



FINAL PROGRAM of the 10th edition of the
Quantitative Infrared Thermography

International Conference

Pavillon Alphonse-DESJARDINS, July 27-30, 2010, Québec City (Canada)

Conference officially hosted by:



Conference organized by:
Canada Research Chair on Multipolar Infrared Vision Infrarouge Mulipolaire (MIVIM)
of the *Electrical and Computer Engineering* Department
[FINAL PROGRAM with data available on July 21st, 2010]

The **Quantitative Infrared Thermography (QIRT)** conference is an international forum which brings together specialists from industry and academia, who share an active interest in the latest developments of science, experimental practices and instrumentation, related to infrared thermography.

Following conferences in Paris (1992), Sorrento (1994), Stuttgart (1996), Lodz (1998), Reims (2000), Dubrovnik (2002), Brussels (2004), Padova (2006) and Krakow (2008), the *10th Quantitative Infrared Thermography Conference, QIRT 2010*, takes place at Université Laval, Québec City, Canada. Information about QIRT 2010 is available at:

<http://qirt2010.gel.ulaval.ca>

Moreover, full proceedings, conference photos, etc. are found on the central website of QIRT at:

<http://qirt.gel.ulaval.ca>

Organizing Committee

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QIRT 2010: Important practical Information

- To keep up with the schedule, it is asked that all presenters download their presentation on the PCs located in the lecture hall where their presentation will take place before their session (in the folder of the day of their presentation).
- **Plenary** duration is 40 minutes + 5 minutes for questions, your cooperation is appreciated to keep the schedule on time!
- **Paper** duration is 20 minutes + 5 minutes for questions, your cooperation is appreciated to keep the schedule on time!
- **Posters** of maximum size 1 m (height) x 2 m (width) are to be displayed from Tuesday July 27, morning (10h00) up to Thursday July 29th, afternoon (17h00). Velcro tape is available at the registration desk to hang the posters. Please remove your posters by Thursday July 29th (17h00). Posters will be displayed by topics following the numbers on the program.
- **Lunches** of Monday (for those who register to the courses) will take place in “Le Pub” on the 1st floor.
- **Lunches** of Tuesday, Wednesday, Thursday will be served in “Le Cercle” on the 4th floor.
- **Poster /Cocktail Welcome Reception** will take place in the Agora, on the first floor of Pavillon Desjardins, Tuesday July 27th from 19h00 to 20h30.
- **Banquet** will be held in *First Nation Wandake Huron Village*. Buses will depart at 16h15 sharp from Pavillon Desjardins (South exit, close to “Le Pub”, on *avenue de la Vie -Étudiante*) and return at the same location around 22h30, on Wednesday July 28th. Bus will depart from *Huron Village* at 22h00 sharp. Please arrive at least 15 minutes before bus departure!
- Don’t miss the **QIRT 2010 group photo**, in the stairs going down to Agora, Wednesday July 28th at 13h50 (after lunch).
- **Internet**: a few PCs will be available in the “Internet room” (room 2300 Pavillon Desjardins). Complimentary wireless internet access is available through the Pavillon, inquire at the registration desk for the passwords.
- Our research group will take the opportunity of QIRT 2010 to record (near) infrared and visible signature of participant’s faces, on a voluntary basis. A complimentary gift will be given for those participating to this activity which will take place Tuesday to Thursday in the Internet room: Please come!
- **IMPORTANT**: Participants are fully responsible of any possible accidents, illness, etc. QIRT 2010 Organizers can not be held responsible for these situations and do not accept any liability.

Abstract for the Invited Plenary Session of Thursday July 29th¹

Lock-in Thermography for Investigating Solar Cells and Materials

O. Breitenstein

Max Planck Institute of Microstructure Physics, Halle, Germany

Since more than 10 years lock-in thermography (LIT) is being used for investigating leakage current phenomena in solar cells. In operation the p-n junction of a solar cell is forward-biased. So-called local shunts are leakage sites which are causing losses in efficiency. They may be investigated by applying a pulsed forward-bias to the cell in the dark (DLIT, typical lock-in frequency 10 Hz), where all local currents become visible as local pulsed heat sources. Such investigations allow the reliable localization of all leakage sites, which is the first step for investigating their physical nature and therefore is very helpful for optimizing the efficiency of solar cells.

In this contribution the practical realization of LIT on solar cells is described and typical results of such investigations are introduced. In the last years several special LIT techniques were developed for imaging special physical parameters of solar cells, some of them employing light irradiation (ILIT). Also non-thermal LIT techniques for imaging the minority carrier lifetime in semiconductor wafers have been developed. These special LIT techniques are introduced in the second part of this contribution. Thus, LIT meanwhile implies a whole family of techniques for investigating solar cells (also solar modules) and materials.

1. This plenary replaces the one included in the printed proceedings.

Photothermal and Photoacoustic Invited Session

The purpose of this Invited Session is to bring together scientists, technology developers and technology users who are investigating or exploiting optically and electromagnetically excited acoustical, thermal and other diffusion-mediated phenomena for the investigation of a large variety of material properties and applications. The many photoacoustic, photothermal and diffusion-wave (PA/PT/DW) topics indicate that this field has developed a broad range of tools for fundamental and applied research. At the present, it is safe to say that PA/PT/DW research has reached a mature state, with an established position in measurement technology, non-destructive evaluation and materials characterization.

This Session gathers those who want to present recent work in this field or related fields. This Session also wants to offer an excellent opportunity for physicists, chemists, engineers, physicians and technology end users, who are less familiar with the field to discover the strengths of photothermal, photoacoustic and general diffusion-wave methodologies for probing material properties and studying phenomena in circumstances where many other techniques fail.

The Chair and Organizer of this Session is:

Prof. Andreas Mandelis

Canada Research Chair (Tier I) in Diffusion-Wave Sciences and Technologies
Center for Advanced Diffusion-Wave Technologies
University of Toronto
CANADA
www.mie.utoronto.ca/cadift

Exhibition

An established tradition of the QIRT conferences is the exhibition which is held concurrently with the sessions.

The **QIRT 2010 Exhibition** will take place from Tuesday morning up to Thursday at noon. Exhibition is located in room 2470 of Pavillon Desjardins. Coffee breaks will take place in that same room so that exchanges will be easy with exhibitors. In 2010, we thank the following companies and research group for their kind participation:

- **Flir Systems**

Canada's Main Office
Burlington, ON
Phone : 1-800-613-0507 or 905-637-5696
<http://www.flir.com/>

- **Instruments Techno Test Inc.**

2345, Michelin street, #100
H7L 5B9 Laval, QC
Canada
Phone : 450 681 5777
Fax : 450 681 3773
<http://www.techno-test.com/en/>

- **JENOPTIK I Defense & Civil Systems ESW GmbH - Sensor Systems**

North America Office:
JENOPTIK Optical Systems, Inc.
16490 Innovation Drive
Jupiter, FL 33478
USA
Phone : +1 561 881 7400 ext.135
Fax : +1 561 881 1947
<http://www.jenoptik.com/infraredtechnology/>

- **MiViM**

Canada Research Chair / Chaire de recherche du Canada
Multipolar Infrared Vision Infrarouge Multipolaire
Université Laval
<http://mivim.gel.ulaval.ca/>

- **Visiooimage Inc.**

2560, rue Lapointe
G1W 1A8 Québec (QC) , Canada
Phone : +1 (418) 653-8574
Fax : +1 (418) 653-8451
www.visiooimage.com/en/

- **Telops**

100-2600 St-Jean-Baptiste avenue
G2E 6J5 Quebec, QC
Canada
Phone : (418) 864-7808
Fax : (418) 864-7843
<http://www.telops.com/>

- **Xenics**

Ambachtenzone Haasrode 3227 + 3126
Ambachtenlaan 44
BE-3001 Leuven
Belgium
Phone : +32 (0)16 38 99 00
Fax : +32 (0)16 38 99 01
<http://www.xenics.com/>

QIRT 2010 - Final program (July 21st, 2010)

Legend

Session Acronyms	
BM	Biomedical Applications
CE	Civil Engineering
CM	Calibration and Metrology
E&S	Electronics & Semiconductors
ENV	Environment
FD	Fluid Dynamics & Energetics
IDP	Image & Data Processing
IRS&R	IR Signature & Recognition
ML	Modeling
MM	Monitoring & Maintenance
MS	Microscale Applications
NDE	NonDestructive Eavluatation & Testing
NT	New Technologies
PPA	Photothermal and PhotoAcoustic techniques
SM	Solid Mechanics
TP	Thermophysics
TSR	TSR (Thermographic Signal Reconstruction) method
WA&B	Works of Art & Buildings

Rooms	
Room A	2320, Pavillon Desjardins
Room B	2530, Pavillon Desjardins: Amphithéâtre Hydro-Québec
Room C	2326, Pavillon Desjardins
Internet room	2300, Pavillon Desjardins (*, **)
Invited plenaries	Chair: X. Maldague
Registration	Agora, Pavillon Desjardins (first floor, main hall)
Poster Session	Agora, Pavillon Desjardins (first floor, main hall)
Exhibit, Coffee Break	2470, Pavillon Desjardins: from Tuesday morning to Thursday at noon (on Thursday afternoon and Friday morning, the Coffee breaks will be held outside the 2470).
Lunch	"Le Cercle", 4th floor Pav. Desjardins, by elevators or stairs (in the back of the hall close to elevators) Note: on Monday, the lunch will be taken at "Le Pub", Pavillon Desjardins, 1st floor

(*) Our research group will take the opportunity of QIRT 2010 to record (near) infrared and visible signature of participant's faces, on a voluntary basis. A complementary gift will be given for those participating to this activity which will take place Tuesday to Thursday in the Internet room: Please come!

(**) Complimentary wireless internet access will be available (in a limited number), inquire for your password at the registration desk.

On Friday, there will be a visit of the Vision lab. The Vision lab is located in Pavillon Pouliot, room 00100. It is required to sign the sheets at the registration desk to form groups.

QIRT 2010 - Conference Overview

July 25th, 2010 - Sunday		July 26th, 2010 - Monday			July 27th, 2010 - Tuesday				July 28th, 2010 - Wednesday				July 29th, 2010 - Thursday				July 30th, 2010 - Friday					
Schedule	Agora	Schedule	Room A	Room C	Schedule	Room A	Room B	Room C	Schedule	Room A	Room B	Room C	Schedule	Room A	Room B	Room C	Schedule	Room A	Room B	Room C		
		8:30	Registration all day		8:00	Registration all day				8:00	Registration all day			8:30	Registration until noon							
					8:30	Opening ceremony				8:25	Invited Plenary			8:50	Invited Plenary			8:50	Invited Plenary			
		9:00	course A	course D	8:50	Invited Plenary				9:10	E&S	CE	FD	9:35	PPA	TSR	TP	9:35	CE	IDP	ML	
					9:35	CM	NDE	FD	9:35	E&S	CE	FD	9:35	PPA	TSR	TP	10:00	CE	IDP	ML		
		10:30	BREAK	BREAK	10:00	CM	NDE	FD	10:00	CM	CE	FD	10:25	PPA	TSR	TP	10:00	CE	IDP	ML		
		10:50	course A	course D	10:25	BREAK - EXHIBIT				10:25	BREAK - EXHIBIT			10:50	BREAK - EXHIBIT			10:25	CE	IDP	ML	
					10:50	BM	NDE	FD	10:50	CM	MM	FD	11:15	PPA	TSR	TP	10:50	BREAK				
		12:20	LUNCH	LUNCH	11:15	BM	NDE	FD	11:15	CM	MM	FD	11:40	PPA	TSR	TP	11:15	CE	IDP	ML		
		14:00	course C	Course B	11:40	BM	NDE	FD	11:40	CM	MM	FD	12:05	PPA	TSR	TP	11:40	Closing ceremony				
					12:05	BM	NDE	FD	12:05	CM	MM	FD	12:30	LUNCH			11:55	End of QIRT 10				
		15:30	BREAK	BREAK	12:30	LUNCH-EXHIBIT				12:30	LUNCH-EXHIBIT			14:00	Invited Plenary							
		15:50	course C	Course B	14:00	BM	NDE	SM	14:00	CM	MM		14:45	MS	IDP	ENV	14:00	Invited Plenary				
		17:20			14:25	BM	NDE	SM	14:25	CM	MM		15:10	MS	IDP	ENV	14:45	Optional visit of the Vision lab				
15:30	Registration				14:50	BM	NDE	SM	14:50	BREAK - EXHIBIT			15:35	BREAK			15:00	(sign the sheet at the registration desk)				
17:00					15:15	BM	NDE	SM	15:15				15:55	ML	IDP	WA&B	15:35					
					15:40	BREAK - EXHIBIT				16:00	BM	NDE	IRS&R	15:55	ML	IDP	WA&B	16:20	ML	IDP	WA&B	
					16:00	BM	NDE	IRS&R	16:25	BM	NDE	IRS&R	16:45	ML	IDP	WA&B	16:20	ML	IDP	WA&B		
					16:50	NT	NDE	IRS&R	17:15	NT		IRS&R	17:10	ML			16:45	ML	IDP	WA&B		
					17:15	NT		IRS&R	17:40	NT		IRS&R	17:35				17:10	ML				
					17:40	NT		IRS&R	18:05													
					18:05																	
					19:00	poster - cocktail in Agora (Pav. Desjardins, 1st floor)				16:15	bus leaves from Pav. Desjardins exit "Le Pub"											
										...	for banquet											
										22:00	bus returns											
					20:30	poster - cocktail																

POSTER SESSION

Topics	#	Authors	Title
BM	1	Lyzhko E.	Physiological characteristics of heat and cold weak effects in the Zakharin-Head zones
BM	2	Matvienko A., Mandelis A., Hellen A., Jeon R., Abrams S. H., Amaechi B. T.	Quantitative analysis of dental tissue properties using photothermal radiometry
CM	3	Moderhak M., Bajorek M.	The influence of carbon dioxide on dynamic thermography results
CM	4	Olbrycht R., Więcek B.	New method for two-point nonuniformity correction of microbolometer detectors
E&S	5	Vainer B.G., Kamaev G. N.	Narrow-band infrared examination of solid-state structures
Env	6	Lesniak A., Bukowska-Belniak B.	Detecting the wastewater leakage from cesspool using noisy thermographic images
IDP	7	Benkő I.	Analysis of infrared images in integrated-circuit techniques by mathematical filtering
IDP	8	Bukowska-Belniak B., Leśniak A., Stasz A., Kielkowski P., Michalski R.	Detection of foreign bodies in comestible product using sequence of low contrast thermographic images
IDP	9	Dudzik S.	Application of the morphological operations for defect area recognition using active thermography
IDP	10	Grys S., Minkina W.	Filtered thermal contrast – error analysis
IDP	11	Minkina W., Dudzik S., Gryś S.	Errors of thermographic measurements – exercises
IDP	12	Ziadi A., Saucier L., Maldague X.	Image analysis in computer vision: A high level means for Non-Destructive evaluation of the marbling in the beef meat
IDP	13	Sahli S., Fissette S., Maldague X.	Infrared Image Processing for Online Quality Control in Laser Welding
NDE	14	Bajorek M.	Analysis of the possibility of defect determination using cold excitation in thermal tomography
NDE	15	Maillard S., Cadith J., Chevallier C., Charron J.I., Walaszek H., Bodnar J. L., Candore J. C.	Towards the use of passive and active infrared thermography to inspect metallic components in the mechanical industry
NDE	16	Mohd Salleh K.A.B., Ibarra-Castaneda C., Maldague X.P.V.	On the Comparison of infrared thermography (IT) and digital industrial radiography (DIR) flat panel system for NDT of welded joints
NDE	17	Montanini R., Freni F.	Nondestructive inspection of luxury yacht glass reinforced composite panels by means of transient thermography
NDE	18	Salazar A., Mendioroz A., Apiñaniz E., Oleaga A., Venegas P., Sáez-Ocáriz I.	Application of vibrothermography to the depth characterization of delaminations
NDE	19	Kim K.S., Kim K.S., Kim D.S., Hong D.P., Yang S.M., Choi M.Y., Chang H.S., Kee C.D., Jung H.C.	Defect detection of pipes using shearography and lock-in infrared thermography
NDE	20	Lee S. G., Kim W. T.	Inspection of the Leakage for the Closure Plug of Heavy Water Reactor using Infrared Thermography in Nuclear On-site Application
NDE	21	Kim W. T., Kim D. Y., Lee J. W., Hong D. P.	Condition Monitoring of Fault Diagnosis under Lubrication Condition in Ball Bearing using Infrared Thermography
PPA	22	Lashkari B., Mandelis A.	Contrast comparison between frequency- and time-domain photoacoustic imaging
PPA	23	Tabatabaei N.*, Mandelis A.** and Amaechi B.T.***	Thermophotonic lock-in imaging: An active thermography system for detecting early carious lesions in human teeth
SM	24	S. Stipetić, Z.Hanić, M. Vražić	Application of IR thermography to measurements on synchronous hydrogenerator in rotation
WA	25	Candoré J.C., Bodnar J.L., Detalle V., Grosse P.	Assistance to the restoration of historical frescoes by stimulated infrared thermography
WA&B	26	Kisilewicz T., Wróbel A.	Quantitative infrared wall inspection
WA&B	27	Mazioud A., Ibos L., Dumoulin J.	Detection of a mosaic hidden behind a plaster layer by IR thermography
WA&B	28	Sales R.B.C., Sales F.A., Gonçalves Tavares S., Andrade R.M., Aguilár M.T.P.	Thermal analysis of structural masonry in concrete block containing expanded polystyrene (EPS) using digital infrared thermography

QIRT 2010

July 25th, 2010 - Sunday

Schedule	
15:30	Registration
17:00	

QIRT 2010

July 26th, 2010 - Monday

Schedule		Preconference COURSES	
8:30	Registration: all day until 17:30		
	Room A	Room C	
9:00	A - Basic Thermography Prof. V. Vavilov, Tomsk Polytechnic Institute, Russia Prof. X. Maldague, Université Laval, Canada	D - Cultural Heritage and buildings Prof. E. Grinzato, CNR-ITC, Padova, Italy	
10:30	BREAK		BREAK
10:50	A - Basic Thermography Prof. V. Vavilov, Tomsk Polytechnic Institute, Russia Prof. X. Maldague, Université Laval, Canada	D - Cultural Heritage and buildings Prof. E. Grinzato, CNR-ITC, Padova, Italy	
12:20	LUNCH		LUNCH
14:00	C - Application to Solids Prof. G. Busse, Universität Stuttgart, Germany	B - Application to Fluids Prof. G. M. Carlomagno, Università di Napoli Federico II, Italy	
15:30	BREAK		BREAK
15:50	C - Application to Solids Prof. G. Busse, Universität Stuttgart, Germany	B - Application to Fluids Prof. G. M. Carlomagno, Università di Napoli Federico II, Italy	
17:20			

July 27th, 2010 - Tuesday

Schedule	Room A	Room B	Room C
8:00	Registration: all day until 18:30		
8:30	Opening ceremony		
8:50	Invited Plenary: D. Balageas, Personal thoughts on the occasion of the Xth QIRT Conference		
	Calibration and Metrology, chairs: Dr. Planquart and Dr. Salazar	NDE, chairs: Dr. Holland and Dr. Vavilov	Fluid Dynamics & Energetics, chairs: Dr. Carlomagno and Dr. Schrijer
9:35	Shape and temperature field distortions induced by convective effect on hot object in the near infrared and infrared spectral band Delmas A., Le Maoult Y., Buchlin J.M., Sentenac T., Orteu J.J.	Feature-extraction from lockin-thermography phase-images Holtmann N., Spiessberger C., Gleiter A., Busse G.	Experimental assessment of a new technique for measuring heat transfer coefficients Carlomagno G.M., Discetti S., Astarita T.
10:00	Temperature measurement at large distance of plasma-facing surfaces in fusion reactor by active pyrometry Melyukov D., Sortais C., Farcage D., Semerok A., Thro P.Y., Gauthier E.	Lock-in Thermography for Process Integrated Non-destructive Evaluation of Carbon Fiber Reinforced Aircraft Structures Ullmann T., Aoki R. and Schmidt T.	Investigation of Gortler vortices in a hypersonic double compression ramp flow by means of infrared thermography Schrijer F.F.J.
10:25	BREAK - EXHIBIT		
	Biomedical Applications, chairs: Dr. Benko and Dr. Nowakowski	NDE, chairs: Dr. Holland and Dr. Vavilov	Fluid Dynamics & Energetics, chairs: Dr. Carlomagno and Dr. Schrijer
10:50	Implementation of Active Dynamic Thermography in medical diagnostics Nowakowski A.	Defect sizing by local excitation thermography Schlichting J., Kervalishvili G.N., Maierhofer Ch., Kreutzbruck M.	Transition detection on an Ultra-Streamlined vehicle using IR thermography Planquart Ph., Claesen A. and Buchlin J.M.
11:15	Quantitative dual-spectrum infrared approach for breast cancer detection Lee C.Y., Chang Z.W., Chuang C.C., Lee W.J., Lee C.Y., Lee S.C., Huang C.S., Chang Y.C., Chen C.M.	Multimodal Defect Quantification Huebner S., Stackelberg B.V. and Fuchs T.	IR wall heat transfer in swirling impinging jets Ianiro A., Cardone G., Carlomagno G. M.
11:40	Continuous monitoring of radiotherapy through infrared image processing Benkő I., Kóteles G.J.	Signal to noise ratio (SNR) comparison for lockin thermographic data processing methods in CFRP specimen Madruga F. J., Albendea P., Ibarra-Castanedo C., López-Higuera J. M.	Heat transfer investigation in an hypersonic boundary layer Schreibvogel P., Paniagua G., Bottini H., Masutti D., Chazot O., Solano J.P.
12:05	Clinical Applications of Medical Thermography Mostovoy A.	NDT characterisation of carbon-fibre and glass-fibre composites using non-invasive imaging techniques Avdelidis N.P., Ibarra-Castanedo C., Bendada A., Saarimaki E., Kauppinen T., Kouli M., Maldague X.P.V.	Infrared thermography measurements on ablative thermal protection systems for interplanetary space vehicles Asma C.O., Helber B., Di Lello L., Magin T.
12:30	LUNCH-EXHIBIT		
	Biomedical Applications, chairs: Dr. Benko and Dr. Nowakowski	NDE, chairs: Dr. Batsale and Dr. Busse	Solid Mechanics, chairs: Dr. Bremond and Dr. Pieczyska
14:00	Observing Temperature Fluctuations in Humans Using Infrared Imaging Liu W., Meyer J., Elster E., Gorbach A.	Ultrasound lockin thermography as a quantitative technique for quality control assessment of cast iron turbine components Montanini R., Rossi G.L., Freni F.	Temperature visualisation of shape memory alloy various behavior Pieczyska E., Tobushi H.
14:25	Wavelength-modulated differential photothermal radiometry for non-invasive blood glucose detection Guo X., Mandelis A., Matvienko A. Sivagurunathan, K., Zinman B.	Structural-thermal FE simulation of vibration and heat generation of cracked steel plates due to ultrasound excitation used for vibrothermography Plum R. and Ummenhofer T.	Full Field Experimental stress/strain analysis by Thermographic stress analyser for fatigue crack detection during HCF Testing. Examples in Automotive and Aircraft industry Bremond P.
14:50	Decision classification criteria for ADT in burn diagnostic basing on in-vivo animal experiments Kaczmarek M.	Using ultrasound infrared thermography to detect defects in pipes Park H.S., Choi M.Y., Park J. H., Lee S.S.	Thermoelastic stress analysis of titanium components and simultaneous assessment of residual stress Galietti U., Palumbo D.
15:15	Imaging and quantitative characterization of bilateral vasomotor reactions in humans using high-performance thermography Vainer B.G., Markel A.L.	Infrared thermography analysis of the equipment beneath the chassis of metropolitan railway vehicle Capote J. A., Alvear D., Abreu O.V., Lázaro M., Hernando J.	Experimental procedure and characterization of the thermo-elastic behaviour of rubber-like materials Boucart N., Brieu M., Desplanques Y., Kondo D.
15:40	BREAK - EXHIBIT		
	Biomedical Applications, chairs: Dr. Gorbach and Dr. Vainer	NDE, chairs: Dr. Batsale and Dr. Busse	IR Signature & Recognition, chairs: Dr. Bendada and Dr. Svaic
16:00	Real-time monitoring of dental lesions using transmission-mode photothermal radiometry and modulated luminescence Hellen A., Mandelis A., Finer Y., Amaechi B.T.	Identification and localization of surface and buried heat sources through curve fitting of the temperature-time profile for vibrothermography Holland S.D.	Automatic defect classification in inductive thermo-graphical testing Oswald-Tranta B. and Sorger M.
16:25	Time-Frequency Analysis of Skin Temperature in a Patient with a Surface Tumor Monitored with Infrared Imaging Scully C.G., Liu W., Meyer J., Dementyev A., Chon K.H., Innominato P., Lévi F., Gorbach A.M.	An experimental study of sub-surface defects detection of bakelite using active mode thermography Umar M.Z., Hamzah A. R., Vavilov V.	Infrared Face Recognition: A Review of the State of the Art Ghiass R.S., Bendada A., Maldague X.
	Novel Techniques, chairs: Dr. Huebner and Dr. Ibarra		
16:50	Development of a hybrid non-destructive inspection system combining induction thermography and eddy current techniques Grenier M., Ibarra-Castanedo C., Maldague X.	Infrared thermography and ultrasonic C-Scan for non destructive evaluation of aerospace materials: A comparative study Duan Y., Wu N., Maldague X., Zhang C., Li X.	Quantitative method of evaluating for recognize people, based on thermograms G. Owczarek, R. Strakowski, M. Wiecek
17:15	Near infrared imaging for multi-polar civilian applications Ebeid A., Ibarra-Castanedo C., Bendada A. and Maldague X.		A new fusion framework for multispectral IR face recognition in the texture space Akhloufi M., Bendada A.
17:40	Thermal converter for 2D real-time TeraHertz imaging using standard InfraRed camera Pradere C., Salort S., Caumes J-P., Chassagne B. and Batsale J.C.		Multispectral infrared face recognition: a comparative study Akhloufi M., Bendada A.
18:05			
19:05	Poster - Cocktail		
20:35			

July 28th, 2010 - Wednesday

Schedule	Room A	Room B	Room C
8:00	Registration: all day until 15:00		
8:25	Invited Plenary: K. Patel, Infrared Photo-Thermography for Standoff Detection of Explosive Substances at Distances up to 150 Meters		
	Electronics & Semiconductors, chairs: Dr. Balageas and Dr. Breitenstein	Civil Engineering, chairs: Dr. Grinzato and Dr. Schlichting	Fluid Dynamics & Energetics, chairs: Dr. Carlomagno and Dr. Gallo
9:10	Quantitative imaging of physical parameters of breakdown sites and avalanche multiplication in solar cells by lock-in thermography Breitenstein O., Bauer J., Wagner J.-M.	High resolution and automatic survey of buildings by IR thermography Grinzato E., Cadelano G., Bison P., Peron F., Maldague X.	A novel Infrared Thermography (IRT) based experimental technique for distributed temperature measurements in hot gas flows Gallo M., Kunsch J.P., Rösger T.
9:35	Interpretation of lock-in thermography on thin film solar cells implying dissipative and Peltier contributions Straube H. and Breitenstein O.	Investigating historic masonry structures at different depth with active thermography Maierhofer Ch., Krankenhagen R., Röllig M., Schiller M., Hennen Ch., Meinhardt J.	Implementation of thermography for determination of air jet geometry in HVAC systems S. Švaić, I. Boras, D. Dović
10:00		Diagnostic of insulated building walls of old restored constructions using active infrared thermography Larbi Youcef M.H.A., Ibos L., Feuillet V., Balcon P., Candau Y., Filloux A.	Effect of nozzle shape on local heat transfer distribution in impinging jets Herrero Martin R. and Buchlin J.M.
10:25	BREAK - EXHIBIT		
	Calibration and Metrology, chairs: Dr. Bendada and Dr. Planquart	Monitoring & Maintenance, chairs: Dr. Avdelidis and Dr. Ibarra	Fluid Dynamics & Energetics, chairs: Dr. Svaic and Dr. Swiderski
10:50	Estimating and quantifying theoretical errors of temperature measurement in bi-spectral thermography Tortel V., Sfaxi Y., Khelalfa R.	Application of thermal methods for characterization of welded joints Galiotti U., Ginex A., Palumbo D.	Heat transfer enhancement with ribs in natural convection Cardone G., Panelli M.
11:15	New approach on determination of emissivity fields using bicolor reflectometry technique Gilblas R., Sentenac T., Hernandez D., Le Maout Y.	Study of the heating of a glass substrate in a spray CVD reactor Logerais P.O., Riou O., Garnier J. Bouteville A.	A novel technique for the continuous evaluation of a burning rate of solid rocket propellant by using IR thermography Swiderski W., Miszczak M., Panas A.
11:40	Fast and accurate calibration-based thermal / colour sensors registration St-Laurent L., Prévost D., Maldague X.	Automated defect detection in large-scale bonded parts by active thermography Thiemann C., Zaeh M. F., Srajbr C., Boehm S.	Frequency analysis of convective cooling for the multi heat-source electronic systems – modeling and IR measurements Świątczak T., Wiecek B., De Mey G.
12:05	Pixel-wise advanced calibration method for infrared cameras Tremblay P., Belhumeur L., Chamberland M., Villemaire A., Dubois P., Marcotte F., Belzile C., Farley V. and Lagueux P.	Optical characterization of growing thin films at high temperatures by analysis of near infrared emissivity variations using CCD thermal imaging Zauner G., Mayrhofer F. and Hendorfer G.	High throughput characterization of gas/solid systems using infrared thermography Jolly J., Pavageau B., Tatibouët J.M.
12:30	LUNCH-EXHIBIT		
13:50	QIRT2010 GROUP PHOTO (in stairs down to Agora, Pav. Desjardins)		
	Calibration and Metrology, chairs: Dr. Bendada and Dr. Planquart	Monitoring & Maintenance, chairs: Dr. Avdelidis and Dr. Ibarra	
14:00	Signal to noise ratio (SNR) comparison for pulsed thermographic data processing methods applied to welding defect detection Albendea P., Madruga F. J., Cobo A., López-Higuera J.M.	Estimation of steel slag parameters using thermal imaging and neural networks classification Wiecek M., Strakowski R., Wiecek B., Olbrycht R., Świątczak T., Wittchen W., Borecki M.	
14:25	Use of extension tubes in thermography Kaluza M., Wiecek B.	Calculation and infrared measurement identification of shell temperature distribution on overhead heat pipeline placed in open air space Kruczek T., Fic A.	
14:50	BREAK - EXHIBIT		
15:10			
16:15	Buses leaves for Banquet (from South DESJARDINS entrance, close to LE PUB) to the Wandake First Nation Village		
...			
22:00	Bus returns		

Schedule	Room A	Room B	Room C
8:30		Registration: all day until 18:00	
8:50	Invited Plenary: A. Mandelis, Infrared Lock-in Carrierography (Photocarrier Radiometric Imaging) of Semiconductors and Si Solar Cells		
	Photothermal and Photoacoustic techniques, chairs: Dr. Mandelis and Dr. Xingwang	TSR (Thermographic Signal Reconstruction) method, chairs: Dr. Balageas and Dr. Shepard	Thermophysics, chairs: Dr. Batsale and Dr. Salazar
9:35	Boundary Effects on the Efficiency of Direct Infra-Red Optical Tomography Boulanger J., Balima O., Charette A.	TSR: origins and observations Shepard S.M.	Simple possibilities of thermal diffusivity estimation for small size samples, with a laser pulse or step heating and infrared cameras Ayvazyan V., Batsale J.-C., Pradere C.
10:00	Thermographic Assessment of Cold Stimulation on Autonomic Vascular Reactions Edwards S.	Thickness or diffusivity measurements from front-face flash experiments using the TSR approach Balageas D.L.	Porosity Determination by Pulsed Thermography in Reflection Mode Mayr G., Hendorfer G.
10:25	Free carrier diffusion-wave modulation of a sub-bandgap cw laser beam Mandelis A., Tolev J.	Thermographic Signal Reconstruction with periodic temperature variation applied to moisture classification Bison P., Cadelano G. and Grinzato E.	Improved algorithm to reconstruct the thermal conductivity depth profile in hardened steels Celorio R., Apiñaniz E., Mendioroz A., Salazar, A., Mandelis A.
10:50	BREAK - EXHIBIT		
	Photothermal and Photoacoustic techniques, chairs: Dr. Mandelis and Dr. Xingwang	TSR (Thermographic Signal Reconstruction) method, chairs: Dr. Balageas and Dr. Shepard	Thermophysics, chairs: Dr. Batsale and Dr. Salazar
11:15	Dual-Mode Photoacoustic Phased-Array Imager for Biomedical Applications Telenkov S., Mandelis A.	Quantitative assessment of the improvement of the detection of defects by pulse stimulated thermography thanks to the use of the TSR approach. Case of a smart composite repair patch Balageas D. L., Chapuis B., Deban G., Passilly F.	Accurate measurements of the thermal diffusivity of thin films and thin filaments using lock-in thermography Salazar A., Mendioroz A., Fuente R., Celorio R.
11:40	Thermophotonic lock-in imaging: An active thermography system for detecting early carious lesions in human teeth Tabatabaei N., Mandelis A., Amaechi B.T.	A hybrid pulsed thermography processing technique for the depth estimation of subsurface defects combining TSR and PPT Klein M., Bendada A., Ibarra-Castanedo C., Maldague X.P.V.	Dual-band active thermography on infrared transparent materials Abuhamad M., Netzelmann U.
12:05	Large dimension photothermal screen for the characterization of very short pulsed microwave fields using infrared thermography Balageas D.L., Levesque P.	Comparison of the defect detection capabilities of flash thermography and vibration excitation shearography Pickering S.G., Almond D.P.	Phase lock-in laser active pyrometry for surface layer characterisation of Tokamaks walls Melyukov D., Sortais C., Semerok, A., Thro P.Y., Courtois X., Farcage D.
12:30	LUNCH		
14:00	Invited Plenary: O. Breitenstein Lock-in Thermography for Investigating Solar Cells and Materials		
	Microscale Applications, chairs: Dr. Batsale and Dr. Busse	Image & Data Processing, chairs: Dr. Netzelmann and Dr. Vavilov	Environment, chairs: Dr. Dumoulin and Dr. Ibarra
14:45	Thermal characterization of silicon integrated spiral inductors by thermal impedance using transient thermography – first approach Kaluza M., Wiecek B., Hatzopoulos A., Chatziathanasiou V., De Mey G.	Some novel approaches to thermal tomography of CFRP composites Vavilov V.	Infrared thermography of solid surfaces under fire Meléndez J., Foronda A., Aranda J.M., López F.
15:10	Heterodyne techniques for the measurement of high frequency (up to 10 kHz) periodic thermal excitation with InfraRed camera Clerjaud L., Pradere C., Dilhaire S., Batsale J.C.	Random photothermal thermography: Principle and examples of applications Bodnar J.L., Candoré J.C., Nicolas J.L., Charon D., Gossel P.	Implementation of an infrared camera for road thermal mapping Marchetti M., Moutton M., Ludwig S., Ibos L., Dumoulin J.
15:35	BREAK		
	Modeling, chairs: Dr. Benitez and Dr. Kim	Image & Data Processing, chairs: Dr. Netzelmann and Dr. Vavilov	Works of Art & Buildings, chairs: Dr. Avdelidis and Dr. Grinzato
15:55	Detecting hidden defects on a thin metallic plate Bison P., Ceseri M., Inglese G.	Spatio-temporal filtering of active thermography data for noise reduction and data compression Alsaadawi Z., Netzelmann U.	Approach of the in situ measurement of thermal diffusivity of mural paintings with stimulated infra-red thermography Candoré J.C., Bodnar J.L., Detalle V., Gossel P., Remy B.
16:20	An Implicit Finite-Difference model for Thermal Processes Simulation and Surveys Ghodsi G., Gavrilov D., Maeva E., Maev R. Gr.	On-off modulated thermography of composite material and signal processing Xingwang G., Zheng L., Yingtao L.	Active thermography data processing for the NDT&E of frescoes Bendada A., Sfarra S., Ambrosini D., Paoletti D., Ibarra-Castanedo C., Maldague X.P.V.
16:45	Near infra-red imaging with the radiative transfer equation: A comparative study with finite elements Balima O., Boulanger J., Charette A., Marceau D.	Fourier based stabilisation of thermal images in dynamic thermography Moderhak M.	A Comparison of Near- and Mid-Infrared band reflectography for the aids of artwork diagnostics Gavrilov D., Kais C., Maeva E., Maev R.Gr.
17:10	Finite element analysis of heat generation in ultrasonic thermography Saboktakin A., Ibarra-Castanedo C., Bendada A., Maldague X.		
17:35			

July 30th, 2010 - Friday

Schedule	Room A	Room B	Room C
8:30	Registration: all day until 12:00		
8:50	Invited Plenary: T. Sakagami, Y. Izumi, N. Mori, S. Kubo, Development of self-reference lock-in thermography and its application to remote nondestructive inspection of fatigue cracks in steel bridges		
	Civil Engineering, chairs: Dr. Dumoulin and Dr. Schlichting	Image & Data Processing, chairs: Dr. Nowakowski and Dr. Servais	Modeling, chairs: Dr. Bison and Dr. Rémy
9:35	Influence of air-gaps on the thermal behaviour of the plaster-concrete bond Krankenhausen R., Kervalishvili G.N., Maierhofer Ch.	Application of the Source Distribution Image (SDI) procedure for porosity detection in honeycomb structures Susa M., Maldague X., Boras I.	Estimation of the Spatial Distribution of High Impulsed Heat Flux Stimulations Through Infrared Thermography Remy B., Degiovanni A., Lasserre J.P., Loreau Y., Voisin L., Desanlis T., Birel B., Galtié A.
10:00	DEFBETIR: Detection by infrared thermography of the heat signature of diseases and defects in concrete structures of civil engineering Nahant M., Paez S.	Region of Interest Extraction based on Multi-resolution Analysis for Infrared Nondestructive Testing Ortiz-Jaramillo B., Benitez-Restrepo H., Garcia-Álvarez J., Castellanos-Dominguez G.	IR non destructive testing experiment design Necsulescu D., Bayat S.
10:25	Hybrid Digital Image Correlation/Thermographic System for Displacement and Defects in Civil Engineering Structures Observation Kujawinska M., Bukalska M., Dymny G., Malowany K., Siwek B.	Probability of detection for in field thermal non destructive testing of aircraft composite structures Servais P., Ibarra-Castanedo C., Maldague X., Gélébart Y.	Cross-correlation Based Compression Techniques for Frequency Modulated Thermal Wave Imaging Subbarao G.V., Mulaveesala R., Takei M.
10:50	BREAK		
	Civil Engineering, chairs: Dr. Dumoulin and Dr. Schlichting	Image & Data Processing, chairs: Dr. Nowakowski and Dr. Servais	
11:15	Evaluation of FRP gluing on concrete structures by active infrared thermography Dumoulin J., Ibarra-Castanedo C., Quiertant M., Taillade F., Bendada A., Maldague X.	Defect detection and characterisation in composite materials using active IR thermography coupled with SVD analysis and thermal quadrupole modeling Feuillet V., Ibos L., Fois M., Dumoulin J., Candau Y.	
11:40	Closing ceremony		
11:55	End of QIRT 10		
14:00	Optional visit of the Vision lab		
15:00	(sign the sheet at the registration desk)		