

## **New results in Newton's problem of minimal resistance.**

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Isaac Newton posed this problem nearly 330 years ago in his *Mathematical Principles of Natural Philosophy*. It is as follows. A body moves in a highly rarefied medium of point particles at rest, and the particles reflect elastically when colliding with the body's surface. It is required to find the shape of the body that minimizes the force of aerodynamic resistance of the medium. Starting from 1993, new interest in mathematical community to Newton's problem has been raised. The problem proved to be highly interdisciplinary, and various aspects of it were studied using methods borrowed from multidimensional variational analysis, theory of billiards, optimal mass transport, Kakeya needle problem, and theory of convex bodies. Interesting connections of the problem with geometric optics were found, including invisibility, retroreflectors, and the problem of camouflaging. A review of the state of art in this area will be given.