

abstract

HERMANN WEYL LECTURES

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

It has been known for a long time that varieties of general type are the most complicated algebraic varieties. It is only recently, however, that the correct definition of the "simplest" algebraic varieties was established. These are the rationally connected varieties.

Lecture 1. Introduction.

We define rationally connected varieties and establish their place in the classification theory of algebraic varieties. Work of Campana, de Jong, Graber, Hacon, Harris, K., McKernan, Miyaoka, Mori, Nadel, Starr and Zhang.

The next 3 lectures will consider 3 aspects of rationally connected varieties. They will be independent of each other.

Lecture 2. Arithmetic over finite and local fields.

Rationally connected varieties are expected to have very good arithmetic properties. Some of these are understood over finite and local fields. Work of Colliot-Thélène, Esnault, K., Kim and Szabo.

Lecture 3. The Nash conjecture and topology over \mathbb{R} .

We discuss the topology of rationally connected varieties over \mathbb{R} , focusing on the conjecture of Nash. Work of Eliashberg, K. and Viterbo.

Lecture 4. The Ax conjecture and degenerations.

Originating with his studies on the logic of finite fields, James Ax conjectured that every PAC field is C_1 . The recent proof of this in characteristic 0 is connected with degenerations of rationally connected varieties. Work of Hacon, Hogadi, K., McKernan and Xu.