1063-76-13 **Fathi M Allan*** (f.allan@uaeu.ac.ae), Department of Mathematical Sciences, POBx 17551, Al Ain, United Arab Emirates, and **James H Curry** (James.H.Curry@colorado.edu), Program of Applied Mathematics, University of Colorado at Boulder, Boulder, CO 80302. *The dynamics of instability of the fluid flow over a flat plate.*

The fluid flow over a flat plate is of primary interest as prototypical nonlinear system. The highly disturbed flow and transition are governed by a nonlinear process. Previous studies have found that the transition to chaos observed experimentally or numerically depends on the system under consideration. For example, quasiperiodic motion arises in a Taylor-Couette system, period doubling occurs in the surface waves and the flow in a rotating annulus with topography. Therefore, our study of the transition in the boundary layer of a flat plate provides an opportunity to understand the effect of nonlinear disturbances on the transition and then to investigate the road to chaos. The goal is achieved by directly solving the time dependent Navier-Stokes equations that describe the flow phenomena under a suitable choice of boundary and initial conditions. The nonlinear theory of dynamical systems is then used to analyze the results. (Received May 14, 2010)