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# *News Release*

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## Wing shape helps swifts glide through storms, study suggests

They are among nature's best fliers, spending most of their time in flight … now scientists have shed new light on how swifts can glide with ease, whatever the weather.

A new study suggests that the aerodynamics of swifts' wings enable them to adapt effortlessly to sudden changes in wind speed and direction.

The wings' crescent shape lessens the effects of blustery conditions, helping to stabilise them as they glide during turbulent weather, researchers say.

This means swifts – which eat, mate and even sleep on the wing – are not forced to use up vital energy to stay on course.

Scientists at the University of Edinburgh constructed a triangular model wing with the characteristic trailing edge shape of swifts' wings. They studied its aerodynamic properties by fitting it into a water flume that simulated airflow during flight.

Using a laser sheet and a digital camera, researchers tracked the movement of tiny glass balls in the water to reveal how air flows over the wing.

Results showed for the first time that as air passes over the wing, it can form into two or three circulating regions of airflow – known as leading-edge vortices, or LEVs.

In aircraft with triangle-shaped wings – including Concorde – LEVs can generate extra lift, researchers say. In swifts, however, the formation of LEVs appears to serve a different function. Researchers suggest that it may act as a dampening mechanism that helps stabilise the birds' wings as they glide in blustery weather.

Researchers say the findings could help inform the design of new aerial technology similar to drones – known as micro air vehicles.

The study is published in *Royal Society Open Science*. It was supported by the Engineering and Physical Sciences Research Council and the Consejo Nacional de Ciencia y Tecnologia.

Dr Ignazio Maria Viola, of the University of Edinburgh's School of Engineering, who led the study, said: "One of the most fascinating secrets in nature is how birds and insects can fly so effortlessly in turbulence. These results provide a small breakthrough towards unravelling this precious secret."

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