1078-14-260   **Sean Timothy Paul*** (`stpaul@math.wisc.edu`), Mathematics Dept. University of Wisconsin, 480 Lincoln Drive, Madison, WI 53706. *K-energy maps and the stability of projective varieties.*

One of the main problems in complex geometry is to detect the existence of "canonical" Kahler metrics in a given Kahler class on a compact complex (Kahler) manifold. In particular one seeks necessary and sufficient conditions for the existence of a Kahler Einstein metric on a Fano manifold. In this case the presence of positive curvature makes this problem extremely difficult and has led to a striking series of conjectures–the "standard conjectures"– which relate the existence of these special metrics (which are solutions to the complex Monge-Ampere equation, a fully non-linear elliptic p.d.e .) to the algebraic geometry of the pluri-anticanonical images of the manifold. Yau speculated that the relevant algebraic geometry would be related (somehow) to Mumford's Geometric Invariant Theory. Eventually it was conjectured that K-energy bounds along Bergman potentials could be deduced from an appropriate notion of "semi-stability". Recently this conjecture has been completely justified by the speaker, building upon work of Gang Tian and Gelfand-Kapranov-Zelevinsky -Weyman. It is the aim of this talk to outline progress on the standard conjectures and to discuss the entire theory in the context of complex algebraic groups and dominance of rational representations of such groups. (Received December 11, 2011)