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- AFM Association Française de Mécanique (France)
- AIM Associazione Italiana di Metallurgia (Italy)
- AWT Arbeitsgemeinschaft Wärmebehandlung und Werkstofftechnik (Germany)
- DGM Deutsche Gesellschaft für Materialkunde (Germany)
- Heat Treatment of Metals (UK)
- IMS Intelligent Manufacturing Systems (USA)
- Institute of Materials, Minerals and Mining (UK)
- MECAMAT Groupe Français de Mécanique des Matériaux
- Metallurgical Society (Canada)
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- SFT Société Française des Thermiciens (France)
- SFV Société Française du Vide (France)
- Society of Materials Science (J)
- TMS The Minerals, Metals & Materials Society (USA)

VENUE : NANCY

PALAIS DES CONGRÈS DE NANCY
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SECRETARIAT

Société Française de Métallurgie et de Matériaux (SF2M)
Les Fontenelles – 1 rue de Craïova
F-92024 Nanterre Cedex
Tél. : 33 1 41 02 03 90 – Fax : 33 1 41 02 03 88
E-mail : sf2mcongress@wanadoo.fr
Conference web site : www.TPMCS-2003.org

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REMINDER OF KEY DEADLINES

Registration form and payment of fees : January 15th, 2003
Full papers for proceedings : January 31st, 2003
Accommodation reservation form with deposit : March 1st, 2003

LANGUAGE

The language of the conference will be English

SCOPE

The 2nd International Conference on Thermal Process Modelling and Computer Simulation will be held from March 31st to April 2nd 2003 in Nancy, France. The first conference in the series was held in Shanghai (China) March 2000.

The conference will be mainly concerned with the modelling and computer simulation of heat treatments and surface engineering processes such as quenching, tempering, high grade energy density heat treating (e.g. induction, laser and electron beam heating), carburizing, carbonitriding, nitrogen-carburizing, coatings (PVD, CVD,...), etc. Other thermal processes such as casting, forging, welding are also included. The emphasis is on metallic alloys, but contributions on other materials (polymers, ceramics, composites) are considered.

On the one hand, simulations must model the materials-related physical phenomena (such as diffusion, phase transformations, thermomechanical behaviour...) and their combinations.

On the other hand, the process-related phenomena (heat transfer including fluid dynamics and combinations with electromagnetic phenomena, mass transfer...) must be thoroughly described.

In addition, simulation needs strong support from advanced numerical techniques.

The aim of the conference is to bring together specialists in modelling in materials science, solid mechanics and fluid mechanics as well as in numerical simulation to discuss the state of the art from both theoretical and applied viewpoints.

The following topics are included :

- Modelling of physical phenomena with approaches on different scales
- New developments in numerical methods and techniques
- Computer simulation of whole processes
- Materials and process databases
- Experimental validation of models and numerical simulation
- Application of computer simulation in industry

The conference includes invited lectures and contributed papers in oral or poster form.

2nd International Conference on Thermal Process Modelling and Computer Simulation

Nancy March 31st – April 2nd 2003

PRELIMINARY PROGRAM

MONDAY MARCH 31, 2003

08:00		REGISTRATION
09:00		INTRODUCTION
09:15	1	Room GALLE – Plenary Conference T. INOUE (Dept. of Energy Conversion Science, Kyoto University, Japan) : <i>Macro-, meso-, and nanoscopic metallo thermo mechanics.</i>
10:00		COFFEE BREAK – POSTER SESSION

SESSION A : Physical Phenomena Modelling - Room GALLE

- 10:30 2 T. ZOELLER*, T.H. SANDERS Jr.** (*School of Mechanical Engineering and **Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia) : *The rate of solidification and the effects of local composition on the subsequent nucleation of $Al_{20}Cu_2Mn_3$ dispersoid phase in Al-4Cu-0.4Mn-0.2Si-Fe alloys.*
- 10:55 3 E. GAMSJÄGER*, F.D. FISCHER*, J. SVOBODA** (*Institut für Mechanik, Montanuniversität Leoben, Christian Doppler Lab. Functionally Oriented Material Design, Austria, **Institute of Physics of Materials, Academy of Sciences of the Czech Republic, Brno, Czech Republic) : *Motion of diffusional transformation fronts in multi-component systems.*
- 11:20 4 T. RÉTI (Budapest Polytechnic, Hungary) : *On the physical and mathematical interpretation of the isokinetic hypothesis.*
- 11:45 5 J. DA COSTA TEIXEIRA***, L. HERICHER*, B. APPOLAIRE*, E. AEBY-GAUTIER*, G. CAILLETAUD***, S. DENIS*, N. SPATH** (*LSG2M, Ecole des Mines de Nancy, **SNECMA Moteurs Gennevilliers, ***Centre des Matériaux Ecole des Mines de Paris, France) : *Prediction of the phase transformations and the associated microstructure during continuous cooling in the Ti17.*
- 12:10 6 H. SURM, O. KESSLER, M. HUNKEL, F. HOFFMANN, P. MAYR (Stiftung Institut für Werkstofftechnik, Bremen, Germany) : *Modelling the ferrite/carbide → austenite transformation of hypoeutectoid and hypereutectoid steels.*

SESSION B : Experimental validation - Room BOFFRAND

- 10:30 14 M. MANIRUZZAMAN, R.D. SISSON Jr (Center for Heat Treating Excellence Metal Processing Institute, Worcester Polytechnic Institute, USA): *Heat transfer coefficients for quenching process simulation.*
- 10:55 15 I. FELDE*, T. RETI**, S. SEGEREBERG***, J. BODIN***, G.E. TOTTEN**** (*Bay Zoltan Institute for Materials Science and Technology, Budapest, **Banki Donat Polytechnic, Budapest, Hungary, ***IVF, Mölndal, Sweden, ****Union Carbide Corporation, Tarrytown, NY, USA) : *Quenchant characterisation by numerical methods.*
- 11:20 16 A. GALOVIC, M. ANDRASSY, S. MUDRINIC (Univ. of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Croatia) : *Analysis of temporal and spatial temperature gradients at pronouncedly fluctuating cooling conditions.*
- 11:45 17 P.F. STRATTON, A. RICHARDSON (BOC Gases, Sheffield, UK) : *Validation of a single component gas quenching model.*
- 12:10 18 J. KANG, Y. RONG (Center for Heat Treating Excellence Metal Processing Institute, Worcester Polytechnic Institute, USA) : *Numerical simulation of heat transfer in loaded heat treatment furnaces.*

MONDAY MARCH 31, 2003

SESSION A : Physical Phenomena Modelling - Room GALLE

12:35 7 C. CABUS**, H. REGLE*, B. BACROIX** (*IRSID-CMC, Maizières-lès-Metz, **LPMTM-CNRS, Institut Galilée, Univ. Paris Nord, Villetaneuse, France) : *Phase transformation textures in steels.*

13:00 LUNCH

14:30 8 M. WOLFF, M. BÖHM, A. SCHMIDT (Universität Bremen, Germany) : *Phase transitions and transformation-induced plasticity of steel in the framework of continuum mechanics.*

14:55 9 S. DACHKOVSKI, M. BÖHM (Universität Bremen, Germany) : *Modelling of elastoplastic materials with phase changes.*

15:20 10 Y. VINCENT*, J.M. BERGHEAU**, J.F. JULLIEN* (*URGC, INSA Lyon, Villeurbanne, **LTDS, CNRS/ECL/ENISE, Saint-Etienne, France) : *Viscoplastic behaviour of steels during phase transformations – Analysis, development and validation.*

15:45 11 R. MOHRMANN (Fraunhofer-Institut Werkstoffmechanik, Freiburg, Germany) : *A model for the phase transformations and the mechanical behaviour of a ferritic-martensitic chromium steel.*

16:10 COFFEE BREAK – POSTER SESSION

16:30 12 A. COMBESURE, M. CORET (LMC-INSA Lyon, Villeurbanne, France) : *A two scale model for the simulation of residual stresses due to welding of a metallic multiphase material.*

16:55 13 J. KOHOUT (Department of Physics, Military Technology Faculty, Military Academy in Brno, Czech Republic) : *Modelling of changes in physical and mechanical properties of structural materials during long-term exposures at elevated temperatures.*

17:20 END

18:30 FINE ARTS MUSEUM PRIVATE VISIT

SESSION B : Experimental validation - Room BOFFRAND

12:35 19 D. APELIAN, S. CHAUDHURY (Metal Processing Institute, Worcester Polytechnic Institute, USA) : *Fluidized bed heat treatment of aluminium cast components.*

14:30 20 M. HUNKEL, Th. LÜBBEN, F. HOFFMANN, P. MAYR ((Stiftung Institut für Werkstofftechnik, Bremen, Germany) : *Using the jominy end-quench test for validation of thermo-metallurgical model parameters.*

14:55 21 Young-Kook LEE (Dept. of Metallurgical Engineering, Yonsei University, Seoul, South Korea) : *Phase transformations of Nb-Added microalloyed steels.*

15:20 22 V. HEIN*, H. FREYDANK*, U. MICHEL*, H. ZIEGER*, G. ZOUHAR*, P. FOERSTER**, H. RÜHL** (*Technische Universität Dresden, Institut für Werkstoffwissenschaft, **EKO Stahl GmbH, Eisenhüttenstadt, Germany) : *Microstructure evolution in cold rolled strips during continuous annealing. Modelling and simulation.*

15:45 23 M. BÖHM, M. HUNKEL, A. SCHMIDT, M. WOLFF (Universität Bremen, Germany) : *Evaluation of various phase-transition models for 100Cr6 for application in commercial FEM-programmes.*

16:30 24 P. AKERSTROM, M. OLDENBURG (Dept. of Applied Physics and Mechanical Engineering, Lulea University of Technology, Sweden) : *Studies of the thermo-mechanical material response of a Boron steel by inverse modelling.*

16:55 25 I. SILLER*, W. WALDHAUSER**, R. EBNER*** (*Materials Center Leoben, **Laser Center Leoben, Joanneum Research GmbH, Austria) : *Numerical simulation and practical investigation of the thermal fatigue behaviour of hot work tool steels in die casting processes.*

TUESDAY APRIL 1, 2003

08:30 26 Room GALLE – Plenary Conference
 M.A.J. SOMERS (Technical University of Denmark) : *Modelling nitriding of iron; from thermodynamics to residual stress*

SESSION A : Experimental validation - Room GALLE

- 09:15 27** M. VEAUX***, S. DENIS**, P. ARCHAMBAULT** (*Sciences & Computer Consultants, Saint Etienne, **LSG2M, Ecole des Mines de Nancy, France) : *Modelling and experimental study of the bainitic transformation, strain and residual stresses in the quenching process of middle alloyed steel parts.*
- 09:40 28** E. PRIETO SILVA*, M.A. SAVI*, P.M.C.L. PACHECO** (*Instituto Militar de Engenharia, Dept. of Mechanical and Materials Engineering, Rio de Janeiro, **CEFET/RJ, Dept. of Mechanical Engineering, Rio de Janeiro, Brazil) : *Finite element method applied to the simulation of quenching process.*
- 10:05 29** F. FRERICHS, Th. LÜBBEN, U. FRITSCHING, M. HUNKEL, H. LOHNER, F. HOFFMANN, P. MAYR (Stiftung Institut für Werkstofftechnik, Bremen, Germany) : *Simulation of gas quenching.*

10:30 COFFEE BREAK – POSTER SESSION

- 11:00 30** S. PETIT-GROSTABUSSIAT*, L. TALEB** , J.F. JULLIEN* (*INSA Lyon/URGC Structures, Villeurbanne, **INSA Rouen/LMR, St Etienne du Rouvray, France) : *Prediction of residual stresses in the heat affected zone.*
- 11:25 31** Zhang LIWEN, Liu CHENGDONG, Qi SHAOAN, Yu YONGSI, Zhu WENHUI, Qu SHEN, Wang JINGHE (Dalian University of Technology, Materials Engineering Department, China) : *Numerical simulation of inertia friction welding process of GH4169 alloy.*
- 11:50 32** G. SIBILIA****, Ph. ROGEON*, P. PAILLARD**, G. SAINDRÉANAN**, J. SOIGNEUX***, Ph. LEMASSON*, D. CARRON* (*LET2E, Univ. de Bretagne Sud, Lorient, **LGM, Ecole Polytechnique de l'Univ. de Nantes, ***PSA Peugeot Citroën, Centre Technique de Vélizy, MXP/CEB/ASG, Villacoublay, France) : *Experimental validation of an electro-thermo-metallurgical predictive model in resistance spot welding.*
- 12:05 33** L. DEPRADEUX, J.F. JULLIEN (INSA Lyon, URG-Structures, Villeurbanne, France) : *Experimental and numerical simulation of thermomechanical phenomena during a TIG welding process.*

SESSION B : Whole process simulation - Room BOFFRAND

- 09:15 42** U. DUITSCH, S. SCHRECK, M. ROHDE (Forschungszentrum Karlsruhe GmbH, Institute of Materials Research I, Eggenstein-Leopoldshafen, Germany) : *Modelling of laser induced surface modification of ceramic substrates.*
- 09:40 43** R. NICKEL, E. LUGSCHEIDER, N. PAPENFUß-JANZEN (Materials Science Institute, Modelling & Simulation Group, Aachen University of Technology, Germany) : *A model of the interface between plasma jet simulation and the simulation of coating formation during atmospheric plasma spraying (APS).*
- 10:05 44** Dong-Ying JU *, V. JI**, H. GASSOT*** (*Dept. of Materials Science and Engineering, Saitama Institute of Technology, Japan, **LM3, ENSAM, Paris, ***Institut de Physique Nucléaire d'Orsay, France) : *Simulation and verification of thermo-mechanical behaviour and residual stresses in thermal spray process.*
- 11:00 45** J. WILDEN*, H. FRANK*, C. THEILER**, T. SEEFELD**, G. SEPOLD** (*Institute of Production Engineering, Technical Univ. Lünen, **BIAS Bremer Institut für Angewandte Strahltechnik, Bremen, Germany) : *Simulation of laser cladding.*
- 11:25 46** L. COSTA*, R. COLAÇO*, T. RETI**, A.M. DEUS*, R. VILAR* (*Instituto Superior Técnico, Dep. Eng. Materiais, Lisboa, Portugal, **Budapest Polytechnic, Hungary) : *Modelling of phase transformations in steel parts built by laser cladding.*
- 11:50 47** J. AHLSTRÖM, B. KARLSSON (Dept. of Materials Science and Engineering, Chalmers University of Technology, Göteborg, Sweden) : *Modelling of laser coating of medium carbon steel.*
- 12:05 48** S. GANG, F. SCIAMMARELLA, T.C. TSZENG (Thermal Processing Technology Center, Dept. of Mechanical, Materials and Aerospace Engineering, Illinois Institute of Technology, Chicago, IL, USA) : *Kinetics and mechanics issues in modelling induction hardening.*

TUESDAY APRIL 1, 2003

SESSION A : Experimental validation - Room GALLE

- 12:30 34 E.D. SCHMITTER, I.M. ZYLLA (Univ. of Applied Sciences, Dept. of Materials Sciences and Chemical Eng., Osnabrueck, Germany) : *Modelling friction stir welding with thermally coupled fluid dynamics.*

13:00 LUNCH

SESSION A : New methods - Room GALLE

- 14:30 35 F. BAY, V. LABBE, Y. FAVENNEC (CEMEF, ENSM Paris, Sophia Antipolis, France) : *Automatic optimization of induction heating heat treatment processes.*
- 14:55 36 D. HÖMBERG (Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany) : *Optimal control of surface heat treatments.*
- 15:20 37 T. FILETIN, I. ZMAK, D. NOVAK (Univ. of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Dept. of Materials, Croatia) : *Prediction of the nitriding parameters by neural network and genetic algorithm.*
- 15:45 38 L. NASTAC*, F.R. DAX*, W. HANUSIAK** (*Concurrent Technologies Corporation, Pittsburgh, PA, **FMW Composite Systems, Bridgeport, WV, USA) : *Methodology for modelling of the EB-PVD coating process.*

16:10 COFFEE BREAK – POSTER SESSION

- 16:30 39 S. GUESSASMA, G. MONTAVON, C. CODDET (LERMPS, UTBM, Belfort, France) : *Plasma spray process modelling using artificial neural networks : application to Al₂O₃-TiO₂ (13% by weight) ceramic coating structure.*
- 16:55 40 Xianwu LING, H.P. CHERUKURI (Dept. of Mechanical Engineering and Engineering Science, The University of North Carolina at Charlotte, North Carolina) : *Stability of solutions of an FEM-based algorithm for inverse heat conduction problems.*
- 17:20 41 G.E. GEORGIEV (Dept. of Mathematical Modelling, Institute of Metal Science, Bulgarian Academy of Science, Sofia, Bulgaria) : *A new numerical approach for solving inverse heat transfer problems in the mold-casting system during the mold filling, solidification and solid-state cooling.*

17:45 ROUND TABLE – POSTER SESSION

20:00 BANQUET GRANDS SALONS DE L'HÔTEL DE VILLE (City Hall)

SESSION B : Whole process simulation - Room BOFFRAND

- 12:30 49 N. SEMMAR, C. BOULMER-LEBORGNE (GREMI, Univ. d'Orléans, France) : *Metallic thin films heated by pulsed lasers. Numerical simulation of the thermal field and the melting kinetics.*

- 14:30 50 K.M. KELKAR*, S.V. PATANKAR*, A. MITCHELL**
R. MINISANDRAM***, R.M. FORBES JONES*** (*Innovative Research Inc., **University of British Columbia, ***Alvac, An Allegheny Technologies Company, Canada) : *Computational modelling of electroslag remelting (ESR) process used for the production of high-performance alloys.*
- 14:55 51 Hong-Yang ZHAO*, Dong-Ying JU **, Lin HU*** (*Dept. of Materials Science and Engineering, ** Dept. of Computer Science, Saitama Institute of Technology, Japan, ***Dept. of Mat. Eng., Anshan Univ. of Sci. & Techn., Liaoming, China) : *Flow modelling and simulation on the feeding system in twin roll caster.*
- 15:20 52 G. BLES, S. CASTAGNE, F. PASCON, M. REMY, A.M. HABRAKEN (M&S Department, University of Liège, Belgium) : *Developments in finite element simulations of continuous casting.*
- 15:45 53 V.M. KONDRATENKO*, V.A. LEYBENSON**, G.P. STOVPCHENKO***, F.V. NEDOPEKIN****, S.S. KAZAKOV** (*Iron and Steel Institute of National Academy of Science of Ukraine, Dnepropetrovsk, **Open Joint-Stock Company Electrometallurgical Steel Works, Dnepropetrovsk, ***National Metallurgical Academy of Ukraine, Dnepropetrovsk, ****National University of Ukraine, Donetsk, Ukraine) : *Simulation of liquid sandwich ingots formation.*

- 16:30 54 C. FRANZ, V. SCHULZE, H. MÜLLER, D. LÖHE (Institut für Werkstoffkunde I, Universität Karlsruhe (TH), Germany) : *Calculation of the distribution of phases and residual stresses and distortions of hardened steel components by simulation of the heat treatment processes.*

- 16:55 55 Gang FANG*, Zeng PAN*, Jiang YU** (*Dept. of Mechanical Engineering, Tsinghua University, Beijing, China, **University Stuttgart, Dept. Lab. Mathematisches Institut A, Germany) : *A simulation study of quenching process of supporting roller.*

- 17:20 56 R.E. AKDUR, C.H. GÜR (Middle East Technical Univ., Metallurgical and Materials Engineering Dept., Ankara, Turkey) : *Simulation of quenching using Ansys software to investigate the evolution of thermal stresses and local plastic deformation.*

WEDNESDAY APRIL 2, 2003

08:30 57 **Room GALLE – Plenary Conference**
M. PLATEAU (PSA Peugeot Citroën) : *Simulation of thermal processes : solutions studied in the automotive industry.*

SESSION A : Physical Phenomena Modelling - Room GALLE

- 09:15 58 J. TARASIUK*, Ph. GERBER**, B. BACROIX** (*Wydzia Fizyki i Techniki J drowej, Akademia Gorniczo-Hutnicza, Krakow, Poland, **LPMTM, Univ. Paris Nord, Villeneuve, France) : *Monte Carlo modelling of metal recrystallization.*
- 09:40 59 P. MUKHOPADHYAY, M. LOECK, G. GOTTSTEIN (Institut für Metallkunde und Metallphysik, RWTH-Aachen, Germany) : *Simulation of microstructure evolution during recrystallization using a high resolution three dimensional cellular automaton.*
- 10:05 60 R. OSSENBRINK, V. MICHAÏLOV, H. WOHLFAHRT (Welding Institute, Technical Univ. of Braunschweig, Germany) : *Numerical simulation of welding stresses and distortions under consideration of temporal and local changes of strain rate.*

10:30 COFFEE BREAK – POSTER SESSION

- 11:00 61 D.R.G. ACHAR, R.M. ARROYO, L. SINGHEISER, W.J. QUADAKKERS (Forschungszentrum Jülich GmbH, IWV, Germany) : *Modelling of phase distribution in MCrAlY coatings and their interaction with nickel based alloys.*
- 11:25 62 F. IMBAULT-HUART***, P. JACQUET***, M. LAMBERTIN**, D. ROUSSE* (*Dépt. de Génie Mécanique, Université Laval, Québec, Canada, **ENSAM, CER de Cluny, ***ECAM, Lyon, France) : *Simulation of carbon fluxes during low pressure carburizing treatment.*
- 11:50 63 T. BELMONTE, C. JAOUÏ, H. MICHEL (LSGS, Ecole des Mines de Nancy, France) : *Modelling of post-discharge nitriding and nitrocarburizing.*
- 12:05 64 T. TURPIN**, J. DULCY*, M. GANTOIS* (*Lab. de Science et Génie des Surfaces, Ecole des Mines de Nancy, **Aubert & Duval) : *Prevision of phases distribution and chemical composition during gas carburizing of stainless steels : the thermogravimetric measurements and image analysis joined in numerical simulation.*
- 12:30 65 J. LUO, Z. ZHANG, H. DONG, T. BELL (Surface Engineering Group, Department of Metallurgy and Materials, The University of Birmingham, UK): *The computer simulation of the oxygen boost diffusion processes for the deep-case hardening of titanium alloys.*

13:00 LUNCH

SESSION B : Application in industry - Room BOFFRAND

- 09:15 70 H. PORZNER (ESI Group, Germany) : *Possibilities of numerical simulation for evaluation and optimization of heat treatment processes.*
- 09:40 71 M. SLOVACEK (Ustav aplikované mechaniky s.r.o., Institute of applied mechanics Ltd., Brno, Czech Republic) : *Application of numerical simulation of heat treatment in industry.*
- 10:05 72 P. AUBURTIN, N. MORIN, C. PILLE (PSA Peugeot Citroën, DINQ/DRIA/SARA/MATE, Vélizy, France) : *Mechanical effects of water quenching on aluminium automotive parts.*
- 11:00 73 P. SCHOBESBERGER*, M. MANN** (*Aichelin Holding GmbH, **Arsenal research, Austria) : *Optimisation of high pressure gas Quenching by application of CFD analysis.*
- 11:25 74 N.I. KOBASKO (Intensive Technologies Ltd., Kyiv, Ukraine) : *Computer simulation for intensive quenching of forgings.*
- 11:50 75 P. DURANTON*, J. DEVAUX*, LARREUR**, R. FORTUNIER***, J.M. BERGHEAU**** (*ESI France, Lyon, **Eurocopter, Marignane, ***Mécanique et Matériaux, ENSMSE, St Etienne, ****LTDS, CNRS/ECL/ENISE, St Etienne, France) : *Three-dimensional numerical simulation of nitriding process.*
- 12:05 76 C. DARCOURT*, J.M. ROELANDT*, M. RACHIK*, D. DELOISON**, B. JOURNET** (*UTC, Lab. Roberval, Compiègne, **EADS CCR, DCR/SE/LM, Suresnes, France) : *Thermomechanical analysis applied to the laser beam welding simulation of aeronautical structures.*
- 12:30 77 A. GALLINO, S. VALSANIA, M. DE BEI (Fiat Research Center, Orbassano, Italy) : *FEM cutting simulation : a way to reach high speed machining.*

WEDNESDAY APRIL 2, 2003

SESSION A : Physical Phenomena Modelling - Room GALLE

- 14:30 66 M.M. MAKHLOUF, Md. MANIRUZZAMAN (Worcester Polytech. Inst., Dept. of Mech. Engineering, USA) : *Modelling of particle removal from molten metals by a rotating impeller degasser.*
- 14:55 67 J. GUO*, P. LE MASSON*, E. ARTIOUKHINE**, T. LOULOU***, P. ROGEON*, D. CARRON*, M. DUMONS*, J. COSTA* (*LET2E/ETM, Univ. de Bretagne Sud, CURST, Lorient, **Institut de Génie Energétique, Univ. de Franche Comté, Belfort, ***Centre Energétique Environnement, Ecole des Mines d'Albi, France) : *A new approach for the estimation of a phase change interface location in a two-dimensional problem ; application to an electron beam welding.*
- 15:20 68 J.H. NADLER, T.H. SANDERS Jr., J.K. COCHRAN (School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia) : *Thermodynamic and kinetic modelling of Fe_2O_3 - Cr_2O_3 reduction.*
- 15:45 69 J. RAMIREZ-CUELLAR*, M.P. GUERRERO-MATA**, L.A. LEDUC*, R. COLAS* (*Division Aceros Planos, Hylsa, S.A. de C.V., Monterrey, **Facultad de Ingenieria Mecanica y Electrica, Univ. Autonoma de Nuevo Leon, San Nicolas de los Garza, Mexico) : *Modelling descaling during hot rolling of steel.*

SESSION B : Application in industry - Room BOFFRAND

- 14:30 78 Xiao (Leo) CHEN, Zhishang YANG, Ashok NANJUNDAN, Nong CHEN (Caterpillar Inc., Peoria, USA) : *Achieving manufacturing quality and reliability using thru-process simulation.*
- 14:55 79 U. LOTTER, H.P. SCHMITZ, L. ZHANG (ThyssenKrupp Stahl, Duisburg, Germany) : *Structure of the metallurgically oriented modelling system TKS-StripCam for simulation of hot strip manufacture and application in research and production practice.*
- 15:20 80 S.S. SAHAY (Tata Research Development & Design Centre54B, Hadapsar Industrial Estate, Pune, India) : *An integrated batch annealing furnace simulator.*
- 15:45 81 H. ABOUCHADI*, I. POITRAULT**, M. LAMBERTIN* (*LaBoMaP, ENSAM, CER de Cluny, **INDUSTEEL, CRMC, Le Creusot, France) : *Determination of residual stresses and deformations in casted part and metallic mould.*

16:20

CONCLUSIONS

POSTERS

- 90 B.B. GUZINA, D.H. TIMM, V.R. VOLLER (Univ. of Minnesota, Minneapolis, USA) : ***Prediction of thermal crack spacing.***
- 91 G. SAAGE, S. ROTH, J. ECKERT, L. SCHULTZ (IFW, Institute of Solid State and Materials Research Dresden, Germany) : ***Extraction of boron $Fe_{80}B_{20}$ ribbons by annealing under hydrogen flow.***
- 92 A. KOVALEV, D. WAINSTEIN (Surface Phenomena Researches Group, Moscow, Russia) : ***Modelling of grain boundary segregation kinetics that are responsible of irreversible and reversible temper embrittlement of engineering steels.***
- 93 E. PRIETO SILVA*, M.A. SAVI*, P.M.C.L. PACHECO** (*Instituto Militar de Engenharia, Dept. of Mechanical and Materials Engineering, Rio de Janeiro, **CEFET/RJ, Dept. of Mechanical Engineering, Rio de Janeiro, Brazil) : ***On the thermo-mechanical coupling in austenite-martensite phase transformation related to quenching process.***
- 94 Wei SHI, Xiangkun ZHANG, Zhuang LIU (Mechanical Engineering Dept., Tsinghua Univ., Beijing, China) : ***Model of stress-induced phase transformation and prediction of internal stresses of large steel workpieces during quenching.***
- 95 D. GLOAGUEN*, S.FREOUR*, M. FRANÇOIS**, R. GUILLEN*, J. ROYER*** (*LAMM, CRTT, IUT Saint-Nazaire, **LASMIS, Univ. de Technologie de Troyes, ***LMM, Ecole Centrale de Nantes, France) : ***Thermal stresses in hexagonal materials-heat treatment influence on their mechanical behaviour.***
- 96 J. RECH****, J.L. BATTAGLIA**, A. MOISAN* (*LaBoMaP, ENSAM, Cluny, **LEPT, ENSAM, Bordeaux, ***LTDS, Ecole Nationale d'Ingénieurs de Saint-Etienne, France) : ***Tribological and thermal functions of cutting tool coatings.***
- 97 O. BERSIROVA, V. KUBLANOVSKY (Institute of General & Inorganic Chemistry, Ukrainian National Academy of Science, Kiev, Ukraine) : ***Mass transfer in the borate-phosphate-carbonate silver plating electrolytes.***
- 98 Liwen ZHANG, Qi ZHONG, Jibin PEI, Guoliang ZHANG, Yuanliang XIA (Dalian University of Technology, Materials Engineering Department, China) : ***FEM simulation of laser forming process of shipbuilding steel plate.***
- 99 N. DAVOR, T. FILETIN, M. STUPNISEK (Faculty of Engineering and Naval Architecture, Univ. of Zagreb, Croatia) : ***Determination of carburizing parameters with variable C-potential using genetic algorithms.***
- 100 P. SALAGNAC, D. DUTOURNIE, P. GLOUANNEC (Lab. d'Etudes Thermiques, Energétiques et Environnement, Université de Bretagne Sud, Lorient, France) : ***Simulations of heat transfers in an autoclave. Application to the firing of composite material parts.***
- 101 Ph. DAVID, M. VEAUX (Sciences & Computers Consultants, Saint-Etienne, France) : ***Virtual heat treatment tool for monitoring and optimising HT process.***
- 102 Zengeya MILES (Graduate Student, Dept. of Metals and Materials Engineering, Univ. of British Columbia, Vancouver, Canada) : ***Method of assessing the applicability of the Avrami equation to predict the progress of isothermal transformation.***
- 103 R. PASCAL***, P. CONRAUX*, J.M. BERGHEAU** (*ESI Software, Lyon, **LTDS, CNRS/ECL/ENISE, Saint Etienne, France) : ***A new method for the numerical simulation of induction hardening processes.***
- 104 A.K. ZAYTSEV (Dept. of Physical Chemistry, Moscow State Steel and Alloys Institute, Russia) : ***Thermodynamic modelling of ecological and recycling problems in ironmaking.***
- 105 M. PRZYLECKA*, W. GESTWA*, G.E. TOTTEN** (*Poznan Univ. of Technology, Poznan, Poland, **G.E. Totten & Associates, LLC, Seattle, WA, USA) : ***Modelling of retained austenite in carburized layer.***
- 106 Ryuji MUKAI, Dong-Ying JU (Dept. of Materials Science and Engineering, Saitama Institute of Technology, Japan) : ***Simulation of carburizing-quenching of gear. Effect of carbon content on residual stresses and distortion.***
- 107 Dong-Ying JU, Hong-Yang ZHAO (*Dept. of Materials Science and Engineering, Saitama Institute of Technology, Japan) : ***Optimum process conditions based on stresses distribution and crack formation for twin roll strip casting.***
- 108 N.P. KANDEV (Institut de Recherche d'Hydro-Québec, LTE, Shawinigan, QC, Canada) : ***Modelling and experimental study of induction heating of moving bronze blocks.***
- 109 D. LANDEK, F. CAJNER, T. FILETIN (Faculty of Mechanical Engineering and Naval Architecture, Univ. of Zagreb, Croatia) : ***Computer simulation of a induction surface hardening axially symmetric workpieces.***
- 110 L. HERNANDEZ*, M.P. GUERRERO-MALTA*, L.A. LEDUC**, R. COLAS**** (*Facultad de Ingenieria Mecanica y Electrica, Univ. Autonoma de Nuevo Leon, San Nicolas de los Garza, **Division Aceros Planos, Hylsa, S.A. de C.V., Monterrey, Mexico) : ***A model for the run out table cooling in a compact rolling mill.***

POSTERS

- 111 T. HOLM (Linde Gas, Lidingo, Sweden) : *Web based heat treatment calculations.*
- 112 L. COSTA*, A.M. DEUS*, I. FELDE**, R. VILAR* (*Instituto Superior Técnico, Dep. Eng. Materiais, Lisboa, Portugal, **Bay Zoltan Institute for Materials Science and Technology, Budapest, Hungary) : *Modelling of residual stresses in metal parts built by laser cladding.*
- 113 J.M. DREZET*, C. BEZENÇON**, S. MOKADEM**, W. KURZ** (*Calcom SA, Lausanne, **Lab. de Métallurgie Physique, EPF-Lausanne, Switzerland) : *Modelling the Marangoni convection during laser heat treatment.*
- 114 T. SOBUSIAK (Institute of Precision Mechanics, Warsaw, Poland) : *Model of transfer of carbon and nitrogen in carbonitriding process.*
- 115 T. INOUE, T. OTSUKA (Dept. of Energy Conversion Science, Kyoto University, Japan) : *Simple method to identify transformation plastic coefficient.*
- 116 Shuqin XU, Shanyuan ZHANG (Taiyuan University of Technology, China) : *Improvement on hot-compression experiment by FEM simulation.*
- 117 G.F. ZHOU, T.C. TSZENG, V. SARAF (Thermal Processing Technology Center, Dept. of Mechanical, Materials and Aerospace Engineering, Illinois Institute of Technology, Chicago, IL, USA) : *Determination of heat transfer coefficients by inverse calculation in conjunction with embedded model for surface-mounted thermocouples.*
- 118 F. FAURE***, J.M. BERGHEAU***, J.B. LEBLOND* (*LMM, CNRS/Univ. Paris VI, **ESI Software, Lyon, ***LTDS, CNRS/ECL/ENISE, Saint Etienne, France) : *Welding simulation with shell elements.*
- 119 U. AHRENS, H.J. MAIER, A.EL.M. MAKSOUD (Universitaet Paderborn, Lehrstuhl Fuer Werkstoffkunde, Germany) : *Stress affected transformation in low alloy steels – factors limiting prediction of plastic strains.*
- 120 G.B. OLSON*, D. APELIAN** (*Wilson-Cook Professor of Engineering Design, Northwestern University, **Metal Processing Institute, Worcester Polytechnic Institute, USA) : *High temperature carburization of ferrous alloys: enhanced performance via control of the microstructure.*
- 121 G. GOUTORBE***, P. THONUS***, R. LEVEQUE****, F. BRIOT*, R. FORTUNIER** (*Akers Specialty Rolls, Fraisse, **ENSM Saint Etienne, France, ***Akers Belgium, Seraing, Belgium, ****CEM, Saint Etienne, France) : *Computer simulation of heat transfer in aluminium continuous casting tools.*
- 122 P. BRISTIEL, X. LALBIN (PRISMECA, Versailles, France) : *3D simulation of induction superficial hardening and tempering. From inductor design to mechanical consequences in the parts. Application to hardening of a crankshaft.*
- 123 M. PRZYLECKA*, W. GESTWA*, G.E. TOTTEN** (*Poznan Univ. of Technology, Poznan, Poland, **G.E. Totten & Associates, LLC, Seattle, WA, USA) : *Modelling of phase transformations and hardening of carbonitrided steels.*
- 124 Satyam S. SAHAY, Kishalay MITRA, Chetan P. MALHOTRA (Tata Research Development and Design Centre 54 Hadapsar Industrial Estate, Pune, India) : *Cost model based optimization of heat treatment operations : a case study for gas carburization.*
- 125 T. MIOKOVIC, V. SCHULZE, O. VÖHRINGER, D. LÖHE (Institut für Werkstoffkunde I, Universität Karlsruhe (TH), Germany) : *Description of short time phase transformations during the heating of steels based on high-rate experimental data.*
- 126 Ph. ROGEON*, D. CARRON*, Ph. LE MASSON*, M. CARIN*, M. DUMONS*, J. COSTA*, P. BOCQUET**, M. GAUTHIER**, R. BERTET***, J.C. PARPILLON*** (*LET2E, Univ. de Bretagne Sud, Lorient, **Centre de Recherche des Matériaux du Creusot, Usinor Industeel, Le Creusot, ***Direction Construction Navale d'Indret, Nantes, France) : *Experimental validation of a predictive model for numerical simulation of thermo-metallurgical phenomena during electron beam welding.*
- 127 J.F. LINES***, G.L. VIGNOLES**, J.M. GOYHÉNÈCHE***, J.R. PUIGGALI* (*LEPT-ENSAM, UMR CNRS 8508, Talence, **LCTS, UMR CNRS 5801, Pessac, ***CEA-Le Ripault) : *Thermal modelling of a carbon/carbon composite material fabrication process.*
- 128 Y. K. STARTSEV (Laboratory of Glass Properties, Institute of Silicate Chemistry of the Russian Academy of Sciences, St. Petersburg, Russia) : *Stresses in glass plate joined with other materials: modeling and experimental validation.*
- 129 Pan Jiansheng*, Zhang Weimin*, Tian Dong**, Gu Jianfeng*, HuMingjuan* (*Shanghai Jiao Tong University, **Shanghai Volkswagen Automotive Company Ltd., PR China) : *Computer simulation on heat treatment and its application in industry.*
- 130 Xun Cai, Tao Zhao, Qiulong Chen (Key laboratory of education for high temperature materials and testing, Shanghai Jiao Tong University, Shanghai, P. R. China) : *Finite Element Simulation of Temperature Field during LSM on Al-Si Alloy.*
- 131 K. TAHAR CHAOUCH, H. MAZA, B. BELKESSA (Research Center of Welding and Control Cheraga Alger, Algeria) : *A Finite Volume Analysis of Two-Dimensional Transient Heat Transfer in TIG Welding.*

- 132 K. TAHAR CHAOUCH, Y. BENKHEDDA (University of Blida, Mechanical Institut, Blida, Algeria) : ***Numerical simulation of the weld nugget displacement of dissimilar thickness in resistance spot welding.***
- 133 K. FUNATANI (IMST Inst., Nagoya, Japan) : ***Modeling and Computer Simulation Technology for Advancement of Materials Processing Technology.***
- 134 A.V. NOGOVITSIN*, A.V. BOGACHEVA** , M.F. EVSUKOV** , D.V. LOSHKAREV** (* Minprompolitiki of Ukraine, Kiev, Ukraine, **Iron and Steel Institute of National Academy of Science of Ukraine, Dnepropetrovsk, Ukraine) : ***Forecasting of processes formation of structure at refrigeration of rolled products with application of a mathematical model.***
- 135 Jiang YU*, Zeng PAN** (*University Stuttgart, Dept. Lab. Mathematisches Institut A, Germany, **Dept. of Mechanical Engineering, Tsinghua University, Beijing, China,) : ***Numerical simulation on quenching process of steel 26Cr2Ni4MoV with thermo-mechano-metallurgical interactions.***
- 136 J. GRUM, M. BATISTA, F. KOSEL, M. ZUPANČIČ, S. BOŽIČ (Faculty of Mechanical Engineering, University of Ljubljana, Ljubljana, Slovenia) : ***Measurement and numerical analysis of surface residual stresses occurring under different quenching conditions.***
- 137 Janez GRUM, Roman ŠTURM (Faculty of Mechanical Engineering, University of Ljubljana, Ljubljana, Slovenia) : ***Optimisation of Laser Surface Remelting Process on Stein Criteria.***
- 138 Janez GRUM, Roman ŠTURM (Faculty of Mechanical Engineering, University of Ljubljana, Ljubljana, Slovenia) : ***Strain and residual stress measurement at laser surface cladding of low carbon steel.***
- 139 S. XU*, J. LIN**, T.A. DEAN**, R. GARRETT**, (*Institute of Material Science and Engineering, Taiyuan University of Technology, Taiyuan, China, **Mechanical and manufacturing Engineering, School of Engineering, University of Birmingham, Edgbaston, Birmingham, UK) : ***An Energy-based Model for Predicting Incubation Time in Bainitic Transformation of Pre-deformed 50CrNiMo Steel.***

GENERAL INFORMATION

ABOUT NANCY AND THE CONFERENCE LOCATION

Nancy is located 300km east of Paris, 150km west of Strasbourg, in the center of the province of Lorraine. Travel from Paris takes 2.5 hours by train or 1 hour by air.

Nancy, historical capital of Lorraine is world-famous for its superb Place Stanislas and for the work of the artists of the «Ecole de Nancy».

The conference will take place at Palais des Congrès, rue du Grand Rabbin Haguenauer, that is situated in the centre of the town.

REGISTRATION

Participants are asked to fill in the enclosed registration form program (also available at www.TPMCS-2003.org) and return it with payment **before January 15th, 2003**, to the Conference secretariat :

Société Française de Métallurgie et de Matériaux (SF2M)
Les Fontenelles – 1 rue de Craïova
F-92024 Nanterre Cedex
Tél. : 33 1 41 02 03 90 – Fax : 33 1 41 02 03 88
E-mail : sf2mcongress@wanadoo.fr

Registration fees include :

- attendance to scientific sessions ; one copy of the extended abstracts volume
- coffee breaks
- lunches (3)
- conference dinner, Fine Arts Museum private visit
- volume of Proceedings

HOTEL RESERVATION

Please fill the hotel reservation form inserted in this program (also available at www.TPCMS-2003.org). This accommodation form should be returned **before March 1st, 2003**, together with the payment of the deposit to :

PALAIS DES CONGRES

BP 663

54063 NANCY Cedex - FRANCE

TEL : 33 (0) 3 83 36 81 81 - FAX : 33 (0) 3 83 36 81 80

WELCOME

The registration desk will be opened near the conference room from 08:00 am on Monday March 31.

Reception desk will remain open from 08:00 am on the 3 Conference days.

CANCELLATION

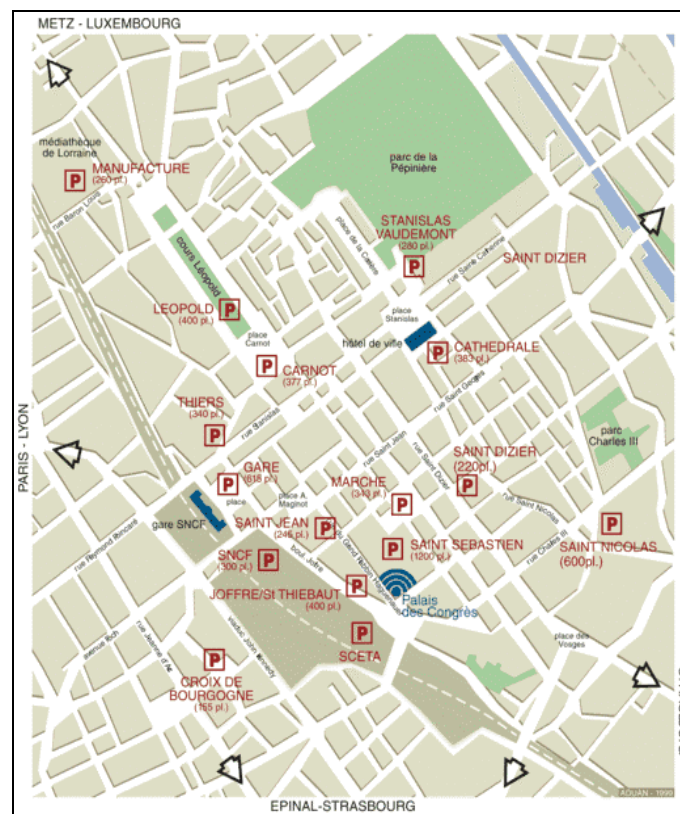
Participants cancelling their registration by e-mail, fax or letter before February 15th, 2003 will be refunded 50 % of their registration fee. No refund will be possible for cancellations made after February 15th, 2003.

PROCEEDINGS

The deadline for sending the full text is **January 31st, 2003**. Manuscripts should comply with the "instructions for the preparation of papers" already sent to all authors.

The proceedings will be published after the conference following a reviewing procedure for both oral and poster presentations.

MAP OF NANCY



2nd International Conference on Thermal Process Modelling and Computer Simulation

Nancy, March 31st – April 2nd 2003

MONDAY MARCH 31

08:00	REGISTRATION	
09:00	INTRODUCTION	
09:15	<u>Room Galle Plenary Conference - 1 - T. Inoue</u>	
10:00	COFFEE BREAK + POSTERS	
10:30	2 – T. Zoeller	14 – R.D. Sisson
10:55	3 – E. Gamsjäger	15 – I. Felde
11:20	4 – T. Réti	16 – A. Galovic
11:45	5 – J. Da Costa Teixeira	17 – P.F. Stratton
12:10	6 – H. Surm	18 – Y. Rong
12:35	7 – C. Cabus	19 – D. Apelian
13:00	<u>LUNCH</u>	
14:30	8 – M. Wolff	20 – M. Hunkel
14:55	9 – S. Dachkovski	21 – Y.K. Lee
15:20	10 – J.F. Jullien	22 – V. Hein
15:45	11 – R. Mohrmann	23 – M. Wolff
16:10	<u>COFFEE BREAK + POSTERS</u>	
16:30	12 – M. Coret	24 – P. Akerstrom
16:55	13 – J. Kohout	25 – I. Siller
17:20	<u>END</u>	
18:30	FINE ARTS MUSEUM PRIVATE VISIT	

Room GALLE

Room BOFFRAND

TUESDAY APRIL 1

08:30	Room Galle Plenary Conference 26 - M.A.J. Somers	
09:15	27 – M. Veaux	42 – M. Rohde
09:40	28 – P.M.C.L. Pacheco	43 – R. Nickel
10:05	29 – F. Frerichs	44 – Dong-Ying Ju
10:30	<u>COFFEE BREAK + POSTERS</u>	
11:00	30 – L. Taleb	45 – J. Wilden
11:25	31 – Z. Liwen	46 – L. Costa
11:50	32 – G. Sibilial	47 – J. Ahlström
12:05	33 – L. Depradeux	48 – T.C. Tszeng
12:30	34 – E.D. Schmitter	49 – N. Semmar
13:00	<u>LUNCH</u>	
14:30	35 – F. Bay	50 – A. Mitchell
14:55	36 – D. Hömberg	51 – Hong-Yang Zhao
15:20	37 – I. Zmak	52 – G. Bles
15:45	38 – L. Nastac	53 – V.M. Kondratenko
16:10	COFFEE BREAK + POSTERS	
16:30	39 – S. Guessasma	54 – C. Franz
16:55	40 – H.P. Cherukuri	55 – Jiang Yu
17:20	41 – G.E. Georgiev	56 – C.H. Gür
17:45	ROUND TABLE + POSTERS	
20:00	BANQUET GRANDS SALONS	

Room GALLE

Room BOFFRAND

WEDNESDAY APRIL 2

08:30	Room Galle Plenary Conference 57 - M. Plateau	
09:15	58 – B. Bacroix	70 – H. Porzner
09:40	59 – P. Mukhopadhyay	71 – M. Slovacek
10:05	60 – R. Ossenbrink	72 – P. Auburtin
10:30	<u>COFFEE BREAK + POSTERS</u>	
11:00	61 – D.R.G. Achar	73 – P. Schobesberger
11:25	62 – P. Jacquet	74 – N.I. Kobasko
11:50	63 – T. Belmonte	75 – P. Durantou
12:05	64 – T. Turpin	76 – C. Darcourt
12:30	65 – J. Luo	77 – A. Gallino
13:00	<u>LUNCH</u>	
14:30	66 – M.M. Makhoulouf	78 – Xiao (Leo) Chen
14:55	67 – J. Guo	79 – U. Lotter
15:20	68 – J.H. Nadler	80 – S.S. Sahay
15:45	69 – R. Colas	81 – M. Lambertin
16:20	CONCLUSIONS	

Room GALLE

Room BOFFRAND

2nd International Conference on Thermal Process Modelling and Computer Simulation - NANCY- FRANCE -31st march- 2nd april , 2003

REGISTRATION FORM

Please print and complete in block letters and return this form before January 15th, 2003 to :

SF2M - Société Française de Métallurgie et de Matériaux - Les Fontenelles – 1 rue de Craïova
F-92024 NANTERRE CEDEX France - Tél. : 33(1) 41 02 03 90 – Fax : 33(1) 41 02 03 88

E-mail : sf2mcongress@wanadoo.fr

Prof. Dr Mr Ms

Name : First Name :

Organisation :

Dept/Laboratory :

Mailing Address :

Postal code : Town : Country :

Phone : Fax : E-mail :

Date of arrival : .../.../... Date of departure: .../.../... Car Train

ACCOMPANYING PERSON(S)

Mr Ms

Name : First Name :

REDUCTION SNCF

I would like to receive reduction fares SNCF (French Railways)
These reductions are available for the travel (round trip) within France only

CONFERENCE DINNER

We will take part in the conference dinner, Tuesday April 1, 2003

REGISTRATION FEES

	<u>Before Jan. 15th</u>	<u>After Jan. 15th</u>	<u>Payment (to be filled)</u>
Invited Plenary Conference	400 Euros	490 Euros
Speaker	490 Euros	560 Euros
Participant	560 Euros	620 Euros
Students	250 Euros	300 Euros

Registration fees include: - attendance to oral and posters sessions
- book of extended abstracts
- coffee breaks and lunches (3)
- conference dinner – Fine Arts Museum private visit
- volume of Proceedings (except for students)

Accompanying persons 150 Euros | 150 Euros |

Registration fees include : - coffee breaks and lunches (3)
- conference dinner – Fine Arts Museum private visit

TOTAL :

MODE OF PAYMENT:

Payment should be made by credit card, by cheque or by bank transfer
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CIC Paris SAINT-PHILIPPE, code banque : 30066 - code guichet : 10161 - N° de compte : 00010341401 - clé RIB : 23

International Bank Account Number :

FR76 3006 6101 6100 0103 4140 -Key : 123 -Bank Identification Code (BIC) : CMCIFRPP

- Cheque of Euros to **SF2M** Bank charges, if any, should not be deducted from the above amount. Any difference will have to be settled at the Conference.
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