Monday, April 25, 2022

10:45 am - 11:00 am

Opening Session

Chair: Kensuke Nishioka (University of Miyazaki)

10:45 am Opening Declaration
Kensuke Nishioka, University of Miyazaki

10:48 am Announcement of the Continuity of CPV-x
Kenji Araki, University of Miyazaki

10:53 am Welcome Speech TPV-13
Makoto Shimizu, Tohoku University, Alejandro Datas, IES-UPM, Rodolphe Vaillon, IES - CNRS - Uni Montpellier

10:57 am Instruction of the Conference System
Beatrix Feuerbach, Conexio-PSE

11:00 am - 01:00 pm

Micro CPV

Chair: Daisuke Sato (Nagaoka University of Technology), Rüdiger Löckenhoff (Azur Space)

11:00 am Science in Micro-CPV
Maike Wiesenfarth, Fraunhofer Institute for Solar Energy Systems ISE

11:30 am Influence of the Thermally Induced Deflection of a Space Micro-Concentrator Photovoltaic Array on its Optical Performances using Finite Element Method
Victor Vareilles[1], Anderson Bermudez-Garcia[1], Fabien Chabuel[1], Mohamed Amara[2], Yannick Veschetti[1], Philippe Voarino[1]
[1] CEA; [2] INL

11:45 am Experimental Characterization of Micro-Optics for Integrated Tracking Included in HIPERION micro-CPV Modules
Guido Vallerotto[1], Norman Jost[1], Gaël Nardin[2], Mathieu Ackermann[2], Mathilde Duchemin[2], Stephen Askins[1], César Domínguez[1], Ignacio Antón[1]
[1] Instituto de Energía Solar (IES); [2] Insolight SA

12:00 pm High Efficiency Roof-Top Solar: Progress and Pilot Installation in the Hiperion Project
Steve Askins[1], Guido Vallerotto[1], César Dominguez[1], Gael Nardin[2], Mathieu Ackerman[2], Delphine Petri[3], Matthieu Despeisse[3], Jacques Levrat[1], Xavier Niquelle[3], Christophe Ballif[3], Juan Francisco Martinez[4], Marc Steiner[5], Gerald Siefer[4], Ignacio Anton[1]
[1] Instituto de Energia Solar - UPM; [2] Insolight SA; [3] Centre Suisse d'Electronique et de Microtechnique SA; [4] Fraunhofer Institute for Solar Energy Systems ISE; [5] Fraunhofer Institute for Solar Energy Systems

12:15 pm Effects of Manufacturing Tolerances on Micro-CPV Module Efficiency
Elisa Kaiser[1], Maike Wiesenfarth[1], Marc Steiner[1], Peter Nitz[1], Henning Helmers[1]
[1] Fraunhofer Institute for Solar Energy Systems ISE

12:30 pm On the Effect of Misalignment Distributions on the I-V Curve of Micro-CPV Modules
Luis Javier San José[1], Guido Vallerotto[2], Zubair Abdullah-Vetter[3], Rebeca Herrero[2], Ziv Hameiri[4], Ignacio Antón[2]
[1] Instituto de Energía Solar, Universidad Politécnica de Madrid; [2] Institute of Solar Energy, Universidad Politécnica de Madrid; [3] School of Photovoltaic and Renewable Energy Engineering, The University of New South Wales; [4] School of Photovoltaic and Renewable Energy Engineering, University of New South Wales

12:45 pm Discussion

01:00 pm - 01:30 pm **Lunch Break**

01:30 pm - 03:50 pm

CPV Technologies

Chair: Maria Martinez (ISFOC) & Victor Vareilles (CEA) & Kareem Younes (Khalifa University)

01:30 pm Energy Yield Modeling of 5J Solar Cell Based CPV Modules
Marc Steiner[1], Philipp Schroth[2], Rüdiger Löckenhoff[2], Gerald Siefer[1], Maike Wiesenfarth[1]
[1] Fraunhofer ISE; [2] AZUR SPACE Solar Power GmbH

01:50 pm First Feedback from a CPV Plant in a Nordic Location, Québec, Canada
Mehdi Talebi[1], Maïté Volatier[1], Abdelatif Jaouad[1], Christian Dubuc[2], Vincent Aimez[1], Maxime Darnon[1]
[1] Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke; [2] Saint-Augustin Canada Electric Inc

02:05 pm Design and Analysis of Hybrid Concentrator Photovoltaic Module Combining Low-Concentration Static Lens and Luminescent Solar Concentrator for Automobile Applications
Daisuke Sato[1], Ryota Tomizawa[2], Taizo Masuda[2], Kenichi Okumura[2], Noboru Yamada[1]
[1] Nagaoka University of Technology; [2] Toyota Motor Corporation

02:20 pm A Highly Efficient, Low-Cost Hybrid Module, Combining Multijunction and Silicon PV Cells
James Roger Angel[1], Barry Hartweg[2], Zach Holman[3], Joel Berkson[4]
[1] homeUniversity of Arizona; [2] Arizona State University; [3] Arizona Stat University; [4] University of Arizona

02:35 pm Electronic Network Simulation of 5-Junction Solar Cells and Impacts on the Ideal Current Matching
Ruediger F. Loeckenhoff[1], Peter Schoettl[2]
[1] AZUR SPACE Solar Power; [2] Fraunhofer ISE

02:50 pm High-Concentration Freeform Microtracking Concentrators with Single-Axis External Tracking
Håkon J. D. Johnsen[1], Jan Torgersen[1]
[1] *NTNU, Department of Mechanical and Industrial Engineering*

03:05 pm A Universal Solar Tracker Controller
Ruediger F. Loeckenhoff[1], Ermanno Antonelli[2]
[1] *AZUR SPACE Solar Power;* [2] *Volt4*

03:20 pm Output Analysis of Plastic-integrated Concentrating Photovoltaic Modules under Outdoor Operation
Taichi Uno
University of Miyazaki

03:35 pm Discussion

03:50 pm - 05:00 pm

Poster Session

Chair: Kenji Araki (University of Miyazaki)

A01 A Comparative Study of 3D Printed Non-Imaging Solar V-Trough and Compound Parabolic Concentrators for Low-Cost, High-Performance CPV Applications
Mohammad Alnajideen
Cardiff University

A02 Multi-Terminal Three-Junction Solar Cells for Sub-Cells Characterization
Farah Ayari[1], Maxime Darnon[1], Abdelatif Jaouad[1], Vincent Aimez[1], Mathieu de Lafontaine[1], Gwénaëlle Hamon[1], Thomas Bidaud[1], Maïté Volatier[1], Solène Moreau[1], Artur Turala[1]
[1] *Interdisciplinary Institute for Technological Innovation (3IT)*

A04 Terrestrial Solar Electric Power 24 Hours Per Day from Space Using 40% Efficient Gasb Concentrator Photovoltaic (CPV) Cells
Lewis Fraas
JX Crystals Inc

A05 Measurement of III-V CPV Solar Cell Non-Linearity in the 1x to 1024x Light Concentration Range
Ruediger F. Loeckenhoff[1], Anton Ruban[1]
[1] *AZUR SPACE Solar Power*

A06 On-orbit Demonstration Plan of Micro CPV on HTV-X
Teppei Okumura[1], Taishi Sumita[1], Daisuke Sato[2], Shuto Tsuchida[2], Noboru Yamada[2]
[1] *Japan Aerospace Exploration Agency;* [2] *Nagaoka University of Technology*

A07 GaAs Vertical-Tunnel-Junction Power Converter for Ultra-High Light Intensities
Celia Outes[1], Eduardo F. Fernández[1], Natalia Seoane[2], Florencia Almonacid[1], Antonio J. García - Loureiro[2]
[1] *University of Jaén;* [2] *University of Santiago de Compostela*

A08 Towards Directly Growing Arrays of Micro-Solar Cells In-Situ for Micro-Concentrator Applications
Ricardo Poeira[1], Ana Pérez-Rodriguez[2], Sascha Sadewasser[2], Phillip Dale[1]
[1] University of Luxembourg; [2] INL - International Iberian Nanotechnology Laboratory

A09 Consideration for Importance of Concentrating Photovoltaics for Creation of Future Net Zero Greenhouse Gas Emission Energy Systems
Masafumi Yamaguchi[1], Kenji Araki[2], Yuchao Zhang[3], Brett Hallam[3]
[1] Toyota Technological Institute; [2] University of Miyazaki; [3] University of New South Wales

B01 Novel Module Configurations Based on Multiple Concentrator Units and Optical Guides Towards High-Performance Ultra-High CPV Systems
María de los Angeles Ceballos Pérez[1], Alvaro Valera Albacete[1], Pedro J. Pérez-Higueras[1], Florencia Almonacid Cruz[1], Eduardo Fernández Fernández[1]
[1] University of Jaén

B02 Computer Simulation of Heat and Mass Transfer inside a HCPV Module
Alexander Chekalin[1], Yuri Ascheulov[1], Yuri Chumakov[2], Evgenii Khrapunov[3]
[1] Ioffe Institute; [2] Peter the Great St. Petersburg Polytechnic University; [3] Krylov State Research Centre

B03 Smart Solar Concentrator Building Integrated for Nearly-Zero Energy Buildings
Daniel Chemisana[1], Fabian Duerr[2]
[1] University of Lleida; [2] Vrije Universiteit Brussel

B04 Estimating the Thermal Characteristics of Transparent Concentrator Photovoltaic Module
Yasuyuki Ota[1], Sota Katsuhara[1], Kenji Araki[1], Kensuke Nishioka[1]
[1] University of Miyazaki

B05 Optimization of the CPV Receiver Cooling System to Improve Energy Transfer Efficiency
Joan Rosell Urrutia[1], Desideri Regany Vendrell[1], Montse Vilarrubí[1], Francesc Majós[1], Manel Ibañez[1], Jerome Barrau[1]
[1] Politechnical School, Universitat de Lleida

B06 Optical, Electrical, and Thermal Characterization of a Novel Tracking-Integrated Semi-Transparent CPV Module
Kareem Younes[1], Majed Bin Saad[1], Harry Apostoleris[2], Noé Bory[3], Gaël Nardin[3], Mathieu Ackermann[3], Matteo Chiesa[4]
[1] Khalifa University; [2] DEWA Research & Development Center; [3] Insolight; [4] UiT The Arctic University of Norway

C01 Spot Size Experiments with Diffractive Optical Elements on Glass Lenses: Correction of Chromatic Aberration
Ralf Leutz[1], Harald Ries[2]
[1] leopil - Leutz Optics and Illumination UG (haftungsbeschränkt); [2] ffOptik GmbH

D03 Comparative Analysis of Control Strategies for the Reduction of Tracking Error in CPV Systems
Sergio Isai Palomino-Resendiz[1], Diego Alonso Flores-Hernández[2], Basil Mohammed Al-Hadithi[3], Víctor Cadix-Martín[3]
[1] Instituto Politécnico Nacional –ESIME-ZAC. Departamento de Control y Automatización; [2] Instituto Politécnico Nacional – UPIITA, Applied Dynamic Systems Laboaratory; [3] Universidad Politécnica de Madrid

D04 FNX an Innovative Tangential Solar Tracker
Paolo Valente
VT Energy Innovation

E01 Solar Electric Power 24 hrs per day Using 40% Efficient GaSb CPV Modules
Lewis Fraas
JX Crystals Inc

E02 Generation of H2 from CPV sources
Maria Martinez[1], Daniel Sanchez[1], Oscar de la Rubia[1], Rafael Cervantes[2], Goulven Quéméré[2], Ignacio Luque-Heredia[2], Delia Muñoz[3], Covadonga García[3]
[1] ISFOC; [2] BSQSOLAR; [3] H2B2 Electrolysis Technologies, SL

E03 Prediction of PPFD (photosynthetic Photon Flux Density) Under Transparent CPV Modules
Teruya Toyoda[1], Daisuke Yajima[1], Masaaki Kirimura[1], Kenji Araki[1], Yasuyuki Ota[1], Akira Nagaoka[1], Kensuke Nishioka[1]
[1] University of Miyazaki

E04 Indoor Measurements of Hybrid MJ Solar Cell and Thermoelectric Generator Receiver
Alvaro Valera Albacete[1], Florencia Almonacid Cruz[1], Eduardo Fernandez Fernandez[1]
[1] Advances in PhotoVoltaic Technology (AdPVTech), Universidad de Jaén

F01 Evaluation of Thermoelectric Properties of N-type (Cu1-xAgx)2ZnSnS4
Kouichi Okamoto[1], Akira Nagaoka[1], Yusuke Shigeeda[1], Kenji Yoshino[1], Kenji Nishioka[1]
[1] University of Miyazaki

G02 Enhanced Radiative Absorption Distribution in Near-Field Thermophotovoltaic System with Multilayer Emitter
Bowen Li
Huazhong University of Science and Technology

G03 Nanospacer Configurations for Large-Area Near-Field Thermal Converters
Esther Lopez[1], Pablo García-Linares[1], Alejandro Datas[1]
[1] Instituto de Energía Solar, Universidad Politécnica de Madrid

H01 Wide Band High Level Thermal Radiation Emission of Highly Doped Black Silicon
Sreyash Sarkar[1], Tarik Bourouina[1], Philippe Basset[1], Frederic Marty[1], Georges Hamaoui[1]
Presented by Georges Hamaoui[1]
[1] ESYCOM Lab, Univ Gustave Eiffel, CNRS

I01 Punctual Contact Formation in Ge for the Development of Interdigitated Back Contacted Thermophotovoltaic Cells

Alba Jiménez Pagán[1], David Canteli[2], Isidro Martín[3], Gema López[3], Alicia López de Ceballos Regife[1], Álvaro Manuel Medrano Gómez[1], Carlos Molpeceres Álvarez[4], Carlos del Cañizo Nadal[1], Alejandro Datas Medina[1]

[1] Instituto de Energía Solar, Universidad Politécnica de Madrid; [2] Centro Láser, Universidad Politécnica de Madrid; [3] Departament d'Enginyeria Electrònica, grup d'investigació MNT,Universidad Politècnica de Catalunya; [4] Centro Láser

I02 Prototype Trial of a Thermophotovoltaic System for Industrial Waste Heat Recovery

Graham Buckley[1], C. M. Iftekhar Hussain[2], Aoife Kelly[3], Brian Norton[4]

[1] Technical University Dublin; [2] TU Dublin; [3] Technological University Dublin; [4] Dublin Energy Lab, Technological University Dublin, Dublin

04:30 pm - 05:00 pm

Speed Dating

Speed dating is the quick (three to five minutes) discussion of three to five people by shaffling the members in every trigger. It is intended to meet as many people in different communities as possible and encourage speaking and discussing in a limited time. The theme of the meeting on the first day is "Warm-up session for the open discussion tomorrow." The dating organizer gives you two questions and shuffles the members. The first question is, "What is the future of CPV industries and technologies?" The second question is, "Do you find any solutions?"

Tuesday, April 26, 2022

10:30 am - 10:45 am

Meet & Greet: Ask Professors

The second-day program is constructed for a transition of the CPV to TPV. Both CPV and TPV people are highly encouraged to participate. Several people are not familiar with CPV technologies or looking for specific solutions from established CPV technologies. This is the reason why professors are on the stage. Come to professors and ask them about cells, optics, alignment, reliability, trackers, field experience, and standards. The experts of CPV technologies will be ready to answer your technical questions.

10:45 am - 12:00 pm

CPV/TPV Transition

Chair: Marc Steiner (Fraunhofer ISE), Myles Steiner (NREL)

10:45 am Radiative Recombination
Prof. Hidefumi Akiyama
University of Tokyo

11:15 am Humidity Control in Planar Micro-Tracking CPV Modules by Means of Passive Solutions
Ruben Nuñez[1], Steve Askins[1], Laetitia Anglade[2], Florian Gerlich[2], Ignacio Anton[1], Cesar Dominguez[1]
[1] Instituto de Energía Solar, Universidad Politécnica de Madrid; [2] Insolight

11:30 am Analysis of Thermally Stressed GaAs Solar Cells for Operation in Terrestrial Hybrid Systems
Paul Oublon[1], Alexandre Arnoult[2], Simon Hurand[3], Maxime Levillayer[2], Frédéric Martinez[4], Inès Massiot[2], Stéphanie Parola[4], Jérémie Drevillon[2], Daniel Chemisana[5], Guilhem Almuneau[2], Yvan Cuminal[4], Rodolphe Vaillon[4]
[1] IES - CNRS - Univ Montpellier; [2] Laboratoire d'Analyse et d'Architecture des Systèmes (LAAS-CNRS), Université Toulouse, CNRS; [3] Institut Pprime, CNRS, Université de Poitiers, ISAE-ENSMA; [4] IES Institut d'Electronique et des Systèmes - UMR5214; [5] Applied Physics Section of the Environmental Science Department, University of Lleida, Jaume II 69

11:45 am Characterization of Antireflective Coatings on a Spherical Lens Secondary Optical Element
Lysander Treumann[1], Thomas Schmidt[1], Peter Schöttl[1], Peter Nitz[1]
[1] Fraunhofer Institute for Solar Energy Systems ISE

12:00 pm - 01:00 pm

Special Session: Future of CPV

This is the special session of Mitsuru Imaizumi, an entertainer from the space community (but always friends of the CPV community). It begins with three ice-breaking speeches from three generations (frontier, golden age, younger generation) and three technologies (cell, optics, and module/system). It is a kind of competition among generations and critical components. We will see how each key component can do in the future by different ages. Then, the open discussion starts. Everybody can write their opinion in the chat window, including TPV people. The conductor selects valuable comments from the equalized view and further encourages the discussion. What is the fate of CPV? Your participation will create the answer.

Chair: Mitsuru Imaizumi (JAXA)

12:00 pm Intermission

12:05 pm Cell, Frontier
Masafumi Yamaguchi, Toyota Technological Institute

12:15 pm Optics, Golden Age
Ralf Leutz, leopil - Leutz Optics and Illumination UG (haftungsbeschränkt)

12:25 pm Module/System, Young Generation
Norman Jost (PhD student), UPM

12:35 pm Open discussion

12:50 pm - 01:00 pm

CPV-18 Award Ceremony

Chair: Kensuke Nishioka (University of Miyazaki)

01:00 pm - 01:30 pm

Lunch Break

01:30 pm - 03:00 pm

Materials and Cells

Chair: Mathieu Francoeur (University of Utah) & Tobias Burger (University of Michigan)

01:30 pm Record Efficiency InGaAs Thermophotovoltaic Cells For Energy Storage Applications
Myles Steiner[1], Eric Tervo[1], Ryan France[1], Cecilia Luciano[2], Dustin Nizamian[2], Benjamin Johnson[2], Alexandra Young[2], Leah Kuritzky[2], Emmett Perl[2], Moritz Limpinsel[2], Brendan Kayes[2], Tarun Narayan[2], Madhan Arulanandam[3], Richard King[3], Andrew Ponec[2], David Bierman[2], Justin Briggs[2]
[1] NREL; [2] Antora Energy; [3] Arizona State University

01:45 pm Mitigating Nonradiative Losses in Low Bandgap Thermophotovoltaic and Thermoradiative Cells
Eric Tervo[1], Andrew Ferguson[1], Myles Steiner[1], Ryan France[1]
[1] National Renewable Energy Laboratory

02:00 pm Maximizing Infrared Reflectance in Germanium TPV Cells
Pablo Martin[1], Clara Sánchez-Pérez[2], Iván García[2]
[1] Instituto de Energía Solar, Universidad Politécnica de Madrid; [2] Instituto Energía Solar, Universidad Politécnica de Madrid

02:15 pm Laser Processed Contacts on p-type c-Ge Based on Al2O3 Films for TPV Devices
Isidro Martín[1], Gema López[1], Moises Garín[2], Alba Jiménez[3], Alicia L. Ceballos[3], Alvaro Manuel Medrano[3], Carlos del Cañizo[3], Alejandro Datas[3]
[1] Universitat Politecnica de Catalunya; [2] Universitat de Vic - Universitat Central de Catalunya; [3] Instituto de Energía Solar, Universidad Politécnica de Madrid

02:30 pm Harvesting Mid-Wave Infrared Radiation with Type-II InAs/InAsSb Superlattices: from Photodetectors to Thermophotovoltaics Cells
Rodolphe Vaillon[1], Basile Roux[2], Maxime Bouschet[2], Stéphanie Parola[2], Frédéric Martinez[2], Philippe Christol[2], Jean-Philippe Perez[2], Rodolphe Vaillon[2]
Presented by Basile Roux[2]
[1] IES - CNRS - Univ Montpellier; [2] Institut d'Electronique et des Systèmes

02:45 pm Discussion

03:00 pm - 03:15 pm **Break**

03:15 pm - 04:15 pm

Special Session: Pathways for TPV R&D

While there have been several major TPV R&D movements in the past, they have yet to reach the point of practical application and widespread adoption.
The development of research over the past few years suggests that a new movement is underway. In order to make this R&D movements sustainable, we will hold a panel discussion on the "Pathway of TPV R&D". The session will start with short impulse talks, followed by a discussion.
Chair: Makoto Shimizu (Tohoku University), Alejandro Datas (IES-UPM), Rodolphe Vaillon (IES - CNRS - Uni Montpellier)

03:15 pm History of TPV
Taizo Shibuya, NEC

03:20 pm Thermophotovoltaic Batteries
Alejandro Datas, IES-UPM

03:25 pm Making TPV Technology Marketable
Moritz Limpinsel, Antora Energy

03:30 pm Towards Low-cost TPV Cell Manufacturing
Myles Steiner, NREL

03:35 pm Pathways for TPV Research From Academic Point of View
Rodolphe Vaillon, CNRS-IES

03:40 pm Panel Discussion

04:05 pm - 04:15 pm

Sponsor Session

04:05 pm Presentation Azur Space

04:15 pm - 04:45 pm

Lab Tour

It is a pre-recorded lab tour of both University of Miyazaki (CPV) and Tohoku University (TPV). It is not limited to CPV/TPV. Miyazaki also shows the most advanced VIPV measurement (Vehicle-integrated photovoltaic) demonstration. The tour will be followed by Q&A.
Chair: Kensuke Nishioka, University of Miyazaki

04:15 pm Lab Tour of Miyazaki University

04:25 pm Lab Tour of Tohoku University

04:45 pm - 05:15 pm

Speed Dating

Speed dating is the quick (three to five minutes) discussion of three to five people by shaffling the members in every trigger. It is intended to meet as many people in different communities as possible and encourage speaking and discussing in a limited time. The agenda of the second day is: "What is the future of the CPV / TPV conference?"

Wednesday, April 27, 2022

10:45 am - 11:00 am **Meet & Greet**

11:00 am - 11:40 am

Emitters

Chair: Rodolphe Vaillon (University of Montpellier - CNRS)

11:00 am Hybrid Resonance Mode Based Narrowband Emission in 2D Superlattice Photonic Microcavity
Zhen Liu[1], Makoto Shimizu[1], Hiroo Yugami[1]
[1] Tohoku University

11:15 am Porous Oxide Thermophotovoltaic Emitters Prepared by Plasma-assisted Aerosol Deposition
Taizo Shibuya
NEC Corp.

11:30 am Discussion

11:40 am - 11:55 am **Break**

11:55 am - 12:50 pm

Advanced Concepts I

Chair: Alejandro Datas (IES-UPM)

11:55 am Temperature Dependence of Thermal Radiation and Impact on Near-Field Thermophotovoltaic Devices
P-Olivier Chapuis[1], Christophe Lucchesi[1], Julien Legendre[1], Rodolphe Vaillon[2]
[1] CNRS-CETHIL (Centre for Energy and Thermal Sciences, Lyon); [2] CNRS-IES (Institute for Electronics and systems, Montpellier)

12:10 pm Near-Field Thermophotonic Devices with AlGaAs Emitters and Cells
Julien Legendre[1], Pierre-Olivier Chapuis[1]
[1] Centre for Energy and Thermal Sciences of Lyon (CETHIL)

12:25 pm Comprehensive Energy Balance Analysis of Photon-Enhanced Thermionic Power Generation Considering Concentrated Solar Absorption Distribution
A N M Taufiq Elahi
University of Utah

12:40 pm Discussion

12:50 pm - 01:30 pm **Lunch Break**

01:30 pm - 03:00 pm

Systems

Chair: Myles Steiner (NREL) & Peter Bermel (Purdue University)

01:30 pm 3D Ray Tracing Model for the Design and Development of Efficient Emitter-TPV Cavities
David Woolf[1], Joel Hensley[1]
[1] *Physical Sciences, Inc.*

01:45 pm Performance Analysis of Tandem Near-Field Solar Thermophotovoltaic System
Bong Jae Lee[1], Jaeman Song[1], Minwoo Choi[1], Jihye Han[1], Jungchul Lee[1]
[1] *KAIST*

02:00 pm Effect of Spectrally Selective Emission on a Solar-Thermophotovoltaics Equipped with a Confined System
Makoto Shimizu[1], Tomoya Furuhashi[1], Zhen Liu[1], Hiroo Yugami[1]
[1] *Tohoku University*

02:15 pm 50 W-scale Demonstration of Thermophotovoltaic Energy Conversion using a Metamaterial Selective Emitter
David Woolf[1], Joel Hensley[1], Rick Wainner[1], Brandon Young[1]
[1] *Physical Sciences, Inc.*

02:30 pm The Effect of Optical Cavities on Thermophotovoltaic Systems
Nima Talebzadeh[1], Paul G. O'Brien[1]
[1] *York University*

02:45 pm Discussion

03:00 pm - 03:15 pm **Break**

03:15 pm - 04:10 pm

Advanced Concepts II

Chair: Pierre-Olivier Chapuis (CNRS-CETHIL)

03:15 pm Non-Local Effects on Near-Field Radiative Heat Transfer Between Graphene Sheets
Saman Zare[1], Sheila Edalatpour[1]
[1] *University of Maine*

03:30 pm A Comprehensive Model of the External Radiative Recombination in Thin-Film Near-Field Radiative Energy Converters
Dudong Feng
Georgia Institute of Technology

03:45 pm Impact of Absorption Layer Thickness on InAs-Based NFTPV Device Performance
Gavin Forcade[1], Christopher Valdivia[1], Sean Molesky[2], Shengyuan Lu[3], Alejandro W. Rodriguez[3], Raphael St-Gelais[1], Karin Hinzer[1], Jacob Krich[1]
[1] *University of Ottawa;* [2] *Polytechnique Montreal;* [3] *Princeton University*

04:00 pm Discussion

04:10 pm - 04:30 pm

Closing Session

04:10 pm CPV Wrap-up
Kenji Araki, University of Miyazaki

04:15 pm TPV Wrap-up
Makoto Shimizu, Tohoku University

04:20 pm TPV Award Ceremony

04:25 pm Closing Remarks
Kensuke Nishioka, University of Miyazaki

04:30 pm - 05:00 pm

Scientific Cosplay

Please, dress up with something implying "Science and Technology" with a glass of drink. Since there is no intermission time from the closing session, some of the committee members (at least the program chair) dress something cosplay while presenting the scientific summary of the conference during the closing session. So, please do not be surprised.

Personal Notes