



universität
wien

Fakultät für Mathematik

Mathematisches Kolloquium

Mittwoch, 29. November 2017

Sky Lounge

EINLADUNG

Douglas Hofstadter

(Indiana University, Bloomington)

"The Human Story behind the Hofstadter Butterfly"

"The Human Story behind the Hofstadter Butterfly"

Abstract:

From the early 1930s onwards, theoretical physicists strove to understand the behavior of electrons in a crystal when the crystal was placed in a magnetic field. While electrons in a crystal (with no magnetic field) were well understood, and while electrons in a magnetic field (with no crystal) were well understood, combining these two situations yielded a strangely recalcitrant problem, and insights were few and far between. In the mid-1970s, the speaker — at the time a graduate student in physics — was given this problem by his doctoral advisor. He struggled with it for almost a year, and then something marvelous suddenly happened. It turned out that over a decade earlier, as an undergraduate mathematics student, he had explored just the right area of mathematics to allow him to see the essence of what was happening in this physics problem. Thanks to this piece of luck, he discovered a visually riveting new type of quantum mechanical energy spectrum — a graph made out of an infinite number of smaller copies of itself. In the following decades, this graph became well known and acquired the nickname of “Hofstadter butterfly”. The lecture will recount the human story of this discovery, a tale rife with emotional twists and turns. In the talk there will be some technical parts, but most of it will be accessible to people with little knowledge of physics; all that is needed is a sense of curiosity about the laws of nature and a sympathy for the idea that beauty must play a key role therein.

15.45 Uhr: Kaffeejause

16.15 Uhr: Vortrag

vinum cum pane im Anschluss

Karl Sigmund
Christian Krattenthaler