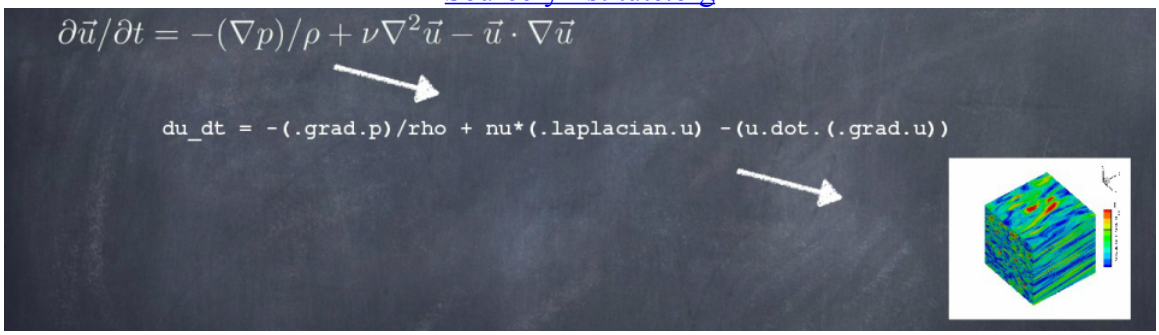
Course Announcement:

Software Engineering in Modern Fortran

Oak Ridge National Laboratory, September 9-11, 2015

Instructor: Damian Rouson, Ph.D., P.E.

SourceryInstitute.org



Description:

Forget everything you thought you knew about Fortran. This course offers a fresh, new perspective on the modern versions of the world's first programming language. The course emphasizes

1. Language features that target applications of interest to computational scientists, engineers, and mathematicians.
2. Programming practices that lead to robust, efficient execution by enabling compilers to perform safety checks and optimize computation.
1. Case studies on exploiting GPUs and on interfacing Fortran with C/C++.

We will explore Fortran's support for parallel, object-oriented, and functional programming. The presented examples and hands-on exercises will simulate problems ranging from fireworks to games to fluid flow using Titan or a provided Linux virtual machine with pre-installed open-source compilers, tools, and libraries.

Optional material (time permitting and based on student interest):

1. Demonstrations of tools for code building, testing, documenting, and performance-tuning.
2. Bring Your Own Code (BYOC) discussion session.

Background Reading:

Attendees will receive the textbook *Scientific Software Design: The Object-Oriented Way* (Cambridge University Press, 2011) co-authored by the instructor. Versions of this course have been taught at several universities, government laboratories, and conferences in the U.S. and Europe.

Prerequisites:

Some familiarity with Fortran 90 and finite difference approximations to differential equations.

Biography:

Dr. Rouson is a mechanical engineer with experience in writing software for turbulent flows in classical, quantum, magnetohydrodynamic, and multiphase media. He co-authored the textbook *Scientific Software Design: The Object-Oriented Way* (Cambridge University Press, 2011) and has taught related courses throughout the United States and Europe. He has been a PI or Co-I on research funded by the National Science Foundation, the Office of Naval Research, and the National Institute of Standards and Technology, and has held visiting and tenure-track faculty and instructional staff positions at universities in the U.S. and Europe. He received a B.M.E. from Howard University and M.S. and Ph.D. degrees from Stanford University. He founded Sourcery Institute, a California nonprofit public benefit corporation.

Dr. Rouson will be available Friday, 9/11, for individual & group consultations. Reserve time at http://rouson.youcanbook.me (include location & contact info.).