



## Mathematics Colloquium

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# Small Representations of finite classical groups

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### Abstract

Suppose you have a finite group  $G$  and you want to study certain related structures (random walks, expander graphs, word maps, etc.). In many cases, this might be done using sums over the characters of  $G$ . A serious obstacle in applying these formulas seemed to be lack of knowledge over the low dimensional representations of  $G$ . In fact, the “small” representations tend to contribute the largest terms to these sums, so a systematic knowledge of them might lead to proofs of some important conjectures. The “standard” method to construct representations of finite classical group is due to Deligne and Lusztig (1976). However, it seems that their approach has relatively little to say on the small representations.

This talk will discuss a joint project with Roger Howe (Yale), where we introduce a language to define, and a new method for systematically construct, the small representations of finite classical groups.

I will demonstrate our theory with concrete motivations and numerical data obtained with John Cannon (MAGMA, Sydney) and Steve Goldstein (Scientific computing, Madison).

**Wednesday, 30 November 2016, 4pm**

**Smith Hall 204**

Tea and refreshments will be served at 3:45pm.