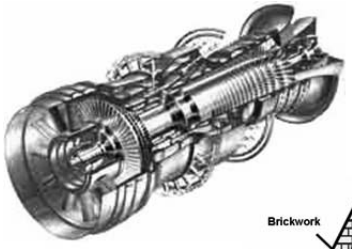
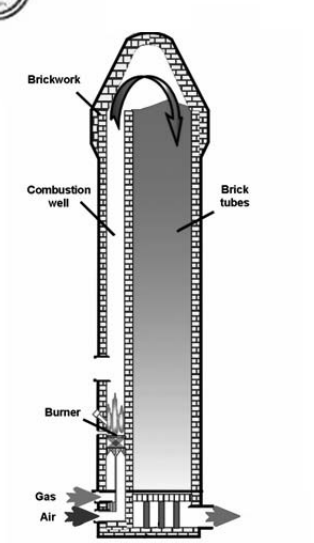
Please correct your address if necessary)

Lecture Series Secretary
von Karman Institute for Fluid Dynamics
72 Chaussée de Waterloo
B-1640 Rhode-St-Genèse
Belgium

von KARMAN INSTITUTE
FOR FLUID DYNAMICS

BASICS OF AERO-ACOUSTICS AND THERMO-ACOUSTICS





AETHER

SIXTH FRAMEWORK PROGRAMME

MARIE CURIE ACTIONS

December 3-7, 2007

von Karman Institute for Fluid Dynamics
72, Chaussée de Waterloo
1640 Rhode-Saint-Genèse, Belgium

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INTRODUCTION

The accurate modelling of the stability properties of energy conversion processes, such as gas turbines, industrial heaters or domestic heating systems, is facing aero-acoustical and thermo-acoustical issues hindering their economic sustainability.

This Lecture Series is organized within the framework of the European Marie Curie Research Training Network (RTN) project "AETHER" (AEro-acoustical and THermo-acoustical coupling in enERgy processes), focused on the development of innovative prediction, diagnostic and control techniques for thermo-acoustical and aero-acoustical problems. The research topics address system modelling and stability analysis, the modelling of reacting and non-reacting unsteady flows and their coupling with acoustics, vibro-acoustic coupling and fatigue analysis, passive & active control techniques. The targeted fields of application encompass gas turbines, industrial heating systems as well as domestic/district heating systems and boilers. For more details of the AETHER project, see http://www.cerfacs.fr/aether.

The aim of the Lecture Series is to present the state-of-the-art in this multi-disciplinary engineering field, in a way accessible to attendees coming from both academic and industrial areas. The course will start with introductory lectures on the fundamentals of aero-acoustical and thermo-acoustical instabilities, on combustion modelling and on internal aero-acoustics. The second day will be devoted to aero-acoustics with courses on unsteady flow modelling and modelling of noise source and propagation. System modelling and stability analysis of the energy conversion processes will be the topic of the third day. The emphasis of the next day will be put on thermo-acoustics with courses on experimental methods in combustion and thermo-acoustics and on passive and active control of combustion instabilities. Additional lectures on biomass combustion, vibro-acoustical coupling and fatigue analysis will conclude the week course.

For each course, selected test cases will illustrate the capabilities of the different approaches, allowing an evaluation of their performances and a quick application in various fields of research. The main objective of the Lecture Series is to allow an information transfer between well-known scientists, leaders in the aero-acoustics and combustion fields, and demanding industries and laboratories. For these reasons, the course should appeal not only to experts already working in the domain, but also to newcomers to the field.

The Lecture Series Director is Prof. J. Anthoine of the von Karman Institute. The lecturers are involved within the AETHER network project.

PRACTICAL INFORMATION

Lunch will be taken from 12h30 to 14h00. Coffee breaks are scheduled each morning and afternoon.

Please pass this announcement to someone who may be interested if you are unable to attend the Lecture Series yourself

TIMETABLE

MONDAY DECEMBER 3, 2007

08:45 **Welcome address**

09:15 **Fundamentals of aero-acoustical instabilities**
A. Hirschberg, Eindhoven University of Technology, The Netherlands

11:00 **Internal aero-acoustics**
A. Hirschberg

14:00 **Fundamentals of thermo-acoustical instabilities**
A. Hirschberg

15:45 **Combustion modelling**
L.P.H. de Goey, Eindhoven University of Technology, The Netherlands

17:00 **Reception**

TUESDAY DECEMBER 4, 2007

09:00 **Unsteady flow modelling**
F. Nicoud, Université Montpellier 2, France

10:45 **Unsteady flow modelling**
F. Nicoud

14:00 **Fundamentals of aero-acoutical analogies**
J. Anthoine, von Karman Institute, Belgium

15:00 **Generation of unsteady aero-acoustic sources from steady CFD**
J. Golliard, TNO Science & Industry, The Netherlands

16:10 **Hybrid approach for aero-acoustic prediction in confined flows**
C. Schram, LMS International, Belgium

WEDNESDAY DECEMBER 5, 2007

09:00 **System modelling and stability analysis**
W. Polifke, Technische Universität München, Germany

10:45 **System modelling and stability analysis**
W. Polifke

14:00 **Visit to the VKI laboratories (only for outside participants)**

15:30 **Departure of bus**

THURSADY DECEMBER 6, 2007

09:00 **Experimental methods in combustion**
S. Hochgreb, University of Cambridge, United Kingdom

10:45 **Experimental methods in thermo-acoustics**
E.C. Fernandes, Instituto Superior Técnico Lisbon, Portugal

14:00 **Passive and active control of combustion instabilities**
A. Dowling, University of Cambridge, United Kingdom

15:45 **Passive and active control of combustion instabilities**
A. Dowling

FRIDAY DECEMBER 7, 2007

09:00 **Introduction to biomass combustion**
R. Gebart, Luleå University of Technology, Sweden

10:45 **Vibro-acoustical coupling and fatigue analysis**
W. Desmet, Katholieke Universiteit Leuven, Belgium

14:00 **VKI bus departure**