



The  
University  
Of  
Sheffield.

Department of Mechanical  
Engineering

## **Mechanical Engineering Departmental Seminar**

**Thursday 14<sup>th</sup> February 2008**

**10.00 am – 11.00 am, St Georges Lecture Theatre 4  
Sir Frederick Mappin Building**

### **“Fluid dynamics at the scale of organisms”**

**Dr S. Humphries  
The University of Sheffield  
Department of Animal and Plant Sciences**

#### **Abstract**

Biology provides a rich source of problems for fluid dynamics, but it can also provide solutions to engineering problems and these themes are central to the emerging fields of comparative biomechanics and biomimetics. Here I illustrate the scales across which animals and plants interact with their fluid environment, with examples of low Reynolds dynamics of particle capture in suspension feeders and high Reynolds number movement at the air-water interface by birds and extinct flying pterosaurs. In the former, I show that non-linear effects due to streamline compression around organisms may lead to novel implications for particle capture in relation to environmental change, and in the latter that physics and engineering can be used to tell us much more about the biology of both living and extinct animals than simple biological intuition alone.