

Secant Varieties of Projective Varieties

Anthony Geramita

The problem of determining the dimensions of the higher secant varieties of the classically studied projective varieties is a problem with a long and interesting history. The recent work by J. Alexander and A. Hirschowitz completed a project that was underway for over 100 years and confirmed that, apart from the (few) well known exceptions, all the Veronese varieties had higher secant varieties of the expected dimension.

There has been no comparable success with the case of the Segre varieties, although there is much interest in this question not only among geometers. In fact, this particular problem is strongly connected to questions in representation theory, coding theory and algebraic complexity theory.

In this talk I will describe this same problem for another family of classically studied varieties, namely the Grassmann varieties in their Plücker embedding. The dimensions of all the higher secant varieties to the Grassmannians of lines in projective space are well known (and I will give a simple proof of this fact) but, to the best of my knowledge, little more can be found in the classical or modern literature.

This is a report on joint work with M.V. Catalisano (Genoa) and A. Gimigliano (Bologna).