In der Reihe „Chemnitzer Mathematisches Colloquium" der Fakultät für Mathematik der TU Chemnitz spricht

Herr Prof. Luis Narváez Macarro (Universidad de Sevilla)

über das Thema

The Bernstein-Sato polynomial of a singularity: a mathematical gem.

Der Vortrag findet am

**Donnerstag, dem 23. Juni 2016, um 16.00 Uhr im Raum B202,
Reichenhainer Straße 70**

statt.

Ich möchte Sie hiermit recht herzlich zu dieser Veranstaltung einladen. Das Kolloquium wird von Herrn Prof. Dr. Christian Sevenheck geleitet.

Abstract:
Joseph Bernstein proved in 1971 that, given any polynomial f in several variables with real or complex coefficients, there exists a functional equation

$$b(k)f^k = P(k)f^{k+1}, \quad k \in \mathbb{Z}$$

where $P(s)$ is a partial linear differential operator depending on a parameter s and $b(s)$ is a non-zero polynomial with constant coefficients. His main motivation was a question raised by I. Gelfand at the Amsterdam ICM 1954 concerning the meromorphic continuation of the distribution f^s, originally defined for $f \geq 0$ and $Re(s) > 0$, and this question was also extremely related with the problem of division of distributions and so with the proof of the existence of fundamental solutions of partial linear differential equations with constant coefficients.

The proof of Bernstein of the above functional equation has been one of the nicest applications of the "algebraic point of view" in Mathematics. But, beside the original motivations, the result of Bernstein has been one of the cornerstone of "D-module theory" and of its applications to the study of singularities. In this direction, B. Malgrange (1974, 1983) and M. Kashiwara (1976, 1984) proved that the roots of the minimal $b(s)$ appearing in the functional equation are always rational numbers, and that they are directly related with the topology of the singularities of $f = 0$.

In this talk we will review all this story and at the end we will illustrate it with some recent results.

Prof. Dr. Christoph Helmberg
Dekan