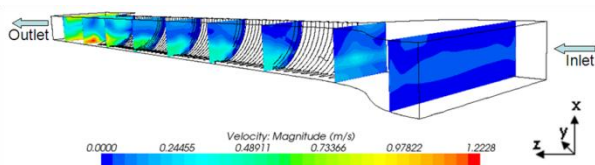# Training Course:

Computational Hydraulics and Aerodynamics using STAR-CCM+ for CFD Analysis

March 30-31, 2011
Argonne, Illinois
And Remote Locations

The US Department of Transportation funded Transportation Research and Analysis Computing Center (TRACC) at Argonne National Laboratory will hold a training course covering the basics of computational fluid dynamics (CFD) analysis and how to apply it using CD-adapco's STAR-CCM+ CFD software.

This course is designed for hydraulic engineers and other analysts with knowledge of fluid mechanics who have little or no experience in using CFD software to analyze fluid flow problems. The course covers both CFD theory as well as practical applications of STAR-CCM+. Participants will be introduced to CFD principles, governing equations, physics models, data requirements, capabilities of the software, problem setup, post processing to graph and visualize results, and procedures for running large jobs in parallel on the TRACC cluster.

Techniques to solve very large 3 dimensional hydraulic and aerodynamic problems of interest to transportation engineers will be covered. Participants will learn how to run simulations in parallel on the TRACC cluster to obtain solutions to problems in a day that would take weeks to run on a workstation.

Hands on training is being planned in the form of tutorials that cover the steps needed to set up problems, run the analysis, and visualize the results. Trial licenses for STAR-CCM+ will be provided to attendees at TRACC and to remote participants.

Location

The training course will be held at the TRACC Collaboratory located on the second floor of building 222 at Argonne National Laboratory pictured above (see directions on reverse side).

Remote Location Participation

Remote participation via Internet2 video conferencing can be arranged by contacting TRACC. The training sessions will also be broadcast over the Internet using Adobe Connect. The link to the Adobe Connect session will be provided to registered participants.

Registration

Participation in the training course is free. Travel, lodgings, and other expenses are the responsibility of the participant. Please contact TRACC at the number or Email address shown below if you would like to participate in the training sessions either by internet or in person.

Contact Information

Dr. Steven Lottes
Argonne TRACC
9700 South Cass Avenue, Bldg. 222
Argonne, IL 60439-4828

630-252-5290
CFD_TRACC@anl.gov

www.tracc.anl.gov

TRACC

Transportation Research and Analysis Computing Center
at Argonne National Laboratory

UChicago ►
Argonne LLC

STAR-CCM+
Training Sessions

Sessions will start at 9:30 AM (CST) and end at 4:30 PM.
Lunch will be from 12 PM till 1 PM.
There will be a 15 minute break in each half day session.
Audience participation is encouraged to maximize learning.

Wednesday-Thursday

March 30-31, 2011

9:30 AM-4:30 PM (CST)

Introductions and Agenda
Basics of Computational Fluid Dynamics
STAR-CCM+ CFD Software Basics
    STAR-CCM+ features
    Graphical User Interface
    Workflow
Meshing with STAR-CCM+
Post-Processing Basics
Becoming a User
Useful Clients
    File Transfer (SSH Secure Shell)
    Desktop Virtualization (NoMachine NX)
How to use STAR-CCM+ on the TRACC Cluster

Hands on Hydraulics and Aerodynamics Tutorials

Trial licenses and STAR-CCM+ software will be provided to participants to carry out a number of tutorials under the guidance of the instructor. Tutorials will include:

• Gravity Driven Flow into a Closed Chamber
• Forces on a Flooded Bridge Deck
• Wind Loading on Roadside Signs
• Flow Through a Laboratory Scale Culvert
• Pressure Flow Scour

Training Site:

Transportation Research and Analysis Computing Center
Argonne National Laboratory
9700 South Cass Avenue
Building 222, Room A253/C253
Argonne, IL 60439
630.252.5200
www.tracc.anl.gov

Training Location
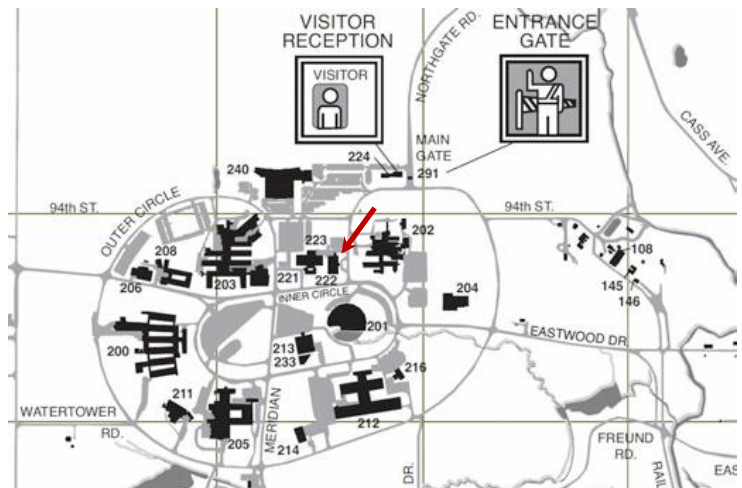
Map of Argonne campus

Directions to Argonne

Argonne National Laboratory occupies 1,500 wooded acres about 25 miles southwest of Chicago. The laboratory hosts thousands of visitors each year. Argonne is easily accessible by car or public transportation from downtown Chicago, as well as from Chicago's two airports. (Google Maps)

To reach Argonne from O'Hare International Airport, take I-294 south to I-55. Exit west on I-55 (toward St. Louis) and continue for about four miles to Cass Avenue. Exit south on Cass and turn right at the Argonne sign on Northgate Road, immediately south of I-55. Follow Northgate Road to the Argonne Information Center.

To reach Argonne from Midway Airport, take Cicero Avenue north to I-55. Enter I-55 south and continue for about 14 miles to Cass Avenue. Exit south on Cass and turn right at the Argonne sign on Northgate Road, immediately south of I-55. Follow Northgate Road