1046-35-729 **Guy Bernard*** (guy.bernard@mwsu.edu), Department of Mathematics, Midwestern State University, 3410 Taft Boulevard, Wichita Falls, TX 76308. *A Global Existence Theorem for the Navier-Stokes Equations.*

The existence of global solutions in time to the Navier-Stokes equations, filling out all of three dimensional space, is demonstrated with weak decay conditions on the initial-value and its first partial derivatives. The initial-value requires to be twice Holder-continuously differentiable, but not square summable. There are no pointwise boundedness condition on the initial-valuem, but it is required to be bounded by some rational bell-like function. Global regular solutions are established directly using Holder-continuous function spaces, without the intermediate step of weak solutions. The key to this result is the repeated use of symmetry transformations to the Navier-Stokes equations, and the use of appropriate bariers (upper and lower solutions) to the heat operator. (Received September 10, 2008)