Title : Counting integral matrices with a given characteristic polynomial

Abstract: Let $P(x) \in \mathbb{Z}[x]$ be a monic irreducible polynomial of degree n and $M_n(\mathbb{Z})$ be the space of $n \times n$ integral matrices. Let $V = \{X \in M_n(\mathbb{Z}) : \det(xI - X) = P(x)\}$ and B_T be the Euclidean ball centered at 0 of radius T in $M_n(\mathbb{R})$. In this talk, I will explain the asymptotic formula of Eskin, Mozes and Shah:

$$\lim_{T\to\infty} \frac{\#(V \cap B_T)}{T^{n(n-1)/2}} = C_P$$

for some constant $C_P > 0$. If time permits, I will explain the interpretation of the constant C_P in terms of orbital integrals by work of Yuchan Lee base on work of Dasheng Wei and Fei Xu. No new results will be discussed in this talk.