

COLLOQUIUM
UNIVERSITY OF PITTSBURGH
FRIDAY, FEBRUARY 17, 2017

704 THACKERAY HALL

3:30 P.M.

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ON THE MOTION OF A RIGID BODY
WITH A LIQUID-FILLED INTERIOR CAVITY

ABSTRACT: The study of the motion of a rigid (undeformable) body under the action of a given system of forces is a central topic in Classical Mechanics, going back to the pioneering work of EULER, POISSON and LAGRANGE. Basically, after almost three centuries of dedicated study, the dynamics of these bodies does not seem to present any undiscovered significant feature.

However, an entirely different dynamics –yet to be fully understood– appears if the body possesses a hollow interior cavity completely filled with a viscous liquid (e.g., a bottle of water filled up to the top). The main characteristic of the motion of this highly coupled liquid-body system is that the presence of the liquid tends to strongly stabilize the motion of the body and, in some cases, even bringing it to the rest.

Objective of this talk is to present a number of significant problems in the mathematical theory of these coupled systems along with their resolution, as well as point out several interesting open questions.

Refreshments served at 3:00 p.m.
in the Math Dept. COMMON ROOM, Thackeray 705