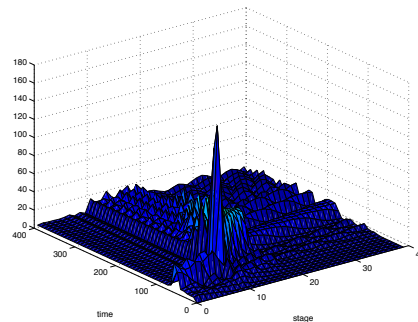


APM 526 SPRING 2018
COMPUTATIONAL METHODS FOR HYPERBOLIC AND PARABOLIC PARTIAL
DIFFERENTIAL EQUATIONS



- INSTRUCTOR: C. Ringhofer
- TIME: T, Th 09:00 AM - 10:15 AM, LOCATION: Tempe - WXL R 307
- LINE Nr. 29012

COURSE DESCRIPTION:

This course will give an overview over computational techniques for partial differential equations of evolution type (i.e. wave propagation problems and parabolic equations) occurring in fluid dynamics, electro dynamics, biology, traffic flow, and various areas of mathematical physics. After introducing the basic concepts of numerical methods for such problems, such as stability, consistency, CFL - conditions, artificial dispersion and diffusion, propagation of discontinuities (shocks) and weak solutions, we will focus on methods for equations with a wide range of applications. Equations considered will include the Euler equations, compressible Navier - Stokes equations and hydrodynamic models for traffic flow and population dynamics. Methods covered will include flux limiter techniques, flux splitting methods, shock fitting and finite volume methods as well as particle based and random methods such as Monte - Carlo techniques.

For more information go to <https://math.la.asu.edu/~chris/courses.htm>

- PREREQUISITES:

- TEXTBOOK:

- The course will rely mainly on classroom notes published online.

- For some of the mathematical foundations we will use:

- Numerical Methods for Conservation Laws, ISBN: 9783764327231, Author: Randall J. LeVeque, Publisher: Springer-Verlag New York, Incorporated, Format: Paperback