1014-39-505 **Christian Poetzsche*** (poetzsch@umn.edu), University of Minnesota, School of Mathematics, 206 Church St SE, Minneapolis, MN 55455. *Discrete Inertial Manifolds.*

Various processes in applied sciences can be described using nonlinear dissipative evolutionary equations generating infinite dimensional dynamical systems. The reduction of such a system in an appropriate infinite dimensional state space to a finite one preserving its long-time behavior, is a relevant and interesting problem in both pure and applied mathematics.

It has been found out that in many cases the global attractor can be embedded into exponentially attractive finite dimensional manifolds. Consequently, it turned out that so-called inertial manifolds are often an appropriate tool for the studies related to the long-term behavior of evolutionary equations, which allow for the reduction of the dynamics to a finite dimensional ordinary differential equation.

Motivated by an analytical discretization theory for evolutionary equations, this talk deals with such questions of existence and exponential attraction to invariant manifolds for nonautonomous (ordinary) difference equations, instead of evolutionary differential equations. We discuss their essential properties, like smoothness, the existence of an asymptotic phase and normal hyperbolicity in a nonautonomous framework of pullback attractors. (Received September 19, 2005)