

Biomathematics Seminar

Friday, 11:00-11:50 am, Sept 5, 2025

Speaker: Dr. Samuel Alexander
U.S. Securities and Exchange Commission

Title: A formal species notion based on identical ancestor points

Abstract:

J.T. Chang showed that in a two-parent Wright-Fisher population model with large constant population size n , with high probability, every generation older than $1.77\log_2(n)$ generations ago consisted entirely of common ancestors and common non-ancestors of the current generation. More realistic numerical simulations confirm that probably within the last 10,000 years, there was a time when humanity consisted entirely of common ancestors and common non-ancestors of the humans alive today. The most recent such time is called the identical ancestor point (for *Homo sapiens* as of today). Chang conjectured this could help us better understand species trees "with a reality that is not tied to or derived from gene trees" but purely from genealogy. We introduce four species axioms, the most important and controversial of which is based on identical ancestor points; we define "atomic species" to be maximal sets of organisms subject to these four axioms; and we show that every organism inhabits such a species. This work recently advanced to "accept pending major revisions" at JOMB.

Zoom link:

<https://texastech.zoom.us/j/93886533169?pwd=sJbJSi4BQsy2OM2ow8A4xsELJHgl22.1>

Meeting ID: 938 8653 3169

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