ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

5. Differential Geometry and Global Analysis

1991 MS Classification: 53C15
Symington, Margaret, University of Texas at Austin, USA

Symplectic rational blowdowns

A *rational blowdown* is a surgery on a 4-manifold whose effect on Donaldson and Seiberg-Witten invariants can be computed. The surgery was developed by Fintushel and Stern. As one application, they used the rational blowdown to construct families of exotic 4-manifolds. They also showed that the exotic $K3$ surfaces of Gompf and Mrowka can be obtained by this surgery. All of the later manifolds and many of their own examples are shown to admit a symplectic structure by proving that the rational blowdown can be defined in the symplectic category. The proof exploits the toric structure of a neighborhood of the (symplectic) submanifolds along which the surgery occurs.