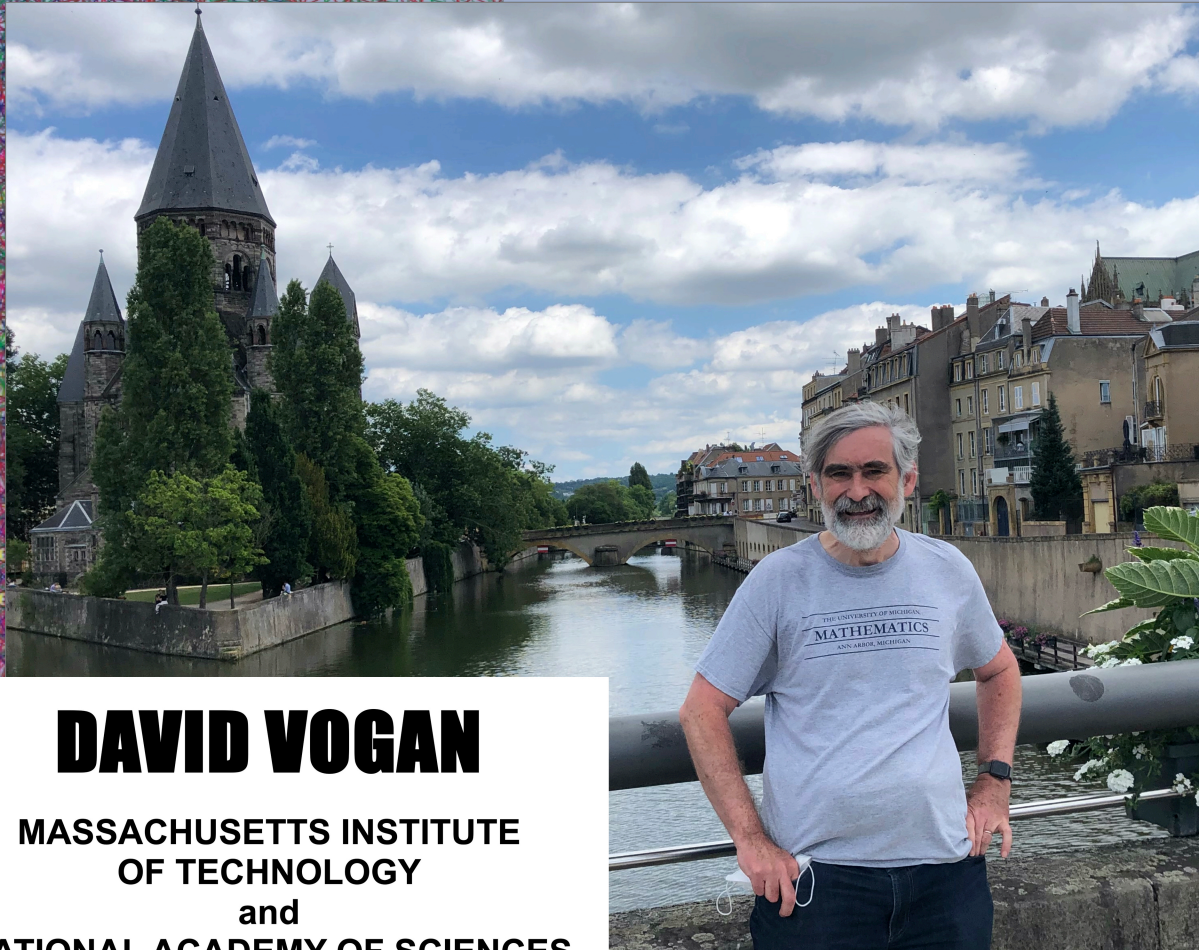


COLLOQUIUM DE MATHÉMATIQUES

# WHAT'S SPECIAL ABOUT SPECIAL?

Jeudi 5 décembre 2024, 16h30  
Amphi Hedy Lamarr, UFR MIM



**DAVID VOGAN**

MASSACHUSETTS INSTITUTE  
OF TECHNOLOGY  
and  
NATIONAL ACADEMY OF SCIENCES  
(USA)

**Abstract:**

Both conjugacy classes of nilpotent matrices (of size  $n$ ) and irreducible representations of the symmetric group  $S_n$  are indexed by partitions of  $n$ . For any complex reductive group, there is a (finite) collection of conjugacy classes of nilpotent Lie algebra elements, and a (finite) set of irreducible Weyl group representations, both enumerated by the 1950s. One might therefore hope for a relationship between these finite sets. I'll first explain Springer's (somewhat complicated) description of such a relationship, and then Lusztig's identification of a *bijection* between what he called *special* Weyl group representations and *special* nilpotent orbits.

I'll explain how these ideas arise in the representation theory of real reductive groups, and what light that might shed on Lusztig's definition of special.

Picture of the Lie algebra E8:  
<https://aimath.org/e8/mcmullen.html>



UNIVERSITÉ  
DE LORRAINE

UFR MATHÉMATIQUES, INFORMATIQUE,  
MÉCANIQUE ET AUTOMATIQUE