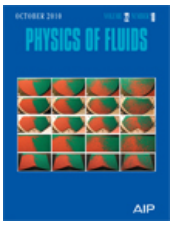

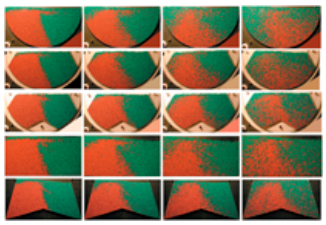

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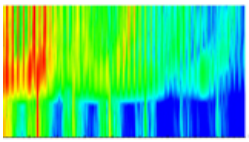
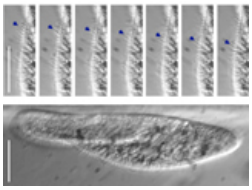


Shear-flow excitation mechanisms of recessed localized arc-filament plasma actuators

R.R. Kleinman, D.J. Bodony, and J.B. Freund

A localized arc-filament plasma actuator, which in this application is recessed in a small cavity near the nozzle lip, causes intense local heating. This heating is thought to be the root mechanism of its influence on the flow, but how this principally entropic thermal source couples with the vortical jet shear layer turbulence downstream is unclear. We investigate this using direct numerical simulations, the results of which have illuminated several features of the actuation.

Phys. Fluids **22**, 116103 (2010)

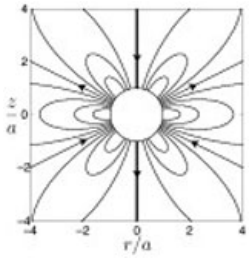


Efficiency optimization and symmetry-breaking in a model of ciliary locomotion

Sébastien Michelin and Eric Lauga

Ciliates exploit the bending of a large number of small and densely packed organelles, termed cilia, in order to propel themselves in a viscous fluid. In this research, a complete optimization diagram for swimming efficiencies, swimming speeds, and amplitudes of surface deformation can be reached, with the mathematically optimal swimmer, of efficiency one-half, being a singular limit.

Phys. Fluids **22**, 111901 (2010)



Jet propulsion without inertia

Saverio E. Spagnolie and Eric Lauga

This paper considers this mechanism of jet propulsion without inertia in the case of spheroidal bodies and derive both the swimming velocity and the hydrodynamic efficiency. Elementary examples are presented and exact axisymmetric solutions for spherical, prolate spheroidal, and oblate spheroidal body shapes are provided. In each case, entirely and partially porous (i.e., jetting) surfaces are considered and the optimal jetting flow profiles at the surface for maximizing the hydrodynamic efficiency are determined computationally.

Phys. Fluids **22**, 081902 (2010)

Announcements

The 2010 Nobel Prize in Physics Announced

The 2010 Nobel Prize in Physics will be awarded to Andre Geim and Konstantin Novoselov from the University of Manchester for their "groundbreaking experiments regarding the two-dimensional material graphene." Read more | Resources

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- Congratulations to John Dabiri, Phys. Fluids author, recipient of the 2010 MacArthur Fellows grant
- Gallery of Fluid Motion featured in National Geographic Read the article | Visit Gallery Archive
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- *Physics of Fluids* is proud to sponsor annual travel grants for students
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- REVTeX 4.1 released with AIP style files included

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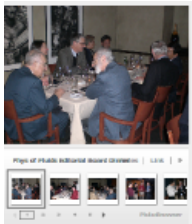

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