

Are insects drawn to light? New research shows it's confusion, not fatal attraction

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This 2022 photo provided by Samuel Timothy Fabian shows an Atlas Moth (*Attacus lorquini*) used to test the interaction of flying insects with artificial light is photographed at Imperial College London. Many scientists have long assumed that moths and other flying insects were simply drawn to bright lights. But a new study suggests, rather than being attracted to light, researchers believe that artificial lights at night may actually scramble flying insects' innate navigational systems. Credit: Samuel Timothy Fabian via AP

Like a moth to flame, many scientists and poets have long assumed that flying insects were simply, inexorably drawn to bright lights.

But that's not exactly what's going on, a new study suggests.

Rather than being attracted to light, researchers believe that artificial lights at night may actually scramble flying insects' innate navigational systems, causing them to flutter in confusion around porch lamps, [street lights](#) and other artificial beacons.

"Insects have a navigational problem," said Tyson Hedrick, a biologist at the University of North Carolina, Chapel Hill, who was not involved in the research. "They're accustomed to using light as a cue to know which way is up."

Insects do not fly directly toward a light source, but actually "tilt their backs toward the light," said Sam Fabian, an Imperial College London entomologist and co-author of the [study published Tuesday](#) in the journal *Nature Communications*.

That would make sense if the strongest light source was in the sky. But in the presence of artificial lights, the result is midair confusion, not attraction.

For the study, researchers attached [tiny sensors](#) to moths and dragonflies in a laboratory to film "motion-capture" video of flight—similar to how filmmakers attach sensors to actors to track their movements.



This 2022 photo provided by Samuel Timothy Fabian shows ongoing experiments on the effect of artificial light on wild flying insects at the field site in Monteverde, Costa Rica. Many scientists have long assumed that moths and other flying insects were simply drawn to bright lights. But a new study suggests, rather than being attracted to light, researchers believe that artificial lights at night may actually scramble flying insects' innate navigational systems. Credit: Samuel Timothy Fabian via AP

They also used high-resolution cameras to film insects swirling around lights at a field site in Costa Rica.

This allowed them to study in detail how dragonflies will circle endlessly around light sources, positioning themselves with their backs facing the beams. They also documented that some insects will flip upside down—and often crash land—in the presence of lights that shine straight upward like search lights.

Insect flight was least disrupted by [bright lights](#) that shine straight downward, the researchers found.

"For millions of years, [insects](#) oriented themselves by sensing that the sky is light, the ground is dark"—until people invented artificial lights, said Avalon Owens, a Harvard entomologist who was not involved in the research.

More information: Samuel T. Fabian et al, Why flying insects gather at artificial light, *Nature Communications* (2024). [DOI: 10.1038/s41467-024-44785-3](https://doi.org/10.1038/s41467-024-44785-3)

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