@POLITO

September 27th – 29th 2017

SUMMER SCHOOL

Eco-evaluation of concrete structures and infrastructures for a sustainable built environment

The impact of concrete buildings on environment is mainly due to clinker, which is the main material used all over the world to produce cement. We first discuss if the medium term CO_2 emission reduction objectives for the cement industry are realistic according to our current scientific and technologic knowledge. We consider two environmental strategies. The first one is the substitution of clinker by mineral additions in cement in order to reduce the environmental cost of the material for a given volume of material; the second one is the reduction of the concrete volume needed for a given construction process by enhancing the concrete performances. The impact on CO2 emissions of a combination of these options is also roughly evaluated.

We show how is possible to increase mechanical performances of concrete considering fiber reinforced concrete and how is possible associate environmental costs and performance requirements using recycled materials in the mix-design. We moreover present here a first step towards a better balance between societal demand in terms of environment and technical building requirements.

Language: All the activities will be held in English

Location: Politecnico di Torino. Department of Structural, Geotechnical and Building Engineering.

Requirements: The program is open to Engineers and M. Civil Eng., M. Building Eng., Environment and Infrastructure Eng. , M. Materials Eng. and to M. Arch. students.

Application and fees: 3 days intensive Summer School with lectures (15 hours) + PoliTo tutoring for the whole academic activity + Welcome and "Arrivederci" cocktail, lunch.

Fee: The Summer School is financially supported by Compagnia di San Paolo and Politecnico di Torino.

Application and deadlines: The Summer School required a maximum 30 participants: the selection will take place in chronological order of registration. To apply, you must send an e-mail to barbara.frigo@polito.it with subject " Eco-Concrete Summer School" and with your biographical information. After the registration, you will receive within 24 hours a confirmation message on your e-mail.

PROGRAM

WEDNESDAY, 27TH SEPTEMBER 2017
14:00-14:30 Introduction (B. Frigo)
14:30-16:00 The sustainability of concrete (Prof. Habert)
16:00-16:30 Welcome cocktail
16:30-18:00 LCA of concrete manufacts (Prof. Habert)

THURSDAY, 28TH SEPTEMBER 2017
9:00-10:30 Increasing the mechanical performances of concrete (Prof. Nishiwaki)
10:30-11:00 Coffee break
11:00-12:30 Tailoring FRC and UHPC (Prof. Nishiwaki)
Lunch
14:30-16:00 Concrete with recycled materials (Prof. Mahgoub)
16:00-16:30 Coffee break
16:30-18:00 The use of recycled concrete as a structure member (Prof. Mahgoub)

FRIDAY, 29TH SEPTEMBER 2017
9:00-10:30 Application to concrete structures – part 1 (Prof. A.P. Fantilli)
10:30-11:00 Coffee break
11:00-12:30 Application to concrete structures – part 2 (Prof. F. Tondolo)
12:30-13:00 Conclusions (B. Frigo)
13:00 – "Arrivederci" cocktail

The Application deadline is September 22nd, 2017

Compagnia di San Paolo

ETH SUMMER SCHOOL

PEOPLE

Alessandro P. Fantilli, Ph.D., is an Associate Professor at Politecnico di Torino (Italy). He is Author of more than 120 articles in scientific journals and international congresses, and his research areas include: reinforced concrete; high-performance concrete, and sustainability of concrete structures. He is currently a member of ACI 544 – fiber reinforced concrete, ACI 555 – concrete with recycled materials, Rilem - TC-EEC Environmental evaluation of concrete structures toward sustainable construction, and fib - WP 1.7.1 -Tunnels in fiber reinforced concrete.

Barbara Frigo is an Assistant Professor in the Department of Structural, Geotechnical and Building Engineering at Politecnico di Torino (Italy). She is Author of more than 50 publications on Journals and Conference papers and her main research fields includes: old concrete strength, Fracture mechanics and scale effect of natural materials, interaction between structures and natural phenomena (earthquakes, snow avalanches and rock falls), natural hazards: risk analysis and management tools in man-made environment.

Guillaume Habert, PhD is associate professor for Sustainable construction at the Swiss Federal institute of Technology (ETH Zurich). He is graduated in Earth Science and before moving to ETH, he worked as associate researcher at IFSTTAR (ex LCPC) on concrete rheology and LCA of concrete. He has carried experimental work on alternative cement and concrete such as activated clays, geopolymer and earth products (Adobe, rammed earth, etc…). His work on Life Cycle Assessment focuses at the scale of building materials on resource depletion indicators and allocations methods between co-products and at the scale of buildings and structures on fast, easy and still accurate calculation methods for environmental impacts. Guillaume Habert is secretary of the RILEM TC-EEC on environmental evaluation of concrete structures toward sustainable construction.

Dr. Mohamed Mahgoub, is an Associate Professor and Concrete Industry Management Program Director at New Jersey Institute of Technology (NJIT) in Newark, New Jersey, USA. He is an expert in bridge rehabilitation, inspection, rating, design and analysis. Dr. Mahgoub is a professional engineer that has served as a member in several concrete industry related organizations such as American Society of Civil Engineers (ASCE), Precast/Prestressed Concrete Institute (PCI), International Concrete Repair Institute (ICRI), and American Concrete Institute (ACI). Dr. Mahgoub has been appointed by ACI as the Chair of Committee 555 (Concrete with Recycled Materials) for a two three-year terms which runs through March, 2018. Dr. Mahgoub has more than 20 technical and scientific publications and presentations to his credit. In addition, he has been selected to be a reviewer for several reputable journals such as ACI Materials and Structural Journals, ASCE Bridge Journal, PCI Journal, and American Society for Testing and Materials (ASTM) International Journal. Dr. Mahgoub has been also serving as a panelist for the National Science Foundation, NSF and National Research Council, NRC.

Tomoya Nishiwaki is an Associate Professor in the Department of Architecture and Building Science of Tohoku University, Sendai, Japan. He received his MS, and PhD from Tohoku University. His research interests include high-performance fiber-reinforced cement-based composites, self-healing/repairing concrete, nondestructive methods of concrete and concrete structures and development of novel functional concrete materials.

Francesco Tondolo is an Assistant Professor in the Department of Structural, Geotechnical and Building Engineering at Politecnico di Torino (Italy).He is Author of more than 50 publications on Journals and Conference papers and his main research fields includes: structural concrete, effects of corrosion in reinforced concrete structures, effect of cracking of concrete at early age in massive concrete casting, monitoring of reinforced concrete structures with smart materials. He is a member of the Task group 2.5 of fib Bond and material models.