

Program & Summaries

International Symposium on THERMAL AND MATERIALS NANOSCIENCE AND NANOTECHNOLOGY

Hotel Dedeman, Antalya, Turkey May 29 – June 3, 2011 Underlined authors are confirmed to be attending the symposium. Click on the paper title to download the summary. SUNDAY, May 29, 2011 15:30 - 18:00

REGISTRATION 19:00 - 20:00 WELCOME COCKTAIL MONDAY, May 30, 2011 17:30 - 8:30

REGISTRATION

8:30 - 8:45 WELCOMING REMARKS

Bayazıtoglu/Arinc KEYNOTE

LECTURE 1 Chair: B. K. Tay 8:45 - 9:30 ENGINEERING AT THE NANOSCALE WITH CARBON NANOSTRUCTURES – A BRIEF COMMENTARY

P. Ajayan SESSION 1 Chair: Y. Joshi 9:30 - 10:00

AN EXPERIMENTAL INVESTIGATION OF EXPEDITED UNIDIRECTIONAL FREEZING OF NANOPARTICLE-ENHANCED PHASE CHANGE MATERIALS (NEPCM)

L. Fan and J. M. Khodadadi 10:00 - 10:30

NANOPARTICLE-MEDICATED ULTRASONIC HEATING FOR BIOMEDICAL APPLICATIONS - Invited Paper

H.-J. Chen and D. Wen 10:30 - 11:00

Coffee Break 11:00 - 11:30

PREPARATION AND PHOTOTHERMAL CHARACTERIZATION OF NANO COMPOSITES BASED ON HIGH DENSITY POLYETHYLENE FILLED WITH EXFOLATED GRAPHITE: PARTICLE SIZE AND SHAPE EFFECTS

M. Chirtoc, N. Horny, I. Tavman, A. Turgut, I. Kılıç and M. Omastov 11:30 - 12:00 EXPERIMENTAL INVESTIGATION OF NANOFLUID POOL BOILING UNDER ELECTRIC FIELD

M. Sheikhabahi, M. Nasr Esfahany, N. Etesami

12:00 - 12:30 PREPARATION AND CHARACTERIZATION OF NANOFLUIDS CONTAINING ALUMINA PARTICLES

A. Turgut, I. Tavman, L. Cetin, M. Chirtoc and O. Fudym 12:30 - 14:30

BREAK KEYNOTE

LECTURE 2 Chair: P. Ajayan 14:30 - 15:15 NANO-ENGINEERED CARBON HYBRID SYSTEMS

B.K. Tay SESSION 2 Chair: J. Khodadadi 15:15 - 15:45

CHARACTERIZATION OF NANOSTRUCTURED THERMAL INTERFACE MATERIALS – A REVIEW - Invited Paper

A. J. McNamara, Y. Joshi, Z. M. Zhang 15:45 - 16:15 PERFORMANCE ANALYSIS OF NANOSCALE-GAP THERMOPHOTOVOLTAIC ENERGY CONVERSION DEVICES

M. Francoeur, R. Vaillon and M. P. Meng 16:15 - 16:45

THERMAL CONDUCTIVITY AND HEAT TRANSFER OF CERAMIC NANOFLUIDS SHOW CLASSICAL BEHAVIOR

S. Pohl, S. Feja and M. H. Buschmann 16:45 - 17:15 Coffee Break SESSION 3 Chair: A. Tan

17:15 - 17:45 QUANTITATIVE TEMPERATURE PROFILING THROUGH NULL-POINT SCANNING THERMAL MICROSCOPY

J. Chung, K. Kim, G. Hwang, O. Kwon, Y. K. Choi, and J. S. Lee 17:45 - 18:15

THERMODYNAMIC AND PHASE BEHAVIOUR OF FLUIDS EMBEDDED WITH NANOSTRUCTURED MATERIALS

D. Nikitin and V. Mazur 18:15 - 18:45 EXPERIMENTAL INVESTIGATION OF NATURAL CONVECTION HEAT TRANSFER OF Fe₃O₄/ ETHYLENE GLYCOL NANOFLUID UNDER MAGNETIC FIELD

N. Naseri Boroujeni, N. Etesami and M. Nasr Esfahany TUESDAY, May 31, 2011 KEYNOTE

LECTURE 3 Chair: S. Kakac 8:30 - 9:15

NANOSCALE THERMOPOWER PROFILING TECHNIQUE USING A DIAMOND THERMOCOUPLE PROBE

J. S. Lee SESSION 4 Chair: M. Francoeur

9:15 - 9:45 THERMAL CONDUCTIVITY OF INDIVIDUAL MULTI-WALLED CARBON NANOTUBES

M. K. Samani, N. Khosravian, G.C.K.Chen and B.K.Tay 9:45 - 10:15 THEORY OF THERMODYNAMICS IN MOLLEN SEMICONDUCTOR-METAL MIXTURES AND ITS APPLICATIONS IN MEMS AND SOLAR CELL FABRICATION

M. Eslamian and M. Z. Saghir 10:15 - 10:45 Coffee Break 10:45 - 11:15 HEAT TRANSFER ANALYSIS OF THIN & ROUGH SILICON NANOWIRES

C. Lee, J. S. Jin, and J. S. Lee 11:15 - 11:45 NOVEL CORROSION SENSOR BASED ON CARBON NANOTUBE COMPOSITES FOR STRUCTURAL HEALTH MONITORING

A. C. Tan, J. J. Yong Cha and I. Kang 11:45 - 12:15

Numerical analysis of channel geometry and fluid bulk composition influence on the performance of DC electro-osmotic micro and nano pumps

M. Geri, M. Lorenzini and G. L. Morini 12:15 - 14:30 BREAK PANEL MEETING Chair: J. Howell

14:30 - 15:15 P. Ajayan, A. Faghri, D. Wen, Y. Joshi, S. Kakac, J. S. Lee SESSION 5 Chair: M. P. Menguc / S. Yun 15:15 - 15:45 EFFECTIVE THERMAL CONDUCTIVITY OF HETEROGENEOUS LYOPHOBIC NANOSYSTEMS FOR USE IN THERMOMECHANICAL ENERGY DEVICES

A. V. Yevtushenko, V. P. Stoudenets, V. A. Eroshenko 15:45 - 16:15

NEW GENERATION FLAME RETARDED POLYMERIC MATERIALS NANOPARTICLES AS SYNERGISTS FOR FIRE RETARDANCY

E. Kico "Walczak", G. Rymarz 16:15 - 16:45 POOL BOILING INVESTIGATION OF Al₂O₃/WATER NANOFLUID ON FLAT PLATE

Z. Shahmoradi, N. Etesami and M. Nasr Esfahany 16:45 - 17:15 Coffee Break SESSION 6 Chair: V. Mazur 17:15 - 17:45 THE ROLE OF CARBON NANOTUBES IN THERMAL BEHAVIOR OF HEAT TRANSFER NANOFLUIDS - Invited Paper

J. W. Lee, B. Kohanloo, J. A. Templeton, A. J. Meade, Jr., and E. V. Barrera 17:45 - 18:15 A THERMAL INVESTIGATION ON JOULE-HEATING INDUCED CRYSTALLIZATION PROCESS OF A AMORPHOUS SILICON THIN FILM

D.-H. Kim, S. Park, W.-E. Hong and J.-S. Ro 18:15 - 18:45

DESIGN AND CONSTRUCTION OF A DEVICE FOR ANALYZING DISTRIBUTION OF AEROSOL NANOPARTICLES IN CONTROLLED CONDITIONS J. Santamaría, K. del Teso, M. M. Bou-Ali, C. Vaquero and J.M. López de

Ipi WEDNESDAY, June 1, 2011 KEYNOTE LECTURE 5 Chair: J.S. Lee 8:30 - 9:15

USING INVERSE ANALYSIS TO FIND OPTIMUM NANO-SCALE RADIATIVE SURFACE PATTERNS TO ENHANCE SOLAR CELL PERFORMANCE

S. Hajimirza, G. El Hitti, A. Heltzel, J. Howell SESSION 7 Chair: T. Okutucu 9:15 - 9:45

NUMERICAL INVESTIGATION OF THE EFFECTIVE THERMAL CONDUCTIVITY OF NANO FLUIDS USING LATTICE BOLTZMANN MODEL

N. R. Pelevic, T. H. van der Meer 9:45 - 10:15

THEORETICAL-EXPERIMENTAL ANALYSIS OF HEAT TRANSFER IN NANOCOMPOSITES VIA INTEGRAL TRANSFORMS AND INFRARED THERMOGRAPHY

D. C. Knupp, J.V.C. Ayres, C. P. Naveira-Cotta, H. R. B. Orlande, and R. M. Cotta 10:15 - 10:45 Coffee Break 10:45 - 11:15

ANALYSES OF FIRE PROPERTIES AND OF THE QUALITATIVE COMPOSITION OF THE GASEOUS PHASE OBTAINED FROM EPOXY NANOCOMPOSITE

M. Pálka, M. Konecki, A. Aukaszek, W. Wn k 11:15 - 11:45 SURFACE TENSION, VISCOSITY, AND THERMAL CONDUCTIVITY OF NANOLUBRICANTS AND VAPOR PRESSURE OF REFRIGERANT / NANOLUBRICANT MIXTURES

D. Nikitin, V. Zhelezny, N. Prihodchenko, and D. Ivchenko 11:45 - 12:15 COFFEE STAIN EFFECT AND CHEERFUL EFFECT IN AN EVAPORATING DROP

H. Song and J. Y. Yoo FREE AFTERNOON THURSDAY, June 2, 2011 KEYNOTE

LECTURE 6 Chair: Y. Joshi 8:30 - 9:15 ADVANCES IN MICRO AND MINIATURE PASSIVE DIRECT METHANOL FUEL CELLS

A. Faghri SESSION 8

Chair: M. Buschmann / E. Barrera 9:15 - 9:45 EXPERIMENTAL STUDY ON THE DIELECTRIC BREAKDOWN

PERFORMANCE WITH MAGNETIC FIELD AND CONCENTRATIONS OF MAGNETIC NANOFUIDS

J.-C. Lee, H.-S. Seo and Y.-J. Kim⁹:45 - 10:15 EFFECTS OF THERMOPHYSICAL PROPERTIES AND ENTRANCE REGION ON THE DIMENSIONAL OPTIMIZATION OF MICROCHANNEL HEAT SINKS

G. Tarkakar and T. Okutucu¹⁰:15 - 10:45 Coffee Break
 10:45 - 11:15 EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF EXTERNAL ELECTRIC FIELD ON VISCOSITY OF Fe₃O₄-EG NANOFUID

E. Monajjemi Rarani, N. Etesami and M. Nasr Esfahany¹¹:15 - 11:45 A NOVEL MAGNETOMECHANICAL PUMP TO ACTUATE FERROFLUIDS IN MINICHANNELS

A. Bilgin, E. Kurtoglu, H. C. Erk, M. Sesen, A. Kosar, and H. F. Yagci Acar¹¹:45 - 14:30 BREAK KEYNOTE LECTURE 7 Chair: A. Faghri¹⁴:30 - 15:15 HEAT TRANSFER ENHANCEMENT IN LAMINAR CONVECTIVE HEAT TRANSFER WITH NANOFUIDS

S. Zerin¹⁵, S. Kakac, A. G. Yazici¹⁶ POSTER PRESENTATIONS Chair: J. Tullius¹⁵:15 - 16:45 POSTER SESSION A (see the list below)¹⁶:45 - 17:15
 Coffee Break¹⁷:15 - 18:30 POSTER SESSION B (see the list below)¹⁸:00 - 23:00 GALA DINNER

FRIDAY June 3, 2011 SESSION 9 Chair: I. Tavman⁸:30-9:00 LAMINAR FORCED CONVECTIVE MASS TRANSFER OF NANOFUIDS IN A CIRCULAR TUBE

H. Beiki, M. Nasr Esfahany, and N. Etesami⁹:00-9:30 DOES THE KNUDSEN LAYER EXIST OVER A CONCAVE SURFACE?

A. Dinler, R. W. Barber, D. R. Emerson and K. Orucoglu⁹:30 - 10:00 NUMERICAL ANALYSIS OF NANOFUID AS HEAT TRANSFER FLUID IN MULTIPLATES TYPE RECIPROCATING MAGNETIC REFRIGERATION SYSTEM

C. Lin, C.-H. Lee and C.-C. Chieng¹⁰:00 - 10:30 THERMOPHYSICAL CHARACTERISTICS OF ETHYLENE GLYCOL-BASED COPPER NANOFUIDS USING NONEQUILIBRIUM AND EQUILIBRIUM METHODS

Y.-S. Lin, P.-Y. H. and C.-C. Chieng¹⁰:30 - 11:00
 Coffee Break
 11:00 - 11:30 STUDY OF HEAT AND MOISTURE MIGRATION IN POROUS MATERIALS

L. Remache and N. Djermane¹¹:30 - 12:00 THERMAL CONDUCTIVITY AND HEAT CAPACITY OF CNT IONANOFUIDS

C.A. Nieto de Castro, S.M. Sohel Murshed, M.J.V. Lourenço, F.J.V. Santos, M.L. Matos Lopes and J.M.P. Franca¹²:00 - 12:30 OPEN FORUM and SUGGESTIONS FOR TMNN-2013¹²:30
 END OF THE SYMPOSIUM POSTER PRESENTATIONS - THURSDAY, June 2, 2011¹⁵:15 - 16:45 Poster Session
 10:00 THERMAL SHOCK BEHAVIOUR OF CORDIERITE CERAMIC FILTER FROM NANOSIZE SEPOLITE¹⁸

M. Sarigöz¹⁸, E. Günay¹⁸ EVALUATION OF MODELS FOR THE THERMAL CONDUCTIVITY OF NANOFUIDS

H. Aybar, M. R. Azizian²³ NUMERICAL STUDY ON THE MECHANICAL PERFORMANCE OF GRAPHENE BRIDGES ON SILICON THIN FILM TRANSISTORS

B.-J. Kim, H.-S. Seo, W.-H. Lee, J.-H. Ahn and Y.-J. Kim²⁴ MODELING HYPERBOLIC HEAT CONDUCTION IN TWO LAYER SLAB BASED ON ELECTRICAL SIMULATION METHOD

A. M. Gheytaghi and G. Atefi²⁸ NUMERICAL SIMULATION OF SOLIDIFICATION OF NANOPARTICLE-ENHANCED PHASE CHANGE MATERIALS (NEPCM) CONSIDERING TRANSPORT OF SUSPENSIONS

Y. El Hasadi and J. M. Khodadadi⁴⁰ Prediction of Thermal Conductivity of a Model Nanofluid via Molecular Dynamics Simulations

H. Babaei and J. M. Khodadadi

068 OPTIMIZATION OF MICROSTRUCTURED FINS IN MINICHANNELS

J. F. Tullius, T. K. Tullius, and Y. Bayazitoglu⁰⁶⁹ WETTING PHYSICS OF WATER-CARBON NANOCARPET

INTERFACES

M. J. Roode and Y. Bayazitoglu 072 TEMPERATURE-DEPENDENT THERMAL CONDUCTIVITY OF ELCOSANE BASED PHASE CHANGE MATERIALS WITH COPPER OXIDE NANOPARTICLES

L. Fan and J. M. Khodadadi 074 EFFECT OF NON-FOURIER BOUNDARY CONDITION ON 3-OMEGA METHOD FOR THERMAL CONDUCTIVITY MEASUREMENT

S. Shenoy and Y. Bayazitoglu 075 LENGTH EFFECT ON THERMAL CONDUCTIVITY OF SINGLE WALL CARBON NANOTUBES AND BUNDLES

K. Toprak and Yildiz Bayazitoglu 073 NUMERICAL INVESTIGATION OF CuO-WATER NANOFLUID IN DIFFERENT GEOMETRY CROSS-SECTION

M. Bahiraei, S. M. Hoseinalipour, S. I. Vasefi, K. Zabihifard 17:15 - 18:30 Poster Session B038 SIZE-DEPENDENT TIN NANOSTRUCTURE COATING DEPOSITED BY THE PACVD METHOD WITH CORROSION BEHAVIOR

H. Elmkhah, A. Abdollah-zadeh, F. Mahboubi, Sh. Ahangarani, M. Raoufi, M. S. Mahdipoor 016 ANALYTICAL STUDY FOR NATURAL CONVECTION WITH POROUS MEDIUM IN A MICRO HORIZONTAL CYLINDRICAL ANNULUS WITH CONSTANT HEAT GENERATION

K. Mansour 020 SELECTIVE EMITTERS DESIGN AND OPTIMIZATION FOR TPV APPLICATIONS

E. NEFZAOU, J. DREVILLON and K. JOULAIN 026 NANO-SATELLITES THERMAL CONTROL

M. Bulut, A. Kahrman, N. Sozbir and S. Gulgonul 049 NUMERICAL MODEL FOR PREDICTING THE FLOW EXCURSION INSTABILITY IN PARALLEL HEATED CHANNELS

I. Rassoul, E. SI-Ahmed, and T. Hamidouche 059 EFFECTS OF FLOW MODE TRANSITION ON HEAT TRANSFER ENHANCEMENT WITH NANOFLUIDS IN RECTANGULAR CAVITY

F. Belaid, M. El Hocine Benhamza and L. Khezzar

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