Singular Floer theory and
singular Hamiltonian/Reeb Dynamics: First steps
PART II

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Non-compact symplectic manifolds can sometimes be compactified as singular symplectic manifolds where the symplectic form "blows up" along an hypersurface in a controlled way (b^m-symplectic manifolds). In natural examples in Celestial mechanics such as the 3-body problem these compactifications are given by regularization transformations à la Moser/Mc Gehee etc. I will use the theory of b^m-symplectic/b^m-contact manifolds as a guinea pig to propose ways to extend Floer theory and the study of Hamiltonian/Reeb Dynamics to singular symplectic/contact manifolds. This, in particular, yields new results for non-compact symplectic manifolds and for special (but, yet, meaningful) classes of Poisson manifolds.

Inspiration comes from several results extending the Weinstein conjecture to the context of b^m-contact manifolds and its connection to the study of escape orbits in Celestial mechanics and Fluid Dynamics. Those examples motivate a model for (singular) Floer homology.

We will describe the motivating examples/results and some ideas to attack the general questions.

The contents of this talk is based on joint works of Miranda-Oms, Miranda-Peralta-Oms and Brugués-Miranda-Oms.