ICM 1998, Berlin, Aug. 18–27

Abstracts of Plenary and Invited Lectures

Section:

5. Differential Geometry and Global Analysis

1991 MS Classification: 53C15
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Invariants in Contact Topology

A contact manifold, i. e. a smooth manifold together with a completely non-integrable tangent hyperplane field, is an odd-dimensional counterpart of a symplectic manifold. Maximal integral submanifolds of contact manifolds, called Legendrian, are contact analogs of Lagrangian submanifolds of symplectic manifolds.
Despite the fact that contact geometry abides Gromov's C^0-rigidity, invariants of contact manifolds and their Legendrian submanifolds are much more difficult to define than in the symplectic case, due to a projective character of contact geometry.
In the talk there will be given a survey of some recent results in this area. In particular, the following topics will be discussed:

1) invariants of open contact manifolds, especially in the 3-dimensional case;
2) invariants of Legendrian isotopy via the theory of generating functions;
3) contact homology theory.

In Part 2 this is a joint work with M. Gromov, and in Part 3 with H. Hofer.