

Periodic orbits of Tonelli Hamiltonian systems on surfaces

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his talk is about the existence of periodic orbits of classical Hamiltonian systems, often called Tonelli or optical Hamiltonian systems, in the cotangent bundle of closed surfaces. This setting encompasses several celebrated dynamical systems, such as the Riemannian and Finsler geodesic flows, and the so called magnetic geodesic flows. After recalling the background, I will summarize some open conjectures in the field, and present a few recent results, including the existence of remarkable action minimizing periodic orbits and of infinitely many periodic orbits on almost all low energy levels.