1016-53-313   **Brian C Hall** and **William D. Kirwin*** (`wkirwin@nd.edu`), Dept. of Mathematics, University
                     of Notre Dame, 255 Hurley Building, Notre Dame, IN 46556. *On the Noncommutativity of
                     Quantization and Symplectic Reduction.*

Consider the quantization of a classical system represented by a compact Kaehler manifold M which has some symmetries described by a Hamiltonian action of a compact Lie group G. Symplectic reduction is the process by which the symmetries are removed from the system, and there are two choices for constructing an associated quantum space: one may either reduce M first, and then quantize the resulting quotient, or one may quantize first, and restrict to the G-invariant subspace.

It is a classical result, known as "quantization commutes with reduction", that there is a natural invertible map between these spaces and hence that they have the same dimension. In this talk, we will see that this natural invertible map is not, in general, unitary, even semiclassically. On the other hand, if we include the metaplectic correction, then the natural invertible map does become unitary to leading order in $\hbar$. (Received February 14, 2006)