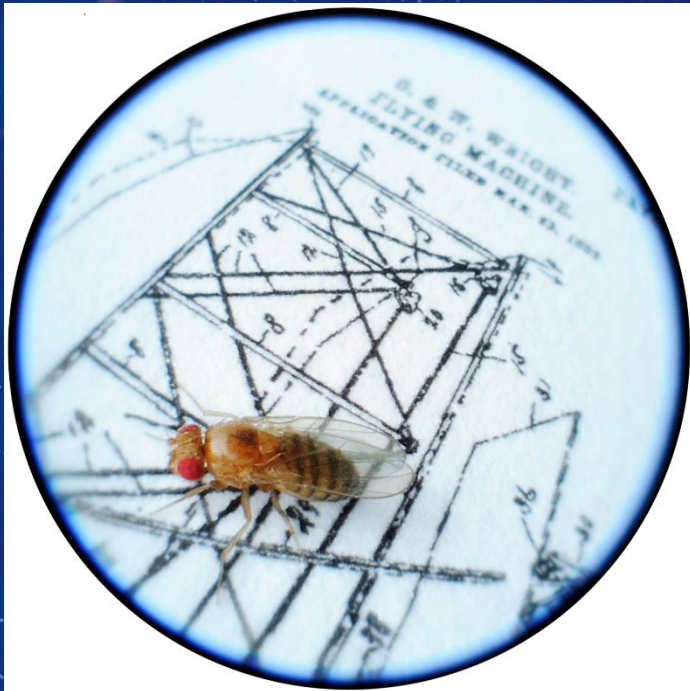


Uncovering motor control in insect flight



There comes a time in each of our lives where we grab a thick section of the morning paper, roll it up and set off to do battle with one of nature's most accomplished aviators - the fly. If, however, instead of swatting we could magnify our view and experience the world in slow motion we would be privy to a world-class ballet full of graceful figure-eight wing strokes, effortless pirouettes, and astonishing acrobatics. After watching such a magnificent display, who among us could destroy this virtuoso? How do flies produce acrobatic maneuvers with such precision? What control mechanisms do they need to maneuver? How is this control implemented at the neuromuscular scale? In this talk I will discuss our strategy for investigating these questions and reveal some of the underlying mechanisms for flight maneuvers, wing actuation, and neuromuscular actuations governing flight stability.



Dr. Itai Cohen
Professor, Department of Physics
Cornell University

Professor Itai Cohen studies the physics of matter in motion. At Cornell, his research has focused on building microscopic robots, controlling the shear thickening behavior of microscopic and nanoscopic particles suspended in a fluid, exploring the mechanics of materials ranging from biological tissues to origami inspired metamaterials, discovering the aerodynamic and neuromuscular mechanisms used by insects during flapping flight, and determining how audiences at heavy metal concerts coordinate their movement. Understanding how emergent behaviors arise from the microscopic rules governing these systems remains one of the biggest challenges in Physics.

Professor Cohen received his BS in Physics from the University of California at Los Angeles, and his PhD in Physics from the University of Chicago. Following his graduate studies, he was a Post-doctoral fellow in Physics and the Division of Engineering and Applied Science at Harvard University. In 2005 he joined Cornell and is currently a professor of Physics. Professor Cohen is an NSF Career grant recipient, he is a Fellow of the American Physical Society, and is the recipient of the Kappa Delta Ann Doner Vaughn Award for his work on cartilage mechanics. He has served as a Feinberg and Braginsky fellow (2012) and the Rosi and Max Varon Visiting Professor at the Weizmann Institute (2021) and the van der Waals Visiting Professor at the University of Amsterdam (2022). He has published over 110 research articles, given nearly 300 invited seminars, colloquia and conference presentations, and co-authored the book Finding Your Research Voice: Story Telling and Theater Skills for Bringing Your Presentation to Life. His work has been covered by various outlets ranging from the BBC, to Scientific American, NPR, and the NYTimes.

Wednesday, October 26th
1:00pm – 1:50pm
GOS-3305

Pizza will be available.

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