The Role of Computation in Protecting the Environment

A WORKSHOP ON THE USE OF SCIENCE AND MATHEMATICS TO PROTECT THE FUTURE OF THE EARTH

July 9, 2013

GREAT OPPORTUNITY

EXCITING AND FASCINATING HANDS-ON WORKSHOP FOR HIGH SCHOOL EDUCATORS AND STUDENTS

TARGETING:

- High school teachers of science and mathematics
- Advanced high school students
- Undergraduate students with an interest in science and mathematics

PROGRAM HOST AND PARTICIPANTS:

National Science Foundation (NSF)
Cyber-Enabled Discovery and Innovation (CDI)
Center for Subsurface Modeling (CSM)
Institute for Computational Engineering & Sciences (ICES)
Bureau of Economic Geology (BEG)
Sequestration Training, Outreach, Research, and Education (STORE)*
Department of Energy (DOE)
Gulf Coast Carbon Center (GCCC)

*STORE is funded with a grant from the U.S. Department of Energy.

PURPOSE

The problem of greenhouse gas accumulation in the atmosphere is a serious and potentially devastating problem. One way to address the problem is to capture carbon dioxide, perhaps from the exhaust of a power plant, so that it does not enter the atmosphere. This carbon dioxide can be disposed of by injecting it deep underground. This geologic sequestration is a proven means of permanent CO_2 greenhouse gas storage. However, it is challenging to design and manage the many elements needed to properly characterize the subsurface environment, understand the complex physical and chemical processes involved, accurately assess and reduce risks and assure the permanency of geological storage of CO_2. Mathematics and computational science have an essential role in better understanding and modeling some of these fundamental processes of earth systems as they relate to carbon storage.

GOALS

The workshop will inform and challenge high school educators and students. We will explore the emerging interdisciplinary role of mathematics and computational science in the simulation and solution of the Grand Challenge of carbon sequestration.

CHALLENGE

Build-up of greenhouse gases in the atmosphere, such as carbon dioxide (CO_2), is a serious environmental problem facing the global community. The National Academy of Engineering considers developing carbon sequestration methods one of the world's Grand Challenges for Engineering.**

Teachers examine cores during a hands-on workshop at The University of Texas at Austin.

There will be discussions on laboratory and field experiments, mathematical modeling and large-scale parallel computation as applied to the environmentally important carbon storage problem.

**http://www.engineeringchallenges.org/cms/challenges.aspx

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AGENDA:

Time:	Event:
8:30am	Breakfast and Registration
9:00am	Wheeler: Introduction
9:15	Olson: International energy usage and carbon footprint
10:45	Break
11:00	Arbogast: Basics of flow in porous media
11:30	Role of capillary pressure
11:50	Delshad: Modeling Cranfield CO_2 injection
12:20pm	Lunch
1:20	Olson: Core analysis and storage capabilities
2:20	TAAC super computer visit
3:20	Break
3:35	Romanak: Monitoring CO_2 injection
4:35	Wheeler: Closing remarks
5:00	Bus boarding
5:30	Departure to Riverboat
6:45	Riverboat boarding
7:00-9:30	Lake Austin Riverboat Cruise and Dinner from Ruby's BBQ
9:45	Return to J.J. Pickle Research Campus

As caretakers of planet earth, we should strive to preserve and protect our environment and ensure its integrity for future generations. We need more students to develop an interest in science and mathematics and solve the energy and environmental challenges that we face today and in the future.

Teachers examine the role of capillary forces related to carbon storage in a workshop at The University of Texas at Austin.

Application:
To receive an application via e-mail

Contact:
Connie Baxter
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Application Deadline: June 21, 2013

UT FACULTY

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UT STAFF

Connie Baxter
Cristabel Bodden
Dino Golgoon

EDUCATORS AND STUDENTS WILL RECEIVE AN HONORARIUM FOR ATTENDING

LOCATION:
Bureau of Economic Geology
VR Room
The University of Texas
J.J. Pickle Research Campus
10100 Burnet Road,
Austin, TX 78758
Phone: 512-471-1534

WHAT STARTS HERE CHANGES THE WORLD

STORE

Bureau of Economic Geology

Gulf Coast Carbon Center