



## Seminar des SFB 647

### ZEIT:

14.12.2009, 15:00 Uhr - 18:00 Uhr

### ORT:

Humboldt-Universität zu Berlin  
Auditorium der Universitätsbibliothek  
Jacob-und-Wilhelm-Grimm-Zentrum  
Geschwister-Scholl-Straße 1/3  
10117 Berlin

### PROGRAMM:

15:00 - 16:00 **Dr. Ursula Ludwig**

#### **The Witten deformation for singular algebraic curves and stratified Morse functions**

About 25 years ago motivated by ideas in physics, Witten introduced a beautiful new approach to proving Morse inequalities based on the deformation of the de Rham complex (see ``Supersymmetry and Morse Theory'', J. of Differ. Geometry, 17). His ideas were fruitfully applied in different situations. In this talk I will first recall Wittens proof of the Morse inequalities for a Morse function on a compact smooth manifold and then explain how to give an analytic proof of the Morse inequalities of stratified Morse theory (as developed by Goresky/MacPherson) for singular algebraic curves by generalising the Witten deformation to the singular setting.

16:00 - 16:30 Kaffeepause

16:30 - 17:30 **Prof. Alessandro Chiodo (Universite Grenoble)**

#### **Mirror symmetry for hypersurfaces in weighted projective spaces**

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We present a very elementary construction (Berglund-Hübsch-Krawitz) of two Calabi-Yau varieties, which are symmetric in the sense of mirror symmetry. We give a proof of their symmetry by introducing the Landau-Ginzburg model. More generally, the Landau-Ginzburg/Calabi-Yau correspondence allows us to approach Gromov-Witten theory for Calabi-Yau varieties via a quantum theory of singularities. We will present the first results in this direction, joint work with Yongbin Ruan.

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