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Department of Mathematics, University of Texas at Austin, 1 University Station, C1200, Austin,
TX 78712, and **Gigliola Staffilani**. *Behavior of solutions to the Navier-Stokes equations in the
scaling invariant spaces.*

In this talk we will discuss the Navier-Stokes equations in scaling invariant spaces. In particular, we will briefly describe regularity of so called "mild" solutions to the Navier-Stokes equations evolving from small initial data in a critical space in \mathbb{R}^n (joint work with Pierre Germain and Gigliola Staffilani) and a recent result on ill-posedness of the Navier-Stokes equations in the largest critical space in 3D (joint work with Jean Bourgain). (Received January 24, 2009)