

## ***LIE THEORY SEMINAR***

**Speaker: Jacob Haley**  
**University of Michigan**

**Date:** Thursday, November 12, 2020

**Time:** 3:00 PM

**Location:** Zoom

**Zoom URL:** <https://notredame.zoom.us/j/94944822572?pwd=UE1CZE5aZVpHSmdVUVpGYjVVTAYyUT09>

**Lecture Title:**

**Parameterizations of Tori in  $p$ -adic Classical Groups**

**Abstract**

If  $G$  is a reductive algebraic group defined over a  $p$ -adic field  $k$ , a fundamental problem is to understand the conjugacy classes of maximal tori over  $k$ . In the case of unramified tori, tori which split over the maximal unramified extension of  $k$ , there are known results. In particular, for a general reductive group, DeBacker gives a parameterization of the  $G(k)$ -conjugacy classes of maximal unramified tori using Bruhat–Tits theory, which allows one to relate the  $p$ -adic group  $G$  to a family of groups defined over a finite field. On the other hand, for classical groups, Waldspurger gives a parameterization in terms of triples of partitions. Given one of these triples, Waldspurger constructs a regular semisimple element, an element in the Lie algebra whose centralizer is a torus, for a maximal unramified torus by defining a map on a  $k$ -algebra whose structure is determined by the parts of the three partitions. After giving an overview of the two parameterizations, we will give a comparison, emphasizing the case of the symplectic group throughout. The talk should hopefully be accessible to anyone who knows some Lie theory and is willing to believe a bit about  $p$ -adic numbers.