Speaker: Gabriele Benedetti (Vrije Universiteit Amsterdam)

Periodic orbits in non-convex, non-flat billiards

We study the existence of periodic billiard orbits inside a compact domain with smooth boundary, in arbitrary dimension. More precisely, the orbits follow the trajectories of a given Hamiltonian function in the interior of the domain and undergo an elastic collision at the boundary. Our main result is that, for energies above the Mañé critical value, there exists a contractible periodic orbit with at most n+1 collisions, where n is the dimension of the manifold. Our approach follows the one of Albers-Mazzucchelli in combining variational methods à la Benci-Giannoni with techniques from symplectic geometry. This is joint work in progress with Anna-Maria Vocke and Peter Albers.