

Wednesday, September 2, 2009  
4:00–4:50 p.m.  
SAS 2229

# Hey! That's not my hat!

## Derangements and the number $e$

Nathan Reading

When you come to this SUM Series talk, check your hat at the door. I'll give it back when the talk is over. But I'm not going to keep track of whose hat is whose. I'll just give them back at random. **Amazing fact:** the probability that nobody will get their own hat back is almost exactly  $1/e$ . (If only 10 people check their hats, the answer  $1/e$  is correct to 8 decimal places, and it gets better the more people check their hats.) To explain this unexpected appearance of the number  $e$ , I'll define and count **derangements** and introduce **inclusion-exclusion**, an important counting technique.

The talk will be **accessible to all undergraduates**.

NCSU Society for Undergraduate Mathematics

# SUM Series

Mathematics and pizza!