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Differential geometry arising from the N -body problem

The Jacobi–Maupertuis principle tells us how to reformulate Newton’s equations for N bodies as geodesic equations for a metric conformal to the Euclidean metric but one whose conformal factor has zeros and poles. We review the principle. We discuss peculiarities of Jacobi–Maupertuis geodesics near the zero locus (“the Hill boundary”) and the pole locus (“the collision locus”).