MATHEMATICS COLLOQUIUM

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Title: Poincaré and Picard bundles for moduli spaces of vector bundles over nodal curves

Abstract: Poincaré and Picard bundles and their different variants have been a topic of interest ever since the quest for moduli spaces of vector bundles was initiated, owing to their universality. Though a great deal is known about these objects in the case of smooth curves, the study on singular curves has been relatively slow. Interestingly, the results for irreducible nodal curves are very similar to those for smooth curves; however, the proofs are different and difficult. It was known for a long time that there does not exist a Poincaré bundle for the moduli problem of vector bundles on smooth curves if the rank and degree are not coprime. We primarily aim to discuss the non-existence of a Poincaré bundle parametrised by the moduli space of vector bundles on nodal curves when the rank and degree are not coprime.

There has also been a considerable amount of interest to understand the stability of Poincaré and projective Poincaré bundles as well as Picard and projective Picard bundles. The secondary aim of the talk is to discuss the stability of projective Poincaré and Picard bundles, again when the degree and rank are not relatively prime to each other in the context of nodal curves.

On the way to achieve these goals, we compute the codimension of a few closed subsets of the moduli spaces. They are of independent interest and have other applications; we discuss a few of them.

This is a joint work with Prof. Usha Bhosle and Dr. Sanjay Singh.