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Nina Otter* (notter@ucla.edu). *Invariants for multiparameter persistence and their computation.*

Persistent homology (PH) is arguably one of the best known methods in topological data analysis. PH allows to study topological features of data across different values of a parameter, which one can think of as scales of resolution, and provides a summary of how long individual features persist across the different scales of resolution. In many applications, data depend not only on one, but several parameters, and to apply PH to such data one therefore needs to study the evolution of qualitative features across several parameters. While the theory of 1-parameter PH is well understood, the theory of multiparameter PH is hard, and it presents one of the biggest challenges of topological data analysis. In this talk I will briefly introduce persistent homology, and then explain how tools from commutative algebra give computable invariants for multiparameter PH, which are able to capture homology classes with large persistence. If time remains I will discuss efficient algorithms for the computation of these invariants and demonstrate how they can be computed in practice on a computer. This talk is based on joint work with A. M. del Campo, H. Harrington, H. Schenck and U. Tillmann. (Received September 25, 2018)