Program Book

(Online Version)

International Conference on

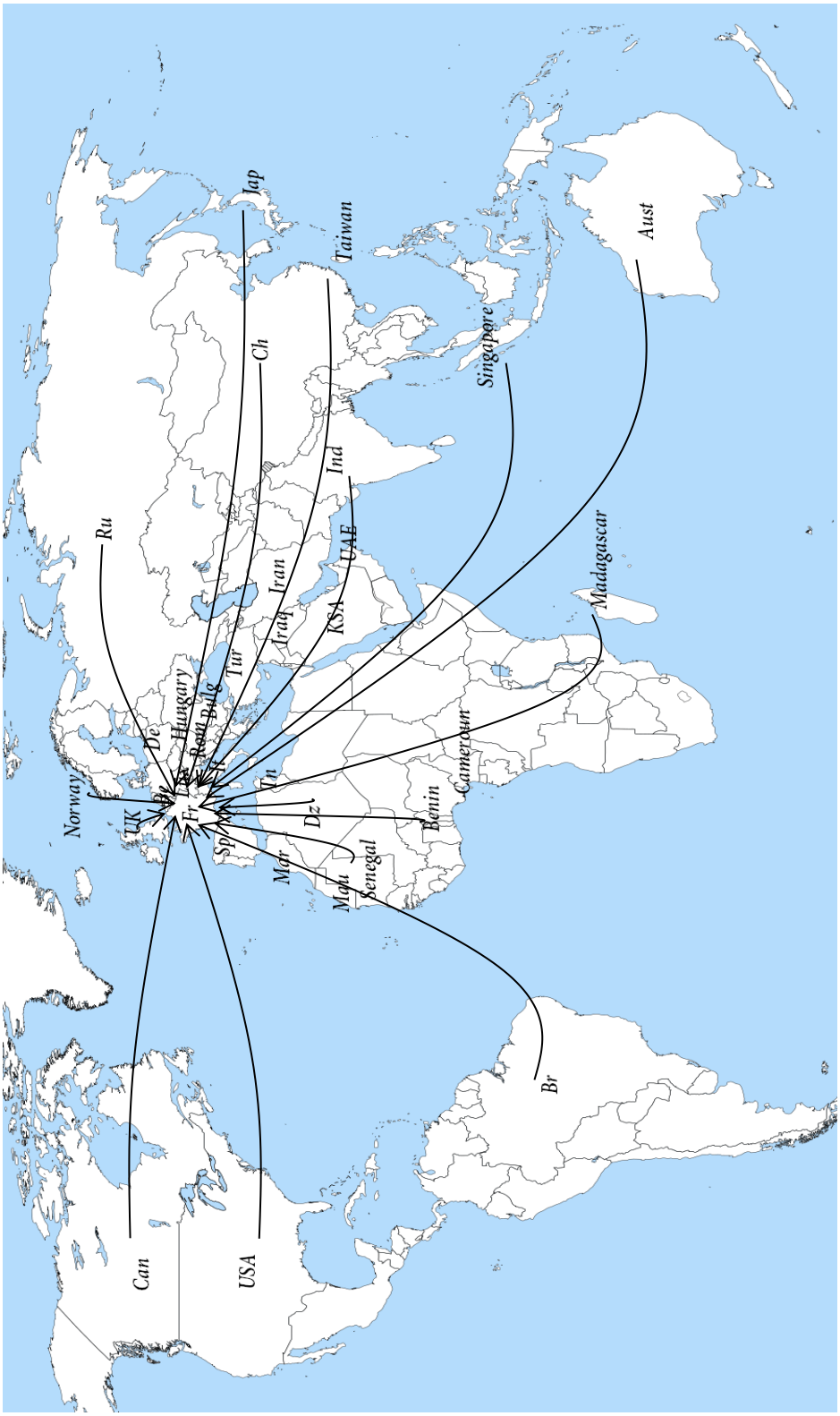
MATERIALS & ENERGY

Metz, France

June 09-11, 2021

ICOME'21

LOCATION OF ICOME'21



ICOME'21 INTERNATIONAL CONTRIBUTORS

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WELCOME

After the success of the International Conference on Materials & Energy (ICOME'15) in the nice Mediterranean city Martil - Tetouan in Morocco, followed by the edition of 2016 in the beautiful Atlantic city of La Rochelle in France, the edition 2017 in the amazing Eastern part of China at Tianjin, ICOME'18 in the sunny coastal city Donostia-San Sebastian located at the North of Spain, ICOME'19 in the sweet city of Hammamet in Tunisia and back to France ICOME'21.

This edition 2021 was scheduled in Lorraine, in the magnificent medieval city of Metz under the organization of the University of Lorraine between the legacy of the Mathematician Henri Poincaré and that of the Poet Paul Vérlaine. The pandemic situation of COVID made it impossible to organize the conference in June 2020 and then in June 2021, the organizers decided to keep the event online to save the links developed within the ICOME community.

The ICOME'21 Conference is an excellent meeting devoted to cutting-edge research that meets the scientific needs of university researchers, industrials and professionals in order to explore new horizons of knowledge on various subjects related to the fields of interconnection between materials and energy. The conference also hosts various specific symposia. The 2021 Edition dedicates its openness to climate change.

The presidents of the ICOME series: Prof. R. Bennacer (Univ. Paris Saclay / ENS-Paris-Saclay) and Prof. M. El-Ganaoui (University of Lorraine / IUT Longwy), and the local co-president of ICOME'21, Prof. M Petrissans (University of Lorraine / IUT Epinal), The president of the University of Lorraine Prof. Pierre. Mutzenhardt, the director of the UFR MIM Prof. Anass Nagih, the director of the ENSAM Prof. Stéphane Fontaine, and the director of IUT Henri Poincaré who opened their institutes to the organization on site in 2020 and 2021, welcome the participants and hope that everyone will find in this event subjects of interest, and a great pleasure in exchanging with the materials and energy communities.

BIENVENUE

Après le succès de la Conférence internationale sur les matériaux et l'énergie (ICOME'15) dans la remarquable ville méditerranéenne de Martil - Tétouan au Maroc, suivie de l'édition 2016 dans la belle cité atlantique de La Rochelle en France, l'édition 2017 dans la magnifique partie orientale de la Chine à Tianjin, l'ICOME'18 dans la ville côtière ensoleillée Donostia-San Sebastian qui située au nord de l'Espagne, ICOME'19 dans la douce ville d'Hammamet en Tunisie. Cette édition 2021 était programmée en Lorraine, à la magnifique cité médiévale de Metz sous l'organisation de l'Université de Lorraine entre l'héritage du Mathématicien Henri Poincaré et celui du Poète Paul Vérlaine. La situation pandémique du COVID a rendu impossible l'événement en juin 2020, puis en juin 2021 les organisateurs ont décidé de maintenir l'événement en ligne pour garder les liens développés au sein de la communauté ICOME.

La Conférence ICOME'21 est une excellente rencontre consacrée à la recherche de pointe qui répond aux besoins scientifiques des chercheurs universitaires, des industriels et des professionnels afin d'explorer de nouveaux horizons de connaissances sur divers sujets liés aux domaines de l'interconnexion entre les matériaux et les domaines de l'application de l'énergie. La conférence accueille également divers symposiums spécifiques. L'Edition 2021 consacre son ouverture aux changements climatiques.

Les présidents de la série ICOME, le Pr R. Bennacer (Univ. Paris Saclay / ENS-Paris-Saclay) et le Pr. M. El-Ganaoui (Université de Lorraine/IUT Longwy), et le co-président local de l'ICOME'21, le Pr. M Petrissans (Université de Lorraine/IUT Epinal), Le président de l'Université de Lorraine Pr Pierre. Mutzenhardt, le directeur de l'UFR MIM Pr. Anass Nagih, le directeur de l'ENSAM Pr. Stéphane Fontaine, Dr Harouna Ali Souley directeur de l'IUT Henri Poincaré qui ont ouvert leurs instituts à l'organisation sur place en 2020 et 2021 pour accueillir les participants, souhaitent la bienvenue à toutes et à tous et espèrent que tout le monde trouvera dans cette manifestation des sujets d'intérêt, et un grand plaisir à échanger avec les communautés des matériaux et de l'énergie.

FOREWORD

The global health crisis of COVID 19 has shown more than ever that the eyes of the citizens are turned towards science in order to bring very quickly palliative and then decisive solutions to the pandemic. In such situation threatening the human species, the prerogative of Science would like researchers to work together in a spirit of sharing information, methods and discoveries, simply working for the sustainability of Man and life in general when it is threatened. Although the situation prevented any face-to-face meeting, the exchanges continued.

Indeed, the evolution of knowledge during the last two centuries allows today, thanks to the development of virtual interfaces and to the progress of the algorithmic, to transport sound and visual information which tend to generalize to the sensory. No one knows the limit of this exercise. In an increasingly reliable, stable and fast way, this connection made possible the continuity of pedagogical transmission and scientific research. This is another demonstration that the knowledge produced, accumulated and preserved is today a kind of lifeline-saving arch for doctors and patients, litigators and judges, teachers and students, professors and doctoral students, to continue to advise, assist, dialogue, transmit and create the knowledge of tomorrow. In this sense, the high places of knowledge that are the Universities, the Academies of Sciences, the Schools have largely fulfilled their saving missions towards the whole humanity.

In mathematics, if the extraction of the square root of a number became a child's play with the advent of calculators, its extraction with a sheet of paper, a pencil and the four elementary operations was previously, an exercise that could be long. Similarly, for prehistoric man, bringing a quantity of water to boil without having a metal container despite the domination of fire was in the same order of challenge as extracting the root of a number without a calculator.

At first, computers worked with lamps, today's computers (for all purposes) are based on the use of transistors industrialized since 1950 and their design is closely linked to the advent of rare earths and soon quantum. By chance, Moore's law (doubling every eighteen months of the density of transistors in processors) sees its predictions come true in the challenge of materials. This law is accompanied in a global context by another law called Dennard's law (increase in computing power at constant energy), which opens the challenge of energy efficiency. Without these two competitions between materials and energy (involving many scientific disciplines), the reader is free to imagine what his daily, life would have been like during the lockdowns that have disrupted the existence of the world's citizens since the end of 2019.

In this spirit, the ICOME (International Conference of Materials & Energy) aims to bring annually an updated and balanced picture of advances in the fields of materials and energy and to address significant progress in both fundamental and applied research as well as in societal areas.

This virtuous circle has punctuated the history of humanity by taking advantage of all the advances in knowledge as a natural laboratory or as a crucible providing innovations allowing experimental physics and numerical mathematics to continue their breakthroughs. Among these breakthroughs, we will particularly note those in optoelectronics, laser physics or high-performance computing.

The ICOME 2020 edition was supposed to take place in Metz, in Lorraine, and address advances in the fields of materials and energy. This edition was to take place under the auspices and legacy of the mathematician Henri Poincaré (Nancy) and the poet Paul Verlaine (Metz), symbolizing science and society. This conference returns after an international tour in Africa and Asia, especially after the success of the 2019 edition in Tunisia. ICOME is also a bridge between the two shores of the Mediterranean, the crucible of a civilization that has largely influenced in its own way the course of the history of materials and energy.

The new edition of ICOME has been postponed to June 2021 and again the health conditions do not allow a face-to-face event, the committee opted to maintain an online edition as a new postponement would be unfavorable to the various strong links created all these years.

We are particularly grateful to the international speakers who were willing to come in 2020 and who reiterated their solidarity with this online edition. Our gratitude also goes to the organizers of the mini-symposia. All authors and contributors have coped and maintained their interest in the event, we hope to live up to their expectations.

Usually, the conference is coupled with a thematic school for PhD students and newly-qualified doctors. It is a privileged place of exchange between juniors and seniors who take advantage of the event's atmosphere to benefit from the seniors' advice and experience. Only face-to-face exchanges can ensure and fully consolidate the benefits of the seniors' values. The committee has chosen to reschedule the theme school for a face-to-face event during the fall of 2021, if pandemic conditions allow for travel and gatherings.

During this edition of ICOME'21, participants are invited to three days of intense activity, through twelve (12) plenary lectures given by renowned scientists and 3 mini-symposia dedicated to current topics such as photonics applied to materials for energy, matter sciences in microgravity or innovative simulation approaches such as Boltzmann network methods.

The topic of climate change has largely shown its importance for the future of the planet. This theme is at the crossroads of science and the organization of our societies. It is not far from the problems of materials and energy. We will leave it to each person to imagine these links. Professor G. Levermore from the University of Manchester, member of the 2007 Nobel Peace Prize team of the Intergovernmental Organisation for Climate Change, has given us the honor and pleasure to talk about climate change in the opening conference.

The series of lectures on materials and energy promotes initiatives and values science as a vector of accumulation of human progress, cultural exchange, economy of mind, sharing and investment in intelligence, strength of argument, guarantee of respect for opinions, initiator of creativity, support for the quest for truth... In this sense, the reference to the universal scientist Averroès born in Cordoba, Spain in 1126 and died in Marrakech, Morocco in 1198, through the prize bearing his name reinforces this vision of a man who places truth beyond the beliefs and allegiances of his time, intelligence beyond temporal interest and societal use.

> *"Knowledge acquired in a foreign country can be a homeland and ignorance can be an exile lived in one's own country"*
> ***Averroès (1126-1198).***

The organizers of the ICOME 20-21 edition wish everyone a fruitful event where young researchers can deepen their knowledge online while waiting for better days.

The organizers would like to thank the entities that supported the event and in particular the laboratories and institutes of the University of Lorraine that encouraged and supported the holding of this edition in Lorraine and accompanied the ICOME series since its creation.

Prof. R. Bennacer, Président ICOME Serie's, Université Paris-saclay

Prof. A. Benyoussef, Directeur du Collège des Sciences Physiques et Chimiques de l'Académie (Academey Hassan II sciences et Technologies).

Prof. M. El-Ganaoui, Chair ICOME Serie's, University of Lorraine

Prof. O. Fassi-Fehri, Permanent Secretary Hassan II Academy of Science and Technology

Prof. M. Petrissans, Co-president ICOME 21 edition

AVANT-PROPOS

La crise sanitaire mondiale du COVID 19 a plus que jamais montré que les regards des citoyens sont tournés vers la science afin que celle-ci apporte très rapidement des solutions palliatives puis définitives à la pandémie. Dans une telle situation menaçant l'espèce humaine, l'apanage de la Science voudrait que les chercheurs travaillent ensemble dans un esprit de partage d'informations, de découvertes et de méthodes, œuvrant simplement pour la pérennité de l'Homme et de la vie en général quand cette dernière est menacée. Bien que la situation ait empêché toutes rencontres présentielles, les échanges ont perduré.

En effet, l'évolution des connaissances au cours des deux derniers siècles permet aujourd'hui à travers le développement d'interfaces virtuelles et du progrès algorithmique, de transporter une information sonore et visuelle qui a tendance à se généraliser au sensoriel. Nul ne connait la limite de cet exercice. De manière de plus en plus fiable, stable et rapide, cette connexion a rendu possible une continuité de la transmission pédagogique et de la recherche scientifique. Une démonstration de plus que les connaissances produites, accumulées et conservées sont aujourd'hui une sorte d'arche de sauvetage pour que médecins et patients, justiciables et juges, enseignants et étudiants, professeurs et doctorants, continuent de conseiller, d'assister, de dialoguer, de transmettre et de créer la connaissance de demain. Dans ce sens les hauts lieux de la connaissance que sont les Universités, les Académies des Sciences, les Écoles ont largement rempli leurs missions salvatrices envers l'humanité entière.

En mathématiques, si l'extraction de la racine carrée d'un nombre est devenue un jeu d'enfant avec l'avènement des calculatrices, son extraction avec une feuille de papier, un crayon et les quatre opérations élémentaires relevait avant, d'un exercice qui peut s'avérer long. De la même manière, pour l'homme préhistorique, ramener une quantité d'eau à ébullition sans disposer d'un récipient métallique malgré la domination du feu relevai du même ordre de défi que l'extraction de la racine d'un nombre sans calculatrice.

Si les premiers ordinateurs fonctionnaient avec des lampes, les calculateurs actuels (tout usage confondu) reposent sur l'usage des transistors industrialisés depuis 1950 et leur conception intimement liée à l'avènement des terres rares. Au hasard des découvertes, la loi de Moore (doublement tous les dix-huit mois de la densité de transistors dans les processeurs) voit ses prédictions se réaliser dans le défi des matériaux. Cette loi s'accompagne dans un contexte global d'une autre loi dite de Dennard (augmentation des puissances de calcul à puissance énergétique constante) ouvrant le défi à l'efficacité énergétique d'usage. Cette dualité impliquant de nombreuses disciplines scientifiques, continue à écrire des pages de l'histoire de l'humanité, chaque domaine de la connaissance se l'appropriant à sa manière. Sans cette compétition entre matériaux et énergie, libre au lecteur d'imaginer ce qu'aurai été son quotidien, pendant les confinements qui ont bouleversé l'existence des citoyens du monde depuis fin 2019.

Dans cet esprit, ICOME (International Conference of Materials & Energy) tend à apporter annuellement et depuis l'édition 2015 à Tétouan au Maroc, une image actualisée et équilibrée des avancées dans les domaines des matériaux et de l'énergie et aborder les progrès significatifs tant en recherche fondamentale et appliquée que dans des domaines sociétaux.

Cette boucle vertueuse a ponctué l'histoire de l'Humanité en profitant de toutes les avancées du savoir en tant que laboratoire naturel ou en creuset fournisseur d'innovations permettant à la physique expérimentale et aux mathématiques numériques de continuer leurs percées. Parmi ces avancées on notera plus spécifiquement ceux en optoélectronique, en physique des lasers ou en calculs de hautes performances.

L'édition ICOME 2020 devait se dérouler à Metz en Lorraine, et aborder les avancées dans les domaines des matériaux et de l'énergie. Cette édition devait se faire sous les auspices et l'héritage du Mathématicien Henri Poincaré (Nancy) et celui du Poète Paul Verlaine (Metz), tout un symbole de science et de société. La conférence se tenant après une tournée internationale en Afrique et en Asie, notamment après l'édition réussie de 2019 en Tunisie. ICOME est aussi une passerelle entre les deux rives de la Mer Méditerranée, berceau d'une civilisation qui a largement influencé à sa manière le cours de l'histoire des matériaux et de l'énergie.

La nouvelle édition ICOME a été reportée à juin 2021 et à nouveau les conditions sanitaires n'ont pas permis une tenue en présentiel, le comité a opté pour maintenir une édition en ligne car un nouveau report serait préjudiciable aux différents liens forts crées toutes ces années.

Nous sommes en particulier vivement reconnaissants aux conférenciers internationaux qui étaient prêts à se déplacer en 2020 et qui ont réitéré leur solidarité avec la décision de cette édition en ligne. Notre reconnaissance va également aux organisateurs des mini-symposiums. L'ensemble des auteurs et contributeurs ont composé avec la situation et maintenu sans faille leur intérêt pour l'évènement, nous souhaitons être à la hauteur de leurs attentes.

De coutume, la conférence est couplée à une école thématique pour doctorants et jeunes docteurs. C'est un lieu d'échange privilégié entre juniors et séniors mettant à profit l'ambiance de l'évènement pour bénéficier des conseils des anciens et de l'expériences des ainés. Seuls des échanges en présentiels peuvent pleinement assurer et consolider les bienfaits des valeurs des ainés. Le comité a choisi de reporter l'Ecole Thématique pour une tenue en présentiel durant l'automne 2021, si les conditions pandémiques permettent les déplacements et les regroupements.

Les participants sont conviés à trois journées d'intense activité, à travers 12 conférences plénières assurées par des personnalités scientifiques de renommée et 3 mini-symposiums dédiés à des thématiques d'actualité comme la photonique appliquée aux matériaux pour l'énergie, les sciences de la matière en microgravité ou les approches de simulation comme les méthodes de type réseaux de Boltzmann.

Le thème du changement climatique a largement montré son importance pour l'avenir de la planète. Cette thématique se trouve au carrefour des sciences et de l'organisation de nos sociétés. Il n'est guère loin de la problématique des matériaux et de l'énergie. On laissera à chacun la liberté d'imaginer ces liens. Le Professeur G. Levermore de l'Université de Manchester, membre de l'équipe lauréate du prix Nobel de la paix 2007 avec l'organisation intergouvernementale pour les changements climatiques nous fait l'honneur et le plaisir de traiter le changement climatique en conférence d'ouverture.

La série de conférences sur les matériaux et l'énergie promeut les initiatives et valorise la science en tant que vecteur d'accumulation du progrès humain, d'échange culturel, d'économie d'esprit, de partage et d'investissement dans l'intelligence, de force d'argumentation, de garantie du respect des opinions, d'initiateur de créativité, de support de quête de vérité… En ce sens, le clin d'œil au scientifique universel Averroès né à Cordoue en Espagne en 1126 et mort à Marrakech au Maroc en 1198 , à travers le prix portant son nom renforce cette vision d'un homme qui place la vérité au-delà des croyances et des allégeances de son temps, l'intelligence au-delà de l'intérêt temporel et de l'usage sociétal.

> *« Le savoir acquis dans un pays étranger peut être une patrie et l'ignorance peut être un exil vécu dans son propre pays »*
>
> ***Averroès (1126-1198)*** ·

Les organisateurs de l'édition ICOME 20-21 souhaitent à toutes et à tous un évènement fructueux où les jeunes chercheurs approfondiront leurs connaissances en ligne en attendant des jours meilleurs.

Les organisateurs adressent leurs remerciements aux Institutions qui ont soutenu l'évènement et en particulier les laboratoires et instituts de l'Université de Lorraine qui a ont encouragé et soutenu la tenue de cette édition en Lorraine et accompagné la série ICOME depuis sa création.

Prof. R. Bennacer, *Président ICOME Serie's, Université Paris-saclay*

Prof. A. Benyoussef, *Directeur du Collège des Sciences Physiques et Chimiques de l'Académie (Academey Hassan II sciences et Technologies).*

Prof. M. El-Ganaoui, *Chair ICOME Serie's, University of Lorraine*

Prof. O. Fassi-Fehri, *Permanent Secretary Hassan II Academy of Science and Technology*

Prof. M. Petrissans, *Co-president ICOME 21 edition*

ICOME SERIES CHAIRS

Prof. M. El-GANAOUI: *is a full professor at the University of Lorraine and researcher in the Jacques Villermaux Federation for mechanics, energy and processes (FR 28 63/LERMAB). He is heading the research in energy in the Henri Poincaré Institute of Technology in Longwy. Previously, he was an associate professor in the University of Limoges and the SPCTS UMR 6638 CNRS laboratory where he was responsible for the Physics Department (2004-2010) and the international cooperation service (2006-2010) in the Faculty of science and technology. His research aims to understand heat and mass transfers through modeling and numerical simulation with a specific activity in the field of the solid -liquid-vapor phase change. Applications concern materials and energy and benefit to energy systems including phenomena for sustainable building (Eco-materials). He teaches the mechanics of continuous media, heat transfers, and numerical methods. He was advisor of more than 25 Phd Thesis with strong international interaction noticeably in the Euro-Mediterranean context. He participated/managed the PAI Australia, Canada, Maghreb (Tassili, Utique, Volubilis), China (Xugangqi). El Ganaoui has participated in the Edition of more than 10 special issues and conference proceedings, co-authored over than 200 publications in journals (rank A) and participated in more than 100 international conferences including ten he co-organized. He is member of many international scientific societies in mechanics and heat transfers.*

Pr. Dr. Ing. R. BENNACER: *is an Engineer in Mechanical field (1989), and he got his PhD thesis at Pierre et Marie Curie University (Paris 6) in 1993. He worked as lecturer in the University Paris XI (1993/94), became an associate professor at Cergy Pontoise University in 1994 and full Professor in 2008. He moved as senior Professor to the prestigious school Ecole Normale Superieure (Paris-Saclay) since 2010. He becomes in 2017 an Exceptional National Class Professor. He is also adjunced professor at Tianjin Uni. Of comm. (China) and UMB Univ. He assumed several responsibilities, director of the LEEVAM research team (2003-2007), Licence degrees (2008-2010), Aggregation title (2010-2011), Master research degree (2011 2013), Transfer and Environmental Research Unit (CNRS LMT-Lab) (since July 2012), dean of Civil/Environmental department (Oct. 2012/Sep. 2016) and since 2019 Coordinate International Affairs Related To Ph.D Univ. Paris-Saclay. His present research activity is within the LMT laboratory where he manages Transfer and Environmental Research Unit. His Research field covers wide spectrum and several domains. It covers the building material for energy applications or on durability aspect, renewable and energy system. The expertise covers the direct numerical simulation including CFD coupling on multi-scales. The previous approach is consolidated by analytical or reduction approach in order to identify the instabilities and global behavior bifurcation and similarity controlling parameters in multiphysics situations. He published around 10 book chapters and more than 150 referenced international journals (Rank A).*

Prof. M. PETRISSANS *: Exceptional National Class Professor at Lorraine University. Served as Vice-President Research at Nancy 2 University, then as Research Officer at the University of Lorraine. He is actually in charge of the "Lorraine Coordination and Scientific Counseling Committee" and Director of the Technological Institute of Epinal. He is an international expert of the biomass and wood thermal behavior.*

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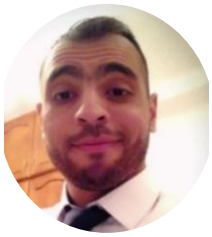

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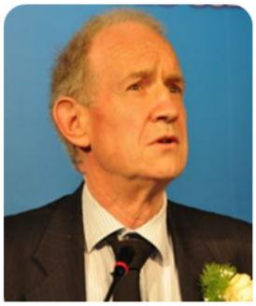
ICOME SCIENTIFIC SECRETARY & WEBMASTER

Dr. Karim RAGUI: Associate Professor at Houari Boumediene University of Science and Technology (USTHB). His research interests focus on heat & mass transfer, supercritical fluids, porous matrix, nanotechnology, pollutants spreading, energy optimizations, modeling and numerical simulation.

ICOME 21 TECHNICAL SC.COMMITTEE

Warm thanks to the reviewers, the administration staff, and the students, as well, for their devotion, allowing the organization success of the present event (see the website for the list) http://www.icome.ecam-epmi.fr/committees/Operational.html

KEYNOTE / INVITED LECTURER



Pr. Geoff LEVERMORE

MANCHESTER 1824
The University of Manchester

Topic : Climate Change and Materials for Mitigation and Adaptation.

By : Prof. Geoffrey LEVERMORE , Manchester University, United Kingdom.

The presentation starts by looking at the evidence for climate change and global warming. It highlights the carbon 12 carbon 13 ratio as evidence of mankind's fossil fuel emissions into the atmosphere. The role of the IPCC, its processes and reports are considered. The influential climate deniers are also discussed, as well as the influential role of China and India. As the built environment is responsible for almost a third of the greenhouse gas emissions the potential for reducing them is discussed, especially with new materials such as quantum dots for photovoltaic cells, glass coatings, phase change materials to reduce summer overheating as well as reflective surface coatings. Superconductors and micro nuclear systems can also contribute to efficient and electricity grids and micro-grids. The urban heat island (UHI) is briefly discussed as well as the "air conditioning" UHI where the condenser heat output produces a micro urban heat island. The presentation concludes by mentioning "maxmaladaptation", and suggests that the profile of science, engineering and ethics be raised to combat climate denial and political ignorance.

Prof. Geoffrey LEVERMORE: *Emeritus Professor of the Built Environment. Author of about 130 refereed journal papers, 44 invited papers and lectures and 25 book chapters and books. He was an investigator on grants worth £14.53m, 17 with UK Research Councils worth £12.75m, PI on 12 worth £2.27m. Chair of the Task Group and editor of CIBSE Guide A Environmental Design, Chapter A2 External Design Data 1999, 2006 and 2013. In 2007 he was one of the Lead Authors of the Intergovernmental Panel on Climate Change (IPCC) awarded the Nobel Peace Prize with Al Gore. From 2002 to 2009 he was Co-ordinator of Working Commission W108: 'Impact of climate change on the built environment' of the CIB. In 2010 he was awarded a CIBSE Silver Medal. He is still researching part-time, analysing climate change, the urban heat island and building energy use. He has published 22 papers since 2011. He has given seven Keynote Speeches to conferences in Turkey, Dubai, France and China since 2017 and is a member of the Daikin European Konwakai which recently met in Japan.*

Pr. Jadran VRABEC

Technische Universität Berlin

Topic : Atomistic Molecular Modelling and Simulation for Prediction Transport Diffusion Coefficients of Liquid Mixtures.

By : Prof. Jadran VRABEC , Technical University of Berlin, Germany.

Chair of Thermodynamics & Process Engineering, Technical University of Berlin, Germany.

Liquids appearing in nature and industrial applications are essentially multicomponent. However, only data on binary diffusion coefficients are relatively abundant because higher order mixtures are significantly more complex. Molecular modeling and simulation offers a promising route for predicting transport diffusion coefficients and for understanding the underlying phenomena on a microscopic basis. Equilibrium molecular dynamics simulations and the Green-Kubo formalism can be used to predict Onsager and Maxwell-Stefan diffusion coefficients. Subsequently, the thermodynamic factor has to be used to transform these data to Fick diffusion coefficients. An overview on the process from devising molecular interaction models employing quantum chemical data to the prediction of Fick diffusion coefficients of multi-component liquid mixtures by atomistic means is given.

Prof. Jadran VRABEC : *Full Professor for Thermodynamics and Process Engineering at the Technical University of Berlin, Germany since 2018. His work is situated around molecular modeling and simulation for process and energy engineering applications. After studying process engineering at the Ruhr-University of Bochum, he also accepted his PhD there in 1996. Subsequent to an interim phase working as a management consultant, he became a group leader for molecular thermodynamics at the University of Stuttgart, where he received his habilitation in 2007. Between 2009 and 2018, he was full professor for Thermodynamics and Energy Technology at the University of Paderborn, Germany. Vrabec has co-authored about 200 peer-reviewed research papers, most of which discuss different aspects of atomistic molecular modeling and simulation methods. He has a strong interest in high-performance computing and the according development of simulation software. Together with his co-authors, he carried out molecular dynamics simulations for the largest system that was described on the atomistic scale. Vrabec is active in different German and European working parties for thermodynamics and molecular simulation.*

Pr. Yogesh JALURIA

RUTGERS
THE STATE UNIVERSITY OF NEW JERSEY

Topic : Chemical Vapor Deposition for the Fabrication of Thin Films in Advanced Materials Processing.

By : Prof. Yogesh JALURIA , Rutgers, The State University of New Jersey, USA.

A wide variety of materials, such as gallium nitride, aluminum nitride and indium gallium nitride, are of interest in applications like power electronics, photovoltaic cells and light-emitting diodes. High-quality, high-performance, thin films of these materials are often obtained by Chemical Vapor Deposition (CVD), which involves precursors that react and deposit on a wafer or substrate. The quality of the film and the deposition rate are largely determined by the transport processes that arise in the reactor. This presentation discusses the fundamental considerations that may be used to accurately model and simulate these systems. Validation of the model is achieved by comparing with experimental results. Different flow regimes arise, with different analysis and experimentation being needed at different scales. The simulation is employed to determine the quality of the thin film produced, process efficiency and optimal conditions. Of particular interest are high productivity, minimal loss of precursor gases and high film thickness uniformity. These results are valuable in practical CVD processes for materials of interest in power devices, LEDs and solar energy.

Prof. Yogesh JALURIA: *Board of Governors Professor and Distinguished Professor at Rutgers, the State University of New Jersey. His research work is in the field of thermal science and engineering. He is the author/co-author of ten books and has contributed over 500 technical articles, including 219 in archival journals and 18 book chapters. He has received several awards and honors for his work, such as the prestigious 2007 Kern Award from AIChE, the 2003 Robert Henry Thurston Lecture Award from ASME, and the 2002 Max Jakob Memorial Award, the highest international recognition in heat transfer, from ASME and the AIChE. He has served as Department Chairman and as Dean of Engineering. He was the Editor of the Journal of Heat Transfer (2005-2010), and Computational Mechanics (2003-2005). He is an Honorary Member of ASME and a Fellow of AAAS and APS. He was the founding President of the American Society of Thermal and Fluids Engineers (ASTFE) and served from 2014 to 2019.*

Pr. Jean M. NUNZI

Queen's University

Topic : Photonics for Life.

By : Prof. Jean-Michel NUNZI , Queen's University, Canada.

Canada Research Chair, Queen's University, Canada.

Technology was often a drive for scientific development. However, besides what science can do for technologies several questions remain quite open, like do evolution, intelligence and the origins of life belong to what Physics can deal with? How may this happen? Self-organization naturally provides materials that can manipulate light and light-matter interactions in a manner that allows building new nano-photonic devices. With that inspiration, we show how light can naturally induce chiral structures [1], or help us design new light harvesting devices like near-IR photodetector using the rectification effect induced by dipole orientation in a thin film [2]. 'New' materials like two-dimensional transition metal di-chalcogenides also provide an interesting route to highly efficient light matter interaction processes [3]. We currently design device structures that allow the fabrication of hot electron-based photodetectors, which are highly sensitive to the NIR range, sensitive to polarization, as well as easy and cost-effective to fabricate. They are highly demanded devices for machine vision and recognition. In a preliminary step towards what we dream of to achieve globe cooling, we also extend our approach to self-organizing structures that permit radiation control from buildings and structures, in order to provide passive cooling or heating solutions under zero energy consumption.

[1] Mazaheri, L.; Lebel, O.; Nunzi, J.M. Transfer of chirality from light to a Disperse Red-1 molecular glass surface, Opt. Lett. 42 (2017) 4845.
[2] Mirzaee, S.M.A.; Lebel, O.; Nunzi, J.M. A simple unbiased hot-electron polarization-sensitive near-infrared photo-detector. ACS Appl. Mater. Inter. 10 (2018) 11862.
[3] Wang, L.; Zhang, S.; McEvoy, N.; Sun, Y.Y.; Huang, J.; Xie, Y.; Dong, N.; Zhang, X.; Kislyakov, I.M.; Nunzi, J.M.; Zhang, L.; Wang, J. Nonlinear Optical Signatures of Transition from Semiconductor to Semimetal in PtSe2. Laser & Photon. Rev. 13 (2019) 1900052.

Prof. Jean-Michel NUNZI: *graduated from l'Ecole de Physique et Chime, Paris in 1982. He joined l'Ecole Polytechnique for a PhD on the nonlinear optics of surface plasma waves (plasmons). He was then hired as full-time Researcher in Organic Photonics at the Atomic Energy Commission (Saclay) in 1984. He joined the Department of Physics at the University of Angers as Professor in 2000, where he built the Plastic Solar Cells Technology Research Team. He moved to Queen's University as Tier 1 Canada Research Chair in Chiral Photonics in 2006 and in Photonics for Life since 2013. He studies Self-organization, Organic and nano-Photonics, including the Chemistry, Instrumentation, Processing and Physics of nanomaterials and devices as well as their use for energy and sustainable development. His Google H-factor is 53.*

Pr. Wei-Hsin CHEN

國立成功大學 National Cheng Kung University

Topic : Advances in Torrefaction Technology for Green Fuel and Energy.

By : Prof. Wei-Hsin CHEN , National Cheng Kung University, Taiwan.

Department of Aeronautics and Astronautics, National Cheng Kung University, Taiwan.

The development of green fuel and energy technologies has attracted a great deal of attention in that it can lessen fossil (nonrenewable) fuel consumption, abate greenhouse gas emissions, and mitigate global warming and climate change for resource and environmental sustainability. Torrefaction is a promising thermochemical conversion process to pretreat and upgrade biomass for its further utilization. After undergoing torrefaction, the disadvantages of biomass such as hygroscopic and biodegradable nature, high moisture content, low calorific value, poor grindability, large volume or low bulk density, and low homogeneity for industrial usage can be solved, making biochar approach coal. As a result, torrefied biomass can be used as an alternative to coal consumed in the industry. This study addresses the advances in biomass torrefaction technology to produce biochar for green fuel and energy. The applications of torrefied biomass in the industry such as combustion, gasification, ironmaking, pyrolysis, and liquefaction are also underlined.

Prof. Wei-Hsin CHEN : *Distinguished Professor at the Department of Aeronautics and Astronautics, National Cheng Kung University, Taiwan. He visited the Princeton University, USA (2004-2005), the University of New South Wales, Australia (2007), the University of Edinburg, UK (2009), the University of British Columbia, Canada (2012 & 2013), and the University of Lorraine, France (2017 & 2018) as a visiting professor. He was also an invited lecturer in the University of Lorraine (2019 & 2020). His research interests include bioenergy, hydrogen energy, clean energy, carbon utilization, etc. He has published around 450 papers in international and domestic journals and conferences. He is the associated editor of International Journal of Energy Research, and the editorial members of some international journals, including Applied Energy, Energies, Energy, Ecology and Environment, etc. He is also the author of several books concerning energy science and air pollution. Recently, his important awards include 2015 and 2018 Outstanding Research Award (Ministry of Science and Technology, Taiwan), 2015 Highly Cited Paper Award (Applied Energy, Elsevier), 2017 Outstanding Engineering Professor Award (Chinese Institute of Engineers), 2019 Bioresource Technology Award for Highly Cited Review Article, and 2016, 2017, 2018, and 2019 Web of Science Highly Cited Researcher Awards.*

Pr. Kamel HOOMAN
THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

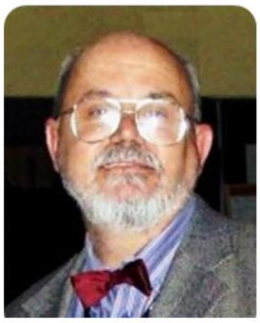
Topic : Increasing the Capacity Factor of Concentrated Solar Thermal Power Plants.

By : Prof. Kamel HOOMAN , Queensland University, Australia.

School of Mechanical & Mining Engineering, Queensland University, Australia.

Though the levelized cost of electricity (LCoE) of a PV plant is currently lower than that of a concentrated solar thermal (CST) plant, the latter offers the possibility of higher capacity factors at lower costs. This is mainly because storage of electricity in batteries is more expensive than thermal energy storage on a per kW basis. Hence, thermal energy storage plays a key role in development of CST. The choice of thermal energy storage depends on the thermodynamics cycle temperatures. Proper choice of thermal energy storage, based on a technoeconomic analysis, conducted for a CST plant in Australia, will be discussed. The selected system is then optimized, aiming at shortening the charge/discharge period, using a combination of numerical, experimental and theoretical techniques results of which will be presented and discussed.

Prof. Kamel HOOMAN: *Dr. Hooman has over two decades of work experience in industry and academia. His research focuses on thermofluids engineering, with a particular attention to energy conversion, using numerical, theoretical and experimental techniques. He is an Associate Editor for Journal of Porous Media, Heat Transfer Engineering and International Journal of Heat and Mass Transfer. He serves on many Editorial Boards and has acted as Guest Editors for some journals with Applied Thermal Engineering and ASME Journal of Fluids Engineering being the latest ones. He has received awards and fellowships from the Emerald, Australian Research Council, Australian Academy of Science, National Science Foundation China, and Chinese Academy of Sciences. With over 150 journal papers and some book chapters, he has also presented as Keynote/Plenary in numerous conferences and meetings. While a full time academic taff at the University of Queensland, Dr. Hooman has held visiting professor positions in Europe and Asia. His has Co-authored a book "Convection Heat Transfer in Porous Media" which has been published in November 2019.*



Pr. Jordan HRISTOV

University of Chemical Technology and Metallurgy

Topic : Nonlocal Effects in Materials and Memory Formalism in Modelling Physical Properties and Heat-Mass Transfer.

By: Prof. Jordan HRISTOV, Department of Chemical Engineering.

University of Chemical Technology and Metallurgy, Bulgaria.

The lecture presents the nonlocal effect in modelling material properties, such local defects and change in material properties (Density, Heat Conductivity or Diffusivity), their physical basis and the memory formalism applied in mathematical modelling. Precisely, problems concerning the principle of peridynamics in material non-homogeneity modelling and the finite speeds of heat and mass adequately modelled by time and space fractional operators are at issue.

Prof. Jordan HRISTOV: *Professor of Chemical Engineering at the University of Chemical Technology and Metallurgy, Sofia, Bulgaria. He was graduated in 1979 as Electrical Engineer (MS equivalent) at the Technical University, Sofia, Bulgaria. His PhD thesis on the magnetically assisted fluidization was awarded by the University of Chemical Technology and Metallurgy in 1995. His Doctor of Science Thesis on non-linear and non-local diffusion models was awarded in 2018. Prof. Hristov's research interests cover the areas of particulate solids mechanics, fluidisation, heat and mass transfer with special emphasis on scaling and approximate solutions of nonlinear problems. His recent direction in mathematical modelling is the nonlocality in transport phenomena with emphasis on application of the fractional calculus.*

Pr. Jean P. FONTAINE

UNIVERSITÉ Clermont Auvergne

Topic : Development of a Mechanistic Model to Predict the Influence of Gravity on Higher Plant Growth.

By : Prof. Jean-Pierre FONTAINE , Clermont Auvergne University, France.

Long-duration human space missions will need to develop an efficient life-support system to recycle atmosphere, water and waste for the crew survival. The European Space Agency MELiSSA project (Micro-Ecological Life Support System Alternative) mimics a lake ecosystem. It consists of a closed-loop bio-regenerative system based on microorganisms and higher plants and providing a circular cycling of mass, including O2 production, CO2 capture, water recycling and food production. As growth and development of higher plants are strongly influenced by the environmental conditions (g, p, T, RH, partial pressure of O2 or CO2), bio-regenerative life support systems require a high level of control and management. The goal of this study is to develop a mechanistic model to predict the effects of microgravity or of a reduced gravity environment on plant growth at its morphological, physicochemical and biochemical levels. Current agronomy plant growth models are not adapted for growth in controlled environments and do not provide a better understanding of physical growth mechanisms. Thus, a mechanistic plant growth model has been under development for the MELiSSA project for a few years. This study describes the addition of gravity as a parameter, taking into account the altered gas exchanges in low-g environments. The influence of convection intensity was investigated for several gravity levels. A recent use of parabolic flights, on a specifically designed set-up, has attempted to quantify plant gas exchange at the leaf level under forced convection based on IR measurements.

Prof. Jean-Pierre FONTAINE: *Professor in chemical engineering at the University Clermont Auvergne (Clermont-Ferrand, France) since 2003. Beforehand, he worked for 08 years in industry (R&D center in Sophia Antipolis, France), 02 years at the University of Colorado (Boulder, Colorado, USA) and 05 years at Aix-Marseille University (France), where he obtained his PhD in Fluid Dynamics in 1990. His research activities have focused on the modelling of complex multi-physics transport phenomena (fluid, heat and mass transfer) in different domains. The main topics concern crystal growth, humidity sensing, condensation transfer on heterogeneous surface, interfacial phenomena, reduced gravity environments, dye sensitized solar cells, hydrodynamics of bioreactors in order to optimize mixing and biological reactions and the influence of gravity on higher plant growth. He has authored more than 60 peer-reviewed publications, 06 European patents, and has contributed to about 80 conferences.*

Pr. Tetsuya TAIMA

金沢大学 KANAZAWA UNIVERSITY

Topic : Efficiency Improvement of Organic Photovoltaic Cells by Nano-Structure and Molecular Orientation Controls.

By : Prof. Tetsuya TAIMA , Kanazawa University, Japan.

Nanomaterials Research Institute (NanoMaRi), Kanazawa University, Japan.

A bulk heterojunction (BHJ) structure by co-evaporation of organic photovoltaics (OPVs) provides the large donor-acceptor interface, which facilitates efficient charge separation. However, it is difficult to control directly the morphology of co-evaporated BHJ layer because of random blend of donor and acceptor molecules. Many efforts have been made for structure control of BHJ layer by introducing a new substitute in molecule and combining additive molecules in solution. Recently, we reported highly efficient OPV cells by inserting CuI molecular orientation control layer under the zinc phthalocyanine (ZnPc):C60 co-evaporated BHJ layer. It is estimated that higher light absorption coefficient was obtained by controlled ZnPc lying-down molecular orientation due to π-d interaction between ZnPc and CuI. However, information of the ZnPc molecular orientation in ZnPc:C60 film has not been obtained by various measurements, such as XRD, XAFS, and TEM, due to its low crystallinity in ZnPc:C60 film. Hence, we report that the identification of molecular orientation in ZnPc:C60 film by Infrared reflection absorption spectroscopy (IR-RAS), which is enabled to measure the molecular orientation in amorphous film. We succeed in calculating the molecular orientation angle in co-evaporated films on various substrates by IR-RAS.

Prof. Tetsuya TAIMA: *Professor at Nanomaterials Research Institute (NanoMaRi), Kanazawa University, Japan, since 2018. 2002 : Doctor Degree. Department of Applied Chemistry, School of Engineering, Tohoku University. 2002-2004 : Post-Doctoral Researcher (JSPS Research Fellowship). National Institute of Advanced Industrial Science and Technology (AIST). 2005-2011 : Research Scientist. Permanent researcher at Research Center for Photovoltaics (RCPV), AIST. 2009-2015 : PRESTO Researcher (Concurrent post). Project member of Precursory Research for Embryonic Science and Technology (PRESTO) at Japan Science and Technology Agency (JST) is the award to excellent researchers. 2012-2015 : Associate Professor (Tenure Track). RSET, Kanazawa University. 2015-2017 : Associate Professor / Unit leader (Tenure Track). InFiniti, Kanazawa University. 2017-2018 : Professor / Unit leader. InFiniti, Kanazawa University.*

M. HAHIDUZZAMAN

金沢大学 KANAZAWA UNIVERSITY

Dr. Md. SHAHIDUZZAMAN: *Assistant Professor at the Nanomaterials Research Institute (NanoMaRi), Kanazawa University where he designs, fabricates and develops highly efficient and stable perovskite solar cells (PSCs) for next-generation solar cells. Born in Bangladesh in 1984, Dr. Shahiduzzaman moved to Japan for postgraduate study in 2011. He obtained a Master degree in Thermoelectric Materials & Application from Japan Advanced Institute Science & Technology (JAIST) in 2013 and did his Ph.D. on PSCs from Kanazawa University in 2016. He was a post-doctoral fellow in Professor Tetsuya Taima's group at Kanazawa University. During his tenure (10/2016 until 09/2017) at Kanazawa University, he extensively worked on the improvement of PSCs performance. Then he did another post-doctoral (10/2017 until 10/2018) at Tokai University, Japan under Tokai University General Research Organization fellowship where he worked on the design and fabricate low-temperature (<180°C)-processed brookite based-TiO2 junctions and test their performance in PSCs. His research interests include integrating micro- and nanotechnology to develop innovative methods to solve energy generation problems. He is also interested in design, fabrication and development of high-efficiency, stable, green and flexible solar cells for various energy applications. He published 1 patent and 26 peer-reviewed articles until the date.*

Pr. Marie C. NÉEL

AVIGNON UNIVERSITÉ

Topic : Experimental and Numerical Study of Geometrically Driven Drop Motion.

By : Prof. Marie-Christine NÉEL , Avignon University, France.

Some organisms living in arid environment harvest water on own skin, on which liquid drops move spontaneously in a privileged direction. Here the word « spontaneous » means that no pressure difference or external force is needed. In view of copying such motion in industrial process we consider it on materials possessing properties like robustness or electric conductivity. Spontaneous directed drop motion on horizontal flat surface may be caused by heterogeneous wettability whose gradient points toward some specific direction. It also occurs on flat surface of uniform physico-chemical properties decorated by sequences of identical micrometric obstacles forming like channels. Measuring drop motion on such device, here made of steel, evidences patterns that promote directed transport. Observed motion is fragmented into successive stages of uneven velocity . Numerical simulation investigates the flow regimes observed during these stages. It also gives us a flexible tool to optimize channel design in order to enhance motion.

Prof. Marie Christine NÉEL: *Professor Emerita at Avignon University, where she teached mechanics and physics since 1998. Her research covered diverse themes in the field of fluid mechanics, with special attention to liquid flowing through porous material. She developped theoretical and numerical methods to predict fluid flow instability caused by thermal gradient or magnetic field. She also studied diffusion equations including derivatives of non-integer order that reveal molecular motion represented by stochastic process more general than Brownian motion. Considering that Nuclear Magnetic Resonance measures the increment characteristic function of such process she is investigating molecular motions on the basis of such data complemented by tracer test. Marie-Christine Néel is moreover presently working on fluid flow in non saturated porous material.*

Pr. Sanjeev CHANDRA

UNIVERSITY OF TORONTO

Topic : Spray Forming of Thermal Management Devices.

By : Prof. Sanjeev CHANDRA , Toronto University, Canada.

Centre for Advanced Coating Technologies, Toronto University, Canada.

Thermal spray is a process in which a coating material (metal, ceramic or polymer) is melted in a high velocity gas jet and sprayed onto a surface. It is widely used to apply protective coatings but can also be used an additive manufacturing technique to make devices for thermal management including heat exchangers, heat sinks, cold plates and heat pipes. Compact, high efficiency heat exchangers were made by spraying metal skins on the exterior surfaces of metal foams that have a large internal surface area for heat transfer. Composite heat sinks were made by spraying thin metal layers on polymer scaffoldings, producing lightweight devices that use only a minimal amount of metal where required. Heat pipes were made by spraying porous metal layers that acted as wicks for capillary transport of liquids. Spraying allows coatings to be applied rapidly over a large area, making it feasible to make thermal management devices that are very large in extent.

Prof. Sanjeev CHANDRA: *Professor in the Department of Mechanical and Industrial Engineering at the University of Toronto, which he joined after receiving his Ph.D. from Cornell University in 1990. Prof. Chandra is known internationally for his research on the dynamics of droplets and sprays and is one of the founders of the Centre for Advanced Coating Technologies at the University of Toronto. His research spans the areas of fluid mechanics, heat transfer and materials science and has also been applied in spray coating, spray cooling, spray painting, ink-jet printing, electronic cooling and waste heat recovery. Prof. Chandra has published over 250 papers in referred journals and international conference proceedings. He has written an undergraduate textbook on thermodynamics and several chapters for books on the subjects of thermal spray coating, heat transfer and sprays. In 2010 he was awarded the The Brockhouse Canada Prize for Interdisciplinary Research, awarded by the Natural Sciences and Engineering Research Council of Canada to recognize outstanding collaborative research. In 2015 he was awarded the Jules Stachiewicz Medal by the Canadian Society for Mechanical Engineering for outstanding contributions to heat transfer.*

Prof. Vanessa FIERRO

UNIVERSITÉ DE LORRAINE

Topic : *Ordered and Disordered Tannin-Derived Carbons as Supercapacitor Electrodes*

By : Dr. Vanessa FIERRO

CNRS Research Director, Institut Jean Lamour, CNRS / Lorraine University, France.

Disordered and perfectly ordered mesoporous carbons (DMC and OMC, respectively) can be produced by soft- templating. An eco-friendly and easy synthesis method, by surfactant-water assisted mechanochemical mesostructuration of Mimosa tannin around the amphiphilic surfactant Pluronic F127© was used for the first time. It is an easy and fast, one-pot method, only requiring 1 h of ball-milling without any additional drying or curing step before carbonization. Furthermore, the method is environment-friendly, due to the use of a natural and renewable carbon precursor and due to the absence of toxic or hazardous substances during the synthesis. After carbonization at 900°C, carbons with moderate BET area (ABET), around 600 m2/g, were obtained and used for different applications. CO_2 activation, which was more efficient in DMC, allowed obtaining materials with a more developed pore texture, ABET ~ 2000 m^2/g. When these materials were used as electrodes of supercapacitors, they exhibited high values of capacitance together with a high specific energy and power. We will discuss the effect of pore connectivity on these performances and we will present the last strategies to improve the characterization of nanoporous materials.

Prof. Pr. Vanessa FIERRO*: A CNRS Research Director presently working at Institut Jean Lamour (IJL). She pursued doctoral researches at the Institute of Carbochemistry (ICB-CSIC) and obtained her PhD from Zaragoza University (Spain) in 1998. She has been working several years as a researcher at the French Institute of Petroleum, at the Institute of Research on Catalysis and the Environment of Lyon (France) then at the Chemical Engineering School of Tarragona (Spain). She entered CNRS in 2006 and joined IJL in 2009 where she is now leading the Biosourced Materials Research Team since 2018.Vanessa is a member of the Coal Technical Group 1 (TGK1) of the Research Fund for Coal and Steel (RFCS). She has more than 300 scientific publications, an h-index of 51 and an extensive background in the area of porous carbon materials for energy and environmental applications. Her current research interests focus on the development of materials from biosourced precursors able to substitute those of petrochemical origin.*

Pr. Sadik DOST

University of Victoria

Topic : *Growth of Semiconductor Single Crystals for Energy Conversion.*

By : Prof. Sadik DOST , University of Victoria, Canada.

Department of Mechanical Engineering, Crystal Growth Laboratory, University of Victoria, Victoria, BC, Canada.

Single crystal and polycrystalline semiconducting materials of silicon (Si), germanium (Ge), cadmium zinc telluride (CdZnTe) and gallium antimonide (GaSb) have been used for energy conversion in the visible and infrared spectrum. The talk will present an overview of single crystal growth of GaSb, CdZnTe and Silicon-Germanium (SiGe) from metallic solutions and melt. The growth techniques used at the University of Victoria are the solution growth techniques of the Travelling Heather Method (THM) for GaSb and CdTe, Liquid Phase Diffusion (LPD) for SiGe, and the melt growth method of Vertical Gradient Freezing (VGF) for CdZnTe. The progress and the remaining issues of these growth processes will be discussed. Recent Experimental and numerical simulation results will be presented.

Prof. Sadik DOST: *is Professor and Director of the Crystal Growth Laboratory at the University of Victoria since 1989. He graduated from Karadeniz Technical University of Turkey in 1969 and obtained his Ph.D. in Istanbul Technical University in 1974. He has then worked as a faculty member in Ege University of Turkey until 1980 and then in the University of Calgary until 1989. He is the founding director of a university research centre: CAMTEC (Centre for advanced materials and related technology) at UVic, and served as its Director from 1992 to 1997. He has also served as Chair of the Department of Mechanical Engineering at UVic from 1997 to 2003. Dr. Dost has been a Canada Research Chair in Crystal Growth from 2003 to 2017. His research combines experimental and theoretical study of growth of bulk single crystals from melt and solution using a variety of crystal growth processes such as Bridgman (B), Vertical Gradient Freezing (VGF), Liquid Phase Electroepitaxy (LPEE), Liquid Phase Epitaxy (LPE), Travelling Heater Method (THM), Liquid Phase Diffusion (LPD), Float-Zone (FZ), and Top-Seeded Solution Growth (TSSG). He has made significant contributions to these techniques.*

SYMPOSIUM TALKS

Topic N°1: Innovative Lattice Boltzmann for Complex Simulations

Lecturer: ***Prof. Ahmed MEZRHAB*** *, Mohammed 1 University, Morocco.*
Lecturer: ***Prof. Samir HOUAT*** *, Mostaganem University, Algeria.*
Lecturer: ***Prof. Hassan NAJI*** *, Artois University, France.*
Lecturer : ***As/Prof. M. Mahdi Tekitek,*** *University Tunis El Manar.*


Pr. Ahmed MEZRHAB
MOHAMMED 1st UNIVERSITY


Pr. Samir HOUAT
MOSTAGANEM UNIVERSITY


Pr. Hassan NAJI
UNIVERSITÉ D'ARTOIS

Topic N°2: Photonics for Energy

Lecturer: Dr. Hassina D. HABAK , Picardie Jules-Verne University, France.
Lecturer: Prof. Ali CHEKNANE , Laghouat University, Algeria.
Lecturer: Prof. Zouheir SEKKAT , University Mohamed V, Morocco.


Dr. Hassina D. HABAK
Picardie J.V. UNIVERSITY


Pr. Ali CHEKNANE
Laghouat UNIVERSITY

Topic N°3: Energy / Materilas & Micro-Gravity

Lecturer: Prof. Jalil OUAZZANI , CEO of ArcoFluid & ArcoFluid Consulting LLC, USA..
Lecturer : Prof. Mounir Bouali, , Mondragon Univ. Spain
Lecturer : Prof. Liu Qiu-Sheng , Chinese Academy of Sciences, China.
Lecturer : Prof. Marcello Lappa , Strath Iniversity, UK.


Pr. Jalil OUAZZANI


Pr. Mounir Bouali


Prof. Liu Qiu-Sheng

PROGRAM (OVERVIEW)

June 7-8th	Topical School : Posponed to October/November of the current year																	
ASIA & AUST 15:15 / LOCAL TIME 16:00					18:30		20:00				22:30				01:30			
USA & CANADA 03:15 / LOCAL TIME: 04:00					06:30		08:00				10:30				13:30			
France 09:15	10:00	10:45		11:30	12:30	13:00	14:00		14:45	15:30	16:30		17:30	18:30	18:40	19:30		
Wednesday June 9th	Opening ICOME21 (MR)	Keynote N°1 Geoffrey LEVERMORE Chair: M. El GANAOUI		Keynote N°2 Jadran VRABEC Chair: R.BENNACER	Session A Chairs (A. Scipioni A1 /A.HamzaouiA2)	Lunch Break	Session B Cahirs (A.Kheiri B1 /I.Ziegler B2)		Keynote N°3 Yogesh JALURIA Chair: P. BONTOUX	Keynote N°4 Jean-Michel NUNZI Chair: M.SCIAMANA	Session C Chairs (A.OuadhaC1/ A.Pétrissans C2)		Symposium N°1 Photonic & Systems Chairs: H.D. HABAK/ J.M.NUNZI Session Symp.1	Session D Chairs (D. Guilbert D1 /K.Choukairy D2)	Informations / Closing Day 01 (MR)	Evaluation Committee (Best Presentation)		
	09:30	10:00	10:45	11:30	12:30	13:00	14:00		14:45	15:45	16:30		17:30	18:30	18:40	19:30		
Thursday June 10th	Committee / Sci./ Org.	Keynote N°5 Wei-Hsin CHEN Chair: M. PETRISSANS		Keynote N°6 Kamel HOOMAN Chair: H.ZAHROUNI	Session E Chairs (M. Alma E1, K.Ragui E2)	Lunch Break	Session F Chairs (C.Tanougast F1, N.Bouaziz F2)		Keynote N°7 Jordan HRISTOV Chair: A. ZAOUI	Session G Chairs (B.MorroneG1 ,S-A Harouna G2)	Keynote N°8 Jean-Pierre FONTAINE Chair: Y. ROGAUME		Symposium N°2 Energy / Materials & Micro-Gravity	Session H Chairs (A.Sabeur H1, R. Absi H2)	Informations / Closing Day 02 (MR)	Evaluation Committee (Best Presentation)		
	09:30	10:00	10:45	11:30	12:30	13:00	14:00		14:45	15:30	16:30		17:30	18:30	19:00	19:30		
Friday June 11th	Committee / Sci./ Org.	Keynote N°9 Tetsuya TAIMA Co- Dr. Md. SHAHIDUZZAMAN Chair: M-O. SIMONOT		Keynote N°10 Marie-Christine NÉEL Chair: C. GERARDIN	Session I Chairs (H.Rameanh I1,L.Baddas I2)	Lunch Break	Session J Chair (G. Pluvinage J1, C. Chen J2)		Keynote N°11 Sanjeev CHANDRA Chair: F. LEMOINNE	Keynote N°12 Vanessa FIERRO Chair: N. TAKORABET	Symbolic Comp.Chairs : A.Carmasol /E-H.Laamri / Session K (A.Carmasol / E-H.Laamri)		Symposium N°3 LBM Development & Computations Chair: S.HOUAT	Session L (M. Bouchoucha) / Evaluation Committee (Best Presentation)	Award Ceremony (MR)	Closing Ceremony (MR)		

SCHEDULED ID – SESSION

ID	Session	Code
5	F2	HMT_Opt1
6	H1	SRnE2
7	E2	HMT_Opt2
8	D2	Mat&Appl2
9	I1	EngS3
12	H2	PorMat1
17	E2	HMT_Opt2
18	A2	SRnE3
19	A1	EngS1
20	G2	ThB&BMat2
21	H1	SRnE2
22	F1	ThB&BMat1
23	G1	InovPr2
24	B2	SRnE1
25	F2	HMT_Opt1
27	E2	HMT_Opt2
28	D1	PhInvMat2
29	G1	InovPr2
30	L	HMT_Opt3
31	D2	Mat&Appl2
32	G1	InovPr2
33	F1	ThB&BMat1
34	H1	SRnE2
35	B2	SRnE1
36	E1	PhInvMat1
38	B2	SRnE1
39	C2	Mat&Appl1
40	F2	HMT_Opt1
41	J	ThB&BMat3
42	G2	ThB&BMat2
43	D2	Mat&Appl2
44	H2	PorMat1
45	I1	EngS3
51	J	ThB&BMat3
52	B1	PorMat2
54	F2	HMT_Opt1
55	C1	EngS2
58	I1	EngS3
81	F1	ThB&BMat1
82	C2	Mat&Appl1
83	A2	SRnE3
84	K	Mat&Mod1
85	B1	PorMat2
86	K	Mat&Mod1
87	B1	PorMat2
88	I1	EngS3
89	I2	InovPr1
90	F2	HMT_Opt1
91	B2	SRnE1
92	G1	InovPr2
93	B1	PorMat2
94	F1	ThB&BMat1
95	A1	EngS1
96	E2	HMT_Opt2
97	J	ThB&BMat3
99	A2	SRnE3
100	C1	EngS2
101	B2	SRnE1
102	I2	InovPr1
103	H1	SRnE2
106	H2	PorMat1
107	C1	EngS2
108	C1	EngS2
111	G1	InovPr2
113	A2	SRnE3
114	G2	ThB&BMat2
115	D1	PhInvMat2
118	D2	Mat&Appl2
119	E1	PhInvMat1
122	E2	HMT_Opt2
126	L	HMT_Opt3
130	E1	PhInvMat1
132	L	HMT_Opt3
133	A1	EngS1
135	L	HMT_Opt3
136	L	HMT_Opt3
140	I2	InovPr1
141	I2	InovPr1
142	C2	Mat&Appl1
143	G2	ThB&BMat2
144	F1	ThB&BMat1
146	C2	Mat&Appl1
147	G1	InovPr2
149	D2	Mat&Appl2
150	A1	EngS1
152	H2	PorMat1
153	A2	SRnE3
154	F2	HMT_Opt1
157	G2	ThB&BMat2
160	G1	InovPr2
163	I1	EngS3
164	E1	PhInvMat1
165	A1	EngS1
166	B2	SRnE1
167	A1	EngS1
168	C1	EngS2
169	D2	Mat&Appl2
170	D1	PhInvMat2
171	K	Mat&Mod1
172	J	ThB&BMat3
173	H2	PorMat1
174	E2	HMT_Opt2
176	L	HMT_Opt3
177	H1	SRnE2
178	B1	PorMat2
179	F2	HMT_Opt1
180	A1	EngS1
181	D1	PhInvMat2
182	D1	PhInvMat2
184	C2	Mat&Appl1
185	I1	EngS3
186	I2	InovPr1
188	B1	PorMat2
190	E2	HMT_Opt2
191	I2	InovPr1
192	A2	SRnE3
193	B2	SRnE1
194	D2	Mat&Appl2
195	H1	SRnE2
196	I1	EngS3
197	C1	EngS2
198	A2	SRnE3
199	E1	PhInvMat1
200	E1	PhInvMat1
201	H1	SRnE2
202	H2	PorMat1
203	C2	Mat&Appl1
204	I2	InovPr1
205	C2	Mat&Appl1
206	E1	PhInvMat1
207	D1	PhInvMat2
208	D1	PhInvMat2
209	I2	InovPr1
209	Symp1	Symp1
210	Symp1	Symp1
211	C1	EngS2
212	Symp1	Symp1
213	C1	EngS2
214	J	ThB&BMat3
215	L	HMT_Opt3
216	J	ThB&BMat3
217	F1	ThB&BMat1
218	J	ThB&BMat3
219	L	HMT_Opt3
220	L	HMT_Opt3
221	C1	EngS2

SESSION NAME & CODE

Session Code		Session name	
A	A1	ENERGETIC SYSTEMS (EngS1)	Wednesday June 9th
	A2	STORAGE & RENEWABLE ENERGY (SRnE3)	
B	B1	POROUS MATERIALS (PorMat2)	
	B2	STORAGE & RENEWABLE ENERGY (SRnE1)	
C	C1	ENERGETIC SYSTEMS (EngS2)	
	C2	MATERIALS & APPLICATIONS (Mat&Appl1)	
D	D1	PHYSICS & INNOVATIVE MATERIALS (PhInvMat2)	
	D2	MATERIALS & APPLICATIONS (Mat&Appl2)	
Symp1		PHOTONIC & SYSTEM (SYMPOSIUM 1)	

Session Code		Session name	
E	E1	PHYSICS & INNOVATIVE MATERIALS (PhInvMat1)	Thursday June 10th
	E2	HEAT AND MASS TRANSFER OPTIMISATION (HMT_Opt2)	
F	F1	THERMAL BUILDINGS & BUILDING MATERIALS (ThB&BMat1)	
	F2	HEAT AND MASS TRANSFER OPTIMISATION (HMT_Opt1)	
G	G1	INNOVATIVE PROCESS (InovPr2)	
	G2	THERMAL BUILDINGS AND BUILDING MATERIALS (ThB&BMat2)	
H	H1	STORAGE & RENEWABLE ENERGY (SRnE2)	
	H2	POROUS MATERIALS (PorMat1)	
Symp2		Eng./Mat/ µGravity (SYMPOSIUM 2)	

Session Code		Session name	
I	I1	ENERGETIC SYSTEMS (EngS3)	Friday June 11th
	I2	INNOVATIVE PROCESS (InovPr1)	
J	J	THERMAL BUILDINGS AND BUILDING MATERIALS (ThB&BMat3)	
K	K	MATERIALS & MODELISATION (Mat&Mod1)	
L	L	HEAT AND MASS TRANSFER OPTIMISATION (HMT_Opt3)	
Symp3		LBM Development & Computational (SYMPOSIUM 3)	

DETAILED PROGRAM

	ID	Authors	Titre	Code	Session
		Energetic Systems			
11:30		**EngS1 (Chairs : A.Scipioni, S.Morsli)**			
11:38	**167**	Rania Jradi, Christophe Marvillet and Mohamed Razak Jeday	APPLICATION OF ARTIFICIAL NEURAL NETWORK METHOD FOR PREDICTION OF TUBE- SIDE FOULING RESISTANCE IN SHELL –AND - TUBE HEAT EXCHANGER	**A1**	EngS1
11:46	**19**	David Alonso de Mezquia, M. Mounir Bou-Ali, Ferruh Erdogdu, Huseyin Topcam, Bart Droogenbreoeck and Dagbjorn Skipness	CFD ANALYSIS OF CAN HEATING PROCESS	**A1**	EngS1
11:54	**180**	Nada Baraket, Benoit Brandelet, Gwenaelle Trouve and Yann Rogaume	COMPARISON OF THE ASHES DEPOSITION IN A BIOMASS MOVING GRATE BOILER FOR WOOD CHIPS AND SEWAGE SLUDGE	**A1**	EngS1
12:02	**150**	Mourad Najjaoui, Thami Ait Taleb, Abdelhalim Abdelbaki, Zaki Zrikem and Hassan Chaib	COUPLED HEAT TRANSFERS IN A HOLLOW BLOCK WITH TWO AIR CELLS DEEP IN VERTICAL DIRECTION SUBJECTED TO AN INCIDENT SOLAR FLUX	**A1**	EngS1
12:10	**211**	Mohamed El-Amine Slimani, Zahia Slimani, Zohra Benzide, Abdelkader Harrouz, Houcine Moungar and Mohammed El Ganaoui	STUDY OF A COUPLED INTEGRATED SOLAR ENERGY SYSTEM: SOLAR HYBRID PVT WITH BI-FLUID SOLAR THERMAL COLLECTOR	**A1**	EngS1
12:18	**133**	Rabeb Toujani and Nahla Bouaziz	EXERGO-ENVIRONMENTAL STUDY OF A NOVEL ORGANIC SOLAR HYBRID HEAT PUMP	**A1**	EngS1
12:26	**165**	Davide Laiso, Antonio Mariani, Biagio Morrone and Andrea Unich	EXERGY ANALYSIS OF ORGANIC RANKINE CYCLES WITH ZEOTROPIC WORKING FLUIDS	**A1**	EngS1
15:30		**EngS2 (Chair : A.Ouadha)**			
15:38	**55**	Maoulida Fahad, Mohamed Aboudou Kassim, Djedjig Rabah and Mohammed El Ganaoui	FEASIBILITY STUDY FOR A HYBRID POWER PLANT (PV-WIND-DIESEL-STORAGE) CONNECTED TO THE ELECTRICITY GRID IN THE COMOROS	**C1**	EngS2
15:46	**108**	Tarek Mraim and Lazreg Hadji	FREE VIBRATION ANALYSIS OF FUNCTIONALLY GRADED PLATES UNDER VARIOUS BOUNDARY CONDITIONS	**C1**	EngS2
15:54	**197**	Belhadj Senini Lina Wafaa and Sabeur Amina	HEAT TRANSFER AND FLUID FLOW SIMULATION IN MICRO-CYLINDER-GROUP	**C1**	EngS2
16:02	**168**	Rania Jradi, Christophe Marvillet and Mohamed Razak Jeday	PREDICTION AND COMPARATIVE ANALYSIS OF TUBE- SIDE FOULING RESISTANCE IN SHELL –AND - TUBE HEAT EXCHANGER USING A SEMI-EMPIRICAL MODEL AND AN ARTIFICIAL NEURAL NETWORK APPROACH	**C1**	EngS2
16:10	**213**	L'Hocine Slimani, Ali Bousri, Abdelmalek Hamadouche and Haykel Ben Hamed	NUMERICAL AND EXPERIMENTAL STUDY OF HEAT TRANSFER ENHANCEMENT WITH METAL FOAMS AND ULTRASOUNDS	**C1**	EngS2
16:18	**221**	Lisa Boussaba and Gilles Lefebvre	EXPERIMENTAL AND NUM ERICAL STUDY ON AN E CO FRIENDLY COMPOSITE BIO BASED PCM / NATURAL CLAY FOR THERMAL ENERGY S TORAGE IN BUILDINGS	**C1**	EngS2

16:26	**107**	Mohamed Oussama Abdellaoui	NUMERICAL ANALYSIS FOR FREE VIBRATION OF FUNCTIONALLY GRADED BEAMS	**C1**	EngS2
16:34	**100**	Taleb Mounia and Aouati Mourad Salim	MONITORING AND DIAGNOSIS OF KILN 525 FAN FAULTS BY VIBRATORY ANALYSIS CASE OF BIR EL ATER JEBEL ONK MINE	**C1**	EngS2
11:30		**EngS3 (Chair : H.Ramenah)**			
11:38	**9**	Khaled Said, Ahmed Ouadha and Amina Sabeur	NUMERICAL ANALYSIS OF TURBULENT DOUBLE DIFFUSIVE NATURAL CONVECTION FLOW AND ENTROPY GENERATION WITHIN INCLINED CAVITY.	**I1**	EngS3
11:46	**196**	Valentin Baguet, Mohammed Khalij, Abdelhamid Kheiri, Mohammed El Ganaoui and Benjamin Remy	NUMERICAL INVESTIGATION OF THE HYDRODYNAMIC OF A SAND FLUIDIZED BED DESIGNED FOR HEAT STORAGE	**I1**	EngS3
11:54	**45**	Baghdad Mohammed and Ouadha Ahmed	NUMERICAL STUDY ON FLOW, HEAT TRANSFER AND ENTROPY GENERATION OF SUPERCRITICAL CO2 IN A HEATED HELICAL COILED TUBE	**I1**	EngS3
12:02	**185**	Dorsaf Khalifa and Foued Mzali	OPTIMAL EXPERIMENT DESIGN FOR THE IDENTIFICATION OF THE INTERFACIAL HEAT TRANSFER COEFFICIENT IN SAND CASTING	**I1**	EngS3
12:10	**58**	Rachedi Khadraoui, Latra Boumaraf and Philippe Haberschill	PERFORMANCE EVALUATION OF A DUAL-EVAPORATOR EJECTOR SUBCOOLING REFRIGERATION CYCLE	**I1**	EngS3
12:18	**163**	Daniele Battaglia, Maria Laura Mastellone, Biagio Morrone and Lucio Zaccariello	THERMAL CHARACTERIZATION OF OAT BIOMASS FOR HYDROTHERMAL CARBONIZATION IN BATCH REACTOR	**I1**	EngS3
12:26	**88**	Abdelkader Safa, Lazreg Hadji and Mohamed Bourada	THERMAL VIBRATION ANALYSIS OF FGM BEAMS	**I1**	EngS3
		Heat and Mass Transfer Optimisation			
13:00		**HMT_Opt1 (Chairs : N.Bouaziz, L. Ouhssaine)**			
13:08	**154**	Aouatif Saad, Rida Tazi and Mohammed El Ganaoui	A METHODOLOGY TO REDUCE THERMAL GRADIENTS DUE TO THE EXOTHERMIC REACTIONS IN THIN RTM PARTS	**F2**	HMT_Opt1
13:16	**179**	Hayat Baamrani, Lahcen Bammou, Ahmed Aharoune and Abdallah Boukhris	NUMERICAL SIMULATION OF HEAT AND MASS TRANSFER IN VERTICAL CHANNEL	**F2**	HMT_Opt1
13:24	**40**	Ali Tarrad	ANALYTICAL MODEL FOR THERMAL ASSESSMENT OF A VERTICAL DOUBLE U-TUBE GROUND-COUPLED HEAT PUMP SYSTEM OPERATES AT STEADY-STATE CONDITIONS	**F2**	HMT_Opt1
13:32	**90**	A.B Vishalakshi, U S Mahabaleshwar, M El Ganaoui and R Bennacer	NAVIER'S SLIP AND HEAT TRANSFER OF NANOFLUID DUE TO A STRETCHING/SHRINKING SHEET: ANANALYTICALSTUDY	**F2**	HMT_Opt1
13:40	**25**	Asma Ouahouah, Mahdi Benzema, Abderrahmane Bourada, Nabila Labsi and Youb Khaled Benkahla	EFFECT OF DYNAMIC VISCOSITY AND THERMAL DIFFUSIVITY RATIOS ON THE THERMOCAPILLARY CONVECTION	**F2**	HMT_Opt1

13:48	**54**	Mourad Najjaoui, Thami Ait Taleb, Abdelhalim Abdelbaki, Zaki Zrikem and Hassan Chaib	EFFECT OF GEOMETRY OF HOLES ON HEAT TRANSFERS COUPLED THROUGH A HOLLOW BLOCK SUBJECTED TO A SOLAR FLUX	**F2**	HMT_Opt1
13:56	**5**	Boutra Abdelkader, Benkahla Youb Khaled, Labsi Nabila and Bennacer Rachid	LATTICE BOLTZMANN INVESTIGATION OF MIXED CONVECTION OF A NANOFLUID IN A CUBICAL ENCLOSURE	**F2**	HMT_Opt1
11:30		**HMT_Opt2 (Chairs : K.Ragui, F. Mustapha)**			
11:38	**27**	Farah Zemani Kaci and Amina Sabeur Bendhina	NUMERICAL STUDY OF NATURAL CONVECTIVE HEAT TRANSFER IN AN AIR FILLED SQUARE CAVITY HEATED FROM BELOW AND SYMMETRICALLY COOLED FROM THE SIDES WITH A PARTITION IN THE HOT WALL	**E2**	HMT_Opt2
11:46	**17**	Saad Adjal, Sabiha Aklouche-Benouaguef and Belkacem Zeghmati	NUMERICAL STUDY OF NATURAL CONVECTION IN AN INCLINED POROUS CAVITY	**E2**	HMT_Opt2
11:54	**122**	Bezandry Germain, Andrianantenaina Marcelin Hajamalala, Belckacem Zeghmati, Fanjirindratovo Tovondahiniriko, Randrianarivelo Raymond and Attoumani Abdallah	MODELING OF 3D NATURAL AND ROTARY MIXED CONVECTION COUPLED WITH MASS TRANSFER AROUND A CONE OF REVOLUTION	**E2**	HMT_Opt2
12:02	**7**	Samy Alami, Mbarek Feddaoui, Nait Alla Abderrahman, Lahcen Bammou and Khalid Souhar	SIMULTANEOUS HEAT AND MASS TRANSFER INSIDE A PARTIALLY HEATED VERTICAL TUBE IN EVAPORATING TURBULENT FALLING FILM INTO A STREAM OF AIR	**E2**	HMT_Opt2
12:10	**190**	Baris Burak Kanbur, Sheng Quan Heng and Fei Duan	THERMOGRAPHIC OBSERVATION OF HIGH-FREQUENCY ETHANOL DROPLET TRAIN IMPINGEMENT ON HEATED ALUMINUM AND GLASS SURFACES	**E2**	HMT_Opt2
12:18	**132**	Dong Li, Yangyang Wu, Changyu Liu, Ruitong Yang and Müslüm Arıcı	AN INVESTIGATION ON HEAT TRANSFER OF CRUDE OIL IN FLOATING ROOF TANK: EFFECT OF HORIZONTAL HEATING FINNED TUBE BUNDLES	**E2**	HMT_Opt2
12:26	**174**	Abdennacer Belazizia and Said Abboudi	CONVECTION HEAT AND MASS TRANSFER IN AN ENCLOSURE WITH SORET EFFECT AND OPPOSING FLOW	**E2**	HMT_Opt2
17:30		**HMT_Opt3 (Chair : M.Bouchouicha)**			
17:38	**95**	Karim Ragui, Gisele Vieira, Rachid Bennacer and Mohammed El Ganaoui	CRITICAL CONDITIONS LINKED TO THE TRANSITION FROM POROUS TO PURE-FLUID MEDIA IN COMPLEX SYSTEMS: CASE OF SIC FILTERS	**L**	HMT_Opt3
17:46	**219**	Yazid Statra, Sara Fawaz, Hocine Menana and Bruno Douine	EXPERIMENTAL CHARACTERIZATION OF THE ELECTROMAGNETIC PROPERTIES OF HTS COILS IN SELF FIELD AND WITH THE PROXIMITY OF ELECTROMAGNETICALLY ACTIVE MATERIALS	**L**	HMT_Opt3
17:54	**96**	Karim Ragui, Mohammed El Ganaoui and Rachid Bennacer	TRANSITION FROM OSCILLATORY TO CHAOTIC FLOW OF NANOFLUIDS IN ANNULI DEVICES: ADVANCED NANOSCIENCE	**L**	HMT_Opt3
18:02	**126**	Abderrahmane Bourada, Abdelkader Boutra, Asma Ouahouah and Youb Khaled Benkahla	NATURAL CONVECTION OF POWER LAW FLUID WITHIN RECTANGULAR INCLINED CAVITY CONTAINING TOW CIRCULAR OBSTRUCTIONS: MRT-LBM APPROACH	**L**	HMT_Opt3
18:10	**94**	Souad Morsli, Mohammed Nouari, Rachid Bennacer and Mohammed El Ganaoui	EVALUATION OF THE PERFORMANCE OF VENTILATION SYSTEMS FOR BUILDING APPLICATIONS	**L**	HMT_Opt3
18:10	**176**	Andrianantenaina Marcelin Hajamalala, Ratovonarivo Noarijaona and Belckacem Zeghmati	MODELING OF AN UNSTEADY NEWTONIAN FLUID FLOW FROM AN OPEN CYLINDRICAL RESERVOIR WITH A HOLE	**L**	HMT_Opt3
18:18	**220**	Er-Rradi Hafida and Idchabani Rachida	THERMAL CHARACTERIZATION OF AN ECOLOGICAL MATERIAL BASED ON PLASTER AND WOOD WASTE	**L**	HMT_Opt3

Innovative Process

11:30		**InovPr1 (Chair : L. Baddas, H.Benhamed)**			
11:38	**89**	Latifa Ould Larbi, Lazreg Hadji and Nafissa Zouatnia	AN ANALYTICAL SOLUTION FOR FREE VIBRATION OF FUNCTIONALLY GRADED BEAM USING A SIMPLE FIRST-ORDER SHEAR DEFORMATION THEORY	**I2**	InovPr1
11:46	**209**	Nadjet Deddouche, Hafida Chemouri and Hassina Derbal Habak	COMPUTATIONAL PREDICTION OF THE ANTICANCER ACTIVITY OF THE FULLERENE NANOSTRUCTURE'S DERIVATIVES. DFT CALCULATION	**I2**	InovPr1
11:54	**140**	Pierre-Frederic Villard, Maureen Boudart, Ioana Ilea and Fabien Pierre	AN APPLICATION OF CONVOLUTIONAL NEURAL NETWORK IN THE QUALITY CONTROL OF MICROMETRIC WOVEN MESHES	**I2**	InovPr1
12:02	**102**	Isabelle Ziegler-Devin, Zahra Menana, Laurent Chrusciel and Nicolas Brosse	BIOMASS CONTAMINATED BY TRACE ELEMENTS FROM PHYTOREMEDIATION: A POTENTIAL VALORIZATION FOR BIOETHANOL PRODUCTION	**I2**	InovPr1
12:10	**191**	Baris Burak Kanbur, Sheng Quan Heng and Fei Duan	HYDRODYNAMIC PATTERN INVESTIGATION OF ETHANOL DROPLET TRAIN IMPINGEMENT ON HEATED ALUMINUM SURFACE	**I2**	InovPr1
12:18	**141**	Aliane Khaled, Benahmed Lamia, Sari Hassoun Zakaria and Abboudi Said	NUMERICAL STUDY OF STRUCTURES AROUND A TAPERED CUBE MOUNTED IN CHANNEL	**I2**	InovPr1
12:26	**186**	Nour Elislam Mougari, Jean François Largeau, Nabil Himrane, Madjid Hachemi and Mohand Tazerout	PREDICTION OF BIOGAS PRODUCTION FROM SEVERAL ORGANIC WASTES USING ARTIFICIAL NEURAL NETWORK AND GENETIC ALGORITHM	**I2**	InovPr1
12:34	**204**	Allaoua Soudani, André Donnot and Riad Benelmir	STUDY OF THE ADSORPTION KINETICS OF THE SILICA GEL/WATER COUPLE USING AN INNOVATIVE APPROACH BASED ON FREQUENCY ANALYSIS.	**I2**	InovPr1
14:45		**InovPr2 (Chairs : B. Morrone, V. Gisele)**			
14:53	**29**	Asma Jedidi, Manuel Marcoux and Jalila Sghaier	REMOVAL OF METHYLENE BLUE FROM AQUEOUS SOLUTIONS BY ADSORPTION ON BIOSORBENT MATERIALS	**G1**	InovPr2
15:01	**160**	Mathew Kk, Sandeep Ohol, Naveen Patil, Sudarshan Sanap and Virendra Bhojwani	ROLE OF PCM BASED HEAT SINK FOR REDUCING THE HOT SPOT ON SMPS BOARD: A NUMERICAL APPROACH	**G1**	InovPr2
15:09	**92**	Benmansour Sid Ahmed and Serdoun Nadjib	STUDY OF FREE VIBRATIONS OF SANDWICH PLATES BY HIERARCHICAL FINITE ELEMENT METHOD	**G1**	InovPr2
15:17	**32**	Hemaizia Abd El Kader and Bentebbiche Abdelhalim	THE EFFECT OF SWIRL INTENSITY ON THE FLOW BEHAVIOR AND COMBUSTION CHARACTERISTICS OF LEAN PROPANE-AIR FLAME	**G1**	InovPr2
15:25	**111**	Afif Larbi and Nahla Bouaziz	THERMODYNAMIC INVESTIGATION OF A SOLAR COGENERATION PLANT USING SUPERCRITICAL ORC	**G1**	InovPr2
15:33	**147**	Fatima Zohra El Hilali and Hicham Fihri Fassi	TOWARDS THE DEVELOPMENT OF AN OPTIMIZED NUMERICAL MODEL OF MECHANICAL SYSTEM WITH NATURAL MATERIAL	**G1**	InovPr2
15:41	**23**	Yoshiyuki Nishio, Bart Janssens, Karim Limam and Jeroen Van Beeck	VMS IMPLEMENTATION FOR CBRN DISPERSION MODELING IN THE ATMOSPHERE	**G1**	InovPr2

Materials & Applications

15:30		**Mat&Appl1 (Chair : A. Pétrissans)**			
15:38	**82**	Sara Ibn Elhaj, Yassine El Hamdouni, Soumia Mounir and Abdelhamid Khabbazi	CARACTERISATION THERMOMECANIQUE D'UN BIOMATERIAU A BASE DE TERRE ET LA PLANTE ALFA	**C2**	Mat&Appl1
15:46	**203**	Joel Koti, Crespin Prudence Yabi, Mohamed Gibigaye, Anne Millien and Christophe Petit	EFFECTS OF PALM KERNEL SHELL ON MIX OF LATERITIC SOIL AND SAND	**C2**	Mat&Appl1

15:54	**146**	Adel Daoud, Ali Cheknane and Jean-Michel Nunzi	ENHANCEMENT OF THE PERFORMANCE OF DYE-SENSITIZED SOLAR CELLS : SOLVATION MODEL	**C2**	Mat&Appl1
16:02	**142**	Zaid Ismahen, Merzoud Mouloud, Beji Hassen and Benazzouk Amar	FEASIBILITY STUDY OF SUSTAINABLE CONSTRUCTION MATERIAL BASED-DISS FIBERS: PHYSICO-MECHANICAL CHARACTERISATION	**C2**	Mat&Appl1
16:10	**39**	Fatma Taouche-Kheloui, Tarik Ben Chabane, Ourdia Fedaoui-Akmoussi, Madjid Almansba and Kahina Benkaci	MECHANICAL BEHAVIOR OF CONFINED CONCRETE BASED ON GLASS WASTE.	**C2**	Mat&Appl1
16:18	**184**	Khadija Oubella, Hind Mouhanni, Younes Bahammou and Ali Idlimam	MODELING SORPTION ISOTHERMS OF MOROCCAN SAFFRON (Crocus sativus L.,)	**C2**	Mat&Appl1
16:26	**205**	H. Ghildas Raoul Sekloka, Crespin P. Yabi, Mohamed Gibigaye and Rudi Cloots	ELABORATION OF A COMPOSITE IN SOUTHERN BENIN BASED ON CLAYEY SAND AND LAGOON SAND FOR USE IN PAVEMENT BASE LAYERS.	**C2**	Mat&Appl1
17:30		**Mat&Appl2 (Chairs : K.Choukairy , O. Lahoucine)**			
17:38	**8**	Madina Djeridane, Ali Zaidi and Mohamed Fatah Lakhdari	NUMERICAL AND EXPERIMENTAL INVESTIGATIONS OF DUNE SAND MORTAR EFFECTS ON FLEXURAL BEHAVIOR OF REPAIRED STEEL BARS-REINFORCED CONCRETE BEAMS	**D2**	Mat&Appl2
17:46	**149**	Rida Tazi, Aouatif Saad, Adil Echchelh and Mohammed El Ganaoui	NUMERICAL SIMULATION OF A GRANULAR FLOW ON A SMOOTH INCLINED PLANE	**D2**	Mat&Appl2
17:54	**194**	Barhdadi El Hassane	ON A NOVEL MICROMECHANICAL MODELING OF THE ELASTIC BEHAVIOR OF NANOCOMPOSITES	**D2**	Mat&Appl2
18:02	**118**	Ruitong Yang, Dong Li, Shu Zhang, Yangyang Wu and Changyu Liu	PHOTOTHERMAL CONVERSION PROPERTIES OF TIO2-ATO/PCM HYBRID NANOFLUIDS FOR SOLAR ENERGY APPLICATIONS	**D2**	Mat&Appl2
18:10	**31**	Maximilien Gibier, Girods Pierre and Yann Rogaume	PRODUCTION OF WOOD FIBERS FROM THERMALLY TREATED WOOD	**D2**	Mat&Appl2
18:18	**43**	Zine El Abidine Rahmouni, Tebbal Nadia and Imen Yamina Omri	THE RELATIONSHIP BETWEEN WATER ABSORPTION AND POROSITY OF GLASS POWDER AND BRICK WASTE MORTAR ACTIVATED	**D2**	Mat&Appl2
18:26	**169**	Sahabi Toufik and Balaska Smain	UNSTEADY HEAT TRANSFER IN BILAYER, AND THREE-LAYER MATERIALS	**D2**	Mat&Appl2

Materials & Modelisation

15:30		**Mat&Mod1 (Chairs : A.Carmasol , E-H.Laamri)**			
16:00		ATELIER MATHEMATICA/ WOLFRAM			
16:08	**84**	U.S. Mahabaleshwar, T Anusha, M El Ganaoui and R Bennacer	EFFECTS OF RADIATION AND SLIPS ON NEWTONIAN LIQUID FLOW DUE TO POROUS STRETCHING/SHRINKING SHEET WITH CARBON NANOTUBES	**K**	Mat&Mod1
16:16	**171**	Mohammed El Ganaoui and Jordan Hristov	MODELLING CAPILLARY ABSORPTION IN BUILDING MATERIALS WITH EMPHASIS ON THE FOURTH ROOT TIME LAW: A VARIETY OF MODELS, SOLUTIONS AND ANALYSIS	**K**	Mat&Mod1
16:24	**86**	K N Sneha, U S Mahabaleshwar, M El Ganaoui and R Bennacer	AN ANALYSIS OF INCLINED MHD JEFFERY FLUID FLOW DUE TO A STRETCHING/SHRINKING SURFACE IN CARBON NANOTUBES	**K**	Mat&Mod1

Physics & Innovative Materials

11:30		**PhInvMat1 (Chairs : M. Alma, R. Djedjig)**			
11:38	**199**	Prince Momar Gueye, Siham Kamali-Bernard and Dame Keinde	CHARACTERIZATION OF THE OMNIPROCESSOR SEWAGE SLUDGE ASH FOR A REUSE AS CONSTRUCTION MATERIAL	**E1**	PhInvMat1
11:46	**36**	Alexander Lukin and Oğuz Gülseren	TUNING THE SPATIALLY CONTROLLED GROWTH, STRUCTURAL SELF-ORGANIZING AND CLUSTER-ASSEMBLING OF THE CARBYNE-LIKE NANO-MATRIX DURING ION-ASSISTED PULSE-PLASMA DEPOSITION	**E1**	PhInvMat1
11:54	**200**	Ibrahima Diaw, Mactar Faye and Vincent Sambou	EFFECTS OF CHEMICAL TREATMENT ON SOME PHYSICAL PROPERTIES OF TYPHA	**E1**	PhInvMat1
12:02	**130**	Amine Laaouatni, Nadia Martaj, Rachid Bennacer, Mohamed El Omari and Mohammed El Ganaoui	FABRICATION AND THERMAL CHARACTERIZATION OF A STABLE MIXTURE OF PHASE CHANGE MATERIAL FOR INTEGRATION IN BUILDING WALLS	**E1**	PhInvMat1
12:10	**164**	Sanae Janati, Izeddine Zorkani and Anouar Jorio	MAGNETIC FIELD AND HYDROSTATIC PRESSURE EFFECTS ON THE DIAMAGNETIC SUSCEPTIBILITY ON SINGLE DOPANT STATES IN SI/SIO2, GAAS/GAALAS AND HGS/CDS CORE/SHELL QUANTUM DOT	**E1**	PhInvMat1
12:18	**119**	Ayda Halouani, Mohammed Nouari, Hamid Makich, Badis Haddag and Julien Yvonnet	MECHANICAL CHARACTERIZATION OF POLYAMIDE (PA12) OBTAINED BY SELECTIVE LASER SINTERING	**E1**	PhInvMat1
12:26	**206**	Zoheir Akil, Mostefa Zemouli, Habib Boutaleb, Kadda Amara, Friha Khelfaoui and Mohammed Elkeurti	FIRST-PRINCIPLE STUDY OF STRUCTURAL, ELASTIC, ELECTRONIC, OPTIC AND THERMODYNAMIC PROPERTIES OF LI2BASNX4 (X = S AND SE) COMPOUNDS	**E1**	PhInvMat1
17:30		**PhInvMat2 (Chairs : D. Guilbert , F.Mustapha)**			
17:38	**170**	Georgie Crewdson and Marcello Lappa	PRELIMINARY INVESTIGATION INTO THE BEHAVIOUR OF NON-ISODENSE PARTICLES IN CHAOTIC THERMOVIBRATIONAL FLOW	**D1**	PhInvMat2
17:46	**207**	Keteb Mohamed, Boutaleb Habib, Zemouli Mostefa, Khelfaoui Friha, Amara Kadda, Akil Zoheir, Kadi Fatima and Elkeurti Mohammed	AB INITIO PREDICTION OF THE STRUCTURAL, ELECTRONIC, ELASTIC, OPTICAL, THERMODYNAMIC AND THERMOELECTRIC PROPERTIES OF HALF-HEUSLER TERNARY COMPOUND LIALSI	**D1**	PhInvMat2
17:54	**182**	Bazzine Zineb, Dobbi Abdalmadjid and Lebtahi Hamid	THE EFFECT OF EMULSIFIERS IN OIL-BASED MUD ON PETROPHYSICAL PARAMETERS	**D1**	PhInvMat2
18:02	**28**	Ane Errarte, Aliaksandr Mialdun, Maialen Aginagalde, Valentina Shevtsova and M. Mounir Bou-Ali	TRANSPORT PHENOMENA IN C60-THN-TOL NANOFLUID: MICROGRAVITY AND ON GROUND PRELIMINARY RESULTS.	**D1**	PhInvMat2
18:10	**115**	Redouane En-Nadir, Haddou El Ghazi, Walid Belaid, Anouar Jorio and Izeddine Zorkani	DIFFERENT OPTICAL TRANSITIONS IN SINGLE PARABOLIC QW MADE OUT OF INGAN/GAN UNDER THE EFFECT OF TEMPERATURE, SIZE-STRUCTURE, AND INDIUM FRACTION .	**D1**	PhInvMat2
18:18	**181**	Yacine Hamza, Yamina Mebdoua, Mohammed El Ganaoui and Taha Houssine Zerguini	SPHEROIDAL RADIAL FUNCTION IN UNSTEADY HEAT TRANSFER FOR THE PLASMA SPRAY PROCESS	**D1**	PhInvMat2
18:26	**208**	Kadi Fatima, Zemouli Mostefa, Boutaleb Habib, Khelfaoui Friha, Amara Kada, Keteb Mohamed and Elkeurti Mohammed	THEORETICAL PREDICTION OF THE STRUCTURAL, ELASTIC, ELECTRONIC, OPTICAL AND THERMOELECTRIC PROPERTIES OF HALF-HEUSLER LIBGE	**D1**	PhInvMat2

Porous Materials

17:30		**PorMat1 (Chairs : R. Absi, S.Ladouy)**			
17:38	**202**	Nour El Houda Ben Mustapha, Ibtissem Boumnijel, Mohammed el Ganaoui and Daoued Mihoubi	COMPARATIVE STUDY OF STATIONARY AND TEMPERING CONVECTIVE DRYING PROCESSES OF A DEFORMABLE SATURATED POROUS MEDIUM	**H2**	PorMat1
17:46	**173**	Abdennacer Belazizia and Said Abboudi	EFFECT OF MAGNETIC FIELD ON CONVECTION HEAT TRANSFER INSIDE AN INCLINED POROUS ENCLOSURE.	**H2**	PorMat1
17:54	**152**	Shreyasi Mittal	INNOVATIVE MATERIALS AND GEOSYNTHETICS ASPECTS IN DESIGNING	**H2**	PorMat1
18:02	**12**	Rida Tazi, Aouatif Saad, Adil Echchelh, Mohamed Hattabi and Mohammed El Ganaoui	NUMERICAL STUDY OF RESIN TRANSFER MOLDING DURING CURING PROCESS FOR THICK COMPOSITES MATERIALS	**H2**	PorMat1
18:10	**106**	Ahmed Keddouri, Lazreg Hadji and Nafissa Zouatnia	EFFECT OF POROSITY ON THE BENDING ANALYSIS OF FUNCTIONALLY GRADED SANDWICH PLATES	**H2**	PorMat1
18:18	**215**	Saadi Amine Aouanouk, Rafik Absi and Abdelkader Mouheb	NUMERICAL STUDY OF DOUBLE-DIFFUSIVE NATURAL CONVECTION IN SQUARE ENCLOSURE WITH PARTIALLY HEATED AND COOLED FROM CORNERS	**H2**	PorMat1
18:26	**44**	Zine El Abidine Rahmouni, Tebbal Nadia, Mekki Maza, Belouadah Messaouda, Habeta Fouzia and Kaddour Imane	EXPERIMENTAL STUDY OF THE EFFECT OF BINARY COMBINATION OF SILICA FUME AND CERAMIC WASTE TO PRODUCE MORTAR USING LOCAL SUSTAINABLE MATERIALS	**H2**	PorMat1
13:00		**PorMat2 (Chairs : A.Kheiri, A.Saad)**			
13:08	**52**	Amal Kraiem and Jalila Sghaier	NUMERICAL STUDY OF THE BOILING PROCESS IN POROUS MATERIALS DURING THE SUPERHEATED STEAM DRYING	**B1**	PorMat2
13:16	**93**	Siheme Guezmir, Amina Mataoui and Ouahiba Guerri	NUMERICAL STUDY OF THE WAKE INDUCED BY A POROUS DISC UNDER DEFLECTED INFLOW	**B1**	PorMat2
13:24	**85**	T Anusha, U S Mahabaleshwar, M El Ganaoui and R Bennacer	ON THE DIFFUSION OF A CHEMICAL REACTIVE SPECIES OF JEFFERY HYBRID NANOFLUID OVER A STRETCHING/SHRINKING SHEET IN A POROUS MEDIUM WITH SLIPS: BRINKMAN MODEL	**B1**	PorMat2
13:32	**87**	Lazreg Hadji, Fabrice Bernard and Nafissa Zouatnia	STATIC AND FREE VIBRATION ANALYSIS OF FUNCTIONALLY GRADED BEAMS WITH POROSITIES	**B1**	PorMat2
13:40	**188**	Ibrahima Diaw, Mactar Faye and Vincent Sambou	INFLUENCE OF CHEMICAL TREATMENT ON THE PHYSICAL AND HYGROSCOPIC CHARACTERISTICS OF TYPHA AGGREGATES USED IN BUILDING CONSTRUCTION	**B1**	PorMat2
13:48	**178**	Aicha Idoum, Lahcen Bammou, Mohamed Errami and Ahmed Aharoune	THERMO-PHYSICAL STUDY OF FIRED CLAY BRICKS INCORPORATING AGRICULTURAL WASTE	**B1**	PorMat2

Storage & Renewable Energy

13:00		**SRnE1 (Chairs : I. Ziegler, B. Colin)**			
13:08	**166**	Mourad Benfares, Izeddine Zorkani, Sanae Janati Edrissi and Ali Didi Deddik	COMPARATIVE ANALYSIS OF MEASURED AND SIMULATED PERFORMANCE OF GRID CONNECTED PV POWER PLANT UNDER FEZ CLIMATIC CONDITIONS	**B2**	SRnE1

13:16	**193**	Sidi Mohamed Karim Benslimane, Antonio Mañino Ferrando, Maria Clavero Glabert and Ali Nemdili	EXPERIMENTAL STUDY ON EFFECT SWEPT BLADE OF WELLS TURBINE, PROBLEM OWC	**B2**	SRnE1
13:24	**35**	Yousra Lahmer, Chaker Abla and Achraf Nedjar	COMPARATIVE STUDY OF PHOTOVOLTAIC ENERGY STORAGE SYSTEMS IN BUILDINGS: HYDRO-PUMPING / BATTERIES	**B2**	SRnE1
13:32	**101**	Missaoui Kolthoum, Frikha Nader, Kheiri Abdelhamid, Gabsi Slimane and El Ganaoui Mohammed	ENERGETIC PERFORMANCE ANALYSIS OF TWO CONFIGURATION OF A SOLAR CONTINUOUS ADSORPTION REFRIGERATION SYSTEM	**B2**	SRnE1
13:40	**24**	Samah Laalej, Bouatem Abdelfattah, Ahmed Al Mers and Rabii El Maani	CORRECTION OF AERODYNAMIC COEFFICIENTS TO TAKE INTO ACCOUNT STALL DELAY EFFECTS	**B2**	SRnE1
13:48	**91**	Sara Ladouy, Samir Briche, Najib El Mernissi and Khabbazi Abdelhamid	EXPERIMENTAL INVESTIGATION OF A SOLAR STILL BASED ON A HUMIDIFICATION-DEHUMIDIFICATION CYCLE (HDH) TO TREAT WASTE-WATER CONTAMINATED BY PHOSPHATE FERTILIZERS.	**B2**	SRnE1
17:30		**SRnE2 (Chair : A.Sabeur)**			
17:38	**6**	Mahdi Majidniya, Benjamin Remy, Thierry Boileau and Majid Zandi	FREE PISTON STIRLING ENGINE (FPSE): A GENERAL SURVEY FROM MODELLING TO APPLICATION	**H1**	SRnE2
17:46	**195**	Pluvinage Guy and Capelle Julien	HYDROGEN EMBRITTLEMENT OF PIPE STEELS	**H1**	SRnE2
17:54	**177**	Ratovonarivo Noarijaona, Marcelin Hajamala Andrianantenaina and Zeghmati Belkacem	NUMERICAL STUDY OF AN UNSTEADY NEWTONIAN FLUID FLOW IN THE RECTANGULAR RESERVOIR WITH AN ORIFICE	**H1**	SRnE2
18:02	**201**	Mame Cheikh Diouf, Mactar Faye, Ababacar Thiam, Alphousseyni Ndiaye and Vincent Sambou	MODELING OF THE PV MODULE OPERATING TEMPERATURE FOR VARIOUS WEATHER CONDITIONS IN THE TROPICAL REGION	**H1**	SRnE2
18:10	**103**	Yassmine Rghif, Belkacem Zeghmati and Fatima Bahraoui	NUMERICAL ANALYSIS OF THE INFLUENCES OF BUOYANCY RATIO AND DUFOUR PARAMETER ON THERMOSOLUTAL CONVECTION IN A SQUARE SALT GRADIENT SOLAR POND	**H1**	SRnE2
18:18	**34**	Achraf Nedjar, Abla Chaker, Zihao Tian, Rachid Bennacer and Rafik Absi	NUMERICAL COMPARISON OF DIFFERENT EXCHANGER GEOMETRIES FOR PHOTOVOLTAIC/THERMAL (PV/T) COLLECTORS	**H1**	SRnE2
18:26	**21**	Roudouane Laouar and Olaf Wünsch	NUMERICAL INVESTIGATION OF THE TEMPERATURE AND FLOW FIELD IN THE SOLAR CHIMNEY POWER PLANT	**H1**	SRnE2
11:30		**SRnE3 (Chairs : A. Hamzaoui, C.Simon)**			
11:38	**113**	Nisrine Hanchi, Hamid Hamza, Jawad Lahjomri, Khalid Zniber and Abdelaziz Oubarra	NUMERICAL STUDY OF THERMAL ENERGY STORED INSIDE A PARTITION WALL PROVIDED WITH PHASE CHANGE MATERIAL	**A2**	SRnE3
11:46	**192**	Feriel Mustapha, Marwa Elyassi, Ikram Elabbassi, Abdelhak Kaci, Elhadi Kadri and Moumen Darcherif	NUMERICAL STUDY ON COMBINING CORTEN STEEL PCM FOR APPLICATION ON CONTAINER WALLS	**A2**	SRnE3
11:54	**153**	Elhadji Ibrahima Cisse, Baye Alioune Ndiogou and Ababacar Thiam	OPTIMISATION OF SOLAR CHIMNEY WITH HORIZONTAL ABSORBER FOR BUILDING VENTILATION: CASE OF SUB-SAHARAN ZONE (DAKAR SENEGAL)	**A2**	SRnE3
12:02	**83**	Ghilen Najeh, Elganaoui Mohammed, Benelmir Riad and Gabsi Slimane	PERFORMANCE OF A NOVEL SOLAR-BIOMASS ADSORPTION CHILLER	**A2**	SRnE3

12:10	**99**	Yassine Sougtan, Abdelhamid Kheiri, Hamid El Qarnia and Mohammed Khalij	STATIC AND DYNAMIC CFD SIMULATION OF A SINGLE TANK STORAGE UNIT (THERMOCLINE) WITH A PACKED BED	**A2**	SRnE3
12:18	**18**	Mahdi Goucem and Alaeddine Mekahlia	STUDY OF A CONCENTRATION THERMO-SOLAR CONVERTER COUPLED TO A THERMAL MACHINE	**A2**	SRnE3
12:26	**198**	Brahim Amahan, Hamid El Qarnia and Ali El Afif	THERMAL ANALYSIS OF MELTING OF A PHASE CHANGE MATERIAL INSIDE A FINNED RECTANGULAR ENCLOSURE EQUIPED WITH DISCREET PROTRUDING PULSED HEAT SOURCES	**A2**	SRnE3

Thermal Buildings and Building Materials

13:00		**ThB&BMat1 (Chairs : C.Tanougast, M. Rahim)**			
13:08	**81**	Zine El Abidine Rahmouni, Belouadah Messaouda and Tebbal Nadia	CONTRIBUTION TO THE STUDY OF THE DEVELOPMENT OF NON-DESTRUCTIVE AND DESTRUCTIVE TESTS OF GLASS POWDER CONCRETE AT HIGH TEMPERATURES	**F1**	ThB&BMat1
13:16	**144**	Hamadou-Ali Mohamed, Benazzouk Amar, Ben Hamed Haikel and Beji Hassen	DEVELOPMENT OF CELLULAR CONSTRUCTION MATERIALS CONTAINING FLAX PARTICLES: PHYSICO-MECHANICAL AND THERMAL PROPERTIES	**F1**	ThB&BMat1
13:24	**33**	Arsalan Shirani, Alexander Merzkirch, Stephan Leyer, Frank Scholzen and Stefan Maas	ENERGY PERFORMANCE COMPARISON OF AIR BASED HEATING VERSUS WATER BASED HEATING SYSTEMS IN EFFICIENT RESIDENTIAL BUILDINGS	**F1**	ThB&BMat1
13:32	**97**	Karim Ragui, Morsli Souad, Mohammed El Ganaoui and Rachid Bennacer	ADVANCED VENTILATION STRATEGY COUPLED TO ENERGY EFFICIENCY FOR BUILDING APPLICATIONS	**F1**	ThB&BMat1
13:32	**22**	Amaia Irigaray, Maroua Maaroufi and Kamilia Abahri	EXPERIMENTAL INVESTIGATION ON THE INFLUENCE OF ACCELERATED AGING ON THE HYGROTHERMAL PROPERTIES OF EXPANDED POLYSTYRENE MORTARS	**F1**	ThB&BMat1
13:40	**217**	Anouar Souissi, Maher Chaabene and Moez Bouchouicha	PHOTOVOLTAIC ENERGY OBSERVATION BASED ON DYNAMIC FORECASTING APPROACH	**F1**	ThB&BMat1
14:45		**ThB&BMat2 (Chairs :S-A. Harouna , M. Xiaoyan)**			
14:53	**42**	Aouane Abderrahim, Rahal Driss Djaouad and Rahal Narimane Dalila	IMPROVING QUALITY IN CONSTRUCTION WITH A SOFTWARE TO ASSIST THE QUALIBAT DECISION	**G2**	ThB&BMat2
15:01	**114**	Assia Mansouri	OPTIMIZATION OF CHEMICAL TREATMENT OF AGRICULTURAL WASTE: DATE PALM STALKS	**G2**	ThB&BMat2
15:09	**143**	Zerrouki Redouane, Benazzouk Amar, Ben Hamed Haikel and Beji Hassen	PERFORMANCES OF SUSTAINABLE CONCRETE BASED ON HEMP PARTICLES : FORMULATION AND CHARACTERISATION	**G2**	ThB&BMat2
15:17	**157**	Xinyi Chen, Antonio Pizzi, Emmanuel Fredon and Christine Gerardin	TANNIN-BASED SELF-BLOWING BIOMASS FOAM WITH EXCELLENT THERMAL INSULATION AND FLAME RETARDANCY	**G2**	ThB&BMat2
15:25	**20**	Tanenbé Teussingka, Rabah Djedig, Bale Baidi Blaise, Mohammed El Ganaoui, Gambo Betchewe and Jacques Michel Njankouo	THERMOGRAPHY AND DRYING STUDY OF THREE CAMEROONIANS WOOD SPECIES OF USED IN NGAOUNDERE REGION: AYOUS (TRIPLOCHITON SCLEROXYLON), SAPELLI (ENTANDROPHRAGMA CYLINDRICUM) AND IROKO (MILICIA EXCELSA)	**G2**	ThB&BMat2

13:00		**ThB&BMat3 (Chairs : G. Pluvinage , C. Chen)**			
13:08	**41**	Salma Kouzzi	TOWARD EFFICIENT TRANSBORDER (MOROCCO, SPAIN) MATERIALS OF EFFICIENT BUILDINGS IN NORTHERN MOROCCO CLIMATE	**J**	ThB&BMat3
13:16	**51**	Dongxia Wu, Mourad Rahim, Mohammed El Ganaoui and Rachid Bennacer	NUMERICAL STUDY OF A NOVEL BUILDING ENVELOPS INTEGRATING PCM AND BIO-BASED MATERIALS	**J**	ThB&BMat3
13:24	**172**	Marwa El Yassi, Ikram El Abbassi, Yannick Mélinge and Alexandre Pierre	COMPARATIVE ANALYSIS OF WALLS COMBINATING PHASE CHANGE MATERIALS AND A BUILDING MATERIAL	**J**	ThB&BMat3
13:32	**218**	Harry Ramenah, Michel Kam and Camel Tanougast	MODELING ENERGY PRODUCTION AND CONSUMPTION FROM THE GREEN PLAFORM	**J**	ThB&BMat3
13:40	**216**	Salma Lahmar, Rachida Idchabani and Mostafa Maalmi	MULTI-OBJECTIVE OPTIMIZATION OF BUILDING USING AN EFFICIENT KRIGING-BASED METHOD	**J**	ThB&BMat3
13:48	**214**	Yanis Masdoua, Moussa Boukhnifer and Kondo Adjallah	CONTROL OF BUILDING ENERGY REDUCTION AND TEMPERATURE REGULATION	**J**	ThB&BMat3

Energy Mat. & photonic (Symposium 1)

17:00		**Chairs : H. Derbal, J. M. Nunzi**			
17:08	**210**	Meriem Adjailia, Hassina Derbal-Habak, Yamina Hamaizi and Houria Triki	SIMULATION AND ANALYSIS OF POST MORTEM DATING USING FIBER BRAGG GRATING SENSORS	**Symp1**	Symp1
17:16	**209**	Nadjet Deddouche, Hafida Chemouri and Hassina Derbal Habak	COMPUTATIONAL PREDICTION OF THE ANTICANCER ACTIVITY OF THE FULLERENE NANOSTRUCTURE'S DERIVATIVES. DFT CALCULATION	**Symp1**	Symp1
17:24	**212**	Hassina Derbal Habak and Jean Michel Nunzi	USING NEW FULLERENE [60] OBTAINED VIA C60 DIANION FOR OPV CELLS	**Symp1**	Symp1

Energy / Mat. & µGravity (Symposium 2)

16:30		**Chairs : J. Ouazzani - R. Bennacer**			
16:50		J. Ouazzani	Thermocapillary Flow Transition in an Evaporating Liquid Layer into a Heated Cylindrical Cell	**Symp2**	Symp2
17:00		Liu Qiu-Sheng,	Space Experiments of Drop and Film Evaporation in China Space Station in 2022	**Symp2**	Symp2
17:10		Marcello Lappa	Complex fluids and particle self-organization in Microgravity conditions	**Symp2**	Symp2

17:20		Mounir Bouali	Analysis of thermodiffusion phenomenon in ternary and nanofluid mixtures	Symp2	Symp2
		Energy / Mat. & LBM Computation (Symposium 3)			
16:30		**Chairs : S. Houat - M. El Ganaoui**			
16:45		Karim Ragui	Technics on 3D Natural convection	Symp3	Symp3
17:00		Mahfoudi Sahraoui	Advection/Diffusion : Mixed convection	Symp3	Symp3
17:15		Mehdi Tekitek	Coupled phenomenon	Symp3	Symp3

ICOME21 Awards

Best Presentation Award With Wolram

The ICOME event want to reward involvement, merit and professionalism of young scientist students. An award of better presentation (Phd) will be provided for each sessions and consist on the ICOME medal and free fees for the next ICOME edition.

Wolfram Mathematica award involvement and merit of young scientist students doing research using theoretical/Mathematical approach. Priority is given to student using Symbolic computing.

Averroes Award

The new edition of the Averroes[1] *prize will take place at this conference, and aims to highlight a scientist or a decision maker who contributed significantly to the development and vitality of international scientific partnership with results, training of young researchers going to scribing the action in a permanent way.*

"Ignorance leads to fear, fear leads to hatred and hatred leads to violence. That is the equation"

(Averroes, 1126-1198)

[1] Averroes (Ibn Rochd) European intellectual, born in Spain, died in Morocco, both a philosopher, a theologian, a lawyer, a mathematician and a 12th century Andalusian doctor

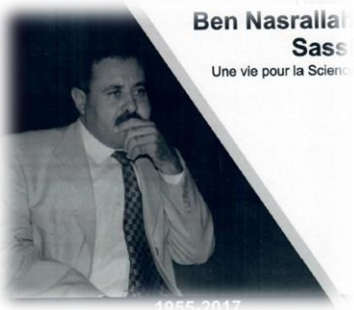
AVERROES PRIZES

2016: Michel COMBARNOUS, French Academy of Sciences

Michel Combarnous, *Professor "Emeritus" at the University of Bordeaux, has been associate professor at the University of Gabès (Tunisia) (2006-2011). A specialist in fluid mechanics and energetics, he was encharged of the Department « Engineering Sciences » at CNRS (1980-1985). He is a founding member of « Académie des Technologies », and Corresponding Member of the Academy of Sciences, since 1978 (www.academie-sciences.fr). Prof. Combarnous has accomplished a huge cooperative work involving north-south Mediterranean cooperation*

2017: Abdul Majeed MOHAMAD, Education Excellence awards

Abdul Majeed Mohamad *Professor in Eastern Mediterranean University, Cyprus (1993-1999). Since 2000 he is Prof. of thermofluid in Dept. of Mechanical Engineering, University of Calgary, Canada. Dr. Mohamad held few admin positions, director of graduate studies, acting director for Centre for Environmental Engineering Centre for Research and Education. Dr. Mohamad has been invited by many institutes around the world (France, Germany, China, USA, Poland, Saudi Arabia, Canada, Portugal, Morocco, Tunisia, Turkey, Indonesia, and Ecuador), as invited Professor and lecturer. He is one of the highly cited researches. Dr. Mohamad elected Fellow Member of American Society of Mechanical Engineer (ASME).Scientific council member of International Centre for Heat and Mass Transfer. He has been awarded Research Excellence and Graduate Teaching Excellence awards from University of Calgary, Dept. of Mechanical Engineering, Canada.*



2018: *Sassi BEN NASRALLAH, Presidential award in 2003*

Born in 1955, Sassi Ben Nasrallah is a doctor in physical sciences. He joined higher education as an assistant professor at ENIS and then as a lecturer and was then promoted to the post of Professor of Higher Education at ENIM. He has contributed a lot to teaching, especially research, since in 1999 he created the Laboratory of Thermal and Energetic Systems, which is one of the most renowned laboratories both nationally and internationally. He is the author of more than 300 scientific articles in major journals, and he supervised several PhD students. Sassi Ben Nasrallah won a presidential award in 2003. The professor has also led several research projects as well as scientific meetings. He has been a professor in both Tunisian and French universities, and is well known for his studies at the Central School of Paris, IMFT Toulouse, Mine's School of Nantes and many others. Sassi Ben Nasrallah founded and chaired the Tunisian Energy Association (ATE). The Ministry of Higher Education announced, on June 30 2017, the death of Sassi Ben Nasrallah, professor of higher education at the National School of Engineering of Monastir.

2019: Abdelilah BENYOUSSEF, member of the Moroccan Academy of Science and Technology (Hassan II)

Abdelilah BENYOUSSEF: *received his (Doctorat d'état) degree from the Paris-Sud University in 1983. He is a permanent member of the Moroccan Hassan II Academy of Science and Technology, since 2006. He is associate professor in the materials and nanomaterials center of the Moroccan Foundation for Advanced Science, Innovation and Research. He is National coordinator of the Competences Pole of Condensed Matter and Systems Modeling. He is also an editor in chief of the Moroccan Journal of Condensed Matter. He is President of the Moroccan Society of Statistical Physics and Condensed Matter. He has been visiting professor in many research centers, laboratories and Universities. The main interest topics of Abdelilah Benyoussef are Ab initio calculation and Monte carlo method in modeling and simulation of new materials for renewable energy; Magnetism and phase transition in condensed matter; complex systems and critical self-organization in statistical physics. He is a co-author of more than 400 research publications and book chapters and about 100 conference presentations including numerous invited papers and talks.*

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