



FRANCO-BRAZILIAN ADVANCED SCHOOL

METTI IV - THERMAL MEASUREMENTS AND INVERSE TECHNIQUES **Pertinent use of experiments and models**

Angra dos Reis, State of Rio de Janeiro, November 8-13, 2009

www.mettischool.org

Recent advances in both thermal instrumentation and modeling permits the combination of efficient experimental procedures and of indirect measurements, within the research paradigm of inverse problems. Although initially associated with the estimation of boundary heat fluxes by using temperature measurements taken inside a heated body, inverse analyses are nowadays encountered in single and multi-mode heat transfer problems, dealing with multi-scale phenomena. Applications range from the estimation of constant heat transfer parameters to the mapping of spatially and timely varying functions, such as heat sources, fluxes and thermophysical properties.

The objective of the Franco-Brazilian Advanced School METTI IV is to promote the theory and application of inverse methods in thermal engineering. This Advanced School is aimed at engineers, graduate students and researchers, working both in the academia and industry. Expected attendance is of one hundred participants. The official language is English.

The METTI (Thermal Measurements and Inverse Techniques) Group, a division of the Société Française de Thermique (French Heat Transfer Society), periodically organizes such schools. Previous versions took place in France in 1995, 1999 and 2005. For the first time this school is organized outside France, as an activity of the [Year of France in Brazil](http://anodafrancanobrasil.cultura.gov.br/) (<http://anodafrancanobrasil.cultura.gov.br/>). The School METTI IV is promoted by [Société Française de Thermique – SFT](http://www.sft.asso.fr) (<http://www.sft.asso.fr>) and [Associação Brasileira de Engenharia e Ciências Mecânicas – ABCM](http://www.abcm.org.br/) (<http://www.abcm.org.br/>).

VENUE

The METTI School will be held in [Portogalo Suite Hotel](http://www.portogalosuite.com.br/en-us/Default.asp) (<http://www.portogalosuite.com.br/en-us/Default.asp>) in Angra dos Reis. From the top of a hill, facing Ilha Grande, Portogalo Suite Hotel offers to its guests an incredible view. The charming cable car that links the hotel to its beach and marina gives Portogalo Suite Hotel a unique characteristic in the beautiful region of Angra dos Reis.

The full-board rates, including breakfast, lunch and dinner, for the METTI School participants is as follows:

Single	R\$ 288.00
Double	R\$ 196.00
Extra bed in double room	R\$ 166.00

Prices above are per person and per day. **Prices are given in the Brazilian currency (R\$ - Reais).** The exchange rate is about **1 Euro = R\$ 3**. For updated exchange rates, please see http://www.bloomberg.com/markets/currencies/americas_currencies.html.

Portogalo Suite Hotel is located about 150 kilometers from the Rio de Janeiro International Airport, in the south coast of the state of Rio de Janeiro. For the METTI School participants, the destination shall be the Rio de Janeiro International Airport. It is served by major airline carriers, with everyday flights from many cities in South America, North America, Europe and Asia. Brazil requests visas for several countries, including the United States. Please, check with the Brazilian Embassy in your country if you need a visa to be admitted to Brazil, at least three months before the METTI School.

The official Travel Agency for the METTI School is [Viamundi](http://www.viamundi.tur.br) (www.viamundi.tur.br). For discounted airline tickets, pre- and post-school tours, please contact Mr. Luiz Fernando Dantas (luizfernando@viamundi.tur.br).

In order to benefit from the reduced hotel rates for the METTI School, your hotel reservation needs to be made through the School organization. Therefore, you must select your lodging option in the METTI Registration form, when registering for the METTI School. Registration for the METTI School and hotel reservations will processed by the School organization only until October 23, 2009.

PROGRAM

The METTI School is organized in theoretical courses and practical hands-on tutorial sessions, covering fundamental and advanced material in inverse problems and measurement techniques, specifically applied to heat transfer problems of practical interest. Courses and tutorial sessions will be jointly given by French and Brazilian internationally recognized specialists in the area.

On each day, two theoretical courses will be given sequentially in the morning. The tutorial sessions will be given in the evenings. The practical character limits the number of 20 participants per tutorial session. Therefore, in each evening the School participants will have to select from a list of tutorial sessions that will take

place simultaneously. Afternoons will be free for interaction and technical discussions between participants.

A Workshop will take place simultaneously with the METTI School. This workshop will be devoted to open problems or new research trends in inverse heat transfer. Papers in this workshop will be presented in poster form.

The program with confirmed **Theoretical Courses** is presented below:

DAY	HOURL	PROGRAM	LECTURERS
MONDAY 9-Nov	8:30 - 10:30	C1A - Modelling in Heat Transfer	J.-L. Battaglia (TREFLE Bordeaux) and D. Maillat (LEMTA Nancy)
	10:30 - 11:00	COFFE-BREAK	
	11:00 - 13:00	C1B - Sensors and Instrumentation	P. Seleglim (USP-SC)
	13:00 - 14:00	LUNCH	
	17:00 - 17:30	COFFE-BREAK	
	17:30 - 19:00	TUTORIALS	
	19:15 - 20:45	TUTORIALS	
TUESDAY 10-Nov	21:00	DINNER	
	8:30 - 10:30	C2A - Measurements in Heat Transfer	F. Lanzetta (FEMTO-ST Belfort) and J.C. Krapez (ONERA Salon)
	10:30 - 11:00	COFFE-BREAK	
	11:00 - 13:00	C2B - Linear Estimation	J.-C. Batsale (TREFLE Bordeaux) and O. Fudym (EMAC Albi)
	13:00 - 14:00	LUNCH	
	17:00 - 17:30	COFFE-BREAK	
	17:30 - 19:00	TUTORIALS	
WEDNESDAY 11-Nov	19:15 - 20:45	TUTORIALS	
	21:00	DINNER	
	8:30 - 10:30	C3A - Nonlinear Estimation	S. André (LEMTA Nancy) and B. Rémy (LEMTA Nancy)
	10:30 - 11:00	COFFE-BREAK	
	11:00 - 13:00	C3B - Optimization Techniques	M. Colaço (IME-RJ)
	13:00 - 14:00	LUNCH	
	17:00 - 17:30	COFFE-BREAK	
THURSDAY 12-Nov	17:30 - 19:00	TUTORIALS	
	19:15 - 20:45	TUTORIALS	
	21:00	DINNER	
	8:30 - 10:30	C4A - Regularization Techniques	H. Campos Velho (INPE)
	10:30 - 11:00	COFFE-BREAK	
	11:00 - 13:00	C4B - Adjoint Methods	Y. Jarny (Nantes) and H. Oriande (UFRJ)
	13:00 - 14:00	LUNCH	
FRIDAY 13-Nov	17:00 - 17:30	COFFE-BREAK	
	17:30 - 19:00	TUTORIALS	
	19:15 - 20:45	TUTORIALS	
	21:00	DINNER	
	8:30 - 10:30	C5A - Bayesian Techniques	D. Gamerman (UFRJ)
10:30 - 11:00	COFFE-BREAK		
11:00 - 13:00	C5B - Model reduction	D. Petit (LET ENSMA Poitiers)	
13:00 - 14:00	LUNCH		

The confirmed **Tutorial Sessions** are presented below.

T1	Hybrid methods and the characterization of nonhomogeneous materials	R. Cotta (UFRJ)
T2	Analysis of errors in measurements and inversion	P. LeMasson (Bretagne du Sud)
T3	Identification of thermophysical properties in the frequency domain	G. Guimarães (UFU)
T4	Infrared measurements	C. Pradere (Bordeaux)
T5	Inversion with reduced models for thermal characterization	E. Palomo (Bordeaux) and O. Wellele (IME-RJ)
T6	Bayesian techniques	Marina Paez (UFRJ)
T7	Discrete ordinates solutions for thermal radiation problems.	Liliane Barichello (UFRGS)
T8	Blackbodies	J. Yanagihara (USP)
T9	Heat flux transducers	S. Guths (UFSC)
T10	Normalized methods for the measurement of thermophysical properties	Z. Silva (UFPB)
T11	Inverse thermal radiation problems.	N. Ruperti Jr. (CNEN) and L. Mauro Moura (PUC-PR)
T12	Homogenization techniques	M. Cruz (UFRJ) and C. F. Matt (CEPEL)

REGISTRATION FEES

Registration fees include the METTI School texts, coffee-breaks and attendance to theoretical courses and selected tutorial sessions.

The registration fees are as follows:

	Members of ABCM, SFT or SBMAC	Non-members
General professionals	R\$ 900 300 Euros	R\$ 1500 500 Euros
Faculty Members	R\$ 600 200 Euros	R\$ 900 300 Euros
Students	Free	Free

Registration is free for graduate and undergraduate students. A proof of the student status, evidenced by a letter from the University that the student is affiliated with, will be required for those applying to this category of registration.

For registration, please fill the form at the end of this announcement and e-mail it to helcio@mecanica.ufrj.br and to fudym@mines-albi.fr.

Registration for the METTI School and hotel reservations will processed by the School organization only until October 23, 2009.

For more information, please contact:

Olivier Fudym

RAPSODEEE FRE CNRS 3213
Ecole des Mines d'Albi
81013 Albi Cedex 09, France
Tel.: 33 (0) 5 63 49 30 24
fudym@mines-albi.fr

Helcio R. B. Orlande

DEM/PEM - Politécnica/COPPE
Universidade Federal do Rio de Janeiro, UFRJ
Cx. Postal 68503 – Cidade Universitária
Rio de Janeiro, RJ, Brasil – 21945-970
Tel : 55-21-2562-8405
helcio@mecanica.ufrj.br



Ministério
da Cultura



« França.Br 2009 » l'Année de la France au Brésil (21 avril - 15 novembre) est organisée:
En France : par le Commissariat général français, le Ministère des Affaires étrangères et européennes, le Ministère de la Culture et de la Communication et Culturesfrance.
Au Brésil : par le Commissariat général brésilien, le Ministère de la Culture et le Ministère des Relations Extérieures.

« França.Br 2009 » Ano da França no Brasil (21 de abril a 15 de novembro) é organizado:
Na França : pelo Comissariado geral francês, pelo Ministério das Relações exteriores e europeias, pelo Ministério da Cultura e da Comunicação e por Culturesfrance.
No Brasil: pelo Comissariado geral brasileiro, pelo Ministério da Cultura e pelo Ministério das Relações Exteriores

REGISTRATION FORM

**FRANCO-BRAZILIAN ADVANCED SCHOOL
METTI IV - THERMAL MEASUREMENTS AND INVERSE TECHNIQUES
Angra dos Reis, State of Rio de Janeiro, November 8-13, 2009
www.mettischool.org**

Please fill this form and e-mail it to:

helcio@mecanica.ufrj.br and fudym@mines-albi.fr

1. NAME: _____

2. AFFILIATION:

Institution: _____

Department: _____

Address: _____

Phone: _____

Fax: _____

e-mail: _____

3. REGISTRATION FEES

Please mark below your registration category.

	Members of ABCM, SFT or SBMAC	Non-members
General professionals	<input type="checkbox"/> R\$ 900 <input type="checkbox"/> 300 Euros	<input type="checkbox"/> R\$ 1500 <input type="checkbox"/> 500 Euros
Faculty Members	<input type="checkbox"/> R\$ 600 <input type="checkbox"/> 200 Euros	<input type="checkbox"/> R\$ 900 <input type="checkbox"/> 300 Euros
Students	Free	Free

Instructions for the payment of the registration fee will be sent to you as soon as we receive your Registration Form.

4. HOTEL RESERVATION

Please select below your lodging option.

<input type="checkbox"/>	Single room	
<input type="checkbox"/>	Double room	Sharing room with: _____
<input type="checkbox"/>	Triple room	Sharing room with: _____
Check-in date: _____		Check-out date: _____

Instructions for the payment of the hotel will be sent to you as soon as we receive your Registration Form.

5. REGISTRATION FOR TUTORIAL SESSIONS

From the list below, please select eight tutorial sessions that you are interested in attending. The schedule of tutorial sessions will appear in the final program, depending on the number of prospective attendees.

T1	Hybrid methods and the characterization of nonhomogeneous materials	R. Cotta (UFRJ)
T2	Analysis of errors in measurements and inversion	P. LeMasson (Bretagne du Sud)
T3	Identification of thermophysical properties in the frequency domain	G. Guimarães (UFU)
T4	Infrared measurements	C. Pradere (Bordeaux)
T5	Inversion with reduced models for thermal characterization	E. Palomo (Bordeaux) and O. Wellele (IME-RJ)
T6	Bayesian techniques	Marina Paez (UFRJ)
T7	Discrete ordinates solutions for thermal radiation problems.	Liliane Barichello (UFRGS)
T8	Blackbodies	J. Yanagihara (USP)
T9	Heat flux transducers	S. Guths (UFSC)
T10	Normalized methods for the measurement of thermophysical properties	Z. Silva (UFPB)
T11	Inverse thermal radiation problems.	N. Rupert Jr. (CNEN) and L. Mauro Moura (PUC-PR)
T12	Homogenization techniques	M. Cruz (UFRJ) and C. F. Matt (CEPEL)