

## High Reynolds Number Locomotion

As mentioned in the introduction, animal locomotion at high Reynolds numbers  $Re > O(100)$  typically employs airfoil (or hydrofoil) structures whose motions use the fluid mechanical lift force to propel the animal forward. As we have seen in the other sections on propulsion (sections (Ddc) and (Ddd)), this mirrors our better human inventions for swimming and flying. Of course, human machines have different design limitations and advantages than those possible for animals, most noticeably the fact that continuous rotation of the parts of the device is a freedom not available to animals (except for bacteria). On the other hand, evolution has produced some marvelously sophisticated flexible structures that more than compensate for the inability to use continuous rotary deformation. To recognize this one need only compare the manic gyrations of most man-made ornithopters with the beautiful flight mechanics of a bird whose body barely oscillates as its wings flap up and down.