The Rumin algebra

by Dr. Jeffrey Case,
Penn State University
(Visiting Associate Professor, Univ. of Washington)

Abstract: The Rumin complex is a chain complex which computes the de Rham cohomology groups of contact manifolds (the odd-dimensional counterparts of symplectic manifolds) in a way which is well-adapted to the underlying contact structure. In this talk, I describe a new construction of the Rumin complex with the additional structure of an A-infinity algebra which recovers the de Rham cohomology algebra, as well as a bigraded version on CR manifolds (the odd-dimensional counterparts of complex manifolds). I will also discuss Hodge theorems associated to the bigraded Rumin algebra and some applications to CR and Sasakian manifolds (the odd-dimensional counterparts of Kahler manifolds).