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Mathematical Colloquia

Tuesday, 22 May 2018

17:15 h, Lecture Room B 78

Prof. Gene Freudenburg, Western Michigan University (USA)

Real Forms of Objects in Affine Algebraic Geometry

Abstract. A real form of an algebraic $\mathbb{C}$-variety Y is an algebraic $\mathbb{R}$-variety X with $Y = \mathbb{C} \otimes X$. This definition extends naturally to objects such as: (1) algebraic groups, Lie groups, Lie algebras; (2) closed embeddings $Y_2 \hookrightarrow Y_1$; (3) fibrations/vector bundles $\pi : Y_2 \to Y_1$; (4) group actions $G \times Y \to Y$. Just as a given variety can have non-isomorphic real forms, these objects can also have non-equivalent real forms. A common pursuit is to classify the real forms of such objects. This talk discusses examples, counterexamples and open questions involving real forms of affine algebraic varieties, and includes the recent result that all closed polynomial embeddings of the circle $\mathbb{S}^1$ in the plane $\mathbb{R}^2$ are algebraically equivalent (F, 2018).