This Bird Can Stay in Flight for Six Months Straight

A lightweight sensor attached to alpine swifts reveals that the small migratory birds can remain aloft for more than 200 days without touching down

New sensing technology reveals that the alpine swift, a small migratory bird, can remain aloft for more than 200 days without touching down. (Photo by D. Occiato)

By Joseph Stromberg
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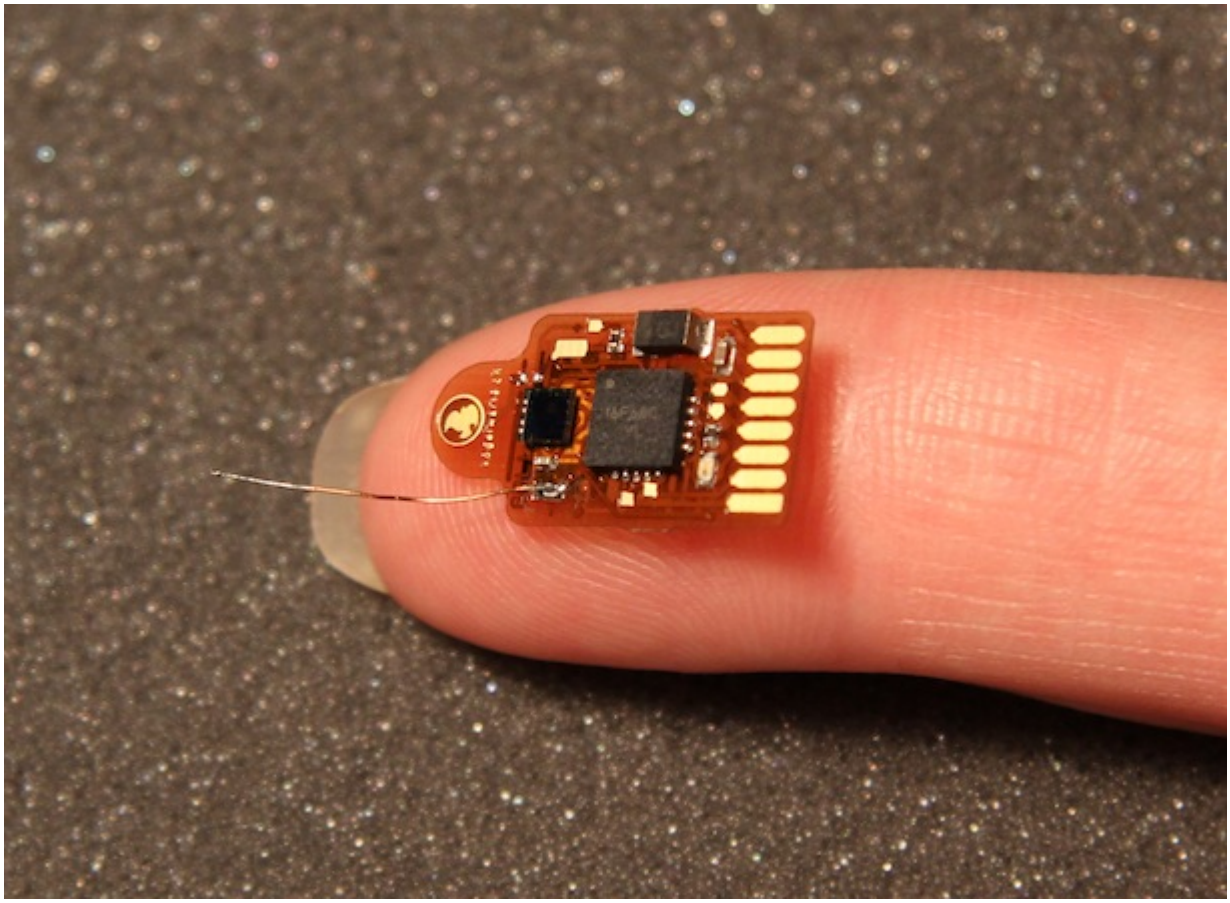
In 2011, Felix Liechti and his colleagues at the Swiss Ornithological Institute attached electronic tags that log movement to six alpine swifts. The small birds—each weighs less than a quarter of a pound—spend the summer breeding in Europe, then migrate to Africa for the winter, thousands of miles away.

“We wanted to learn about energy demands during migration. We expected to see how often they fly, how often they stop, that sort of thing,” he said.

But a year later, when three of the birds returned to the same breeding site and the scientists removed their tags to collect the data, the electronic tags revealed something unexpected. “When we looked at the data, we were totally blown away,” Liechti said. “During their non-breeding period in Africa, they were always in the air.”

For more than 200 straight days straight, as revealed by his team’s study published today in *Nature Communications*, the birds stayed aloft over West Africa. The tags only collect data every four minutes, so it’s impossible to rule out the chance that they touched down occasionally in between these intervals—but every single one of the data points collected for more than six months in a row indicated that, at the time, they were either actively flying or at least gliding in the air.



The tiny sensor records acceleration, the bird's pitch and the timing of sunrise and sunset.
Image via Swiss Ornithological Institute

Ornithologists had previously speculated that a closely related common swift was capable of staying in flight for extremely long periods of time, but this is the first time anyone has collected hard data. The new finding was, in part, enabled by developments in technology—this was the first time that this particular kind of sensor, developed by at Bern University, was attached to birds for research.

Its tiny size allowed the researchers to attach it to relatively small birds without interfering with their free movement. The tags solely collected data on acceleration, the pitch of the bird's body (the angle of its body relative to the ground) and light hitting the bird at any given time. From the latter, scientists were able to infer latitude, due to the timing of sunrise and sunset.

By comparing the acceleration and pitch data to that of birds under observation, Liechti and the others could match particular data patterns with different types of movement—flying (with flapping wings), passively gliding in the air and resting on the ground. "They stayed in the air for all time they spent south of the Sahara, day and night," he said. "Sometimes they just glide for a few minutes, so there's no movement, but the pitch of the body indicates that they're still gliding in the air."

It's still a mystery how the birds are able to physiologically accomplish this feat. The diet aspect is relatively straightforward—they largely feed on airborne insects—but until now, opinions differed over the question of whether birds could sleep while aloft. Sleep patterns in birds are fundamentally different than in mammals, and the difficulty of studying the brainwaves of migrating birds makes it very hard to fully understand how they rest while in motion. But the fact that these swifts never touch down for such a long time indicates that they're able to rest in midair.

There's also the deeper (and perhaps more confounding) question of *why* the birds would bother staying aloft for their entire time in Africa. At this point, it's pure speculation, but Liechti suggests that diet could play a role. "We observed that the further north they go, the more they stay on the ground at night," he said. "Additionally,

the further north you go, the less insects there are in the air—so it might be related." He also proposes that staying in air could reduce the risk of predation or perhaps the chance of catching a disease.

Perhaps most exciting is the fact that this finding came after just the first time the new, ultra-lightweight movement sensor was used in avian research. Tagging other sorts of birds that are too small for conventional sensors might tell us similarly surprising things about their movement or migrations habits. "It's fascinating," Liechti said, "and it opens up a whole new window for us into these species."

About Joseph Stromberg

Joseph Stromberg was previously a digital reporter for *Smithsonian*.