**Assoc. Prof.**
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Study on Zonal Flow Formations in Two-Dimensional Turbulence on a Rotating Sphere

A two-dimensional incompressible flow on a rotating sphere governed by the two-dimensional Navier-Stokes equation is one of the simplest mathematical models for planetary atmospheres. Although this mathematical model is highly simplified and does not contain many physical processes that may be actively functioning in real atmospheres, the flow field shows rich and interesting phenomena, including a spontaneous formation of large-scale zonal flows. However, these phenomena are the results of very complicated interactions between many factors, and even the mechanisms of simple and typical flow dynamics are not necessarily clear. I am especially interested in the emergence and the development of large-scale structures in two-dimensional turbulence on a rotating sphere, and investigating these by both numerical and analytical methods.
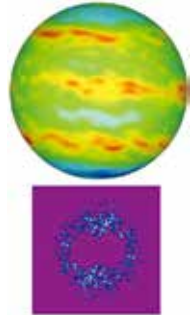
Analysis on Characteristic Features/Structures of Creatures
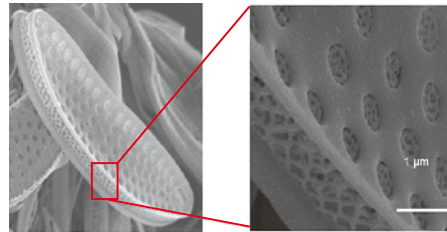
Pseudoleyanella lunata

Some creatures possess highly unique body structures and biological properties. In order to obtain knowledge and information of essential factors related to the appearance and formation of such characteristic features, I am performing two different kinds of investigations. One is data analysis of genetic and some biological data obtained by experiments (collaborative research with an experimentalist), and the other is based on mathematical modellings and numerical simulations.