



## Seminar des SFB 647

### ZEIT:

15.12.2009, 16:00 Uhr - 19:00 Uhr

### ORT:

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

### PROGRAMM:

16:00 - 17:00 **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.

17:00 - 17:30 Kaffeepause

17:30 - 18:30 **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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