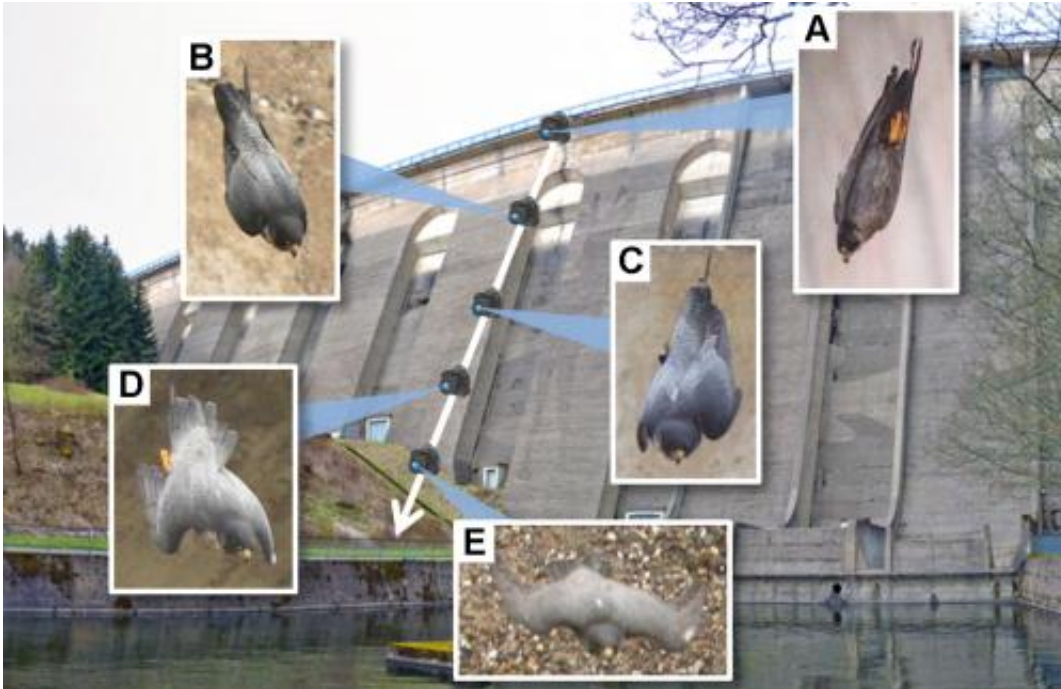


Falcon feathers pop-up during dive

February 6 2014



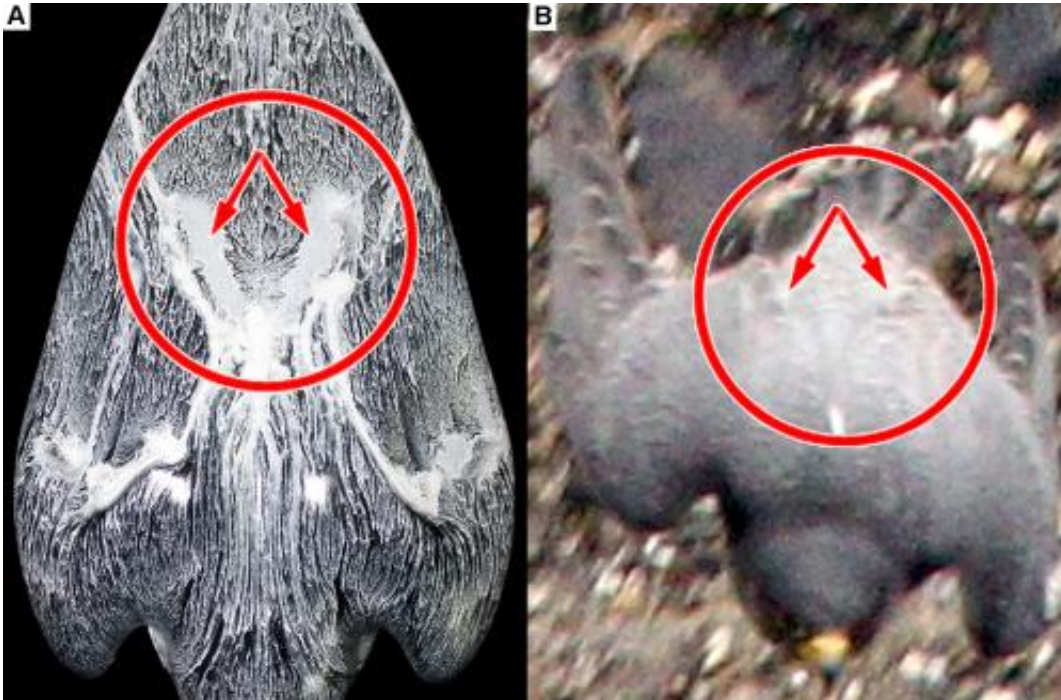
The body of a falcon changes shape as they gain speed. Credit: Benjamin Ponitz

Similar to wings and fins with self-adaptive flaps, the feathers on a diving peregrine falcon's feathers may pop-up during high speed dives, according to a study published in *PLOS ONE* on January 29, 2014 by Benjamin Ponitz from the Institute of Mechanics and Fluid Dynamics in Germany and colleagues.

Peregrine falcons are one of the world's fastest birds and may reach up to 200 miles per hour when diving. Scientists studying the body shape

and wing contour of the bird want to better understand how they reach these high diving speeds while maintaining maneuverability. Researchers trained peregrine falcons to dive in front of a 200 foot dam, and scientists captured 35 dives with a stereo high-speed camera system and hi-res camera. The images allowed researchers to reconstruct the flight path and body shape of the falcon during certain flight phases, and to build a life size model of the falcons. They then analyzed the aerodynamics of the model bird in a wind tunnel.

The body of a falcon changes shape as they gain speed. During the 200 foot dive, birds reached 50 miles per hour and the [body shape](#) showed a V-type configuration, with the leading edge of the wing appearing like a wavy structure with grooves in the gaps between the neck and both shoulders. A comparison of the high-resolution pictures of the diving peregrine and visualizations of the model in the wind tunnel indicate that feathers may pop-up in the same regions where local flow separation occurs. These results may shed light on the aerodynamics and structural adaptations of high speed diving. Benjamin Ponitz added, "Only the combined investigations of a model in a [wind-tunnel](#) with the dives of individual falcons allowed us to reveal diving flight details. In particular, [feathers](#) of peregrines pop-up and might prevent local flow separation."



Falcon feathers pop-up during high speed dives and might prevent local flow separation. Credit: Benjamin Ponitz

More information: Ponitz B, Schmitz A, Fischer D, Bleckmann H, Brücker C (2014) Diving-Flight Aerodynamics of a Peregrine Falcon (*Falco peregrinus*). *PLoS ONE* 9(2): e86506. [DOI: 10.1371/journal.pone.0086506](https://doi.org/10.1371/journal.pone.0086506)

Provided by Public Library of Science

Citation: Falcon feathers pop-up during dive (2014, February 6) retrieved 24 April 2024 from <https://phys.org/news/2014-02-falcon-feathers-pop-up.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.