Prof. Dr. Martin Kreuzer
Lehrstuhl für Symbolic Computation

UNIVERSITÄT PASSAU
Fakultät für Informatik und Mathematik

Habilitationskolloquium

Im Rahmen seines Habilitationsverfahrens trägt vor:

Herr Dr. Le Ngoc Long

zum Thema

Differential Techniques for 0-Dimensional Schemes

am Dienstag, 28.11.2023, um 17 Uhr c.t., in Raum (IM) HS 11

Abstract. Zero-dimensional schemes in a projective space over a field are important objects in algebraic geometry. They have been shown to have strong connections with other branches of mathematics such as singularity theory, coding theory, computer algebra, and algebraic cryptography. Currently, they continue to attract a lot of research interest. Especially, many approaches have been developed to analyze their geometric properties, for instance, via the use of their vanishing ideals and coordinate rings, their Hilbert functions and graded Betti numbers, cohomology, moduli spaces, etc.

In this talk we examine how differential techniques, i.e., techniques based on the structure and module-theoretic properties of Kähler differential modules, can be applied to study the algebraic structure and geometric properties of 0-dimensional schemes. In particular, we discuss recent results on the Hilbert functions of the Kähler differential modules of a 0-dimensional scheme, and on differential characterizations of geometric properties like the uniformity, curvilinear and complete intersection properties.