

## Meetings

11<sup>th</sup>-12<sup>th</sup> June 2014

MeMeA2014 - 9<sup>th</sup> edition of IEEE International Symposium on Medical Measurement and Applications in Lisbon, Portugal

Special session on  
“Developments and Applications of Thermography”

Organizers:

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Http://memea2014.ieee-ims.org,

7<sup>th</sup>-11<sup>th</sup> July 2014

12th Quantitative InfraRed Thermography Conference, QIRT 2014 in Bordeaux, France

### PROGRAMME

*Keynote 1:* Alain Arneodo,  
Wavelet-based multifractal analysis of dynamic infrared thermograms and X-ray mammograms to assist in early breast cancer diagnosis

*Keynote 2:* Francis Ring,  
Pioneering Progress in Infrared Imaging for Medicine

*Keynote 3:* Gerd Busse,  
Lockin-Thermography: Principles, NDE-applications and trends

*Keynote 4:* François Simoens and Olivier Gravrand,  
Imaging technology developments at Leti, and focus on cooled and uncooled infrared detectors

*Keynote 5:* V. Vavilov,  
Thermal NDT? Historical milestones, state-of-the-art and trends

### BIOMEDICAL APPLICATIONS

*BIO 1 Tuesday 8<sup>th</sup> July, 11:00-12:20*

Multifractal analysis of skin temperature fluctuations of women breasts with and without tumor  
by E. Gerasimova, B. Audit, S.-G. Roux, A. Khalil, F. Argoul, O. Naimark, A. Arneodo and O. Gileva

Integration of thermographic data with the 3D object model  
by M. Kaczmarek

Infrared thermography-based integrated approach aimed at objective evaluation of systemic vascular reactivity in humans  
by B. G. Vainer and V. V. Morozov

Proposals to standardize results in human thermography.  
by M. Sillero-Quintana, J. Arnaiz-Lastras, P.M. Gómez-Carmona and I. Fernández-Cuevas

*BIO 2 Tuesday 8<sup>th</sup> July, 16:15-17:55*

(IRT applied to skin)

Study of a possible detection of abnormalities under skin tissue by infrared thermography  
by H. Trabelsi, N. Elkadri and E. Sediki

Comparison of image analysis methods in skin temperature measurements during physical exercise  
by D. Formenti, A. Trecroci, M. Gargano, G. Alberti, and N. Ludwig

A preliminary study on the relationship between energy expenditure and skin temperature in swimming  
by A. Seixas, T. Gonjo, R. Vardasca, J. Gabriel, R. Fernandes and J.P. Vilas-Boas

Thermal skin pattern of diabetic children  
by F. J. González, E. S. Kolosovas-Machuca, E. Galván-Sánchez, B. Moncada and A. Di Carlo

*BIO 3 Wednesday 9<sup>th</sup> July 16:15-17:55*

(Analysis techniques)

Modelling and Correction of Influences on Surface Temperature Measurements using infrared thermography for animal health and welfare assessments  
by T. Landgraf, St. Zipser, M. Stewart, S. Dowling, A.L. Schaefer

A correlational analysis of human cognitive activity using Infrared Thermography of the supraorbital region, frontal EEG and self-report of core affective state.  
by S.D.Jenkins, R.D.H.Brown

Dynamics of skin temperature of the knee during physical exercise measured by infrared thermography  
by V. Svaic, B. Jurinjak, D. Zupanic and A. Bolaric

Lock-in thermography versus dye penetration testing and SEM for in vitro adaptation of smart dental restorative materials (giomers) to the walls of the cavity  
by M. Streza, D. Dadarlat, I. Hodisan, C. Prejmerean and C. Boue

A Template Based Method for Normalizing Thermal Images of the Human Body

by R. Vardasca, J. Gabriel, C. D. Jones, P. Plassmann and E. F. J. Ring

*BIO 4 Thursday, 10<sup>th</sup> July, 11:00-12:20*

System and software for thermal image screening in medicine using thermal inverse modeling  
by M. Strakowska, M. Strzelecki, B. Wiecek, G. De Mey

Towards a Medical Imaging Standard Capture and Analysis Software  
by R. Vardasca, P. Plassmann, J. Gabriel and E. F. J. Ring

A proposal of a standard rainbow false color scale for thermal medical images  
by R. Vardasca and J. Gabriel

Rapid vs. delayed infrared responses after ischemia reveal recruitment of different

by K. Chang, M. Antalek, M. Seidel, T. Darlington, A. Ikeda, S. Yoon, H. Ackerman, A. M. Gorbach

*BIO 5 Thursday, 10<sup>th</sup> July 14:45-15:45*  
(IRT cardio applications)

Problems of cardiosurgery wound healing evaluation

by A. Nowakowski, P. Siondalski, M. Moderhak, M. Kaczmarek and L. Jaworski

Infrared thermography as applied to the studies of cardiovascular system in rats

by B. G. Vainer, V. I. Baranov and E. G. Vergunov

Thermography-based blood perfusion imaging in hands: spectral amplification and time shift

by A.A. Sagaidachnyi, D.A. Usanov, A.V. Skripal, A.V. Fomin

*BIO 6 Friday, 11<sup>th</sup> July 11:00-12:20* (Analysis)

Infrared thermography as an objective technique for evaluation of patch tests results

by M. Szwed, B. Tomaka, J. Targosz, K. Targosz, B. Jasiewicz-Honkisz

Local temperature head of fetus during final period of birth

by A. Urakov, N. Urakova

Infrared Imaging for Real-Time Noncontact Respiration Monitoring

Abdulkadir Hamidu Alkali, Reza Saatchi, Heather Elphick, Derek Burke

## CALIBRATION AND METROLOGY

*CM1 Wednesday 9<sup>th</sup> July, 11:00-12:20* (technics)

3D Thermal Imaging: Fusion of Thermography and Depth Cameras

by J. Rangel and S. Soldan

Mapping non-destructive testing data on the 3D geometry of objects with complex shapes

by S. Soldan, D. Ouellet, P.Hedayati, H. Bendada, D. Laurendeau, A. Kroll

Quantitative Infrared Thermography on Carbon Stripper-Foils under Swift Heavy Ion Irradiation

by K. Kupka, M. Tomut, C. Hubert, R. Danjoux, and C. Trautmann

Qualitative diagnostics of wind-turbine blades inspection using active thermography

by M. Szwed and P. Hellstein

*CM2 M Wednesday 9<sup>th</sup> July, 14:45-15:45*  
(special measurement)

Scanning infrared microscope with a high spatial resolution

by V.M. Bazovkin, I.V. Mzhelskiy and V.G. Polovinkin

Evaluation in a controlled environment of a low-cost IR sensor for indoor thermal comfort measurement

by G.M. Revel, M. Arnesano and F. Pietroni

Investigation of separate adsorbent particles under adsorption-desorption conditions with the use of infrared thermography and computer simulation

by B.G.Vainer, A.B.Ayupov and M.S.Melgunov

*CM3 Thursday, 10<sup>th</sup> July, 14:45-15:45*  
(properties characterisation)

Emissivity evaluation of Ultra Short Pulse Laser Textured steel surfaces

by J. Wullink, C. Delicaat, F. D. van den Berg, M. Groenendijk and J. van Tienhoven

Experimental facility dedicated to high temperatures thermophysical properties measurement: validation of the temperature measurement by multispectral method

by L. Dejaeghere, T. Pierre, M. Carin and P. le Masson

Determination of anisotropic properties of carbon fiber composites for civil engineering applications using infrared thermography with periodic excitation

by L. Ibos, J. Dumoulin and V. Feuillet

*CM4 Friday, 11<sup>th</sup> July; 08:50-10:30* (state of art)

Development of a shutterless calibration process for microbolometer-based infrared measurement systems

by A. Tempelhahn, H. Budzier, V. Krause and G. Gerlach

Temperature monitoring on a plasmatron experiment by pyroreflectometry

by R. Gilblas, T. Sentenac, D. Hernandez, O. Chazot, and Y. Le Maoult

Increasing performances on blackbodies to extend their temperature range

by Catherine Barrat, Sébastien Violleau

IR thermography on misaligned tiles in Tore Supra Tokamak : MTF knowledge help to solve sharp temperature profile

by F. Rigollet, J. L. Gardarein, Y. Corre and J. Gaspar

Performance tests of thermal imaging systems to assess their suitability for quantitative temperature measurement

by A. Whittam, R. Simpson and H. McEvoy

## CIVIL ENGINEERING & BUILDINGS

*CEB1 Wednesday 9<sup>th</sup> July, 09:30-10:30* (Application 1)

Quantitative analysis and image processing techniques of large-scale industrial size fire tests using infrared thermography

by J. de Vries

Soundness assessment of structural timber elements in traditional timber dwellings: the combined use of quantitative IR thermography and ultrasonic testing

by A. Kandemir-Yücel, A. Tavukçuoglu, E. N. Caner-Saltik

Detection of reinforcement bars in concrete slab by infrared thermography and microwaves excitation

by F. Brachelet, S. Keo, D. Defer and F. Breaban

*CEB2 Thursday, 10<sup>th</sup> July, 11:45-15:45* (Application 2)

Laboratory thermal transmittance assessments of homogeneous building elements using infrared thermography

by I. Simões, N. Simões, A. Tadeu, J. Riachos

Influence of environmental parameters on the thermographic analysis of the building envelope  
by S. Van De Vijver, M. Steeman, N. Van Den Bossche, K. Carbonez, A. Janssens

Dynamic heating control by infrared thermography of prepreg thermoplastic CFRP designed for reinforced concrete strengthening  
by L-D. Th eroux, J. Dumoulin and J.L. Manceau

*CEB3 J Thursday, 10th July, 16:15-17:55 (bonding)*

Active and passive thermography evaluations of bonding defects in adhered ceramic tiling: experimental assessment  
by J. Laranjeira, N. Sim oes, I. Sim oes, A. Tadeu and C. Serra

Active thermography evaluation of bonding defects in adhered ceramic tiling: thermal stimulation conditions and data analysis methods assessment  
by N. Sim oes, J. Laranjeira, I. Sim oes, A. Tadeu and C. Serra

Characterization of density variations of historic timber structure by thermal methods  
by O. Carpentier, E. Antczak, F. Brachelet, D. Defer, T. Descamps and L. Van Parys

Inspection of bonding areas between two metallic plates with flash method and two temperature analyses  
by T. Vogt Wu, C. Pradere, J.L. Dauvergne, J.C. Batsale, D. Balageas

Square pulse heating infrared thermography and shearography applied simultaneously on CFRP tissue bonded to reinforced concrete  
by L-D. Th eroux, J. Dumoulin and X. Maldague

*CEB4 Friday 11th July, 08:50-10:30 (in-situ measurement)*

Aerial oblique thermographic imagery for the generation of building 3D models to complement Geographic Information Systems  
by S. Lag uela, L. D az Vilari o, D. Roca, J. Armesto

Gasteizmografia.com : Thermographic map of the Vitoria-Gasteiz facades  
by Iker G omez Iborra, Itziar Gorosabel

Simulation of 3D heat diffusion in multilayered construction systems for active IRT data analysis  
by C. Serra, A. Tadeu, N. Sim oes, I. Sim oes

Civil engineering structure daily monitored through IR Thermography and environmental measurement  
by A. Criniere, J. Dumoulin, L. Perez and F. Bourquin

Innovative technique for the implementation of three dimensional indoor temperature measurements using infrared thermography  
by P.A. Fokaides, S.A. Kalogirou

**FLUID DYNAMICS & ENERGETIC**

FDE 1 Wednesday 9th July, 9:30-11:00 (heat transfer and exchanger)  
Infrared Thermography to Study Endwall Cooling and Heat Transfer in Turbine Stator Vane

Passages Using the Auxiliary Wall Method  
by H. Werschnik, T. Ostrowski, G. Schmid, H.-P. Schiffer

Determination of local heat-transfer coefficient distribution on a vortex enhanced finned-tube heat exchanger fin using infrared thermography  
by Daniel Bougeard and Serge Russeil

Inverse identification of unsteady heat transfer coefficient using infrared thermography in a fin an tube heat exchanger assembly  
by Mohammed Mobtil, Daniel Bougeard

*FDE 2 Thursday 10th July, 9:30-11:00 (control and check)*

Investigation of the quality and performance of organic solar cells by thermographic imaging  
by R.  ttking, R. R sch, M. Seeland, B. Muhsin, K.-R. Eberhard, D. Fluhr and H. Hoppe

Tracking a moving boundary layer transition front in supersonic flow using infrared thermography  
by Rogier Giepmans, Ferry Schrijer and Bas van Oudheusden

Differential Infrared Thermography of Gasoline Direct Injection  
by H. Golzke, P. Leick and A. Dreizler

*FDE 3 Friday 11th July, 08:50-10:30 (application IR in fluid)*

The effect of heating time on heat transfer rate measurement  
By LI Ming, Yang Yanguang, Luo Wanqing, LI Zhi-hui

Gas temperature imaging using the heated grid technique with adaptive background correction  
by M. Ehrensperger, J.P. Kunsch and T. R sgen

Experimental study of evaporation of a static liquid plug inside a heated dry capillary tube  
by Vyas Srinivasan, Balkrishna Mehta and Sameer Khandekar

IR thermography investigation on roughness induced transition in high-speed flows  
by F. Avallone, F.F.J. Schrijer and G. Cardone

IR Experimental investigation on twin synthetic impinging jets heat transfer behaviour  
by C.S. Greco, A. Ianiro and G. Cardone

**IMAGE & DATA PROCESSING**

**IDP 1 Tuesday 8th July, 9:30-11:00 (estimation)**

Fast estimation of the phase diagram of a binary system using infrared thermography  
by R. Cadoret, E. Palomo del Barrio, J. Daranlot

Quantitative application of pulse phase thermography to determine material parameters  
by B. Stotter, K.H. Gresslehner, G. Mayr, G. Hendorfer and J. Sekelja

Infrared tomography: towards a novel methodology to investigate the volumetric radiative properties of heterogeneous materials

by B. Rousseau, Y. Favennec, S. Guevelou, F. Dubot, D. R. Rousse

*IDP 2 Tuesday 8th July, 14:00-15:40*  
(defect detection)

Thermal non-destructive testing: Localization of hidden defects

by S. Hatefipour, J. Ahlberg, J. Wren, A. Runnemalm

Defect detection strategies in Nickel Superalloys welds using active thermography

by E. Fernández, A. Beizama, A. García de la Yedra, A. Echeverria, P. Broberg, A. Runnemalm

Early defect diagnosis in installed PV modules exploiting spatio-temporal information from thermal images

by S. Rogotis, D. Ioannidis, A. Tsolakis, D. Tzovaras

Lock-In thermography for the wide area detection of paint degradation on RAAF AP3-C Aircraft

by R. Jones, M. Lo, M. Dorman, A. Bowler, D. Roles, S. A. Wade

Ultrasonic and optical stimulation in IR thermographic NDT of impact damage in carbon composites

by V. Vavilov, W. ?widarski and D. Derusova

*IDP 3 Wednesday 9th July, 11:00-12:20*  
(defect detection)

Towards automatic defect detection in carbon fiber composites using active thermography

by R. Usamentiaga, P. Venegas, J. Guerediaga and L. Vega

A defect detection approach in thermal images

by P. Hedayati Vahid, S. Hesabi, X. Maldague, and D. Laurendeau

Evaluation of frescoes detachments by partial least square thermography

by P. Bison, A. Bortolin, G. Cadelano, G. Ferrarini, F. Lopez and X. Maldague

Multimodal fusion system for NDT and Metrology

by M. Akhloufi and B. Verney

*IDP 4 Wednesday 9th July, 16:10-17:50*  
(numerical processing)

Finite element optimization by pulsed thermography with adaptive response surfaces

by J. Peeters, G. Steenackers, B. Ribbens, G. Arroud, J. Dirckx

Towards longwave infrared tunable filters for multispectral thermal imaging applications

by K. K. M. B. D. Silva, H. Mao, and L. Faraone

Preprocessing of temperature measurement by IR techniques using POD truncated basis for heat source estimation

by N. Ranc, A. Blanche, D. Ryckelynck and A. Chrysochoos

Background Thermal Compensation by Filtering (BTFCF) for Contrast Enhancement of Thermographic Sequences

by Andrés D. Restrepo G. and Humberto Loaiza C.

Automatic generation of façade textures from terrestrial thermal infrared image sequences

by L. Hoegner and U. Stilla

*IDP 5 Thursday 10th July, 11:00-12:20*  
(experimental applications)

Experimental analysis of heterogeneous nucleation in undercooled melts by infrared thermography

by M. Duquesne, A. Godin, E. Palomo del Barrio and J. Daranlot

Analysis of crystal growth kinetics of meta-stable phases in undercooled melts by infrared thermography

by A. Godin, M. Duquesne and E. Palomo del Barrio

Weld pool surfaces temperature measurement from polarization state of thermal emission

by Nicolas Coniglio, Alexandre Mathieu, Olivier Aubreton and Christophe Stolz

A fusion method with robustness analysis for infrared weak small target enhancement based on NSCT

by Q. Zhang and X. Maldague

*IDP 6 Thursday 10th July, 16:10-17:50*  
(quality control)

Calorimetric analysis of coarse-grained polycrystalline aluminum by IRT and DIC

by L. Li, J.-M. Muracciole, L. Sabatier, L. Waltz and B. Watrisse

Thermal Imaging for Monitoring Rolling Element Bearings

by R. Schulz, S. Verstockt, J. Vermeiren, M. Loccufer, K. Stockman and S. Van Hoecke

Development of infrared and visible endoscope as the safety diagnostic for steady-state operation of Wendelstein 7-X

by M. W. Jakubowski, C. Biedermann, R. König, A. Lorenz, T. S. Pedersen, A. Rodatos and the Wendelstein 7-X team

Texte Fatigue limit evaluation of martensitic steels with thermal methods

by U. Galietti, D. Palumbo, R. De Finis and F. Ancona

RITA - Robotized Inspection by Thermography and Advanced processing for the inspection of aeronautical components

by C. Ibarra-Castanedo, P. Servais, A. Ziadi, M. Klein and X. Maldague

*IDP 7 Friday 11th July, 11:00-12:20 (developed method)*

New concept for higher accuracy in measuring position to be implemented with the existing prototype automated thermography end-effector utilising an industrial robot and laser system

Development of standards for flash thermography and lock-in thermography

by C. Maierhofer, P. Myrach, H. Steinfurth, M. Reischel, M. Röllig

Temporal resampling of time-varying infrared images sequences

by R. Montanini, T. Scimone, S. De Caro and A. Testa

Active infrared maging for 3D control of multi-layer transparent objects

by O. Aubreton, A. Bajard, B. Verney, M. Belckacemi, F. Truchetet

## INDUCTION THERMOGRAPHY & VIBROTHERMOGRAPHY

*ITVT Tuesday 8th July, 09:30-10:30*

Highly-efficient and noncontact vibro-thermography via local defect resonance

by I. Solodov, M. Rahammer and G. Busse

Scanning induction thermography (SIT) on damaged carbon-fiber reinforced plastics (CFRP) Components

by Renil Thomas, M. N. Libin, Krishnan Balasubramanian

Induction thermography as an alternative to conventional NDT methods for forged parts

by P. Bouteille, G. Legros

## INDUSTRIAL APPLICATIONS

*LA 1 Tuesday 8th July, 09:30-10:30 (Surface Characterization)*

Surface crack detection using infrared thermography and ultraviolet excitation

by A. Runnemalm, P. Broberg

Thermal behavior of the mold surface in HPDC process by infrared thermography and comparison with simulation

by S. Tavakoli, I. Ranc and D. Wagner

Phase lock-in thermography for thermal diffusivity measurement and layer surface characterization

by S. Pham Tu Quoc, G. Cheymol, A. Semerok

*LA 2 Wednesday 9th July, 09:30-10:30 (Engine Characterization)*

Losses determination in induction motors using infrared thermography techniques

by E.C. Bortoni, R.A. Yamachita, J.M.C. Guimarães and M.C.C. Santos

Combustion characterization of hybrid catalytic fuelled with methane and hydrogen mixtures

by C. Allouis, S. Cimino

Identification and mapping of early thermoacoustic phenomena in gas turbine test rig

by C. Allouis, A. Ferrante

*LA 3 Thursday 10th July, 09:30-10:30 (IRT Examinations)*

A Simple and Practical Device to Make Feasible the Practical Examinations for Certification in Thermography

By Laerte dos Santos, Alisson M. Lemos and Marco A. AbiRamia jr.

Finite Element Thermal Analysis of Surface Cold Spots Observed during Infrared Video Imaging of a Moving Hot Steel Skelp

by J. Barry Wiskel, J. Prescott and H. Henein

Condition Assessment of Electrical Connections Utilizing Infrared Thermography

by G.B. McIntosh

*LA 4 Friday 11th July, 11:00-12:20*

*(Materials Characterization)*

Application of infrared technology for the control of aeronautical composite components subjected to bending load tests

by P. Venegas, I. Sáez de Ocáriz, L. Vega, J. Guerediaga

Heat Conductance Determination using Infrared Thermography

by Jean-Marie Buchlin, Mathieu Delsipé, Philippe Planquart, Michel Renard

Thermoelastic investigation of a hydraulic plastic valve undergoing a time dependant internal pressure variation

by A. Salerno and F. Pezzani

Coupling infrared thermography and acoustic emission for damage study in CFRP composites

by V. Munoz Cuartas, M. Perrin, M.-L. Pastor, H. Weleman, A. Cantarel and M. Karama

## IR - SIGNATURE & RECOGNITION

*IRS Wednesday 9th July, 14:45-15:45*

Time Resolved Multispectral Imaging

by F. Marcotte, Ph. Lagueux

Development and validation of a numerical tool for the simulation of the temperature field and infrared radiance rendering in an urban scene

by N. Lalanne, J.-C. Krapez, C. Le Niliot and X. Briottet

## MICROSCALE APPLICATIONS

*MA Thursday 10th July, 16:15-17:55*

The infrared measurements of damages of laser-processed carbon fiber reinforced plastics

by M. Muramatsu, Y. Harada, T. Suzuki and H. Niino

Quantitative kinetics and enthalpy measurements of bi phasic underflow chemical reactions by InfraRed Thermography

by M. Romano, C. Pradere, J. Toutain, C. Hany, J.C. Batsale

Synchronous use of FPA-based infrared thermography and fast ellipsometry for high-sensitive investigation of the adsorption-desorption processes rapidly progressing on solid surfaces

by B. G. Vainer, A. A. Guzev, K. P. Mogilnikov, S. I. Romanov, V. A. Shvets

Signal imposing system of micro-scale thermal imaging applied to un-cooled infrared cameras

by J. Morikawa, E. Hayakawa and T. Hashimoto

Thermal measurements of integrated inductors in CMOS technology and simple 1D analytical model of heat conduction

by I. Papagiannopoulos, M. Kaluza, B. Wiecek, A. Hatzopoulos, V. Chatziathanasiou and G. De Mey

## MONITORING & MAINTENANCE

*MM Tuesday 8th July, 11:00-12:20*

Online beam monitoring on targets at an ion beamline by infrared thermography

By M. Tomut, C. Hubert, K. Kupka, D. Severin, M. Bender and C. Trautmann

Thermal Nondestructive Control of an Aircraft Trellis Welding

by A. Eddazi and S. Belattar

Method of determination of sky thermal radiation and sky temperature with the use of long-wave IR camera measurement results  
by T. Kruczek

Air curtain temperature measurement in an open refrigerated display cabinet by IR Thermography  
by S. Marinetti\*, A. Rossetti\* and S. Minetto\*

## NDE

*NDE1 Tuesday 8th July, 14:00-15:40*

Infrared thermography for non-destructive evaluation of thermoplastic composites  
by S. Boccardi, G.M. Carlomagno, C. Meola, G. Simeoli and P. Russo

Comparison of IR Thermography and Reflectance-Enhanced Photoluminescence for early Quantitative Diagnostic of Thermal Barrier Coatings Spallation  
by E. Copin, T. Sentenac, Y. Le Maout, P. Lours

LEDs for thermographic NDT: status and chances  
by Mathias Ziegler, Henrik Steinfurth, Mathias Röllig, Philipp Myrach, and Christiane Maierhofer

Infrared tomography: towards a novel methodology to investigate the volumetric radiative properties of heterogeneous materials

by B. Rousseau, Y. Favennec, S. Guevelou, F. Dubot, D. R. Rousse

Detecting hidden defects from real data  
by P. Bison, M. Ceseri, F. Clarelli and G. Inglese

*NDE2 Wednesday 9th July, 16:15-17:55*

Temporal analysis for implicit compensation of local variations of emission coefficient applied for laser induced crack checking

by G. Traxler, P. Thanner, G. Mahler

Titre Vertical cracks characterization and resolution from lock-in vibrothermography

by A. Castelo, A. Mendioroz, R. Celorrio, and A. Salazar

Titre flying-spot lock-in thermography and its application to thickness measurement and crack detection

by U. Netzelmann

Thermography for Characterisation of Deformation Process in Stainless Steels

by B. Venkatraman, M. Menaka and Baldev Raj

Mechanical and infrared thermography analysis of shape memory polymer - focus on thermoelastic effect

by J. Délémontez, M. Tagliione

*NDE3 Thursday 10th July, 9:30-10:30*

Fiber orientation measurement in cylindrical carbon reinforced parts

by H. Fernandes and X. Maldague

Defect Depth Detectability in Austenitic Stainless Steel by Lock in Thermography

by M. Menaka and B. Venkatraman and Baldev Raj

Thermal effect of local defect resonance in ultrasonically excited shearography and thermography  
by N. Gulnizkij, I. Solodov, M. Rahammer and G. Busse

NDE3 Thursday 10th July, 11:00-12:20 (modelling)

Analytic model for pulsed thermography of subsurface defects  
by P. Broberg

Development of a discontinuous finite element method to characterize vertical cracks using lock-in thermography  
by R. Celorrio, A.J. Omella, N.W. Pech-May, A. Mendioroz, A. Oleaga and A. Salazar

A model for the depth effect on the reconstruction of defect geometry triangular by pulsed thermography  
by A. Elhassnaoui, S. Sahnoun

TAn analytical model and parametric analysis of ultrasound-excited infrared thermography  
by Xingwang Guo

## NDE APPLIED TO COMPOSITE STRUCTURES

*NDEC1 Tuesday 8th July, 16:10-17:30*

Composite characterization using infrared inspection technologies  
by David G. Moore

Investigation of multiple cracking in glass/epoxy 2D woven composites by vibrothermography  
by G. Bai, B. Lamboul, J.-M. Roche, S. Baste

Wide-area impact damage evaluation with sonic infrared imaging NDE in advanced composite structures  
by X. Han, Justin M. Ar-Rasheed, D. Zhang, A. Lubowicki, L. Favro, and G. Newaz

Active infrared sensing of impact damage in carbon fibre reinforced polymer  
by Tong Kuan Chuah, Liping Zhao and Shaochun Ye

*NDEC2 Wednesday 9th July, 14:45-15:45*

Inspection of Pseudo Kissing-bond Defects in Composite Laminate with Infrared sensing  
by L. Zhao and W. Guo

Thermal characterization of composite materials exposed to fire: quantitative comparison between classic and infrared-nondestructive methods

by C. Justo-María, S. Sánchez, J. Meléndez, F. López, M.E. Rabanal and F.J. López del Cerro

Infrared thermography to monitor composites under bending tests

by S. Boccardi, G.M. Carlomagno, C. Bonavolontà, M. Valentino, and C. Meola

## THERMOMECHANICS

*Tuesday 8th July, 11:00-12:20*

Study of strain localization and energy dissipation in metals based on infrared thermography

by O.A. Plekhov, A. Fedorova, A. Kostina and I. Panteleev

Development of the measurement system for determination of dissipation rate near the fatigue crack tip  
by A. Prokhorov, A. Vshivkov, A. Iziumova, P. Plekhov, J.C. Batsale

Mechanical and infrared thermography analysis of shape memory polymer - focus on thermoelastic effect  
by M. Staszczak, E. A. Pieczyska, M. Maj, K. Kowalczyk-Gajewska, M. Cristea, L. Urbański, H. Tobushi and S. Hayashi

Experimental study by full field measurement techniques of the stress gradients effect under fretting, fretting-fatigue and notch fatigue  
by A-R. Moustafa, B. Berthel, E. Charkaluk, S. Fouvry

#### THERMOGRAPHIC SIGNAL RECONSTRUCTION (TSR)

*TSR1 Tuesday 8th July, 14:00-15:40 (Method developments)*

Characterization of Full-Range Time Evolution in Active Thermography  
by S. Shepard, M. Freundberg and Y. Hou

Approaches to Data Reduction, Visualization and Analysis in Thermographic Signal Reconstruction  
by S. Shepard

Images of TSR coefficients: A simple way for rapid and efficient defect detection  
by J.-M. Roche, F.-H. Leroy, D.L. Balageas

Common tools for quantitative pulse and step-heating thermography - Part II: experimental validation  
by J.-M. Roche, D.L. Balageas

Comparative study of Thermographic Signal Reconstruction and Partial Least Squares Thermography for detection and evaluation of subsurface defects  
by F.López, V.P. Nicolau, C. Ibarra-Castanedo, X. Maldague and S. Sfarra

*TSR 2 Wednesday 9th July, 11:00-12:20 (Application)*

Detection and characterization of composite real-life damage by the TSR-polynomial coefficients RGB-projection technique  
by J.-M. Roche, D.L. Balageas

Defect depth determination in a CFRP structure using TSR technique  
by B. Oswald-Tranta, A. Maier, R. Schledjewski

Thermal diffusivity measurements of porous CFRP specimens with different number of plies using pulsed thermography in transmission and reflection mode  
by G. Mayr, B. Plank, J. Gruber, J. Sekelja and G. Hendorfer

Reconstruction of thermal signals in infrared images reveals sub-cutaneous vasculature and thermogenicity  
by Wei-Min Liu, Ken Chang, Stephen Yoon, and Alexander M. Gorbach

#### STUDENT AWARD

*SA Tuesday 8th July, 16:10-17:30*

Characterization of temperature and strain fields during cyclic laser shocks

by A. Charbal, D. Farcage, F. Hild, M. Poncelet, S. Roux and L. Vincent

Simultaneous front and rear faces flash characterization method for thin cylindrical multilayered composites  
by L. Duquesne, C. Lorrette, C. Pradere, G. L. Vignoles and J-C. Batsale

Multiscale analysis of thermography imaging dynamic for sol-gel coating discrimination  
by S. Mezghani, E. Perrin, J.L. Bodnar, B. Cauwe, V. Vrabie

Analogous of Wien's law for the optimal wavelengths selection in bi-spectral method used for temperature measurement of surfaces exhibiting non-uniform emissivity, and general methodology for the multi-spectral method  
by C. Rodiet, B. Rémy and A. Degiovanni

14<sup>th</sup>- 16<sup>th</sup> July 2014

10<sup>th</sup> International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics in Orlando, Florida,

*Venue:* Hyatt Regency Grand Cypress Hotel, USA, One Grand Cypress Blvd, Orlando, Florida, FL32836

*Purpose:* The conference is broad in scope and provides a forum for specialists in heat transfer, fluid mechanics and thermo-dynamics from all corners of the globe to present the latest progress and developments in the field. The broad scope brings together a wide range of research areas from narrow fundamental work to important applications such as in the broad fields of energy, manufacturing, biomedical, processes, production, education, instrumentation and control, MEMS, etc. This will not only allow the dissemination of the state of the art, but it will serve as a catalyst for discussions on future directions and priorities in these areas. The additional purpose of this conference is to initiate collaboration in research.

*Information:* <http://edas.info/web/hefat2014/home.html>

25<sup>th</sup> July 2014

1<sup>st</sup> Seminar of Medical Infrared Thermography  
London

In association with **UCL**, the **European Association of Thermology** and the **Royal Free Hospital**



Supported by Instrotech and FLIR Systems



*Venue:* Institute of Immunity and Transplantation, Royal Free Hospital, London NW3 2QG

*Date:* Friday, 25<sup>th</sup> July 2014, 10 am - 1 pm

The seminar is free to attend, but numbers are strictly limited. To reserve a delegate place or submit an abstract (max-

imum 100 words) contact the organiser Dr. Kevin Howell (Microvascular Diagnostics, Royal Free Hospital) at [k.howell@ucl.ac.uk](mailto:k.howell@ucl.ac.uk)

PowerPoint presentations to be submitted via email by 21st July. Please contact the organiser if you wish to bring your own media for presentation on the day.

A light lunch will be provided at the end of the seminar. Please inform the organiser of any special dietary requirements.

For programme updates and further information during spring 2014:

Follow us on Twitter:  [@MIRT\\_London](https://twitter.com/MIRT_London)

Follow and like our Facebook page:

 [www.facebook.com/MIRTLondon](http://www.facebook.com/MIRTLondon)

11<sup>th</sup>-12<sup>th</sup> August 2014

International Conference on Heat Transfer and Fluid Flow (HTFF'14) in Prague, Czech Republic

*Information:* [info@HTFFconference.com](mailto:info@HTFFconference.com)

13<sup>th</sup> - 14<sup>th</sup> September 2014

Kinesiology and Thermography, in Epe, the Netherlands

The course given by Prof. Dr. med. Marcos Brioschi, Brazil

Sign Up before 10<sup>th</sup> August.

*Information:*

Irma Wensink

De Leegte 16, 8162 BZ Epe, The Netherlands

email: [irma@thermografie-centrum.nl](mailto:irma@thermografie-centrum.nl)

[www.thermografie-centrum.nl](http://www.thermografie-centrum.nl)

September 15<sup>th</sup>, 2014

The use of Thermography in Rheumatology.

The course given by Prof. Dr. med. Marcos Brioschi, Brazil

Sign Up before 10<sup>th</sup> August.

*Information:*

Irma Wensink

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email: [irma@thermografie-centrum.nl](mailto:irma@thermografie-centrum.nl)

[www.thermografie-centrum.nl](http://www.thermografie-centrum.nl)

20<sup>th</sup> -21<sup>st</sup> September 2014

AAT Annual Scientific Session in Greenville, South Carolina

The AAT Annual Meeting will be held at the Bon Secours St. Francis Hospital campus.

A Pre-Meeting Physicians Member Certification Course will be held on September 19<sup>th</sup>, 2014

PROGRAMME

*General Sessions: Saturday, September 20, 2014*

08:00am - Registration

08:30am - *Welcoming Remarks*

Jeffrey Lefko, Greenville, SC,

Executive Director, American Academy of Thermology

8:35-9:15 *Keynote Address: Historical Overview of AAT and the Use of Thermal Imaging for RSD and Neuromusculoskeletal Testing*

Joseph Uricchio, MD, Florida,

Past President, American Academy of Thermology

9:15am - *Session 1: Basic Science, Clinical Conditions, AAT Guidelines & Indications*

9:15-9:45am *Role of Cold Stress testing in Thermography*

Dr. Robert Schwartz, MD, Greenville, SC,

President of American Academy of Thermology

9:45-10:15am *Status Update on the Practice and Use of Thermography*

Dr. Philip Getson, DO, Marlton, NJ,

Vice President, American Academy of Thermology

10:15-10:45 am *AAT Veterinarian Thermography Guidelines Improves Reliability of Thermography in Veterinary Imaging Diagnostics*

Dr. Tracy Turner, DVM, Elk River, MN,

Board Member, American Academy of Thermology

Q&A/ Discussion

10:45am - Break

11:15am - *Session 2: Panel Discussion: Recruiting A Medical Director For Thermography Technicians*

11:15-11:40am *Nuances Of The Multiple Site Model*

Nina Rea, Atlanta Georgia,

Member, AAT Education Committee

11:40-12:05pm *Strengths Of The Single Office Setting*

Jan Crawford, RN, Rockford, Illinois,

Chair, AAT Technicians Subcommittee

12:05-12:15pm *Insight Into The Doctor's Point of View*

Dr. Robert Schwartz, MD, Greenville, SC,

President of American Academy of Thermology

Q&A/ Discussion

12:30pm - Lunch (provided)

1:30pm - *Session 3: Panel Discussion: Influence of Thermographic Cameras and Equipment on Thermographic Studies*

1:30-2:00pm *Understanding the Factors Which Influence Quality of Thermograms- Emissivity, Environment, Range, Focus, and Techniques*

Mr. Gary Lux, Cold Mountain Infrared, Black Mountain, NC, LLC

2:00-2:20pm *How Different Imaging Studies Influence the Diagnostic Accuracy of Breast Cancer*

Raghava Bhaskaran, MD, Atlanta, Georgia

2:20-2:45pm *Integration of Musculoskeletal Thermography into an Existing Autonomic Testing Program*

Dr. Tashof Bernton, MD, Denver, CO,

Board Member, American Academy of Thermology

2:45-3:10pm *Recent International Developments in Thermography*

Bryan O'Young, MD, New York, NY,

Secretary, AAT Board of Directors

Q&A/ Discussion

3:20pm - Break



3:40pm - *Session 4: Panel Discussion: Hot Topics In Thermal Research Issues and Challenges*

3:40-3:50pm Thermal Imaging and Estrogen Dominance:  
Are We On The Same Page?

Dr. Robert Schwartz, MD, Greenville, SC,  
President of American Academy of Thermology

3:50 -4:10pm Thermal Imaging and Estrogen Dominance:  
How I Read It

Dr. Philip Getson, DO, Marlton, NJ, Vice President,  
American Academy of Thermology

4:10-4:30pm Thermal Imaging and Estrogen Dominance:  
How I Read It

Bruce Rind, MD, Washington, DC,  
Member AAT Website Committee

4:30-4:45pm Issues and Challenges for Research and  
Education in Medical Thermography

James Melton, MHA, Cary, NC,  
Member, AAT Board of Directors

Q&A/ Discussion

5:00pm - Annual Scientific Session Wrap Up and Remarks

5:30pm - Session Ends

Shuttle back to Hilton Hotel

6:30- 7:30pm - Meet and Mingle Reception with the  
Leadership at the Hilton Hotel

Presentation of AAT 2014 Achievement Award

*Committee Meetings: Sunday September 21st, 2014*

07:30am - Shuttle from Hilton Hotel

- 08:00am - Committee Meetings  
(Committee members and other attendees):  
Membership Committee including:
  - Sub Committee on Complimentary Alternative Medicine  
(CAM) and Allied Health
  - Sub Committee on Technicians/Technologists.  
Devices and Equipment Committe
- Journal/Newsletter
- Website Committee
- Education Committee
- Advocacy Committee

09:15am - General Session (all in attendance)

10:15am - General Session Ends

10:30am - Shuttle returns to Hilton Hotel

10:15am - Board of Directors Meeting (board members only)

1pm - Board of Directors Meeting Ends

Further information on registration, travel and hotels at the  
AAT-Website: <https://aathermology.org>

26<sup>th</sup>-28<sup>th</sup>September 2014

ThermoMed International 2014

60<sup>th</sup> Anniversary of the German Society of Thermography  
and Regulation Medicine, in Langen near Frankfurt

Website: [www.thermomed2014.org](http://www.thermomed2014.org)

Please send all abstract in parallel to  
[reinhold.berz@gmx.de](mailto:reinhold.berz@gmx.de) and to [sauer@hsauer.de](mailto:sauer@hsauer.de)