

Previously unknown letter reveals Einstein's thinking on bees, birds and physics

May 13 2021

ALBERT EINSTEIN
312 MERCER STREET
PRINCETON,
NEW JERSEY, U.S.

October 18, 1949

Mr. Ghyn Davys
60 A Lansdowne Rd,
Bournemouth, Hampshire
England

Dear Sir:

I am well acquainted with Mr. v. Frisch's admirable investigations. But I cannot see a possibility to utilize those results in the investigation concerning the basis of physics. Such could only be the case if a new kind of sensory perception, resp. of their stimuli, would be revealed through the behaviour of the bees. It is thinkable that the investigation of the behaviour of migratory birds and carrier pigeons may some day lead to the understanding of ^{some} ~~the~~ physical process which is not yet known.

Sincerely yours,

A. Einstein

Albert Einstein,

Letter by Albert Einstein, validated by The Hebrew University of Jerusalem, where Einstein bequeathed his notes, letters and records. Credit: Dyer et al. 2021, J Comp Physiol A / The Hebrew University of Jerusalem

The 1949 letter by the physicist and Nobel laureate discusses bees, birds and whether new physics principles could come from studying animal senses.

It's a position still being realized within [physics](#) to this day, with a growing body of research and understanding of how animals such as birds and bees find their way around.

Now a study led by RMIT University in Melbourne, Australia, discusses how recent discoveries in [migratory birds](#) back up Einstein's thinking 72 years ago.

The previously unpublished [letter](#) was shared with researchers by Judith Davys—Einstein had addressed it to her late husband, radar researcher Glyn Davys.

RMIT's Associate Professor Adrian Dyer has published significant studies into bees and is the lead author of the new paper on Einstein's letter, published in the *Journal of Comparative Physiology A*.

Dyer said the letter shows how Einstein envisaged new discoveries could come from studying animals.

"Seven decades after Einstein proposed new physics might come from animal sensory perception, we're seeing discoveries that push our

understanding about navigation and the fundamental principles of physics," he said.

The letter also proves Einstein met with Nobel laureate Karl von Frisch, who was a leading bee and animal sensory researcher.

In April 1949, von Frisch presented his research on how honeybees navigate more effectively using the polarization patterns of light scattered from the sky.

The day after Einstein attended von Frisch's lecture, the two researchers shared a private meeting.

Although this meeting wasn't formally documented, the recently discovered letter from Einstein provides insight into what they might have talked about.

"It is thinkable that the investigation of the behavior of migratory birds and carrier pigeons may someday lead to the understanding of some physical process which is not yet known," Einstein wrote.

Professor Andrew Greentree, a [theoretical physicist](#) at RMIT, said Einstein also suggested that for bees to extend our knowledge of physics, new types of behavior would need to be observed.

"Remarkably, it is clear through his writing that Einstein envisaged new discoveries could come from studying animals' behaviors," Greentree said.

More than 70 years since Einstein sent his letter, research is revealing the secrets of how migratory birds navigate while flying thousands of kilometers to arrive at a precise destination.

In 2008, research on thrushes fitted with [radio transmitters](#) showed, for the first time, that these birds use a form of magnetic compass as their primary orientation guide during flight.

One theory for the origin of magnetic sense in [birds](#) is the use of quantum randomness and entanglement. Both of these physics concepts were first proposed by Einstein.

More information: Adrian G. Dyer et al, Einstein, von Frisch and the honeybee: a historical letter comes to light, *Journal of Comparative Physiology A* (2021). [DOI: 10.1007/s00359-021-01490-6](https://doi.org/10.1007/s00359-021-01490-6)

Provided by RMIT University

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