

The Incredible Locomoting Jake

With flying snakes and clapping scallops, an inspired researcher makes science come alive.

THE FIRST TIME UNIVERSITY OF CHICAGO student James Waters saw Jake Socha giving a lecture, Socha was imitating a fish. “He was up there basically doing a dance,” recalls Waters, “and he was so excited and into what he was teaching that there was no way I could miss the next class.”

He didn’t, having immediately enrolled in the course, called “Animal Locomotion.” Socha (pronounced SO-ha), whose teaching was funded in part by an HHMI undergraduate science education grant, brought his fast-paced and theatrical teaching approach into play in virtually every class. For example, he would show short videos of animals in motion—a scallop clapping its shells together and surging forward, a web-footed “flying” frog gliding from tree to tree, a Jesus lizard running on water—and after each video, Socha would ask a student to mimic the animal’s movements. Then he’d derive a formula that described its pattern. “He managed to make the course incredibly mathematical,” says Waters, “yet he didn’t lose anybody.”

Socha, 33, who recently earned his doctorate in biomechanics from the University of Chicago, discovered the field as an undergraduate. Definable as the mechanical engineering of living

things, biomechanics nicely combined his interests in physics and biology, and he had the good fortune to study with a pioneer in the field, Steven Vogel.

While visiting potential graduate schools, Socha heard from a professor that certain snakes in Asia somehow moved through the air. He came back to the idea after beginning school, thinking he’d check it out and then “move on to something real.” But once Socha discovered that no one completely understood how a vertebrate without wings or any other steering appendage could control its flight path, his interest grew. The study of flying snakes became his doctoral research.

As part of his doctoral work, Socha coaxed 21 paradise tree snakes to launch themselves in turn from a scaffolding tower built for him in the Singapore Zoological Garden, and he filmed all the action. Socha’s 3-D reconstruction of the snakes in flight showed that they flatten their cylindrical bodies—doubling their width—and then curl into an S-shape and undulate as they move through air (see the movies at www.flyingsnake.org). He’s still trying to understand how they steer. ■

~ Cathy Shufro ~

BELOW — *CHRYSOPELEA PARADISI*, COMMONLY KNOWN AS THE PARADISE TREE SNAKE, FLATTENS ITSELF OUT SO IT CAN GLIDE. TO LEARN MORE—AND TO VIEW THE REPTILE AIRBORNE—VISIT JAKE SOCHA’S FLYING SNAKE HOME PAGE, WWW.FLYINGSNAKE.ORG/.



JAKE SOCHA