

- INTRODUCTION TO MEASUREMENT TECHNIQUES
OCTOBER 8-12, 2012
- INTRODUCTION TO CFD
JANUARY 21-25, 2013
- CUBESAT TECHNOLOGY AND APPLICATIONS
JANUARY 29 - FEBRUARY 1, 2013
- CFD FOR ATMOSPHERIC FLOWS AND WIND
ENGINEERING
MARCH 11-13, 2013
- RADIAL COMPRESSOR DESIGN
MARCH 11-15, 2013
- ACCURATE AND EFFICIENT AEROACOUSTIC
PREDICTION APPROACHES FOR AIRFRAME NOISE
MARCH 25-28, 2013
- AEROENGINE DESIGN: FROM STATE OF THE ART
TURBOFANS TOWARDS INNOVATIVE
ARCHITECTURES
APRIL 9-12, 2013
- FLUID DYNAMICS ASSOCIATED TO LAUNCHER
DEVELOPERS (STO-AVT-VKI-206)
APRIL 15-17, 2013
- RADIATION AND GAS-SURFACE INTERACTION
PHENOMENA IN HIGH SPEED RE-ENTRY
(STO-AVT-VKI-218)
MAY 6-8, 2013
- TURBULENT COMBUSTION
MAY 13-17, 2013
- SOURCE TERM CHARACTERIZATION OF THE
CONSEQUENCES OF STORAGE TANK
AGGRESSIONS (STO-AVT-VKI-219)
JUNE 4-6, 2013
- TRANSITION AND TURBULENCE IN HIGH-SPEED
FLOW
JUNE 10-14, 2013
- FLOW CHARACTERISTICS AND PERFORMANCE OF
SAFETY VALVES
SEPTEMBER 9-11, 2013
- ACCURATE TEMPERATURE MEASUREMENTS
SEPTEMBER 16-20, 2013
- 37TH COMPUTATIONAL FLUID DYNAMICS:
ADJOINT METHODS IN CFD
TO BE DETERMINED

VON KARMAN INSTITUTE

VKI is a non-profit international educational and scientific organisation, hosting three departments (aeronautics and aerospace, environmental and applied fluid dynamics, and turbomachinery & propulsion).

It provides post-graduate education in fluid dynamics (research master in fluid dynamics, former "VKI Diploma Course", doctoral program, short training program and lecture series) and encourages "training in research through research". The von Karman Institute undertakes and promotes research in the field of fluid dynamics.

It possesses about fifty different wind tunnels, turbomachinery and other specialized test facilities, some of which are unique or the largest in the world. Extensive research on experimental, computational and theoretical aspects of gas and liquid flows is carried out at the VKI under the direction of the faculty and research engineers, sponsored mainly by governmental and international agencies as well as industries.

The von Karman Institute organizes each year about 10 one-week Lecture Series on specialized topics in the field of aerodynamics, fluid mechanics and heat transfer with application to aeronautics, space, turbomachinery, the environment and industrial fluid dynamics. These courses have gained over the years world wide recognition for their high quality, which is the result of a careful choice of subjects of current interest and lecturers known for their excellency and willing to co-operate in building up well-structured courses.

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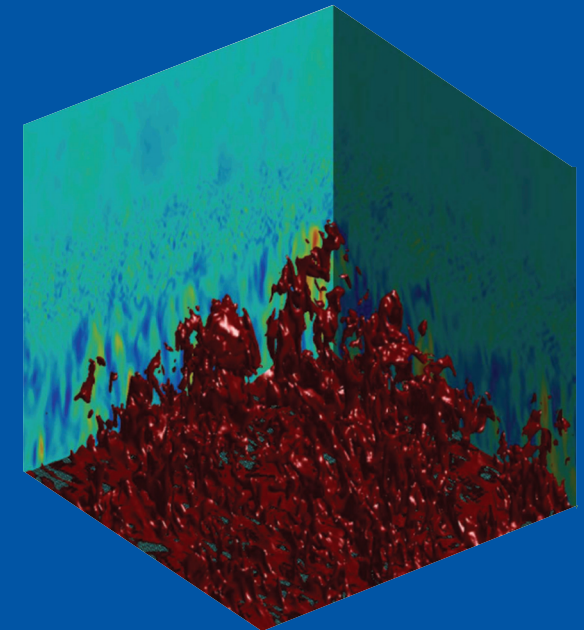
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von KARMAN INSTITUTE
FOR FLUID DYNAMICS

CFD FOR ATMOSPHERIC FLOWS AND WIND ENGINEERING



March 11-13, 2013

INTRODUCTION

There is an increasing interest in the application of Computational Fluid Dynamics (CFD) to the quantification of fluid flow in the lower atmosphere (troposphere and lower stratosphere) at mesoscale for weather prediction and wind resource assessment, and in the lower troposphere at the microscale, where the highly turbulent atmospheric boundary layer (ABL) interacts directly with the human environment. Simulation of atmospheric flows at the meso and micro scales over both flat and complex domain is necessary for the estimation of wind loads on buildings and building heating requirements, to predict wind turbine loadings and power and to site and optimize grouping of wind turbines in wind farms, and to predict and evaluate the production and transport of pollution in the atmosphere.

This von Karman Institute Lecture Series presents an overview of state-of-the-art CFD prediction methods of atmospheric flows at both the mesoscale and microscale. The course specifically addresses Reynolds Averaging (RANS) and large-eddy (LES) approaches, and their respective capabilities for different scales of atmospheric flows. The lectures include discussion of practical examples and implementation of applications using open source software such as OpenFOAM and WRF, as well as in-house and commercial software.

The lecture Series directors are Prof. Jeroen van Beeck and Prof. Carlo Benocci from the von Karman Institute for Fluid Dynamics.



VON KARMAN INSTITUTE FOR
FLUID DYNAMICS

ONLINE REGISTRATION AVAILABLE

<https://www.vki.ac.be/registration>

It is highly recommended that the registration is sent at the latest 15 days before the beginning of the course. A letter of acceptance and additional information will be sent on receipt of the application form.

COURSE FEE

The fee for the lecture series is 1010 euro, applicable to citizens of NATO countries contributing to the financing of the VKI (Belgium, Czech Republic, France, Germany, Hungary, Iceland, Italy, Luxemburg, Norway, Portugal, Spain and Turkey). For citizens of other NATO countries and of NATO partner countries, the fee is 1320 euro. For non-NATO citizens the fee is 1440 euro. These prices include 21% VAT. The fee includes printed notes, lunches, beverages, and administrative costs. Lectures will be given in English and printed notes will be distributed during registration.

FELLOWSHIPS

To encourage greater participation in our Lecture Series programme by university members, the Institute has established a limited number of VKI Lecture Series fellowships for citizens of NATO countries contributing to the financing of the VKI, as well as for citizens of other NATO countries and NATO partner countries coming from a university in a VKI financing country. The recipient of such fellowship is entitled to attend the Lecture Series at a reduced fee, which will be 505 euro (VAT included) for assistants not having a Ph.D. degree and for Ph.D. candidates, and 225 euro (VAT included) for undergraduate students. For non-NATO citizens coming from a university in a VKI financing country, the fee is 720 euro (VAT included) for assistants not having a Ph.D. degree and for Ph.D. candidates, and 300 euro (VAT included) for undergraduate students.

The request to be considered for an award must accompany the application to attend the Lecture Series, and the applicant must provide a recommendation letter from his or her professor; if not done so, the request will not be taken into consideration. All possible alternative sources of funding should be investigated before aid is requested under this scheme, so that those most in need will benefit.

PRELIMINARY SCHEDULE

Monday 11 March 2013

09:15 Welcome Address

09:30 Introduction to CFD for atmospheric flows and wind engineering
Prof. B. Blocken, Eindhoven University of Technology, The Netherlands

10:00 Coffee Break

10:30 Introduction to CFD for atmospheric flows and wind engineering (Cont'd)
Prof. B. Blocken

12:30 Lunch Break

14:00 CFD inflow conditions, wall functions and turbulence models for flows around obstacles
Prof. A. Parente, Université Libre de Bruxelles, Belgium

15:15 Coffee Break

15:45 Uncertainty Quantification for ABL flows using CFD
Dr. C. Gorié, von Karman Institute for Fluid Dynamics & University of Antwerp, Belgium

17:00 Reception

Tuesday 12 March 2013

9:00 CFD application to wind energy using RANS
Prof. N. N. Sørensen, Technical University of Denmark, Denmark

10:00 Coffee Break

10:30 CFD application to wind energy using RANS (Cont'd)
Prof. N. N. Sørensen

12:30 Lunch Break

14:00 The Atmospheric Boundary Layer: mean turbulence structure, large-eddy simulation of atmospheric winds, and application to wind turbine aerodynamics
Prof. J. G. Brasseur, The Pennsylvania State University, USA

15:15 Coffee Break

15:45 The Atmospheric Boundary Layer: mean turbulence structure, large-eddy simulation of atmospheric winds, and application to wind turbine aerodynamics (Cont'd)
Prof. J. G. Brasseur

Wednesday 13 March 2013

9:00 The Atmospheric Boundary Layer: mean turbulence structure, large-eddy simulation of atmospheric winds, and application to wind turbine aerodynamics (Cont'd)
Prof. J. G. Brasseur

10:30 Coffee Break

11:00 Introduction to mesoscale meteorology
Prof. S. Basu, North Carolina State University, USA

12:30 Lunch Break

14:00 Simulation of atmospheric flows at mesoscale (Cont'd)
Prof. S. Basu

17:00 End of Lecture Series