

Abstract Submitted
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Diving, Jumping and Drinking: instabilities during water entry and exit SUNGHWAN JUNG, Virginia Tech — All organisms interact with fluids in one way or another, and some have presumably adapted their behaviors or features in response to fluid-mechanical forces. Particularly, fluid forces are of great importance when organisms or their body parts move in and out of water. In this talk, I will discuss three problems in which fluid mechanics principles affect form and function of animals. The first problem is how several seabirds (e.g. Gannets and Boobies) dive into water at up to 24 m/s without any injuries. This study examines the effects of their beak shape and dense feathers during water entry to reduce or spread the impact force on the body. The second problem is how animals jump out of water, from plankton to whales. Some aquatic animals generate enough force to exit the water surface as an effective method of capturing prey or escaping from predators. Finally, I will discuss about lapping animals (e.g. dog and cat) as a combined water entry and exit. During the tongue-lapping, associated fluid forces and pinch-off instability will be discussed.

Sunghwan Jung
Virginia Tech

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