

Researchers develop simple device to recreate complex birdsongs

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A new study finds that the inherent complexity in birdsongs might actually be the result of a simple controllable instability in the structure of the specialized organ used to create song.

Researchers at the Harvard John A. Paulson School of Engineering and Applied Sciences have developed a simple device that mimics complex birdsongs. The device, developed by the group of L. Mahadevan, the Lola England de Valpine Professor of Applied Mathematics, of Organismic and Evolutionary Biology, and of Physics, uses air blown through a stretched rubber tube to recreate birdsongs found in nature, including the songs of Zebra and Bengalese finches.

The study finds that the inherent complexity in birdsongs might actually be the result of a simple controllable instability in the structure of the specialized organ used to create song, known as a syrinx.

The research suggests that birds may have harnessed the physical properties of a soft material to produce and control [birdsong](#).

"Our study adds to the growing realization that physical instabilities with rich nonlinear dynamics, when coupled to relatively simple control mechanisms, may provide a mechanism for birds to begin to create complex behavior by taking advantage of their physical, material nature," said Mahadevan.

The research published recently in *Journal of the Royal Society Interface* was co-authored with Aryesh Mukherjee and Shreyas Mandre, both former group members of the lab. Mahadevan is also a Core Faculty Member of the Wyss Institute for Biologically Inspired Engineering at Harvard University.

More information: Aryesh Mukherjee et al. Controllable biomimetic birdsong, *Journal of The Royal Society Interface* (2017). [DOI: 10.1098/rsif.2017.0002](#)

Provided by Harvard John A. Paulson School of Engineering and Applied Sciences

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