23rd NIST Computer Modeling Workshop sponsored by RILEM and in cooperation with ASTM Committees C01 and C09

DATE and LOCATION

Monday July 16, 2012 to Wednesday July 18, 2012
Lecture Room B, Building 101
National Institute of Standards and Technology
Gaithersburg, Maryland 20899 USA

INSTRUCTORS

Jeff Bullard (coordinator), Dale Bentz, Chiara Ferraris, Edward Garboczi, Nicos Martys, Paul Stutzman, Kenneth Snyder, NIST Materials and Structural Systems Division
Jason Weiss, Purdue University
Jeff Thomas, Schlumberger-Doll Research
Barbara Lothenbach, EMPA
Walairat Bumrongjaroen, Catholic University

GENERAL DESCRIPTION

The workshop lectures will cover computational and experimental materials science of concrete topics, including simulation of microstructural development and prediction of physical properties. "Microstructure" ranges from nanometer to meter length scales, while physical properties include pressure-driven fluid flow, rheology, mechanical properties, neutron scattering, scanning electron microscopy, and various X-radiation probes like diffraction and tomography. Close cooperation between computation and experiment is crucial for making progress in the materials science of concrete and so is an emphasis of the workshop. The workshop will have a mix of tutorial lectures and short 15-minute talks by the participants describing their technical work.

WORKSHOP SCHEDULE

MONDAY July 16, 2012 Lecture Room B, Administration Building

9:30-9:45 Welcome and Orientation — Jeff Bullard

9:45-10:30 Lecture No. 1 — Ed Garboczi
Principles of modeling cement and concrete

10:30-10:45 Break

10:45-11:45 Lecture No. 2 — Paul Stutzman
Microstructure in portland cement paste and concrete

11:45-1:15 Lunch, NIST Cafeteria

1:15-2:15 Lecture No. 3 — Jeff Thomas
Neutron scattering and hydration modeling of cementitious materials

2:15-2:30 Break

2:30-3:30 Lecture No. 4 — Jeff Bullard
Simulating early-age reaction and transport in hydrating cement pastes

3:30-3:45 Break

3:45-5:00 Workshop Participants Presentations (5)

TUESDAY July 17, 2012 Lecture Room B, Administration Building

9:30-10:30 Lecture No. 5 — Barbara Lothenbach
Thermodynamic modeling of cement hydration

10:30-10:45 Break

10:45-11:30 Lecture No. 6 — Jeff Bullard
Late-age hydration and microstructure modeling with thermodynamics

11:30-12:00 Workshop Participants Presentations (2)

12:00-1:15 Lunch, NIST Cafeteria

1:15-2:00 Lecture No. 7 — Chiara Ferraris
Experimental rheology of cement, mortar and concrete

2:00-2:10 Break

2:10-3:00 Lecture No. 8 — Nicos Martys
Computational rheology of cement, mortar and concrete

3:00-3:15 Break

3:15-4:00 Lecture No. 9 — Walairat Bumrongjaroen
Characterizing the composition and reactivity of fly ash materials

4:00-4:15 Break

4:15-5:00 Workshop Participants Presentations (3)

WEDNESDAY July 18, 2012 Lecture Room B, Administration Building

9:00-9:45 Lecture No. 10 — Ken Snyder
Modeling reactions and transport for service life prediction

9:45-10:00 Break

10:00-11:15 Lecture No. 11 — Dale Bentz
Sustainable concrete materials: experiments and modeling

11:15-11:30 Break

11:30-12:15 Workshop Participants Presentations (3)

12:15-1:15 Lunch, NIST Cafeteria

1:15-2:15 Lecture No. 12 — Jason Weiss
Early-age cracking

2:15-2:30 Break

2:30-4:30 Software Tutorial — Jeff Bullard
Using eVCCTL software for concrete education and research