TIME TABLE

TIME	Monday September 14	Tuesday September 15	Wednesday September 16	Thursday September 17	Friday September 18
9.00 - 9.45	Registration	Stathopoulos	Borri	Baniotopoulos	Schaumann
9.45 - 10.30	Stathopoulos	Stathopoulos	Borri	Baniotopoulos	Zasso
11.00 - 11.45	Stathopoulos	Blocken	Borri	Schaumann	Zasso
11.45 - 12.30	Stathopoulos	Blocken	Baniotopoulos	Schaumann	Zasso
14.30 - 15.15	Britter	BIlocken	Baniotopoulos	Schaumann	
15.15 - 16.00	Britter	Britter	Baniotopoulos	Schaumann	
16.30 - 17.15	Blocken	Britter	Zasso	Borri	
17.15 - 18.00	Blocken	Britter	Zasso	Borri	

ADMISSION AND ACCOMMODATION

Applicants must apply at least one month before the beginning of the course. Application forms can be sent by post or on-line through our web site: http://www.cism.it. A letter of confirmation will be sent to accepted participants.

The registration fee is 600,00 €.

A limited number of participants from universities and research centres who are not supported by their own institutions can be offered board and/or lodging in a reasonably priced hotel. Requests should be sent to CISM Secretariat by **July 14, 2009** together with the applicant's curriculum and a letter of recommendation by the head of the department or supervisor confirming that the institute cannot provide funding. Preference will be given to applicants from countries which sponsor CISM.

The Deutsche Forschungsgemeinschaft offers scholarships to German students (please contact Dr-Ing. Marcel Urban, DFG, Kennedyallee 40, 53175 Bonn, Germany, tel. +49 (228) 885 2655, e-mail: Marcel.Urban@dfg.de - web site: http://www.dfg.de).

Information about travel and accommodation are available at http://www.cism.it/cism/travel-reach.htm, or can be mailed upon request.

Please note that the Centre will be closed for summer vacation the first three weeks in August.

For further information please contact:

CISM
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33100 Udine (Italy)
tel. +39 0432 248511 (6 lines)
fax +39 0432 248550
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ENVIRONMENTAL WIND ENGINEERING AND WIND ENERGY STRUCTURES

Advanced Professional Training coordinated by

Charalambos C. Baniotopoulos
Aristotle University of Thessaloniki
Greece

Claudio Borri
Università di Firenze
Italy

Ted Stathopoulos
Concordia University
Canada

Udine, *September 14 - 18,* **2009**

with the Patronage of

ANIV

ENVIRONMENTAL WIND ENGINEERING AND WIND ENERGY STRUCTURES

Following the success of the CISM course on Wind Effects on Buildings and Design of Wind-Sensitive Structures offered in 2006, this advanced professional training course, co-promoted by ANIV (Italian Association for Wind Engineering) addresses the positive and negative effects of wind on buildings and the urban environment. Positive effects refer, e.g. to ventilation in "heat islands" as improving the micro-climate of urban areas and, of course, to the wind energy, an important source for sustainable and renewable energy production;

whereas negative effects refer mainly to the environmental influence of wind on pedestrians and potential re-ingestion of pollutants originating from buildings, issues for which the state-of-the-art of analysis and design procedures has been advanced significantly.

Environmental aerodynamics has progressed in the last decade, particularly regarding the computational front. The course will present the fundamentals of both experimental and computational approaches along with examples from actual

studies involving pedestrian level winds, comfort levels, relevant legislation and remedial measures. Pollutant dispersion in the building environment will be also presented and discussed along with the methodologies available to deal with potentially critical design problems, which if left unattended, jeopardize the successful operation of new construction developments. Wind energy production involves special wind turbine structures, the design of which requires special reliability assessment. Experimental and computational

approaches will be presented and case studies will be analyzed in order to make the participants familiar with the uncertainties involved and the design methodologies currently available.

This course will be of interest to doctoral students, junior and senior researchers, practicing engineers, architects and other design professionals, who work on relevant scientific research or design topics in research centers, universities, industry and government agencies.

PRELIMINARY SUGGESTED READINGS

Ted Stathopoulos & Charalambos Baniotopoulos (Editors), 2007: Wind Effects on Buildings and Design of Wind-Sensitive Structures, CISM Lecture Notes 493, Springer Wien New York.

Franke J., Hellsten A., Schlünzen H., Carissimo B. Best practice guideline

for the CFD simulation of flows in the urban environment. COST Action 732: Quality Assurance and Improvement of Microscale Meteorological Models, 2007.

Erich Hau, 2005: Wind Turbines: Fundamentals, Technologies, Application, Economics, Springer; 2nd ed.

Peinke, J.; Schaumann, P.; Barth, S.: Wind Energy: Proceedings of the Euromech Colloquium, Springer, 2006, ISBN-10: 3540338659, ISBN-13: 978-3540338659.

http://www.gigawind.de/

LECTURES

All lectures will be given in English. Lecture notes can be downloaded from CISM web site, instructions will be sent to accepted participants.

INVITED LECTURERS

Charalambos C. Baniotopoulos - Aristotle Un. of Thessaloniki, Greece
5 lectures on: "Design of wind energy structures". Overview of the typical design process of wind turbine towers, structural analysis models, loading and design checks, stability issues of the cylindrical/conical shells, stiffeners, door/openings, design of the foundation, anchoring systems, pre-tensioned bolts/connectors. Optimization issues and innovative aspects with respect to the tower design.

Bert Blocken - Technical University of Eindhoven, The Netherlands
5 lectures on: "Computational wind engineering (CWE)". CWE for building aerodynamics, with special emphasis on grid quality, turbulence modelling, consistent atmospheric boundary layer modeling, verification and validation. Case studies will be presented where CWE has been applied to analyse pedestrian-level winds and air pollutant dispersion around buildings.

Claudio Borri - Università di Firenze, Italy
5 lectures on: "Large wind turbines in earthquake areas: structural analyses, design/construction & in-situ testing". Static and dynamic analyses of wind turbine towers, aeroelastic loads by large rotor blades, wind–earthquake load combination; design and verification of r.c. precasted elements and longitudinal prestressing; verifications according IEC 61400, Eurocodes and Italian standards; design and verifications of foundations structures; piled and superficial foundations (with and without buoyancy); construction/erection technology; monitoring and testing techniques on site (through radar interferometry).

Rex Britter - University of Cambridge, UK
5 lectures on: "Dispersion of pollutants". Dispersion in the urban environment, regional, city, neighbourhood, street and source scales. Urban climatology, regional air pollution models, estimation of transport of pollutants from and to cities. Field experimentation and CFD applications.

Peter Schaumann - University of Hannover, Germany
5 lectures on: "Steel substructures of onshore and offshore wind energy systems". Wind energy coverters, in particular loads and load cases for structural design, safety concept, discussion of different types of substructures, detailed design and assessment of ULS (buckling, fatigue, connections), loads and design of offshore substructures, erection process, recent research results .

Ted Stathopoulos - Concordia University, Canada
5 lectures on: "Environmental aerodynamics". Introduction to environmental aerodynamics and the description of the wind characteristics including the significance of turbulence, exposure and climatology from the design perspective. Wind environmental issues, pedestrian winds, dispersion of pollutants in the building environment.

Alberto Zasso - Politecnico di Milano, Italy
5 lectures on: "Aerodynamic design of wind structures". Introduction on the state of the art guidelines for the aerodynamic design of wind turbines (codes and numerical methods). Wind tunnel test challenges in Wind Energy: orography and wake effects on power generation. Wind turbines scale modelling and wake characterization techniques for wind tunnel testing.

ENVIRONMENTAL WIND ENGINEERING
AND WIND ENERGY STRUCTURES

Udine, September 14 - 18, 2009
Application Form
(Please print or type)

Surname _____

Name _____

Affiliation _____

Address_____

_____

E-mail _____

Phone_____Fax_____

Method of payment upon receipt of confirmation (Please check the box)

The fee of Euro 600,00 includes IVA/VAT tax and excludes bank charges

❏ *I shall send a check of Euro _____*

❏ *Payment will be made to CISM - Bank Account N° 094570210900, VENETO BANCA - Udine   (CAB 12300 - ABI 05418 - SWIFT AMBPIT2M - IBAN CODE IT83Z 05418 12300 09457 0210900).*
Copy of the receipt should be sent to the secretariat

❏ *I shall pay at the registration counter with check, cash or VISA Credit Card (Mastercard/Eurocard, Visa, CartaSi)*

IMPORTANT: CISM is obliged to present an invoice for the above sum. Please indicate to whom the invoice should be addressed.

Name _____

Address _____

_____

_____

C.F.* _____

VAT/IVA* No_____
(*) Only for EU residents or foreigners with a permanent business activity in Italy.

Only for Italian Public Companies
❏ I ask for IVA exemption (ex law n. 537/1993 - art. 14 comma 10).

Privacy policy: I understand that data received via this form will be used only to provide information about CISM and its activities, within the limits set by the Italian legislative decree no. 196/2003 and subsequent amendments.
Complete information on CISM's privacy policy is available at www.cism.it.

I have read the "Admission and Accommodation" terms and conditions and agree.

Date _____   Signature _____