

Meeting: 1006, Lubbock, Texas, SS 7A, Special Session on Topology of Dynamical Systems

1006-37-24 **Jyoti Champanerkar*** (jac4@njit.edu), Department of Mathematics, William Paterson University, 300 Pompton Road, Wayne, NJ 07470, and **Denis Blackmore**. *Pitchfork Bifurcations of Invariant Manifolds*.

A pitchfork bifurcation of an $(m - 1)$ -dimensional invariant submanifold of a dynamical system in \mathbb{R}^m is defined analogous to that in \mathbb{R} . Sufficient conditions for such a bifurcation to occur are stated and existence of the bifurcated manifolds is proved under the stated hypotheses. For discrete dynamical systems, the existence of locally attracting manifolds M_+ and M_- , after the bifurcation has taken place is proved by constructing a diffeomorphism of the unstable manifold M . For continuous dynamical systems, the theorem is proved by transforming it to the discrete case. Techniques used for proving the theorem involve differential topology and analysis. The theorem is illustrated by means of a canonical example. (Received December 21, 2004)