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Captions: Avian secret: the key to agile bird flight is switching quickly between stable and unstable gliding



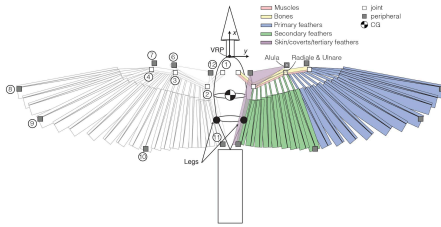
[2022-morphingwing_001.jpg](#): Jasmin Wong records the range of motion of a gull wing using tracking markers. The study results revealed how birds use the shapes of their wings to switch quickly between stable and unstable gliding, enabling agile maneuvers. Photo: Derek Tan, University of British Columbia.



[2022-morphingwing_002.jpg](#): Dan Inman, the Harm Buning Collegiate Professor of Aerospace Engineering who supervised the aerodynamic modeling, inspects a model from a 2016 project studying how birds use their tails for stability. Credit: Joseph Xu, Michigan Engineering



[2022-morphingwing_003.jpg](#): Ildiko Szabo, Vikram Baliga and Doug Altshuler examine wings of various bird species in the Beaty Biodiversity Museum in 2019 at the University of British Columbia. Baliga led the evolutionary analysis and Altshuler supervised the biology aspects of the project. Photo: Derek Tan, University of British Columbia.



[2022-morphingwing_004.jpg](#): Birds included in the study were modeled as a composite of 232 simple geometric shapes to identify stable and unstable wing configurations. The study showed that rather than evolving toward instability for increased maneuverability, bird agility comes from the ability to switch quickly between stable and unstable gliding. Graphic: Christina Harvey, University of Michigan.

[All photos](#)