

## St. Olaf Workshop

An NSF sponsored workshop on “*Teaching ODE’s with Computer Experiments*” will be held June 20-25, 1993, at St. Olaf College. Intended for college and university faculty who teach courses in ordinary differential equations or courses in which ODE’s are a major topic, the goal of this workshop is to provide the expertise and materials necessary for the introduction of a computer laboratory component into their home institution’s ODE program.

The workshop will include:

- Hands-on experiences using a variety of readily available software packages on Sun, NeXT, Macintosh, and IBM PC-compatible computers.
- Opportunities to review some of the instructional materials that are now available and to work with other workshop participants to develop new course materials.
- A series of lectures on dynamical systems and the qualitative behavior of solutions of systems of differential equations.
- Discussions on the role of computer laboratories in undergraduate mathematics education, the implications for ODE instruction of widespread availability of symbolic computing software, and the effects of calculus reform efforts on courses in ODE’s.

The workshop begins on the evening of Sunday, June 20, and ends around noon on Friday, June 25. On-campus accommodations and meals will be provided and each participant will receive a \$200 stipend. Participants are responsible for their own travel expenses. Please contact Professor Arnold Ostebee by e-mail ([ostebee@stolaf.edu](mailto:ostebee@stolaf.edu)) or phone (507-646-3420).

## Washington State Workshop

June 12 - 18, 1993, a workshop about using computers in the introductory differential equations course will be presented at Washington State University. Available to faculty from post-secondary institutions, the workshop is sponsored by the National Science Foundation, and it is under the direction of Professors Michael Kallaher and Michael Moody. Twenty-five participants will be selected; each will receive a stipend of \$200 plus room and board. **Mathematica** (on a DEC 5000 system) and software on PCs will be used and available for hands-on experience preparing computer experiments. Contact: Michael J. Kallaher, Department of Mathematics, Washington State University, Pullman, WA, 99164-3113 (e-mail: [odeworkshop@wsumath.bitnet](mailto:odeworkshop@wsumath.bitnet))

## ODEs in MATLAB

John Polking announces two programs for **MATLAB**; a direction field program called **DF** and a phase plane program called **PHPL**.

**What are they?** **DF** takes as input a first order differential equation and plots the direction field, and can then compute and plot solution curves. The user may change the display window, the number of field points plotted, or from direction lines to a vector field display. **PHPL** has the same functionality for first order planar autonomous systems, and will locate and analyze equilibrium points, and plot stable and unstable orbits at a saddle point.

**How you get them:** This software is available by anonymous FTP from [math.rice.edu](http://math.rice.edu), in the `pub/ode` directory. A manual is also available, write to J. Polking, Mathematics, Rice University, Houston, TX 77251 or e-mail to [polking@math15.rice.edu](mailto:polking@math15.rice.edu).

## Highlights of the Next Issue!

**The Region of Oscillatory Solutions of  $x'' = x^2 - t$** , Anne Noonburg

**Heating and Cooling of Buildings**, Steven Dunbar.

**The Flight of a Ski Jumper**, Ernest True.

**PLUS** even more software reviews, more commentary on computer methods, and lots of other useful information for instructors of ODEs and numerical analysis!

## Suite of Runge-Kutta Codes for Solving ODEs

R. W. Brankin, I. Gladwell, L. F. Shampine

**What is it?** RKSUITE is a collection of codes based on Runge-Kutta methods for the numerical solution of initial value problems for first order systems of ordinary differential equations. It supersedes some very widely used codes written by the authors and their coauthors, namely the RKF45 code and its descendant DDERKF in the SLATEC library and D02PAF and associated codes in the NAG Fortran library.

RKSUITE is written in standard FORTRAN 77 and is distributed in source form. The advanced algorithms provide more functionality than is found in earlier codes, including new, more efficient formulas, interpolation, automatic selection of the initial step size, a stiffness diagnostic, and global error assessment. The advanced software design includes a novel interface permitting both interval- and step-oriented solutions and is highly portable.

**It's free (almost)!** The primary source for the suite is R.W. Brankin, I. Gladwell, and L.F. Shampine (1992), *RKSUITE: a suite of Runge-Kutta codes for the initial value problem for ODEs*, **SoftReport 92-S1**, Department of Mathematics, Southern Methodist University, Dallas, TX 75275, U.S.A. The SMU SoftReports are 3.5" high density diskettes in MS-DOS format that are available at cost, \$10 U.S., from the address above. Checks (in U.S. funds only) should be made out to the SMU Department of Mathematics. Precisely the same information is available at no cost from several sources: It is available in the ode library in the netlib collection of mathematical software available from netlib@ornl.gov. It is also available by anonymous (binary) ftp from seas.smu.edu in the /pub directory, in both zip and tar.Z format, with filenames rksuite.zip and rksuite.tar.Z, respectively.

**Write the authors:** Please send ordinary mail to Ian Gladwell at the SMU address above or e-mail to Richard Brankin at richard@nag.co.uk or at na.brankin@na-net.ornl.gov ; Ian Gladwell at gladwell@seas.smu.edu or at na.gladwell@na-net.ornl.gov ; L.F. Shampine at h5sr1001@vm.cis.smu.edu or na.shampine@na-net.ornl.gov . □