

MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Is There Sex on Other Planets?

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Zoom

Abstract

We ask the question: if an alien system of self-replicating entities were discovered, should we expect sex and/or recombination to be features of this system? Put differently, are sex and recombination inherent features of life itself? Current theory finds many special circumstances in which sex and recombination might be expected to evolve, but this “patchwork of special cases” (with many holes) does not seem to fit the observations: in nature, sex and recombination are everywhere — spanning all environments and all levels of organismal size and complexity. Increasingly, even species traditionally thought to be asexual have been caught “having sex on the sly”. The observations, therefore, seem to call for an encompassing feature common to living things in general that promotes the evolution of sex and recombination. And we think we have a candidate! We think this general feature might very well be none other than natural selection itself. Using a probabilistic framework, we have shown this to be true both across space in a structured population and across time within a single population. I will go into some detail in showing how the across-space case works for which I will show an intuitive “visual proof”, I will outline the math for the less intuitive across-time case, and I will mention ideas and current work on the connection between the two. Proofs of both cases are remarkably encompassing, having zero dependence on where heritable variation comes from, how it is generated, or how fitness is distributed. The implication is that sex and recombination should be selectively favored anywhere natural selection operates.

Authors:

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Zoom details can be found at: <https://stt.natsci.msu.edu/stt-colloquium-zoom-info/>

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