

## **Similarity Searches on Parallel Heterogeneous Architectures and Their Applications**

**Tuesday, April 14, 2026**  
**2:00 pm – 3:00 pm**  
**E-Hall 236**

Reception to follow  
3:00 pm – 3:30 pm  
E-Hall 236



### **Dr. Micheal Gowanlock**

Associate Professor of the School of Informatics, Computing, and Cyber Systems, Northern Arizona University

**ABSTRACT:** In this talk, I will discuss accelerating similarity searches and related search problems using several parallel architectures, including the specialized tensor and ray tracing cores that are found on modern graphics processing units (GPUs). Similarity searches (sometimes referred to as range queries) are fundamental operations that are used in many database and machine learning algorithms that require information about nearby points/feature vectors in a data space. However, similarity searches have data-dependent workload characteristics, which make them challenging to parallelize efficiently on parallel architectures. I will discuss my work on parallel similarity searches and describe how they are being applied to a large-scale astronomy project, the Rubin Observatory's Legacy Survey of Space and Time.

**BIOGRAPHY:** Mike Gowanlock is an associate professor in the School of Informatics, Computing, and Cyber Systems at Northern Arizona University. He obtained his PhD in Computer Science from the University of Hawaii at Manoa in 2015 and was a postdoctoral associate at MIT Haystack Observatory from 2015-2017. Mike Gowanlock's research interests include parallel, high performance, and data-intensive computing, general purpose computing on graphics processing units, and applications of parallel computing, including those in astronomy, ecology, and cybersecurity.