IU^B International University Bremen

Mathematics Colloquium at IUB

MIKHAIL ZAIDENBERG

Institut Fourier, Grenoble, and MPIM, Bonn

will speak on

Affine surfaces with group actions

Date: **Monday, March 13, 2006**
Time: **17:15**
Place: **Lecture Hall Research II, IUB**

Abstract:

Among the largely unresolved core problems in Affine Algebraic Geometry are:

- To give a description of the group of automorphisms of $\mathbf{A}^n$ (Nagata's Problem);
- To find standard forms for algebraic group actions on $\mathbf{A}^n$.

Under the impetus of quite spectacular, if somewhat sporadic, early successes (the automorphism theorem for $\mathbf{A}^2$ of Jung and Van der Kulk, the embedding theorem for $\mathbf{A}^1$ into $\mathbf{A}^2$ of Abhyankar-Moh and Suzuki, characterizations of $\mathbf{A}^2$ by Ramanujam and Fujita-Miyanishi-Sugie), work in this area has developed into a systematic discipline.

Progress on the automorphism problem has been made with the discovery of non-linearizable actions by reductive groups in the form of G-vector bundles over representations (G. Schwarz), with the proof of linearizability of torus actions in some cases (Gutwirth, Białynicki-Birula, Koras–Russell–Kaliman–Makar-Limanov), and with a recent confirmation that the Nagata automorphism of $\mathbf{A}^3$, which was supposed by Nagata to be wild, is so indeed (Shestakov and Umirbaev).

The talk is mainly devoted to a systematic study of one-parameter group actions on affine spaces and on affine surfaces. In particular, we discuss a presentation of affine surfaces with a multiplicative group action proposed (in a restrictive case) by Dolgachev, Pinkham and Demazure. We illustrate on several simple examples how does it work.

Colloquium Tea at ca. 16:45 in the Tea Room of Research II, close to the lecture hall. Everybody is welcome!

M. STOLL