

1083-57-3

**Lenhard L. Ng\*** ([ng@math.duke.edu](mailto:ng@math.duke.edu)), Mathematics Department, Duke University, box 90320, Durham, NC 27708. *From holomorphic curves to knot invariants via the cotangent bundle.*

In recent years, symplectic geometry has emerged as a key tool in the study of low-dimensional topology. One approach is to study the topology of a smooth manifold through the symplectic geometry of its cotangent bundle, building on the familiar concept of “phase space” from classical mechanics.

We will focus on a particular application of this philosophy, which uses certain counts of holomorphic curves to produce an invariant of knots called “knot contact homology”. Knot contact homology has a combinatorial definition and appears to be a very strong knot invariant. Recently it has been linked to other known invariants such as the HOMFLY-PT polynomial, via a deep connection to string theory and mirror symmetry that we are just barely beginning to understand. We will introduce knot contact homology, discuss its properties and some applications, and speculate about the meaning of its appearance in string theory. No previous familiarity with symplectic geometry or knot theory is assumed. (Received August 22, 2012)