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**Flocking and self-defense: experiments and simulations of avian mobbing**

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We have performed motion capture studies in the field of avian mobbing, in which flocks of prey birds harass predatory birds. Our empirical studies cover both field observations of mobbing occurring in mid-air, where both predator and prey are in flight, and an experimental system using actual prey birds and simulated predator “perch and wait” strategies. To model our results and establish the effectiveness of mobbing flight paths at minimizing risk of capture while optimizing predator harassment, we have performed computer simulations using the actual measured trajectories of mobbing prey birds combined with model predator trajectories. To accurately simulate predator motion, we also measured raptor acceleration and flight dynamics, well as prey-pursuit strategies. These experiments and theoretical studies were all performed with undergraduate research assistants in a liberal arts college setting. This work illustrates how biological physics provides undergraduate research projects well-suited to the abilities of physics majors with interdisciplinary science interests and diverse backgrounds.