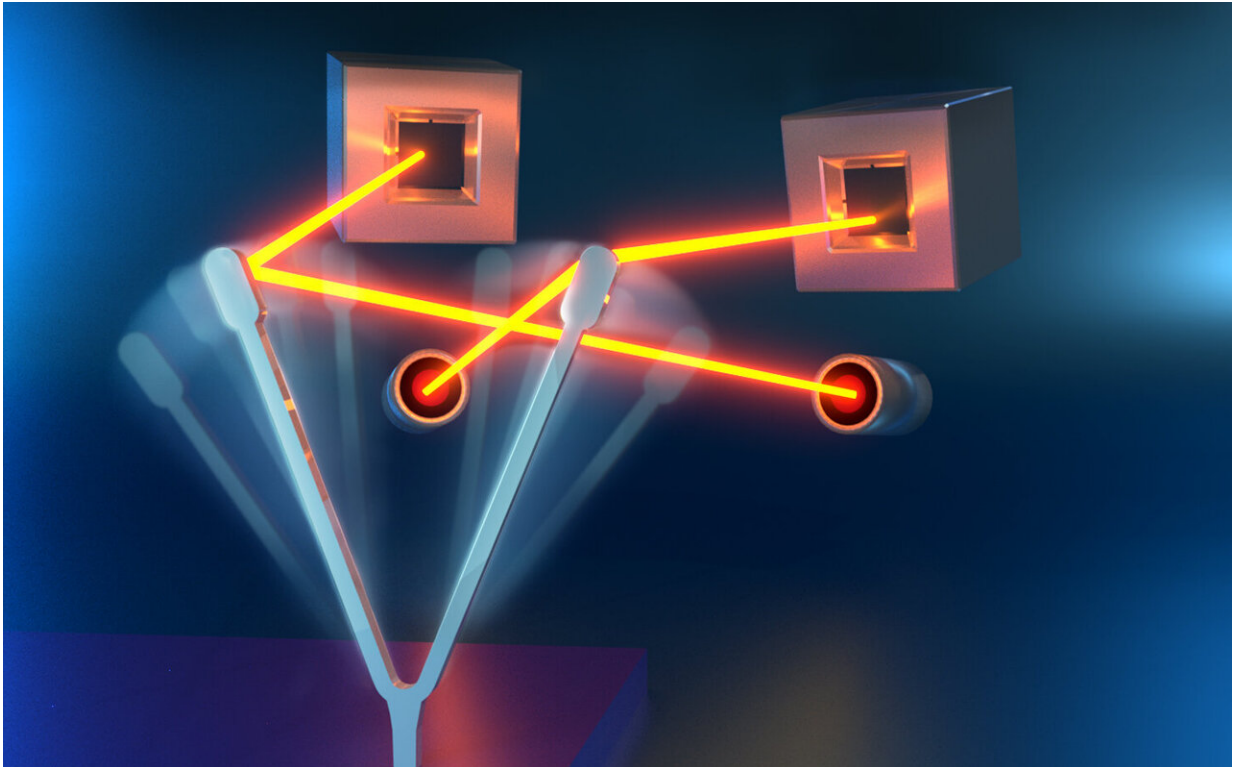


Nanoscience—Insect-inspired motion sensing

November 5 2019



Researchers at the Center for Nanophase Materials Sciences demonstrated an insect-inspired, mechanical gyroscope to advance motion sensing capabilities in consumer-sized applications. Credit: Jill Hemman/Oak Ridge National Laboratory, U.S Dept. of Energy

Researchers at Oak Ridge National Laboratory and the National Renewable Energy Laboratory took inspiration from flying insects to demonstrate a miniaturized gyroscope, a special sensor used in

navigation technologies.

Gyroscopes sense rotational motions to provide directional guidance without relying on satellites, so they are immune to signal jamming and other [cyber threats](#), making them ideal for aircraft and submarines.

Integrating the devices into smaller defense and consumer electronics has been challenged by fundamental obstacles.

At micro sizes, gyroscopes' electrical components can produce noise that interferes with their operation.

To maintain performance at microscale, the team developed an all-[mechanical device](#) with no on-chip [electrical components](#).

The coin-sized design, fabricated at the Center for Nanophase Materials Sciences, mimics halteres, the vibrating wing-like organs flying insects use to navigate.

"Our goal was to optimize cost and performance in the smallest design possible to expand the market for this technology," said ORNL's Nick Lavrik.



Researchers at the Center for Nanophase Materials Sciences demonstrated an insect-inspired, mechanical gyroscope to advance motion sensing capabilities in consumer-sized applications. Credit: Jill Hemman/Oak Ridge National Laboratory, U.S Dept. of Energy

More information: N. V. Lavrik et al. Optically read Coriolis vibratory gyroscope based on a silicon tuning fork, *Microsystems & Nanoengineering* (2019). [DOI: 10.1038/s41378-019-0087-9](https://doi.org/10.1038/s41378-019-0087-9)

Provided by Oak Ridge National Laboratory

Citation: Nanoscience—Insect-inspired motion sensing (2019, November 5) retrieved 19 April

2024 from <https://phys.org/news/2019-11-nanoscienceinsect-inspired-motion.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.