



## Erin Molloy, Ph.D.

Assistant Professor,  
Computer Science Department  
University of Maryland, College Park  
<https://ekmolloy.github.io/>

**Friday, Feb 27, 2026**

**12:00-1:00 pm**

**Morgridge Hall Seminar Room 7650 or**

**Zoom:**

<https://uwmadison.zoom.us/j/96633729112?pwd=tHFc9i1dAAgmXe05uWtw8wXBIZxGB.1>

**Passcode: 621125**

# Fast species tree (and tree of blobs) reconstruction with statistical guarantees

**Abstract:** Evolution is a complex process involving the transmission of genetic variation from parent to offspring, along with populations splitting into isolated groups or interbreeding (i.e., mixing). Reconstructing these splitting events as evolutionary trees, or networks in the case of mixing, is a critical step in many biological studies; however, this task poses significant computational and statistical challenges. Notably, some of the most widely used methods for tree reconstruction, including the ASTRAL family of methods, are often applied in settings where they are the fastest option, yet their statistical properties are not fully understood.

In this talk, I will present new statistical guarantees for ASTRAL. In the first part, I will show that a variant of ASTRAL, closely related to ASTRAL-Pro, is consistent under a unified model of gene duplication, loss, and inheritance (i.e., coalescence), with some assumptions on input correctness. To our knowledge, this is the first consistency result since ASTRAL-Pro was introduced in 2020. In the second part, I will present a simple algorithm, based on ASTRAL, and show that it is a consistent estimator for the "tree of blobs," which captures only the tree-like components of a network. This result informs the interpretation of popular evolutionary analyses and may enable fast network reconstruction. Throughout the talk, I will highlight practical challenges and open questions.

**Bio:** Erin Molloy is an Assistant Professor of Computer Science at University of Maryland, College Park. She is interested in the design, analysis, and evaluation of bioinformatics methods, particularly for evolutionary tree and network reconstruction. Her research is supported by an NSF CAREER Award. Before joining Maryland, Molloy was a postdoctoral researcher at the University of California, Los Angeles. Her Ph.D. is in Computer Science from the University of Illinois at Urbana-Champaign. More information about her research group is available at [molloy-lab.org](http://molloy-lab.org).



**School of Medicine  
and Public Health**

UNIVERSITY OF WISCONSIN-MADISON