Powers of Volume Forms on Manifolds with Boundary

Abstract:

In this talk I will consider the problem of local analytic classification of powers of volume forms on manifolds with boundary, i.e. of ordinary volume forms multiplied by the (complex in general) power of a function f, under the action of the group of diffeomorphisms preserving both the boundary and the hypersurface defined by the zero locus of f. In the case where this function defines an isolated boundary singularity in the sense of Arnol’d, I will show how to obtain local normal forms and moduli theorems, analogous to those obtained by Arnol’d, Varchenko, Lando and others for the ordinary, without boundary case. Moreover I will show how these moduli are related to (in fact obtained by) the topological and analytic (Hodge theoretic) invariants of the boundary singularity, such as the relative Picard-Lefschetz monodromy, the relative Brieskorn lattices with their relative Gauss-Manin connection, the relative spectrum and so on, all objects generalising, in the presence of a boundary, the corresponding well known objects already defined for isolated hypersurface singularities.