Oberwolfach Prize 2003 to Paul Biran

The Oberwolfach Prize 2003 in Geometry and Topology was awarded to *Paul Biran* (Tel Aviv) for fundamental and influential contributions to symplectic topology as well as algebraic geometry. This year, the amount of 5000 Euro for the Oberwolfach Prize was donated by the Oberwolfach Foundation.

In his thesis he found a remarkable solution to the symplectic packing problem, i.e. the question which percentage of the volume of a symplectic 4-manifold can be filled by a symplectic embedding of n disjoint balls of equal size. For small numbers of balls obstructions have been known since the work of Gromov. Biran proved that full packing is possible for every symplectic 4-manifold provided that the number of balls is sufficiently large. His proof introduces original new techniques in symplectic topology: he showed that every symplectic manifold (with integral symplectic class) can be decomposed into a 2-disc bundle over a symplectic submanifold and an isotropic CW complex (on which the symplectic form vanishes).

This structure theorem has many other consequences, such as intersection results for Lagrangian submanifolds (the "Lagrangian barrier" phenomenon discovered by Biran) and new obstructions to Lagrangian embeddings. Biran's work also provides new interconnections between symplectic and algebraic geometry; he was able to use symplectic techniques to obtain new results in algebraic geometry, including his contributions to the Nagata conjecture, and new obstructions for smooth projective varieties to appear as hyperplane sections of any other smooth variety, or as sections in a fibration with isolated singularities.

In another direction Paul Biran made some important contributions to the theory of periodic orbits of Hamiltonian systems as well as to the new theory of Calabi quasimorphisms on the group of Hamiltonian symplectomorphisms. His work covers a wide range of mathematics and brings together many deep and powerful techniques in symplectic topology such as Floer homology, pseudoholomorphic curves, Donaldson's theory of symplectic submanifolds and Lefschetz pencils, and Seiberg-Witten invariants.