

1154-VC-1444      **Ho-Chun Herbert Chang\*** (hochunhe@usc.edu), 3502 Watt Way, Suites G4 & G6, Los Angeles, CA 90089-0281, and **Feng Fu**. *Social Network of Mathematical Concepts: A Study on Wikipedia*. Preliminary report.

Collaborative encyclopedias like Wikipedia provide a unique opportunity to understand the temporal, social and historical dynamics of how knowledge is organized. In mathematics, a theorem is any true statement generated by a set of axioms by logical consequence. While there are multitudes of "theorems," there is some notion of importance attributed to key theorems. Wikipedia only lists 1,063 theorems, many of which do not have their own page. In other words, mathematical concepts and their curation arise from collective and social consensus. This paper "maps" how mathematical concepts are popularly organized on Wikipedia, its editorial behavior and mathematicians in history. A multi-layer social network of mathematical objects (axioms, theorems, and conjectures) is constructed using graph-theoretic metrics. Results reveal a core-periphery topology on each layer, including a giant components. Raw categories (224 total) follow a power-law distribution, which is typically consistent with human curation and consensus. Furthermore, many theorems spill over to other fields in the natural and social sciences, for which we provide preliminary results, which yields insight into historical collaborations between pure and applied mathematics and also potential future synergies. (Received September 15, 2019)