RADIATION IV

PRELIMINARY PROGRAM: May 17, 2004

SUNDAY JUNE 20, 2004

14:00-18:00 MEETING OF THE EXECUTIVE COMMITTEE OF ICHMT

15:30-18:00 REGISTRATION

MONDAY JUNE 21, 2004

7:30-8:00 REGISTRATION

8:00-8:30 WELCOMING REMARKS Mengüç/Selçuk/Arinç/Cumo

RADIATION TRANSFER IN NEW APPLICATIONS Chair: N. Selçuk

8:30-9:30 DEDICATION LECTURE 1 Y. Kurosaki
RADIATIVE HEAT TRANSFER IN PLASTIC WELDING PROCESS

9:30-9:55 Study on Radiation Transfer in Human Skin For Cosmetics
J. Yamada, A. Kawamura, Y. Miura, S. Takata, K. Ogawa

9:55-10:20 Temporal Analysis of Reflected Optical Signals for Short Pulse Laser Interaction with Nonhomogeneous Tissue Phantoms
A. Trivedi, S. Basu, K. Mitra

10:20-10:55 COFFEE BREAK

RADIATION TRANSFER AT NANO-SCALE Chair: D. Lemonnier

10:55-11:20 Radiation Transfer through Nanoscale Apertures
E.X. Jin, X. Xu

11:20-11:45 Modeling the Radiative Properties of Semitransparent Wafers with Rough Surfaces and Thin-Film Coatings
H.J. Lee, B.J. Lee, Z.M. Zhang

11:45-12:10 Thermal Radiation in 1D Photonic Crystals
A. Narayananswamy, G. Chen

12:10-12:35 Characterization of Metallic Nano-Particles via Surface Wave Scattering: (Parts A and B)
M. Aslan, M.P. Mengüç, G. Videen

BRIDGE BETWEEN RADIATION TRANSFER AND LIGHT SCATTERING COMMUNITIES Chair: M. P. Mengüç

12:35-13:00 Light Scattering and Radiative Transfer Research: Similarities and Differences
G. Videen

13:00-14:30 BREAK

RADIATION TRANSFER MODELS: 1 Chair: P.-f. Hsu

14:30-14:55 Some Thoughts on Solving the Radiative Transfer Equation in Media with Stochastic Properties Using Polynomial Chaos and Wick Products as Applied to Radiative Equilibrium
A. Emery

14:55-15:20 Applications of Sensitivity Estimations by Monte Carlo Methods
M. Roger, M. El Hafi, R. Fournier, S. Blanco, A. de Lataillade, V. Eymet, P. Perez

TIME DEPENDENDENT AND COUPLED PROBLEMS Chair: K.T.G. Hollands

15:20-15:45 Transient Radiative Heat Transfer within a Particle Suspension undergoing Endothermal Decomposition
W. Lipinski, A. Steinfeld

15:45-16:10 Sequential Nano-Patterning using Electron and Laser Beams: A Numerical Methodology
B. Wong, M.P. Mengüç, R. Vallance

16:10-16:35 Transient Simulation of Radiating Flows
N. Selçuk, A.B. Uygur, I. Ayranci, T. Tarhan

16:35-17:00 COFFEE BREAK

RADIATIVE TRANSFER MODELS: 2 Chair: L. Dombrovsky

17:00-17:25 A Numerical Method for the Solution of Radiative Heat Transfer Problems in Irregular Domains with Fresnel Interfaces-Axisymmetric Problems
V.M. Mamedov, S.A. Rukolaine, V.S. Yuferev

17:25-17:50 The SKN Approximation for Solving Radiative Transfer Problems in Rectangular Participating and Isotropically Scattering Inhomogeneous Medium
M. Tekkalmaz, Z. Altaç

17:50-18:15 Application of Parametric Surface Representation to Evaluating Form Factors and like Quantities
K.G.T. Hollands

18:30-19:30 **WELCOME PARTY: COCKTAIL**

TUESDAY JUNE 22, 2004

RADIATION TRANSFER IN FIRE AND MIST Chair: M. F. Modest

8:30-9:30 DEDICATION LECTURE 2 J.-F. Sacadura
RADIATIVE HEAT TRANSFER IN FIRE SAFETY SCIENCE

9:30-9:55 Effect of Radiation Absorption on a Water Droplet Evaporation
C.C. Tseng, R. Viskanta

9:55-10:20 Role of Radiation in Extinguishing Properties of Water Mist
J. Richard, J.-P. Garo, J.-P. Vantelon, D. Lemonnier

10:20-10:55 COFFEE BREAK

RADIATION TRANSFER IN SPRAYS AND BUBBLES Chair: F. Liu

10:55-11:20 Modeling Heat Exchanges in a Water Spray with Strong Radiative Transfer Participation
A. Collins, P. Boulet, G. Parent, D. Lacroix

11:20-11:45 Thermal Radiation Transfer in a Semi-Transparent Liquid with Gas Bubbles
L. Dombrovsky

DIAGNOSTIC APPROACHES: 1 Chair: B. W. Webb

11:45-12:10 Soot Processes in a Strongly-Radiating Turbulent Flame from Laser Scattering/Extinction Experiments
B. Yang, U. Koylu

12:10-12:35 Effects of Primary Particle Diameter and Aggregate Size Distribution on the Temperature of Soot Particles Heated by Pulsed Lasers
F. Liu, G.J. Smallwood, D. Snelling

12:35-13:00 Radiative Transfer Diagnostic Technique of Sooting Flames from Emission Spectroscopy
F. Andre, R. Vaillon, I. Ayranci, D. Escudie, N. Selçuk

13:00-14:30 BREAK

RADIATION TRANSFER: GAS PROPERTIES: 1 Chair: P. Coelho

14:30-14:55 High-Accuracy, Compact Database of Narrow-Band k-Distributions for Water Vapor and Carbon Dioxide
A. Wang, M.F. Modest

14:55-15:20 Evaluation of the SNB Based Full-Spectrum CK Method for Thermal Radiation Calculations in CO2-H20 Mixtures
F. Liu, M. Yang, G.J. Smallwood, H. Zhang

15:20-15:45 Engineering Correlations for Full Spectrum k-Distribution of H2O from the HITEMP Spectroscopic Databank
M.F. Modest, V. Singh

15:45-16:10 The Cumulative Wavenumber Method for Modeling Radiative Transfer
in High Temperature Gases with Soot
V.P. Solovjov, B.W. Webb

16:10-16:35 Nongray Soot and Gas-Phase Radiation Modeling in Luminous Turbulent Nonpremixed Jet Flames
L. Wang, M.F. Modest, D.C. Haworth, S.R. Turns

16:35-17:00 COFFEE BREAK

17:00-19:00 **POSTER PRESENTATIONS (see the end of the program for the list)**

WEDNESDAY JUNE 23, 2004

INVERSE RADIATION TRANSFER: 1 — Chair: A. Charette

8:30-9:05 DEDICATION LECTURE 3 J.R. Howell
APPLICATIONS OF INVERSE RADIATION PROBLEMS

9:05-9:30 Inverse Design Methods for Radiative Transfer Systems
K.J. Daun, J.R. Howell

9:30-9:55 Optimal Design of Complex Human Environment by Inverse Radiative Method
G. Leduc, F. Monchoux, F. Thellier

9:55-10:20 Backward Method of Characteristics in Radiative Heat Transfer
K.M. Katika, L. Pilon

10:20-10:45 Optimal Experiment Design to Estimate the Radiative Properties of Materials
A. Nenarokomov, D.V. Titov

10:45-11:10 COFFEE BREAK

RADIATION TRANSFER MODELS: 3 — Chair: Z. Altaç

11:10-11:35 Comparison between Performances of Monte Carlo Method and Method of Lines Solution
of Discrete Ordinates Method
G. Demirkaya, F. Arinç, N. Selçuk, I. Ayranci

11:35-12:00 A Hybrid Finite Volume / Finite Element Discretization Method for the Solution
of the Radiative Heat Transfer Equation
P. Coelho

12:00-12:25 Discrete Ordinate Method with a New Quadrature Scheme
S.C. Mishra, N. Misra

12:25-12:50 The Radiative Transfer Equation with Mean Absorption Coefficients
J.-F. Ripoll, A.A. Wray

12:50-13:15 The Effect of Three-Dimensional Radiative Heat Transfer in Clouds Field using the Radiation Element Method
A. Sakurai, S. Maruyama, S. Sakai, T. Nishikawa

AFTERNOON FREE TIME

THURSDAY JUNE 24, 2004

INVERSE RADIATION TRANSFER: 2 — Chair: S. Maruyama

8:30-8:55 Reconstruction Optical Spectroscopy using Transient Radiative Transfer Equation
and Pulsed Laser: A Numerical Study
J. Boulanger, A. Charette

8:55-9:20 Determination of the Gas Temperature Profile in a Large-Scale Furnace using a Fast/Efficient Inversion Scheme for the SRS Technique
H.K. Kim, T.-H. Song

9:20-9:45 Inverse Determination of Heat Source Distribution in Conductive-Radiative Media with Irregular Geometry
S.M.H. Sarvari

9:45-10:20 Reverse Monte Carlo Simulations of Light Pulse Propagation in Nonhomogeneous Media Part I: Theoretical Development & Part II: Numerical Simulations
X. Lu, P.-F. Hsu

10:20-10:55 COFFEE BREAK

RADIATION TRANSFER MODELS: 4 Chair: T.-H. Song

10:55-11:20 Identification of Appropriate Source Models for Accurate Diffusion Modeling of Radiative Transfer in a Non-Absorbing Foam Layer
M.R. Jones, V.P. Solovjov, B.W. Webb, S.M. Salisbury

11:20-11:45 Theoretical Analysis of Frequency and Time Domain Methods for Optical Characterization of Absorbing and Scattering Media
M. Francoeur, R. Vaillon, D.R. Rousse

11:45-12:10 Simulation of Whispering-Gallery-Mode Resonance for Optical Miniature Biosensor
H. Quan, Z. Guo

12:10-12:35 Fourier Analysis Applied to Enclosures with Isothermal Gases
K.G.T. Hollands

12:35-13:00 Isotropic Scaling Limits for One Dimensional Radiative Heat Transfer with Collimated Incidence
H.T.K. Tagne, D. Baillis

13:00-14:30 BREAK

RADIATION TRANSFER: GAS PROPERTIES: 2 Chair: D. Lacroix

14:30-14:55 Modeling of the Absorption Coefficient in the Exponential Wide Band Model (EWBM)
M. Bahador, M. Sunden

14:55-15:20 Application of the CW Model for the Solution of Non-Gray Coupled Radiative Conductive Heat Transfer in Double Glass Window with a Cavity Filled with Mixtures of Absorbing Gases
K.A.R. Ismail, C.T. Salinas

DIAGNOSTIC APPROACHES 2 Chair: U. Koylu

15:20-15:45 In-Situ Optical Diagnostics for Measurement of Water Vapor Concentration and Temperature in a PEM Fuel Cell
S. Basu, H. Xu, M.W. Renfro, B.M. Cetegen

15:45-16:10 Parametric Study for Monitoring Cerebral Blood Oxygenation using Dual-Wavelength Optical Reflectance Measurement
S.K. Wan, Z. Guo

16:10-16:35 On the Measurement of Flame Temperatures using Thermocouple
A. Ergut, Y. Levendis

16:35-17:15 COFFEE BREAK

RADIATION TRANSFER MODELS: 5 Chair: R. Vaillon

17:15-17:40 The Dresor Method for the Solution of the Radiative Transfer Equation in Gray Plane-Parallel Media
H.-C. Zhou, Q. Cheng

17:40-18:05 2-D Conduction and Radiation Heat Transfer Using the Lattice Boltzmann Method and the Collapsed Dimension Method
S.C. Mishra, A. Lankadasu

18:05-18:30 On Closure Models for Radiative Pressure
J.-F. Ripoll, A.A. Wray

19:00-22:00 **GALA DINNER ON BOSPHOROUS CRUISE**

FRIDAY JUNE 25, 2004

WORK-IN-PROGRESS PRESENTATIONS Chairs: M. P. Mengüç, B. W. Webb

8:30-10:00 5-minute presentations of Work-in-Progress and Discussions

10:00-10:30 COFFEE BREAK

10:30-12:00 **OPEN FORUM:** Chairs: M. P. Mengüç, N. Selçuk

Noon **END OF THE RAD-IV SYMPOSIUM**

13:00-18:00 **JQSRT SELECTION COMMITTEE MEETING**

POSTER PRESENTATIONS (TUESDAY AFTERNOON)

The Role of Radiative Transfer for Vehicles for Being Descent through the Atmosphere of Earth and the Solar System Planets
A.N. Rumynsky, N.A. Anfimov, A.A. Katasonov

Numerical Simulation of Radiative Transfer for Mars Entry Flows
T. Soubrie, O. Rouzaud, L. Tesse, F. Longueteau

Discretization Scheme Efficiency for RTE Solution in the Case of Coupled Radiative
and Conductive Heat Transfer in High Temperature Glasses
N.Berour, D. Lacroix, X. Brige, A. Collin, G. Jeandel

Limits of Rosseland and Deissler Approximations when Applied to the Case of a Complex Medium
X. Brige, B. Monod, G. Jeandel, F. Asllanaj

Polarized Light Scattering Experiments for Evaluation of Micro-Bubble Size and Gas Hold-Up in Two-Phase (Gas-Liquid) Flows
M. Aslan, M.P. Mengüç, C. Crofcheck, D. Tao

An Application of the Transport Theory in Optical Oceanography: The Estimation of the Apparent Optical Properties
using Infinite Medium Green's Function for Isotropic and Anisotropic Scatterings
A. Kaskas, C. Tezcan, M.C. Guleçyuz

Numerical Study of Raditive Heat Transfer in an Industrial Incinerator of Fumes of Wood Carbonization
M.A. Abbassi, K. Halouani, M.S. Radhouani

Application of the SKN Method to Two-Dimensional Cylindrical Medium with Isotropic Scattering
N. Doner, Z. Altaç

A Visual Unsteady Navier Stokes Solver with Radiation, Mass, and Heat Transfer
K. Senturk, N. Aslan

Transient Combined Radiation and Conduction in a Non-Grey Participating Medium with Anisotropic Optical Properties
and Covered by Semi-Transparent Surfaces Submitted to Flux Boundary Conditions
F. Asllanaj, X. Brige, G. Jeandel, D. Lacroix, N. Berour

View Factor Calculations using the Collapsed Dimension Method
S.C. Mishra, A. Shukla

Numerical Solution of Radiative Heat Transfer Problems in Three-Dimensional Irregular Domains with Fresnel Interfaces
V.M. Mamedov, S.A. Rukolaine, V.S. Yuferev

Radiative Heat Transfer in Axisymmetric Cylindrical Enclosure with Two-Phase Scattering Medium
A. Boutoub, H. Ettouati, H. Benticha, M. Sassi

Modeling Radiative Heat Transfer in Tubular Solid Oxide Fuel Cells
J.D.J. VanderSteen, M.E. Austin, J.G. Pharoah

Characterization of Irregularly Shaped Metallic Nanoparticles via Light Scattering
M. Kozan, M.P. Mengüç