

1116-L1-1922

Emilie Purvine* (emilie.hogan@pnnl.gov), **Michael Robinson** and **Cliff Joslyn**.

Categorification in the real world. Preliminary report.

Categorification, as the process of enriching a set or category by lifting it to a category with deeper structure, has been a part of pure mathematics for many years. Examples include taking the natural numbers to the category of finite vector spaces, the integers to Euler characteristic, and the Jones polynomial to Khovanov homology. Our recent joint work between Pacific Northwest National Laboratory and American University has been in the field of heterogeneous information integration for Business, Industry, and Government (BIG) applications using sheaf theory. In doing this work it is necessary to ground many different information types - e.g., semantic, partial ordinal, interval valued - within a common data type, namely, finite vector spaces. In order to achieve this, we have developed a two step categorification process. First we define categories for each of our data types (e.g., semantic data becomes SET). We then categorify each into FVECT, the category of finite vector spaces. In this talk I will describe this categorification process and how it is relevant to the problem of heterogeneous information integration. (Received September 21, 2015)