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# Oberseminar Dynamische Systeme

# An index theory for asymptotic motions in the gravitational N-body problem

**Dienstag, 17. Mai 2022**
**16:15 Uhr – Raum IA 1/181**

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## (Torino)

Abstract:

Completely parabolic and total colliding trajectories are the basic representatives of a large class of asymptotic motions.
In this talk we sketch the construction of an index theory for such classes of motions. Both problems suffer from a lack of compactness and can be brought in a similar form of a Lagrangian system on the half (time) line by a regularizing change of coordinates which preserves the Lagrangian structure. We introduce a Maslov-type index which is suitable to capture the asymptotic nature of these trajectories as half-clinic orbits and we develop the relative index theory by proving the relation with the Morse index of these trajectories as critical points of the Lagrangian action functional.
If time permits, we discuss asymptotic estimates for the growth of the Morse index for such classes of solutions as well as possible applications of non-action minimization methods in the Newtonian N-body problem.
This talk is based on a recent joint work with Barutello, Hu and Terracini.

Guests are very welcome!