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FAKULTÄT FÜR MATHEMATIK
Dekan Univ.-Prof. Dr. Christian Krattenthaler

Einladung zur öffentlichen Defensio von

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Thema der Dissertation:

On varieties in power series spaces

Abstract:
The goal of this thesis is to study the set $\mathcal{Y}(f)$ of solutions to an implicit equation $f(x, y(x)) = 0$ given by a vector of either algebraic, convergent or formal power series in two sets of variables. In 1968, Micheal Artin showed that if $f(x, y)$ is a vector of convergent power series, then every formal solution $\widehat{y}(x) \in \mathbb{C}[|x|]^N$ can be approximated up to any order by solutions given by vectors of convergent power series. Shortly after Artin, A. Ploski proved that it is even possible to parametrize a piece of the solution set of $f(x, y(x)) = 0$ by a substitution map $z(x) \mapsto \varphi(x, z(x))$ whose formal extension passes through $\widehat{y}(x)$. Motivated by these results and linearization techniques for power series by H.Hauser, G.Müller and C.Bruschek, we investigate the geometry, with an emphasis on local regularity properties, of analytic varieties $\mathcal{Y}(f)$ in power series spaces. It is shown that the set of points at which $\mathcal{Y}(f)$ can be locally trivialized by (infinite-dimensional) analytic isomorphisms is dense in $\mathcal{Y}(f)$. If the components of f define an isolated complete intersection singularity, then $\mathcal{Y}$ can be trivialized at each point and defines a smooth variety in this sense.

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