Positivity of Divisors and Vector Bundles in Algebraic Geometry

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Timetable: 16 hrs. First lecture on April 6, 2021, 11:00 date already fixed, see Calendar) Torre Archimede, Room 1BC/45.

Course requirements: Basic algebraic geometry.

Examination and grading: Seminar.

SSD: MAT/03.

Aim: Have a view on the algebraic aspects of positivity, in the cases of divisors, line bundles and vector bundles.

Course contents:

• Divisor groups, numerical equivalence, duality. Equivalence on smooth varieties. Real divisors.
• Divisor cones. Properties of cones of divisors, criterions.
• Base loci of line bundles. Asymptotic properties.
• Time permitting: parenthesis on Okunkov bodies; examples; birational properties.
• Vector bundles and their base loci. Projective bundles, Grassmannian varieties. Globally generated vector bundles.
• Asymptotic base loci for vector bundles, positivity for vector bundles, algebraic properties and analytic properties.
• Varieties with positive tangent / cotangent bundle, some characterizations.