



Bio-inspired Wind Energy: From fish schools and seagrass to better wind farms

**Wednesday,
November 06, 2013,
3:30P.M.**

**Carey Auditorium,
Hesburgh Library**

Refreshments served
at 3:00 p.m. outside of
Carey Auditorium

This talk will describe recent efforts using bio-inspired arrays of counter-rotating vertical-axis wind turbines to reduce the cost, size, and environmental impacts of wind farms. Full-scale field tests of 10-meter tall vertical-axis wind turbines in various counter-rotating configurations have been conducted under natural wind conditions over the past four years. Whereas wind farms consisting of propeller-style, horizontal-axis wind turbines produce 2 to 3 watts of power per square meter of land area, these field tests indicate that power densities an order of magnitude greater can be achieved by arranging vertical-axis wind turbines in layouts inspired by the configurations of schooling fish and seagrass beds. The higher power density is leveraged to achieve meaningful power generation at lower altitudes than required by existing systems.

Notably, this improved performance does not require higher individual wind turbine efficiency, only closer wind turbine spacing and a sufficient vertical flux of turbulence kinetic energy from the atmospheric surface layer. The results suggest an alternative approach to wind farming and pose a broad array of interesting, unanswered scientific questions related to the modeling and control of canopy flows.



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*If you are interested in
meeting individually with
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