

### **Existence of totally reflexive modules in graded local rings with Hilbert series $1+et+(e-1)t^2$**

Basanti Poudyal, University of Texas at Arlington

Abstract: Let  $(A,m)$  be a Noetherian local graded ring with Hilbert series  $1+et+(e-1)t^2$ . It is known that the existence of exact zero divisors implies the existence of non-free totally reflexive modules. We are interested in the existence of these modules in the absence of exact zero divisors. In a recent study, Vraciu and Atkins constructed an example of a ring of codimension 8 that does not have exact zero divisors, but has non-free totally reflexive modules. In this talk, I will give a class of rings of codimension 5 and higher admitting totally reflexive modules, but without having exact zero divisors.

### **Dimensions of $Kl(p^2)$ -invariant vectors for irreducible non-supercuspidal representations of $GSp(4, F)$**

Shaoyun Yi, University of Oklahoma

Abstract: In this talk, firstly I will review the result of dimensions of Parador-invariant vectors for Iwahori-spherical representations of  $GSp(4,F)$ . Then I would like to talk about the  $Kl(p^2)$ -invariant case for all the irreducible non-supercuspidal representations of  $GSp(4, F)$  which I am working on recently.

### **Uniserial Representations of $Vec(\mathbb{R})$**

Connor O'Dell, University of North Texas

Abstract: The infinite dimensional representations of infinite dimension Lie algebras frequently fail to be decomposable into a direct sum of irreducible representations. In this talk, we will see a method to classify a certain class of completely indecomposable representations of the vector fields on the real line.

### **Arithmetic in Quaternion Algebras**

Jordan Weibe, University of Oklahoma

Abstract: In this talk we'll construct and classify some important quaternion algebras, develop orders and some important properties, and discuss local and global constructions.

### **Solvable Metric Lie Algebras and their Nilradicals**

Thomas Lane, University of Oklahoma

Abstract: One can often reduce the study of Lie groups with left-invariant metrics to the study of metric Lie algebras. For the case of a solvable Lie algebra, the nilradical, the largest nilpotent ideal, contains a substantial amount of information. In this talk, we will obtain some results when the nilradical is 2-step nilpotent or filiform.

## **Schur Functors and Young Symmetrizers**

Gordon Brown, University of Oklahoma

Abstract: When representation theory was still in its infancy, Issai Schur discovered a remarkable interplay between the general linear and symmetric groups. This relationship is encapsulated by the existence of certain elements of the group algebra of the latter, the Young symmetrizers, which act as a bridge between the two: the ideal generated by a symmetrizer is a simple symmetric group module, and every symmetrizer induces a functor which transforms finite-dimensional vector spaces into simple general linear group modules. In this talk, I will describe the origins of this duality from both perspectives, and indicate some places where these topics have appeared more recently.

## **Level of Siegel modular form constructed via $\text{Sym}^3$ map**

Manami Roy, University of Oklahoma

Abstract: Ramakrishnan and Shahidi proved a lifting from an elliptic (non-CM) modular form  $f$  of weight 2 and level  $N$  to a degree 2 Siegel modular form  $F$  of weight 3 and principal congruence subgroup level  $N$ . Our goal is to better understand the level of Siegel modular form  $F$ . For example one can ask what will be the level with respect to the paramodular subgroup. In this talk I will explain the result proven by Ramakrishnan-Shahidi and my ongoing research for better understanding the level of Siegel modular form.