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**Swarms of bees could unlock secrets to human brains**

**Scientists at the University of Sheffield believe decision making mechanisms in the human brain could mirror how swarms of bees choose new nest sites.**

Striking similarities have been found in decision making systems between humans and insects in the past but now researchers believe that bees could teach us about how our brains work.  
  
Experts say the insects even appear to have solved indecision, an often paralysing thought process in humans, with scouts who seek out any honeybees advertising rival nest sites and butt against them with their heads while producing shrill beeping sounds.  
  
Dr James Marshall, of the University of Sheffield's Department of Computer Science, who led the UK involvement in the project and has also previously worked on similarities between how brains and insect colonies make decisions, said: "Up to now we've been asking if honeybee colonies might work in the same way as brains; now the new mathematical modelling we've done makes me think we should be asking whether our brains might work like honeybee colonies.  
  
"Many people know about the waggle dance that honeybees use to direct hive mates to rich flower patches and new nest sites.

Our research published in the journal Science (on December 9), shows that this isn't the only way that honeybees communicate with each other when they are choosing a new nest site; they also disrupt the waggle dances of bees that are advertising alternative sites."  
  
Biologists from Cornell University, New York, University of California Riverside and the University of Bristol set up two nest boxes for a homeless honeybee swarm to choose between and recorded how bees that visited each box interacted with bees from the rival box.

They found that bees that visited one site, which were marked with pink paint, tended to inhibit the dances of bees advertising the other site, which were marked with yellow paint, and vice versa  
  
Tom Seeley of Cornell University, author of the best-selling book Honeybee Democracy said "We were amazed to discover that the bees from one nest box would seek out bees performing waggle dances for the other nest box and butt against them with their heads while simultaneously producing shrill beeping sounds.

We call this rough treatment the 'stop signal' because most bees that receive this signal will cease dancing a few seconds later."  
  
Dr Patrick Hogan of the University of Sheffield, who constructed the mathematical model of the bees, added: "The bees target their stop signal only at rivals within the colony, preventing the colony as a whole from becoming deadlocked with indecision when choosing a new home.

This remarkable behaviour emerges naturally from the very simple interactions observed between the individual bees in the colony."

**Notes for Editors:** The Faculty of Engineering at the University of Sheffield is one of the largest in the UK. Its seven departments include over 3,000 students and 800 staff and have research-related income worth more than £40M per annum from government, industry and charity sources. The 2008 Research Assessment Exercise (RAE) confirmed that two thirds of the research carried out was either Internationally Excellent or Internationally Leading.  
  
The Faculty of Engineering has a long tradition of working with industry including Rolls-Royce, Network Rail and Siemens. Its industrial successes are exemplified by the award-winning Advanced Manufacturing Research Centre (AMRC) and the new £25 million Nuclear Advanced Manufacturing Research Centre (NAMRC). To find out more, visit: [Engineering](http://www.shef.ac.uk/faculty/engineering)  
  
For more information on the University of Sheffield's Department of Computer Science visit: [Department of Computer Science](http://www.shef.ac.uk/dcs)

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