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Mina E. Ossiander* (ossiand@math.oregonstate.edu), Department of Mathematics, Oregon State University, Corvallis, OR 97331. *Navier-Stokes equations: short-time existence and stochastic representations of solutions.*

Although the 3-dimensional Navier-Stokes equations governing the velocity of incompressible fluids have been studied extensively over the last century, important questions remain concerning existence and uniqueness of solutions, both for all time and over short time intervals. The challenges derive from the presence of incompressibility as well as the inherent non-linearity. This talk describes some stochastic representations that allow mild solutions to the Navier-Stokes equations to be formulated as conditional expectations. These representations incorporate both incompressibility and non-linearity while giving existence and uniqueness of solutions on short time intervals for large initial data. (Received September 13, 2005)