

The focuses of PVSEC-23 are:

- Area 1: Advanced Technologies for Crystalline Silicon Materials and Solar Cells
- Area 2: Amorphous, Microcrystalline and Other Silicon based thin film Solar Cells
- Area 3: CIS, CdTe and Other (II-VI) thin film Solar Cells
- Area 4: Concentrator Photovoltaic, III-V and Space Solar Cells
- Area 5: Advanced Nanostructured Solar Cells: New Concepts, Materials and Structures
(dye-sensitized solar cells, organic solar cells and the other)
- Area 6: PV Modules and Systems Including BOS Components, testing and reliability
- Area 7: PV Systems and Deployment



Program at a Glance

Date	Oct. 28 (Monday)	Oct. 29 (Tuesday)		Oct. 30 (Wednesday)		Oct. 31 (Wednesday)		Nov. 1 (Friday)	
08:15-08:45	Registration	08:00-08:30	Registration	08:00-08:30	Registration	08:00-08:30	Registration	08:00-08:30	Registration
08:45-09:00	Opening Ceremony	08:30-10:20	Parallel Sessions (Area 1, 3, 4, 5)	08:30-10:20	Parallel Sessions (Area 1, 2, 3)	08:30-10:20	Parallel Sessions (Area 1, 3, 5, 7)	08:30-10:20	Parallel Sessions (Area 1, 2, 5)
09:00-10:20	Plenary Sessions	10:20-10:40	Break Time	10:20-10:40	Break Time	10:20-10:40	Break Time	10:20-10:40	Break Time
10:20-10:30	Break Time	10:40-12:10	Parallel Sessions (Area 1, 3, 4, 5)	10:40-12:10	Parallel Sessions (Area 1, 2, 3)	10:40-12:10	Parallel Sessions (Area 1, 3, 5, 7)	10:40-12:10	Parallel Sessions (Area 1, 3, 6, 7)
10:30-11:50	Plenary Sessions	12:10-13:30	Lunch Break	12:10-13:30	Lunch Break	12:10-13:30	Lunch Break	12:10-12:30	Closing Ceremony
11:50-13:00	Lunch Break	13:30-15:00	Parallel Sessions (Area 1, 2, 5, 6)	13:30-15:00	Parallel Sessions (Area 1, 4, 5)	13:30-15:00	Parallel Sessions (Area 1, 4, 6)		
13:00-15:00	Plenary Sessions	15:00-15:20	Break Time	15:00-15:20		15:00-15:20			
15:00-15:10	Break Time	15:20-17:10	Parallel Sessions (Area 1, 2, 5, 6)	15:20-17:00	Poster Session I (Area 1, 2, 5)	15:20-17:00	Poster Session II (Area 3, 4, 6, 7)		
15:10-17:00	Plenary Sessions			18:00-21:00	PV Taiwan 2013 & PVSEC-23 VIP Joint Dinner (ticket required)				

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- All presentations will be conducted in English.
- No recording/ photography during seminar.

Program at A Glance																						
Date	Oct. 28 (Monday)	Oct. 29 (Tuesday)					Oct. 30 (Wednesday)				Oct. 31 (Thursday)					Nov. 1 (Friday)						
Venue	101	Venue	101AB	101C	101D	103	Venue	101B	101A	103	Venue	101B	101C	101A	101D	Venue	101B	101C	101A	101D		
08:15-08:45	Registration	08:00-08:30	Registration				08:00-08:30	Registration				08:00-08:30	Registration				08:00-08:30	Registration				
08:45-09:00	Opening Ceremony	08:30-09:00	1-I-1 Kenji Yamamoto	5-I-1 Alex Jen	3-I-1 A. N. Tiwari	4-I-1 Frank Dimroth	08:30-09:00	1-I-5 Deren Yang	2-I-4 Xiaodan Zhang	3-I-3 B.-T. Ahn	08:30-09:00	1-I-8 Weeber, A.W.	5-I-5 Chain-Shu Hsu	3-I-5 C.C. Chiang	7-I-1 Sammi Lin	08:30-09:00	1-I-9 Budi Tjahjono	3-I-6 Katsumi Kushiya	4-I-7 J. T. Lai	7-I-2 Jackie Chang		
09:00-09:40	Prof. Martin Green	09:00-09:20	1-O-1 1476	5-O-1 TBD	3-O-1 1171	4-I-2 Ray Lin	09:00-09:20	1-I-6 Kazuo Nakajima	2-O-7 1358	3-O-8 1054	09:00-09:20	1-O-23 1117	5-O-19 1111	3-O-14 1425	7-O-1 1480	09:00-09:20	1-O-34 1219	3-O-21 1212	4-I-12 1267	7-O-8 1516		
09:40-10:20	Dr. Makoto Konagai	09:20-09:40	1-O-2 1333	5-O-2 1205	3-O-2 1239	4-O-1 1198	09:20-09:40	1-O-15 1154	2-O-8 1351	3-O-9 1146	09:20-09:40	1-O-24 1266	5-O-20 1316	3-O-15 1504	7-O-2 1491	09:20-09:40	1-O-35 1424	3-O-22 1123	4-O-13 1114	7-O-9 1517		
10:20-10:30	Break Time	09:40-10:00	1-O-3 1417	5-O-3 1325	3-O-3 1189	4-O-2 1243	09:40-10:00	1-O-16 1237	2-O-9 1095	3-O-10 1285	09:40-10:00	1-O-25 1469	5-O-21 1221	3-O-16 1322	7-O-3 1524	09:40-10:00	1-O-36 1458	3-O-23 1079	4-O-14 1357	7-O-10 1116		
10:30-11:10	Dr. P. H. Chang	10:00-10:20	1-O-4 1569	5-O-4 1069	3-O-4 1134	4-O-3 1472	10:00-10:20	1-O-17 1138	2-O-10 1112	3-O-11 1192	10:00-10:20	1-O-26 1523	5-O-22 1060	3-O-17 1257	7-O-4 1269	10:00-10:20	1-O-37 1485	3-O-24 1376	4-O-15 1319	7-O-11 1475		
11:10-11:50	Dr. Michael Graetzel	10:20-10:40	Break Time				10:20-10:40	Break Time				10:20-10:40	Break Time				10:20-10:40	Break Time				
11:50-13:00	Lunch Break	10:40-11:10	1-I-2 Antoine Descoeudres	5-I-2 Chun-Guey Wu	3-I-2 Tokio Nakada	4-I-3 Noren Pan	10:40-11:10	1-I-7 S. Saravanan	2-I-5 Hideki Matsumura	3-I-4 Sean Yang	10:40-11:00	1-S-4 (TBD)	5-O-29 1044	3-O-28 1133	7-S-1 (TBD)	10:40-11:10	1-O-38 1404	3-I-7 Akira Yamada	5-I-6 Ken-Tsung Wong	6-I-3 John Pern		
13:00-13:40	Prof. Masafumi Yamaguchi	11:10-11:30	1-O-5 1063	5-O-5 TBD	3-O-5 1428	4-I-4 P.K. Chiang	11:10-11:30	1-S-1 Hung-Kwei Hu	2-S-1 Frank Lan	3-S-1 Frank Lan	11:00-11:20	1-O-27 1248	5-O-23 1277	3-O-18 1302	7-O-5 1162	11:10-11:30	1-O-39 1423	3-O-25 1490	5-O-26 1038	6-O-11 1066		
13:40-14:20	Dr. Yang Yang	11:30-11:50	1-O-6 1242	5-O-6 TBD	3-O-6 1210	4-O-4 1339	11:30-11:50	1-O-18 1373	2-O-11 1323	3-O-12 1276	11:20-11:40	1-O-28 1159	5-O-24 1528	3-O-19 1141	7-O-6 1115	11:30-11:50	1-O-40 1494	3-O-26 1122	5-O-27 1187	6-O-12 1077		
14:20-15:00	Dr. David B. Mitzi	11:50-12:10	1-O-7 1216	5-O-7 1413	3-O-7 1172	4-O-5 1251	11:50-12:10	1-O-19 1262	2-O-12 1272	3-O-13 1415	11:40-12:00	1-O-29 1320	5-O-25 1120	3-O-20 1499	7-O-7 1365	11:50-12:10	1-O-41 1169	3-O-27 1180	5-O-28 1228	6-O-13 1080		
15:00-15:10	Break Time	12:10-13:30	Lunch Break				12:10-13:30	Lunch Break				12:00-13:30	Lunch Break				12:10-12:30	Closing Ceremony				
15:10-15:50	Dr. John Wohlgemuth	13:30-14:00	1-I-3 W.-M. Chen	5-I-3 Hironori Arakawa	6-I-1 Tsuyoshi Shioda	2-I-1 Hiromu Takatsuka	13:30-14:00	1-S-2 Zhenguo Li	5-S-1 Tim Lai	4-I-5 Okada Yoshitaka	13:30-14:00	1-S-5 Thomas Hengst	6-S-1 Wenjin Xie	4-I-6 Allen M. Barnett	IEVP							
15:50-16:30	Prof. Kosuke Kurokawa	14:00-14:20	1-O-8 1065	5-O-8 TBD	6-O-1 1043	2-I-2 Gregory Bugnon	14:00-14:20	1-O-20 1361	5-O-15 1097	4-O-6 1118	14:00-14:20	1-O-30 1278	6-S-2 Vincent Fan	4-S-1 Frank Ernst Haugwitz								
16:30-17:00	Mr. Conrad Burke	14:20-14:40	1-O-9 1444	5-O-9 1068	6-O-2 1057	2-O-1 1230	14:20-14:40	1-O-21 1418	5-O-16 1305	4-O-7 1300	14:20-14:40	1-O-31 1050	6-O-8 1031	4-O-10 1366								
		14:40-15:00	1-O-10 1465	5-O-10 1484	6-O-3 1064	2-O-2 1463	14:40-15:00	1-O-22 1055	5-O-17 1336	4-O-8 1036	14:40-15:00	1-O-32 1526	6-O-9 1052	4-O-11 1377								
		15:00-15:20	Break Time				15:00-15:20	1-S-3 (TBD)	5-O-18 1056	4-O-9 1152	15:00-15:20	1-O-33 1421	6-O-10 1513	4-O-16 1346								
		15:20-15:50	1-I-4 Koichi Kakimoto	5-I-4 Yong Soo Kang	6-I-2 Yoshihiro Hishikawa	2-I-3 Qi Wang	15:20-15:50	Poster Session I (A1, A2, A5)			15:20-15:50	Poster Session II (A3, A4, A6, A7)										
		15:50-16:10	1-O-11 1405	5-O-11 1354	6-O-4 1082	2-O-3 1053	15:50-16:10															
		16:10-16:30	1-O-12 1231	5-O-12 1391	6-O-5 1132	2-O-4 1389	16:10-16:30															
		16:30-16:50	1-O-13 1308	5-O-13 1493	6-O-6 1209	2-O-5 1142	16:30-16:50															
		16:50-17:10	1-O-14 1286	5-O-14 1024	6-O-7 1017	2-O-6 1445	16:50-17:00															
							18:00-21:00	PVSEC 23 BanquetPV Taiwan 2013 & PVSEC-23 VIP Joint Dinner (ticket required)														

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Detailed Program--October 28

Day 1	Oct. 28 (Monday)	Room
08:15-08:45	Registration	
08:45-09:00	Opening Ceremony	101
09:00-09:40	Silicon Solar Cells: What Does the Future Hold?	101
KL-01	<i>Prof. Martin GREEN</i> <i>University of New South Wales/Australia</i>	
09:40-10:20	Advanced Silicon Thin-Film SolarCells	101
KL-02	<i>Dr. Makoto KONAGAI</i> <i>Tokyo Institute of Technology/Japan</i>	
10:20-10:30	Break Time	
10:30-11:10	Advanced Production Technology of Si Solar Cells	101
KL-03	<i>Dr. P. H. CHANG</i> <i>MOTECH Industries Inc./Taiwan</i>	
11:10-11:50	The Advent of Mesocopic Solar Cells	101
KL-04	<i>Dr. Michael GRAETZEL</i> <i>École Polytechnique Fédérale de Lausanne/Switzerland</i>	
11:50-13:00	Lunch Break	
13:00-13:40	Present Status and Future of Super High Efficiency Multijunction and Concentrator Solar Cells	101
KL-05	<i>Prof. Masafumi YAMAGUCHI</i> <i>Toyota Technological Institute/Japan</i>	
13:40-14:20	Strategies of Achieving High Performance OPV Devices	101
KL-06	<i>Dr. Yang YANG</i> <i>UCLA/U.S.A.</i>	
14:20-15:00	Current Status and Future Prospects of Earth Abundant Kesterite Photovoltaic Technology	101
KL-07	<i>Dr. David B. MITZI</i> <i>IBM T. J. Watson Research Center/U.S.A.</i>	
15:00-15:10	Break Time	
15:10-15:50	PV Module Reliability and Service Life Predictions	101
KL-08	<i>Dr. John WOHLGEMUTH</i> <i>NREL- PV Reliability Group/U.S.A.</i>	
15:50-16:30	Main Role of Solar Photovoltaic Systems in Renewable Energy Ensembles throughout the 21st Century	101
KL-09	<i>Prof. Kosuke KUROKAWA</i> <i>Solutions Research Laboratory, Tokyo Institute of Technology (Tokyo Tech)/Japan</i>	
16:30-17:00	DuPont Photovoltaic Solutions	101
KL-10	<i>Conrad Burke</i> <i>Global Marketing Director/DuPont</i>	

Detailed Program --October 29											
Oct. 29 (Tuesday)											
08:00-08:30	Registration		08:00-08:30	Registration		08:00-08:30	Registration		08:00-08:30	Registration	
08:30-10:20	Session A1-1	Room	08:30-10:20	Session A5-1	Room	08:30-10:20	Session A3-1	Room	08:30-10:30	Session A4-1	Room
08:30-09:00 1-I-1 Invited Speech	High Efficiency Copper Electroplated Heterojunction Solar Cells and Modules – the Path Towards 25% Cell Efficiency	101AB	08:30-09:00 5-I-1 Invited Speech	Rational Material Design, Interface, and Device Engineering forHigh-Performance and Stable Polymer Solar Cells	101C	08:30-09:00 3-I-1 Invited Speech	TBD	101D	08:30-09:00 4-I-1 Invited Speech	Development of 4-junction Solar Cells for Concentrator PV Applications	103
	<i>Kenji Yamamoto</i> <u>KANEKA Corporation/Japan</u>			<i>Alex Jen</i> <u>University of Washington/U.S.A</u>			<i>A. N. Tiwari</i> <u>EMPA Swiss Federal Laboratories for Materials Science and Technology/Switzerland</u>			<i>Frank Dimroth</i> <u>Fraunhofer-Institut für Solare Energiesysteme/Germa</u>	
09:00-09:20 1-O-1	24.6% Efficient back Contact Cell with Oxide and Nitride Passivation 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101AB	09:00-09:20 5-O-1	TBD	101C	09:00-09:20 3-O-1	Growth of amorphous Zn–Sn–O buffer layers by RF sputtering for CIGS solar cells 3-5: Buffer and Window Layers	101D	09:00-09:30 4-I-2 Invited Speech	HCPV Cells for Ultrahigh Solar Concentration (>1000 suns) Applications -A Roadmap Toward \$0.07/kWh LCOE Power Generation	103
	<i>Andrew Blakers¹, Kean Fong¹, Evan Franklin¹, Nick Grant¹, Yimao Wan¹, Da Wang¹, Soe Zin¹, Teng Kho¹, Keith McIntosh²</i> 1) <u>Australian National University/Australia</u> , 2)PV Lighthouse/Australia			<i>TBD</i>			<i>Shao-Wei Chang, Ishikawa Kaoru, Mutsumi Sugiyama</i> <u>Tokyo University of Science</u>			<i>Ray Lin</i> <u>Taicrystal International Technology Co./Taiwan</u>	
09:20-09:40 1-O-2	Towards Industrial Cost Effective n-Pasha Solar Cells with 21% Efficiency 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101AB	09:20-09:40 5-O-2	Balanced Charge Transport in Inverted Hybrid Polymer/ZnO Solar Cells Through Interfacial Modification 5-5: Organic Thin Film Solar Cells and Related Materials I	101C	09:20-09:40 3-O-2	Impacts of Surface Sulfurization on High-Efficiency CIGS Thin Film Solar Cells 3-1: Absorber and Thin Film Process	101D	09:30-09:50 4-O-1	Simple Anti-soiling Coating Based on Silica for Fresnel Lens of Concentrator Photovoltaic 4-3: CPV System, Cell, Components, Optical Design and Thermal Management	103
	<i>Gaby Janssen, Ingrid Romijn, Astrid Gutjahr, Desislava Saynova, Machteld Lamers, Martien Koppes, John Anker, Eric Kossen, Kees Tool</i> <u>Solar Energy/Netherlands</u>			<i>Fang-Chi Hsu</i> <u>National United University/Taiwan</u>			<i>Taizo Kobayashi¹, Nakada Tokio¹, Hiroki Sugimoto², Takuya Kato², Hideki Hakuma²</i> 1) <u>Tokyo University of Science/Japan</u> , 2) <u>Showa Shell Sekiyu K.K./Japan</u>			<i>Kensuke Nishioka, Takuya Hirohata, Yasuyuki Ota</i> <u>University of Miyazaki/Japan</u>	
09:40-10:00 1-O-3	Over 20% Efficient N-type Bifacial Solar Cell by Industrial Fabrication Process 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101AB	09:40-10:00 5-O-3	InGaAsP/InGaP Quantum Well Top Cells and the Pathways to High-efficiency Multi-junction Quantum Well Solar Cells 5-7: Nanostructured PV and Related Materials I	101C	09:40-10:00 3-O-3	Non-vacuum and Vacuum Process for Chalcopyrite-related Materials Used in Solar Cells 3-1: Absorber and Thin Film Process	101D	09:50-10:10 4-O-2	Self-consistent Approach for Modeling the Luminescent Coupling in Concentrator III-V Multijunction Solar Cells 4-1: Advanced Concepts	103
	<i>Po-Tsung Hsieh</i> <u>Motech Industries, Inc. Science Park Branch/Taiwan</u>			<i>Kan-Hua Lee</i> <u>Imperial College London/United Kindom</u>			<i>Chung-Hsin Lu</i> <u>National Taiwan University/Taiwan</u>			<i>Tomah Sagabe</i> <u>The University of Tokyo/Japan</u>	
10:00-10:20 1-O-4	Development of Hetero-junction Back Contact Si Solar Cell toward 25% 1-5: Progress in Silicon Hetero Junction Solar Cells	101AB	10:00-10:20 5-O-4	DSCs Performance of {010}-Faceted TiO2 Nanoparticles with Different Particle Morphology 5-1: Dye-sensitized Solar Cells and Related Materials I	101C	10:00-10:20 3-O-4	Fabrication of Device-quality CIGS Thin Films with Compositional Gradient by Sputtering from Quaternary Targets without Extra Se Supply 3-1: Absorber and Thin Film Process <i>Chia-Hao Hsu, Shih-Yuan Weim Wei-Hao Ho, Chih-Huang Lai</i> <u>National Tsing Hua University/Taiwan</u>	101D	10:10-10:30 4-O-3	Development of Ga(x)In(1-x)P on Si for High Performance, Low Cost Multijunction Photovoltaics 4-2: III-V New Materials and Cell	103
	<i>Junichi Nakamura¹, Kenji Kimoto¹, Naoki Asano¹, Takeshi Hieda¹, Naoki Koide¹, Hiroyuki Katayama¹, Yuhsuke Fukuoka¹, Kyotaro NAKAMURA²</i> 1) <u>Sharp corporation/Japan</u> , 2)Meiji University/Japan,			<i>Changdong Chen, Qi Feng</i> <u>Kagawa University/Japan</u>						<i>Chris Ratcliff, Tyler J Grassman, John A Carlin, Steven A Ringel</i> <u>Ohio State University/United States</u>	
10:20-10:40	Break Time		10:20-10:40	Break Time		10:20-10:40	Break Time		10:30-10:50	Break Time	
10:40-12:10	Session A1-2		10:40-12:10	Session A5-2		10:40-12:10	Session A3-2		10:50-12:20	Session A4-2	
10:40-11:10 1-I-2 Invited Speech	Recent Progress in High-efficiency Silicon Heterojunction Solar Cells at EPFL	101AB	10:40-11:10 5-I-2 Invited Speech	Strategies for High Efficiency and Cost EffectiveDye-sensitized Solar Cells	101C	10:40-11:10 3-I-2 Invited Speech	The Effects of Sulfur Incorporation on CIS-Based Thin Film Solar Cells: a Review	101D	10:50-11:20 4-I-3 Invited Speech	Epitaxial Lift Off of High Efficiency Solar Cells	103
	<i>Antoine Descoeurdes</i> <u>Ecole Polytechnique Federale de Lausanne (EPFL)/Switzerland</u>			<i>Chun-Guey Wu</i> <u>National Central University/ Taiwan</u>			<i>Tokio Nakada</i> <u>Tokyo University of Science/Japan</u>			<i>Noren Pan</i> <u>MicroLink Devices/USA</u>	
11:10-11:30 1-O-5	MWT: the Integrated ECN Foil Module Technology 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101AB	11:10-11:30 5-O-5	TBD	101C	11:10-11:30 3-O-5	Synthesis of CuInS2 Nanoparticles for Thin Film Solar Cells 3-1: Absorber and Thin Film Process I	101D	11:20-11:50 4-I-4 Invited Speech	Development of High Efficiency, Low Cost HCPV Module	103
	<i>Kees Tool</i> <u>ECN/Netherlands</u>			<i>TBD</i>			<i>Nontachai Phoemongsacharoen, Sutichai Chaisitsak, Anchaleeporn Waritswat Lothongkum</i> <u>King Mongkut's Institute of Technology Ladkrabang/Thailand</u>			<i>P.K. Chiang</i> <u>Arima Photovoltaic & Optical Corp./Taiwan</u>	

Oct. 29 (Tuesday)											
11:30-11:50 1-0-6	Extended Loss Analysis for Silicon Solar Cells, fully considering intensity dependent recombination 1-2: Analysis and Characterization of Silicon Solar Cells <i>Rolf Arnold Stangl, Peters Marius, Zixuan Qiu, Bram Hoex, Armin Gerhard Aberle</i> <u>Solar Energy Research Institute of Singapore (SERIS)/Singapore</u>	101AB	11:30-11:50 5-0-6	TBD	101C	11:30-11:50 3-0-6	Mechanism of Antimony Promoted CIGS Thin Film Formation 3-2: Absorber and Thin Film Process <i>Shu Zhang, Xiaokun Zhang, Lu Wu, Feng Jia, Yong Xiang</i> <u>University of Electronic Science and Technology/China</u>	101D	11:50-12:10 4-0-4	Addition of the Hydrophilic Content into HF Solution Used in Epitaxial Lift-off Process for GaAs Solar Cell Applications 4-3: CPV System, Cell, Components, Optical Design and Thermal Management <i>Fan-Lei Wu, Ray-Hua Horng, Sin-Liang Ou, Yu-Cheng Kao, Jian-Heng Lu, D. S Wuu</i> <u>National Chung Hsing University/Taiwan</u>	103
		11:50-12:10 1-0-7	Characterization of the Emitter Collection Efficiency by Contactless Photoconductance Measurements 1-6: Modeling and Simulation of Silicon Solar Cells <i>Tobias Ohrdes¹, Robby Peibst¹, Nils-P. Harder¹, Rolf Brendel¹, Pietro P. Altermatt²</i> <u>1) Institute for Solar Energy Research Hamelin (ISFH)/Germany, 2) Leibniz University of Hannover/Germany</u>	101AB	11:50-12:10 5-0-7	Interfacial Modification on the Working Electrode of Dye-Sensitized Solar Cell to Improve the Charge Transport Properties 5-2: Dye-sensitized Solar Cells and Related Materials II <i>Kuang-Wei Wu, Cheng-Yu Chi, Abebe Tedla, Yian Tai</i> <u>National Taiwan University of Science and Technology/Taiwan</u>	101C	11:50-12:10 3-0-7	Growth of Alternative N-type Layer for CIGS Solar Cells by RF Sputtering and Investigation of Sputtering Damage Around Pn-interface by Impedance Spectroscopy 3-4: Characterization <i>Shao-Wei Chang, Mutsumi Sugiyama, Masayuki Itagaki</i> <u>Tokyo University of Science/Japan</u>	101D	12:10-12:30 4-0-5
12:10-13:30						Lunch Break					
13:30-15:00			Session A1-3			13:30-15:00			Session A5-3		
13:30-14:00 1-I-3 Invited Speech	Strategies for High Efficiency and Cost Effective Crystalline Si Solar Cells <i>W.-M. Chen</i> <u>Neo Solar Power Corporation (NSP)/Taiwan</u>	101AB	13:30-14:00 5-I-3 Invited Speech	Highly efficient black-dye-based dye-sensitized solar cells with 12% efficiency <i>Hironori Arakawa</i> <u>Tokyo University of Science/Japan</u>	101C	13:30-14:00 6-I-1 Invited Speech	Degradation of PV Materials and Those Influences on Reliablilty of PV Modules <i>Tsuyoshi Shioda</i> <u>Mitsui Chemicals, Inc./Japan</u>	101D	13:30-14:00 2-I-1 Invited Speech	TBD <i>Hiromu Takatsuka</i> <u>Mitsubishi Heavy Industry,Ltd./Japan</u>	103
14:00-14:20 1-0-8	International Technology Roadmap for PV (ITRPV) 1-4: Manufacturing Issues, Equipments, and Processing <i>Stephan Raitchel</i> <u>SEMI Europe/Germany</u>	101AB	14:00-14:20 5-0-8	TBD	101C	14:00-14:20 6-0-1	Temperature-dependent Behavior of Different Photovoltaic Technologies Installed in Tropical Climate Zone 6-1: PV Modules <i>Amornrat Limmanee¹, Kamonpan Chumpolrat¹, Nuttakarn Udomdachanut¹, Songpakit Keawniyompanit³, Sato Yukinobu², Masaki Nakaishi², Songkiate Kittisontirak¹, kobsak Sriprapha¹, Yukitaka Sakamoto²</i> <u>1) NECTEC, NSTDA/Thailand, 2) Tabuchi Electric Co.,Ltd./Japan, 3) Thai Tabuchi Electric Co.,Ltd./Thailand</u>	101D	14:00-14:30 2-I-2 Invited Speech	Recent Advances in High-efficiency Thin-film Silicon Technology <i>Gregory Bugnon</i> <u>EPFL – IMT – PV-Lab/Switzerland</u>	103
14:20-14:40 1-0-9	Recycle of Kerf-Loss Silicon from Cutting Slurry Wastes for Photovoltaic Applications 1-4: Manufacturing Issues, Equipments, and Processing <i>Chung-Wen Lan, C.F. Yang, W.P. Huang, H. P. Hsu</i> <u>National Taiwan University/Taiwan</u>	101AB	14:20-14:40 5-0-9	Effect of Organic Dye Adsorption Parameters on the Photovoltaic Performance of Dye Sensitized Solar Cells 5-1: Dye-sensitized Solar Cells and Related Materials I <i>Asha Sewvandi Galhenage, Qi Feng</i> <u>Kagawa University/Japan</u>	101C	14:20-14:40 6-0-2	Estimation and Verification of Energy Production from Various Photovoltaic Module Technologies 6-1: PV Modules <i>Tetsuyuki Ishii, Kenji Otani, Atsushi Masuda, Yoshihiro Hishikawa</i> <u>National Institute of Advanced Industrial Science and Technology (AIST)/Japan</u>	101D	14:30-14:50 2-0-1	Next generation High Efficiency Polycrystalline Silicon-on-glass Solar Cells: Setting New Records 2-3: Solar Cells and Related Science & Technologies <i>Varlamov Sergey</i> <u>University of New South Wales/Australia</u>	103
14:40-15:00 1-0-10	Study of Phosphorus Gettering for the Improvements on Solar Cell Efficiency and Production Yields of Low-Lifetime Wafers 1-4: Manufacturing Issues, Equipments, and Processing <i>Chung-Han Wu, Jiunn-Chenn Lu, Chih-Min Chen</i> <u>Gintech Energy Corporation/Taiwan</u>	101AB	14:40-15:00 5-0-10	Femtosecond Time-resolved Photoluminescence Study of P3HT:PCBM Blends with and without Additive/Thermal Annealing 5-5: Organic Thin Film Solar Cells and Related Materials I <i>Sheng Hsiung Chang¹, Chien-Hung Chiang², Chun-Guey Wu²</i> <u>1) National Central University/Taiwan, 2) Research Center for New Generation Photovoltaics/Taiwan</u>	101C	14:40-15:00 6-0-3	Cell-induced Hot Spots in Crystalline Silicon Solar Modules 6-2: PV Reliability <i>Fabian Juergen Fertig, Ino Geisemeyer, Hannah Lindner, Martin C. Schubert, Stefan Rein</i> <u>Fraunhofer Institute for Solar Energy Systems/Germany</u>	101D	14:50-15:10 2-0-2	Optimization of Light Management in a-SiOx:H/a-SiGe:H/μc-Si:H Triple-junction Solar Cells 2-3: Solar Cells and Related Science & Technologies <i>Hung-Jung Hsu</i> <u>National Chiao Tung University/Taiwan</u>	103

Oct. 29 (Tuesday)											
15:00-15:20	Break Time		15:00-15:20	Break Time		15:00-15:20	Break Time		15:10-15:30	Break Time	
15:20-17:10	Session A1-4		15:20-17:10	Session A5-4		15:20-17:10	Session A6-2		15:30-17:20	Session A2-2	
15:20-15:50 1-1-4 Invited Speech	Crystal Growth of Single Crystals by Using a Seed-Cast Method	101AB	15:20-15:50 5-1-4 Invited Speech	3-Dimensionally Micro-PatternedTiO2Photoanodesin Dye-Sensitized Solar Cells	101C	15:20-15:50 6-1-2 Invited Speech	Estimation and Verification of Energy Production from Various Photovoltaic Module Technologies	101D	15:30-16:00 2-1-3 Invited Speech	TBD	103
	<i>Koichi Kakimoto</i> <u>Kyushu University/Japan</u>			<i>Yong Soo Kang</i> <u>Hanyang University/Korea</u>			<i>Yoshihiro Hishikawa</i> <u>National Institute of Advanced Industrial Science and Technology (AIST)/Japan</u>			<i>Qi Wang</i> <u>National Renewable Energy Laboratory/China</u>	
15:50-16:10 1-0-11	24.7% Notably High Efficiency HIT® Solar Cell 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101AB	15:50-16:10 5-0-11	All solid dye-sensitized solar cells with perovskite material 5-1: Dye-sensitized Solar Cells and Related Materials I	101C	15:50-16:10 6-0-4	Uncertainty Analysis of Polychromatic Determination of Photovoltaic Device Spectral Response 6-1: PV Modules	101D	16:00-16:20 2-0-3	Solution Growth of Crystalline Si on Glass 2-2: Fundamental Science and Innovative Concepts	103
	<i>Satoshi Tohoda</i> <u>Eco Solutions Division, Sanyo Electric Co., Ltd. Eco Solutions Company of Panasonic Group/Japan</u>			<i>Shuzi Hayase</i> <u>Kyushu Institute of Technology/Japan</u>			<i>Ira Devi Sara, Tom Betts, Ralph Gottschalg</i> <u>loughborough university/United Kingdom</u>			<i>Roman Bansen, Robert Heimbürger, Thomas Teubner, Torsten Boeck</i> <u>Leibniz Institute for Crystal Growth/Germany</u>	
16:10-16:30 1-0-12	Suppression of Multi-crystallization of Mono-like Si 1-3: Crystal Growth and Materials Characterization	101AB	16:10-16:30 5-0-12	Solid-state Dye-sensitized Solar Cells Based on Graft Copolymer Templated TiO2 5-1: Dye-sensitized Solar Cells and Related Materials I	101C	16:10-16:30 6-0-5	The Differential Spectral Responsivity (DSR) technology for evaluation of new generation PV 6-3: PV Standards	101D	16:20-16:40 2-0-4	Cross-evaluation of Micromorph Solar Cells Deposited on LPCVD- and Sputter-etched-ZnO Special Session: Innovative Light Trapping Technologies: Textured TCO Glass	103
	<i>Kentaro Kutsukake</i> <u>Tohoku University/Japan</u>			<i>Jong Hak Kim, Sung Hoon Ahn, Jung Tae Park, Dong Kyu Roh</i> <u>Yonsei University/Korea, Republic of</u>			<i>Satoshi Uchida¹, Yoshihiro Nishikawa², Shigeaki Tochimoto², Kiyoshi Imai², Keiji Miyao², Katsuhiko Takagi³, Hidenori Saito³, Daisuke Aoki³, Tomoko Aoki³, Shinichi Magaino³</i> 1) <u>The University of Tokyo/Japan</u> , 2) <u>KONICA MINOLTA, INC./Japan</u> , 3) <u>Kanagawa Academy of Science and Technology (KAST)/Japan</u>			<i>Etienne Moulin¹, Xavier Niquille¹, Mathieu Boccard¹, Loïc Garcia¹, Grégory Bugnon¹, Karin Soederstroem¹, Michael Stuckelberger¹, Franz-Josef Haug¹, Christophe Ballif¹, Michael Ghosh², Matthias Meier², Karsten Bittkau², Jordi Escarre³</i> 1) <u>EPFL IMT PV-LAB/Switzerland</u> , 2) <u>IEK-5 (photovoltaics), research center Jülich/Switzerlar</u> , 3) <u>CSEM/Switzerland</u>	
16:30-16:50 1-0-13	Photoluminescence Evaluation of Fe Contamination at SA-GBs in Multi-crystalline Silicon 1-3: Crystal Growth and Materials Characterization	101AB	16:30-16:50 5-0-13	Efficiency enhancement of DSSCs by surface treatment of anodes using imidazolium salt solutions 5-1: Dye-sensitized Solar Cells and Related Materials I	101C	16:30-16:50 6-0-6	Local Deposition of Copper on Aluminium Based MWT Back Contact Foil Using Cold Spray Technology 6-1: PV Modules	101D	16:40-17:00 2-0-5	Fabrication of a-Si:H Solar Cells at 100 oC for High Voc Top Cell of Spectrum Splitting Solar Cells 2-3: Solar Cells and Related Science & Technologies	103
	<i>Masaki Funakoshi¹, Atsushi Ogura¹, Tomihiha Tachibana², Yoshio Ohshita², Koji Arafune³</i> 1) <u>Meiji University/Japan</u> , 2) <u>Toyota Technological Institute/Japan</u> , 3) <u>University of Hyogo/Japan</u>			<i>Yijia J Chen</i> <u>National Dong Hwa University/Taiwan</u>			<i>Maurice Goris, Ian Bennett, Wilma Eerenstein</i> <u>ECN/Netherlands</u>			<i>Dong-Won Kang, Sinae Kim, Porponth Sichanugrist, Makot Konagai</i> <u>Tokyo Institute of Technology</u>	
16:50-17:10 1-0-14	Crystalline ITO Thin Films Fabricated by Reactive Plasma Deposition at Room Temperature for the Application in a-Si:H/c-Si Heterojunction Solar Cells 1-5: Progress in Silicon Hetero Junction Solar Cells	101AB	16:50-17:10 5-0-14	TBD	101C	16:50-17:10 6-0-7	Characterization and Defect Mechanism of c-Si Photovoltaic Cells in Truck and Air Transportation Environment 6-2: PV Reliability	101D	17:00-17:20 2-0-6	Simulation of Silicon Tandem Solar Cells Surface-textured with Low-refractive-index material Special Session: Innovative Light Trapping Technologies: Textured TCO Glass	103
	<i>Jianhua Shi¹, Fanying Meng¹, Zhengxin Liu¹, Yanfeng Cui², Zhongdan Lu²</i> 1) <u>Shanghai Institute of Microsystem and Information Technology/China</u> , 2) <u>Changzhou Trina Solar Energy Co., Ltd./China</u>			TBD			<i>Shu-Tsung Hsu, Yean San Long</i> <u>ITRI/Taiwan</u>			<i>Chien-Wei Chen, Bing-Ru Yang, Pinghui S. Yeh, Lu-Sheng Hong</i> <u>National Taiwan University of Science and Technology/Taiwan</u>	

Detailed Program --October 30								
Oct. 30 (Wednesday)								
08:00-08:30	Registration		08:00-08:30	Registration			Registration	
08:30-10:30	Session A1-5	Room	08:30-10:20	Session A2-3	Room	08:30-10:20	Session A3-3	Room
08:30-09:00 1-1-5 Invited Speech	Formation of Boron-Oxygen complexes in n-type B-doped Czochralski Silicon with thermal donor compensation	101B	08:30-09:00 2-1-4 Invited Speech	Toward High-efficiency Thin-film Silicon Solar Cells with Well Controlled Light Absorption and Carrier Extraction	101A	08:30-09:00 3-1-3 Invited Speech	TBD	103
	<i>Deren Yang</i> <u>Zhejiang University/China</u>			<i>Xiaodan Zhang</i> <u>Nankai University/China</u>			<i>B.-T. Ahn</i> <u>Korea Advanced Institute of Science and Technology [CIGS]/Korea</u>	
09:00-09:30 1-1-6 Invited Speech	Growth of Si Single Bulk Crystals for Solar Cells by the Noncontact Crucible Method	101B	09:00-09:20 2-0-7	Earth Abundant Silicon based Thin Film Photovoltaic-Photoelectrochemical Water Splitting Devices 2-2: Fundamental Science and Innovative Concepts	101A	09:00-09:20 3-0-8	Preferred Orientation of Cu(In,Ga)Se2 for Enhanced Open-Circuit Voltage of Its Solar Cell 3-1: Absorber and Thin Film Process I	103
	<i>Kazuo Nakajima</i> <u>Kyoto University/Japan</u>			<i>Arno Smets, Paula Perez Rodriguez, Lihao Han, Miro Zeman</i> <u>Delft University of Technology/Netherlands</u>			<i>Jakapan Chantana¹, Takashi Minemoto¹, Taichi Watanabe², Seiki Teraji², Kazunori Kawamura²</i> 1) <u>Ritsumeikan University/Japan</u> , 2) <u>Nitto Denko Corporation/Japan</u>	
09:30-09:50 1-0-15	Stability of Cat-CVD Silicon-Nitride/Amorphous- Silicon Stacked Passivation System Realizing Extremely Low Surface Recombination Velocity 1-5: Progress in Silicon Hetero Junction Solar Cells	101B	09:20-09:40 2-0-8	Recent Advances in High-efficiency Thin-film Silicon Technology 2-3: Solar Cells and Related Science & Technologies	101A	09:20-09:40 3-0-9	Investigation about Grain Boundary Character in Semiconducting BaSi2 by Kelvin Probe Force Microscopy 3-4: Characterization	103
	<i>Koichi Koyama, Keisuke Ohdaira, Hideki Matsumura</i> <u>Japan Advanced Institute of Science and Technology/Japan</u>			<i>Grégory Bugnon, Mathieu Boccard, Simon Haenni, Karin Soederstroem, Gaetano Parascandolo, Remi Biron, Michael Stuckelberger, Maximilien bonnet-eynard, Laura Ding, Sylvain Nicolay, Etienne Moulin, Bjorn Niesen, Jan-Willem Schuttauf, Fanny Sculati-meillaud, Christophe Ballif</i> <u>EPFL IMT PV-LAB/Switzerland</u>			<i>Masakazu Baba</i> <u>Institute of Applied Physics, University of Tsukuba/Japan</u>	
09:50-10:10 1-0-16	Development of Copper Electroplating Technique for Silicon Heterojunction Solar Cells with Efficiency over 23% 1-5: Progress in Silicon Hetero Junction Solar Cells	101B	09:40-10:00 2-0-9	SnO2:F Substrates with Larger Feature Size and Its Application to Thin-Film Silicon Solar Cells 2-3: Solar Cells and Related Science & Technologies	101A	09:40-10:00 3-0-10	Modeling of the Surface Sulfurization of CIGSe Solar Cells 3-2: Absorber and Thin Film Process II	103
	<i>Jay Chang, YI-JIUNN CHIEN, Ming-Yu Chen, Ya-Lan Chang, Fu-Shan Chen, Ming-Yi Huang, Po-Chuan Yang</i> <u>AU Optronics Corporation/Taiwan</u>			<i>Masanobu Isshiki¹, Takuji Oyama¹, Hidefumi Odaka¹, Porponth Sichanugrist², Yusuke Abe², Makot Konagai²</i> 1) <u>Asahi Glass Co., Ltd./Japan</u> , 2) <u>Tokyo Institute of Technology/Japan</u>			<i>Zacharie Jehl Li Kao, Taizo Kobayashi, Nakada Tokio</i> <u>Tokyo University of Science/Japan</u>	
10:10-10:30 1-0-17	Evaluation of a-SiO:H Passivation Films for Application to SHJ Solar Cells 1-5: Progress in Silicon Hetero Junction Solar Cells	101B	10:00-10:20 2-0-10	High Open-Circuit Voltage a-SiO: H Solar Cell Evaluated Using EL Emission Spectrum Analysis	101A	10:00-10:20 3-0-11	Modeling Ga-profiles for Cu(In,Ga)Se2 Thin Film Solar Cells with Varying Defect Density 3-4: Characterization	103
	<i>Kazuyoshi Nakada, Shinsuke Miyajima, Makot Konagai</i> <u>Tokyo Institute of Technology/Japan</u>			<i>Mitsuoki Hishida, Atsushi Fukushima, Takeyuki Sekimoto, Shigeo Yata, Mitsuhiro Matsumoto, Wataru Shinohara, Youichirou Aya, Akira Terakawa, Masahiro Iseki</i> <u>Panasonic Corporation, R&D Division/Japan</u>			<i>Christopher Frisk¹, Charlotte Platzer-Björkmar¹, Viktor Fjällström¹, Jörgen Olsson¹, Marika Edoff¹, Pedro Salom²</i> 1) <u>The Ångström Laboratory, Uppsala University/Sweden</u> , 2) <u>International Iberian Nanotechnology Laboratory/Portugal</u>	
10:30-10:50	Break Time		10:20-10:40	Break Time			Break Time	
10:50-12:20	Session A1-6		10:40-12:10	Session A2-4		10:40-12:10	Session A3-4	
10:50-11:20 1-1-7 Invited Speech	Cutting-edge Process Improvements towards the High Efficiency Crystalline Silicon Solar Cells	101B	10:40-11:10 2-1-5 Invited Speech	Device Quality Thin Films Prepared by Cat-CVD and Their Application to Solar Cells	101A	10:40-11:10 3-1-4 Invited Speech	TBD	103
	<i>S. Saravanan</i> <u>Indian Institute of Technology Bombay</u>			<i>Hideki Matsumura</i> <u>Japan Advanced Institute of Science and Technology/Japan</u>			<i>Sean Yang</i> <u>TSMC/Taiwan</u>	
11:20-11:40 1-S-1 Invited Speech	PECVD for High Efficient Hetero Junction PVs Applications	101B	11:10-11:30 2-S-1 Invited Speech	TBD	101A	11:10-11:30 3-S-1 Invited Speech	Fully Inline Chemical Bath Deposition Technology for CIGS/CdTe Mass Production	103
	<i>Hung-Kwei Hu</i> <u>Ideal Energy Equipment (Shanghai) Co., Ltd/China</u>			<i>Frank Lan</i>			<i>Shou-Long Lan</i> <u>Manz AG/Taiwan</u>	

Oct. 30 (Wednesday)								
11:40-12:00 1-0-18	Quantum Effect at Front Layer Stack in HIT Cell 1-6: Modeling and Simulation of Silicon Solar Cells <i>Takefumi Kamiooka 1, Yutaka Hayashi 1, Yoshio Ohshita 1 , Kyotaro Nakamura 2</i> 1)Toyota Technological Institute/Japan 2) Meiji University	101B	11:30-11:50 2-0-11	a-SiOx:H single Junction Solar Cell Improved by Optimizing n-layers and Its Application to Multi-junction Solar Cells 2-3: Solar Cells and Related Science & Technologies <i>Do Yun Kim, Pavel Babal, René A. C. M. M. van Swaai Miro Zeman</i> <u>Delft University of Technology/Netherlands</u>	101A	11:30-11:50 3-0-12	Deposition Temperature Optimization of ALD Zn1-xSnxOy Buffer Layers for Cu(In,Ga)Se2 Solar Cells 3-5: Buffer and Window Layers <i>Johan Sven Lindahl</i> <u>Uppsala University/Sweden</u>	103
12:00-12:20 1-0-19	Design and Improve the Jsc of Heterojunction (HIT) Solar Cell by TCAD 1-6: Modeling and Simulation of Silicon Solar Cells <i>Teng-Hsiang Chang, Bao-Huang Tsai, Yen-Ho Chu, Chien-Chieh Lee, Jenq-Yang Chang</i> <u>National Central University/Taiwan</u>	101B	11:50-12:10 2-0-12	Optical Approaches for 20% Efficient Thin-film Silicon-based Quadruple Junction Solar Cells 2-2: Fundamental Science and Innovative Concepts <i>Miro Zeman, Olindo Isabella, Arno Smets</i> <u>Delft University of Technology/Netherlands</u>	101A	11:50-12:10 3-0-13	Mechanism Understanding of the Device Performance Change in the Zn(S,O)/Cu(In,Ga)Se2 Solar cell with Thermal Annealing 3-5: Buffer and Window Layers <i>Dong Hyeop Shin ¹ , Ji Hye Kim ¹ , Seung Tae Kim ¹ , Byung Tae Ahn ¹ , Hyuck Sang Kwon ¹ ,Hee Jae Kang ²</i> 1) <u>Korea Advanced Institute of Science and Technology/Korea, Republic of</u> , 2) <u>Chungbuk National University/Korea, Republic of</u>	103
12:20-13:30	Lunch Break		12:10-13:30	Lunch Break			Lunch Break	
13:30-15:20	Session A1-7		13:30-15:10	Session A5-5		13:30-15:20	Session A4-3	
13:30-14:00 1-S-2 Invited Speech	Recent Progress and Future Prospect of Quantum Dot Intermediate-Band Solar Cells <i>Zhenguo Li</i> <u>Xi'an LONGI Silicon Materials Corp./China</u>	101B	13:30-13:50 5-S-1 Invited Speech	How Turnkey Solution Accelerates the Development of DSSC Industry <i>Tim Lai</i> <u>Taiwan DSC PV LTD./Taiwan</u>	101A	13:30-14:00 4-I-5 Invited Speech	Recent Progress and Future Prospect of Quantum Dot Intermediate-Band Solar Cells <i>Okada Yoshitaka</i> <u>The University of Tokyo/Japan</u>	103
14:00-14:20 1-0-20	Accurate and Cost-effective Solution for Inline I-V Measurement of High Efficiency Cells 1-2: Analysis and Characterization of Silicon Solar Cells <i>Corinne Droz</i> <u>Pasan SA/Switzerland</u>	101B	13:50-14:10 5-0-15	Further Performance Enhancement of Hybrid Si-nanocrystal/P3HT Solar Cells through Hydrofluoric Acid Vapor Treatment 5-7: Nanostructured PV and Related Materials I <i>Yi Ding, Ryan Gresback, Tomohiro Nozaki</i> <u>Tokyo Institute of Technology/Japan</u>	101A	14:00-14:20 4-0-6	Modulation-doped Broadband InGaAs Quantum Dots-in-a-well Solar Cells 4-1: Advanced Concepts <i>Tsong-Sheng Lay</i> <u>National Chung Hsing University/Taiwan</u>	103
14:20-14:40 1-0-21	Investigation on passivation mechanism of boron diffusion conditions 1-2: Analysis and Characterization of Silicon Solar Cells <i>Hsieh, Po-Tsung</i> <u>Motech Industries, Inc. Science Park Branch/Taiwan</u>	101B	14:10-14:30 5-0-16	Perovskite/fullerence Planar-heterojunction Solar Cells 5-5: Organic Thin Film Solar Cells and Related Materials I <i>Jun-Yuan Jeng ¹ , Yi-Fang Chiang ¹ , Mu-Huan Lee ¹ , Shin-Rung Peng ¹ , Tzung-Fang Guo ¹ , Peter C. Y. Chen ²</i> 1) <u>National Cheng Kung University/Taiwan</u> , 2) <u>National University of Singapore/Singapore</u>	101A	14:20-14:40 4-0-7	Fabrication and Characterization of Intermediate Band Solar Cells Using GaAs:N Delta-Doped Superlattice 4-1: Advanced Concepts <i>Shuhei Yagi ¹ , Shunsuke Noguchi ¹ , Yasuto Hijikata ¹ , Hiroyuki Yaguchi ¹ , Shigeyuki Kuboya ² , Kentaro Onabe ³ , Yoshitaka Okada ³</i> 1) <u>Saitama University/Japan</u> , 2) <u>The University of Tokyo/Japan</u> , 3) <u>Tohoku University/Japan</u>	103
14:40-15:00 1-0-22	Investigation on New Combination Method of Emitter-BSF Formation in Npp+ Bifacial Solar Cell 1-2: Analysis and Characterization of Silicon Solar Cells <i>Suhaila Sepeai, M. Khairunaz Mat Desa, Saleem H Zaidi, M.Y. Sulaiman, Kamaruzzaman Sopian, Norasikin A. Ludin</i> <u>Solar Energy Research Institute (SERI)/Malaysia</u>	101B	14:30-14:50 5-0-17	Long-term Stability of Low-cost Dye-sensitized Solar Cells Prepared by All Screen-printing Method 5-1: Dye-sensitized Solar Cells and Related Materials I <i>MA Tingli ¹ , Chaolei Wang ² ,Shi yantao ² , Wu Mingxing ³</i> 1) <u>Kyushu Institute of Technology/China</u> , 2) <u>Dalian University of Technology/China</u> , 3) <u>Hebei Normal</u>	101A	14:40-15:00 4-0-8	The Importance of Dielectric Over-coating of Metal Nanoparticles for a Plasmonic Solar Cell 4-2: III-V New Materials and Cell <i>Yang Yang</i> <u>UNSW/Australia</u>	103
15:00-15:20 1-S-3 Invited Speech	TBD	101B	14:50-15:10 5-0-18	Hydrazine-treated Carbon Nanotubes as Penetrating Nanoelectrodes for Enhancing the Performance of Photovoltaic Solar Cells 5-5: Organic Thin Film Solar Cells and Related Materials I <i>Pen-Cheng Wang</i> <u>National Tsing Hua University/Taiwan</u>	101A	15:00-15:20 4-0-9	Light-biased Quantum Efficiency Analysis of the InGaAs/GaAsP Multiple Quantum Wells Solar Cells 4-2: III-V New Materials and Cell <i>Kentaroh Watanabe, Hassanet Sodabanlu, Yunpeng Wang, Masakazu Sugiyama, Yoshiaki Nakano</i> 1) <u>University of Tokyo/Japan</u>	103
15:20-17:00	Poster Session							
18:00-21:00	PV Taiwan 2013 & PVSEC-23 VIP Joint Dinner (ticket required)							

Detailed Program --October 31											
Oct. 31 (Thursday)											
08:00-08:30			08:00-08:30			08:00-08:30			08:00-08:30		
Registration			Registration			Registration			Registration		
08:30-10:20			08:30-10:20			08:30-10:20			08:30-10:20		
Session A1-8			Session A5-6			Session A3-5			Session A7-1		
Room			Room			Room			Room		
08:30-09:00 1-1-7 Invited Speech	Recent progress in industrial processing of n-type crystalline Si solar cells	101B	08:30-09:00 5-1-5 Invited Speech	High Efficient and Thermally Stable Organic Photovoltaics Based on Low Band Gap Conjugated Polymers and Cross-linkable Fullerene Derivatives	101C	08:30-09:00 3-1-5 Invited Speech	TBD	101A	08:30-09:00 7-1-1 Invited Speech	TBD	101D
	Weeber A. W. ECN Solar Energy/Netherlands			Chain-Shu Hsu National Chiao Tung University/Taiwan			C.C. Chiang ITRI/Taiwan			Sammi Lin AUO/Taiwan	
09:00-09:20 1-0-23	Extremely Low Surface Recombination Velocity of Crystalline Silicon Realized by Low Temperature Phosphorus Cat-Doping and Successive Deposition of Cat-CVD Silicon-Nitride Films 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101B	09:00-09:20 5-0-19	Toward High Efficiency Isoindigo Based Polymer Solar Cells 5-5: Organic Thin Film Solar Cells and Related Materials I	101C	09:00-09:20 3-0-14	Study of Aluminum and Gallium Co-sputtered ZnO thin film as front contact in CIGS solar cell 3-5: Buffer and Window Layers	101A	09:00-09:20 7-0-1	Probabilistic Forecasting of Spatial Average Irradiance using Meso-Scale Model Grid Point Value 7-3 Simulation	101D
	Cham Thi Trinh Japan Advanced Institute of Science and Technology/Japan			Wei-Fang Su, Chun Yu Chang, Chien-Ann Chen, Chun-Chih Ho National Taiwan University/Taiwan			Udai Pratap Singh, Chandan Ashish Gupta, Abhisek P Mishra KIIT UNIVERSITY/India			Takeyoshi Kato Nagoya university/Japan	
09:20-09:40 1-0-24	Metal-free and Ultra-thin Crystalline Silicon Solar Cells Approaching 4n2 Absorption-enhancement Limit 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101B	09:20-09:40 5-0-20	Conjugated Random Copolymers with Full Visible Light Absorption for Bulk Heterojunction Solar Cells 5-5: Organic Thin Film Solar Cells and Related Materials I	101C	09:20-09:40 3-0-15	Effect of Annealing Temperature of Tin(II) Sulfide Solar Cells with CdS Buffer Layers 3-6: CZTS, CdTe, and Related Materials	101A	09:20-09:40 7-0-2	A Case Study of Dust Impact Detecting Methodology on Utility-Scale Photovoltaic Power Plant 7-1 Enablers for PV Development and Benefits of PV	101D
	Miro Zeman, Andrea Ingenito, Olindo Isabella Delft University of Technology/Netherlands			Jian-Ming Jiang, Hsiu-Cheng Chen, His-Kuei Lin, Kung-Hwa Wei National Chiao Tung University/Taiwan			Yu Kawano, Hirokazu Isonishi, Yuto Kodani, Daichi Suenga, Takashi Minemoto Ritsumeikan university/Japan			Jui Kang Chiang Tokyo Electron Taiwan Limited/Taiwan	
09:40-10:00 1-0-25	Low-Temperature Oxidation of Phosphorus-Diffused Surfaces for the Voltage Improvements of Industrial PERL Solar Cells 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101B	09:40-10:00 5-0-21	Enhancing the Efficiency of Inverted Structure Polymer Solar Cell Based on Low Bandgap Material by Solution-processed Cathode Modification 5-5: Organic Thin Film Solar Cells and Related Materials I	101C	09:40-10:00 3-0-16	Improvement Performances of CdTe Solar Cells by CdS Treatment 3-6: CZTS, CdTe, and Related Materials	101A	09:40-10:00 7-0-3	Survival in a Challenging Market Environment - Success Strategies in the European PV Market 7-1 Enablers for PV Development and Benefits of PV	101D
	Jong-Keun LIM, Dohyeon KYEONG, Jinyoun CHO, Taejun KIM, Kyumin LEE, Won-jae LEE, Eun-Chel CHO Hyundai Heavy Industries, Co. Ltd./Korea, Republic of			Chia-Yu Kao, Ping-Yi Ho, Shao-Hsuan Kao, Cheng-Che Lee, Ching-Fuh Lin National Taiwan University/Taiwan			Hui Li The Key Laboratory of Solar Thermal Energy and Photovoltaic System, Institute of Electrical Engineer/China			Wolfgang Johann Hummel ZSF Center for Solarmarket Research/Germany	
10:00-10:20 1-0-26	Application of Cat-CVD SiNx/a-Si Stacked Passivation Films to Crystalline Si Solar Cells 1-1: Technologies for Higher Efficiency Silicon Solar Cells I	101B	10:00-10:20 5-0-22	Bandgap Tuning with the Lattice-distorted Region by Two Symmetries Coexisting in A Quantum Dot 5-4: Dye-sensitized Solar Cells and Related Materials IV	101C	10:00-10:20 3-0-17	Spray-deposited CuInS2/TiO2/FTO Solar Cells with A CdS Buffer Layer 3-6: CZTS, CdTe, and Related Materials	101A	10:00-10:20 7-0-4	Trends in Photovoltaic Applications - the Latest Survey Results and Analysis on PV Markets from the IEA PVPS 7-1 Enablers for PV Development and Benefits of PV	101D
	Shogo Tsuzaki JAIST/Japan			Eui-Hyun Kong, Yong-June Chang, Hyun-Jin Park, Hyun Myung Jang Pohang University of Science and Technology (POSTECH)/Korea, Republic of			Sutichai Chaisitsak, J Kaliang King Mongkut's Institute of Technology Ladkrabang/Thailand			Gaëtan Masson ¹ , Greg Watt ² , Hubert Fechner ³ , Pius Hüsser ⁴ , Izumi Kaizuka ⁵ 1) IEA PVPS/Belgium, 2) Australian PV Association/Australia, 3) University of Applied Sciences Technikum Wien/Austria, 4) Nova Energie/Switzerland, 5) RTS Corporation/Japan	
10:20-10:40			10:20-10:40			10:20-10:40			10:20-10:40		
Break Time			Break Time			Break Time			Break Time		
10:40-12:00			10:40-12:00			10:40-12:00			10:40-12:00		
Session A1-9			Session A5-7			Session A3-6			Session A7-2		
10:40-11:00 1-S-4 Invited Speech	TBD	101B	10:40-11:00 5-0-29	TBD	101C	10:40-11:00 3-0-28	TBD	101A	10:40-11:00 7-S-1 Invited Speech	TBD	101D
	TBD			TBD			TBD			TBD	
11:00-11:20 1-0-27	Three-dimensional Simulation of Metal Grid Effects on Si Solar Cells 1-6: Modeling and Simulation of Silicon Solar Cells	101B	11:00-11:20 5-0-23	Graphene-amorphous Carbon Composite Films for Photovoltaic Solar Cell 5-7: Nanostructured PV and Related Materials I	101C	11:00-11:20 3-0-18	Over 10% Efficiency Cu2ZnSn(SeS)4 Submodules 3-3: Module and Related Technology	101A	11:00-11:20 7-0-5	Evaluation of the Effect of Solar Inverters Installed with Different Reactive Power Control Systems Types on the Distribution System 7-3 Simulation	101D
	Jheng-Sin Liu, Wen-Ling Lu, Cheewee Liu National Taiwan University/Taiwan			Sudip Adhikari ¹ , H. Uchida ¹ , K. Wakita ² , M. Yasubayashi ² , M. Umeno ¹ 1) Department of Electronics and Information Engineering, Chubu University, Kasugai, Aichi, Japan, 2) Department of Clinical Engineering, Chubu University/Japan			Hiroki Sugimoto ¹ , Takuya Kato ¹ , Noriyuki Sakai ² 1) Showa Shell Sekiyu K.K./Japan, 2) Solar Frontier K.K./Japan			Miyoshi Ryunosuke ¹ , Ryo Takahashi ¹ , Naoyuki Takahashi ¹ , Yasuhiro Hayashi ¹ , Shuichi Ashidate ² 1) Waseda University/Japan, 2) Tokyo Electric Power Company/Japan	
11:20-11:40 1-0-28	Griddler: Intelligent Computer Aided Design of Complex Solar Cell Metallization Patterns 1-6: Modeling and Simulation of Silicon Solar Cells	101B	11:20-11:40 5-0-24	Efficient Seamless Series Connected Polymer Solar cell Module Architecture 5-6: Organic Thin Film Solar Cells and Related Materials II	101C	11:20-11:40 3-0-19	Solution-processing of 10.3% CZTSSe Thin Film Solar Cell by Automatic Slit Coating of Metal Chalcogenide Ink 3-6: CZTS, CdTe, and Related Materials	101A	11:20-11:40 7-0-6	A High-Efficiency DC-DC Converter with High Voltage Gain and Switching Loss Reduction for PV Application 7-1 Enablers for PV Development and Benefits of PV	101D
	Johnson Wong Solar Energy Research Institute of Singapore/Singapore			Jongjin Lee ¹ , Sung-Oong Kang ² , Hyungcheol Back ³ , Kwanghee Lee ³ 1) Korea Advanced Institute of Science and Technology/Korea, Republic of, 2) Kyung Hee University/Korea, Republic of, 3) Gwangju Institute of Science and Technology/Korea, Republic of			Hidenori Miyamoto ¹ , Yubun Kikuchi ¹ , Masaru Kuwahara ¹ , Takuya Ohhashi ¹ , Hiroyuki Iida ¹ , Kouichi Misumi ¹ , Yoshiaki Masu ¹ , Akimasa Nakamura ¹ , Oki Gunawan ² , David B Mitzi ² 1)Tokyo Ohka Kogyo, Co. Ltd., 2)IBM Corporation)			Chih Lung Shen, Hong Yu Chen National Kaohsiung First University of Science and Technology/Taiwan	

Oct. 31 (Thursday)											
11:40-12:00 1-O-29	Quokka Version 2: Selective Surface Doping, Luminescence Modeling and Data Fitting 1-6: Modeling and Simulation of Silicon Solar Cells <i>Andreas Fell¹, Daniel Walter¹, Keith Reid McIntosh², Abbott Malcolm²</i> 1) <u>Australian National University/Australia</u> , 2) <u>PV Lighthouse/Australia</u>	101B	11:40-12:00 5-O-25	Above-11%-Efficiency Organic-Inorganic Hybrid Solar Cells with Omnidirectional Harvesting Characteristics by Employing Hierarchical Photon Trapping Structures 5-7: Nanostructured PV and Related Materials I <i>Wan Rou Wei¹, Ren Jei Chung¹, Meng-Lin Tsai², Dai Siang Shi², Shu Te Ho², Cherng Rong Ho², Shin Hung Tsai², Jr Hau He²</i> 1) <u>National Taipei University of Technolog/Taiwan</u> , 2) <u>National Taiwan University/Taiwan</u>	101C	11:40-12:00 3-O-20	Fabrication of Cu2ZnSnS4 Thin Films from Electro-deposited Cu/Sn/Zn Metallic Stacks 3-6: CZTS, CdTe, and Related Materials <i>Feng Jiang¹, Shigeru Ikeda²</i> 1) <u>Osaka University/Japan</u> , 2) <u>Research Center for Solar Energy Chemistry, Osaka University/Japan</u>	101A	11:40-12:00 7-O-7	Evaluation of PV System Performance of Six Different PV Module Technologies Operating in Thailand 7-2 System <i>Perawut Chinnavornrungsee¹, Sasiwimon Songtra¹, Kobsak Sriprapha², Jaran Sritharathikhun², Songkiate Kittisontirak³, Amornrat Limmanee³, Aswin Hongsingthong³, Nattaphong Boriraksantikul⁴, Tianchai Taratiwat⁴, Nirod Akarapanavit⁴</i> 1) <u>National Electronics and Computer Technology Center, NSTDA/Thailand</u> , 2) <u>National Science and technology Development Agency (NSTDA)/Thailand</u> , 3) <u>NECTEC/Thailand</u> , 4) <u>PTT Research & Technology Institute/Thailand</u>	101D
12:00-13:30 13:30-15:10	Lunch Break Session A1-10		12:00-13:30 13:30-15:10	Lunch Break Session A6-4		12:00-13:30 13:30-15:20	Lunch Break Session A4-4		12:00-13:30 13:30-17:00	Lunch Break	
13:30-13:50 1-S-5 Invited Speech	Higher Energy Yield with New Generation Solar Cell Technologies <i>Thomas Hengst</i> <u>Meyer Burger Technology AG/ Germany</u>	101B	13:30-13:50 6-S-1 Invited Speech	A Novel Glue-Membrane Integrated Solar Module Backsheet <i>Wenjin Xie</i> <u>Jolywood(Suzhou) / China</u>	101C	13:30-14:00 4-I-6 Invited Speech	GaAsPonSiGe/SiTandem Solar Cells <i>Allen M. Barnett</i> <u>The University of New South Wales/USA</u>	101A		IEVP	101D
13:50-14:10 1-O-30	High Efficient N-type Solar Cells Using Ion Implanted Emitters and back Surface Field 1-1: Technologies for Higher Efficiency Silicon Solar Cells I <i>Ya-Shiun Wu, Yen-Yu Chen, Chih-Hsiung Huang, Chee-Wee Liu</i> <u>National Taiwan University/Taiwan</u>	101B	13:50-14:10 6-S-2 Invited Speech	TBD <i>Vincent Fan</i> <u>Taiwan HIUV/Taiwan</u>	101C	14:00-14:20 4-S-1 Invited Speech	China's CPV Development & Trends during the 12th Five-Year-Plan (2011-2015) <i>Frank Ernst Haugwitz</i> <u>Asia Europe Clean Energy (Solar) Advisory Co. Ltd. (AECEA)/Hong Kong</u>	101A			
14:10-14:30 1-O-31	Correlation of Dislocation Line Densities and Emitter Saturation Current Densities of Ion Implanted Boron Emitters 1-1: Technologies for Higher Efficiency Silicon Solar Cells I <i>Jan Krügener¹, H. Jörg Osten¹, F. Alexander Wolf², Claus Schoellhorn², Robby Peibst³, Fabian Kiefer³, Rolf Brendel³</i> 1) <u>Institute of Electronic Materials and Devices, Leibniz University of Hannover/Germany</u> , 2) <u>BOSCH/Germany</u> , 3) <u>Institute for Solar Energy Research Hamelin</u>	101B	14:10-14:30 6-O-8	Novel Cooling Technology of Solar Module 6-1: PV Modules <i>C L Wang¹, Cher Zer Yang²</i> 1) <u>WIN WIN Precision Technology, Ltd./Taiwan</u> , 2) <u>Solar group</u>	101C	14:20-14:40 4-O-10	The Properties of III-nitride Nanorods Photovoltaics on Silicon Grown by PA-MBE 4-2: III-V New Materials and Cell <i>Ching-Wen Chang, Paritosh Wadekar, Hui-Chun Huang, Chen-Yu Lin, Fu-Peng Lu, Li-Wei Tu</i> <u>National Sun Yat-sen University/Taiwan</u>	101A			
14:30-14:50 1-O-32	20 Micron Thin Silicon Solar Cells on Steel 20 Micron Thin Silicon Solar Cells on Steel <i>Allen Barnett</i> <u>The University of New South Wales/Australia</u>	101B	14:30-14:50 6-O-9	Determination of Acetic Acid Content in Ethylene-Vinyl Acetate (EVA) Based PV Modules 6-1: PV Modules <i>Ethan Wang1, Hsinjin Yang1, Sunny Chi1, Carl Wang1, Chien-Yu Peng2, Chih-Chun Tsai3, Ivan Chou4</i> 1) <u>Underwriters Laboratories</u> , 2) <u>Department of Mathematics, Tamkang University</u> , 3) <u>Institute of Statistical Science, Academia Sinica</u> , 4) <u>Neo Solar Power Corp.</u>	101C	14:40-15:00 4-O-11	Effects of MOVPE InGaN Growth Conditions on the Solar Cell Properties of P-on-n Structure Si Substrate 4-2: III-V New Materials and Cell <i>Akio Yamamoto¹, Akihiro Mihara¹, Naoteru Shigekawa²</i> 1) <u>University of Fukui/Japan</u> , 2) <u>Osaka City University/Japan</u>	101A			
14:50-15:10 1-O-33	Large Area Transfer of Silicon Films with Midair Cavity Using Meniscus Force 1-1: Technologies for Higher Efficiency Silicon Solar Cells I <i>Shogo Nakamura, Kohei Sakaike, Muneki Akazawa, Takashi Fukunaga, Shohei Hayashi, Seiichiro Higashi</i> <u>Hiroshima University/Japan</u>	101B	14:50-15:10 6-O-10	Antireflective and Self-cleaning Glass for Solar Modules: Investigation of Outdoor Performance and Durability 6-1: PV Modules <i>Mridul Sakhuja, Hyunsoo Yang, Charanjit Singh Bhatia, Aaron James Danner</i> <u>NATIONAL UNIVERSITY OF SINGAPORE/Singapore</u>	101C	15:00-15:20 4-O-16	TBD <i>TBD</i>	101A			
15:10-17:00										Poster Session	

Detailed Program --November 1											
	Nov. 1 (Friday)										
08:00-08:30	Registration										
08:30-10:20	Session A1-11	Room	08:30-10:20	Session A3-7	Room	08:30-10:20	Session A4-5	Room	08:30-10:20	Session A7-3	Room
08:30-09:00 1-1-9 Invited Speech	TBD	101B	08:30-09:00 3-1-6 Invited Speech	CIS-based Thin-film PV Technology in the Giga-watt Production Era	101C	08:30-09:00 4-1-7 Invited Speech	Process Overview for CPV Cell Foundry Service	101A	08:30-09:00 7-1-2 Invited Speech	PV System Applications: New Green Tech Solution on Organic Greenhouse	101D
	Budi Tjahjono Sunrise Global Solar Energy Co., Ltd./ Taiwan			Katsumi Kushiya Solar Frontier K. K./Japan			J.T. Lai WIN Semiconductors Corp/Taiwan			Jackie Chang Sunny Rich Power Co., Ltd./Taiwan	
09:00-09:20 1-0-34	Development of High-Performance Multi-crystalline Silicon for Photovoltaic Industry 1-1: Technologies for Higher Efficiency Silicon Solar Cells Chung-Wen Lan ¹ , Y. M. Yang ² , A. Yu ² , B. Hsu ² , W. C. Hsu ² , A. Yang ³ 1) National Taiwan University/Taiwan, 2) Sino-American Silicon Productions Inc./Taiwan, 3) Solartech Energy Inc./Taiwan	101B	09:00-09:20 3-0-21	Presence of Deep n-type Defects in CZTS _{Se} Solar Cells with Efficiency of 9 % 3-6: CZTS, CdTe, and Related Materials	101C	09:00-09:20 4-1-12 Invited Speech	Analysis and Improvement of the Performances of Chemical Beam Epitaxy Grown GaAsN Solar Cells 4-2: III-V New Materials and Cell	101A	09:00-09:20 7-0-8	Examination of Input Information for Forecasting of Photovoltaic Power 7-2 System	101D
				Shih-Yuan Wei, Chia-Hao Hsu, Chih-Huang Lai National Tsing Hua University/Taiwan			Boussairi Bouzazi, Nobuaki Kojima, Yoshio Ohshita, Masafumi Yamaguchi Toyota Technological Institute/Japan			Katsunori Mizuno ¹ , KAZUTO YUKITA ¹ , Yamada Fujithiro ² , Wazawa Yoshihiko ² , Kawai Ryuji ³ , Ichibanagi Katsuhiro ³ , Kinno Tomoki ³ , Goto Yasuyuki ³ 1) Aichi Institute of Technology /Japan, 2) Chubu Electric Power Co.,Inc./Japan, 3) Power system laboratory/Japan	
09:20-09:40 1-0-35	Crystalline ITO thin films fabricated by reactive plasma deposition at room temperature for the application in a-Si:H/c-Si heterojunction solar cells 1-5: Progress in Silicon Hetero Junction Solar Cells	101B	09:20-09:40 3-0-22	Cu ₂ ZnSnS ₄ Thin-film Solar Cells Containing Grains Grown Using Sn Vapor Transport 3-6: CZTS, CdTe, and Related Materials	101C	09:20-09:40 4-0-13	In-situ Reflectance Monitoring in MOVPE Growth of InGaAs / GaAsP Superlattice on Misoriented GaAs Substrate 4-2: III-V New Materials and Cell	101A	09:20-09:40 7-0-9	Investigation of the Matching Performance of the Thermophotovoltaic Modules 7-3 Simulation	101D
	Jianhua Shi ¹ , Fanying Meng ¹ , Zhengxin Liu ¹ , Yanfeng Cui ² , Zhongdan Lu ³ 1) Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences 2)Changzhou Trina Solar Energy Co., Ltd 3)Changzhou Trina Solar Energy Co., Ltd.			Toshihiko Toyama Osaka University/Japan			Hiromasa Fujii, Hassanet Sodabanlu, yunpeng wang, Kentaroh Watanabe, Masakazu Sugiyama, Yoshiaki Nakano The University of Tokyo/Japan			Chen Xue Shanghai Institute Of Space Power/China	
09:40-10:00 1-0-36	Thin Silicon Dioxide Layers for Surface Passivation of a-Si:H/c-Si Heterojunction Solar Cells 1-5: Progress in Silicon Hetero Junction Solar Cells	101B	09:40-10:00 3-0-23	Investigation of Ga segregated behavior in CIGS thin films prepared by Se-containing precursors 3-6: CZTS, CdTe, and Related Materials	101C	09:40-10:00 4-0-14	Management of GaAsP Related Hetero-interface in Strain-balanced MQWs Solar Cells 4-1: Advanced Concepts	101A	09:40-10:00 7-0-10	All-sky Image Analysis Based Nowcasting of Spatial Average Irradiance in Several km Radius Area 7-2 System	101D
	Jieyu Bian ¹ , Fanying Meng ¹ , liping Zhang ¹ , dongliang Wang ¹ , jinning Liu ¹ , zhengxin liu ¹ , wanwu Guo ² , jian Bao ² 1) Shanghai Institute of Microsystem & Information Technology/China, 2) Trinasolar/China			Kuang-Hsiang Liao ¹ , Cherng-Yuh Su ² 1) Institute of Manufacturing Technology,National Taipei University of Technology/Taiwan, 2) National Taipei University of Technology/Taiwan			Yunpeng Wang, Hassanet Sodabanlu, Hiromasa Fujii, Kasidit Toprasertpong, Kentaroh Watanabe, Masakazu Sugiyama, Yoshiaki Nakano The University of tokyo/Japan			Yuta Makino, Takeyoshi Kato, Yasuo Suzuoki Nagoya university /Japan	
10:00-10:20 1-0-37	Investigation of the Open Circuit Voltage in c-Si Solar Cells with Ge/Si Heterostructures 1-5: Progress in Silicon Hetero Junction Solar Cells	101B	10:00-10:20 3-0-24	Zn(O,S) Buffer for CZTS (Cu ₂ ZnSnS ₄) Thin Film Solar Cells 3-5: Buffer and Window Layers	101C	10:00-10:20 4-0-15	Fabrication of Monolithic Integrated Series-Connected InGaP/GaAs Dual-junction Solar cells 4-3: CPV System, Cell, Components, Optical Design and Thermal Management	101A	10:00-10:20 7-0-11	A Comparative Examination of Relative Power Losses in PV strings: An Indian experience 7-2 System	101D
	Takeshi Tayagaki ¹ , Yusuke Hoshi ² , Noritaka Usami ² 1) Kyoto University/Japan, 2) Nagoya University/Japan			Xiaojing Hao, Fangyang Liu, Chang Yan UNSW/Australia			Minato Seno, Kentaroh Watanabe, Masakazu Sugiyama, Yoshiaki Nakano The University of Tokyo/Japan			Sudipta Basu Pal ¹ , Sekher Ranjan Bhadra Chaudhuri ¹ , Dipankar Mukherjee ¹ , Hiranmoy Saha ² 1) Bengal Engineering & Science University, Shibpur ,Howrah./India, 2) BESUS,Shibpur,Howrah,India/India	

	Nov. 1 (Friday)										
10:20-10:40	Break Time		10:20-10:40	Break Time		10:20-10:40	Break Time		10:20-10:40	Break Time	
10:40-12:00	Session A1-12		10:40-12:10	Session A3-8		10:40-12:10	Session A5-8		10:40-12:10	Session A6-5	
10:40-11:00 1-0-38	Achieve High Cell Efficiency by Advanced Metallization Materials 1-1: Technologies for Higher Efficiency Silicon Solar Cells I <i>Mike Barker</i> <u>DuPont/United States</u>	101B	10:40-11:10 3-1-7 Invited Speech	Highly Efficient CIGS Solar Cells L Numerical and Experimental Approached <i>Akira Yamada</i> <u>Tokyo Institute of Technology/Japan</u>	101C	10:40-11:10 5-1-6 Invited Speech	TBD Ken-Tsung Wong	101A	10:40-11:10 6-1-3 Invited Speech	Reliability Issues of CuInGaSe2 Thin-Film Solar Cells <i>Dr. John Pern</i> <u>NREL/U.S.A</u>	101D
11:00-11:20 1-0-39	High-mobility W-doped In2O3 films fabricated at low substrate temperature and its application to solar cells 1-5: Progress in Silicon Hetero Junction Solar Cells <i>Fanying Meng</i> <u>Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences</u>	101B	11:10-11:30 3-0-25	Open Circuit Voltage Improvement on Solution-based Cu2ZnSn(SeS)4 Solar Cells by Hybrid Buffer Layer 3-5: Buffer and Window Layers <i>Homare Hiroi¹, Hiroki Sugimoto¹, Masaru Kuwahara², Jeehwan Kim³, Teodor K Todorov³, Wei Wang³, Yu Luo³, Xiaoyan (Ingrid) Shao³, Tayfun Gokmen³, Richard Haight³, Mark T Winkler³, David B Mitzi³</i> 1) Showa Shell Sekiyu K.K. & Solar Frontier K.K./Japan, 2) TOKYO OHKA KOGYO CO., LTD./Japan, 3)IBM corporation/United States	101C	11:10-11:30 5-0-26	Self-assemble Ferroelectric Nanoarray and Its Application to c-Si/PEDOT:PSS Heterojunction Solar Cells 5-7: Nanostructured PV and Related Materials I <i>Qiming Liu</i> <u>Saitama University/Japan</u>	101A	11:10-11:30 6-0-11	Examination of a Standardized Test for Evaluating the Cure State of EVA Encapsulation 6-3: PV Standards <i>Stefan Schulze¹, Enno Malguth², Tsuyoshi Shioda³, Xiaohong Gu⁴, David C Miller⁵, John H Wohlgemuth⁵, Manuel Hidalgo⁶, Steven V Haldeman⁷, Charles G Reid⁸, Zhaoyun Wang⁹</i> 1) <u>Fraunhofer-Center für Silizium Photovoltaik</u> (Fraunhofer-CSP)/Germany, 2) <u>LayTec in-line GmbH/Germany</u> , 3) <u>Mitsui Chemicals, Inc./Japan</u> , 4) <u>National Institute of Standards & Technology/United States</u> , 5) <u>National Renewable Energy Laboratory/United States</u> , 6) <u>Sollia Project Laboratory at INES – LMPV/France</u> , 7) <u>Solutia Inc./United States</u> , 8) <u>STR Solar, Specialized Technology Resources, Inc/United States</u> , 9) <u>Trina Solar Limited Company/China</u>	101D
11:20-11:40 1-0-40	Low-Cost BiFacial Multi-crystalline Solar Cell with uncapped Al2O3 passivation and local Firing-through Al-BSF 1-1: Technologies for Higher Efficiency Silicon Solar Cells I <i>Ernst H.A. Granneman¹, Pascal Vermont¹, Olga Siarheyeva¹, Petra Manshanden², Arthur Weeber², Ilkay Cesar²</i> 1) <u>Levitech BV/Netherlands</u> , 2) <u>ECN/Netherlands</u>	101B	11:30-11:50 3-0-26	Effect of Different Annealing Temperatures on the Sol-gel Technique Deposited Cu2ZnSnS4 Absorber Layers for Thin Film Solar Cells 3-6: CZTS, CdTe, and Related Materials <i>Ganesh Agawane¹, A. V. Moholkar², P. S. Patil¹, Jin-hyeok Kim¹, Seung-wook Shin³</i> 1) <u>Chonnam National University, Gwangju./Korea, Republic of</u> , 2) <u>Electrochemical Mat. Lab., Dept. of Physics/India</u> , 3) <u>KAIST, Daejeon/Korea, Republic of</u>	101C	11:30-11:50 5-0-27	Effects of Introduction of the Other Carboxyl Groups to Terpyridine Ligand Having Ortho-dicarboxyphenyl Unit of Ruthenium Sensitizer on the Performance of Dye-sensitized Solar Cell 5-1: Dye-sensitized Solar Cells and Related Materials I <i>Takahito Sugiura, Ryosuke Shimizu, Hironobu Ozawa, Hironori Arakawa</i> <u>Tokyo University of Science/Japan</u>	101A	11:30-11:50 6-0-12	A Novel Concentrator Design with High Performance- flexible Waveguiding Photovoltaics 6-1: PV Modules <i>Chun-Hsien Chou, Fang-Chung Chen</i> <u>National Chiao Tung University/Taiwan</u>	101D
11:40-12:00 1-0-41	Improved Silicon Surface Passivation by Reactive Sputtered AlOx via Post-deposition Anneal 1-1: Technologies for Higher Efficiency Silicon Solar Cells I <i>Xinyu Zhang, Andres Cuevas, Andrew Thomson</i> <u>The Australian National University/Australia</u>	101B	11:50-12:10 3-0-27	Study of Sn Loss in the Fabrication of Cu2SnS3 Thin Films 3-6: CZTS, CdTe, and Related Materials <i>Meng Xie, Haitao Zhang, Jundi Liu, Yanlin Zhu, Shu Zhang, Yong Xiang</i> <u>University of Electronic Science and Technology of China/China</u>	101C	11:50-12:10 5-0-28	Deposition of Ge Nanoparticle Films and Their Application to Ge Quantum-dot Sensitized Solar Cells 5-7: Nanostructured PV and Related Materials I <i>Kazunori Koga, Giichiro Uchida, Daiki Ichida, Hyunwoong Seo, Kunihiro Kamataki, Naho Itagaki, Masaharu Shiratani</i> <u>Kyushu University/Japan</u>	101A	11:50-12:10 6-0-13	Development of An Arduino-based I-V curve Tracer for Performance Testing of Photovoltaic Modules Under Outdoor Conditions 6-1: PV Modules <i>Robert Alfie Pena, Ian Christopher Gamara, Keir Alexis Pareja, Erees Queen B. Macabebe</i> <u>Ateneo de Manila University/Philippines</u>	101D
12:10-12:30	Closing Ceremony										

Detailed Program for Poster Session

The Schedule for Poster Presentation is arranged as below:

Time	Schedule
10/28 08:00-17:00	Hand in your Poster to the staff at Conference Secretariat Room (Room 105, 1F, TICC)
10/29 08:00-12:00	The Conference staff will help put on all posters in the Exhibition Area.
Poster Session I 10/30 15:20-17:10	Area 1, 2 and 5
Poster Session II 10/31 15:20-17:10	Area 3, 4, 6, and 7

- Programs are subject to change without prior notice.
- All presentations will be conducted in English.
- The assigned presenters MUST be onsite during the presentation time, and it is permitted to tear down your own poster after the session is closed. But since the Exhibition Area will be open on Nov. 1, it is also encouraged to leave your Poster for other visitors' reference.
- No recording/ photography during seminar.

IMPORTANT: Please be well noted that the Posters MUST be handed in BEFORE 12:00, 10/29, or your presentation may be canceled.

Area 1: Advanced Technologies for Crystalline Silicon Materials and Solar Cells

1-1: Technologies for Higher Efficiency Silicon Solar Cells I

- | | |
|--------------|--|
| 1-P-1 | (1042)Light-enhanced Surface Passivation of Atomic Layer Deposited Aluminum Oxide Passivated Crystalline Silicon and Its Underlying Mechanism

Armin Gerhard ABERLE ¹ , Bram HOEX ¹ , Baochen LIAO ¹ , Thomas MUELLER ¹ , Rolf Arnold STANGL ¹ , Charanjit Singh BHATIA ² , Dongzhi CHI ³
1) Solar Energy Research Institute of Singapore (SERIS)/GERMANY 2) National University of Singapore (NUS)/UNITED STATES 3) A*STAR Institute of Materials Research and Engineering (IMRE)/SINGAPORE |
| 1-P-2 | (1051)Possibility of Efficiency Improvement of Silicon Solar Cells by Hydrogen Implantation

Masayalchimura
<u>Nagoya Institute of Technology/JAPAN</u> |
| 1-P-3 | (1071)A Wet Chemical Etching Method to Remove the Boron-rich Layer and Its Impact on N-type Silicon Solar Cells

Zongcun LIANG, Lei SHEN, Dianlei WANG
<u>Sun Yat-sen University/CHINA</u> |
| 1-P-4 | (1076) A wet-chemical Etching Method to Remove the Boron-rich Layer for N-type Silicon Solar Cells

Shuquan CHEN ¹ , Zongcun LIANG ²
1) <u>Institute for Solar Energy Systems, Sun Yat-sen University/CHINA</u>
2) <u>Sun Yat-sen University/CHINA</u> |
| 1-P-5 | (1158) Simplified Bifacial PERL Cell

Kyotaro NAKAMURA ¹ , Motoo Morimura ² , Yoshio Ohshita ² , Yoshinobu Murakami ³
1) <u>Meiji University/Japan</u> 2) <u>Toyota Technological Institute/Japan</u>
3) <u>Sumitomo Heavy Industries, Ltd./Japan</u> |
| 1-P-6 | (1159)Simplified PERL Cell for Next Generation Turnkey System

MariAOKI ¹ , Yoshio OHSHITA ¹ , Isao SUMITA ¹ , Kyotaro NAKAMURA ²
1) <u>Toyota Technological Institute/JAPAN</u> 2) <u>Meiji University/JAPAN</u> |

- 1-P-7** (1164) A Study on Diffusion Process for Uniform Emitter of Crystalline Silicon Solar Cells
Jeong Ho CHOI, Si Cheol ROH, Hwa Il SEO
Korea University of Technology and Education/KOREA, REPUBLIC OF
- 1-P-8** (1195) Analyzing the Recombination Current Densities in Industrial Like N-type PERT Solar Cells Exceeding 20% Efficiency
Fabian Kiefer², Robby Peibst¹, Tobias Ohrdes², Thorsten Dullweber², Jan KRUGENER⁴, H. JORG Osten⁵, Claus SCHOLLHORN³, Andreas Grohe³, Rolf Brendel¹
1) Institute for Solar Energy Research Hamelin/GERMANY 2) Institute for Solar Energy Research Hamelin (ISFH)/GERMANY 3) Bosch Solar Energy AG/GERMANY 4) Institute of Electronic Materials and Devices, Leibniz University of Hannover/GERMANY 5) Institute of Electronic Materials and Devices/GERMANY
- 1-P-9** (1214) Study of Silicon Dioxide Masking Layer in IBC Solar Cell
Li Li¹, Chenming Jiang¹, Hui Shen^{1,2}
1) Sun Yat-sen University/CHINA 2) Institute for Solar Energy Systems, Sun Yat-sen University /CHINA
- 1-P-10** (1241) Investigation of Wet-chemical Surface Conditioning of Crystalline Silicon Wafers for Solar Cell Applications
Armin Gerhard ABERLE¹, Ziv HAMEIRI¹, Thomas MUELLER¹, Muzhi TANG²
1) SERIS/SINGAPORE 2) Solar Energy Research Institute of Singapore/SINGAPORE
- 1-P-11** (1250) Detailed Study of Aluminum Nitride Thin Films for the Surface Passivation of Crystalline Silicon
Koji ARAFUNE¹, Haruhiko YOSHIDA¹, Shin-ichi SATOH¹, Toyohiro CHIKYOW², Hyunju LEE³, Atsushi OGURA³
1) University of Hyogo/JAPAN 2) National Institute for Materials Science/JAPAN 3) Meiji University/JAPAN
- 1-P-12** (1256) Advanced N-type Crystalline Silicon Solar Cells with Al Rear Emitter
Shih-Wei CHEN
Industrial Technology Research Institute /TAIWAN

- 1-P-13** (1273)Antireflection and Metal-electrode-production Using Catalytic Nanoparticles for Efficient Silicon Solar Cells
 Hiroyuki ATSUSHIBA¹, Masato ENOMOTO¹, Naoki FUKUMURO¹, Hitoshi MATSUDA¹, Shinji YAE¹, Kano YAMAKAWA¹, Yukiko ORITA², Susumu SAKAMOTO³
 1) University of Hyogo/JAPAN 2) Murata Co., Ltd./JAPAN 3) Nippon Oikos Co., Ltd./JAPAN
- 1-P-14** (1274)Effect of Transparent Conducting Layer with Graded Refractive Index on Silicon-based Solar Cells
 Gyujin OH¹, Dong Uk LEE², Eun Kyu KIM²
 1) Quntum-Function Research Laboratory and Department of Physics, Hanyang University/KOREA, REPUBLIC OF 2) Department of Physics, Hanyang University/KOREA, REPUBLIC OF
- 1-P-15** (1279)Patternization of the Front Metal Electrode by Laser Annealing on Solar Cells
 Chien-Chang CHAO¹, Chun-Yao HOU¹, Chun-Fu LIN¹, Yu-Han SU¹, Tsun-Neng YANG¹, Shan-Ming LAN², Wei-Yang MA³
 1) Institute of Nuclear Energy Research, Atomic Energy Council, Executive/TAIWAN 2) Chung Yuan Christian University/TAIWAN 3) Institute of Nuclear Energy Research (INER)/TAIWAN
- 1-P-16** (1284)Enhancement of Efficiencies of Heterojunction Silicon-based Solar Cells Using the ZnO:B Films Grown by Low Pressure Chemical Vapor Deposition
 Jui-Chung HSIAO
Industrial Technology Research Institute/TAIWAN
- 1-P-17** (1287)Improvement of Laser-fired Contact Process by a Boron-doped Aluminium Layer
 Chien-Chang CHAO¹, Guan-Lin CHEN¹, Yu-Han SU¹, Tsun-Neng YANG¹, Wei-Yang MA²
 1) Institute of Nuclear Energy Research, Atomic Energy Council, Executive/TAIWAN 2) Institute of Nuclear Energy Research (INER)/TAIWAN

- 1-P-18** (1329)Capacitance-voltage Characteristics of ALD Deposited Hafnium Oxide Film for Silicon Surface Passivation
Neha BATRA¹, Jhuma Gope¹, Mukul SHARMA¹, Vandana VANDANA¹, P. PRATHAP², C.M.S. RAUTHAN³, Sanjay Kumar SRIVASTAVA³, P.K. SINGH³
1) National Physical Laboratory/INDIA 2) CSIR-National Physical Laboratory, New Delhi India/INDIA 3) CSIR-National Physical Laboratory, New Delhi India/INDIA
- 1-P-19** (1362)Refractive Index Dependence of SiNx Surface Passivation Quality for Crystalline Silicon Solar Cells
Koji ARAFUNE , Atsushi OGURA, Chikako SAKAI , Shin-ichi SATOH, Ko URUSHIBATA, Shunsuke YAMAMOTO, Hotta YASUSHI
University of Hyogo/JAPAN
- 1-P-20** (1363)Effect of UV Irradiation on Passivation Quality of Ozone Based Atomic Layer Deposited AlOx Films
Koji ARAFUNE¹, Shohei MIKI¹, Chikako SAKAI¹, Shin-ichi SATOH¹, Ko URUSHIBATA¹, Hotta YASUSHI¹, Haruhiko YOSHIDA¹, Atsushi OGURA²
1) University of Hyogo/JAPAN 2) Meiji University/JAPAN
- 1-P-21** (1368)Passivation Quality of AlOx Film Deposited by Mist CVD
Koji ARAFUNE¹, Kojil GUCHI¹,Hirokil MAEDA¹, Shohei MIKI¹, Chikako SAKAI¹, Shin-ichi SATOH¹, Hotta YASUSHI¹, Haruhiko YOSHIDA¹, Atsushi OGURA²
1) University of Hyogo/JAPAN 2) Meiji University/JAPAN
- 1-P-22** (1395)Application of Etching Paste on Metallization of Interdigitated Back-contact N-type Silicon Solar Cells
Kuang Chieh LAI
Motech Industries,Inc. Science Park Branch/TAIWAN
- 1-P-23** (1400)The Effects of Rear-side Morphology on PERC Cells by Alkaline Etching
Chih-Wei CHANG, Ting FANG
Motech Industries/TAIWAN

- 1-P-24** (1403) Investigated Boron Diffusion in N-type Si Substrate
Hung-Chih CHANG
Motech Industries Inc./TAIWAN
- 1-P-25** (1408) V-shaped Void Free Process of High Temperature Boron Diffusion
Kuang Chieh LAI, Bo Shen LEE, Chiung Nan LI, Shu Yen LIU, Yu Pan PAI,
Yun Kuo TSAO
Motech Industries, Inc. Science Park Branch/TAIWAN
- 1-P-26** (1409) Control of Sheet Resistance of n+ Emitters by Etch Back Process in Crystalline Silicon Solar Cells
Taeko SEMBA
NAMICS Corporation/JAPAN
- 1-P-27** (1448) Difference of Surface Recombination Velocity of SiNx:H/c-Si(100) Interface with Light Irradiation at Different Temperature
Takai DAISUKE¹, Nobuaki KOJIMA¹, Takuto KOJIMA¹, Yoshio OHSHITA¹,
Masafumi YAMAGUCHI
Toyota Technological Institute/JAPAN
- 1-P-28** (1477) 19.6% Average Efficiency of P-type Solar Cell by Ion Implantation
Yi Jyun LIN
Inventec Solar Energy Co., Taiwan /TAIWAN
- 1-P-29** (1515) N-Type Mono-Like Silicon Bifacial Solar Cell with Industrial Process
Chia Lung LIN, Yu-Ta Cheng, Yu-Hsiang Huang, Chuan-Chi Chen,
Jung-Wu Chien
Inventec Solar Energy Co., Taiwan/TAIWAN

1-2: Analysis and Characterization of Silicon Solar Cells

1-P-30 (1032) Angularly Resolved Light Distribution and the Effect of Front Encapsulant Film

Yang YANG

UNSW/AUSTRALIA

1-P-31 (1061) PC2D Device Simulation and Performance Optimization on Selective-Emitter Crystalline Silicon Solar Cell

Bin AI, Youjun DENG, Xiaojie JIA, Hui SHEN

Institute for Solar Energy Systems, Sun Yat-sen University /CHINA

1-P-32 (1074) Study on Light-induced Degradation (LID) of Different Types of Silicon Wafers and Solar Cells

Bin AI, Xiang An ZENG

Institute for Solar Energy Systems, Sun Yat-sen University, Guangzhou , China/CHINA

1-P-33 (1075) Study on Stability of the Silicon Wafer with Different Surface Passivation Process

Bin AI, Xiang An ZENG

Institute for Solar Energy Systems, Sun Yat-sen University, Guangzhou , China/CHINA

1-P-34 (1104) Surface Photovoltage Characterization of Si Wafers and Solar Cells

Cheow Siu LEONG¹, Suhaila SEPEAI², Saleem H ZAIDI², Kamaruzzaman SOPIAN³

1) University Kebangsaan Malaysia/MALAYSIA 2) Solar Energy Research Institute (SERI)/MALAYSIA 3) University Kebangsaan Malaysia/MALAYSIA

1-P-35 (1108) Morphological Characterization of Monofacial and Bifacial Crystalline Silicon Solar Cells

Cheow Siu LEONG¹, Ayu WAZIRA¹, Kamaruzzaman SOPIAN¹, Seow SEOW², Saleem H ZAIDI³

1) University Kebangsaan Malaysia/MALAYSIA 2) Hi-Tech Instruments Sdn Bhd/MALAYSIA 3) Solar Energy Research Institute (SERI)/MALAYSIA

- 1-P-36** (1110)LIV Response Variation of Crystalline Silicon Solar Cell with Spectrally Variant Light Sources
Ivan AUDWINTO¹, Hoy Yen CHAN¹, Cheow Siu LEONG¹, Kamaruzzaman SOPIAN¹, Wanzul HAFIZHAZUAN², Saleem H ZAIDI³
1) University Kebangsaan Malaysia/MALAYSIA 2) HBE Gratings Sdn Bhd/MALAYSIA 3) Solar Energy Research Institute (SERI)/MALAYSIA
- 1-P-37** (1200)Comparison Between PC and PL Measurements: A Versatile Characterisation Method for Silicon Wafers
Kavitha GOPALAN¹, Ziv HAMEIRI²
1)SERIS-NUS/Singapore, 2)Cochin University of Science and Technology/INDIA
- 1-P-38** (1235)Variations of Carrier Lifetime on Manufacturing Procedures of Silicon Solar Cells
Hiroyuki KANDA
University of hyogo/JAPAN
- 1-P-39** (1309)Evaluation of Surface Passivation Material with Controlled Fixed Charge by Hard X-ray Photoelectron Spectroscopy
Toyohiro CHIKYOW¹, Norihiro IKENO², Atsushi OGURA², Masa-aki KOBATA³, Keisuke KOBAYASHI³, Shin-ichi SATOH⁴, Setsu SUZUKI⁵
1) National Institute for Materials Science/JAPAN 2) Meiji University/JAPAN 3) Japan Atomic Energy Agency/JAPAN 4) University of Hyogo/JAPAN 5) COMET Inc./JAPAN
- 1-P-40** (1401)Influence of Front Surface Field Diffusion Profiles for Interdigitated Back Contact Solar Cell
Kuang Chieh LAI, Bo Shen LEE, Chiung Nan LI , Shu Yen LIU , Yu Pan PAI, Yun Kuo TSAO
Motech Industries,Inc. Science Park Branch/TAIWAN
- 1-P-41** (1407)The Influence of High Temperature Boron Diffusion Process on the Bulk Lifetime of Si Wafer
Kuang Chieh LAI¹, Bo Shen LEE¹,Chiung Nan LI¹, Shu Yen LIU¹, Yu Pan PAI¹, Yun Kuo TSAO¹
Motech Industries,Inc. Science Park Branch/TAIWAN

- 1-P-42** (1449) Metrology of Electroluminescence for Solar PV Application
Tzu Huan CHENG, Chien Sheng LIU
LiveStrong Biomedical Technology Co.,Ltd/TAIWAN
- 1-P-43** (1537) Characterization of Boron Diffusion Phenomena for N-type Silicon Solar Cells
Chel-Jong CHOI¹, Soonji KWON¹, Woojin LEE¹, O-Bong YANG¹, Meong-II JEONG², Changmo LEE²
1) Chonbuk National University/KOREA, REPUBLIC OF 2) Dongwoo fine-chem Co., LTD/KOREA, REPUBLIC OF
- 1-P-44** (1542) Power Losses Analysis for Two-layer Contact of Crystalline Silicon Solar Cells
Tao LI
CAS/CHINA
- 1-P-45** (1543) Interface Phase Formation and Electrical Property of ZnO:Al and Si After Annealing
Daisuke ANDO, Junichi KOIKE, Zifeng LI, Yuji SUTOU
Tohoku University/JAPAN

1-3: Crystal Growth and Materials Characterization

1-P-46 (1026)Growth of Si Single Bulk Crystals for Solar Cells by the Noncontact Crucible Method

Kohei MORISHITA, Ryota MURAI, Kazuo NAKAJIMA
Kyoto University/JAPAN

1-P-47 (1125)Mirror Shifting and Lamp Power Effects on Solid-liquid Interface During Growth of Silicon Crystals by Infrared Convergent Heating Floating Zone (IR-FZ) Method

Md.MukterHOSSAIN, Masanori NAGAO, IsaoTANAKA, Satoshi WATAUCHI
University of Yamanashi/JAPAN

1-P-48 (1220)Grain Control by Patterned Layers in Multi-crystalline Silicon Growth by Directional Solidification

C. T.HSIEH, Chung-Wen LAN, Y. T. WONG
National Taiwan University/TAIWAN

1-P-50 (1258)Thermal Stability and Fixed Charge States of SrSiO_x Passivation Layer on Si Substrate

Taniwaki Shota¹, Toyoshima Yuki¹, Hotta Yasushi¹, Haruhiko Yoshida¹, Koji Arafune¹, Atsushi Ogura², Shin-ichi Satoh¹
1) University of Hyogo/JAPAN 2) Meiji University/JAPAN

1-P-51 (1299)Characterization of N-type Cz Silicon Wafers by Photoluminescence Imaging and Transient Photoconductance Decay
Chunlan ZHOU

Institute of Electrical Engineering, Chinese Academy of Science/CHINA

1-P-52 (1360)Recycle of Silicon Powder in a Waste Coolant from Fixed-abrasive Wire Sawing

Koji ARAFUNE, Norihisa LIO, Shohei MIKI
University of Hyogo/JAPAN

1-4: Manufacturing Issues, Equipments, and Processing

- 1-P-53** (1103) Investigation of Laser-Fired Aluminum Foil Back-Contact in Silicon Solar Cells
Nowshad AMIN¹, Victor C.H. LIM¹, Kamaruzzaman SOPIAN¹, Ayu Wazira AZHARI², Saleem H ZAIDI³
1) University Kebangsaan Malaysia/MALAYSIA 2) UNIVERSITI MALAYSIA PERLIS/MALAYSIA 3) Solar Energy Research Institute (SERI)/MALAYSIA
- 1-P-54** (1211) Ag/Cu Double Screen Printing Metallization
Kyotaro NAKAMURA¹, Tetsu Takahashi¹, Aki Tanaka¹, Kazuo Muramatsu¹, Hiroki Yoshimura¹, Atsushi Ogura², Yoshio Ohshita³
1) NAMICS CORPORATION/JAPAN 2) Meiji University/JAPAN 3) Toyota Technological Institute/JAPAN
- 1-P-55** (1263) Recovery of Useful Elements in Crystalline Silicon Solar Cell by Chemical Etching
Kei TAKAMI
Graduate School of Environmental and Life Science, Okayama University, Okayama, Japan/JAPAN
- 1-P-56** (1330) Al Fire Through Process for Fabricating Al₂O₃ Passivation
Mari AOKI¹, Yoshio OHSHITA¹, Norihiro IKENO², Atsushi OGURA², Yusuke KAWAMOTO³, Yasushi YOSHINO³, Shin-ichi SATOH⁴, Tomihiha TACHIBANA⁵
1) Toyota Technological Institute/JAPAN 2) Meiji University/JAPAN 3) Noritake Co., Limited/JAPAN 4) University of Hyogo/JAPAN 5) Toyota Tech. Inst/JAPAN
- 1-P-57** (1486) Effect of HF and HCl Mixture on the Electrical Performance in the Multicrystalline Silicon Solar Cells
Rahul P¹, Murty Dasari SREENIVASA¹, Prakash SURATKAR¹, Pratibha PATIL², Guru RASAD³
1) TATA Power Solar Systems Ltd/INDIA 2) Safran Engineering Services India Pvt Ltd/INDIA 3) Centum Rakon India Pvt Ltd./INDIA
- 1-P-58** (1511) Optimization of Al₂O₃ Backside Passivation into Mass Production
Jaap H.M. Beijersbergen, Pascal Vermont, Marius Ernst, Olga Siarheyeva, Ernst H.A. Granneman
Levitech B.V./NETHERLANDS

1-5: Progress in Silicon Hetero Junction Solar Cells

- 1-P-59** (1067) Surface Passivation Properties of Hydrogenated Intrinsic Amorphous Silicon Thin Films Fabricated Using a Remote Inductively Coupled Plasma Source
Jia GE¹, Thomas MUELLER²
1) NUS Graduate School for Integrative Science and Engineering; Solar Energy Research Institute of S'po/SINGAPORE 2) SERIS/SINGAPORE
- 1-P-60** (1233) Optimization of Hydrogenated Amorphous Silicon Oxide as Passivation Layer Grown by ECR-CVD
Jenq-Yang CHANG, Teng-Hsiang CHANG, Yen-Ho CHU, Chien-Chieh LEE
National Central University/TAIWAN
- 1-P-61** (1275) Improvement of Effective Lifetime by Surface Passivation of Ge Wafers Using Al₂O₃ Films
Nobuyuki KANEKO¹, Yasuyoshi KUROKAWA², Kazuyoshi NAKADA², Akira YAMADA²
1) Graduates School of Science and Engineering, Tokyo Tech/JAPAN 2) Tokyo Institute of technology/JAPAN
- 1-P-62** (1294) Doping Profile Control of Epitaxial-like Si Emitting Layer for the Application of C-Si Solar Cells
D. P. CAI, Jenq-Yang CHANG, Teng-Hsiang CHANG, Yen-Ho CHU, Chien-Chieh LEE, Ting-Tung LI
National Central University/TAIWAN
- 1-P-63** (1386) Deposit Intrinsic A-Si:H Passivation Layer by Using Radio Frequency Magnetron Sputtering
Sheng-Hui CHEN, Shao-Ze TSENG
National Central University/TAIWAN
- 1-P-64** (1402) Silicon Heterojunction Solar Cell on 6 Inch Wafers with Efficiency Exceeding 21%
Yi-Jiunn CHIEN¹, Jay CHANG², Ya-Lan CHANG², Fu-Shan CHEN², Ming-Yu CHEN², Ming-Yi HUANG², Po-Chuan YANG²
1) AU Optronics/TAIWAN 2) AU Optronics Corporation/TAIWAN

1-P-65 (1474) Comparison of Deposition Methods for TCO Coating on Hetero-junction Solar Cells
Guangyong XIONG
Canadian Solar Inc./CHINA

1-6: Modeling and Simulation of Silicon Solar Cells

1-P-66 (1160) Numerical Study of SiGe Graded Bandgap Solar Cell
Che-Pin TSAI¹, Chien-Chung LIN¹, Ming-Hsuan TAN¹, Yen-Hua LO¹,
Hun-Chieh HSU¹, Hung-Ruei TSENG²
1) Institute of Photonic System, National Chiao Tung University, Tainan 7/TAIWAN 2) INSTITUTE OF PHOTONIC SYSTEM, NATIONAL CHIAO TUNG UNIVERSITY, TAINAN 711, TAIWAN/TAIWAN

1-P-67 (1170) The Effects of Wafer Resistivity on the SHJ Solar Cells Revealed by 1D Computer Simulation
Makot KONAGAI, Shinsuke MIYAJIMA, He ZHANG
Tokyo Institute of Technology/JAPAN

1-P-68 (1271) Numerical Analysis of Submicron Size Texture on Crystalline Silicon Solar Cells Performances
Shinji ARAKI, Masahiro HORITA, Yasuaki ISHIKAWA Yunjian JIANG, Yuki Haru URAOKA, Seiya YOSHINAGA
Nara Institute of Science and Technology/JAPAN

1-P-69 (1398) Numerical Study of Depletion Effect in Back-contact Back-junction Solar Cell Induced by Fixed Charges Contained in Passivation Films
Hsin-Li CHEN, Chih-Ming WEI
Motech Industries, Inc./TAIWAN

Area 2: Amorphous, Microcrystalline and Other Silicon based thin film Solar Cells

2-2: Fundamental Science and Innovative Concepts

2-P-1 (1072) The Choice Parameters of SiGe Thin-film Solar Cell by Calculating and Theoretic Tuning

Cho-Fan HSIEH¹, Hung-Sen WU¹, Teng-Chun WU²

1) Industrial Technology Research Institute/TAIWAN 2) ITRI CMS/TAIWAN

2-P-2 (1175) The Effect of Mechanical Strain on Flexible Hydrogenated Amorphous Silicon Solar Cells

Yung-Chih CHEN

Institute of Nuclear Energy Research/TAIWAN

2-P-3 (1227) The Scope of Plasmonic Light Trapping Using Transfer-printed Ag Nanostructures: A Case for Microcrystalline Si Solar Cells

Michio KONDO, Koji MATSUBARA, Hidenori MIZUNO, Hitoshi SAI

AIST/JAPAN

2-3: Solar Cells and Related Science & Technologies

2-P-4 (1048) Study of N-layer Electrical Properties in the Performance of Amorphous Si Thin-film Solar Cells

Yu-Hung CHEN

Green Energy & Environment Research Laboratories, ITRI/TAIWAN

2-P-5 (1260) Selective Removal of Clusters in Silane Plasmas Using Cluster Eliminating Filter

Yuji HASHIMOTO, Naho ITAGAKI, Kunihiro KAMATAKI, Yeon Won KIM, Hyunwoong SEO, Masaharu SHIRATANI, Susumu TOKO, Giichiro UCHIDA, Daisuke YAMASHITA, Kazunori KOGA

Kyushu University/JAPAN

2-P-6 (1264) Device-quality Nanocrystalline Silicon Films Prepared by ECRCVD for Single-junction Solar Cells

In-Cha HSIEH¹, Chia-Hsun HSU¹, Shui-Yang LIEN², Ming-Chun TSNEG²

1) National Chung Hsing University/TAIWAN 2) MingDao University/TAIWAN

- 2-P-7** (1280) Evaluation of Local Diffusion Potential in Amorphous Si Solar Cell by Kelvin Probe Force Microscopy
Takanori ITOH, Takashi ITOH, Hiroshi KURIYAMA, Shuichi NONOMURA, Toshimasa SUZUKI
Gifu univ./JAPAN
- 2-P-8** (1344) Effect of Low Temperature Oxidation on the Textured Si for Heterojunction Solar Cells
Si Ming CHIOU
National Chung Hsing University/TAIWAN
- 2-P-9** (1383) Fabrication of Flexible Silicon Thin Film Solar Cell Modules by Substrate Transfer Technology
Chengying SHI¹, Hongwei DIAO², Guanghong WANG³, Lei ZHAO³
1) China Academy of Research Of MIIT/CHINA 2) wangguanghong@mail.iee.ac.cn/CHINA 3) Institute of Electrical Engineering, the Chinese Academy of Sciences/CHINA
- 2-P-10** (1387) Development of Oxide Based Window and Buffer Layer for Single Junction Amorphous Silicon Mini Modules: Reduction of Light Induced Degradation
Chandan BANERJEE
HHV Center for Advanced Photovoltaic Technologies Pvt. Ltd./INDIA
- 2-P-11** (1410) Effects of Graded Bandgaps and Buffer Layers on a-SiGe: H Thin-film Solar Cells
Tai-Chao KUO
National Chung Hsing University/TAIWAN
- 2-P-12** (1435) Optical Analysis of Bioinspired Plasmonic Structures for Light Absorption Enhancement of Ultrathin Film Silicon Solar Cell
Toshikazu IJIRO, Noboru YAMADA
Nagaoka University of Technology/JAPAN
- 2-P-13** (1464) Development of Hydrogenated Microcrystalline Silicon-Germanium Thin-Film Solar Cells for Enhancing Infrared Absorption
YenTang HUANG
National Chiao Tung University/TAIWAN

2-P-14 (1467) Enhancing the Performance of α -Si: H Single-Junction Cells and α -Si:H/ α -Si1-XGeX:H Tandem Cells by Replacing the N-layer with α -SiOX:H
Li-Hung LAI
National Chiao Tung University/TAIWAN

2-P-15 (1468) Effect of TCO/Si Interface Modification on Hydrogenated Microcrystalline Silicon Thin-Film Solar Cells
Shin-Wei LIANG
National Chiao Tung University/TAIWAN

2-4: Materials Preparation and Characterization

2-P-16 (1040) Dynamic Impedance of Difference B₂H₆ Doping Concentration of α -Si:H PV Modules
Dhirayut CHENVIDHYA¹, Krissanapong KIRTIKARA¹, Nitikorn SILSIRIVANICH¹, Kobsak SRIPRAPHA², Jaran SRITHARATHIKHUN²
1) King Mongkut's University of Technology Thonburi (KMUTT)/THAILAND
2) National Science and technology Development Agency (NSTDA)/THAILAND

2-P-17 (1102) The Influence of α -Si:H dehydrogenation on the AlC Formation of Poly-Silicon Thin Films on Glass Substrates
Weiyuan DUAN¹, Yu QIU², Zhengxin LIU²
1) Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences/CHINA 2) Shanghai Institute of Microsystem and Information Technology/CHINA

2-P-18 (1145) Fabrication of the BaSi₂ p-n Junction Diode on a p+-BaSi₂/p+-Si Tunnel Junction Towards Solar Cell Applications
Weijie DU
University of Tsukuba/JAPAN

2-P-19 (1315) Mono-Crystalline SiGe Films Grown by Reactive CVD Using SiH₄, GeH₄, and F₂ and Their Heterojunction Solar Cells
Tetsuya KANEKO¹, Hiroshi NOGE, Michio KONDO², Akira OKADA³
1) Fukushima University/JAPAN 2) AIST/JAPAN 3) Corning Holding Japan GK/JAPAN

2-P-20 (1352) Dopant Activation and Diffusion During Solid-Phase Crystallization of Thin-Film Silicon Solar Cell Structures

Regan Wilks², Mark Wimmer², Dominic Gerlach², Roberto Felix², Florian Ruske², Klaus Lips², Mihaela Gorgoi², Monika Blum¹, Wanli Yang⁴, Lothar Weinhardt³, Bernd Rech², Clemens Heske¹, Marcus BAR²

1) University of Nevada, Las Vegas (UNLV)/UNITED STATES 2) Helmholtz Zentrum Berlin/GERMANY 3) Karlsruhe Institute of Technology (KIT)/GERMANY 4) Advanced Light Source, Lawrence Berkeley National Lab/UNITED STATES

2-P-21 (1378) Capacitance-voltage of α -Si:H PV Module Measurement from IV Characteristics Using Pulse Solar Simulator

Dhirayut CHENVIDHYA¹, Krissanapong KIRTIKARA¹, Nifikorn SILSIRIVANICH¹, Chamnan LIMSAKUL², Manit SEAPAN²

1) King Mongkut's University of Technology Thonburi (KMUTT)/THAILAND 2) King Mongkut's University of Technology Thonburi/THAILAND

2-P-22 (1455) The Use of Toughened Glass Substrates for the Formation of Polycrystalline Silicon Films by Flash Lamp Annealing

Keisuke OHDAIRA

Japan Advanced Institute of Science and Technology/JAPAN

Special Session: Innovative Light Trapping Technologies: Textured TCO Glass

2-P-23 (1107) Comparative Study of the Output of Amorphous Silicon Photovoltaic Solar Cells When Receiving Direct and Diffused Radiation

Olatunji Henry DAVID, Mufutau Olatunde OLATINWO, Olaosebikan OYELEKE

Federal Polytechnic Offa/NIGERIA

2-P-24 (1193) Optical Scattering Properties of Double-textured ZnO Substrates

Hiroaki NATSUSONO

Tokyo Institute of Technology/JAPAN

2-P-25 (1238) Study of Double-textured ZnO:B Substrate with Larger Feature Size and Its Application to Thin-film Si Solar Cell

Taijiro KAGEI, Makot KONAGAI, Keiichi NISHIKUBO, Porponth SICHANUGRIST

Tokyo Institute of Technology/JAPAN

2-P-26 (1349) Smooth Light Scattering TCO Substrates for Thin Film Si Solar Cells by Using Nanocrystalline Oxide Particles

Shigeo HORI, Shuhei MIURA, Shuichi NONOMURA, Kazutoshi SUZUKI, MasakiTASHIRO

Gifu University/JAPAN

2-P-27 (1518) Design of Advanced Surface-textures for Thin-film Silicon Micromorph Solar Cells

Christophe BALLIF¹, Franz-Josef HAUG¹, Etienne MOULIN¹, Janez KRC², Martin SEVER², MarkoTOPIČ², Andrej ČAMPA², Mark STELTENPOOL³, Robvan ERVEN³

1) EPFL IMT PV-LAB/SWITZERLAND 2) University of Ljubljana, Faculty of Electrical Engineering/SLOVENIA 3) OM&T B.V./NETHERLANDS

Area 3: CIS, CdTe and Other (II-VI) thin film Solar Cells

3-1: Absorber and Thin Film Process□

3-P-1 (1099) Preparation of CIGS Thin Films for Solar Cells Using Van Doorn Apparatus

Takatoshi ISHIHARA , Shigeyuki NAKAMURA
Tsuyama National Collge of Technology/JAPAN

3-P-2 (1128) Solvothermal Synthesis of CIGS Nanomaterials

Xiaokun Zhang, Feng Jia, Wenbin Guo, Shu Zhang, Yong Xiang
University of Electronic Science and Technology of China/CHINA

3-P-3 (1129) Defect Passivation by Post-Selenization on Polycrystalline CuIn_{1-x}Ga_xSe₂ Thin Films Sputtered from a Quaternary Target

Chuan CHANG , Wei-Hao HO, Chia-Hao HSU, Chih-Huang LAI, Yue-Shun SU
National Tsing Hua University/TAIWAN

3-P-4 (1133) Mo Effect On One-step Sputtering Chalcopyrite CIGS Thin Films

Chia-Hsiang CHEN, Chih-Huang LAI, Tzu-Ying LIN
National Tsing Hua University/TAIWAN

3-P-5 (1155) Cu-poor Cu(In,Ga)S₂ Solar Cells Prepared Using Lift-Off Process

Ryuji KAIGAWA ¹, Shibamoto KOUICHI ¹, Shohei NAKANO ¹, Gerhardt PAUL ², Klenk REINER ²

1) Ryukoku University/JAPAN 2) Helmholtz-Zentrum für Materialien und Energie/GERMANY

3-P-6 (1174) Fabrication of Compound Semiconductor Films for Solar Cells via Supercritical Fluid Selenization Using SeO₂

Itaru HONMA, Yuta NAKAYASU, Takaaki TOMAI
Tohoku University/JAPAN

3-P-7 (1190) Characterization of Copper Indium Gallium Sulfur Selenide Films Prepared via Using the Selenization and the Surface Sulfurization Process

Shin-Hom LIN, Chung-Hsin LU
National Taiwan University/TAIWAN

- 3-P-8** (1213) Synthesis of Iron Pyrite (FeS₂) Nanoparticle for Photovoltaic Applications
Feng JIA, Yong XIANG, Shu ZHANG
University of Electronic Science and Technology of China/CHINA
- 3-P-9** (1254) Characterization of selenide-Cu(In,Al)Se₂ Thin Films for Solar Cell with Different Cu/III Ratio
De Ru JUNG
Metallurgy Section, Materials & Electro-Optics Research Division/TAIWAN
- 3-P-10** (1427) Realization of Cu₂ZnSnS₄/Cu₂ZnSn(S/Se)₄ Thin Film Absorber Layer by Chemical Deposition Technique
Bhagyashree PANI, Udai Pratap SINGH
KIIT UNIVERSITY/INDIA
- 3-P-11** (1456) Effects of Process Parameters on Characteristics of Co-Evaporated CIGS Photovoltaic Devices
Chia-Hua HUANG
National Dong Hwa University/TAIWAN
- 3-P-12** (1456) Effects of Process Parameters on Characteristics of Co-Evaporated CIGS Photovoltaic Devices
Chia-Hua HUANG
National Dong Hwa University/TAIWAN
- 3-P-13** (1570) Sprayed Low Resistivity Ga-doped ZnO Films For Cu(In,Ga)Se₂ Solar Cells
Akiko Ide¹, Akiko Mochihara¹, Kenji Yoshino¹, Shigeru Ikeda², Takashi Minemoto³
1)University of Miyazaki /Japan 2)Research Center for Solar Energy Chemistry, Osaka University/Japan 3) Ritsumeikan University/Japan
- 3-P-14** (1598) The Influence of the Cu-rich/Cu-poor sequence on the properties of Cu(In,Ga)Se₂ films deposited by in-line co-evaporation process
He Wang
Tianjin Institute of Power Sources

3-2: Absorber and Thin Film Process□

3-P-15 (1396) Fabrication of Zn(S, O) Buffer Layer for CIGS Solar Cells by Highly Deposited Rate Chemical Bath Deposition Process

Weitse HSU

ITRI/TAIWAN

3-4: Characterization

3-P-16 (1090) Study of 14.1% Efficiency Cd-free CIGS Flexible Thin-Film Solar Cells
Chzu-Chiang TSENG ¹, Wu-Shiung FENG ¹, Chen Lung-CHIEN ²

1) CHANG-GUNG-UNIVERSITY./TAIWAN 2) National Taipei University of Technology./TAIWAN

3-P-17 (1172) Growth of Alternative N-Type Layer for CIGS Solar Cells by RF Sputtering and Investigation of Sputtering Damage around Pn-Interface by Impedance Spectroscopy

Shao-Wei CHANG, Masayuki ITAGAKI, Mutsumi SUGIYAMA

Tokyo University of Science/JAPAN

3-P-18 (1181) Device Modeling on Optimum Absorber Bandgap Profile of Cu(In,Ga)(S,Se)₂ Solar Cells

Kenta AOYAGI , Jakapan CHANTANA, Daisuke HIRONIWA, Naoya KATAOKA, Takashi MINEMOTO, Masashi MURATA

1) Ritsumeikan University/JAPAN

3-P-19 (1207) Characterization of Deep Defects in Cu(In, Ga)Se₂ by Transient Photo-Capacitance Method

Xiaobo HU

University of Tsukuba/JAPAN

3-P-20 (1295) Fabrication of p-n Cu₂O Homojunction Solar Cells by Electrochemical Deposition Methods

LEO CHAU-KUANG LIAU

Yuan Ze University/TAIWAN

3-P-21 (1328) Microwave Photoconductivity Study on the Characteristics of CIGS Thin Films with Different Ga Contents

MING-JER JENG

Chang Gung University/TAIWAN

3-P-22 (1332) Investigating of Optical Properties of Different Cu/In Ratio CuInSe₂ Thin Films by Photoluminescence

Shou-Yi KUO¹, Fang-I LAI², Pei-Jhe LIOU², Jui-Fu YANG²

1) Chang Gung University/TAIWAN 2) Yuan Ze University/TAIWAN

3-P-23 (1345) Synthesis of Cu(In,Ga)Se₂ Crystal Grown by Crank Ball Mill

Yoji AKAKI

Miyakonojo National College of Technology/JAPAN

3-P-24 (1510) Meta-stability of Recombination Mechanism during CIGS Solar Cell Formation

Tzu-Huan CHENG

TSMC Solar/TAIWAN

3-P-25 (1539) Measurement of CdTe Ratio for Composition Control

Tim CHANG¹, Gary Richard MOUNT², Wesley NIEVEEN², Larry WANG²

1) Evans Analytical Group/TAIWAN 2) Evans Analytical Group/UNITED STATES

3-P-26 (1596) Investigating of Optical Properties of Different Cu In Ratio CuInSe₂ Thin Films by Photoluminescence

Fang-I Lai¹, Jui-Fu Yang¹, Pei-Jhe Liou¹, Shou-Yi Kuo²

1) Yuan Ze University /TAIWAN 2) Chang Gung University /TAIWAN

3-P-27 (1599) Effect of the second and third stage on CIGS absorber layers produced by the three stage process and solar cells

Yu-chi Chang¹, Du-Cheng Tsai¹, Huan-Hsin Sung¹, Fuh-Sheng Shieu¹, Shih Chang Liang²

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3-5: Buffer and Window Layers

3-P-28 (1127) Influences of Deposition Temperature on Sputtered-InxSy/CIGS Solar Cells

Wei-Hao HO , Chia-Hao HSU , Chih-Huang LAI , Shih-Yuan WEI
National Tsing Hua University/TAIWAN

3-P-29 (1140) Effects of Ammonia Hydroxide Etching with Chemical Routes Dependence for Zinc Sulfide Fabricated by Chemical Bath Deposition

Wei-Hao HO, Chia-Hao HSU, Chih-Huang LAI, Jen-Hao LIN, Tzu-Ying LIN, Shih-Yuan WEI
National Tsing-Hua University/TAIWAN

3-P-30 (1224) The Structural and Optical Properties of Vacuum Annealed CdS Thin Films Prepared by Thermal Evaporation

Ameen M ALI ¹ , Md. Aminul ISLAM ¹ , Nowshad AMIN ² , Shahidan RADIMAN ² , Kamaruzzaman SOPIAN ³ , M. AlOthman Zeid⁴, Mohammad Mezbaur Alam⁴

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4) King Saud University

3-P-31 (1252) Investigation of Light Soaking Behavior of CIGS Solar Cell with Mg Based Buffer Layers Prepared by CBD Process

Wen-Chieh LI
Chung-Shan Institute of Science and Technology/TAIWAN

3-P-32 (1255) Optimization of Sputtered Zn(S1-Xox)-Based Buffer Layers and Interfaces between Zn(S1-xOx)/Cu(In,Ga)Se2

Wei-Chieh HUANG
Chung-Shan Institute of Science and Technology/TAIWAN

3-P-33 (1393) Improvement of ZnMgO/Cu(In,Ga)Se2 solar cells by modifying the ZnMgO buffer layer

Byung Tae Ahn, Chnag Soo Lee
Korea Advanced Institute of Science and Technology/KOREA, REPUBLIC OF

3-6: CZTS, CdTe, and Related Materials

- 3-P-34** (1098) Facile One-Pot Synthesis of Cu₂ZnSnS₄ Quaternary Nanoparticle with Microwave-Assisted Method

Guo-Qin WANG

National Cheng Kung University/TAIWAN

- 3-P-35** (1100) Preparation of Cu₂ZnSnSe₄ Thin Films for Solar Cells Using Van Doorn Apparatus

Shigeyuki NAKAMURA , Shinji TAKAKURA

Tsuyama National College of Technology/JAPAN

- 3-P-36** (1119) Preparation of Cu₂ZnSnSe₄ (CZTSe) Thin Films by Selenization E-Beam Evaporated Metal Precursors

Hou-ying HUANG ¹ , Shang-En LIU ²

1) Institute of nuclear energy reserch/TAIWAN 2) Institute of Nuclear Energy Research Atomic Energy Council/TAIWAN

- 3-P-37** (1121) Preparation of Cu₂ZnSnSe₄ Absorber Layer by Non-Vacuum Method and Its Thickness Effect

Hwen-Fen HONG,Cherng-Tsong KUO , Shang-En LIU, Hwa-Yuh SHIN

Institute of Nuclear Energy Research Atomic Energy Council/TAIWAN

- 3-P-38** (1136) CuSbS₂ Thin Film Solar Cells Prepared from Electroplated Precursors

Takashi HARADA, Yuta IGA, Shigeru IKEDA, Michio MATSUMURA, Wilman SEPTINA

Research Center for Solar Energy Chemistry, Osaka University/JAPAN

- 3-P-39** (1139) Physical Properties of CIGS Polycrystalline Films Deposited by Physical Vapor Deposition for Solar Cell Processing

M. Estela CALIXTO ¹ , José Miguel GRACIA-JIMÉNEZ ¹, Gaspar

CASADOS-CRUZ ² , Arturo MORALES-ACEVEDO ², Jorge

SASTRE-HERNANDEZ ³ , MIGUEL TUFINO ³

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CINVESTAV-IPN/MEXICO 3) INSTITUTO POLITECNICO NACIONAL/MEXICO

- 3-P-40** (1149) Fabrication of $\text{Cu}_2\text{ZnSn}(\text{S},\text{Se})_4$ Thin Films by Annealing in Sulfur and Selenium Mixing Atmosphere with Tin Addition
Mitsuki NAKASHIMA , Toshiyuki YAMAGUCHI
Wakayama National College of Technology/JAPAN
- 3-P-41** (1151) Instantaneous Direct Synthesis of $\text{Cu}_2\text{ZnSn}(\text{S}_{1-x}\text{Se}_x)_4$ Films Using a Spot Welding Machine and its Dependence on Energy
Kenta HORIO¹ , Ryuji KAIGAWA¹ , Shotaro SHIBATA¹ , Klenk REINER²
1) Ryukoku University/JAPAN 2) Helmholtz-Zentrum für Materialien und Energie/GERMANY
- 3-P-42** (1153) The Effect of Ethanol in Solvent for Low Temperature Deposited CZTS Thin Film by Spray Pyrolysis
Hisashi MIYAZAKI , Jun MORIMOTO , Masayuki YOSHIOKA
National Defense Academy/JAPAN
- 3-P-43** (1173) Fabrication of b-axis-Orientated SnS Thin Films with a High Mobility by Sulfurization for Use in Solar Cells
Takashi HIRAMATSU , Kazuma HISATOMI, Hiro NAGAYASU, Mutsumi SUGIYAMA
Tokyo University of Science/JAPAN
- 3-P-44** (1177) Synthesis of the $\text{Cu}_2\text{ZnSn}(\text{S}, \text{Se})_4$ Powder with Tunable Phase Structure and Composition via a Novel Non-Toxic Solution Method
Xiuxun HAN¹ , Wen LI¹ , Liang LIU¹ , Yun ZHAO¹ , Tooru TANAKA²
1) Chinese Academy of Sciences/CHINA 2) Saga University/JAPAN
- 3-P-45** (1179) Low Temperature Pre-Annealing of Cu_2SnS_3 Thin Film Precursors
Jundi LIU, Yong XIANG, Meng XIE, Haitao ZHANG, Shu ZHANG, Yanlin ZHU
University of Electronic Science and Technology of China/CHINA
- 3-P-46** (1208) Effect of Sulfur Concentration on the Growth of $\text{Cu}_2\text{ZnSnS}_4$ Nanoparticles Synthesized by Hot Injection Method
Mao-Cheng HUANG, Chih-Huang LAI, Shih-Yuan WEI
National Tsing Hua University/TAIWAN

- 3-P-47** (1223) An Investigation on Structural and Electrical Properties of RF-Sputtered Molybdenum Thin Films
Samia AHMED, MD AKHTARUZZAMAN, Faiz ARITH, Puvaneswaran CHELVANATHAN, Faiazul HAQUE, Nowshad AMIN ², Kamaruzzaman SOPIAN ³, M. AlOthman Zeid⁴, Mohammad Mezbaul Alam⁴
1) Solar Energy Research Institute/MALAYSIA 2) The National University of Malaysia/MALAYSIA 3) University Kebangsaan Malaysia/MALAYSIA
4) King Saud University/MALAYSIA
- 3-P-48** (1281) Effects of Br-related Etchant on CZTS Thin Films
Hisashi Miyazaki ¹, Masami Aono ¹, Hiroaki Kishimura ¹, Hironori Katagiri²
1) National Defense Academy/JAPAN 2) Nagaoka National College of Technology/JAPAN
- 3-P-49** (1292) Fabrication of Cu₂Sn(S,Se)₃ Solar Cells by Screen Printing and High-Pressure Sintering Process
Tsuyoshi MAEDA , Takeshi NOMURA, Takahiro WADA
Ryukoku University/JAPAN
- 3-P-50** (1293) First-Principles Calculations of Diffusion of Na in CuInSe₂ and CuGaSe₂
Atsuhito KAWABATA , Tsuyoshi MAEDA, Takahiro WADA
Ryukoku University/JAPAN
- 3-P-51** (1303) Crystallographic and Optical Properties of Cu₂(Zn_{1-x}Cd_x)SnS₄ Solid Solution
Yutaka KOTAKE, Tsuyoshi MAEDA, Koji TAKEI, Takahiro WADA
Ryukoku University/JAPAN
- 3-P-52** (1307) Fabrication of Cu₂Zn(Sn,Ge)Se₄ Solar Cells by Printing and High-Pressure Sintering Process
Feng GAO , Tsuyoshi MAEDA, Masaru MORIHAMA, Takahiro WADA
Ryukoku University/JAPAN
- 3-P-53** (1312) Effect of KCN-Etching on Photovoltaic Properties of Cu₂ZnSnSe₄ Thin Film Solar Cell
Qixin GUO ¹, Mitsuhiro NISHIO ¹, Katsuhiko SAITO ¹, Tooru TANAKA ¹, Satoshi TOKUNAGA ¹, Xiuxun HAN ²
1) Saga University/JAPAN 2) Chinese Academy of Sciences/CHINA

- 3-P-54** (1318) Fabrication of $\text{Cu}_2\text{ZnSnS}_4$ Thin Films by Sulfurization of Electrodeposited CuZn/CuSn Precursor Layers with CS_2
E Chong WANG
Kansai University/JAPAN
- 3-P-55** (1385) Effects of Cd Ion-Soaking Treatment on CIGS Solar Cells
Sheng-Hui CHEN , Wei-Ting LIN
National Central University/TAIWAN
- 3-P-56** (1388) Influences of Zn Contents on Tetragonal Deformation and Optoelectronic Properties of Sputtered Chalcopyrite CuInZnSe_2 Thin Films
KYOHO KIM
Yeungnam University/KOREA, REPUBLIC OF
- 3-P-57** (1422) The Vacuum-free Preparation of Cu_2SnS_3 Thin Films by the Sulfurization of Precursors Deposited Using Metal-organic Decomposition
Naoya AIHARA , Hideaki ARAKI , Naofumi TAKAHASHI, Kotoba TOYONAGA
Nagaoka National College of Technology/JAPAN
- 3-P-58** (1429) Fabrication of $\text{Cu}_2\text{SixSn}_{1-x}\text{S}_3$ Thin Films for Solar Cells by Sulfurization of Si/Cu/Sn Precursors
Naoya AIHARA , Hideaki ARAKI, Ayaka KANAI, Kazuki KIMURA, Kotoba TOYONAGA, Manami YAMADA
Nagaoka National College of Technology/JAPAN
- 3-P-59** (1446) Preparation and Properties of TZO and CZTSe Composite Films for Solar Cells
Yu-Chen SYU
Minghsin University of Science and Technology/TAIWAN
- 3-P-60** (1497) Wide Bandgap CdS:O Thin Films Grown by Reactive RF-Sputtering
Nowshad Amin², Md. Aminul Islam¹, K Sajedur Rahman², Faiazul Haque¹, MD Akhtaruzzaman¹, Kamaruzzaman Sopian³, Mohammad Mezbaul Alam⁴, M. AlOthman Zeid⁴
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3-P-61 (1500) The Structure Properties of $\text{Cu}_2\text{ZnSnSe}_4$ Powders Prepared by Solid State Synthesis Method

MING-JER JENG

Chang Gung University/TAIWAN

3-P-62 (1502) Fabrication and Physical Characteristics of $\text{Cu}_2\text{ZnSn}(\text{S},\text{Se})_4$ Films by Pulsed Laser Deposition and Post-annealing Treatment

Xiang-Ru CHOU

Minghsin University/TAIWAN

Area 4: Concentrator Photovoltaic, III-V and Space Solar Cells

4-1: Advanced Concepts

4-P-1 (1059) Bandgap Engineering of Cu₂CdxZn_{1-X}SnS₄ Alloy for Photovoltaic applications

Zhan Hui DING, Yong Feng LI, Zhen Yu XIAO, Bin YAO
Jilin University/CHINA

4-P-2 (1245) Electrical Parameters Extraction from Voltage Dependent Spectral Response in Multi-junction Solar Cells without Bias Light

TOMAH SOGABE
The University of Tokyo/JAPAN

4-P-3 (1382) Growth of N-Type ZnS Blocking Epilayers for ZnTeo-Based Intermediate Band Solar Cells

Qixin GUO ¹, Shin HARAGUCHI ¹, Masaki MIYABARA ¹, Mitsuhiro NISHIO ¹, Katsuhiko SAITO ¹, Tooru TANAKA ¹, Wladek WALUKIEWICZ ², Kin M YU ²
1) Saga University/JAPAN 2) Lawrence Berkeley National Laboratory/UNITED STATES

4-P-4 (1437) Feasibility Study of Harvesting Diffuse Solar Radiation in High Concentration CPV Module Toward Higher Solar Energy Conversion

Toshikazu IJIRO, Kazuya OKAMOTO, Noboru YAMADA
Nagaoka University of Technology/JAPAN

4-2: III-V New Materials and Cell

4-P-5 (1084) Semiconductor Nitride Heterojunctions Applied In Solar Cell Devices

Jorge R. AGUILAR-HERNÁNDEZ ¹, Gerardo S. CONTRERAS-PUENTE ¹, Luis A. HERNÁNDEZ-HERNÁNDEZ ¹, Daniel JIMÉNEZ-OLARTE ¹, Francisco MOURE-FLORES ¹, Andrés CANTARERO ², Maria Jose RECIO ², Máximo LÓPEZ-LÓPEZ ³, Osvaldo MELO ⁴, Rogelio MENDOZA-PÉREZ ⁵, José B. ROJAS-TRIGOS ⁶, Guillermo SANTANA-RODRIGUEZ ⁷, Luis ZAMORA ⁸
1) Escuela Superior de Física y Matemáticas-IPN/MEXICO 2) Universidad de Valencia/SPAIN 3) Centro de Investigación y de Estudios Avanzados-IPN/MEXICO 4) Universidad de la Habana, Habana City, Cuba/CUBA 5) Universidad Autónoma de la Ciudad de Mexico/MEXICO 6) CICATA-IPN, Unidad Legaria/MEXICO 7) Instituto de Investigaciones en Materiales-UNAM/MEXICO 8) Universidad Veracruzana, Veracruz City/MEXICO

- 4-P-6** (1201) First-Principles Study of an Intermediate Band of Gapn Alloys
Makoto SAITO, Kei SAKAMOTO, Shuhei YAGI, Hiroyuki YAGUCHI
Saitama University/JAPAN
- 4-P-7** (1206) Thermionic Behavior of Carrier Transport in InGaAs/GaAsP Multiple Quantum Well Solar Cells
Hiromasa FUJII, Yoshiaki NAKANO, Masakazu SUGIYAMA, Kasidit TOPRASERTPONG, Kentaroh WATANABE, Yunpeng WANG
The University of Tokyo/JAPAN
- 4-P-8** (1232) X-ray Reciprocal Space Mapping Determination and Photovoltaic Performance of the InGaAs Solar Cell Grown on Misorientation Substrate
Ray-Hua HORNG¹, Shui-Yang LIEN², Ming-Chun TSENG²
1) National Chung-Hsing University/TAIWAN 2) MingDao University/TAIWAN
- 4-P-9** (1282) Effects of N Precursor Duration on Opt-Electrical Properties of GaAsN films Grown by Atomic Layer Epitaxy
Wen DING, Atsuhiko FUKUYAMA, Shoma GOTO, Tomohiro HARAGUCHI, Tetsuo IKARI, Kouji MAEDA, Hidetoshi SUZUKI, Toshihiro YAMAUCHI, Yuki YOKOYAMA
University of Miyazaki/JAPAN
- 4-P-10** (1283) Crystal Qualities of GaAs Hetero-Epitaxial Layers Grown on Si (111) Substrate Using Pre-Evaporation Technique of Group III Atoms
Atsuhiko FUKUYAMA, Akihiro HAGA, Tetsuo IKARI, Daiki ITO, Hidetoshi SUZUKI
University of Miyazaki/JAPAN
- 4-P-11** (1290) Structural Characterization of Novel Buffer Material (In_xGa_{1-x})₂Se₃ for GaAs on Si System
Nobuaki KOJIMA, Hiroya NAKAMURA, Yoshio OHSHITA, Masafumi YAMAGUCHI
Toyota Technological Institute/JAPAN
- 4-P-12** (1298) Effect of Annealing on Acceptors Densities in P-Type GaAsN Grown by Chemical Beam Epitaxy
Boussairi BOUZAZI¹, Koshiro DEMIZU², Omar ELLEUCH³, Kowaki HIROYUKI⁴, Ikeda KAZUMA⁵, Nobuaki KOJIMA⁶, Yoshio OHSHITA⁷, Masafumi YAMAGUCHI⁸
Toyota Technological Institute/JAPAN

4-P-13 (1301) Fabrication and Characterizations of MOCVD-Grown GaAs_{1-x}N_x (X~0.04) Surface Barrier Photodiode

Kai-Chiang PENG ¹, Chih-Hung WU ², Bing-Tang YANG ²

1) Chung Yuan Christian University/TAIWAN

2) Institute of Nuclear Energy Research/TAIWAN

4-P-14 (1306) Passivation Effects of Amorphous Ge Thin Film on Ge Single-Junction Solar Cells

Chih-An HSU ¹, Chih-Hung WU ², Chih-Chao YANG ²

1) Chung Yuan Christian University/TAIWAN

2) Institute of Nuclear Energy Research/TAIWAN

4-P-15 (1337) The Defect Level of N-H Complex in GaAsN Grown by Chemical Beam Epitaxy

Koshiro DEMIZU, Ikeda KAZUMA, Nobuaki KOJIMA, Yoshio

OHSHITA, Masafumi YAMAGUCHI

Toyota Technological Institute /JAPAN

4-P-16 (1342) The Analysis of Recombination Process Through the Hole Trap in GaAsN Solar Cell Grown by Chemical Beam Epitaxy

Boussairi BOUZAZI, Kowaki HIROYUKI, Ikeda KAZUMA, Nobuaki KOJIMA, Yoshio OHSHITA, Masafumi YAMAGUCHI

Toyota Technological Institute/JAPAN

4-P-17 (1343) Anisotropic Relaxation in Lattice Mismatched AlInGaAs/GaAs

Daisuke KODERA ¹, Nobuaki KOJIMA ², Yoshio OHSHITA ², Masafumi YAMAGUCHI ²

1) Toyota Technical Institute/JAPAN

2) Toyota Technological Institute/JAPAN

4-P-18 (1346) Efficiency of InGaAs/GaAsP Multiple Quantum Well Solar Cells on Various Mis-oriented GaAs Substrates under Concentrated Light

Yoshiaki NAKANO, Hassanet SODABANLU, Masakazu

SUGIYAMA, Kentaroh WATANABE, Yunpeng WANG

The University of Tokyo/JAPAN

4-P-19 (1359) Structure of N-H complex in GaAsN(001) Grown by Chemical Beam Epitaxy

Koshiro DEMIZU ¹ , Ikeda KAZUMA ² , Nobuaki KOJIMA ² ,
Oshio OHSHITA ² , Masafumi YAMAGUCHI ²

1) Toyota technical institute/JAPAN

2) Toyota Technological Institute/JAPAN

4-P-20 (1426) Surface Texturing on Thin Film GaN-Based Solar Cells

Jing-Huang CHEN, Lu-Sheng HONG, Yen-Hsiang HUANG , Cong Jun LIN ,
Bing-Ru YANG, Pinghui S. YEH

National Taiwan University of Science and Technology/TAIWAN

4-P-21 (1433) Defect States in GaAs Solar Cells Grown at Various Growth Temperatures by Molecular Beam Epitaxy

Kyoung SU Lee ¹ , Dong Uk LEE ¹ , Min tae KIM ¹ , Eun Kyu KIM ¹ , Won Jun CHOI ²

1) Quantum-Function Research Lab. and Department of Physics, Hanyang University/ KOREA, REPUBLIC OF 2) Opto-Electronic Convergence System, Korea Institute of Science and Technology/ KOREA, REPUBLIC OF

4-P-22 (1492) Real-time observation of crystallographic tilting in InGaAs layers on GaAs offcut substrates

Toshiaki Nishi

Toyota Technological Institute/JAPAN

4-P-23 (1576) Addition of the hydrophilic content into HF solution used in epitaxial lift-off process for GaAs solar cell applications

Ray-Hua Horng

National Chung-Hsing University/TAIWAN

4-P-24 (1580) Structural characterization of novel buffer material (InGa)₂Se₃ for GaAs on Si system

Hiroya Nakamura

Toyota Technological Institute/JAPAN

4-P-25 (1581) Effect of annealing on ionized acceptors density in p-type GaAsN grown by chemical beam epitaxy

Omar Elleuch, Boussairi Bouzazi, Kowaki Hiroyuki, Koshiro Demizu, Ikeda Kazuma, Nobuaki Kojima, Yoshio Ohshita, Masafumi Yamaguchi

Toyota Technological Institute /JAPAN

4-P-26 (1584) Real-time observation of crystallographic tilting? in InGaAs layers on GaAs offcut substrates

Toshiaki Nishi¹, Ikeda Kazuma¹, Hidetoshi Suzuki², Nobuaki Kojima¹, Yoshio Ohshita¹, Masafumi Yamaguchi¹

1)[Toyota Technological Institute/JAPAN](#) 2)[University of Miyazaki/JAPAN](#)

4-P-27 (1594) Anisotropic relaxation in lattice mismatched InAlGaAs/GaAs

Daisuke Koderu, Yoshio Ohshita, Nobuaki Kojima, Masafumi Yamaguchi
[Toyota Technological Institute /JAPAN](#)

4-3: CPV System, Cell, Components, Optical Design and Thermal Management

4-P-28 (1049) Design and Analysis of a 20-kW Grade Solar Tracker

Hsu Kuo CHUN

[Institute of Nuclear Energy Research HCPV system R&D Project/TAIWAN](#)

4-P-29 (1085) Influence of Lens Cleaning for Elimination of Micro Particulate Dust to Electricity Characteristics of a Concentrator PV System in Japan

Shinichiro OKE

[Tsuyama National College of Technology/JAPAN](#)

4-P-30 (1135) Shadowing Effect on High Concentrating Photovoltaic System Deployment

Wen-Fu CHEN , Wan-Li HSU , I-Tao LUNG, Chih Chieh Ma

[Institute of Nuclear Energy Research, Atomic Energy Council, Executive/TAIWAN](#)

4-P-31 (1156) Influence of SOG Fresnel Lens Deformation on Module Performance

Hwen-Fen HONG ¹ , Cherng-Tsong KUO ¹ , Hwa-Yuh SHIN ¹ , Yi Ya HUANG ²

1) [Institute of Nuclear Energy Research Atomic Energy Council/TAIWAN](#)

2) [Institute of Nuclear Energy Research/TAIWAN](#)

4-P-32 (1161) Improvement in Thermal-Stability for GaAs Thin Film Solar Cell with Copper Substrate

Ray-Hua HORNG ¹, Shui-Yang LIEN ² , Ming-Chun TSENG ²

1) [National Chung-Hsing University/TAIWAN](#) 2) [MingDao University/TAIWAN](#)

- 4-P-33** (1168) Design and Degradation Test of HCPV Homogenizer
Hwen-Fen HONG ¹ , Cherng-Tsong KUO ¹ , Hwa-Yuh SHIN ¹ , Yi Ya HUANG ² ,
Yueh-Mu LEE ² , Yi-Ping LIANG ² , Zun-Hao SHIH ²
1) Institute of Nuclear Energy Research Atomic Energy Council/TAIWAN
2) Institute of Nuclear Energy Research/TAIWAN
- 4-P-34** (1203) Optical Properties Characteristics of InAlP/GaAs/Ge
Subwavelength Structures by Nanoimprint Lithography and Dry Etching
Yung Zhao CHENG , Fang-I LAI , Yen Chen LAI
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- 4-P-35** (1229) Heat Transfer Simulation to Calculate Operating Temperature in
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Kensuke NISHIOKA , Yasuyuki OTA
University of Miyazaki/JAPAN
- 4-P-36** (1265) Two Innovative Methods to Measure The Concentration Ratio of
Fresnel Lens
Yi-Wei CHEN¹ ,Der-Ray HUANG¹ ,Jian-Lin QIU¹ ,Yu-Tai LI² , Hung-Sen WU ²
1) National Dong Hwa University/TAIWAN
2) Industrial Technology Research Institute/TAIWAN
- 4-P-37** (1268) Temperature Measurement Method of HCPV Module
Hwen-Fen HONG¹ ,Cherng-Tsong KUO¹ ,Hwa-Yuh SHIN¹ ,Yueh-Mu LEE
² ,Zun-Hao SHIH ²
1) Institute of Nuclear Energy Research Atomic Energy Council/TAIWAN
2) Institute of Nuclear Energy Research/TAIWAN
- 4-P-38** (1289) Study of Different Current in Step Stress Accelerated Degradation
Test for III-V Triple Junction Solar Cells
Mei Hui CHIANG¹ , Kai-Hsiang YANG ¹ ,Cherng-Tsong KUO² , Wu Yih
UEN¹ ,Hwen-Fen HONG²
1) Chung Yuan Christian University /TAIWAN 2) Institute of Nuclear Energy
Research Atomic Energy Council/TAIWAN
- 4-P-39** (1314) Temperature Dependence of InGap/InGaAs/Ge Triple-Junction
Solar Cells
Ming-Jer JENG
Chang Gung University/TAIWAN

4-P-40 (1340) Optical Design of a High Concentrated Flat Plate Solar Module

Zhenguang CHEN

SUN YAT-SEN UNIVERSITY/CHINA

4-P-41 (1367) Temperature characterizations of Metamorphic InGaAs/Ge Dual-Junction Solar Cells

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Institute of Nuclear Energy Research/TAIWAN

4-P-42 (1372) Optical Design for the Concentrated System with Fresnel Lens and Secondary Optical Element

Ji Fan CHEN ¹ ,Der-Ray HUANG ¹ ,Run-Lin LIOU ²

1) National Dong Wna University/TAIWAN 2) NDHUOEE/TAIWAN

4-P-43 (1434) Optical and Thermal Analysis of Solar Concentrator for CPV Module Based on LED Package Technology

Kazuya OKAMOTO ¹ ,Noboru YAMADA ¹

Nagaoka University of Technology/JAPAN

4-P-44 (1438) Computational Fluid Dynamics Analysis of Scaling Effect on Convective Heat Transfer in Fresnel Lens-Based CPV Module

Takahiro FUJITA ,Noboru YAMADA

Nagaoka University of Technology/JAPAN

4-P-45 (1534) Design and Preparation of ITO Film Filter Using in TPV System

Yang HUIYIN ,Chen XUE

Shanghai Institute Of Space Power/CHINA

4-P-46 (1595) Optical properties characteristics of InAlP GaAs Ge subwavelength structures by nanoimprint lithography and dry etching

Yen Chen Lai , Fang-I Lai

Yuan Ze University/TAIWAN

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4-P-47 (1126) Photovoltaic Behavior of GaN Multiple Quantum Wells in Harsh Environment

Der-Hsien LIEN,Jr Hau HE , Meng-Lin TSAI , Po-Kang YANG , Shih-Guo YANG, Tzu-Chiao WEI

National Taiwan University/TAIWAN

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5-P-1 (1083) Improved Efficiency of Dye Sensitized Solar Cells with HfO₂ Barrier Layers

Chin-Hsiang CHEN

Cheng Shiu University/TAIWAN

5-P-2 (1088) Dynamic and Static Photovoltaic Characteristics of Variation in Thickness of TiO₂ Photoanode of Dye-Sensitized Solar Cells

Dhirayut CHENVIDHYA, Surawut CHUANGCHOTE, Krissanapong KIRTIKARA, Thossaporn PONGKLANG

King Mongkut's University of Technology Thonburi (KMUTT)/THAILAND

5-P-3 (1092) Synthesis of Anatase TiO₂ Nanorod Like Structure for Dye Sensitized Solar Cells

Chaochin SU ¹, Sasipriya KATHIRVEL ¹, Wen-Ren LI ²

1) National Taipei University of Technology/TAIWAN, 2) National Central University/TAIWAN

5-P-4 (1096) Dye-Sensitized Solar Cells with Quasi-Solid State Electrolytes Prepared from Titanium-Containing Agarose

Shing jiang LUE ¹, Yun Ling WU ¹, Yung Liang TUNG ²

1) Chang Gung University/TAIWAN, 2) Industrial Technology Research Institute/TAIWAN

5-P-5 (1163) Facile and Low-Cost Multi-Anchoring Porphyrin Dyes as Efficient Sensitizers for Dye-Sensitized Solar Cells

Ram Babruvan AMBRE, Chen-Hsiung HUNG

Academia Sinica, Taipei./TAIWAN

5-P-6 (1178) Novel Coumarin Dyes for Fluorescence Chemosensor and Dye-sensitized Solar Cells

Shun-Chi CHEN, Jui-Hung HSU, Chun-Ping HUANG, Yan-Rong LIU

Ming Chi University of Technology/TAIWAN

- 5-P-7** (1188) Preparation of Highly Efficient Carbonaceous Counter Electrode of Dye-Sensitized Solar Cell
Hironori ARAKAWA, Kouya NOZAWA, Hironobu OZAWA
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- 5-P-8** (1196) Preparation of Efficient Thin TiO₂ Photoelectrode for the Durable Black-Dye-Based Dye Sensitized Solar Cells Using MPN Electrolyte Solvent
Hironori ARAKAWA, Daichi KATANO, Hironobu OZAWA, Satoshi YAMASHITA
Tokyo University of Science/JAPAN
- 5-P-9** (1199) Performance of dye-sensitized solar cell with a Ruthenium Sensitizer Bearing 3',4'-Dicarboxy-2,2';6',2''-Terpyridine Ligand
Hironori ARAKAWA, Kei FUKUSHIMA, Hironobu OZAWA, Ayako URAYAMA, Yasuyuki YAMAMOTO
Tokyo University of Science/JAPAN
- 5-P-10** (1202) Research on the Performance of Dye-Sensitized Solar Cells with Diatom Structure
Chih-Han CHEN, Der-Ray HUANG, Yan-Jang JIANG, Chih-Hung TSAI
National Dong Hwa University/TAIWAN
- 5-P-11** (1204) Efficiency Improvement of a Durable Plastic-Substrate Dye-Sensitized Solar Cell Using MPN Electrolyte Solvent by the Optimization of TiO₂ Photoelectrode
Hironori ARAKAWA, Shogo MUROYA, Hironobu OZAWA, Naoyuki SHIBAYAMA, Kudo TOMOHIRO
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- 5-P-12** (1236) Effect of Nano-Composite Gel Electrolyte on Solar Cell Performance of Black-Dye-Sensitized Solar Cell Using Ionic Liquid Electrolyte Solvent
Hironori ARAKAWA, Daichi KATANO, Hironobu OZAWA, Satoshi YAMASHITA
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- 5-P-13** (1240) Effect of Quaternary Phosphonium Cation in Electrolyte on the Performances of Black-Dye-Sensitized Solar Cells
Hironori ARAKAWA, Yu OKUYAMA, Hironobu OZAWA, Ayako URAYAMA
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5-P-14 (1261) The Photovoltaic Efficiency of Dye-Sensitized Solar Cells Improved by the Paint Reflection Effect

Der-Ray HUANG ¹, Yan-Jang JIANG ¹, Chih-Hung TSAI ¹, Run-Lin LIOU ²

1) National Dong Hwa University/TAIWAN, 2) NDHUOEE/TAIWAN

5-P-15 (1304) A Systematic Study of the Effects of Donor, Spacer and Anchor of D-Pi-A Type Dye on Absorption Properties for DSSC by DFT

Chun-Jui TAN

National Central University/TAIWAN

5-P-16 (1321) Preparation of Thin TiO₂ Photoelectrodes for High-Performance Black-Dye-Based Dye-Sensitized Solar Cells

Hironori ARAKAWA, Hironobu OZAWA, Ryosuke SHIMIZU, Motoki TAKESHITA
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Wen-Hsin TSENG

National Central University/TAIWAN

5-P-18 (1369) The Effect of MgO Coatings on the Performance of the Dye-Sensitized Solar Cells Based on WO₃

Chaochin SU ¹, Hsuan-Ching LIN ¹, Wen-Ren LI ²

1) National Taipei University of Technology/TAIWAN, 2) National Central University/TAIWAN

5-P-19 (1420) Fabrication Flexible Dye-Sensitized Solar Cells Using Graphene Counter Electrode and TiO₂ Plastic Photoanode

Hong-Wen WANG

Chung Yuan Christian University /TAIWAN

5-P-20 (1430) Characterization of UV Curable Sealant for Dye-Sensitized Solar Cell Application

Po-Tsung HSIAO

Industrial Technology Research Institute/TAIWAN

5-P-21 (1440) Enhanced Efficiency of Dye-Sensitized Solar Cells with Dual-Porous Honeycomb-Like Organized TiO₂ Photoanodes

Sung Hoon AHN, SungYeon HEO, Jong Hak KIM, SangJin KIM, ChangSoo LEE

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5-P-22 (1443) Performance Improvement And Harvesting Indoor Light of Flexible Dye-Sensitized Solar Cells

Qiao-Zhi GUAN, Ming-De LU, Yung Liang TUNG

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5-P-23 (1454) Improving the Efficiency of Solid-State Dye-Sensitized Solar Cells Using Mesoporous Bragg Stack Layer

Ha Rim JEON, Dong Jun KIM, Jin Kyu KIM, Jong Hak KIM, Jung Tae PARK

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5-P-24 (1466) ZnO Nanocrystalline Aggregates Synthesized through a Low-temperature Aqueous Solution Method for Dye-Sensitized Solar Cells

Chang Wei CHEN, Yu Wan CHIN

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5-P-25 (1496) D- π -2A Push-Pull Boryl Oxasmaragdyrins as Efficient Sensitizers for DSSC

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Academia Sinica, Taipei./TAIWAN

5-P-26 (1512) Molecular Origins of Dye Aggregation and Complex Formation Effects in Coumarin 343

Jacqueline M COLE, Xiaogang LIU

University of Cambridge/UNITED KINGDOM

5-P-27 (1519) An Industrial Route to Low Temperature Efficient Fabrication Processes for Flexible Dye-Sensitized Solar Cells and Their Scale Up Towards Monolithic Interconnected Modules

Kishore Kumar DEVAREPALLY, Upadhyaya HARI, Min-Hung HSU, Obinna ONUOHA, Senthilarasu SUNDARAM

Heriot-Watt University/UNITED KINGDOM

5-P-28 (1522) DSSC anode of nano-sculptured porous titania films by vapor glancing-angle deposition under various oxygen flow rates

Haw Kai CHANG, Pan Sheng Wu
National Dong Hwa University/TAIWAN

5-P-29 (1529) Electrochemical Impedance Spectroscopy Analysis of Effect of Graphene Doping on TiO₂ and Dye in Dye-Sensitized Solar Cell

Erwin Paredes ENRIQUEZ, Anna Carissa Matawaran San ESTEBAN
Chemistry Department, Ateneo de Manila University/PHILIPPINES

5-P-30 (1532) The Photovoltaic Performance of Dye-Sensitized Solar Cell Based on UV Curable Adhesives Sealing

Chun Hsiung CHEN, Tzu Hsuan CHIANG, Chun Yu LIU
1) National United University/TAIWAN

5-P-31 (1536) Highly Catalytic Electrodes Based on Ultrathin Polypyrrole Nanosheets for Dye-Sensitized Solar Cells

Dong Ki HWANG, Seung Soon IM, Yong Soo KANG, Donghoon SONG
Hanyang University/KOREA, REPUBLIC OF

5-3: Dye-sensitized Solar Cells and Related Materials III

5-P-32 (1137) Zinc Oxide Dye-Sensitized Solar Cell Efficiency Enhancement by Rapid Thermal Treatment

Pichanan TEESETSOPON
King Mongkut's Institute of Technology/THAILAND

5-P-33 (1226) Microwave-Assisted Synthesis of Anatase TiO₂ Nanocrystals for Dye-Sensitized Solar Cells

Peter CHEN, Po-Shen SHEN, YuChun WU
National Cheng Kung University/TAIWAN

5-P-34 (1234) Fabrication of Inorganic Bulk Hetero Junction Solar Cells of Nanocrystalline-TiO₂/Sb₂S₃/CH₃NH₃PbI₃/CuSCN

Souichirou TANAKA
University of Hyogo/JAPAN

5-P-35 (1348) Preparation and Properties of Transparent Conducting B-Doped ZnO Film Electrodes for Dye-Sensitized Solar Cells

Yu-Chen SYU

Minghsin University of Science and Technology/TAIWAN

5-P-36 (1412) Dye-Sensitized Solar Cell with W:Zno-Based Electrode Films and Its Photovoltaic Characterization

Ming-Sian JIAN

Minghsin University of Science/TAIWAN

5-P-37 (1414) Influence of Cu₂O Doping in ZnO Films on Optoelectronic Conversion Efficiency of Dye-Sensitized Solar Cells

Jhih-Jie FONG

Minghsin University of Science and Technology/TAIWAN

5-P-38 (1509) An Electrochemically Assisted Route to Fabricating Highly Efficient Quantum-Dot-Sensitized Solar Cells

Chien-Wei CHANG, Ting-Wei CHANG, Ching-Fa CHI, Yuh-Lang LEE, I-Ping LIU, Song-Chuan SU

National Cheng Kung University/TAIWAN

5-P-39 (1538) Advanced Composite Electrolyte of Graphene and Polyethylene Oxide for Dye Sensitized Solar Cells

M. Shaheer AKHTAR

Chonbuk National Univerity/KOREA, REPUBLIC OF

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- 5-P-40** (1441) A Counter Electrode of WS₂/Graphene Nanocomposite Used in Pt-Free Dye-Sensitized Solar Cells

Huai-Yi CHEN, Chien-Chin WANG
Huafan University/TAIWAN

- 5-P-41** (1442) ZnO Nanorods Prepared by RF Sputtering and Hydrothermal Method for the Application of Dye-Sensitized Solar Cells

Huai-Yi CHEN, Chi- Shiu YEN
Huafan University/TAIWAN

- 5-P-42** (1521) SnO₂-TiO₂ Nanopillar Photoanode for Dye-Sensitized Solar Cells

Hsyi-En CHENG, Cheng-Sian LIN, Chia-Hui WEN
Southern Taiwan University of Science and Technology/TAIWAN

5-5: Organic Thin Film Solar Cells and Related Materials I

- 5-P-43** (1024) New Set-up Procedures and Integrated Measurement System for Organic Photovoltaic (OPV) Module

Shu-Tsung HSU ¹, Yean San LONG ², Teng-Chun WU ²
1) ITRI/TAIWAN, 2) CMS/ITRI/TAIWAN

- 5-P-44** (1078) Optical Enhancement of Gold Nanoparticles in Inverted Low-bandgap Polymer Solar Cells

Ping-Yi HO, Chia-Yu KAO, Shao-Hsuan KAO, Ching-Fuh LIN, Chien-Ting Liu, Hsin-Che Lee
National Taiwan University/TAIWAN

- 5-P-45** (1086) Plasmonic-Enhanced Inverted Polymer Solar Cells Using Gold Nanoparticle-Decorated Graphene Oxides

Chung-Lei CHEN, Fang-Chung CHEN
National Chiao-Tung University/TAIWAN

- 5-P-46** (1143) Performance Improvement of Large-Area, Roll-To-Roll, Slot-Die-Coated, Inverted Polymer Solar Cell by Tailoring Electron Transport Layer

Hou-Chin CHA, Charn-Ying CHEN, Cheng-Wei CHOU, Chih-Min CHUANG, Fan-hsuan HSU, Yu-Ching HUANG, De-Han LU, Cheng-Si TSAO
Institute of Nuclear Energy Research/TAIWAN

5-P-47 (1144) Hierarchical Structure of Spray-Coated Bulk-Heterojunction Blend Film Studied by Grazing Incidence Small- and Wide- Angle X-Ray Scattering

Hou-Chin CHA ¹, Charn-Ying CHEN ¹, Chih-Min CHUANG ¹, Fan-hsuan HSU ¹, Yu-Ching HUANG ¹, Cheng-Si TSAO ¹, U-Ser JENG ², Chun-Jen SU ²

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5-P-48 (1148) Effect of Nitrogen Plasma Treatment on All-Sprayed Inverted Polymer Solar Cells

Charn-Ying CHEN, Cheng-Wei CHOU, Yu-Ching HUANG, Cheng-Si TSAO
Institute of Nuclear Energy Research/TAIWAN

5-P-49 (1157) Employing a Surface Modifier to Enhance the Performance of Large-Area Inverted Polymer Solar Cells by Spray Coating Process

Charn-Ying CHEN, Cheng-Wei CHOU, Yu-Ching HUANG, De-Han LU, Cheng-Si TSAO

Institute of Nuclear Energy Research/TAIWAN

5-P-50 (1166) Gold Nanoparticle-Decorated Graphene Oxide Nanocomposites for Plasmonic-Enhanced Polymer Photovoltaic Devices

Fang-Chung CHEN, Ming-Kai CHUANG, Shih-Wei LIN

National Chiao Tung University/TAIWAN

5-P-51 (1186) Solution-Processable Invert Polymer Solar Cells Using Plasma Treatment

Yang-Fang CHEN, Meng-Huan JAO, Hsueh-Chung LIAO, Wei-Fang SU

National Taiwan University/TAIWAN

5-P-52 (1191) Solution-Processable Bismuth Iodide Nanosheets as an Anode Buffer Layer for Organic Solar Cells

Karunakara Moorthy BOOPATHI¹, Chih-Wei Chu²

1)Academia Sinica/TAIWAN 2)Research Center for Applied Sciences, Academia Sinica

5-P-53 (1217) Perovskite/Fullerence Planar-Heterojunction Hybrid Solar Cells

Peter CHEN, Yi-Fang CHIANG, Tzung-Fang GUO, Jun-Yuan JENG

National Cheng Kung University/TAIWAN

5-P-54 (1218) Application of ZnO Nanorod Array In Inverted Low Bandgap Polymer Solar Cells

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Hsin-Che LEE ², Ching-Fuh LIN ²

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5-P-55 (1253) Fabrication of Organic Photovoltaic Cells Using Various Spray Coating

Hiroki AKENAGA ¹, Yoshinori KOBAYASHI ¹, Keiji MIYACHI ¹, Yoshiyuki SEIKE ¹,
Tatsuo MORI ², Takao NISHIKAWA ³

1) Asahi Sunac/JAPAN, 2) Aichi Institute of Technology/JAPAN, 3) Iwate University/JAPAN

5-P-56 (1317) The Dual Localized Surface Plasmonic Effects of Gold Nanodots and Gold Nanoparticles Enhance the Performance of Bulk Heterojunction Polymer Solar Cells

Chia-Min CHEN, Chih-Ming LIU, Kung-Hwa WEI
National Chiao Tung University/TAIWAN

5-P-57 (1381) Photoconductive Properties of Phthalocyanine-ZnO Films Prepared from Their Nano-particle Pastes

Masaie FUJINO, Aya ISHIZAKI
Gunma National College of Technology/JAPAN

5-P-58 (1489) Effects of Annealing Temperature and Doping on the Characteristics of ZnO Thin Films

Kyung Ho KIM
Kitami Institute of Technology/JAPAN

5-6: Organic Thin Film Solar Cells and Related Materials II

- 5-P-59** (1087) Effect of Silver Nanoparticles on the Performance of Poly(3,4-Ethylenedioxythiophene):Poly(Stylenesulfonate)/n-Si Hybrid Solar Cell

Ishwor KHATRI, Qiming LIU
Saitama University/JAPAN

- 5-P-60** (1246) Enhancing the PCE of Inverted Structure Polymer Solar Cell Based on Low Bandgap Material by Solution-Processed Cathode Modification

Ping-Yi HO ^{1,2}, Chia-Yu KAO ¹, Cheng-Che LEE ¹, Ching-Fuh LIN ¹
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- 5-P-61** (1247) Enhancing the Efficiency of Inverted Structure Polymer Solar Cell Based on Low Band Gap Material by Solution-Processed Cathode Modification

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- 5-P-62** (1028) Photovoltaic Characterization of Polymer Solar Cell with Gold Nanoparticles

Chen-Shiung CHANG ¹, Cheng-En CHENG ¹, Forest CHIEN ², Hwa-Wei SHIH ², Zingway PEI ³
1) National Chiao Tung University/TAIWAN, 2) Tunghai University/TAIWAN, 3) National Chung Hsin University/TAIWAN

- 5-P-63** (1039) Effects of Molybdenum Oxide Molecular Doping on the Chemical Structure of Poly(3,4-Ethylenedioxythiophene):Poly(Stylenesulfonate) and on Carrier Collection Efficiency of c-Si/PEDOT:PSS Heterojunction Solar Cells

Qiming LIU
Saitama University/JAPAN

5-P-64 (1044) High Quantity and Quality Few-Layers Graphene-Analogs Nanosheets from Wet-Milling Exfoliation for Highly Stable Organic Solar Cells

Chih-Wei CHU ¹, Mohammed Aziz IBRAHEM ²

1) Research Center for Applied Sciences, Academia Sinica/TAIWAN, 2) NTU, Academia Sinica/TAIWAN

5-P-65 (1047) Cu₂ZnSnS₄ Nanocrystals-Based Solar Cells: Efficient Removal of Surfactants from the Nanocrystal Surface Using Alkylating Agents

Tetsuya KIDA

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5-P-66 (1070) Electrochemical Deposition of Fe-S-O Thin Films

Masaya ICHIMURA ¹, Kai YANG ¹, Shoichi KAWAI ²

1) Nagoya Institute of Technology/JAPAN, 2) DENSO CORPORATION/JAPAN

5-P-67 (1073) Advanced Nanostructured Photonic Crystal Solar Cells

Cho-Fan HSIEH ¹, Hung-Sen WU ¹, Teng-Chun WU ²

1) Industrial Technology Research Institute/TAIWAN, 2) ITRI CMS/TAIWAN

5-P-68 (1081) Electrochemical Deposition of Iron Sulfide Thin Films and Heterojunctions with Zinc Oxide

Masaya ICHIMURA ¹, Ryuta YAMAZAKI ¹, Shoichi KAWAI ², Eiichi OKUNO ², Susumu SOBUE ²

1) Nagoya Institute of Technology/JAPAN, 2) DENSO CORPORATION/JAPAN

5-P-69 (1094) Structure, Resistivity and Deflection Properties of SiO_x Barrier Layer Deposited by Spray Pyrolysis Technique for CIGS Solar Cells on Metallic Substrates

Chien Wei TSENG

National Central University, Taiwan/TAIWAN

5-P-70 (1130) Thin Films and Nanostructures for Photovoltaics

Zakaria LAGHFOUR, Khalid NOUNEH, Zouheir SEKKAT, Ajjammouri TARIK
Moroccan Foundation for Advanced Science, Innovation and Research/MOROCCO

5-P-71 (1131) Monolayer MoS₂/p-Si Based Photovoltaic Devices

Lih-Juann CHEN ¹, Jr Hau HE ¹, Dung-Sheng TSAI ¹, Meng-Lin TSAI ¹,
Lain-Jong LI ², Sheng-Han SU ²

1) National Tsing Hua University/TAIWAN, 2) Academia Sinica/TAIWAN

5-P-72 (1150) Investigation of silicon nanowire solar cell by Using Two-Dimensional Device Simulation

Shinya KATO ¹, Makot KONAGAI ², Yasuyoshi KUOKAWA ², Shinsuke
MIYAJIMA ², Akira YAMADA ²

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Technology/JAPAN

5-P-73 (1167) Enhancing Performance of Silicon Heterojunction Solar Cells by Luminescent Graphene Quantum Dots

Jr-Hau HE, Shu Ping LAU, Wei-Chen TU, Tzu-Chiao WEI
National Taiwan University/TAIWAN

5-P-74 (1176) Heteroepitaxial Growth of SixGe_{1-x} Films on Nanostructured Si Substrates

Ayu Wazira AZHARI ¹, Victor C.H. LIM ², Kamaruzzaman SOPIAN ², Suhaila
SEPEAI ³, Saleem H ZAIDI ³

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Malaysia/MALAYSIA, 3) Solar Energy Research Institute (SERI)/MALAYSIA

5-P-75 (1184) Rapid Thermal Annealing of Silver Thin Film to Obtain Self-Assembly Nanoparticle for Solar Cell Application

Wang HAO ¹, Rusli RUSLI ¹, Xincan WANG ², Hongyu ZHENG ⁴, Nanyang
HONG ⁵

1) Nanyang Technological University/SINGAPORE, 2) Singapore Institute of
Manufacturing Technology/SINGAPORE

5-P-76 (1249) Evaluation of Effective Lifetime of Silicon Nanowire Arrays Passivated by Al₂O₃

Shinya KATO ¹, Yasuyoshi KUOKAWA ², Akira YAMADA ², Yasuharu
YAMADA ²

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technology/JAPAN

5-P-77 (1270) Two-Step Photocurrent Generation in Lattice-Matched GaAs/AlGaAs QD-IBSCs at Room Temperature
Martin ELBORG, Liyuan HAN, Takaaki MANO, Takeshi NODA, Kazuaki SAKODA, Yoshiki SAKUMA
National Institute for Materials Science/JAPAN

5-P-78 (1310) Optical Simulation of Si Nanowire Arrays Textured Thin-film Si/Polymer Hybrid Solar Cells
Lining HE, Wang HAO, Rusli RUSLI, Nanyang HONG
Nanyang Technological University/SINGAPORE

5-P-79 (1326) Observation of Conduction Electrons in Superlattice Structure by Visible Light Photoemission Spectroscopy
Kenji Nishitani¹, Fumiaki Ichihashi¹, Daiki Shimura², Shunta Harada¹, Makoto Kuwahara¹, Miho Tagawa¹, Takahiro Ito¹, Toru Ujihara¹
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5-P-80 (1327) Enhancement of Carrier Harvesting by Multi-textured Pyramid/Silicon Nanostructure for Hybrid Heterojunction Solar Cells Applications
Chen-Chih HSUEH, Ching-Fuh LIN, Tzu-Ching LIN, Chien-Ting LIU, Thiyagu SUBRAMANI, Hong-Jhang SYU
National Taiwan University/TAIWAN

5-P-81 (1331) Wet Chemically Etched Silicon Nanowires Array Based P-N Junction Solar Cells
Dinesh KUMAR, Sanjay Kumar SRIVASTAVA, P.K. SINGH
CSIR-National Physical Laboratory, New Delhi India/INDIA

5-P-82 (1347) Optical Characteristics of Silicon Nanowire Structures for Solar Cell Applications
Shinya KATO ¹, Makot KONAGAI ², Shinsuke MIYAJIMA ², Takahiko MORITA ³
1) MEXT/JST FUTURE-PV Innovation Research/JAPAN, 2) Tokyo Institute of Technology/JAPAN, 3) Graduate School of Science and Engineering, Tokyo Tech/JAPAN

5-P-83 (1380) Evaluation of Transition Metal Nitrides as Absorber for the Hot Carrier Solar Cell

Santosh SHRESTHA

The University of New South Wales/AUSTRALIA

5-P-84 (1416) Synthesis and Optical Properties of Type II SiGe Alloy Clathrate

Takayuki BAN, , Roto HIMENO, Shoichi IMAI, Tetsuji KUME, Shuichi NONOMURA, Takuya OGURA, Fumitaka OHASHI, Yoshitaka OHASHI, Shogo SUNABA

Gifu University/JAPAN

5-P-85 (1419) Study of Photo-Current Conversion Efficiency and Absorbance in a Quantum-Dot-Sensitized Solar Cell Incorporated with SWNTs

Junyoung LEE, Sanghun LEE, Hyunjune PARK, Hokyong SHIN, Whikun YI
Hanyang University/KOREA, REPUBLIC OF

5-P-86 (1439) Tapered Silicon Nanorod Solar Cell on Aluminum Foil

Li-Fen CHOU ¹, Chao-Yang TSAO ¹, Pai-Yi WANG ¹, Hsi-Lien HSIAO ²

1) Taiwan Power Company/TAIWAN, 2) Tunghai University/TAIWAN

5-P-87 (1495) CuInSe₂ Deposition into TiO₂ Porous Thin Film Using Supercritical Fluid

Itaru HONMA, Yuta NAKAYASU, Takaaki TOMAI, Shinji WATANABE
Tohoku University/JAPAN

5-P-88 (1506) GaSb/GaAs Quantum Dots on (001) Ge Substrates for Photovoltaic Applications

Songphol Dep. Electrical ENGINEERING, F KANJANACHUCHAI ¹, Somsak PANYAKEOW ¹, Supachok THAINOI ¹, Somchai RATANATHAMMAPHAN ¹, Suwit KIRAVITTAYA ²

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5-P-89 (1514) Γ -Al₂O₃ as Barrier Material for Energy Selective Contacts of Hot Carrier Solar Cells

Yuanxun LIAO

UNSW/AUSTRALIA

5-P-90 (1541) The influence of shell thickness of Au@TiO₂ core-shell nanoparticles on plasmonic enhancement effect in dye-sensitized solar cells

Jer-Shing HUANG

National Tsing Hua University/TAIWAN

5-P-91 (1555) Pore Modulation of Anodic Aluminum Oxide on Silicon Substrate at Room Temperature as a Template for Silicon Nanowires

Van Hoang NGUYEN, Yusuke Hoshi, Noritaka Usami

Nagoya University /JAPAN

5-P-92 (1556) Optical Properties, Electron Dynamics of Carbon Nanodots and Photovoltaic Applications

Xiaoming Wen

University of New South Wales /AUSTRALIA

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5-P-93 (1338) Fabrication and Characterization of Nano-Scale Textured Silicon/PEDOT:PSS Hetero-Junction Solar Cells

Jhuma GOPE ¹, P. PRATHAP ¹, C.M.S. RAUTHAN ¹, Sanjay Kumar SRIVASTAVA ¹, P.K. SINGH ¹, S.N. SINGH ¹, Manish SRIVASTAVA ¹, Kamini TURAN ¹, Vandana VANDANA ²

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5-P-94 (1535) Carbon Nanodots and Photovoltaic Applications

Xiaoming WEN

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Area 6: PV Modules and Systems Including BOS Components, testing and reliability

6-1: PV Modules

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|--------------|--|
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Ton SCHLESS
<u>SIBCO China / SIBCO BV/CHINA</u> |
| 6-P-2 | (1027) The competitiveness of thin film modules
Hailing LI, Wenjing WANG
<u>Institute of Electrical Engineering, Chinese Academy of Science/CHINA</u> |
| 6-P-3 | (1030) Field Measurements of Temperature Dependence for Different PV-Module Technologies in Libya.
Hamed Mohammed ABUFARES, Ibrahim Mohammed SALEH, Haithem Mohammed SENOUSI, Suheir Mohammed YOUSEF
<u>University of Tripoli/LIBYA</u> |
| 6-P-4 | (1106) A Crystalline Silicon Module Designed Solely with Polymers, Steps to a Module Compatible with the Normative Exigencies
Simon BODDAER
<u>CSTB/FRANCE</u> |
| 6-P-5 | (1109) Low-Concentration Output Power Enhancement from Photovoltaic Panels
Ivan AUDWINTO ¹ , Hoy Yen CHAN ¹ , Kamaruzzaman SOPIAN ¹ , Saleem H ZAIDI ²
1) <u>University Kebangsaan Malaysia/MALAYSIA</u> , 2) <u>Solar Energy Research Institute (SERI)/MALAYSIA</u> |
| 6-P-6 | (1335) PV Module Diagnostics Using Dynamic Response to External Cell Excitation
Satoshi Hashizume, Ryo Hayashida, Tomoaki Ikegami, Ryouhei Kunimatsu, Fumiaki Mitsugi, Tatsuro Yamaguchi, Akio Tanaka
<u>Kumamoto University/JAPAN</u> |

6-P-7 (1375) Thermal Characterization of Photovoltaic System Operation in Thailand

Dhirayut CHENVIDHYA, Tanokkorn Banjongla-iad CHENVIDHYA, Natapol Maz JIRARUNGSATIAN, Krissanapong KIRTIKARA, Roongrojana SONGPRAKOR, Thanawit SRISAKSOMBOON
King Mongkut's University of Technology Thonburi (KMUTT)/THAILAND

6-P-8 (1392) Light Capturing Film on Interconnect Ribbon for Power Improvement of c-Si PV Modules

Indeok Chung, In-Sik Moon
Hyundai Heavy Industries/KOREA, REPUBLIC OF

6-P-9 (1399) Bankability Management and Extended Qualification Tests for Photovoltaic Modules

Shu-Tsung HSU ¹, Yean San LONG ², Hsien-Chen MA ³
1) ITRI/TAIWAN, 2) CMS/ITRI/TAIWAN, 3) Industrial Technology Research Institute/TAIWAN

6-P-10 (1431) Spectral Response of PV Modules

Siyu GUO, Rolf Arnold STANGL, Timothy Michael WALSH, Jiaying YE
Solar Energy Research Institute of Singapore (SERIS)/SINGAPORE

6-P-11 (1452) International Status and Practice of Certified PV Module Registration and Management

Jia Cheng CHOU, Hsien-Chen MA, Teng-Chun WU
Industrial Technology Research Institute (ITRI)/TAIWAN

6-P-12 (1460) Dynamic characterization of solar cell using intensity modulation transfer impedance spectroscopy

Dhirayut CHENVIDHYA ¹, Chaya JIVACATE ¹, Krissanapong KIRTIKARA ¹, Koarakot WATTANAVICHEAN ¹, Anon NAMIN ², Jutturit TONGPRON ²
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6-P-13 (1540) PERC Module Weak-Light Performance Measurement

Cheng-Lieh Wang¹, Sascha Rossmann¹, Chien-Hsiang Chen¹, Chien-Chun Hsieh¹, You Wei Chang¹ and Chen-Wei Chen²
1) Win Win Precision Technology Co.,Ltd (WINAICO), TAIWAN, 2) Industrial Technology Research Institute, Photovoltaic Metrology Laboratory, TAIWAN

6-P-14 (1547) A Prominent Bi-Functional Coating Material for PV Module

Yasukazu KISHIMOTO¹, YingYing Fan¹, Tohru Yoshida²

1)KIES New Energy Co., Ltd./CHINA 2)MORESCO Corporation

6-P-15 (1558) Development of an Arduino-based I-V curve tracer for performance testing of photovoltaic modules under outdoor conditions

Erees Queen B. Macabebe, Robert Alfie S. Peña, Ian Christopher Gamara, Keir Alexis Pareja

Ateneo de Manila University /PHILIPPINES

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6-P-16 (1046) High Accuracy Optical System of a Large Scale Continuous Type Solar Simulator

Si Xian Li

Industrial Technology Research Institute/TAIWAN

6-P-17 (1058) A Rapid Screening Method for UV test of EVA in PV Modules by Using UV Pulse Laser

Yi-Wei CHEN ¹, Der-Ray HUANG ¹, Yu-Tai LI ², Yi Wei LIN ², Hung-Sen WU ²

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6-P-18 (1113) Comparison of Accelerated Degradation of PV Module Encapsulant by using Different UV Light - Sources

Yi-Wei CHEN ¹, Der-Ray HUANG ¹, Jian-Lin QIU ¹, Chen-Wei CHEN ², Yu-Tai LI ²

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6-P-19 (1165) Classification and Inspection Methods of Cracks in Photovoltaic Cell -- Induced by Transportation Vibration

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6-P-20 (1185) Failure Assessments of Outdoor Exposed PV Modules by Using Electroluminescence Image

Takuya DOI ¹, Shigenori SHIMIZU ¹, Tomoro HAKARI ², Yushi HETA ³, Jun ONOZATO ³, Atsushi MASUDA ⁴, Sadao SAKAMOTO ⁵, Kentaro SUZUKI ⁶, Yasushi TACHIBANA ⁷, Hideki TANAKA ⁸, Masaru KADOWAKI ⁹

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6-P-21 (1291) Long-Term Monitoring of a Small Residential Rooftop PV Grid-Connected System in Thailand

Dhirayut CHENVIDHYA, Tanokkorn Banjongla-iad CHENVIDHYA, Chaya JIVACATE, Chamnan LIMSAKUL, Ballang MUENPINIJ, Yaowanee SANGPONGSANONT, Manit SEAPAN
King Mongkut's University of Technology Thonburi (KMUTT)/THAILAND

6-P-22 (1353) Analysis of PV Modules Deterioration

Dhirayut CHENVIDHYA, Tanokkorn Banjongla-iad CHENVIDHYA, Chaya JIVACATE, Krissanapong KIRTIKARA, Yaowanee SANGPONGSANONT, Buntoon WIENGMUON
King Mongkut's University of Technology Thonburi (KMUTT)/THAILAND

6-P-23 (1370) The Snail Trail Phenomenon on Photovoltaic Modules

Han-Chang LIU
Industrial Technology Research Institute/TAIWAN

6-P-24 (1390) Ionomer Encapsulants Enable High Efficiency, Durable Modules

Hitoshi AKABANE
DuPont/JAPAN

6-P-25 (1394) Key PV Backsheet and Module Properties and Performance from Fielded Exposure and Accelerated Testing

Tomoko AOKI ¹, Kana HASHIMOTO ¹, Yushi HETA ¹, Alexander BRADLEY ², Thomas FELDER ², Vinci FELIX ², Babak HAMZAVYTEHRANY ², James KOPCHICK ², Steven Mac MASTER ², T. John TROUT ², Oakland FU ³, William GAMBOGI ⁴

1) DuPont/JAPAN, 2) DuPont/UNITED STATES, 3) DuPont/CHINA, 4) DuPont Photovoltaic Solutions/UNITED STATES

6-P-26 (1397) Performance and Reliability Analysis of Grid-Connected Photovoltaic Systems in Taiwan

Mao-Ting HUANG

Industrial Technology Research Institute, R.O.C/TAIWAN

6-P-27 (1453) Quality Deterioration of Multicrystalline Silicon Solar Cell in Transshipment Process

Jia Cheng CHOU ¹, Cho-Fan HSIEH ¹, Teng-Chun WU ²

1) Industrial Technology Research Institute (ITRI)/TAIWAN,

2) ITRI CMS/TAIWAN

6-P-28 (1471) Growth Mechanism of Silver-tin Intermetallic in c-Silicon Solar Cells with Ag Metallization Layer Type of Assembly Structure

Hsin-Hsin HSIEH ¹, Jen Loong HWANG ¹, Kuan Yu HUANG ², Chenhung KAO ², Ting Li YANG ²

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2) National Taiwan University/TAIWAN

6-P-29 (1481) Investigating the Reliability of PV Module with Dash-Line Busbar Cell by Thermal Cycling Test

MaoYi CHANG, Haomin CHEN, Jeff CHEN, Kerry K.L. HO, Eva YEN

AU Optronics/TAIWAN

6-P-30 (1488) Comparison of UV Aging Tests on Polymethylmetacrylate (PMMA) and Silicone-On-Glass (SOG) for Fresnel Lenses

Yi-Wei CHEN ¹, Der-Ray HUANG ¹, Jian-Lin QIU ¹, Yu-Tai LI ², Yi Wei LIN ²

1) National Dong Hwa University/TAIWAN, 2) Industrial Technology Research Institute/TAIWAN

6-P-31 (1531) The Field Performance of Crystalline Silicon and CIGS System in South Taiwan

Chen-Wei CHEN, Mei-Ching CHIU, Min-An TSAI
Industrial Technology Research Institute/TAIWAN

6-P-32 (1544) Phenomenon by Light-Induced Plating of SnPb solder on front Ag Finger of 25 Years Field-Aged Photovoltaic Modules

Soohyun BAE ¹, Byungjun KANG ¹, Donghwan KIM ¹, Seongtak KIM ¹,
Haeseok LEE ¹, Wonwook OH ¹, Sungeun PARK ¹, Nochang PARK ²
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Institute/KOREA, REPUBLIC OF

6-P-33 (1546) Failure Assessments of Interconnection Ribbons in Crystalline Solar Cells Assembly Structure

Tao-Chih CHANG ¹, Hsin-Hsin HSIEH ¹, Jen-Loong HWANG ¹, Chi-Shiung Hsi
HSI ², Fang-Chi HSU ²
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University/TAIWAN

6-3: PV Standards

6-P-34 (1016) An overview of Photovoltaic Products Transportation Standards: A Case Study Developing SEMI PV Standards in Taiwan

Shu-Tsung HSU
ITRI/TAIWAN

6-P-35 (1025) Development a New Standard for Transport Simulation on Complete PV-Cell Shipping Units

Shu-Tsung HSU ¹, Yean San LONG ², Teng-Chun WU ²
1) ITRI/TAIWAN, 2) CMS/ITRI/TAIWAN

6-P-36 (1183) ISO/IEC17025 Accredited Laboratory for PV Testing in Thailand

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LIMSAKUL, Ballang MUENPINIJ, Panom PARINYA, Yaowanee
SANGPONGSANONT, Manit SEAPAN
King Mongkut's University of Technology Thonburi (KMUTT)/THAILAND

6-P-37 (1520) The Comparison of NMOT and Existing NOCT Procedure with PV Module under Tropical Weather Condition

Chen-Wei CHEN, Mei-Ching CHIU, Min-An TSAI, Hung-Sen WU
Industrial Technology Research Institute/TAIWAN

6-4: PV Inverter

6-P-38 (1487) Development of Micro DC-DC Converter Realizes High Efficiency and Temperature-Tolerance in CPV Module

Jun-ichi ITOH, Kazuya OKAMOTO, Koji ORIKAWA, Nagisa TAKAOKA,
Noboru YAMADA
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6-5: BOS Components

6-P-39 (1483) An Apply MPPT PSO Algorithm within Partially Shaded Condition for Highland Area at Thailand

Worrajak MUANGJAI, Kosol ORANPIROJ, Teerasak SOMSAK, Jutturit
THONGPRON
Rajamangala University of Technology Lanna Chiangmai/THAILAND

6-P-40 (1505) Tackling the Balance of System (BoS) Issues in an Operating 30kWp Photovoltaic System in Tropical Urbanized Country, Singapore

Yang Thee QUEK
Republic Polytechnic/SINGAPORE

Area 7: PV Systems and Deployment

7-1 Enablers for PV Development and Benefits of PV

7-P-1	(1101) Long-Term Analysis of Factors Affecting the Dissemination of Residential PV Systems in Japan Eiichi ENDO <u>National Institute of Advanced Industrial Science and Technology/JAPAN</u>
7-P-2	(1244) Universal-Axis Solar Tracking System Der-Jenq LIU <u>TOPPER SUN Energy Technology Co., Ltd./TAIWAN</u>
7-P-3	(1259) PV Market in Japan - Challenges and Opportunities Osamu IKKI, Izumi KAIZUKA, Hiroshi MATSUKAWA, Ohigashi TAKASHI, Haruki YAMAYA <u>RTS Corporation/JAPAN</u>
7-P-4	(1432) A tool for low performance notification and authentication of the PV power generation in Taiwan Yi-Yen CHEN, Li-Fen CHOU, Chao-Yang TSAO, Chin-Tun WANG <u>Taiwan Power Company/TAIWAN</u>
7-P-5	(1450) PV Policies and Market Status in Taiwan Ku Hsiu HSIUNG <u>Industrial Technology Research Institute Green Energy and Environment Research Laboratories/TAIWAN</u>
7-P-6	(1451) A Technical-Economic Evaluation of PV Grid Connected System to Decrease Electricity Cost of University Building Patcharaprakiti NOPPORN ¹ , Jeerawan SAEROUR ² 1) <u>Rajamangala University of Technology Lanna/THAILAND</u> , 2) <u>Maejo University/THAILAND</u>
7-P-7	(1478) Discussion Temperature and Optical Properties by PV Module of Laminated Materials Chang Yung CHU <u>National Kaohsiung University of Applied Sciences/TAIWAN</u>
7-P-8	(1498) Crystalline Silicon PVmodules for Outdoor Power Efficient

Monitoring System Research

Yun Chuan LIN

National Kaohsiung University of Applied Sciences/TAIWAN

7-P-9 (1587) Universal Axis iPV Solar Tracker

Der-Jenq Liu

TOPPER SUN Energy Technology Co., Ltd./TAIWAN

7-2 System

7-P-10 (1019) Hybrid Solar Photovoltaic System for Decentralized Power Supply
Hsu-yu CHANG, Guang-Yu CHEN, Po-chien HSU, Bin-Juine HUANG, Kang LI, Yu-Mi LIN, Tai-chuan WANG,
National Taiwan University/TAIWAN

7-P-11 (1020) Shading Effect on Solar Photovoltaic Power Generation with 1 axis-3 Position Tracking

Guang-Yu CHEN, Bin-Juine HUANG, Yin-chen HUANG, Kang LI, Tai-chuan WANG

National Taiwan University/TAIWAN

7-P-12 (1021) Solar Air Conditioner Driven Directly by Solar PV Panels

Chi-wen Chen, Yan-Tze Chen, Bin-Juine Huang, Kang Li, Je-Han Lin

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7-P-13 (1022) Application of Solar Home Systems in Remote Area of Taiwan

Hsing-Chieh CHANG, Hsu-yu CHANG, Guang-Yu CHEN, Po-chien HSU, Bin-Juine HUANG, Yu-Mi LIN, Hsiao-Chun TSAI, Wei-Min TSENG

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7-P-15 (1062) Performance Test of a Solar Tree Using the Novel Design of a Distributed PV Power Harvesting System

Ru-Min Chao, Shuo-Gang Liu

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7-P-16 (1124) Current Tracking Error Minimization Control for Grid-Tied PV Inverters

Woei-Luen CHEN, Bo-Yuan JIANG, Chung-Ting Tsai
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7-P-17 (1215) A Design and Assessment on a Household Micro-scale Building Integrated Photovoltaic (BIPV) System

Ruijiang HONG ¹, Liying XIE ¹, Yunlin SUN ²

1) Institute for Solar Energy Systems (ISES), Sun Yat-sen University/CHINA,

2) ShunDe SYSU Institute for Solar Energy/CHINA

7-P-18 (1296) Designing and Operation Analysis of PV System Integrated with Secondary-used Li-ion Battery Set of EVs

Po-Chun HUANG

Industrial Technology Research Institute/TAIWAN

7-P-19 (1334) Significant Improvement of I-V Measuring Method for Outdoor Photovoltaic System

Der-Ray HUANG, Bor Fang WANG

National Dong Hwa University/TAIWAN

7-P-20 (1379) Design, Implementation and Evaluation of a Solar Powered Spot Cooling System for Electric Vehicles

KoChin CHAO, Bin-Juine HUANG, Kang LI, Wei-Chuan LIN

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7-P-21 (1457) Intelligent Protection for Photovoltaic Systems

Kenji ANDO ¹, Ichiyanagi KATSUHIRO ², Kinno TOMOKI ², Sakai KOHTA ³, Naoya OZUMI ³, Kazuto YUKITA ³, Goto YASUYUKI ³

1) NITTO KOGYO CORPORATION/JAPAN, 2) Power system

laboratory/JAPAN, 3) Aichi Institute of Technology/JAPAN

7-P-22 (1459) PV Grid-Connected System Variability

Dhirayut CHENVIDHYA, Tanokkorn Banjongla-iad CHENVIDHYA, Chamnan LIMSAKUL, Ballang MUENPINIJ, Panom PARINYA, Yaowanee SANGPONGSANONT, Anawach SANGSWANG, Manit SEAPAN, Nitikorn SILSIRIVANICH, Roongrojana SONGPRAKOR

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Hiroo KONISHI

7-P-24 (1525) A Study on Insolation Estimation Method Using Meteorological Data for Photovoltaic Power Generation

Koyama MASAYOSHI ¹, Hiroaki MIYOSHI ¹, Koji NAKAGAWA ¹, Yohei TAKIGAWA ¹, Kazuto YUKITA ¹, Kinno TOMOKI ²

1) Aichi Institute of Technology/JAPAN, 2) Power system laboratory/JAPAN

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National Chung Cheng University/TAIWAN

7-P-26 (1530) Energy Flow on AC/DC Loads of Solar Home System

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Rajamangala University of Technology Lanna,Muang, Chiang Mai, Thailand/THAILAND

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Yu FUJIMOTO ¹, Yasuhiro HAYASHI ¹, Genta KIKUCHI ¹, Yoshikane KOJIMA ², Shunji NAKAO ²

1) Waseda University/JAPAN, 2) Obayashi Corporation/JAPAN

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Yu-Cai HSU, Wei-ting KUO

National Taiwan University/TAIWAN

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Ming-Cheng HUANG, Yaw-Juen WANG, Wen-Chin ZENG

National Yunlin University of Science and Technology/TAIWAN

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Takeyoshi Kato
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Takeyoshi Kato
Nagoya university/JAPAN
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Aika Kamei, Naoya Kataoka, Seiya Ueno, Takashi Minemoto
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National Taiwan University/TAIWAN
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1)University of Ljubljana, Faculty of Electrical Engineering/SLOVENIA
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