Quadratic forms in four variables

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Monday, January 28, 2019
108 Kemeny, 3:30PM
High tea at 2:45PM

Abstract

From the classical study of ruled surfaces by Archimedes to the theory of space-time in mechanics and special relativity by Hamilton and Einstein, quadratic forms in four variables have found numerous applications in geometry and physics. In this talk, I will explain an interconnected web of results that relates quadratic forms in four variables to problems in algebra and number theory. Among these are the rationality problem, the Hasse principle, the Grothendieck-Serre conjecture for orthogonal groups, and the classification of biquaternion orders over number fields. Throughout, I will highlight how tools from geometry, topology, and computation enter into my own contributions to these problems.

This talk should be accessible to graduate students.