1145-18-1376 **Michael Robinson*** (michaelr@american.edu), 4400 Massachusetts Ave NW, Washington, DC 20016. *Analyzing data with the consistency filtration of a sheaf assignment.*

Suppose that there are a number of events that have occurred, and that we have observed a subset of these events. Some of these events are related by causality, which is to say that the occurrence of some events ensures that certain others will also occur. Conversely, there may be events that could have happened, but didn't. One rarely has a complete understanding of causality among events, so the model of which events cause other events may be wrong and our observations may be faulty.

Sheaves can represent both data and modeling assumptions about causality, yet can avoid prioritizing one over the other. By incorporating geometry into "attributes" attached to events from the start, the global "fit" between local data and models can be quantified. This supports robust inferences about missing or inaccurate data.

This talk will formalize and unify these ideas using the consistency filtration associated to a sheaf of pseudometric spaces and an assignment of data. As a filtration, it has persistence properties – both functorial and geometric – and generalizes persistent cohomology. This generalization is strict, which leads to new, interesting, and robust tools for data analysis. (Received September 21, 2018)