

The SUMO Speaker Series for Undergraduates

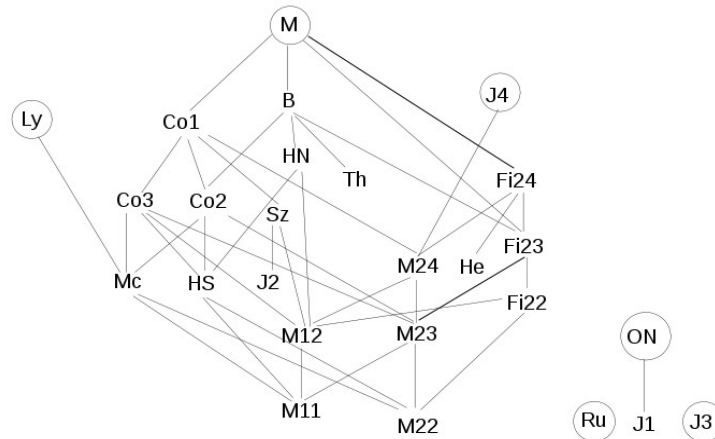
(Pizza Provided)

Wednesday, June 1st

4:15-5:05, room 380C

Classification of Finite Simple Groups

Professor Brian Conrad



ABSTRACT:

In a first course on group theory, one encounters two infinite families of finite simple groups: cyclic groups of prime order and alternating groups A_n for $n > 4$. It is a remarkable fact that apart from the cyclic and alternating groups and 26 other exceptions (see the picture above), all finite simple groups can be constructed in a systematic way using linear algebra over finite fields (and fall into 4 infinite families, along with 5 exceptional types, and "twisted" versions of these in characteristics 2 and 3).

After describing the classification in more precise terms, we'll see through examples how to use ideas originally developed in the study of connected (!) compact groups to think about the "linear algebra" examples in a more-or-less unified manner (including the proof of their simplicity!), thereby making it plausible that the classification does not lead to infinitely many ad hoc arguments in practice. We will assume familiarity with finite fields and linear algebra.

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