

# 11<sup>th</sup> International Symposium on Radiative Transfer

RAD-25 • KoruMar Hotel De Luxe, Kuşadası, Türkiye

15 - 20 June 2025

## PROGRAM

### SUNDAY JUNE 15, 2025

15:30 - 18:00 REGISTRATION

### MONDAY JUNE 16, 2025

7:30 – 8:30 REGISTRATION

8:30 – 8:55 WELCOMING REMARKS (K Daun / F Liu/ I Tari)

#### PLENARY LECTURE

**Chair: Brent Webb**

8:55 – 9:40 Reflections on Thirty Years of the International Symposia on Radiative Transfer  
M. Pinar Mengüç

#### SESSION 1 – PARTICLE/EM WAVE INTERACTIONS - I

**Chair: Fengshan Liu**

9:40 – 10:05 APPLICATION OF STATIC STRUCTURE FACTOR FOR POLYDISPERSE PARTICLE SUSPENSIONS (RAD25-28)

S Dincer, RA Yalçın, H Ertürk

10:05 – 10:30 COMPARISON OF SAXS MODELS WITH THE HELP OF PAIR CORRELATION FUNCTIONS (RAD25-49)

M Littin, M Mazur, G Lefevre, M Sztucki, A Fuentes, J Yon

10:30 – 10:55 Coffee Break

#### SESSION 2 – HETEROGENEOUS MEDIA - I

**Chair: AV Nenarokomov**

10:55 – 11:20 COMPARATIVE ANALYSIS OF METHODS FOR SOLVING CONDUCTION-RADIATION COUPLING IN HETEROGENEOUS MATERIALS (RAD25-48)

L Penazzi, MA Badri, S Blanco, C Caliot, S Chupin, C Daoût, J Dauchet, S Eibner, M El Hafi, F Enguehard, V Eymet, O Farges, Y Favennec, A Adjovi Fortunat, R Fournier, D Jehl, Y Jobic, P Jolivet, F Rigollet, D Rochais, B Rousseau, F Topin, J Vicente, G Vignoles

11:20 – 11:45 DEVELOPMENT OF A PHYSICS-BASED RADIATIVE MODEL FOR ANISOTROPIC SCATTERING ABSORBING MEDIUM (RAD25-43)

A Yassin, SJ Poovathingal

11:45 – 12:10 DEVELOPMENT OF THE EFFECTIVE MEDIUM THEORY APPLICABILITY MAP  
(RAD25-30)  
S Akay, RA Yalçın, H Ertürk

12:15 – 14:00 LUNCH BREAK

### **DEDICATION LECTURE 1**

**Chair: Michael Modest**

14:00 – 14:45 HIGH ACCURACY, COMPUTATIONALLY EFFICIENT MODELING OF RADIATIVE  
TRANSFER IN GASES  
Brent W Webb

### **SESSION 3 – GAS RADIATION**

**Chair: Pedro Coelho**

14:45 – 15:10 AN IMPROVED SUPERPOSITION WEIGHTED-SUM-OF-THE-GRAY-GASES MODEL  
FOR MIXTURES OF ARBITRARY COMPONENTS (RAD25-01)  
GC Fraga, RJC da Fonseca, F Asllanaj, FHR França

15:10 – 15:35 EVALUATION OF THE WIDE-BAND BASED WEIGHTED-SUM-OF-GRAY-GASES  
MODEL APPLIED TO TWO-DIMENSIONAL PROBLEMS ENCLOSED BY NON-GRAY  
WALLS (RAD25-56)  
RJC da Fonseca, GC Fraga, FHR França

15:35 – 16:00 Coffee Break

16:00 – 16:25 A COMPARISON OF MACHINE / STATISTICAL LEARNING STRATEGIES FOR  
MODELING THE RADIATIVE PROPERTIES OF NON-UNIFORM GASEOUS  
ATMOSPHERES (RAD25-03)  
X Aihemaiti, T Ren, L Guilmard, F André

16:25 – 16:50 A PHYSICS-INFORMED NEURAL NETWORK-BASED WSGG MODEL FOR H<sub>2</sub>O-  
CO<sub>2</sub>-CO MIXTURES (RAD25-08)  
W Chen, R Yang, T Ren

16:50 – 17:15 AN IMPLEMENTATION OF  $\ell$ -DISTRIBUTION MODEL WITH QUASI-MONTE  
CARLO METHOD FOR RADIATIVE TRANSFER IN PARTICIPATING MEDIA (RAD25-  
20)  
SP Roy, F André

18:30 – 20:00 WELCOME RECEPTION

## **TUESDAY JUNE 17, 2025**

### **DEDICATION LECTURE 2**

**Chair: Kyle Daun**

8:30 – 9:15 EFFECT OF RADIATION ON NATURAL CONVECTION IN SEMITRANSSPARENT GASEOUS MEDIA

Denis Lemonnier

### **SESSION 4 – MONTE CARLO METHODS**

**Chair: Somesh Roy**

9:40 – 10:05 FLUORESCENT BIOMARKERS QUANTIFICATION WITH SYMBOLIC MONTE CARLO FOR INTRAOPERATIVE IMAGING IN NEUROSURGERY (RAD25-32)

L Martinez-Ceseña, M Roger, M Galtier, A Gautheron, L Mahieu-Willame, B Montcel, L Penazzi, A Delmas

10:05 – 10:30 SENSITIVITY CALCULATION IN SPECTRO-RADIATIVE COUPLING: A COMPARATIVE STUDY FOR THREE MONTE CARLO PATH INTEGRALS (RAD25-57)

N Mourtaday, F André, S Blanco, C Cornet, J-L Dufresne, R Fournier, Z He, Y Nyffenegger-Péré, J Riedi

10:30– 10:55 Coffee Break

### **SESSION 5 – PARTICLE/EM WAVE INTERACTIONS - II**

**Chair: Mengqi Liu**

10:55 – 11:20 INVESTIGATION OF THE APPARENT ANOMALOUS COOLING OF SOOT DURING LASER-INDUCED INCANDESCENCE (RAD25-34)

S Robinson-Enebeli, C Schulz, KJ Daun

11:20 – 11:45 SCATTERING PROPERTIES OF CRUMPLED FEW-LAYER GRAPHENE AND GRAPHENE OXIDE PARTICLES INVESTIGATED BY WIDE-ANGLE LIGHT SCATTERING (WALS) (RAD25-35)

Hİ Yazıcı, P Lang, HI Looi, FJT Huber, S Will, C Schulz, KJ Daun

11:45 – 12:10 SOOT PRIMARY PARTICLE DIAMETER AND REFRACTIVE INDEX DETERMINED FROM MOBILITY SIZE DISTRIBUTION, VOLUME FRACTION, AND ABSORPTION AND SCATTERING COEFFICIENTS (RAD25-38)

F Liu, TA Sipkens, JC Corbin

12:10 – 13:40 LUNCH BREAK

## **SESSION 6 – RADIATION IN COMBUSTION AND FIRES – I**

**Chair: Guilherme Fraga**

13:40 – 14:05 NUMERICAL CALCULATION AND ANALYSIS OF SPECTRUM EMITTED BY FLAME IN A BOILER FURNACE BURNING HIGH ALKALI COAL (RAD25-21)

Y Pu, B Yao, Z Hu, C Lou

14:05 – 14:30 NUMERICAL BENCHMARK FOR MODELING SPRAY-RADIATION INTERACTION IN FIREFOAM: IMPLEMENTATION AND VALIDATION OF THE FVDM MODEL (RAD25-23)

E Chopard, V Robin, Z Bouali

14:30 – 14:55 EVALUATING PERFORMANCE OF APPROXIMATE RADIATION MODELS AGAINST PHOTON MONTE CARLO LINE-BY-LINE BENCHMARK FOR FIRE SIMULATION (RAD25-19)

C Paul, SP Roy, J Sailer, F Brännström, MM Ahmed, A Trouvé, H Bordbar, S Hostikka, R McDermott

14:55 – 15:20 COMPARISON OF FVM WITH DGFEM SOLVING THE RADIATIVE TRANSFER EQUATION (RAD25-53)

J Sailer, F Brännström

**15:20 – 15:45 Coffee Break**

## **SESSION 7 – RADIATION IN COMBUSTION AND FIRES – II**

**Chair: Maxime Roger**

15:45 – 16:10 NUMERICAL SIMULATION OF COMBUSTION IN A GLASS MELTING FURNACE: INFLUENCE OF SPECTRAL RADIATION MODELS (RAD25-31)

B Halvaşı, A Melik Başol, MP Mengüç

16:10 – 16:35 CHARACTERIZATION OF SPECTRAL TURBULENCE-RADIATION INTERACTION FOR LUMINOUS FLAMES (RAD25-42)

GC Fraga, PJ Coelho, J-L Consalvi, X Zhao

16:35 – 17:00 THE EFFECTS OF THERMAL RADIATION WITH/WITHOUT TRI ON PERFORMANCE OF AERO-ENGINE COMBUSTORS WITH VARYING GEOMETRIC SCALES BY PRESERVING SIMILARITY OF DYNAMICS (RAD25-46)

J Zhu, Y Liu, G Liu

17:00 – 17:25 AN A PRIORI EVALUATION OF CONDITIONAL SOURCE TERM ESTIMATION (CSE) FOR MODELING TURBULENCE RADIATION INTERACTION IN SOOTING NON-PREMIXED JET FLAMES (RAD25-33)

J-L Consalvi, F. Nmira

17:25 – 17:50 RECONSTRUCTING TEMPERATURE FIELD AND RADIATIVE PROPERTIES INSIDE BOILER FURNACE THROUGH DEEP LEARNING (RAD25-02)

Y An, S Ren, C Lou, N Kalaycı

**WEDNESDAY JUNE 18, 2025**

**POYNTING AWARD LECTURE**

**Chair: M. Pinar Mengüç**

8:30 – 9:30

**SESSION 8 – NANOSCALE AND NEARFIELD RADIATION - I**

**Chair: Hakan Ertürk**

9:30 – 9:55 NEAR-FIELD RADIATIVE HEAT TRANSFER INSIDE TWISTED BILAYER LATTICE WITH ANISOTROPIC BAND TOPOLOGY (RAD25-10)

Z Gong, WB Zhang, HF Yang, C-Y Zhao

9:55 – 10:20 THE PLASMONIC METASURFACE THERMAL EMITTER FOR CATALYSIS AND SENSING (RAD25-13)

J Zhou, M Liu, C Zhao

10:20 – 10:45 Coffee Break

**SESSION 9 – NANOSCALE AND NEARFIELD RADIATION - II**

**Chair: M. Pinar Mengüç**

10:45 – 11:10 EVALUATION OF QUANTUM AND SPECTRAL EFFICIENCIES IN A SIMPLE NEAR-FIELD THERMOPHOTOVOLTAIC DEVICE (RAD25-37)

YM Kose, H Ertürk

11:10 – 11:35 A FEASIBILITY STUDY FOR ENHANCING LIGHT ABSORPTION BY GOLD NANOSPHERES VIA DIELECTRIC NANOROD ADDITION FOR PHOTOTHERMAL THERAPY APPLICATIONS (RAD25-29)

EŞ Tahmaz, H Ertürk

11:35 – 12:00 IMPACT OF NATIVE OXIDE ON NEAR-FIELD RADIATIVE HEAT FLUX MODULATION IN SILICON-BASED PHOTONIC P-N JUNCTION (RAD25-18)

G Wang, D Xu, J Zhao

12:00 – 12:25 NEAR-FIELD ENERGY AND ENTROPY DENSITY, FLUX, AND EFFECTIVE TRANSMISSION VELOCITY (RAD25-15)

ZM Zhang, ANM Fuhadul Islam, S Mostafa Ghiaasiaan

12:25 – 13:55 LUNCH BREAK

**FREE AFTERNOON**

## THURSDAY JUNE 19, 2025

### KEYNOTE LECTURE 1

Chair: Denis Lemonnier

8:30 – 9:15 RADIATIVE TRANSFER IN SOLAR ENERGY CONVERSION  
Xiulin Ruan

### SESSION 10 – SURFACE PROPERTIES

Chair: Denis Lemonnier

9:15 – 9:40 ESTIMATING OXIDE LAYER THICKNESS USING *EX SITU* REFLECTANCE  
MEASUREMENTS OF HOT STAMPED Al-Si COATED 22MnB5 STEEL (RAD25-51)  
A Bhattacharya, C Yau, KJ Daun

9:40 – 10:05 EXPERIMENTAL SETUP DEVELOPMENT FOR  $\text{CO}_2$  NORMAL SPECTRAL  
EMISSIVITY MEASUREMENT AT HIGH TEMPERATURE (RAD25-58)  
L Gaillard, A Aouali, J. Aubril, G. Biotteau, P-M. Geffroy, B. Rousseau

10:05 – 10:30 SPECTRAL RADIATIVE PROPERTIES OF COMMON BUILDING MATERIALS AND  
THEIR IMPACT ON RADIATIVE COOLING (RAD25-25)  
Y Yan, A Hervé, M Hendel, T Bourouina, E Nefzaoui

10:30 – 10:55 Coffee Break

### SESSION 11 – HETEROGENEOUS MEDIA - II

Chair: Xiulin Ruan

10:55 – 11:20 RADIATIVE TRANSFER IN SEMITRANSSPARENT FIBROUS SUBSTRATES FOR  
PHOTOELECTROCHEMICAL REACTIONS (RAD25-50)  
A Bhanawat, S Haussener

11:20 – 11:45 MULTISCALE APPROACH FOR DESIGNING  $\text{Pr}_2\text{NiO}_{4+\delta}$ -BASED OPEN CELL  
FOAMS WITH PRESCRIBED RADIATIVE PROPERTIES UP TO 1,000°C (RAD25-36)  
B Rousseau, A. de la Vauvre, L Gaillard, A Aouali, J Vicente

11:45 – 12:10 ROLE OF THE TEXTURE OF AN OPEN-CELL FOAM ON THE DESIGN BY  
TOPOLOGY OPTIMIZATION OF A VOLUMETRIC SOLAR RECEIVER (RAD25-59)  
A De la Vauvre, Y Favennec, L Cangémi, B Rousseau

12:10 – 13:40 LUNCH BREAK

### SESSION 12 – REMOTE SENSING – I

Chair: Sunil Kumar

13:40 – 14:05 INTER-COMPARISON OF DIFFERENT ORDER-SCATTERING MODELS FOR  
ACCURATE SENSING IN DUSTY CONDITIONS (RAD25-40)  
S Nejari, A Ben-Daoued, F Bernardin, C Debain, PS Heritier

- 14:05 – 14:30 HIGHER-ORDER MODAL DECOMPOSITION OF URBAN IRRADIANCE  
VARIABILITY IN SPACE AND TIME (RAD25-45)  
G Le Gall, M Thebault, V Simoncini, J Ramousse
- 14:30 – 14:55 COMPARISON OF LWIR AND MWIR IMAGING FOURIER TRANSFORM  
SPECTROMETERS FOR ESTIMATING CH<sub>4</sub> AND CO<sub>2</sub> EMISSION RATES (RAD25-  
52)  
AR Singh, CS Turcotte, KJ Daun
- 14:55 – 15:20 PROBABILISTIC MACHINE LEARNING FOR XCO<sub>2</sub> RETRIEVALS FROM SATELLITE  
SPECTRAL DATA (RAD25-09)  
W Chen, T Ren
- 15:20 – 15:45 Coffee Break
- 15:45 – 16:10 ON THE PERFORMANCES OF GASEOUS ABSORPTION MODELS (LBL, CKD, AND  
ALD) IN A RADIATIVE FORWARD MODEL FOR ATMOSPHERIC REMOTE SENSING  
(RAD25-26)  
A Rimboud, N Mourtaday, F Thieuleux, C Cornet, J Riedi, LC-Labonnote, F  
André
- 16:10 – 16:35 THE CONCEPT OF QUASI-CORRELATED SPECTRA AND ITS APPLICATION IN  
ATMOSPHERIC REMOTE SENSING SCENARIOS (RAD25-62)  
F André, VP Solovjov, BW Webb, N Mourtaday, Ph Dubuisson
- 16:35 – 18:00 POSTER SESSION
- 19:30 - 23:00 GALA DINNER

## **FRIDAY JUNE 20, 2025**

### **KEYNOTE LECTURE 2**

**Chair: Zhuomin Zhang**

- 8:30 – 9:15 PHOTON TUNNELING MEDIATED HEAT TRANSFER IN PARTICLE NETWORKS:  
FROM PARTICLE-SCALE TO CONTINUUM-SCALE  
Junming Zhao

### **SESSION 13 – RADIATION IN CONJUGATE HEAT TRANSFER APPLICATIONS**

**Chair: Kyle Daun**

- 9:15 – 9:40 IDENTIFICATION OF MATHEMATICAL MODELS OF RADIATIVE-CONDUCTIVE  
HEAT TRANSFER IN BIOLOGICAL TISSUES (RAD25-16)  
AV Nenarokomov, DS Semenov, SA Budnik, DM Titov
- 09:40 – 10:05 COUPLED SIMULATIONS OF RADIATIVE TRANSFER AND NONEQUILIBRIUM  
FLOW IN HIGH ALTITUDE ROCKET PLUMES (RAD25-17)  
G Janodet, J-M Lamet, P Rivière, V Rialland, A Soufiani

10:05 – 10:30 Coffee Break

## **SESSION 14 – SPECIAL TOPICS**

**Chair: Frederic André**

10:30–10:55 TOMOGRAPHIC RECONSTRUCTION OF THE LOCAL PROBABILITY DENSITY FUNCTION OF SOOT VOLUME FRACTION IN A TURBULENT JET DIFFUSION FLAME (RAD25-22)

F Liu, F Nmira, J-L Consalvi

10:55 – 11:20 RADIATION MODELLING FOR ELECTRICAL ARC SIMULATION IN AIR PLASMAS (RAD25-24)

F Ouchar, P Rivière, C Van de Steen, A Soufiani

11:20 – 11:45 MEASURING THE DIRECTIONAL EMISSIVITY OF PLASMA FACING COMPONENTS AT HIGH TEMPERATURES WITH A NEW SETUP, MAGRYT (RAD25-27)

F Retailleau, M-H Aumeunier, P Malard

11:45 – 12:10 CONCLUDING STATEMENTS

12:10 – 14:00 LUNCH BREAK

14:00 END OF RAD-25 SYMPOSIUM

## **POSTER PRESENTATIONS**

Thursday, June 15

16:35 – 18:00

P01 APPLICATION OF A  $\ell$ -DISTRIBUTION MODEL WITH MONTE CARLO AND QUASI-MONTE CARLO METHODS FOR RADIATIVE TRANSFER IN GAS MIXTURES  
SP Roy, F André

P02 INTERACTION OF SURFACE RADIATION AND BUOYANCY-INDUCED FLOW IN HOLLOW BUILDING STRUCTURES  
IV Miroshnichenko, NS Bondareva

P03 ON THE IMPACT OF SCATTERING EVENTS ON THE CONVERGENCE OF QUASI-MONTE CARLO METHODS FOR RADIATIVE TRANSFER CALCULATIONS IN ATMOSPHERIC REMOTE SENSING SCENARIOS  
A Rimboud, N Mourtaday, F Thieuleux, C Cornet, SP Roy, F André

P04 HIGH-TEMPERATURE NONRECIPROCAL THERMAL RADIATIVE PROPERTIES OF SEMICONDUCTORS  
B Nabavi, B Zhao

P05 TOWARDS A REFERENCE FRAMEWORK FOR RADIATIVE TRANSFER AND UNCERTAINTY PROPAGATION IN STOCHASTIC MEDIA  
N Mourtaday, F André, S Blanco, C Cornet, J-L Dufresne, R Fournier, J Riedi