A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Donnerstag, 8. Juni 2017, 16.00 Uhr

Ort: Raum 031, Arnimallee 6, 14195 Berlin

Disputation über die Doktorarbeit von

Herrn Ángel Luis Muñoz Castañeda

Thema der Dissertation:

Principal G-bundles on Nodal Curves

Thema der Disputation:

Convolutional Codes and Enumerative Geometry

Die Arbeit wurde unter der Betreuung von **Prof. Dr. A. Schmitt** durchgeführt.

Abstracts: **1. Dissertation:**

ABSTRACT— A compactification for the moduli space of principal G-bundles over irreducible projective curves with at most one node as a singularity have been constructed by A. Schmitt, and generalized to higher dimensional algebraic varieties by U. Bhosle and A. Langer. This compactification happens to be isomorphic to the classical moduli space constructed by A. Ramanathan when the curve is non singular, and has good degeneration properties, making this construction to be directly linked with X. Sun's work about the degenerations of SL_n-bundles.
In this talk, I will discuss the main result of my thesis, which is the existence of a compactification over an arbitrary nodal curve, remarking some intermediate technical steps that allow us to give the first steps towards the compactification of the universal moduli space over $\overline{\mathcal{M}_g}$, following R. Pandharipande's work for $G = \mathrm{GL}_n$.

2. Disputation:

ABSTRACT— Convolutional codes appeared in the second half of the last century, and have been studied in deep from both, practical and theoretical point of view. As in the case of block codes, one can define convolutional Goppa codes. They are convolutional codes defined by evaluation of global sections of an invertible sheaf $\mathcal{L}$ over a smooth projective curve $\mathcal{C}$ defined over the field $\mathbb{F}_q(z)$. A natural question arises in both, block and convolutional cases: which codes are of Goppa type? The case of block codes was discussed by R. Pellikaan, *et al.*, while J. M. Muñoz-Porras, *et al.* prove that every convolutional code is Goppa.
In this talk, I will discuss the above result, regarding convolutional codes. Finally, I will show how this result establishes a link between enumerative algebraic-geometry and the theory of convolutional codes.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission

Prof. Dr. A. Schmitt