurfaces and Riemannian unit tangent bundles of the sphere in terms of their equivariant spectral invariants, e.g., the Ekeland–Hofer capacities.

This characterization is a part of a much more general phenomenon, which is best understood in the context of (equivariant) Lusternik-Schnirelmann theory.