Erwin Schrödinger Lecture

Thursday, December 10, 2015 - 5 p.m.

Boltzmann Lecture Hall, ESI, Boltzmanngasse 9, Vienna

Daniel Huybrechts

Mathematical Institute
University Bonn

Symmetries and K3 surfaces

Since Kodaira and Weil in the fifties, K3 surfaces have attracted a great deal of attention and it seems they will continue to do so for many years to come. Many mathematical concepts can be tested in their realm, from geometry, arithmetic, and more recently conformal field theory.

There is, however, one aspect that remains completely mysterious. Why is it that K3 surfaces have symmetries that can only be explained in terms of sporadic simple groups like the Conway group, related to the famous Leech lattice, or the slightly smaller Mathieu groups? This intriguing link has been observed in many instances but it has not yet been explained.

This talk will introduce into this fascinating area, starting with Mukai's result on finite groups of automorphisms of K3 surfaces, its modern version using derived algebraic geometry and to a phenomenon called 'K3 moonshine' in superconformal field theory.

Daniel Huybrechts holds a chair in mathematics at the University of Bonn; he is a member of the ESI Scientific Advisory Board.

The Erwin Schrödinger Lectures are directed towards a general audience of mathematicians and physicists. In particular it is an intention of theses lectures to inform non-specalists and graduate students about recent developments and results in some area of mathematics or physics.

The lecture will be followed by a reception in the spirit of Advent.

Joachim Schwermer
Director