

Lessons from Ants



Deborah M Gordon
Professor, Biology

CURRENT RESEARCH

Probing ant colonies to gain insight into other biological and technological systems

The most fundamental question in biology is: How do the parts work together to create the behavior of the whole system? Dr. Deborah Gordon, Professor of Biology at Stanford University, focuses on how ant colonies, without any central control, function using simple interactions among individuals. No ant understands what needs to be done, yet the whole colony can adjust to changing conditions. Ant colonies are an ideal system to study, because we can see everything that is happening, and they can help us to understand what to look for in analogous systems that are much harder to see -- such as in the brain, in cancer, or in data networks.

An ant colony works without anyone in charge. The queen has no political authority; she just lays the eggs. Many systems in nature, such as brains, work this way. Collaborating with biologists in other fields like genetics and neuroscience, engineers, and physicists, Dr. Gordon examines how the diverse species of ants 14,000 species in every conceivable habitat on Earth - solve ecological problems collectively. Dr. Gordon is interested in understanding what we can learn from analogies among systems.

Current projects include:

- Long-Term Study of a Population of Ant Colonies: Dr. Gordon's study of a population of harvester ant colonies in the desert of the Southwest US, now lasting nearly 30 years, is the longest study of social insect colonies. It has shown how colonies change as they grow older and larger, and has demonstrated for the first time how evolution is currently shaping collective behavior. The results show that in the current drought, colonies that conserve water are more likely to produce offspring. Dr. Gordon continues to study the...

AFFILIATION

 Stanford University

EDUCATION

- Ph.D. in Zoology 1984, Duke University
- M.Sc. in Biology 1977, Stanford University
- B.A. in French 1976, Oberlin College

AWARDS

- Gores Teaching Award, Stanford, 2000
- Guggenheim Fellowship, 2002
- Fellow, Center for Advanced Studies in Behavior, 1999, 2001, 2009

RESEARCH AREAS

Environment, Ecology, Neurological / Cognitive, Computational Sciences / Mathematics

FUNDING REQUEST

Your contributions will support the continued research of Dr. Deborah Gordon at Stanford University as she draws parallels between ant colonies and other biological and technological systems that we surround us. Donations will help fund \$75K required for fieldwork, \$100K/year for each team member, and \$50K/year for supplies in conducting robust research. Partner with Dr. Gordon as her lab makes unique discoveries about ants and the lessons they teach us!

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