IEEE

IRSEC'19

7th International Renewable and Sustainable Energy Conference

Nov.27-30, 2019 - Agadir, Morocco

Program and useful information

Under the Aegis of

Kingdom of Morocco
Ministry of Energy, Mines, and Environment

Kingdom of Morocco
Ministry of Industry, Trade, Green and Digital Economy

MSTI Mediterranean Space of Technology and Innovation
www.med-space.org

masen
Strategic Partner

Energy Storage
A subsidiary of Hydro-Québec

Royaume du Maroc
Région Souss Massa

MASciR Moroccan Foundation for Advanced Science, Innovation and Research

PAREMA Partenariat énergétique Maroco-Allemand Deutsch-Marokkanische Energiepartnerschaft

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

amee
Moroccan Agency for Energy Efficiency

IEEE
Advancing Technology for Humanity

ISES
International Solar Energy Society

Mohammed V University of Rabat

Abdelmalek Essaadi University

Faculty of Science
Rabat, Morocco

Abdelmalek Essaadi University

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Greetings

Dear participants,

Welcome to Agadir, where the 7th edition of the International Renewable and Sustainable Energy Conference is held. This year, more than 420 scientific papers were submitted from 41 countries. The selected works will be published in the IEEE Digital Library and a selection will be published in renowned journals.

Undoubtedly, IRSEC is now a high-quality scientific conference and one of the largest in Africa and the MENA region about renewable energy. It is an honor for Morocco to be behind this initiative; it is also essential today for the region to have such an exchange platform for innovation and R&D in renewable energy. IRSEC holds a network for our researchers and experts, and helps to create synergies and to nourish the debate around the most current issues.

Masen's active participation in IRSEC is yet another testament to its ongoing support for scientific research in the renewable energy sector. For that matter, Masen is committed to developing a market relevant R&D strategy that is able to respond to business opportunities or to improve existing technologies in terms of performance or competitiveness. The results of the Masen R&D platform in Ouarzazate are actually convincing: 14 committed partnerships have been signed so far.

At the dawn of its 10th anniversary, Masen is more than ever a consistent and devoted partner to IRSEC. I am delighted to note the growing success of this conference and wish you a rich and exciting event.

Mustapha Bakkoury

CEO, Masen

Foreword

It is our real pleasure to welcome you to the 7th edition of the International Conference on Renewable and Sustainable Energy (IRSEC'19), taking place in Agadir, Morocco in November 27 – 30, 2019.

Placed under the auspices of the Ministry of Energy, Mines and Environment, and the Ministry of Industry, Commerce and Green and Digital Economy the conference, IRSEC'19 is co-organized by the Mediterranean Space of Technology and Innovation (MSTI) in partnership with the Moroccan Agency for Sustainable Energy (MASEN-Strategic Partner), Mohammed V University in Rabat (UM5), GIZ, CNRST, Hydro Quebec, and several other National and International organizations (http://www.med-space.org/irsec19).

The latest IRSEC distinction is its global ranking by Google Scholar: IRSEC publications are now the only African and MENA ranked in TOP 20 publications in the field of "Solar Energy" (14th in the World).

Based upon its world-class scientific standards, IRSEC'19 is co-technically sponsored by two renowned international scientific and technical organizations concerned by its scope and the topics it covers, namely, Institute of Electrical and Electronics Engineers (IEEE) and International Solar Energy Society (ISES).

IRSEC'19 succeeded to attract more than 400 participants from academia, industry and government representing about forty nationalities taking part in this event. A very rich and attractive scientific program is expected featuring recent advances in renewable energies and sustainable development. Several workshops and tutorials led by world-renowned experts are scheduled. In addition, a large exhibition space is allocated to accommodate national and international industries concerned by IRSEC scope and topics. The fact that confirms this international conference as an essential forum for exchange, networking and technology transfer among experts, academics, industrialists and decision-makers in matters related with renewable energies, energy efficiency and sustainable development.

We would like to extend our most sincere thanks and gratitude to all the TPC members, to the keynotes and tutorials speakers, workshop and special sessions chairs and organizers and to all the organizing committee members for the amazing job that contributed to the overwhelming success of IRSEC'19.

We wish all the participants a wonderful IRSEC'19 experience and the pleasant stay in the beautiful city of Agadir.

Prof. Mohamed Essaaidi
National Higher School of IT (ENSIAS), Rabat, Morocco

Dr. Youssef Zaz
President of MSTI
& Abdelmalek Essaadi Univ., Asso. Prof.
Faculty Science, Tetouan, Morocco

General Chairs

Prof. Ahmed Ennaoui
President of the Scientific Council of IRESEN, Morocco

TPC Chair

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Mustapha Bakkoury, President of MASEN - Moroccan Agency for Sustainable Energy
Philipp Schattenmann, Director at GIZ
Mohamed Khalfaoui, Director of CNRST, Morocco
Said Mouline, Director of AMEE - National Agency for Energy Efficiency
Mohammed El Rhachi, President, Mohammed V University, Rabat, Morocco
Omar Hilli, President of Ibn Zohr University, Agadir, Morocco
Mohammed Errami, President of Abdelmalek Essaadi University, Tetouan, Morocco
Nawal Chraibi, executive director of MAScIR - Moroccan Foundation for Advanced Science, Innovation and Research
Hicham Bouzekri, R&D Director at MASEN

General Chairs

Mohamed Essaaidi, National Higher School of IT (ENSIAS), Rabat, Morocco
Youssef Zaz, President of MSTI & Asso. Prof., Faculty of Science, Abdelmalek Essaadi University, Tetouan, Morocco

TPC Chair

Ahmed Ennaoui, President of the scientific council of IRESEN

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Bulent Akinoglu, Middle East Technical University (Turkey)
Khalil Amine, Argone National Lab (USA)
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hajji bekkay, ENSA Oujda (Morocco)
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Abdelilah Benyoussef, Hassan II Academy (Morocco)
Badre Bossoufi, EST-Oujda (Morocco)
Mongi Bouaicha, CRTEn (Tunisia)
Jamila Boudaden, Fraunhofer (Germany)
Othmane Bouhali, Texas University (Qatar)
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Soumia El Hani, Mohammed V University, Rabat (Morocco)
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Salima El Makhtari, UIR (Morocco)
Youssef Errami, Faculty of Science, Eljadida (Morocco)
Ahmed Essadki, ENSET (Morocco)
Vladimir Falko, National Graphene Institute, Manchester (UK)
Joao A. Farinha Mendes, Uni. Energia Solar, Eólica e dos Oceanos (Portugal)
Amir-Ali Feiz, Université d'Evry Val-d'Essonne, LMEE (France)
Adelino Ferreira, University of Coimbra (Portugal)
Benjamin Figgis, QEERI (Qatar)
Bruno Francois, Ecole Centrale de Lille (France)
Mohammed Garoum, EST, Mohammed V University in Rabat (Morocco)
Salif Gay, Université de Thiès (Senegal)
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Yogi Goswami, University of South Florida (USA)
Oliver Groning, Empa Materials Science and Technology (Switzerland)
Thomas Hannappel, Ilmenau University of Technology (Germany)
Peter Heller, DLR (Germany)
Mohamed Henini, Nottingham University (UK)
Andreas Hintennach, Mercedes-Benz (Germany)
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Yaser Jararweh, Jordan University of Science and Technology (Jordan)
Mustapha Jouiad, Masdar Institute of Science and Technology (UAE)
Abdelkader Kara, University of Central Florida (USA)
Nachida Kasbadji Merzouk, UDES – CDER (Algeria)
Asmae Khaldoun, Al Akhawayn University (Morocco)
Marwan Khraisheh, Masdar Institute of Science (UAE)
Shinichi Komaba, Tokyo University of Science (Japan)
Djamila Rekioua, University of Bejaia (Algeria)
Moncef Krarti, Colorado University (USA)
Najma Laaroussi, EST, Mohammed V University in Rabat (Morocco)
Salah Laghrouche, UBTM (France)
Giorgio Mannina, UNIPA (Italy)
Diego Martinez Plaza, CIEMAT (Spain)
Joao Martins, Universidade NOVA de Lisboa (Portugal)
Dieter Meissner, Tallinn University of Technology (Estonia)
Takashi Minemoto, Ritsumeikan University (Japan)
Tohru Miyake, Miraikikai, inc. (Japan)
Saad Motahhir, usmba (Morocco)
Tokio Nakada, Aoyama Gakuin University (Japan)
Khaja Nazeeruddin, Ecole Polytec. Federale de Lausanne (Switzerland)
Mohamed Ouassaid, EMI, Med V University in Rabat (Morocco)
Hamid Oughaddou, Institut des Sciences Moléculaires d'Orsay (France)
Serge Rashkeev, QEERI (Qatar)
Jochen Rentsch, Fraunhofer (Germany)
Benoit Robyns, HEI – Lille (France)
Teofilo Rojo, CIC energiGUNE (Spain)
Rachid Saadane, LETI, EHTP (Morocco)
Ismael Saadoune, FST, Cadi Ayyad University, Marrakech (Morocco)
Luis Martinez Salmero, University of Rovira i Virgili (Spain)
Edgardo Saucedo, Catalonian Institute for Energy Research (Spain)
Susan Schorr, HZB (Germany)
Ari Paavo Seitsonen, École Normale Supérieure, Paris (France)
Lee Seung Joo, Dongguk University (Korea)
Vinod Kumar Sharma, ENEA (Italy)
Abdelilah Slaoui, ICUBE/ CNRS-University of Strasbourg (France)
Greg P. Smestad, Solideas, San Jose (USA)
Abdelhafed Taleb, Chimie-Paristech (France)
Mohammed Tarbouchi, Royale military College (Canada)
Teodor Todorov, IBM (USA)
Abdelmounaim Tounzi, Université Lille 1, IUT A, Lille (France)
Hicham Tribak, Faculty of Science-Tetouan (Morocco)
Rasit Turan, Center for Solar Energy Research and Applications (Turkey)
Ruxandra Vidu, University of California Davis (USA)
Jud Virden, PNNL (USA)
Rachid Yazami, Nanyang Technological University (Singapore)
Karim Zaghib, Hydro-Quebec (Canada)
Ahmad Zahedi, James Cook University (Australia)
Eduardo Zarza Moya, CIEMAT-PSA (Spain)

Session/Workshop	Theme
S-I-PV	Solar Energy - PV
W1	Workshop 1 - Crystalline-Silicon Photovoltaics
W4	Workshop 4 - Next generation of Solar Devices
SS4	Special session 4 - Predicting materials and device structure
S-I-th	Session I - Solar Energy - Thermal
SS7	Special Session 7 - Quality Infrastructure for Solar Thermal Energy
S-II	Session II - Wind Energy
S-III	Energy efficiency
	Energy harvesting
W3	Workshop 3 - Energy Efficiency in Building and Industry
S-IV	Command and control systems for RE
	Simulation and Modelling for RE
S-V	Hydrogen energy storage
	Batteries and energy storage
W5	Workshop 5: Future Battery for e-Mobility & Stationary Storage Applications: Lithium-ion Technology and Beyond
SS-5	Special Session 5: Metal hydrides' Energy
S-VI	Renewable energy for IT equipments
	Smart Grid
	Green technology
S-VII	Biomass
SS1	Special session 1: Biomass and Biogas Energy
W2	Workshop 2: Renewable energy and desalination sustainability
SS2	Special session 2: Magnetocaloric refrigeration
SS3	Special session 3: Harnessing Local Resources for sustainable development

Program Overview

Wednesday

- Registration
- Opening Ceremony
- Kawtar Hafidi — P-KN01 (Plenary Room)
- Break
- Rachid Yazami — P-KN02 (Plenary Room)
- Mohammad A. Khaleel — P-KN03 (Plenary Room)
- David Newman — SS1-KN13 (Plenary Room)
- Mohamed Balli — +D6 (Room 1)
- Ilias Belharouak — P-KN05 (Plenary Room)
- Daniel Fruchart — SS2-KN11 (Room 1)
- SI-PV (1) Material (Room 3)
- Lunch
- Mohammad Khaja Nazeeruddin — W4-KN06 (Plenary Room)
- Helmut Tributsch — W4-KN07- (Plenary Room)
- Hady Hadiyanto — SS1-KN14 (Room 1)
- Marcus Bär — W4-KN08 (Plenary Room)
- Isam Janajreh — SS1-IS03 (Room 1)
- S-II (Room 2)
- S-III (Room 3)
- SS3 (Room 4)
- Thomas Hannappel — W4-KN09 (Plenary Room)
- Hassan El Bari — SS1-IS04 (Room 1)
- Abdelhafed Taleb — W4-KN10 (Plenary Room)
- Break / Posters Session I
- Fouad Ghamouss — SS3-(Plenary Room)
- Sébastien Poncet — SS2-KN12 (Room 1)
- Tarik Chafik — SS3-IS02 (Plenary Room)
- SS2 (Room 1)
- SI-PV (1) Material (Room 3)
- S-V & W5 (Room 4)
- Tutorial 1 by El Mehdi Salmani (Room 1)
- Tutorial 4 by Ahmed Ennaoui (Room 3)
- Tutorial 5 By Mouad Dahbi & Amine Bouibes (Room 4)
- Gala Dinner

Thursday

- Intro W5
- Amine Khalil — W5-KN15 (Plenary Room)
- Shahzada Ahmad — W4-KN27 (Room1)
- SS7
- Tetsuya Osaka — W5-KN16 (Plenary Room)
- Morten Madsen — W4-KN28 (Room1)
- (Room 2)
- SS1 (Room 3)
- Zhongwei Chen — W5-KN17 (Plenary Room)
- Samrana Kazim — W4-KN29 (Room1)
- Break
- Xinping Qiu — W5-KN18 (Plenary Room)
- Stefaan De Wolf — W1-KN33 (Room 1)
- Dominique Guyomard — W5-KN20 (Plenary Room)
- Hisham Nasser — W1-IS18 Room1)
- W3 (Room 3)
- Karim Zaghib — W5-KN21 (Plenary Room)
- Olindo Isabella — W1-KN32 (Room 1)
- Lunch
- Sarper Sarp — W2-KN24 (Plenary Room)
- Helcio Orlande — W3-KN35 (Room 1)
- S-VI (Room 2)
- Lijo Francis — W2-KN25 (Plenary Room)
- Mohammed Garoum — W3-IS06 (Room 1)
- S1-PV (2) (Room 3)
- S-V & W5 (Room 4)
- Mohammed Al-Abri — W2-IS17 (Plenary Room)
- S-IV (Room 2)
- Asmae Khaldoun — W3-IS16 (Room 1)
- Break / Posters Session II
- W2 (Plenary Room)
- Abdelilah Benyoussef — SS4-IS08 (Room 1)
- S-I-th (Room 2)
- S-VII (Room3)
- SS5 (Room 4)
- Tutorial 1 by El Mehdi Salmani (Room 1)
- Tutorial 4 by Ahmed Ennaoui (Room 3)
- Tutorial 5 By Mouad Dahbi & Amine Bouibes (Room 4)

Friday

- Takayuki Ichikawa — SS5-KN36 (Plenary Room)
- Marcello Baricco — SS5-KN37 (Plenary Room)
- Abdelouahab El Kharbachi — SS5-IS-10(Plenary Room)
- SI-PV (3) (Room 1)
- S-IV (Room 2)
- Erika Michela Dematteis — SS5-IS-11 (Plenary Room)
- SS2 (Room 4)
- Michael Heere — SS5-IS-12 (Plenary Room)
- Break / Local Posters Session
- Petra Ágota Szilágyi — SS5-IS-13 (Plenary Room)
- S-III (Room 1)
- S-VI (Room 2)
- SS3 (Room 4)
- Claudia Zlotea — SS5-IS-15 (Plenary Room)
- Closing Ceremony

Saturday

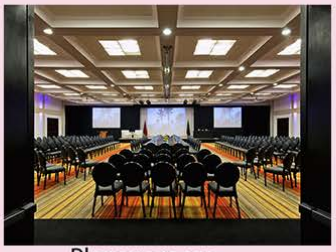
- Tourist Tour

La Médina

Crocoparc

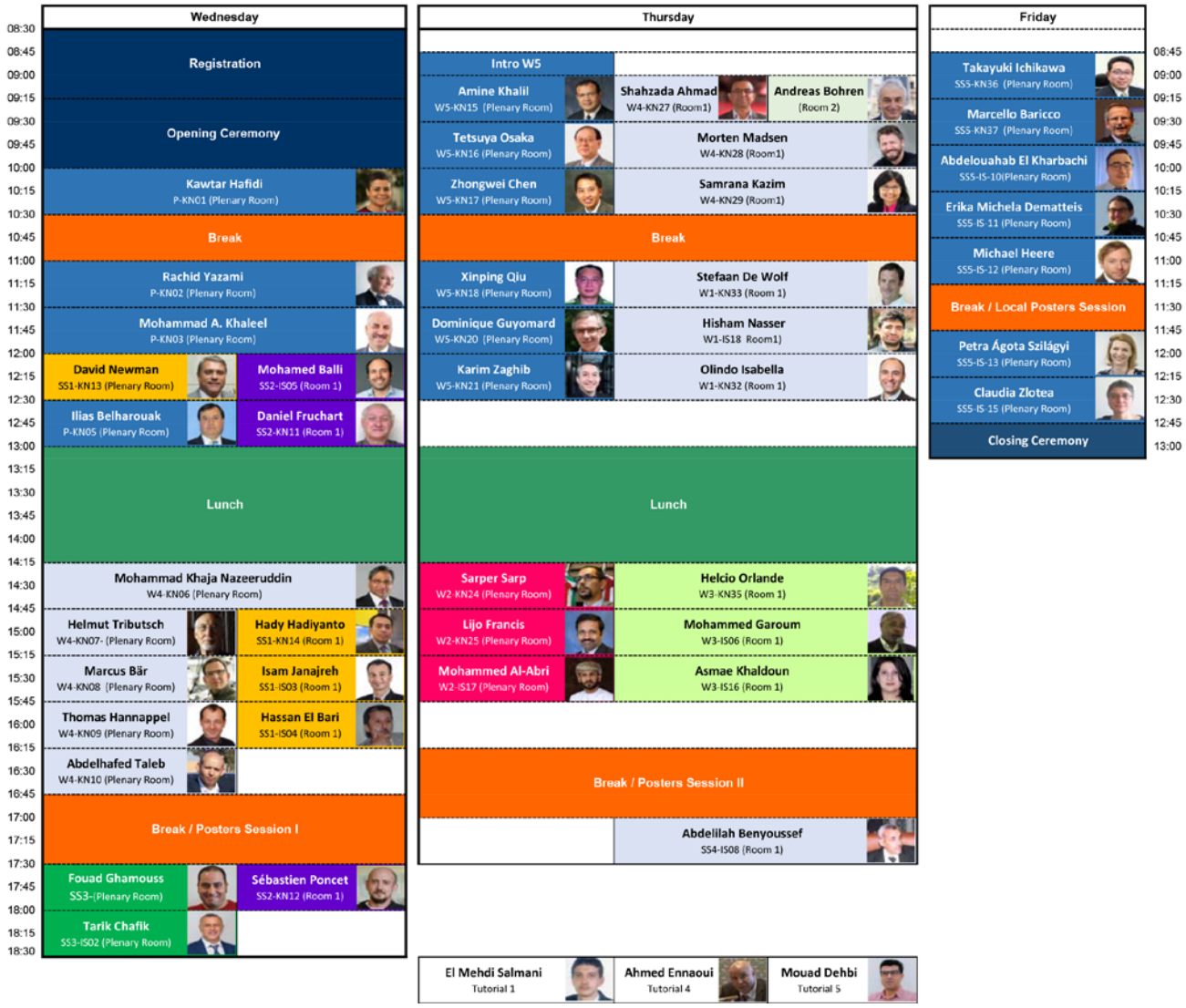
- Lunch

The Marina



to the swimming pool, beach, ...
Hotel Main entrance
To Rooms I, II, III & IV, Restaurant, & Coffee break area
Hotel Reception
Registration desk
Ground floor
Posters / Exhibition area I
To upstairs: Plenary room & exhibition area II
Poster supports
Ground floor
Room III
Room II
Room I
Room IV
First floor
Exhibition area II
To downstairs: Rooms I, II, III & IV, Posters area & exhibition area I
Plenary room

Program of Keynote and Invited Talks



Plenary Talks

Wednesday 10:00 - 10:30 (Plenary Room) P-KN01		**Renewable Energy and Energy Storage at Argonne National Lab** *By* **Dr. Kawtar Hafidi** Associate Laboratory Director Physical Sciences and Engineering, Argonne National Laboratory, USA.
Wednesday 11:00 - 11:30 (Plenary Room) P-KN02		**Artificial Intelligence Enabling the Future of Batteries** *By* **Prof. Rachid Yazami** KVI PTE LTD, Singapore.
Wednesday 11:30 - 12:00 (Plenary Room) P-KN03		**Integrated Energy Systems, Nano and Micro Grids and Smart Neighborhoods** *By* **Prof. Mohammad (Moe) A. Khaleel** Ph.D., P.E. Associate Laboratory Director Energy and Environmental Sciences Oak Ridge National Laboratory, USA.
Wednesday 12:00 - 12:30 (Plenary Room) SS1-KN13		**Policies for the 22nd century- climate, food, waste and energy** By **Dr. David Newman** President of World Biogas Association, UK
Wednesday 12:30 - 13:00 (Plenary Room) P-KN05		**Battery Storage Systems for Mobility and Electrification at Oak Ridge National Laboratory (ORNL)** **Dr. Ilias Belharouak** Oak Ridge National Laboratory (ORNL), Tennessee, USA. Editor of Journal of Power Sources (Elsevier).
Wednesday 14:15 - 14:45 (Plenary Room) W4-KN06		**Stable perovskite solar cells by compositional and interface engineering** *by* **Prof. Mohammad Khaja Nazeeruddin** Ecole Polytechnique Federale de Lausanne, Switzerland

Workshop 1

Crystalline-Silicon Photovoltaics

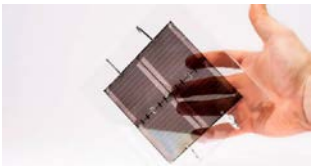
Chair:

Prof. Stefaan De Wolf, KAUST Solar Center, King Abdullah University of Science and Technology, Saudi Arabia.
Dr Olindo Isabella, Delft University of Technology, The Netherlands.

Thursday 11:00 - 11:30 (Room 1) W1-KN33		**Passivating contacts for silicon and perovskite solar cells** By **Prof. Stefaan De Wolf** KAUST Solar Center, King Abdullah University of Science and Technology, Saudi Arabia.
Thursday 11:30 - 12:00 (Room 1) W1- IS17		**Development of electron and hole selective layers for dopant-free c-Si solar cells** By **Dr. Hisham Nasser** Senior Research Scientist, the Center for Solar Energy Research and Applications (GUNAM), METU, Ankara, Turkey.
Thursday 12:00 - 12:30 (Room 1) W1-KN32		**High performance semi-transparent Si-based carrier-selective passivating contacts for c-Si solar cells manufactured at different thermal budgets** By **Dr Olindo Isabella** Delft University of Technology, The Netherlands.

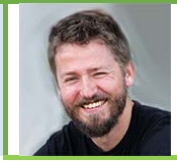
Workshop 4

Next generation of Solar Devices



Chairs:

Prof. Mohammad Khaja Nazeeruddin, Ecole Polytechnique Federale de Lausanne, Switzerland.
Prof. Ahmed Ennaoui, Retired from HZB-Germany & Actually President of the Scientific Council of IRESEN.
Prof. Helmut Tributsch, Retired from Helmholtz Centre Berlin for Materials and Energy, Germany.

Wednesday 14:45 - 15:15 (Plenary Room) W4-KN07		**Water Splitting for Energy: The Challenge of Irreversibility and Self-Organization** *By* **Prof. Helmut Tributsch** Retired from: Free University Berlin, Institute for physical and theoretical Chemistry, &Helmholtz Centre Berlin for Materials and Energy, Germany.
Wednesday 15:15 - 15:45 (Plenary Room) W4-KN08		**Surface and Interface Characterization by X-ray and Electron Spectroscopies – Insights into Chalcopyrite and Perovskite-based Thin Film Solar Cell Structures** *By* **Prof. Marcus Bär** Helmholtz-Zentrum Berlin für Materialien und Energie, GmbH, Germany & Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy, Berlin, Germany
Wednesday 15:45 - 16:15 (Plenary Room) W4-KN09		**Photoelectrochemical tandem cells for highly efficient, unassisted solar fuels production** *By* **Prof. Thomas Hannappel** Ilmenau University of Technology, Germany.
Wednesday 16:15 - 16:45 (Plenary Room) W4-KN10		**Nanomaterials for Energy Applications** *By* **Dr. Abdelhafed Taleb** Sorbonne University, France.
Thursday 09:00 - 09:30 (Room1) W4-KN27		**Interface engineering through surface passivation and innovative charge selective layer development for perovskite solar cells** By **Prof. Shahzada Ahmad** BCMaterials-Basque center for materials, applications & nanostructures, Leioa, Spain
Thursday 09:30 - 10:00 (Room1) W4-KN28		**Rational Design of charge selective contacts for Metal Halide Perovskite Solar Cells** **By Prof. Samrana Kazim** BCMaterials-Basque center for materials, applications & nanostructures, Leioa, Spain
Thursday 10:00 - 10:30 (Room1) W4-KN29		**Interlayers in organic and perovskite solar cells: The impact on performance and device stability** **By Prof. Morten Madsen** University of Southern Denmark, Denmark

Associated Tutorial

Wednesday & Thursday 18:30 - 20:00 (Room 3) T4		**Photoelectrochemical (PEC) vs. Photovoltaic (PV) devices: Fundamental similarities for solar energy conversion** **Prof. Ahmed Ennaoui** Institut de Recherche en Energie Solaire et Energies Nouvelles, Morocco.

Special Session 4

Predicting materials and device structure by Materials Theory tools, Computation, & Design

Chairs:

Prof. Shahzada Ahmad, BCMaterials-Basque center for materials, applications & nanostructures, Leioa, Spain
Prof. Abdelilah Benyoussef, Académie Hassan II des Sciences et Techniques, Morocco
Prof. *Sergey Rashkeev*, *QEERI, Qatar*
Prof. Mohammed Hamedoun, MAScIR, Rabat, Morocco

Thursday 17:00 - 17:30 (Room1) SS4-IS08	 **Properties of some two-dimensional materials for application to energy conversion and storage** **Prof. Abdelilah Benyoussef** Académie Hassan II des Sciences et Techniques, Morocco
Thursday 17:30-18:30 (Room 1)	**Electronic, optical, properties and photocatalytic potential of arsenene surfaces (ID-139)** *Hind Benzidi, Abdelilah Benyoussef, Omar Mounkachi, M. Garara, A. Al-Shami and A. El Kenz* **Towards Control of Band Gap in Two-Dimensional Hexagonal Boron Nitride by Doping (ID-321)** *Sergey Rashkeev, Merid Legesse, Hamed Saidaoui, Fedwa El Mellouhi, Said Ahzi and Fahhad Alharbi* **Improved remanent and (BH)max of $SrFe_{12}O_{19}$/ $CoFe_2O_4$ nanocomposite (ID-40)** *Rachida Lamouri, Lahcen Fkhar, Omar Mounkachi, El Mehdi Salmani, Mohammed Hamedoun, M. Ait Ali , Hamid Ez-Zahraouy and Abdelilah Benyoussef* Local oral **Photo-electrochemical Properties Engineering of Nano-Structured SnO2 (ID-82)** *Zineb Kerrami, Anass Sibari, Omar Mounkachi, Abdelilah Benyoussef and Mohammed Benaissa*

Associated Tutorial

Wednesday 18:30 - 19:30 & Thursday 18:30 - 20:00 (Room 2) T1	 **Calculating the electronic structure of random alloys with the KKR-CPA method** By **Prof. EL Mehdi Salmani** Faculty of Science, Mohammed V University, Rabat, Morocco

S-I-PV (1)	Solar Energy - PV *(Material)*
	Chairs: **Prof. Mohammad Khaja Nazeeruddin,** EPFL, Switzerland **Prof. Morten Madsen,** University of Southern Denmark, Denmark **Prof. Ahmed Ennaoui,** Institut de Recherche en Energie Solaire et Energies Nouvelles, Morocco.
Wednesday 12:00-13:00 (Room 2)	**Electrical properties of Si Quantum Dot in $GaAs_{1-x}P_x$ matrix for Solar cell Applications (ID-39)** *H. Guesmi, A. Aissat, M. Safi, I. Barbezier* **Novel c-Si compound heterojunction solar cell: HCT (heterojunction with compound thin-layer: TCO:ITO/ buffer : In2S3 (ID-121)** *Kahina Medjnoun, Kamal Djessas, Stefano Grillo, Mohamed Belaqziz and Hassan Chehouani* **$Zn_{0.99}V_{0.01}O$ Transparent Conductive Oxide obtained using a novel green and low cost process (ID-123)** *Kahina Medjnoun, Kamal Djessas, Stefano Grillo, Romain Magnan and Françoise Massines*
17 :30-18-30 (Room 3)	**Synthesis of perovskite thin films ($FAPbBr_{1.6}I_{1.4}$) by Spin coating technique for tandem solar cells (ID-352)** *Saida Laalioui, Kassem El Assali, Abdelkader Outzourhit, Kawtar Belrhiti and Badr Ikken* **Elaboration and characterization of (Ce,Sm) doped lanthanum oxychloride for photovoltaic solar cell (ID-69)** *Oumayma Mlida, Mohamed Youssef Messous and Mounia Tahri* **$CuSbSe_2$ thin films deposited from aqueous solution by electrodeposition in one step (ID-110)** *K. Abouabassi, M. Ouafi, A. Ait Hssi, L. Atourki, H. Kirou, N.Labchir, E. Gilioli, A. Elfanaoui, K. Bouabid, A. Ihlal*
	3mn Thesis: El Baraka Ayoub (ID-288) *Sidi Mohamed Ben Abdellah University and Al Akhawayn University* **3mn Thesis: Rachida Lamouri (ID-40)** *Faculty of Science, Rabat, Morocco*

S-I-PV (2)	Solar Energy - PV *(MPPT - water pumping)*
	Chairs: **Prof. Thomas Hannappel,** Ilmenau University of Technology, Germany **Dr Olindo Isabella,** Delft University of Technology, The Netherlands.
Thursday 14:15-16:15 (Room 3)	**SMC based MPPT to Track the GMPP under Partial Shading (ID-11)** *Mohcine Mokhlis, Mohammed Ferfra, Ahmed Abbou, Rafika El Idrissi and Cheikhne Cheikh Ahmed* **New analytical models for cardinal points of photovoltaic solar module operating outdoor under arbitrary conditions (ID-36)** *Mhammed Zaimi, Hicham El Achouby, Asmaa Ibral, Mohammed Salaheddine El Maliki and El Mahdi Assaid* **Impact of installation substrates on photovoltaic modules energy yield (ID-179)** *Mahfoud Abderrezek, Mohamed Fathi, Toufik Zerade and Mohammed Ayad* **Sensorless Predictive current Controlled DC-DC Boost Converter for PV MPPT Applications (ID-219)** *Billel Talbi, Fateh Krim, Abdelbaset Laib, Abdeslem Sahli and Hamza Feroura* ***Fuzzy-PI controller for photovoltaic water pumping systems (ID-355)*** *Mustapha Errouha, Saad Motahhir, Quentin Combe, Aziz Derouich and Abdelaziz El Ghzizal* **Double Stage Solar PV Array Fed Sensorless Vector Controlled Induction Motor for Irrigational Purpose (ID-63)** *Zakaria Massaq, Abdelouahed Abounada, Abdenabi Brahmi, Ghizlane Chbirik and Mohamed Ramzi* **Design and performance analysis of a photovoltaic water pumping system based on DC-DC boost converter and BLDC motor (ID-285)** *Mohammed Benzaouia, Loubna Bouselham, Bekkay Hajji, Anne-Megan Dubois, Anas Benslimane and Mostafa El Ouariachi* **Analysis and Simulation of Characteristics and Maximum Power Point Tracking for Photovoltaic Systems (ID-429)** *Mounir Ouremchi, Ahmed Rahali, Abdellali Elboutahiri, Karim El Khadiri, Mustapha El Alaoui, Fouad Farah, Ahmed Tahiri and Hassan Qjidaa*

	Solar Energy - PV *(solar modules - Soiling treatment)*
S-I-PV (3)	Chairs: **Prof. Marcus Bär,** Helmholtz-Zentrum Berlin für Materialien und Energie, GmbH, Germany **Prof. Samrana Kazim,** BCMaterials-Basque center for materials, app. & nanostructures, Leioa, Spain **Dr. Abdelhafed Taleb,** Sorbonne University, France.
Friday 09:00-11:15 (Room 1)	**The impact of PVs over building roofs on local temperatures (ID-220)** *Asmaa Zaz, Mohammed Ouassaid, Mounir Ghogho, Yasunobu Ashie and Mohammed Bakkali* **Detailed design of a 6 KWp grid connected PV plant with storage batteries: Part-I- Central inverter benchmark study & simulation (ID-339)** *Messaoud Khelif* **Performance analysis of a Micro Photovoltaic Concentrator (ID-107)** *Salima El Ayane, Sarah El Himer, Ali Ahaitouf and Sara El-Yahyaoui* **Photovoltaic Dust Soiling Statistical Representation in Doha, Qatar (ID-49)** *Nicolas Barth, Shahzada Pamir Aly, Said Ahzi and Benjamin Figgis* **Modeling and simulation of the longtime behavior and fatigue failure of photovoltaic modules under desert environment (ID-51)** *Said Ahzi, Shahzada P. Aly, Nicolas Barth and Amir Abdallah* **Condition Monitoring with Management of Dust and Soiling-Induced Failures in Solar Photovoltaic Modules Installed in NCERD, South East Nigeria (ID-151)** *Paul Amaechi Ozor, Howard O Njoku, Kenechukwu Maryvera Ifediora, Julius M Dzah and Charles Mbohwa* **Modeling and Simulation of a PV Monocrystalline Panel Performances under Real Environmental Conditions (ID-197)** *Halim Eddahbi and Mohamed Khafallah* **On the use of dew for cleaning PV panels in Morocco : Literature survey and experimental results (ID-357)** *Samira Belihi, Dounia Dahlioui, Bouchra Laarabi and Abdelfettah Barhdadi*

	Solar Energy - PV
S-I-PV Posters	Chairs: **Prof. Samrana Kazim,** BCMaterials-Basque center for materials, applications & nanostructures, Leioa, Spain **Dr. Abdelhafed Taleb,** Sorbonne University, France. **Prof. Abdelkader Aissat**, University of Blida, Algeria
Wednesday 16:45-17:30	**Study of $GaAs_{1-x}N_x$/GaAs Quantum dotStructure For Solar Cell Applications (14)** *Manel Boubakeur, Abdelkader Aissat, J.P. Vilcot* **Improvement of the stand-alone PV system performance by PVSYST software (33)** *Abdelmadjid Kaddour, Lazhar Benmebrouk, Simohamed Amine Bekkouche, Boumédiène Benyoucef, Salah Bezari and Rachid Khenniche* **Study of the effect of Al and In doping on the structural, optical, and electrical properties of sprayed SnO_2 films. (73)** *Soussi Lahcen, Ouiame Karzazi, Taoufik Garmim, Ahmed Rmili, Abdelhadi El Bachiri, Ahmed Louardi, Erguig Hassane and Bachir Elidrissi* **Temperature Effect on $ZnGe_xSn_{1-x}N_2$/GaN Multiwell Quantum Solar Cells (86)** *Abdelmoumene Laidouci, Abdelkader Aissat, Jean Pierre Vilcot* **Structural Properties of Europium Electrodeposited on Silicon Rich Silicon Nitride (95)** *Bedra Benyahia, Afaf Brik, Brahim Mahmoudi, Faïza Tiour, Amar Manseri, Amine Mefoued, Abdelkader Guenda* **Study of economic impact of solar pumping system (144)** *Amale Laaroussi and Abdelrhani Bouayad* **An intelligent irradiance equalization approach based on Fuzzy logic for small reconfigurable photovoltaic architecture (148)** *Loubna Bouselham, Abdelhamid Rabhi, Hajji Bekkay, Adel Mellit and Chaimae El Fouas* **Ab-initio study of structural, electronic and optical properties of ZnTe at wurtzite and Zinc blende phases (ID-214)** *Mohamed Aazi, El Houssine Atmani and Najma Fazouan* **Ab-initio study of structural, electronic and optical properties of CdS (ID-217)** *Ibrahim Bziz, El Houssine Atmani and Najma Fazouan* **Investigation of High-Temperature effect on passivation of p-type Cz silicon wafers for PV applications (ID-78)** *Mohamed Maoudj, Bouhafs Djoudi, Bourouba Nacer Eddine, Abdelkader El Amrani and Abdelhak Ferhat Hamida*

Design and Implementation of Three Phase SVM inverter MPPT application for stand-alone photovoltaic pumping system using induction motor control V / f. (ID-96)
Azzedinne Tayebi, Mohammed Yaichi, Mostefa Brahami and Abdelkader Boutadara

Dust Soiling Concentration Measurement on Solar Panels based on Image Entropy (ID-432)
Hicham Tribak and Youssef Zaz

LOCALS

First-Principles and Experimental Study of Structural, Electronic, Optical, Transport and Dielectric Properties of Sillenites-Type Oxide Bi25FeO40 (ID-229)
Houda Jebari, M'Hamed Taibi, Toufik Bahraoui, Azzam Belayachi, Mourad Boujnah, Elizabeth Chavira and Hamid Ez-Zahraouy

Physical properties of BTO perovskite using ab initio calculations (ID-436)
S. Dahbi, N. Tahiri, O. El Bounagui and H. Ez-Zahraouy

Pumping System Controlled By Neuro-Fuzzy Based On DFIM (333)
Mansouri Smail and Ouled Ali Omar

DFT analyses of properties of Organic inorganic hybrid perovskites (ID-334)
Hajar Moatassim, Omar Mounkachi, Mohammed Loulidi and Abdelilah Benyoussef

Hydrogen Storage properties of Arsenene-Mg/Na/ K: ab initio and molecular dynamics study (ID-354)
Mustapha Abdellaoui, Marwan Lakhal, Hind Benzidi, Mourad Garara, Omar Mounkachi, Abdelilah Benyoussef, Abdallah El Kenz, Mohammed Loulidi and Hamid Ez-Zahraouy

Elaboration and Characterization of an Heterojunction CuO/ZnO Prepared by Sol-Gel Method (ID-80)
Dekhil Djohra, Hocine Guessas and Abdelhak Nouri

Electrical and Optical Properties of Copper Oxide (CuO), Photovoltaic Application (ID-81)
Dekhil Djohra, Hocine Guessas and Abdelhak Nouri

A genetic algorithm based improve P&O–PI MPPT controller for stationary and tracking grid-connected photovoltaic system (ID-174)
Layachi Zaghba, Messaouda Khennane, Abdelhalim Borni, Amor Fezzani, Abdelhak Bouchakour, Idriss Hadj Mahammed and Samir Hamid Oudjana

Artificial Neural Network based Controller for Energy Management in a Solar Home in Algeria (ID-278)
Chekired Fathia, Mahrane Achour, Berkane Smain and Meflah Aissa

ELABORATION AND CARACTERIZATION OF AN HETEROJUNCTION CuO/ZnO PREPARED BY SOL-GEL METHOD (ID-80)
Dekhil Djohra, Hocine Guessas and Abdelhak Nouri

ELECTRICAL AND OPTICAL PROPERTIES OF COPPER OXIDE (CuO), PHOTOVOLTAIC APPLICATION (ID-81)
Dekhil Djohra, Hocine Guessas and Abdelhak Nouri

First-Principles Study of Phosphorene and Graphene as Anode Materials for Metal (Li, Na) Ion Batteries (ID-169)
Zouhir Mansouri, Omar Mounkachi, Abdelilah Benyoussef and Abdallah El Kenz

study of the structural, electronic and optical properties of materials of geophysical interest (ID-331)
Zidane Mustapha, Salmani Elmehdi and Ez-Zahraouy Hamid

	Solar Energy - Thermal	
S-I-Th	Chairs: **Dr. Mohammad Khalil Elahee**, University of Mauritius, Mauritus **Prof. Thomas Hannappel,** Ilmenau University of Technology, Germany. **Dr. Paul A Ozor**, University of Johannesburg, South Africa.	
Wednesday 17:30-18:30 (Room 3)	**Simulators selection for design and simulation of a CSP-driven forward osmosis process (ID-23)** *Samya Sigue, Souad Abderafi, Sébastien Vaudreuil and Tijani Bounahmidi* **Novel Stand Alone Solar Still (ID-47)** *Abderrahmane Diaf, Imane Dermouche and Rachida Elkheir* **Solar Climatic Atlas of Daily Utilisability by Variable Sky in Algeria (ID-56)** *Karima Smaili, Nachida Kasbadji Merzouk and Mustapha Merzouk* **Waste Crown Corks as Alternative Materials for Solar Air Heater Absorber Plates: A Preliminary Experimental Evaluation (ID-152)** *Howard O Njoku, Anthony I Nwafor, Peace Obute, Esther T Akinlabi, Paul A Ozor and Charles Mbohwa*	
Thursday 17:00-18:30 (Room 2)	Invited talk:	**Concentrated Solar Power: a game-changer for Africa** **Building Capacity and the Importance of Collaboration for a Low-Carbon Africa** *Dr. Mohammad Khalil Elahee and Dr. Abdel Khoodaruth* *The University of Mauritius*
	Design of a Concentrated Solar Power hybrid system for electricity production for a textile manufacturing plant (ID-106) *Darvesh Beegun, Diksha Juggurnath, M. Khalil Elahee and Abdel Khoodaruth* **Modelling and Simulation of a Single Effect Solar Absorption Cooling System H_2O-LiBr (ID-325)** *Siham Ghatos and Mourad Taha Janan* **Operational Electricity dispatch based on Direct Normal Irradiance (DNI) and load forecasting Case study: STPP with TES system (ID-353)** *Oumaima Benkirane, Ismail Belhaj, Yassine Ennassiri and Hicham Bouzekri* **Economic Comparison of Parabolic trough collector and Linear Fresnel Reflectors Power Plants (ID-337)** *Fayrouz El Hamdani, Souad Abderafi, Sébastien Vaudreuil and Tijani Bounahmidi* **Applicability of solar evaporative cooling in greenhouses productibility improvement (ID-416)** *Merabti Leila and Abbas Mohamed*	

	Solar Energy - Thermal
S-I-Th Posters	Chairs: **Dr Abdel Khoodaruth**, University of Mauritus, Mauritus **Dr Olindo Isabella,** Delft University of Technology, The Netherlands. **Prof. Abdelfettah Barhdadi,** ENS, Rabat, Morocco
Wednesday 16:45-17:30	**Anti-soiling protective coating for CSP Reflectors (ID-288)** *Ikhlas Aoukli, Ayoub El Baraka and Asmae Khaldoun* **Design of a cogeneration system based on hybrid PVT solar collectors - Application for an habitation in the south of Algeria (ID-38)** *Khaled Touafek, Abdelkrim Khelifa, Lyes Boutina, Mohamed Tahar Baissi, Hafsia Haloui, Hanane Ben Cheikh El Hocine, Salim Haddad, Ismail Tabet and Ali Malek* **Feasibility of a box solar cooker powered by photovoltaic energy (ID-48)** *Talbi Sofian, Atmane Ilias, Elmoussaoui Noureddine, Kassmi Khalil and Deblecker Olivier* **Impact of Shading design of Transparent Surfaces on Indoor Temperatures; Case Study : an Arid Climate (ID-367)** *Cherier Mohamed Kamal, Bekkouche Sidi Mohammed El Amine and Hamdani Maamar* **Suitable sites for CSP power plants installation in Algeria (ID-409)** *Houda Tassoult and Brahim Haddad*

Special Session 7

Quality Infrastructure for Solar Thermal Energy

Thursday 28 November 2019
(Room 2)

Session Chairs :

- **Dr. Andreas Bohren,** SPF Institute for Solar Technology, Switzerland.
- **Prof. Brahim Benhamou**, Cadi Ayyad University Marrakech, Morocco
- **Prof. Najma Laaroussi**, Mohamed V University Rabat, Morocco

Oral Presentations	**08:45-09:00**	**Introduction to Solar Maghreb Project (ID - 405)** ***Brahim Benhamou**, Cadi Ayyad University Marrakech, Morocco*
	09:00-09:30	**Quality assurance instruments for solar thermal components. Testing and certification according to the international standards (ID – 393)** ***Andreas Bohren*** *SPF Institute for Solar Technology, Switzerland.* 
	09:30-10:00	**Standards and national certification for solar thermal products in Morocco (394)** ***Karim Bakari*** *Moroccan Institute of Standardization (IMANOR)*
	10:00-10:30	**Moroccan Experience in the Labeling of Solar Thermal Devices and Quality Control of Solar Collectors and Water Heaters (ID - 401)** ***Ahmed Tabarani*** AMEE, Rabat, Morocco
Posters / Break	**10:30-11:00**	**Study of the efficiency of a compact geosolar system for the heating needs of a building in Algeria. (ID - 379)** ***Karim Dehina**,* USTO Oran, Algeria **Optimal Planning and Operation of hybrid s Renewable Energy and combined cooling, heating, and power (CCHP) (ID - 381)** ***Souheil Elalimi**, National School of Engineering of Monastir, Tunisia*
Oral Presentations	**11:00-11:15**	**The Impact of Energy Policies on the Macroeconomic Indicators: a case of Solar Thermal Energy (ID - 395)** ***Fatima Zohra El Wardi**, ENSMR, Rabat, Morocco*
	11:15-11:30	**Analysis and optimization of flat plate collectors (ID - 384)** ***Najma Laaroussi**, Mohamed V University Rabat, Morocco*
	11:30-11:45	**The declared thermal conductivity of insulating materials used in solar thermal collectors : definition and survey of experimental technics (ID - 397)** ***Mohammed Garoum**, Mohamed V University Rabat, Morocco*
	11:45-12:00	**Study of Hybrid PV/Thermal Bi-fluid (water/air) Solar Collector Provided with Self-Ventilation and Tracking Structure: Experimental and Numerical Investigation (ID - 399)** ***Mohamed El Amine Slimani**, USTHB, Algeria*
Discussion	**12:00-12:30**	**Discussion**

S-II Wind	Wind Energy
	Chairs : **Prof. Ammar Alkhalidi**, German Jordanian University, Amman, Jordan **Prof. Mohammed Ouassaid**, EMI, Morocco
Wednesday 14:45-16:45 (Room 2)	**Sensorless MPPT Controller using Particle Swarm and Grey Wolf Optimization for Wind Turbines (ID-108)** *Youssef Ait Ali and Mohammed Ouassaid* **Comparative Study of SMC and PI Control of a Permanent Magnet Synchronous Generator Decoupled by Singular Perturbations (ID-167)** *Rania Moutchou and Ahmed Abbou* **Primary Frequency Control for Wind/Battery Stand-Alone Microgrid (ID-168)** *Assia Mahrouch and Mohammed Ouassaid* **Response of DFIG Based Wind System During Severe Volatage Unballance (ID-223)** *Choroq-Zadelkhair El Archi, Tamoou Nasser and Ahmed Essadki* **Micro-Smart Wind Collecting Technology (ID-247)** *Ammar Alkhalidi, Ahmad Fraihat and Khaled Masaeed* **Power Control for Wind Turbine Driving a Doubly Fed Induction Generator using Type-2 Fuzzy Logic Controller (ID-329)** *Ahmed Vall Hemeyine, Ahmed Abbou, Sidi Mohamed Ould Mohamed El Moustapha, Anass Bakouri and Moussa Labbadi*

S-II Posters	Wind Energy
	Chairs: **Prof. Badre Bossoufi**, Faculty of Science, Fez, Morocco **Prof. Hajji Bekky**, ENSA Oujda, Morocco
Wednesday 16:45-17:30	**Permanent-Magnet Synchronous Generator Wind Turbine based on Takagi-Sugeno Fuzzy Models (ID-3)** *Tidjani Naoual, Guessoum Abderrezek and Ounnas Djamel* **Control strategies in wind energy conversion connected to the grid (ID-44)** *Radia Abdelli, Djamila Rekioua, Toufik Rekioua and Ahcene Bouzida* **Hybrid Control of Wind Energy Conversion System Based PMSG and Three Level NPC Converter (ID-83)** *Youssef Errami, Abdellatif Obbadi, Smail Sahnoun, Mohammed Ouassaid and Mohamed Maaroufi* **Robust Direct Power Control Applied To Wind Power SystemUnder Variable Speed (ID-119)** *Hala Alami Aroussi, Ziani Elmostafa, Badre Bossoufi and Manale Bouderbala* **A novel control strategy using Arduino in micro grid and grid connected including wind generator, diesel and battery storage plants: experimental behavior (ID-177)** *Djohra Saheb Koussa, Mustapha Koussa, Ahmed Rennane, Mustapha Boudraf, Ahmed Boufertella* **Maximum Power Point Tracking Of Wind Turbine System Connection to Permanent Magnet Synchronous Generator Using Fuzzy Logic and Artificial Neural Network (ID-191)** *Hayat El Aissaoui, Mohammed Zerouali, Abdelghani El Ougli and Belkassem Tidhaf* **Kutta-Joukowski Momentum model for predicting the 3D aerodynamics loads and velocities on wind turbines blades (ID-192)** *Yassine Ouakki and Abdelaziz Arbaoui* **Different failure modes of the horizontal axis wind turbine gearbox (ID-242)** *Kawtar Lamhour and Abdeslam Tizliouine* **An Overview of Control Techniques for Wind Energy Conversion System (ID-279)** *Habiba Abouri, Fatima El Guezar and Hassane Bouzahir* **Numerical investigation of turbulent flow over a vertical axis wind turbine (ID-303)** *Ahmed Bekhti, Mohamed Maizi, Madjid Tata and Sebaa Laazab* **Hybrid Solar/Wind/Diesel Power System for Water Pumping Application (ID-320)** *Waleed Obaid, Abdul-Kadir Hamid and Chaouki Ghenai* **Control of a Multilevel Inverter (two levels in cascade) by Three-Dimensional SVM strategy (ID-323)** *Ismail Bouyakoub, Rachid Taleb and Fayçal Mehedi* **Wind resource assessment at Illizi Site in the Algerian Sahara, with environmental analysis (ID-365)** *Sabiha Kheder-Haddouche and Sidi Mohammed Boudia* **A New Investigation of the Effect of Airfoils Thicknesses on the Transition Point in Laminar Flows using XFOIL (ID-372)** *Zakaria Belfkira* **Comparative study between speed control and Torque control of The Flywheel Energy Storage System (ID-433)** *Ihssen Hamzaoui, Farid Bouchafaa, Nawel Tidjani and Saida Boukhalfa* ***Locals*** **Probabilistic Wind Power Forecasting using Stochastic Differential Equations (ID-101)** *Waleed Alhaddad and Raul Tempone* **Stochastic Optimal Control of Renewable Energy (ID-103)** *Renzo Caballero and Raúl Tempone*

Workshop 3

Energy Efficiency in Buildings and Industry

Chairs:

Prof. Helcio R. B. Orlande, Escola Politécnica, Federal University of Rio de Janeiro, Brazil.
Prof. Mohammed Garoum, EST, Mohammed V University, Morocco.

Thursday 14:15 - 14:45 (Room 1) W3-KN34		**Inverse Heat Transfer Problems** **Prof. Helcio R. B. Orlande** Escola Politécnica, Federal University of Rio de Janeiro, Brazil.
Thursday 14:45 - 15:15 (Room 1) W3-KN35		**On the measurement of thermal diffusivity of building materials by "flash" technique – Modelling, sensitivity analysis and inverse estimation based approaches** **Prof. Mohammed Garoum** EST, Mohammed V University, Morocco
Thursday 15:15 - 15:45 (Room 1) W3-IS06		**Clay as Construction material, a Step towards Green Buildings in Ifrane Region** **Dr. Asmae Khaldoun** Akhawayn University in Ifrane, Morocco

W3 (Oral Presentations)	Energy Efficiency in Buildings and Industry
	Chairs: **Prof. Helcio R. B. Orlande,** Escola Politécnica, Federal University of Rio de Janeiro, Brazil. **Prof. *Asmae Khaldoun***, *AUI, Morocco*
Thursday 11:00-13:00 (Room 3)	**Invited Talk: Presentation of the Solar Decathlon Africa winner Team (InterHouse)** *Prof. Brahim Benhamou, InterHouse Faculty senior advisor, Morocco*
	Complex On-Off Air-Conditioning Control Strategy for Peak Demand Reduction in Desert Climate Conditions (ID-178) *Mohammed Al-Azba, Zhaohui Cen, Said Ahzi and Yves Remond* **Bioclimatic Building Design Analysis. Case Study: Oujda, Morocco (ID-201)** *Mouatassim Charai, Haitham sghiouri, Ahmed Mezrhab, Mustapha Karkri* **Thermal performances of hollow concrete blocks based on ISO Norm calculations (ID-238)** *Najma Laaroussi, Mohamed Ouakarrouch, Karima El Azhary and Mohammed Garoum* **Design of an efficient insulation system for a house in Zaouiat Sidi Abdesalam based Binayate software (ID-291)** *El Mehdi Saidi, Ayoub El Baraka and Asmae Khaldoun* **Thermal Behavior of a New Eco-Friendly Sandwich Material Based on Clay Combining with Granular Cork (ID-363)** *Fatima Zohra El Wardi, Rhita El Boukili, Asmae Khaldoun and Abdelhamid Khabbazi* **A comparative Dynamic Life Cycle Inventory between a double and triple glazed uPVC window (ID-185)** *Patrice Megange, Amir-Ali Feiz, Pierre Ngae and Thien-Phu Le* **On the use of Deep Learning Approaches for Occupancy prediction in Energy Efficient Buildings (ID-408)** *Hamza Elkhoukhi, Mohamed Bakhouya, Majdoulayne Hanifi and Driss El Ouadghiri* **High-Power Load Management for Residential House under Desert Climate Conditions - A Case Study in Qatar (ID-415)** *Zhaohui Cen, Mohammed Al-Azba and Said Ahzi*

	Experimental study of thermophysical proprieties of wooden materials used in building construction (ID-388) *Mohamed Ouakarrouch, Mohammed Garoum and Najma Laaroussi*

S-III	Energy efficiency Energy harvesting
	Chairs **Prof. Helcio R. B. Orlande,** Escola Politécnica, Federal University of Rio de Janeiro, Brazil. **Prof. Asmae Khaldoun**, AUI, Morocco
Wednesday (14:45-16:45) (Room 3)	**Unfired Clay Bricks with Additives and Mechanical Simulation of Perforated Bricks (ID-8)** *Houssame Limami, Leila Amazian, Asmae Khaldoun, Imad Manssouri, Ayoub El Baraka and Khalid Cherkaoui* **Solar wastewater treatment: advantages and efficiency for reuse in agriculture and industry (ID-13)** *Sadek Igoud, Belgassim Boutra and Lamine Aoudjit* **Thermal evaluation of local construction materials under hot semi-arid climate of Marrakech (ID-67)** *Fatima Zahra Benaddi, Lahcen Boukhattem Boukhattem, Brahim Benhamou and Fatima Ait Nouh* **Mechanical Properties of Unfired Clay Bricks with Polymeric HDPE & PET Additives (ID-102)** *Houssame Limami, Asmae Khaldoun, Imad Manssouri and Khalid Cherkaoui* **A comparative study of the energy cosumed by an electric vehicle on trunk driving roads vs. highway driving roads (ID-336)** *Salima El Amrani, Mohammed Chennani and Driss Belkhayat* **Effect of Biomass Ash Addition on the Properties of Fired Clay (ID-347)** *El Boukili Ghita and Asmae Khaldoun* **Pyrolysis of Morupule coal dust for the production of tar (ID-253)** *Amogelang Medupe, Edison Muzenda, Joshua Gorimbo, Nhlanhla Nkosi and Mpho Rapoo*
	3mn Thesis : Mouatassim Charai (ID-201) *Université Mohammed Premier (UMP) & Université Paris-Est Créteil (UPEC)*
Friday (11:45-12:45) (Room 1)	**Experimental validation of an electromechanical device to convert vehicles mechanical energy into electrical energy (ID-124)** *Francisco Duarte, Adelino Ferreira and Paulo Fael* **Towards Autonomous Solar Driven Agricultural Greenhouses in Qatar - Integration with Solar Cooling (ID-420)** *Abdelhakim Hassabou and Moazzam Khan* **Urban heat island: state of the art (ID-424)** *Hicham Bahi, Hassan Radoine and Hicham Mastouri* **Spatio-temporal evaluation of urban thermal environment using smart spatial data (ID-425)** *Hicham Bahi, Hassan Radoine and Hicham Mastouri*

S-III – W3 Posters	Energy efficiency Energy harvesting
	Chairs : **Prof. Isam Janajreh,** Khalifa University, Abu Dhabi, UAE. ***Dr. Petra Ágota Szilágyi,*** Queen Mary University of London, School of Materials Science and Engineering, UK
Thursday 16:45-17:30	**Ecological Roof Design for the Renovation of a House in Zaouiat Sidi-Abdessalam in Ifrane (ID-17)** *Houssame Limami, Othmane Remch, Asmae Khaldoun, Imad Manssouri and Ayoub El Baraka* **Energy efficiency and importance of energy monitoring system in Moroccan hospitals (ID-70)** *Brahim Nourdine and Abdallah Saad* **The Effect of Addendum Factor on Contact Ratio Factor and Contact Stress for Spur Gears (ID-114)** *Samya Belarhzal, El Moustapha Boudi and Aziz El Bachir* **Numerical investigation of the PCM type and position influence on the melting process in a concrete wall (ID-216)** *Ayman Benkaddour, Musapha Faraji and Hamza Faraji* **Impact of orientation on the thermal performances of traditional buildings in the south of Morocco (ID-243)** *Laaroussi Najma, El Azhary Karima, Mohamed Ouakarrouch, Mohammed Garoum and Majid Mansour* **Commercial Building Energy Management Design for HVAC system Based on Fuzzy Logic (ID-332)** *Meryem Hamidi and Omar Bouattane* **Numerical study of Trombe wall as a passive ventilation system: The case of Moroccan climate (ID-26)** *Youssef Hamidi, Bouchra El Gharbi, Hajar Hafs, Mustapha Malha and Abdellah Bah* **Effect of Natural Ventilation on the Thermal Performance of a Residential Building in a Hot Semi-Arid Climate (ID-129)** *Hicham Mastouri, Brahim Benhamou and Hassan Hamdi*

	Performance Evaluation of Photovoltaic Systems Using Simulation Model and Solmetric Analyzer (ID-278) *Amor Fezzani, Idrssi Hadj Mahammed, Said Drid, Layachi Zaghba, Messouda Khennane, Abdelhak Bouchakour and Samir Hamid Oudjana* **Local** **The notion of comfort in an architectural design (ID-190)** *Karima Mazirh*

S-IV	Command and control systems for RE Simulation and Modelling for RE
	Chairs: **Prof. Thomas Hannappel,** Ilmenau University of Technology, Germany. **Prof. Djamila Rekioua**, University of Bejaia, Algeria **Dr. Abdelhafed Taleb,** Sorbonne University, France.
Thursday (15:15-16:15) (Room 2)	**Power Management and Supervision of Hybrid Renewable Energy Systems (ID-24)** *Faika Zaouche, Hanane Hassani, Djamila Rekioua and Seddik Bacha* **Power Quality Improvement of A Photovoltaic Active Power Filter using A Fuzzy Hysteresis Band Current Controller (ID-161)** *Asmae Azzam-Jai and Mohammed Ouassaid* **MFO Algorithm for Optimal Location and Sizing of Multiple Photovoltaic Distributed Generations Units for Loss Reduction in Distribution Systems (ID-256)** *Samir Settoul, Mohamed Zellagui, Rachid Chenni, Heba Ahmed Hassan and Mohamed Nassim Kraimia* **Performance comparison of Two-SVPWM-Strategies Based Vector Space Decomposition Controlled Dual Three-Phase PMSM for Electric Ship Propulsion (ID-359)** *Mhammed Hasoun, Aziz Elafia and Mohamed Khafallah*
Friday 08:45-11:15 (Room 2)	**Molecular Dynamics Simulations of Self-Assembled Polyethylene-Hexagonal Boron Nitride Composite and Its Thermal Conductivity (ID-72)** *One-Sun Lee, Mehamed Ali, Said Ahzi, Abdelnasser Mabrouk and Ahmed Abdala* **Study of the GaInAsN/GaAs structure for improve the efficiency of solar cell (ID-90)** *A. Aissat, R. Bestam, I. Bouaicha, S, Naser, J.P. Vilcot* **Key provisions to make an energy efficient residential building in Algerian Saharan climate (ID-141)** *Sidi Mohammed El Amine Bekkouche, Mohamed Kamal Cherier, Maamar Hamdani, Bekkouche Née Belgherras Sifia, Redouane Mihoub and Noceir Benamrane* **Modeling of dust deposition impact on PV/T hybrid collector performances (ID-203)** *Chaimae El Fouas, Oussama El Manssouri, Bekkay Hajji, Loubna Bouselham, Giuseppe Marco Tina, Antonio Gagliano* **Coupled Identification Procedure of Piezoelectric Constants using PSO and Exact Solution by Stroh-like formalism (ID-215)** *Najat Magouh, Yassin Belkourchia, Hamzah Bakhti and Lahcen Azrar* **Wind Tower Integration with Evaporative Cooling for Greenhouse Humidity and Temperature Control (ID-301)** *Khadije El Kadi and Isam Janajreh* **Sensible and Evaporative Cooling of Greenhouse via Wind-tower Integration (ID -302)** *Khadije El Kadi and Isam Janajreh* **Convective Heat Transfer Performance of Nanofluid in a Horizontal Annular Duct Considering Nanoparticles Shapes Effect (ID-89)** *Mohammed Benkhedda and Toufik Boufendi* **Pathway to 100 percent Renewable Energy Supply: Morocco Options Until 2030 (ID-403)** *Ali Bouabid, Andrei Sleptchenko and Said Mouline* **Behavioral study of a New DC-AC Boot Inverter for Photovoltaic Applications: theory and simulation (ID-75)** *Abdennabi Brahmi, Abdelouahed Abounada and Weam Elmerrassi*

S-IV Posters	Command and control systems for RE Simulation and Modelling for RE
	Chairs: **Prof. Stefaan De Wolf,** KAUST Solar Center, KAUST, Saudi Arabia. **Dr. Abdelhafed Taleb,** Sorbonne University, France.
Thursday	**Characterization of a Mixture of Scale and Pigment to Synthesize Anti-Corrosive Coating (ID-9)** *Mohammed Tayeb Abedghars, Mokhtar Ghers and Belgacem Bezzina* **Study and realization of a monoaxial solar tracker over an equatorial mount (ID-29)**

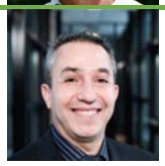
16:15-17:00	*Hicham Bouzakri and Ahmed Abbou* **Application of various classical and intelligent MPPT tracking techniques for the production of energy through a photovoltaic system (ID-42)** *Salaheddine Zouirech, Mohammed Zerouali, Hayat Elaissaoui, Abdelghani El Ougli and Belkassem Tidhaf* **Power Quality Improvement using Interval Type-2 Fuzzy Logic Controller for Five-Level Shunt Active Power Filter (ID-57)** *Yousfi Abdelkader, Chaker Abdelkader and Bot Youcef* **Improvement of Conventional MPPT Techniques P&O and INC by Integration of Fuzzy Logic (ID-61)** *Mohammed Zerouali, Salaheddine Zouirech, Abdelghani El Ougli, Belkassem Tidhaf and Hafida Zrouri* **Impacts of Integration of Decentralized Production on On-Load Tap Changer (ID-66)** *Bot Youcef, Allali Ahmed and Yousfi Aek* **The impact of the type of converter and the algorithm of the control on the production of maximum power by a photovoltaic system (ID-150)** *Salaheddine Zouirech, Mohammed Zerouali, Abdelghani El Ougli and Belkassem Tidhaf* **A Novel Fast MPPT Strategy with constant output voltage based on predictive current control (ID-246)** *Sana Sahbani, Hassane Mahmoudi and Abdennebi Hasnaoui* **Design and Test of the Smart Composter Controlled by Sensors (ID-368)** *Mustafa Elalami, Yassine Baskoun, Fatima Zahra Beraich, Mohamed Taouzari, Moha Arouch and Salah Dine Qanadli* **Estimation of Annual Energy Yield Roof Mount PV System on a Solar House based on CIS and Crystalline silicon (ID-41)** *Aissa Meflah, Zoubeyr Smara, Achour Mahrane, Madjid Chikh and Fathya Chekired* **Solar tower plant driven a humidification-dehumidification water desalination process (ID-76)** *Oumaima Choukai and Driss Zejli* **Numerical Investigation of Welded Rectangular Profiles for Electric Vehicles Utilization (ID-109)** *Imane Amarir, Hamid Mounir and Abdellatif El Marjani* **Damage Analysis of Welded Rectangular Profiles for Electric Vehicles Utilization under Variable and Constant Amplitude Loads (ID-127)** *Imane Amarir, Hamid Mounir and Abdelatif Elmarjani* **Simulation and modeling of charging in an oxygen converter (ID-146)** *Samira Djemili, Djamel Berdjane, Badreddine Maalem and Latifa Tairi* **Interest of connecting a mini solar station to the public electricity grid in a desert environment (ID-180)** *Boussaid Mohammed, Dahbi Abd Eldjalil, Lahcen Abd Ella and Elkaiem Lalla Moulaty* **Performance analysis of Bi-fluid photovoltaic/thermal (PV/T) solar collector (ID-209)** *Oussama El Manssouri, Chaimae El Fouas, Bekkay Hajji, Loubna Bouselham, Abdelhamid Rabhi, Giuseppe Marco Tina, Antonio Gagliano* **Temperature Prediction Using Time Series Time-Delay Neural Networks (ID-211)** *Anas Kabbori, Jilali Antari, Radouane Iqdour and Zine El Abidine El Morjani* **Numerical study of the influence of geometry on the primary fluid instability in the Couette-Taylor (ID-290)** *Ismahane Chaieb and Toufik Boufendi* **SOLAR-E-CYCLES, EMPOWERING PEOPLE PROJECT 2014-2019 (ID-390)** *Roger Christen and Hamid El Omari* **Development of robust and efficient control and state estimation strategies for the photovoltaic system (ID-157)** *Fatim-Zahra Zaghar* **Electrical standalone PV system sizing with Graphic User Interface (GUI) based on UTE C15-712-2 guide (ID-361)** *Nasreddine Belhaouas, Fatah Mehareb, Houria Assem, Salah Bensalem and Amar Hadj Arab* **PWM Buck Converter used in PV controller (ID-299)** *Walid Merrouche, Said Ould Amrouche and Idir Gaci* **Fuzzy Logic Based DTC-SVM for Speed Control of Five-Phase IPMSM (ID-330)** *Fayçal Mehedi, Abdelkadir Belhadj Djilali, Adil Yahdou and Ismail Bouyakoub* **Modeling and control of a DFIG for wind turbine conversion system using back-to-back PWM converters (ID-338)** *Abdelouhid El Jalyly, Monir Derri, Touria Haidi and Abderahmane Janyenne* <u>Locals</u> **Adsorption of small gas molecules on phosphorene: optB88-vdW and SCAN+rVV10 (ID-64)** *Anass Sibari, Zineb Kerrami, Mohammed Benaissa and Abdelkader Kara* **Irrigation system controlled by programmable automate (ID-16)** *Mansouri Smail, Saadeddine Manaa and Harrouz Abdelkader*

Workshop 5

Future Battery for e-Mobility & Stationary Storage Applications: Li-ion Technology and Beyond

Chairs

Dr. Khalil Amine, Argonne National Laboratory, IL, USA.
Prof. Ismael Saadoune, FST, Cadi Ayyad University, Marrakech, Morocco.

Thursday 09:00 - 09:30 (Plenary Room) W5-KN15		**Advances in lithium ion battery & beyond toward mass electrification and grid scale storage** **Dr. Khalil Amine** distinguished Fellow and manager of the Advanced Lithium Battery Technology program at Argonne National Laboratory, IL, USA. Winner of "Global Energy Prize" in 2019.
Thursday 09:30 - 10:00 (Plenary Room) W5-KN16		**New and non distractive Diagnostic system to probe battery failure** **By Prof. Tetsuya Osaka** Institute for Research Organization for Nano & Life Innovation, Japan
Thursday 10:00 - 10:30 (Plenary Room) W5-KN17		**Next Generation Zinc Batteries for Wide Integration of Energy Storage** **By Prof. Zhongwei Chen** Advanced Materials for Clean Energy, University of Waterloo, Canada
Thursday 11:00 - 11:30 (Plenary Room) W5-KN18		**Cobalt Free Cathode Material of $Li(Li_{0.16}Ni_{0.19}Fe_{0.18}Mn_{0.46})O_2$ for Lithium-ion Batteries** **By Prof. Xinping Qiu** Tsinghua University, China.
Thursday 11:30 - 12:00 (Plenary Room) W5-KN20		**Recent advances in energy storage technologies for higher power and large scale applications** **By Prof. Dominique Guyomard** Institut des Materiaux Jean Rouxel at Nantes, France.
Thursday 12:00 - 12:30 (Plenary Room) W5-KN21		**HQ Li-ion and Solid State Lithium Metal Batteries: from atoms to system** **Dr. Karim Zaghib** General Director of the Center of Excellence in Transportation Electrification and Energy Storage, Canada.

Associated Tutorial

Wednesday & Thursday 18:30 – 20:00 (Room 4) T5	 	**Energy storage tutorial: Introduction to Electrochemical Energy Storage Technologies** By **Dr. Mouad Dahbi**, Materials Science and Nanoengineering, Med VI Polytechnic University, Benguerir, Morocco. & **Dr. Amine Bouibes**, Graduate School of Informatics, Nagoya University, Japan

W5 - S-V	Hydrogen energy storage Batteries and energy storage
	Session Chairs **Prof. Zhongwei Chen,** Advanced Materials for Clean Energy, University of Waterloo, Canada **Prof. Tetsuya Osaka,** Institute for Research Organization for Nano & Life Innovation, Japan
Wednesday 17:30-18:30 (Room 4)	**Sizing of standalone photovoltaic/battery without and with hydrogen production systems (ID-249)** *Hanane Hassani, Djamila Rekioua, Faika Zaouche, Toufik Rekioua and Seddik Bacha* **Study of interaction of hydrogen with di-aza-substituted sumanene compounds (ID-322)** *Siham Naima Derrar* **Techno-Economic Assessement of Hydrogen Production from vRE in Morocco Case Study: Laayoune, Ouarzazate, Midelt (ID-344)** *Yassine Ennassiri, Ismail Belhaj and Hicham Bouzekri* **Prediction of serious capacity fading at overcharge conditions in NCA lithium-ion batteries using electrochemical impedance spectroscopy (ID-154)** *Norihiro Togasaki, Tokihiko Yokoshima, Yasumasa Oguma and Tetsuya Osaka*
Thursday 14:15-16:15 (Room 4)	**Si-based anode materials synthesized by electrodeposition for energy storage devices (ID-155)** *Seongki Ahn, Toshiyuki Momma and Tetsuya Osaka* **Catalytic performance of modified Vermiculite-supported Nickel in Methane dry Reforming with carbon dioxide (ID-343)** *Farah Mesrar, Hanane Mahir, Fatiha Ouanji and Mohammed Kacimi* **P-doped hard carbon as anode material for sodium-ion batteries (ID-392)** *Charifa Hakim, Habtom Desta Asfaw, Mouad Dahbi, Daniel Brandell, Kristina Edström, Reza Younesi and Ismael Saadoune* **Functionalized graphite nanoplatelet by nitroxide radical PILs as anode materials for Li-ion battery (ID-407)** *Mohamed Aqil, Mouad Dahbi, Ismael Saadoune and Abdelhafid Aqil* **CMC/Carbon/Silicon Li-ion batteries composite anode: Influence of polymer ball-milling onto performances (ID-411)** *Mariama Ndour, Veronique Bonnet, Jean-Pierre Bonnet, Sébastien Cavalaglio, Tristan Lombard, Luc Aymard and Cédric Przybylski.* **A Facile Synthesis and Characterization of Titanium Dioxide as Negative Electrode Material for Lithium Ion Batteries (ID-422)** *Karim El Ouardi, Charifa Hakim, Mouad Dahbi, Mehmet Oğuz Guler, Hatem Akbulut, Abdeslam El Bouari and Ismael Saadoune* **New Phosphate-based Electrode Material for High Performance Sodium-Ion Batteries (ID-417)** *Abdelwahed Chari, Mouad Dahbi, Karim El Ouardi, Brahim Orayech, Abdeslam El Bouari and Ismael Saadoune*

W5 - S-V Posters	Hydrogen energy storage Batteries and energy storage
	Session Chairs **Dr. Amine Bouibes**, Graduate School of Informatics, Nagoya University, Japan **Prof. Xinping Qiu,** Tsinghua University, China. **Dr. Mouad Dahbi**, Med VI Polytechnic University, Benguerir, Morocco.
Thursday 16:15-17:00	**Effect of Mg substitution on structure and the electrochemical properties of MnWO4 (ID-65)** *Chaimae Kdider, Mohamed Youssef Messous, Youssef Naimi, Mounia Tahri and Mohammed Moutaabbid* **Synthesis and study of the structural properties of $La_{(1-x)}Mg_xMn_{0,98}Fe_{0,02}O_3$ perovskite by co-precipitation method as application in fuel cell for energy storage (ID-71)** *Yousra Sabri and Mohamed Youssef Messous* **Optimisation of The Energy Lack and Surplus in A Stand-Alone Photovoltaic System (ID-74)** *Meriem Andam, Jamila El Alami and Younes Louartassi* **Investigation of the New Traction Chains for Electrics and Hybrids Vehicles (ID-284)** *Said Anougou, Hamid Mounir and Abdellatif El Marjani* **Arduino Based Platform for Managing a PV Battery Charge (ID-400)** *Rachid El Bachtiri, Karima El Hammoumi, Mohammed Boussetta and Maha Khanfara* **A Ni-rich cathode material for lithium-ion batteries with improved safety and cost (ID-404)** *Mariam Baazizi, Mouad Dahbi, Mohamed Aqil, Fouad Ghamouss and Ismael Saadoune* **Locals**

	New electrode material for lithium-ion and sodium-ion batteries: Electrochemical synthesis mechanism. (ID-375) *Asma Kafih and Aicha Guessous* **CMC/Carbon/Silicon Li-ion batteries composite anode: Influence of polymer ball-milling onto performances (ID-411)** *Mariama Ndour, Veronique Bonnet, Jean-Pierre Bonnet, Sébastien Cavalaglio, Tristan Lombard, Luc Aymard and Cédric Przybylski* **Modeling and Simulation of Solar Cell Batteries (ID-364)** *Achaibou Nadia* **CMC/Carbon/Silicon Li-ion batteries composite anode: Influence of polymer ball-milling onto performances (ID-412)** *Mariama Ndour, Veronique Bonnet, Jean-Pierre Bonnet, Sébastien Cavalaglio, Tristan Lombard, Luc Aymard and Cédric Przybylski.* **CMC-citric acid Cu(II) cross-linked binder approach to improve the electrochemical performance of Si-based electrodes (ID-170)** *Mazouzi Driss, Rabeb Grissa, Michael Paris, Zuina Karkar, Lucas Huet, Dominique Guyomard, Lionel Roué, Thomas Devic and Bernard Lestriez*

Special Session 5

Metal hydrides' Energy

Chairs:

Dr. Abdelouahab El Kharbachi, Helmholtz Institute Ulm (HIU), Germany
Prof. Marcello Baricco, Department of Chemistry and NIS, University of Torino, Italy
Prof. Takayuki Ichikawa, Hiroshima University, Japan

Friday 08:45 - 09:15 (Plenary Room) SS5-KN36		**Metal hydrides for H_2 storage, heat storage, and anode for Li-ion batteries** *By **Prof. Takayuki Ichikawa*** Hiroshima University, Japan
Friday 09:15 - 09:45 (Plenary Room) SS5-KN37		**Metal Hydrides as Hydrogen Carriers** *By **Prof. Marcello Baricco*** Department of Chemistry and NIS, University of Torino, Italy
Friday 09:45 - 10:15 (Plenary Room) SS5-IS10		**Optimization of metal hydride anodes and $LiBH_4$ -based electrolytes for all-solid-state lithium ion batteries** *By **Dr. Abdelouahab El Kharbachi*** Helmholtz Institute Ulm (HIU), Germany
Friday 10:15 - 10:45 (Plenary Room) SS5-IS11		**Hydrogen storage properties of Mn and Cu substituted TiFe intermetallic compounds (ID-262)** *By **Dr. Erika Michela Dematteis*** Researcher at CNRS, Thiais, France
Friday 10:45 - 11:15 (Plenary Room) SS5- IS12		**Dynamics and Structural Evolution in a Solid-state Mg-ion Conductor** *By **Dr. Michael Heere*** Karlsruhe Institute of Technology (KIT), Eggenstein, Germany.
Friday 11:45 - 12:15 (Plenary Room) SS5- IS13		**Metal-Organic Frameworks: Templates, Supports, and Surface Functionalisation of Pd Nanoclusters (ID-398)** *By **Dr. Petra Ágota Szilágyi*** Queen Mary University of London, School of Materials Science and Engineering.
Friday 12:15 - 12:45 (Plenary Room) SS5- IS15		**Multi-Principal-Element Alloys based on refractory elements for hydrogen storage (ID-307)** *By **Dr Claudia Zlotea*** Institut de Chimie et des Matériaux Paris Est, CNRS-UPEC, France.
(Local orals) Thursday 17:00 - 18:30 (Room 4)		**"Waste" from thermal decomposition of hydrogen storage materials being useful – the case of BN synthesis from $(NH_4)_3Mg(BH_4)_5$ precursor (ID-413)** *Wojciech Wegner, Karol Fijalkowski and Wojciech Grochala* **Effect of Graphite on Hydrogen Absorption Properties of Titanium (254)** *Keita Shinzato, So Hamamoto, Norio Ogita, Hiroki Miyaoka and Takayuki Ichikawa* **Mixed borohydride-halides as potential solid-state electrolytes (391)** *Siobhan C. Stevenson and Duncan H. Gregory* **CaH_2-$LiBH_4$ as negative electrode for solid state lithium-ion batteries: An unexpected electrochemical behavior (ID-232)** *Fernando Cano-Banda, Ankur Jain, Junya Hashimoto, Keita Shinzato, Abel Hernandez, Luc Aymard, Jean-Pierre Bonnet and Takayuki Ichikawa* **Metal Hydride Based Optical Hydrogen Sensors beyond Palladium (ID-423)** *Lars J. Bannenberg, Christiaan Boelsma, Herman Schreuders and Bernard Dam*

S6	Smart grid
	Chairs **Prof. Dominique Guyomard,** Institut des Materiaux Jean Rouxel at Nantes, France. **Prof. Mohamed Bakhouya**, UIR, Morocco
Thursday 14:15-15:15 (Room2)	**Optimization and Control based Energy Management for a Smart Building Integrated Microgrid (ID-37)** *Rachid Benchrifa, Ahmed Ouammi and Younes Dagdougui* **Implementation of an intelligent system for remote control of decentralized photovoltaic sources using the Internet of Things infrastructure (ID-113)** *Chaimae Zedak, Abdelaziz Belfqih, Anass Lekbich, Jamal Boukherouaa and Abdeljalil Laamimi* **Microgrid Voltage Control with On-Line grid Parameters Estimation (ID-125)** *Leila Ammeh and Hassan El Fadil* **Consumption Profiling in Ifrane, Morocco using Bottom-Up Approach (ID-130)** *Khadija Tazi, Fouad Abbou, Farid Abdi and Fouad Chaati*
Friday 11:45-12-45 (Room 2)	**Elman Neural Network for Solar Radiation Components Forecasting based on the desired tilt angle (ID-142)** *Mohammed Ali Jallal, Samira Chabaa, Abdessalam El Yassini, Abdelouhab Zeroual, Saida Ibnyaich and Mustapha Raoufi* **Architecture and methodology for a grid connected PV-Battery hybrid system (ID-228)** *Asmae Chakir, Mohamed Tabaa, Fouad Moutaouakkil, Hicham Medromi and Karim Alami* **Performance Analysis of a Grid-Connected PV Panels- Electrolyzer - Fuel Cell System for Cogeneration in Buildings (ID-298)** *Sofia Boulmrharj, Mohamed Bakhouya, Khalid Zine-Dine, Mustapha Siniti and Mohammed Khaidar* **Energy Management of micro grid based Electrical Vehicle to the Building (V2B) (ID-280)** *Fadoul Souleyman, Abdelhamid Hamadi, Ambrish Chandra, Mounir Benadja, Seghir Benhalima and Garoum Mohammed* **Control strategy for dynamic braking energy recovery of AMT Montreal train (ID-346)** *Fadoul Souleyman, Abdelhamid Hamadi, Ambrish Chandra, Seghir Benhalima, Mounir Benadja and Garoum Mohammed*

S6 Posters	Smart Grid
	Chairs ***Prof. Dominique Guyomard,*** *Institut des Materiaux Jean Rouxel at Nantes, France.* ***Prof. Marcello Baricco,*** Department of Chemistry and NIS, University of Torino, Italy
Friday 11:45-12:15	**Power Flow Control of PV System Featuring On-Grid and Off-Grid Modes (ID-53)** *Zakaria Abousserhane, Ahmed Abbou and Lahoucine Id-Khajine* **Domestic load management with renewable energy integration (ID-171)** *Imane Hammou Ou Ali, Mohammed Ouassaid and Mohamed Maaroufi* **Integration of the Multi Agent System Paradigm and ZigBee Smart Home Area Network (ID-202)** *Jawad Lotfi, Fouad Abbou, Farid Abdi and Fouad Chaatit*

Special Session 1

Biomass and Biogas Energy

Chairs:
Dr. David Newman, President of World Biogas Association, UK
Prof. Isam Janajreh, Khalifa University, Abu Dhabi, UAE.
Prof. Hassan El Bari, Faculty of Science, Ibn Tofail University, Morocco

Wednesday 14:45 - 15:15 (Room 1) SS1-KN14		**Microalgae-Microbial Fuel Cell (MMFC) for Bioelectricity Generation and Domestic Wastewater Treatments** By **Prof. H. Hadiyanto** Center of Biomass and Renewable Energy (CBIORE), Diponegoro University, Indonesia. Editor in Chief of The International Journal of Renewable Energy Development.
Wednesday 15:15 - 15:45 (Room 1) SS1-IS03		**Waste to Energy Via thermochemical conversion** By **Prof. Isam Janajreh** Khalifa University, Abu Dhabi, UAE.
Wednesday 15:45 - 16:15 (Room 1) SS1-IS04		**Biogas Potential and Opportunities for organic wastes in Morocco** By **Prof. Hassan El Bari** Moroccan Association of Solid Waste, President Faculty of Science, Ibn Tofail University, Morocco
16:15 - 16:45	**Discussion**	
Thursday 08:45-10:30 (Room 3)	**Suitability of municipal solid waste transfer stations in Harare, Zimbabwe (255)** *Trust Nhubu, Edison Muzenda and Charles Mbohwa* **Biogas Production Potential of Poultry Discharge in a Batch Reactor at Mesophilic Temperature (257)** *Ademola O. Adebayo, Simeon O. Jekayinfa, Paul A. Ozor and Charles Mbohwa* **Bio-oil from pine residues- yields, quality and potential applications (269)** *Gratitude Charis, Gwiranai Danha, Edison Muzenda and Nhlanhla Nkosi* **Design of a biodigester to treat cow dung in Botswana (276)** *Innocent Valela, Edison Muzenda and Gratitude Charis* **Effect of thermal pretreatment on anaerobic digestion performance of recycled paper sludge (ID-378)** *Mohammed Bakraoui, Yahya Lahlou, Fadoua Karouach, Nabila Lahboubi, Omar Kerrou, Mohammed Aggour and Hassan El Bari* **Study of the energy recovery by anaerobic digestion of dairy sludge from Moroccan industry (ID-434)** *Beniche Ikram, Karouach Fadoua, Mohammed Bakraoui and El Bari Hassan* **Study of the effect of Ultrasonic Pre-treatment on the methanogenic potential of University Restaurant Waste (ID-435)** *Fadoua Karouach, Rachid Gomhanad, Mohammed Bakraoui, Yasser El Gnaoui, Omar Kerrou and Hassan El Bari*	

	Biomass
S-VII	Chairs **Prof. H. Hadiyanto**, Diponegoro University, Indonesia. **Prof. Edison Muzenda**, Johannesburg University, South Africa **Prof. Hassan El Bari,** Faculty of Science, Ibn Tofail University, Morocco
Thursday 17:00-18:30 (Room 3)	**Biogas Production from Exhausted Pomace after Polyphenol Recovery (163)** *Sergio Mapelli, Gianpiero Ventimiglia, Cesare Sala and Silvana Castelli* **Combustion Analysis of Fixed Beds of Argan Nut Shell (ANS) Biomass in a Batch Type Reactor (165)** *Yassine Rahib, Toufik Boushaki, Brahim Sarh, Sylvie Bonammy, Ahmed Ihlal, Jamal Chaoufi* **Characteristics of biogas and syngas combustion (241)** *Toufik Boushaki, Hajar Zaidaoui and Brahim Sarh* **A review of experimental scope, designs and methods from intermediate-fast pyrolysis of biomass (244)** *Gratitude Charis, Gwiranai Danha, Edison Muzenda and Nhlanhla Nkosi* **Thermal Modeling of a Pilot-scale Liquid Recirculation Anaerobic Digester (283)** *Mohammed El Ibrahimi, Ismail Khay, Anas El Maakoul and Mohamed Bakhouya*

	Identification and physicochemical valorization of the aggregates of the siderurgical slags blast furnace (377) *Latifa Tairi, Djamel Berdjane, Badreddine Maalem, Samira Djemili and Nacira Sassane* **Production of Bio Char and Bio Oils from Botswana Marula Shells Through Torrefaction and Pyrolysis (ID-187)** *Janet Rakereng, Edison Muzenda and Joshua Gorimbo* Local **Study of the influence of nutrients on the microalgae growth (ID-274)** *El Kaihal Abderahmane and Fatima Kifani Sahban*

Workshop 2

Renewable energy and desalination sustainability

Chairs:

Dr. Sarper Sarp, Swansea University, UK.

Dr. Lijo Francis, Qatar Environment and Energy Research Institute, Qatar.

Thursday 14:15 - 14:45 (Plenary Room) W2-KN24		**Salinity Gradient Processes: FO and PRO – Are They Really the Answers to Desalination and Sustainable Energy Production?** By **Dr. Sarper Sarp** Swansea University, UK. Editor-in-Chief of Case Studies in Chemical and Environmental Engineering (Elsevier) Editorial Board Member of Desalination (Elsevier).
Thursday 14:15 - 15:15 (Plenary Room) W2-KN25		**Membrane Distillation – A Sustainable and Renewable Energy Driven Water Reclamation Process** By **Dr. Lijo Francis** Qatar Environment and Energy Research Institute, Qatar.
Thursday 15:15 - 15:45 (Plenary Room) W2-IS17		**Brackish Water Desalination using Capacitive Deionization** *By* **Dr Mohammed Al-Abri** *Nanotechnology Research Center, Sultan Qaboos University, Alkhoudh, Oman & College of Engineering, Sultan Qaboos University, Alkhoudh, Oman.*
Thursday 17:00-18:30 (Plenary Room)		**Artificial Intelligence Enabling Desalination Sustainability Optimization (360)** *Shadi Alzubi, Mohammad Alsmirat, Mahmoud Al-Ayyoub and Yaser Jararweh* **Optimization of The Capacitance of Activated Carbon in Symmetric Capacitive Deionization System (402)** *Adil Sghiouri Idrissi, Aissam Addou, Mohammed Aqil, Tarik Chafik, Ismael Saadoune and Mouad Dahbi* **Surface modification of a cellulose acetate membrane nanofiltration using thermal annealing to treat purified wastewater (ID-376)** *Hanane Aburideh, Nachida Kasbadji, Zahia Tigrine, Sarah Hout, Djilali Tassalit, Mohamed Abbas, M.W. Naceur* **Low Energy Desalination via Direct Contact Membrane Distillation: Looking Into the Concentration Polarization (ID-427)** *Khadije El Kadi and Isam Janajreh*

Special Session 2

Magnetocaloric refrigeration

Chairs:
Prof. Daniel Fruchart, Institut Néel, CNRS, Grenoble, France
Prof. Sébastien Poncet, Université de Sherbrooke, Canada.
Prof. Mohamed Balli, International University of Rabat, Morocco.

Wednesday 12:00 - 12:30 (Room 1) SS2-IS05		**Past, Present and Future Challenges of Magnetocalorics** *By* ***Prof. Mohamed Balli*** International University of Rabat, Morocco.
Wednesday 12:30 - 13:00 (Room 1) SS2-KN11		**Magnetocalorics of frustrated Fe_2P type-compounds. Two examples: $MnRh_{1-x}Ru_xAs$ with intricate fundamentals and $Mn_{2-x}FexP_{1-y}Si_y$, for promising cooling applications** *By* ***Prof. Daniel Fruchart*** Institut Néel, CNRS, Grenoble, France
Wednesday 17:30 - 18:00 (Room 1) SS2-IS05		**CFD modeling of Active Magnetic Regenerator in magnetocaloric refrigeration: a comprehensive review** *By* ***Prof. Sébastien Poncet*** Université de Sherbrooke, Canada.
Wednesday 18:00 - 18:30 (Room 1)		***Local*** ***Invited talk*** **: Magnetic ceramics for domestic and cryogenic magnetic refrigeration (ID-318)** *E. K. Hlil* **3mn Thesis : Aicha El Boukili (ID-205)** *MAScIR foundation, Rabat, Morocco*
Friday 09:45-11:15 (Room 3)		**Numerical modeling of AMR cascade cycles for hydrogen magnetic liquefier (199)** *Khathir Hamdani and Arezki Smaili* **Magneto-elastic properties of the $MnRu_xRh_{1-x}As$ system: Crystal, electronic structure and magnetocaloric effect analyses (ID-389)** *D. Szymański, R. Zach, J. Tobola, W. Chajec, R. Duraj, S. Baran, M. Michalec, S. Haj-Klifa and D. Fruchart* **Ameliorated Magnetocaloric Properties of $La_{0.6}Ca_{0.4}MnO_3$ through Composites based Mno Addition (ID-205)** *Aicha El Boukili, Omar Mounkachi, M. Hamedoun, A. Benyoussef, M. Balli and H. Ez-Zahraouy* **Effect of Mn-site doping on the magnetic and magnetocaloric properties of $(La_{0.6}Pr_{0.1})Sr_{0.3}Mn(Fe/Cr)O_3$ (ID-182)** *Lahcen Fkhar, Mohammed Hamedoun, Mustapha Ait Ali, Omar Mounkachi, Abdillah Benyoussef and Khadija El Maalam*

Special Session 3

Harnessing Local Resources for sustainable development

Chairs:
Prof. Tarik Chafik, Faculty of Sciences and Techniques of Tangier, Morocco.
Dr. Fouad-Ghamouss, University of Tours, France.
Prof. Peter Onu, University of Johannesburg, South Africa

Wednesday
17:30 - 18:00
(Plenary Room)
SS3-IS01

Some examples of using local resources in adsorption and catalytic processes involved in sustainable development technologies
*By **Prof. Tarik Chafik***
Faculty of Sciences and Techniques of Tangier, Morocco.

Wednesday
18:00 - 18:30
(Plenary Room)
SS3-IS02

Few examples in valorizing natural local resources in electrochemical storage
*By **Dr. Fouad Ghamouss***
University of Tours, France.

Wednesday
14:45 - 16:55
(Room 4)
&
Friday
(11:45-12:45)
(Room 4)

Concentrated Solar Power Technology and Thermal Energy Storage: A brief Overview of Nascent Sustainable Designs (ID-131)
Peter Onu, Charles Mbohwa and Peter Onu
Advances in Solar Photovoltaic Grid Parity (ID-132)
Peter Onu and Charles Mbohwa
Waste to Energy Opportunities in Botswana: A case study review (ID-245)
Gratitude Charis, Gwiranai Danha, Edison Muzenda, Bilal Patel and Corina Mateescu
Options for decentralised municipal solid waste management in Harare, Zimbabwe (ID-251)
Trust Nhubu, Edison Muzenda and Charles Mbohwa
How to achieve a decentralised, participatory, and people-centred energy transition towards 100% renewables on the African continent? (ID-271)
Kerstin Opfer, Marine Pouget, Yossef Ben-Meir, Mohamed Adow, Ursula Hagen, Augustine Njambshi and Joachim Fünfgelt
Pilot Scale Tar Production From Morupule Coal Dust Through Flash Pyrolysis (ID-236)
Abigail Tamu, Edison Muzenda, Mpho Rapoo and Bilal Patel
A Review of the Recycling and Economic Development Initiative of South Africa (REDISA) Waste Tyre Management Plan: Successes and Failures (ID-240)
Nhlanhla Nkosi, Edison Muzenda, Mohammed Belaid, Bilal Patel and Corina Mateescu
Global Plastic Waste Pollution Challenges and Management (ID-260)
Zvanaka Senzeni Mazhandu and Edison Muzenda
The interaction between Urban heat island and air quality in Casablanca (ID-385)
Laila El Ghazouani, Amine Ouhechou, Vatimatou Hamoud, Kenza Khomsi, Majid Mansour, Hassan Radoine, Najma Laaroussi

SS1-SS2 SS3 (Posters)	Chairs : ***Prof. Daniel Fruchart,*** Institut Néel, CNRS, Grenoble, France ***Dr. Nachid Kasbadji Merzouk***, CDER, Algiers, Algeria
Friday 11:15-11:55	**Acacia tortilis encroacher bush as a bioenergy source (ID-268)** *Gratitude Charis, Gwiranai Dr Danha, Edison Muzenda and Nhlanhla Nkosi* **Growth of Green Microalgae Strain in Torus Photobioreactor (ID-282)** *Amel Ounnar, Dalila Zitouni, Lynda Djouaher, Fayrouz Kaidi and Majda Amina Aziza* **Activity of Potassium antimony (III) tartrate hydrate $K(SbO)C_4H_4O_6.3H_2O$ derived catalysts in biodiesel production by transesterification (ID-319)** *Abdellah Aitlaalim, Mariam Khachani, Fatiha Ouanji, Abdelkbir Bellaouchou, Mohammed Kacimi and Mahfoud Ziyad* **Performances Enhancements of magnetic refrigeration device based on TiO2 (ID-248)** *Younes Chiba, Y. Marif, A. Boukaoud and D. Sebbar* **Local** **Design and performance of a magnetic refrigerator working with a magneto-caloric oxide (ID-252)** *Oumayma Chdil, Mohamed Balli and Omar Mounkachi*

IRSEC'19 Venue:

SOFITEL
LUXURY HOTELS
AGADIR ROYAL BAY RESORT

Sofitel Agadir Royal Bay Resort

Address : Cité Founty P4, Baie des Palmiers, Agadir, Morocco.

Sofitel Agadir Royal Bay Resort
(The main entrance)

IRSEC'19 partner hotel :

Kenzi Europa Hotel

Address: Boulevard 20 août - Agadir– Morocco

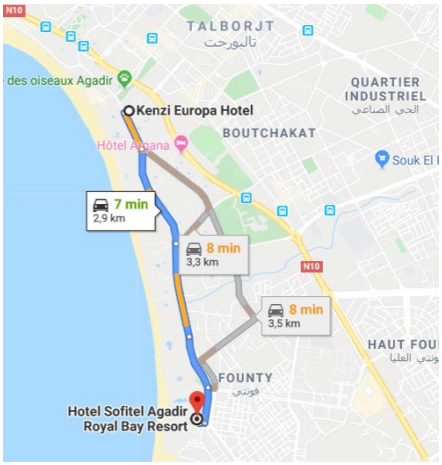
Kenzi Europa Hotel (the main entrance)

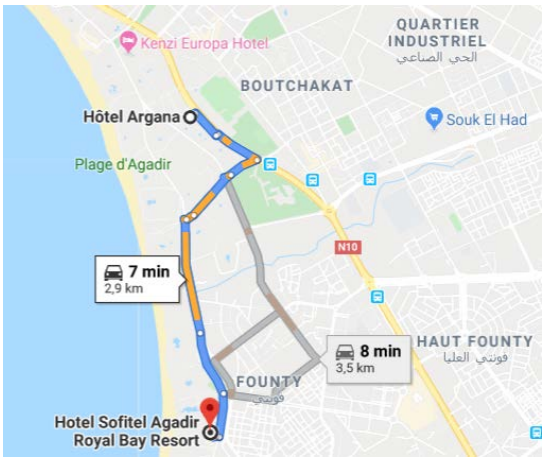
IRSEC'19 partner hotel :

Argana Hotel

Address: Boulevard Mohamed V B P 93 ،Agadir – Morocco

Argana Hotel (the main entrance)





Oral Presentation guidelines:

There will be three types of presentations at the IRSEC19 of different durations:

Type of presentation	*Maximum timeslot for talking*	*questions/discussion*
Oral presentation (15 min)	12 minutes	3 minutes
Keynote or plenary (30 min)	24 minutes	6 minutes
3 minutes thesis (5min)	3 minutes	1-2 Questions (2 minutes)

- The chairperson will promptly stop your presentation when your time is up.
- The speakers should give their slides to the session chair before the beginning of each session.
- All presentations **should be in English**.

Poster Presentation guidelines:

- All posters should be prepared in advance and brought to the conference by the presenters. There will NOT be facilities on-site for printing posters.
- Each poster should be no larger than A0 paper size measuring 84.1 cm (width) × 118.9 cm (height) and must be oriented in the portrait position.
- Limit the text to about one-third of the poster space: In presenting your research with a poster, you should aim to use the poster as a means for generating active discussion of the research. It should be prepared in a graphically based approach. Use visuals (graphs, figures, photographs maps, etc.).
- Text should be readable from 1 meter away. Use a minimum font size of 18 points.
- Put your "Paper ID" on the top right of your Poster.
- Posters should be displayed one hour before the beginning of the poster session and any explanation required should be provided to session chairs and visitors (in English).

Contacts

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