Universität Stuttgart

mathematik
physik fakultät8

Kolloquium
des Fachbereichs Mathematik

Es spricht am Montag, 21. Juni 2021 um 16:00 Uhr

Dr. Davide Cesare Veniani
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zum Thema:

"*A Himalayan tour between geometry and arithmetic*"

Abstract:

K3 surfaces form a class of compact complex surfaces named by Weil after the three mathematicians Kähler, Kummer and Kodaira and "the beautiful mountain K2 in Kashmir". They occupy a central place in the classification of compact complex surfaces.

Although all K3 surfaces have the same underlying topological space, their geometry is extremely variegated. One of the most common forms in which they appear is as smooth quartic surfaces in projective space.

In this seminar I will give an overview of my research, which started from a very classical question: how many lines can a quartic surface contain?

Since the 19th century it is known that a smooth cubic surface contains exactly 27 lines. The answer for quartic surfaces came much later in 1943 and it was actually flawed. A correct proof was given only a few years ago.

From there we will move to other enumerative problems on K3 surfaces, like counting Enriques quotients or elliptic fibrations. All these enumerative problems share a common pattern. In order to understand this pattern, I will give an elementary introduction to the theory of integral symmetric bilinear forms, which will lead us to the edge of arithmetic.

Finally we will try to reach unclimbed peaks: I will report on my latest results about a generalization of K3 surfaces in higher dimension, namely hyperkähler manifolds

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Die Dozentinnen und Dozenten des Fachbereichs Mathematik