



PVSEC-12 (2001) / Jeju, Korea

	Chairperson's Message
	Jinsoo Song

[▲ Back to TOP](#)

■ Plenary Session

PL-1	Strategic Plan for PV Technologies in Korea
	D. G. Lee Ministry of Commerce, Industry & Energy, Korea
PL-2	Solar cells: Past, Present and Future
	A. Goetzberger, J. Luther and G. Willeke Fraunhofer ISE, Germany
PL-3	The Solar-Electric Decades: Opportunities and Expectations 2001-2020
	L. L. Kazmerski National Center for Photovoltaics, USA
PL-4	Solar PV Energy Conversation and the 21st Century's Civilization
	Y. Hamakawa Ritsumeikan University, Japan

[▲ Back to TOP](#)

■ Session 2 – Crystalline Si Solar Cells I

2-1	(invited) High efficiency PERT Cells on High Quality N-Type CZ Silicon Substrates
	J. Zhao, A. Wang, P. P. Altermatt and M. A. Green University of New South Wales, Australia
2-2	(invited) Research on Light-Induced Lifetime Degradation in Crystalline Si Wafers and Solar Cells
	T. Saitoh Tokyo University of Agriculture and Technology, Japan
2-4	Carrier Lifetime Improvement in Czochralski Silicon for Solar Cells by Rapid Thermal Processing
	J. Y. Lee, S. Peters, S. Rein and S. W. Glunz Fraunhofer Institute for Solar Energy Systems, Germany
2-5	Advances in Monocrystalline Si Thin Film Solar Cells by Layer Transfer
	R. B. Bergmann, T. J. Rinke, C. Berge, J. Schmidt and J. H. Werner University of Stuttgart, Germany
2-6	Assessment of Carrier Mobility in CZ and FZ Silicon
	P. P. Altermatt University of NSW, Australia

[▲ Back to TOP](#)

■ Session3 - Amorphous Si Solar Cells I

3-1	(invited) Metastability in Hydrogenated Amorphous Based Materials And Solar Cells
	C. R. Wronski, J. M. Pearce, R. J. Koval and R. W. Collins The Pennsylvania State University, USA
3-2	(invited) High Stabilized Efficiency Amorphous Silicon Multilayer Solar Cells

	K. S. Lim, S. W. Kwon and S. Y. Myong Korea Advanced Institute of Science and Technology, Korea
3-3	(invited) High Rate Growth of Amorphous and Microcrystalline Silicon M. Kondo, T. Nishimoto, M. Takai, S. Suzuki, Y. Nasuno and A. Matsuda National Institute of Advanced Industrial Science & Technology, Japan
3-4	High Efficiency Amorphous Silicon Solar Cells at High Deposition Rates of More than 1.5nm/sec M. Sano, K. Saito, S. Okabe, S. Sugiyama and K. Ogawa Canon Inc., Japan
3-5	Undoped and Aluminum Doped ZnO by PECVD as Natively Textured Superstrate TCO for Amorphous Silicon Pin Solar Cells J. Löffler*, R. Groenen**, P. Sommeling***, H. Linden****, E. Hamers**, R. van de Sanden** and R. Schropp* *Utrecht University, The Netherlands **Eindhoven University, The Netherlands ***ECN, Solar Energy, The Netherlands ****TNO-TPD, The Netherlands
3-6	Electrode-Distance Dependence of Photo-Induced Degradation in Hydrogenated Amorphous Silicon H. Miyahara, M. Takai, T. Nishimoto, M. Kondo, and A. Matsuda National Institute of Advanced Industrial Science and Technology, Japan

[▲ Back to TOP](#)

■ Session4 - National Programs I

4-1	(invited) Outlook for the United States Photovoltaics Research Program and Its Implications for Terrestrial Systems and Applications R. King, T. Leader United States Department of Energy, USA
4-2	(invited) PV in Developing Countries (IEA PVPS Task 9) B. McNelis IT Power, UK
4-3	(invited) Status and Prospect of PV R&D Projects by NEDO K. I. Ogawa NEDO, Japan
4-5	The Prospects of Photovoltaics Development in Russia S. Karabanov JSC, Ryazan Metal Ceramics Instrumentation Plant, Russia

[▲ Back to TOP](#)

■ Session5 - Thin Film Si & Poly Si Solar Cells

5-1	(invited) Status and Perspectives of Thin Film Solar Cells in Japan M. Konagai Tokyo Institute of Technology, Japan
5-3	(invited) Crystalline Silicon Thin Film Solar Cells J. H. Werner and R. B. Bergmann University Stuttgart, Germany
5-4	Fabrication of Crystalline Si Film for Solar Cell by Zone-Melting Re-crystallization of Amorphous Si M. Ihara*, S. Yokoyama*, K. Izumi**, C. Yokoyama* and H. Komiyama*** *Tohoku University, Japan **Iwatani International Corporation, Japan ***The University of Tokyo, Japan
5-5	Highly Conducting Boron Doped Polycrystalline Silicon Prepared by Hot Wire Cell Method for Thin Film Solar Cell Applications M. K. Kim, A. Yamada and M. Konagai Tokyo Institute of Technology, Japan
5-6	Thin Film Silicon Solar Cells on Upgraded Metallurgical Silicon Substrates Prepared by Liquid Phase Epitaxy K. Peter*, R. Kopecek*, J. Hötzel, P. Fath*, E. Bucher*, C. Zahedi** and F. Ferrazza *** *University of Konstanz, Germany **Elkem Solar, Norway ***Eurosolare, Italy
5-7	Structural And Electrical Properties of Polycrystalline Silicon Films Deposited by Hot-Wire CVD

J. C.Lee, K. H. Kang, S. K. Kim, K. H. Yoon, J. Song and I. J. Park
KIER, Korea

[▲ Back to TOP](#)

■ **Session6 - II-VI Solar Cells I**

6-1	(invited) High Efficiency CdTe Thin Film Solar Cells A. Yamada and M. Konagai Tokyo Institute of Technology, Japan
6-2	ZnSe Buffer Prepared by Iodine Enhanced Chemical Vapour Deposition for CIGSS Based Solar Cells A. Rumberg, A. Gerhard, S. Lindner, A. Jäger-Waldau and M. Ch. Lux-Steiner Hahn-Meitner-Institut GmbH, Germany
6-3	Effect of Proton Irradiation on Electrical Properties of CuInSe₂ Thin Films H. S. Lee*, H. Okada*, A. Wakahara*, A. Yoshida*, T. Ohshima**, H. Itoh**, S. Kawakita***, M. Imaizumi*** and S. Matsuda*** *Toyohashi University of Technology, Japan **Japan Atomic Energy Research Institute, Japan ***National Space Development Agency of Japan, Japan
6-4	CIGS Solar Cells on Stainless Steel Substrates Covered with Insulating Layers T. Satoh, Y. Hashimoto, S. Shimakawa, S. Hayashi and T. Negami Matsushita Electric Ind. Co., Ltd., Japan
6-5	High Efficiency Cu(InGa)Se₂ Thin-Film Solar Cells with Novel ZnIn₂S₄ Buffer Layer Y. Tokita, S. Chaisitsak, A. Mori, M. Kurata, A. Yamada and M. Konagai Tokyo Institute of Technology, Japan
6-6	Enhancement of Metastability of Cu(InGa)Se₂ Thin-Film Solar Cell with ZnO/CIGS Structure S. Chaisitsak, Y. Tokita, A. Mori, M. Kurata, A. Yamada and M. Konagai Tokyo Institute of Technology, Japan

[▲ Back to TOP](#)

■ **Session7 - Modules and Systems I**

7-1	(invited) Toward Large-Scale PV power Generation K. Kurokawa Tokyo University of Agriculture and Technology, Japan
7-2	(invited) Initial Results from 300 kW High-Concentration PV Installation V.Garboushian*, D. Roubideaux*, P. Johnston** and H. Hayden** *Amonix, Inc., USA **Arizona Public Service Company, USA
7-3	(invited) The Role and Value of Utilities in Promoting PV C. Herig National Renewable Energy Laboratory, USA
7-4	Performance Prediction of a 2.5 kWp Photovoltaic Hybrid Power System A. Zahedi Monash University, Australia
7-5	Optical Loss of Photovoltaic Modules Under Diffuse Light A. Parretta*, H. Yakubu*, F. Ferrazza**, J. Zhao*** and M. A. Green*** *ENEA Centro Ricerche, Italy **Eurosolare SpA, Italy ***University of New South Wales, Australia
7-6	A Preliminary Study on Potential for Very Large-Scale Photovoltaic Power Generation(VLSPV) System on the Gobi Desert from Economic and Environmental Viewpoints M. Ito*, K. Kato**, H. Sugihara***, T. Kichimi****, J. Song***** and K. Kurakawa* *Tokyo University of Agriculture and Technology, Japan **New Energy and Industrial Technology Development Organization, Japan ***Kandenko Co., Ltd., Japan ****Resources Total System, Japan *****Korea Institute of Energy Research, Korea

[▲ Back to TOP](#)

■ **Session8 - Polycrystalline Si (bulk) Cells I**

8-1	(invited) A Metallurgical Approach to Solar Grade Silicon Feed Stock
-----	--

	K. Hanazawa*, M. Abe*, H. Baba*, N. Nakamura*, N. Yuge*, Y. Sakaguchi*, Y. Kato*, S. Hiwasa*, M. Obashi* and F. Aratani** Kawasaki Steel Corporation, Japan Solar-Grade Silicon Technology Research Association, Japan
8-2	(invited) Industrial Manufacturing of Semitransparent Crystalline Silicon Power Solar Cells P. Fath University of Konstanz, Germany
8-3	RIE-Texturing of Multicrystalline Silicon Solar Cells D. S. Ruby*, S. H. Zaidi**, S. Narayanan***, B. M. Damiani**** and A. Rohatgi**** *Sandia National Laboratories, USA **Gratings Inc., USA ***BP Solar, USA ****Georgia Institute of Technology, USA
8-4	Improvement of Minority Carrier Lifetimes in Multicrystalline Cast Si Wafers by Boron Gettering K. Koyanagi, R. Ozaki, D. Marwan and T. Saitoh Tokyo A&T University, Japan
8-5	Low Cost Multicrystalline Back Contact Silicon Solar Cells with Screen Printed Metallization A. Kress, P. Fath and E. Bucher University of Konstanz, Germany

[▲ Back to TOP](#)

■ Session9 - Fundamentals I

9-1	(invited) The Search for and Potential Impact of Improved Transparent Conducting Oxides on Thin-Film Solar Cells T. J. Coutts, J. S. Ward, D. L. Young, T. A. Gessert and R. Noufi National Renewable Energy Laboratory, USA
9-2	(invited) Dependence of Silicon Solar Cell Performance Parameters on Orientation Dependent Etching P. K. Singh*, R. Schindler**, H. Lautenschlager** and R. Kumar* *National Physical Laboratory, India **Fraunhofer Institut für solare Energiesysteme, Germany
9-3	Novel External Field Source by Localization of Electrons for Improving Field Effect Solar Cells D. König and G. Ebest Technical University of Chemnitz, Germany
9-4	Antireflection and Surface Passivation Behaviour of SiO₂/Si/SiO₂ Quantum Wells on Silicon E. C. Cho*, P. Widenborg*, J. Xia*, A. G. Aberle*, D. S. Moon*, D. S. Kim** and S. H. Lee*** *University of New South Wales, Australia *Seoul National University of Technology, Korea *Samsung SDI Co. Ltd, Korea
9-5	A High Efficiency HITTM Solar Cell (21.0%~100cm²) with Excellent Interface Properties K. Kawamoto, T. Nakai, T. Baba, M. Taguchi, H. Sakata, S. Tsuge, K. Uchihashi, M. Tanaka and S. Kiyama Sanyo Electric Co., Ltd., Japan

[▲ Back to TOP](#)

■ Session10 - III-V and Space Cells I

10-1	(invited) Multi-junction Solar Cells: Present and Future M. Yamaguchi Toyota Technological Institute, Japan
10-2	(invited) Semiconductor Materials-Groups IV/III-V/II-VI for Solar Cell Research at Chulalongkorn University, Thailand S. Panyakeow Chulalongkorn University, Thailand
10-3	Comparison of Flight and Ground Test Degradation Behavior of Space Solar Cells on Highly Irradiated ETS-VI M. Imaizumi*, S. Matsuda* and M. Yamaguchi** *NASDA, Japan **Toyota Technological Institute, Japan
10-4	Strategies for Improving Radiation Tolerance of Si Space Solar Cells A. Kahn*, M. Yamaguchi*, Y. Ohshita*, N. Dharmarasu*, K. Araki*, V. T. Khanh*, T. Abe**, H. Itoh***, T. Ohshima***, M. Imaizumi**** and S. Matsuda**** *Toyota Technological Institute, Japan **Shin-Etsu Handotai Co., Ltd., Japan ***Japan Atomic Energy Research Institute, Japan ****National Space Development Agency of Japan, Japan
10-5	Characterisation of a High Concentration System with One-Axis Tracking

M. Hein, F. Dimroth, G. Siefert, A. W. Bett
Fraunhofer Institute for Solar Energy Systems, Germany

[▲ Back to TOP](#)

■ **Session11 - Crystalline Si Solar Cells II**

11-1

[\(invited\) High-Efficiency Low-Cost Integral Screen Printing MultiCrystalline Silicon Solar Cells](#)

J. Szlufcik, F. Duerinckx, J. Horzel, E. van Kerschaver, S. De Wolf, P. Choulat, H. Dekkers and J. Nijs IMEC, Belgium

11-2

[\(invited\) High-Efficiency OECO Cz-Silicon Solar Cells for Mass Production](#)

R. Hezel
ISFH, Germany

11-3

[\(invited\) Development of Crystalline Silicon Solar Cells for Commercialization](#)

S. H. Lee
Samsung SDI, Korea

[▲ Back to TOP](#)

■ **Session12 - Amorphous Si Solar Cells II**

12-1

[Large Area a-Si/a-SiGe and a-Si/a-SiGe/a-SiGe Solar Cells on Plastic Film Fabricated by Roll to Roll Process](#)

M. Tanda, M. Shimosawa, M. Uno, K. Tabuchi, S. Iwasaki, S. Saitou, S. Fujikake and T. Yoshida
Fuji Electric Corporate Research and Development, Ltd., Japan

12-2

[Enhanced Light-Absorption and Photo-Sensitivity in Amorphous Silicon Germanium/Amorphous Silicon Multilayer](#)

K. H. Jun, J. K. Rath and R. E. I. Schropp
Utrecht University, The Netherlands

12-3

[A-Si: H-Buffer in a-SiGe: H-Solar Cells](#)

D. Lundszen, F. Finger and H. Wagner
Forschungszentrum Jülich GmbH, Germany

12-4

[Optical Properties of Thin Film Solar Cells in Substrate and Superstrate Configuration](#)

T. Brammer, N. Senoussaoui, W. Reetz, O. Vetterl, B. Rech, H. Stiebig and H. Wagner
Forschungszentrum Jülich GmbH, Germany

12-5

[\(Late News\) Development of TCO Coated Glass with High Optical Transmittance for Amorphous Si Solar Cells](#)

M. Fukawa, M. Kambe, K. Sato and N. Taneda
Asahi Glass, Japan

[▲ Back to TOP](#)

■ **Session13 - National Programs II**

13-1

[\(invited\) The New Role of PVTEC for Developing PV in Japan](#)

N. Mori
PVTEC, Japan

13-2

[\(invited\) Eastern Indonesia Hybrid Energy Project: Design and Implementation](#)

S. Trihadi
UPT LSDE – BPP Teknologi., Indonesia

13-3

[\(invited\) Present Status and Future Prospects of PV Activities in Japan](#)

O. Ikki
Resources Total System Co., Japan

[▲ Back to TOP](#)

■ **Session14 - Poly(μ)-Si Solar Cells I**

14-1

[\(invited\) New Materials and Deposition Techniques for Highly Efficient Silicon Thin Film Solar Cells](#)

B. Rech, O. Kluth, T. Repmann, T. Roschek, J. Springer, J. Müller, F. Finger, H. Stiebig and H. Wagner
Forschungszentrum Jülich GmbH, Germany

14-2

[\(invited\) Over 10% Efficiency Solar Cell Using Microcrystalline Silicon](#)

	K. Ogawa, K. Saito, M. Sano, A. Sakai and K. Matsuda Canon Inc., Japan
14-3	(invited) Device Simulation and Modeling of Microcrystalline Silicon Solar Cells H. Takakura and Y. Hamakawa Ritsumeikan University, Japan
14-4	Analysis of Free Carrier Optical Absorption Used for Characterization of Solid Phase Crystallized Silicon Films H. Watakabe, T. Watanabe, N. Andoh and T. Sameshima Tokyo University of Agriculture and Technology, Japan
14-5	Dependence of the Recombination in Thin-Film Si Solar Cells Grown by Ion-Assisted Deposition on the Crystallographic Orientation of the Substrate N. -P Harder*, D. H. Neuhaus*, S. Oelting**, P. Widenborg* and A. G. Aberle* *University of NSW, Australia **ANTEC GmbH, Germany
14-6	Influence of Microstructure and p/i Interface Properties of Polycrystalline Silicon Thin Films on Photovoltaic Performances T. Matsui, M. Tsukiji, H. Saika, T. Toyama and H. Okamoto Osaka University, Japan
14-7	Hydrogen Passivated Polycrystalline Silicon Solar Cell Using Photo-CVD K. I. Bang, S. Y. Myong, K. D. Yang, H. K. Lee, H. C. Lee, E. S. Yoon and K. S. Lim KAIST, Korea

[▲ Back to TOP](#)

■ Session15 - II-VI Solar Cells II

15-1	(invited) Cu(In,Ga)Se₂ Thin-Film Evolution During Growth from (In,Ga)₂Se₃ Precursors M. AbuShama*, R. Noufi*, Y. Yan*, K. Jones*, B. Keyes*, P. Dippo*, M. Al-Jassim*, J. Alleman* and D. L. Williamson** *NREL, USA **Colorado School of Mines, USA
15-2	(invited) Development of Large Area CIGS Modules M. Powalla* and B. Dimmler** *Centre for Solar Energy and Hydrogen Research, Germany **Wuerth Solar GmbH & Co. KG, Germany
15-3	(invited) High Efficiency Cu(In,Ga)Se₂ Mini-Modules J. Kessler, J. Wennerbergh, M. Bodegård and L. Stolt Uppsala University, Sweden
15-4	XPS, TEM and NRA Investigations of The Cu(In, Ga)(S, Se)₂/ZnSe Heterostructure for Highly Efficient Solar Cells W. Eisele*, A. Ennaoui*, P. Schubert-Bischoff*, M. Giersig*, C. Pettenkofer*, J. Krauser*, M. Lux-Steiner*, S. Weigart** and F Karg*** *Hahn-Meitner-Institute Berlin, Germany **Siemens Corporate Technology, Germany ***Siemens Solar GmbH, Germany
15-5	Influence of CdS Window Layer on 2-µm thick CdS/CdTe Thin Film Solar Cells K. Nakamura, M. Gotoh, T. Fujihara, T. Toyama and H. Okamoto Osaka University, Japan
15-6	Cu(In,Ga)Se₂-Based Modules Optimized for Long-Term Performance J. Wennerberg, J. Kessler and L. Stolt Uppsala University, Sweden
15-7	Fabrication of Cu(In, Ga)Se₂ Solar Cells by the Evaporation of Selenide Compounds D. Y. Lee*, J. H. Yun*, B. T. Ahn*, K. H. Yoon* and J. Song** *Korea Advanced Institute of Science and Technology, Korea **Korea Institute of Energy Research, Korea

[▲ Back to TOP](#)

■ Session16 - Modules and Systems II

16-1	(invited) Utility Business Opportunities with the Commercialization of Grid-Connected Photovoltaic Systems: SMUD as a Case Example D. E. Osborn and D. E. Collier Sacramento Municipal Utility District, USA
------	--

16-2	Analysis of the Impacts of Transferring a Photovoltaic Module Manufacturing Facility P. Menna*, U. Ciorba*, F. Pauli*, K. Komoto**, K. Kato***, J. Song**** and K. Kurokawa***** *ENEA, Italy **Fuji Research Institute Corporation, Japan ***New Energy and Industrial Technology Development Organization, Japan ****Korea Institute of Energy Research, Korea *****Tokyo University of Agriculture and Technology, Japan
16-4	Building Integrated Multi PV/T/A Solar System Roof Tile A. Elazari B. Millenium Electric, Israel
16-5	A Universal Dense-Array Photovoltaic(CPV) Module for High-Concentration Applications V. Garboushian, D. Roubideaux and J. Turner Amonix, Inc., USA
16-6	Evaluation of Operation Characteristics in Multiple Interconnection of PV Systems T. Ishikawa*, K. Kurokawa*, N. Okada** and K. Takigawa** *Tokyo University of Agriculture and Technology, Japan **Central Research Institute of Electric Power Industry, Japan
16-7	A Study of Interconnection Operation of Photovoltaic Generation System to Power Distribution System E. S. Kim*, S. K. Kim* and G. J. Yu** *Korea Electrotechnology Research Institute, Korea **Korea Institute of Energy Research, Korea
16-8	PV System for Lighting of Pedestrian Crossing S. M. Pietruszko and A. Warszawik, Warsaw University of Technology, Poland
16-9	Dynamic Evaluation of Maximum Power Point Tracking Operation with PV Array Simulator H. Matsukawa*, K. Koshiishi*, H. Koizumi*, K. Kukokawa*, M. Hamada** and L. Bo** *Tokyo University of Agriculture and Technology, Japan **Myway Labs Co., Ltd., Japan

[▲ Back to TOP](#)

■ Session17 - Poly(μc)-Si Solar Cells II

17-1	(invited) Large Area Thin Film Si Module K. Yamamoto, M. Yoshimi, Y. Tawada, S. Fukuda, T. Sawada, T. Meguro, H. Takata, T. Suezaki, Y. Koi, K. Hayashi, T. Suzuki and A. Nakajima Kaneka Corporation, Japan
17-2	(invited) Layer Transfer: New Perspectives for Crystalline Thin-Film Si Solar Cells R. Brendel ZAE Bayern, Germany
17-3	(invited) Mass-Production of Thin Si Solar Modules and Future Plan Y. Tawada Kaneka Corporation, Japan
17-4	Crystalline Silicon Thin-Film Solar Cells on ZrSiO₄ Ceramic Substrates T. Kieliba*, S. Bau*, D. Obwald**, R. Schober***, S. Reber*, A. Eyer* and G. Willeke* *Fraunhofer Institute for Solar Energy Systems, Germany **Freiburger Materialforschungszentrum, Germany ***Fraunhofer Institute for Ceramic Technologies and Sintered Materials, Germany
17-5	Growth of Device Grade μc-Si Film at over 50A/s Using PECVD S. Suzuki*, M. Kondo** and A. Matsuda** *National Institute of Advanced Industrial

[▲ Back to TOP](#)

■ Session18 - Amorphous Si Solar Cells III

18-1	(invited) Mass Production of Amorphous Silicon Alloy Photovoltaic Modules S. Guha, J. Yang, A. Banerjee, B. Yan and K. Lord United Solar Systems Corp., USA
18-2	(invited) Toward stabilized 10% Efficiency of Large-Area (>5000cm²) a-Si/a-SiGe Tandem Solar Cells Using High-Rate Deposition

	E. Maruyama, S. Okamoto, A. Terakawa, W. Shinohara, M. Tanaka and S. Kiyama Sanyo Electric Co. Ltd., Japan
18-3	Stable Amorphous Silicon Germanium Solar Cells: a Study of Medium Range Order J. K. Rath*, A. Gordijn*, F. D. Tichelaar** and R. E. I. Schropp* *Utrecht University, The Netherlands **University of Technology, The Netherlands
18-4	Low Degradation of Alternately Hydrogen Diluted Amorphous Silicon Multilayer Thin Film S. W. Kwon, S. S. Kim, K. H. Jun and K. S. Lim Korea Advanced Institute of Science and Technology, Korea

[▲ Back to TOP](#)

■ **Session19 - III-V and Space Cells II**

19-1	(invited) Advanced Thin Film Solar Arrays for Space -the Terrestrial Legacy S. Bailey*, A. Hepp*, R. Raffaele** and D. Flood*** *NASA Lewis Research Center, USA **Rochester Institute of Technology, USA ***NanoDielectrics Corp., USA
19-2	Analysis for Superior Radiation-Resistance of InP-Based Solar Cells M. Yamaguchi, A. Khan and N. Dharmarasu Toyota Technological Institute, Japan
19-3	Determination of Absolute External Quantum Efficiency of Monolithic Triple-Junction Solar Cells R. Beckert, M. Meusel, G. Siefer, W. Warta and A. W. Bett Fraunhofer Institute for Solar Energy Systems, Germany
19-4	Metastability Effects in InGaP Solar Cells G. C. Sun*, J. C. Bourgoin*, N. de Angelis, M. Yamaguchi**, A. Khan**, T. Takamoto*** and O. Gilard**** *Universite Pierre et Marie Curie, France, **Toyota Technological Institute, Japan ***Japan Energy Corporation, Japan ****Centre National d'Etudes Spatiales, France
19-5	Short-Circuit Current Enhancement in Bragg Stack Multi-Quantum-Well Solar Cells for Multi-Junction Space Applications D. B. Bushnell*, N. J. Ekins-Daukes*, K. W. J. Barnham*, J. P. Connelly*, J.S. Roberts**, G. Hill, R. Airey** and M. Mazzer*** *Imperial College of Science, UK **University of Sheffield, UK ***University of Lecce, Italy
19-6	Quantum Well Incorporation in Triple Junction InGaP/GaAs/Ge Solar Cells A. Freundlich, A. Alemu and F. Newman University of Houston, USA

[▲ Back to TOP](#)

■ **Session20 - Crystalline Si Solar Cells III**

20-1	(invited) Increase in Efficiency by use of PECVD Silicon Nitride in a Simple Screen Printing Process Cz Material M. Lal National Physical Laboratory, India
20-2	(invited) Efficiency Improvement of Silicon Solar Cells by Simplified Diffusion and Firing Processes C. J. Huang, C. S. Huang, C. T. Chen, S. C. Lin, L. C. K. Liao and L. C. Kuo Industrial Technology Research Institute, Taiwan
20-3	Advanced Diffusion System for Low Contamination in Line Rapid Thermal Processing of Silicon Solar Cells D. Biro, R. Preu, O. Schultz, S. Peters, D. M. Huljic, D. Zickermann, R. Schindler and R. Lüdemann Fraunhofer Institute for Solar Energy Systems, Germany
20-4	Error Diagnosis and Optimisation of cSi Solar Cell Processing using Contact Resistances Determined with the CoreScanner A.S.H. van der Heide, J. H. Bultman, J. Hoorstra and A. Schönecker ECN Solar Energy, The Netherlands

[▲ Back to TOP](#)

■ **Session21 - Fundamentals II**

21-1	(invited) TCO Coated Glass Substrates for Amorphous and Microcrystalline Silicon Solar Cells K. Sato Ashi Glass Co., Ltd., Japan
------	--

21-2	Phosphorous Ion Implantation in C₆₀ for the Photovoltaic Applications
	K. L. Narayanan and M. Yamaguchi Toyota Technological Institute, Japan
21-3	Progress in the Development of Thermophotovoltaic Cells
	V. M. Andreev, V. P. Khvostikov, V. D. Romyantsev, M. Z. Shvarts, O. V. Pakkonen and E. V. Oliva Ioffe Physico-Technical Institute, Russia
21-4	Characteristics of Low Temperature-Annealed TiO₂ Films Deposited by precipitation in Hydrolyzed TiCl₄ Solution
	K. J. Kim*, K. D. Benkstein**, J. van de Lagemaat** and A. J. Frank* *Korea University, Korea **National Renewable Energy Laboratory, USA

[▲ Back to TOP](#)

■ **Session22 - Modules and Systems III**

22-1	(invited) A Development & Performance Test of Smart Power Conditioner for Value Added PV Application
	K. Takigawa*, N. Okada*, N. Kuwabara*, A. Kitamura** and F. Yamamoto** *Central Research Institute of Electric Power Industry, Japan **The Kansai Electric Power Company, Japan
22-2	(invited) Demonstrative Testing of a Large Population of Grid Connected Small PV Systems
	A. Kitamura, H. Matsuda and F. Yamamoto The Kansai Electric Power Company, Japan
22-3	PV Application in the Super Low Energy Office Building of KIER in Korea
	H. S. Suh, N. H. Kyong and M. W. Jung KIER, Korea

[▲ Back to TOP](#)

■ **Session23 - Polycrystalline Si (bulk) Cells II**

23-1	(invited) Fundamental Understanding and Implementation of Al-Enhanced PECVD Si_{Nx} Hydrogenation in Silicon Ribbons
	A. Rohatgi*, V. Yelundur*, J. Jeong*, A. Ebong*, M. D. Rosenblum** and J. I. Hanoka*** *University Center of Excellence for Photovoltaics Research and Education, USA **ASE American Inc., Usa ***Evergreen Solar, USA
23-2	(invited) Large Area Multicrystalline Silicon Solar Cells in High Volume Production Environment-History, Status, New Processes, Technology Transfer Issues
	S. Narayanan BP Solar, USA
23-3	Formation of the Chromium-Boron Complex in Solar-Grade Multicrystalline Silicon
	O. Klettke*, D. Karg*, G. Pensl*, M. Schulz*, G. Hahn** and T. Lauinger*** *University of Erlangen-Nürnberg, Germany **University of Konstanz, Germany ***ASE GmbH, Germany
23-4	Effects of Emitter p-n Junctions Bordering on Surfaces in Silicon Solar Cells
	P. P. Altermatt, J. Zhao, A. Wang, G. Heiser and A. G. Aberle University of NSW, Australia
23-5	Industrially Attractive Front Contact Formation Methods for Mechanically V-Grooved Multicrystalline Silicon Solar Cells
	M. Spiegel, C. Gerhards, F. Huster, W. Jooss, P. Fath and E. Bucher University of Konstanz, Germany
23-6	Reduction of Thermal Budget for Fabrication of Multicrystalline BCSC
	K. Y. Lee, D. S. Kim, J. Kim and S. H. Lee Samsung SDI, Japan
23-7	Spatial Distribution of minority-Carrier Lifetime and Local Concentration of Impurities in Multicrystalline Silicon Solar Cells
	K. Kurobe, M. Miura, K. Hirano and H. Matsunami Kyoto University, Japan

[▲ Back to TOP](#)

■ **Session24 - Fundamentals III**

24-1	(invited) Quantification of Losses in Thin-Film Polycrystalline Solar Cells
------	---

	J. R. Sites Colorado State University, USA
24-2	Interpretation of Light-Induced Cell Performance Degradation by means of Spectroscopic Light Illumination H. Hashigami, Y. Itakura and T. Saitoh Tokyo University of Agriculture and Technology, Japan
24-3	Influence of an Ammonia Activation Prior to the PECVD-SiN Deposition on the Solar Cells Performance A. Hauser, M. Spiegel, P. Fath and E. Bucher University of Konstanz, Germany
24-4	Novel Texturing Method Based on the Spray Deposition System and Isotropic Etching S. W. Park, J. Kim, D. S. Kim and S. H. Lee Samsung SDI, Korea
24-5	Oxidation Process Effects on Lifetime Degradation T. K. Vu, Y. Ohshita, K. Araki and M. Yamaguchi Toyota Technological Institute, Japan
24-6	A New Approach to Modelling Quantum Dot Concentrators A. J. Chatten*, K. W. Barnham*, B. F. Buxton** and N. J. Ekins-Daukes* *Imperial College of Science, UK **University College London, UK
24-7	Bulk Photoconductivity in Photovoltaic Action Spectra of Fullerene-Based Photovoltaic Cells O. Chevaleevski and K. S. Lim KAIST, Korea
24-8	X 50 Concentration Silicon Cell by a Single Photolithography Process K. Araki and M. Yamaguchi Toyota Technological Institute, Japan

[▲ Back to TOP](#)

■ Session25 - National Programs III

25-1	(invited) The Latest Developments in Photovoltaics in Poland S. M. Pietruszko Warsaw University of Technology, Poland
25-3	(invited) ENEA's Activities in Photovoltaics A. Sarno*, T. Contardi*, G. Graditi*, M. Garozzo**, S. Li Causi** *Enea Portici Research Center, Italy **Enea Casaccia Research Center, Italy
25-4	(invited) Photovoltaic Status in the United Kingdom A. Sayigh WREN, UK

[▲ Back to TOP](#)

■ Session26 - Poly(μ c)-Si Solar Cells III

26-1	(invited) Microcrystalline Silicon and the Impact on Micromorph Tandem Solar Cells J. Meier*, S. Dubail*, S. Golay*, U. Kroll*, S. Fay*, E. Vallat Sauvain*, L. Feitknecht*, J. Dubail** and A. Shah* *Institute de MicroTechnique, Switzerland **API Portescap, Switzerland
26-2	(invited) Thin Film Crystalline Si Solar Cells; IMEC's Approach in a Global Perspective J. Nijs****, G. Beaucarne**, R. Bilyalov***, T. Vermeulen***, J. Poortmans*** *Katholieke Universiteit, Belgium **University of NSW, Australia ***IMEC, Belgium
26-3	(invited) Microcrystalline Silicon Thin-Film Solar Cells Prepared at Low Temperature Using PECVD Y. Nasuno**, M. Kondo* and A. Matsuda* *National Institute of Advanced Industrial Science and Technology, Japan **SHARP Corporation, Japan
26-4	Fast Deposition of Microcrystalline Silicon Films with Preferred(220) Crystallographic Texture by the High-Density Microwave Plasma

	H. Shirai*, K. Yoshino*, G. Ogawara and H. Ueyama** *Saitama University, Japan **Nihon Koshuha Co. Ltd., Japan
26-5	a-Si/mc-Si Hybrid Solar Cell Using Silicon Sheet Substrate Y. Komatsu, N. Koide, M. J. Yang, T. Nakano, Y. Nagano, K. Igarashi, K. Yoshida, K. Yano, T. Hayakawa, H. Taniguchi, M. Shimizu and H. Takiguchi SHARP Corporation, Japan
26-6	Microcrystalline Silicon-Germanium Solar Cells for Multi-Junction Structures M. Isomura, K. Nakahata, M. Shima, S. Taira, K. Wakisaka, M. Tanaka and S. Kiyama Sanyo Electric Co., Ltd., Japan

[▲ Back to TOP](#)

■ **Session27 - Modules and Systems IV**

27-1	(invited) Simulation and Fabrication of Flat-Plate Concentrator Modules K. Yoshioka and T. Saitoh Tokyo University of Agriculture and Technology, Japan
27-2	(invited) Novel Applications for Flat-Plate Modules Utilizing Bifacial PV Cells T. Uematsu*, K. Tsutsui*, Y. Yazawa*, T. Warabisako*, I. Araki**, Y. Eguchi ** and T. Joge** *Central Research Lab., Hitachi Ltd., Japan **Hitachi Works, Hitachi Ltd., Japan
27-4	Metallisation Wrap through from Cell Concept to High Performance Back Contact Module E. Van Kerschaver***, S. De Wolf*** and J. Szlufcik* *IMEC v.z.w., Belgium **E. E. Dept. of K. U. Leuven, Belgium
27-5	A Study of the Characteristic Water Pollution Alarm Communication System with Solar Cells J. P. Yoon*, S. A. Yoon*, I. S. Cha*, J. S. Choi*, G. J. Yu** *Dongshin University, Korea **KIER, Korea

[▲ Back to TOP](#)

■ **Session28 - National Programs IV**

28-1	(invited) The Hong Kong Schools Solar Education Programme J. Close University of Hong Kong, Hong Kong
28-2	(invited) An Epoch of PV R&D in a National Research Institute ---ETL to AIST Y. Owadano National Institute of Advanced Science and Technology, Japan
28-3	(invited) Indian National Programme on Solar Photovoltaics E. V. R. Sastry Ministry of Non-Conventional Energy Sources, India
28-4	(invited) China Development Policy and Research and Development Plan on Renewable Energy Li Baoshan Ministry of Science and Technology, China
28-5	Cost-Effectiveness Analysis of R&D on Solar Cells in Japan E. Endo and Y. Tamura National Institute of Advanced Industrial Science and Technology, Japan

[▲ Back to TOP](#)

■ **Poster Session I - Fundamentals and New Approaches**

P-1	IC Silicon Solar Cell - Design and Fabrication H. Saha, U. Gangopadhyay, S. Chakraborty, D. Majumder, S. Dey, S. K. Dutta and S. Chatterjee *Jadavpur University, India
P-2	Efficiency Optimization of the Induction Motor Fed from a Photovoltaic Source using Direct Torque Control Y. Atia*, O. Mahgoub**, M. Kamel***, S. El-Hefnawi* and E. Aboul-Zahab** *Electronics Research Institute, Egypt **Cairo University, Egypt ***Benha Higher Institute of Technology, Egypt

P-3	New Contact Frame Design for Minimizing Losses due to Edge Recombination and Grid Induced Shading D. König and G. Ebest Technical University of Chemnitz, Germany
P-4	Process Optimization of PEVCD Anti-Reflection Coated Silicon Solar Cell Using Neural Networks L. C-K Liao, C. J. Huang, C. C. Chen, C. S. Huang, C. T. Chen, S. C. Lin and L. C. Kuo Industrial Technology Research Institute, Taiwan
P-5	ESR Study of Structural Defect Formation in P⁺ Implanted and Annealed C₆₀ Films N. F. Fahim, N. Kojima, M. Yamaguchi, Y. Ohshita, N. Dharmarasu and T. Sakai Toyota Technological Institute, Japan
P-6	Transmittance from Photovoltaic Materials Under Diffuse Light A. Parretta* and J. Zhao** *ENEA Centro Ricerche, Italy **University of New South Wales, Australia
P-7	Simultaneous Optical Losses and Current Measurements in Photovoltaic Devices at Variable Angle of the Incident Light P. Maddalena*, A. Parretta**, P. Tortora* and J. Zhao*** *University of Napoli, Italy **Center Ricerche ENEA, Italy ***University of New South Wales, Australia
P-8	Design of Concentrating Elements with Thin Film Solar Cells for Wall Integration M. Brogren*, J. Wennerberg*, R. Kapper** and B. Karlsson** *Uppsala University, Sweden **Vattenfall Utveckling AB, Sweden
P-9	Irradiance and Wavelength Dependence of the I-V Characteristics of Solar Cells Y. Hishikawa, Y. Imura and T. Oshiro Solar Technocenter, Japan
P-10	Basic Study on Prediction of Solar Irradiation and Its Application to Photovoltaic-Diesel Hybrid Generation System S. Yamamoto, J. S. Park, M. Takata, K. Sasaki and T. Hashimoto Kobe University of Mercantile Marine, Japan
P-11	Performance Simulations for Designing Recent Advanced Bifacial Silicon Solar Cells Using Simulation Programs on Internet K. Matsukuma*, T. Terakawa*, I. Araki** and T. Johge** *Sojo University, Japan **Hitachi Ltd., Japan
P-12	Generation of Interstitial Boron by Minority-Carrier Injection Y. Ohshita, T. K. Vu and M. Yamaguchi Toyota Technological Institute, Japan
P-13	Photovoltaic Effects of a:c/C₆₀/Si (p-i-n) Solar Cell Structures K. L. Narayanan and M. Yamaguchi Toyota Technological Institute, Japan
P-14	Titanium Dioxide Anti-Reflection Coating from Metallo-Organic Liquid Precursors P. K. Singh, B. R. Awasthy, R. Kumar and S. N. Singh National Physical Laboratory, India
P-15	Diffusion Processes for Doping of C₆₀ (Fullerene) Thin Films E. A. Katz*, D. Faiman*, S. Shtutina*, N. Froumin*, M. Polak* and Y. Strzhemechny** *Ben-Gurion University, Israel **Ohio State University, USA
P-16	SnS Thin Films Fabricated by Pulsed and Normal Electrochemical Deposition K. Takeuchi*, M. Ichimura*, E. Arai* and Y. Yamasaki** *Nagoya Institute of Technology, Japan **Fuji Xerox Co. Ltd., Japan
P-17	Short Time Annealing Characteristics on Hot Steam Annealing H. Nagayoshi*, H. Imaseki*, H. Abe* and T. Saitoh** *Shonan Institute of Technology, Japan **Tokyo University of Agriculture and Technology, Japan

P-18	Numerical Analysis of Bulk Diffusion Length in Thin Film c-Si Solar Cells Y. Yamamoto, Y. Ishikawa, T. Hatayama, Y. Uraoka and T. Fuyuki Nara Institute Science and Technology, Japan
P-20	Raman Study of The P-ion Implanted C₆₀ films T. Sakai*, N. Kojima**, N. F. Fahim** and M. Yamaguchi** *Samsung SDI Co. Ltd., Korea **Toyota Technological Institute, Japan
P-21	Surface Analysis and TEM Study of Al/Al₂O₃ Multilayers Y. Xue*, J. Xia**, B. Gong** and M. A. Green** *Dalian Railway Institute, China **University of New South Wales, Australia
P-22	Effect of Design Parameters on the Efficiency of the Solar Cells Fabricated Using SOI Structure S. H. Lee, K. M. Lee and Y. K. Kim University of Incheon, Korea
P-23	Variation of ESR Lineshapes in Hydrogen-Diluted DLC Films for Solar Cells W. J. Yun, J. M. Cho, Y. O. Cho and J. K. Lee Chonbuk National University, Korea
P-24	Pyrite(FeS₂) Thin Films Prepared by Spray Method Using FeSO₃ and (NH₄)₂S_x A. Yamamoto*, M. Nakamura*, A. Seki*, Z. L. Li*, A. Hashimoto* and S. Nakamura** *Fukui University, Japan **Tsuyama National College of Technology, Japan
P-25	Thermal Stability of SiO₂ and SiN_x-H/SiO₂ Passivation Layers with High Temperature Steam Annealing T. Wake*, Y. Fusimi*, Y. Abe*, H. Nagayoshi**, T. Saitoh* and K. Kamisako* *Tokyo University of Agriculture and Technology, Japan **Shonan Institute of Technology, Japan
P-26	A Study of Measuring and Estimating for In-Plane Irradiation Using Minute Horizontal Global Irradiation J. Tamura*, K. Kurokawa* and K. Otani** *Tokyo University of Agriculture and Technology, Japan **National Institute of Advanced Industrial Science and Technology, Japan
P-27	A Study on the New Maximum Power Point Tracking Control Algorithm and Efficiency K. H. Kim, G. J. Yu, Y. S. Jung and Y. S. Kim Korea Institute of Energy Research, Korea
P-28	The Differences Between the Measured Series and Shunt Resistances Values and Related DC Model Values of Solar Cells Z. Liu***, H. Liao***, T. Chen**, Z. Hu** and Z. Zhang** *Sichuan University, China **Yunnan Normal University, China
P-29	A Study on the Parameter Estimation and MPPT Control of Solar Cell T. Y. Kim*, H. G. Ahn**, K. Park**, Y. K. Lee** *Ssangyong Heavy Industries Co. Ltd., Korea **Changwon National University, Korea
P-30	Novel Equivalent Circuit Model and Statistical Analysis in Parameters Identification K. Araki and M. Yamaguchi Toyota Technological Institute, Japan
P-31	Extended Distributed Model for Analysis of Non-Ideal Concentration Operation K. Araki and M. Yamaguchi Toyota Technological Institute, Japan
P-32	Manufacturing Method of Transparent Electric Window Using Dye-Sensitized TiO₂ Solar Cells M. G. Kang, N. G. Park and S. H. Chang ETRI, Korea
P-33	Effect of Titania Particles Prepared by Sol-Gel Method on the Performance of Dye Sensitized Solar Cell S. J. Moon, W. W. So and K. J. Kim Korea Research Institute of Chemical Technology, Korea

P-34	Electrical and Optical Properties of ITO Thin Films Fabricated by R.F. Magnetron Sputtering W. J. Jeong*, G. C. Park** and H. D. Chung** *Hanlyo University, Korea **Mokpo National University, Korea
P-35	Fabrication of Tin Oxide Film by Sol-Gel Method for Photovoltaic Solar Cell System S. C. Lee, J. H. Lee, T. S. Oh and Y. H. Kim Hong Ik University, Korea

[▲ Back to TOP](#)

■ **Poster Session I - Crystalline Si**

P-36	Liquid Phase Epitaxy Growth of Textured Silicon Layer on Transferable Silicon Grid A. Fave*, S. Berger*, J. P. Boyeaux*, A. Laugier*, P. Kleimann** and J. Linnros** *Laboratoire de Physique de la Matière, France **Royal Institute of Technology, Sweden
P-37	Rapid Thermal Technologies for High Efficiency Silicon Solar Cells A. Ebong*, Y. H. Cho*, M. Hilali*, A. Rohatgi* and D. Ruby** *Georgia Institute of Technology, USA **Sandia National Laboratory, USA
P-39	Thin-Film c-Si Solar Cells Prepared by Metal-Induced Crystallization S. I. Muramatsu*, Y. Minagawa*, F. Oka*, T. Sasaki* and Y. Yazawa** *Hitachi Cable Ltd., Japan **Hitachi, Ltd., Japan
P-40	Effect of Irradiation Conditions on Light-Induced Lifetime Degradation in B-Doped Cz-Silicon Wafers Y. Itakura, H. Hashigami and T. Saitoh Tokyo A&T University, Japan
P-41	Influence of Hydrogen Passivation on Majority and Minority Charge Carrier Mobilities in Ribbon Silicon G. Hahn, P. Geiger, D. Sontag, P. Fath and E. Bucher University of Konstanz, Germany
P-42	Ni/Cu Metallization for Low Cost High Efficiency PERC Cells E. J. Lee, D. S. Kim, I. S. Moon and S. H. Lee Samsung SDI, Korea
P-43	Multicrystalline Silicon Solar Cells Fabricated by Using a Preferential Grain Boundary Etching Method D. G. Lim*, W. J. Lee*, M. S. Choi**, B. K. Kho** and J. S. Yi* *SungKyunKwan University, Korea **Photon Semiconductor & Energy Company, Korea
P-44	Selective Emitter Formation with a Single Screen Printed P-Doped Paste Deposition using Out-Diffusion in a RTP-Step L. Debarge*, J. C. Muller* and R. Monna** *Laboratoire PHASE, France **Photowatt Int., France
P-45	The Generation and Annihilation of Defect-Induced by Minority Carrier Injection in Cz-Grown Si Solar Cells T. K. Vu, Y. Ohshita, A. Khan, K. Araki and M. Yamaguchi Toyota Technological Institute, Japan
P-46	A Simple Process to Remove Boron from Metallurgical Grade Silicon C. P. Kattak, D. B. Joyce and F. Schmid Crystal Systems, Inc., USA
P-47	Passivation of SiO₂/Si Interfaces using High-Pressure H₂O Vapor Heating T. Sameshima, Y. Kaneko, N. Andoh and T. Saitoh Tokyo University of Agriculture & Technology, Japan
P-48	Investigation of the Cu Metallization of Si Solar Cells J. M. Kang*, J. S. You**, J. H. Pak*, D. H. Kim* *Korea University, Korea **Seoul National University, Korea

[▲ Back to TOP](#)

■ **Poster Session I - Poly – Si (Bulk)**

P-49	Three-Dimensional Numerical Simulations of Grain Boundaries in Silicon Solar Cells
------	--

	P. P. Altermatt and G. Heiser University of New South Wales, Australia
P-50	Comparison of Multicrystalline Silicon Surfaces after Wet Chemical Etching and Hydrogen Plasma Treatment: Application for the Heterojunction Solar Cells A. Ulyashin, M. Scherff, R. Hussein, R. Job and W. R. Fahrner University of Hagen, Germany
P-51	Quality Evaluation and Improvement of Iron-Doped Electromagnetic Multicrystalline Si Wafers M. Dhamrin, K. Koyanagi, R. Ozaki and T. Saitoh Tokyo A&T University, Japan
P-52	Lifetime Improvement in Fe-Contaminated Electromagnetic Cast Si Wafers R. Ozaki, M. Dhamrin and T. Saitoh Tokyo A&T University, Japan
P-53	Light Degradation of Minority-Carrier Lifetimes for Multicrystalline Cast Silicon Substrates A. Takaki, H. Hashigami and T. Saitoh Tokyo A&T University, Japan
P-54	Preparation of Silicon BSF Solar Cell with Co-Diffusion Method of Phosphorus and Boron G. P. Wei*, W. T. Yu*, Z. J. Dong* and G. A. Gun** *Shanghai University, China **Shanghai Bomim Industry DEVCD, Ltd., China
P-55	Fabrication of High-Efficiency Tri-Crystalline CZ Silicon Solar Cells D.S. Kim, K. Y. Lee, S. H. Won, S. W. Park, J. Kim and S. H. Lee Samsung SDI, Korea
P-56	The Application of SiNx Layers to Multicrystalline Buried Contact Silicon Solar Cells S. H. Won, S. W. Park, J. Kim and S. H. Lee Samsung SDI, Korea
P-57	Rear Contact Patterning by Mechanical Scriber for Low Cost High-Efficiency Solar Cells I. S. Moon, D. S. Kim, E. J. Lee and S. H. Lee Samsung SDI, Korea
P-58	Double Layer AR Coatings on Multicrystalline Silicon Solar Cells W. J. Lee*, D. G. Lim*, I. Lee*, J. Kim**, D. S. Kim**, S. H. Lee**, M. S. Choi***, B. K. Kho*** and J. Yi* *Sungkyunkwan University, Korea **Samsung SDI, Korea ***Photon Semiconductor and Energy Co., Korea
P-59	High-Density Inductively Coupled Plasma Chemical Vapor Deposition of Silicon Nitride for Solar Cell Application I. O. Parm*, K. H. Kim*, D. G. Lim*, J. H. Lee*, J. H. Heo*, J. Kim**, D. S. Kim**, S. H. Lee** and J. Yi* *Sungkyunkwan University, Korea **Samsung SDI, Korea
P-60	Multicrystalline Silicon-Germanium Growth for Photovoltaic Applications P. K. Singh, P. Prakash and S. N. Singh National Physical Laboratory, India
P-205	First xSi Cells Results Using Selective Emitters formed with Diffusion Barriers in One Step R. Kinderman, J. H. Bultman, J. Hoornstra, M. Koppes and A. W. Weeber ECN Solar Energy, The Netherlands

[▲ Back to TOP](#)

■ **Poster Session I - a – Si**

P-61	Multibandgap a-Si/poly-Si Tandem nip/nip Solar Cells with both Absorber Layers Deposited by Hot Wire CVD (Cat-CVD) on Stainless Steel R. E. I. Schropp, C. H. M. van der Werf, M. K. van Veen, P. A. T. T. van Veenendaal, R. J. Zambrano, J. Löffler, Z. Hartman and J. K. Rath Utrecht University, The Netherlands
P-62	Use of Different Types Window Layers for the Top and the Bottom Cell of a Double Junction a-Si Solar Cell A. K. Barua, A. Sarker and S. Ray Indian Association for the Cultivation of Science, India

P-63	<p>Aluminum-Induced Catalytic Crystallization of a-Si:H for Solar Cells Application</p> <p>Z. Yu*, Y. Matsumoto**, X. Geng* and J. Xue* *Nankai University, China **CINVESTAV-IPN, Mexico</p>
P-64	<p>Modeling of a-Si/Poly-Si and a-Si/Poly-Si/Poly-Si Stacked Solar Cells</p> <p>X. H. Geng, H. C. Ge, J. M. Xue, H. B. Li, Z. P. Wang, Q. Z. Wang and H. Z. Ren Nankai University, China</p>
P-65	<p>Raman Microspectroscopy Study of Epitaxial Silicon Thin Films Produced by ECR PECVD</p> <p>S. D. Summers and H. S. Reehal South Bank University, UK</p>
P-66	<p>In-situ Chamber Cleaning using Atomic H in Catalytic-CVD Apparatus for Mass Production of a-Si:H Solar Cells</p> <p>A. Masuda, Y. Ishibashi, K. Uchida, K. Kamesaki, A. Izumi and H. Matsumura Japan Advanced Institute of Science and Technology, Japan</p>
P-67	<p>Study on Catalytic-CVD a-Si:H-Based Solar Cells with High Deposition Rate</p> <p>M. Itoh, Y. Ishibashi, A. Masuda and H. Matsumura Japan Advanced Institute of Science and Technology, Japan</p>
P-68	<p>Doping of a-SiC_x: H Films Including μ-Si: H by Hot-Wire CVD and Their Application to Wide Gap Window of Heterojunction Solar Cells</p> <p>T. Itoh, Y. Katoh, K. Fukunaga, T. Fujiwara and S. Nonomura Gifu University, Japan</p>
P-69	<p>Large Area VHF PCVD Equipment for Amorphous Silicon Deposition Using Novel Discharge Technique</p> <p>T. Takagi*, M. Ueda*, Y. Watabe*, H. Sato**, K. Tamashiro** and K. Sawaya** *ANELVA Co., Japan **Tohoku University, Japan</p>
P-70	<p>Performance of Double Junction a-Si Solar Cells by Using ZnO:Al Films with Different Electrical and Optical Properties at the N/Metal Interface</p> <p>S. Ray, R. Das and A. K. Barua Indian Association for the Cultivation of Science, India</p>
P-71	<p>Substrate Temperature and Hydrogen Dilution: Parameters for Amorphous to Microcrystalline Phase Transition in Silicon Thin Films</p> <p>S. Ray, C. Das, S. Mukhopadhyay and S. C. Saha Indian Association for the Cultivation of Science, India</p>
P-72	<p>Limitations of Bulk Generation-Recombination on Open Circuit Voltage Under 1 Sun Illumination in Amorphous Silicon Solar Cells</p> <p>J. M. Pearce, R. J. Koval, A. S. Ferlauto, R. W. Collins and C. R. Wronski The Pennsylvania State University, USA</p>
P-73	<p>Modelling and Analysis of Light Scattering in a-Si: H-Based PIN Solar Cells with Rough Interfaces</p> <p>J. Krč*, M. Zeman**, M. Topič*, F. Smole* and J. W. Metselaar** *University of Ljubljana, Slovenia **Delft University of Technology, The Netherlands</p>
P-74	<p>The Influence of Doping Concentration on Ni Induced Lateral Crystallization of Amorphous Silicon Films</p> <p>Y. Minagawa*, Y. Yazawa** and S. Muramatsu* *Hitachi Cable Ltd., Japan **Hitachi Ltd., Japan</p>
P-75	<p>Electronic Properties of Amorphous Silicon Layers Fabricated by Photo-CVD Method: Spin Susceptibility and EPR Studies</p> <p>O. Chevaleevski, S. W. Kwon and K. S. Lim KAIST, Korea</p>
P-76	<p>Effect of the Boron-Doped Hydrogenated Nanocrystalline SiC:H Buffer Layer Prepared by Photo-CVD</p> <p>S. Y. Myong and K. S. Lim KAIST, Korea</p>
P-77	<p>Applying the p-n₂-SiC: H Window Layer Deposited onto Al-Seed/SnO₂</p> <p>S. Y. Myong, and K. S. Lim KAIST, Korea</p>

P-78 [Recovery Characteristics of the Amorphous Solar Cell by the Temperature Effect Method](#)

J. Itsumi
Sojo University, Japan

[▲ Back to TOP](#)

■ **Poster Session II - Poly – Si Film**

P-79 [Optical Confinement Effect of Thin Films between Si and Substrate in Thin Film Si Solar Cells formed on Alumina Ceramics](#)

G. Xu, P. Jin, K. Yoshimura and M. Tazawa
National Institute of Advanced Industrial Science and Technology, Japan

P-80 [Pulsed KrF Excimer Laser Annealing of Silicon Solar Cell](#)

H. Azuma*, A. Takeuchi*, T. Ito*, H. Fukushima*, T. Motohiro* and M. Yamaguchi**
*Toyota Central Research & Development Labs., Inc., Japan **Toyota Technological Institute, Japan

P-81 [Optimization of Layered Laser Crystallization for Thin-Film Crystalline Silicon Solar Cells](#)

N. D. Sinh, G. Andrä, F. Falk, E. Ose and J. Bergmann
Institut für Physikalische Hochtechnologie Jena, Germany

P-82 [Back Electrode Formation for Poly-Si Thin Film Solar Cells on Glass having AIC-Grown Seeding Layer](#)

P. Widenborg, D. H. Neuhaus and A. G. Aberle
University of NSW, Australia

P-83 [TEM Observation of Epitaxial Growth of Si Films on Si Wafers by Ion-Assisted Deposition](#)

J. A. Xia*, N. P. Harder*, S. Oelting** and A. G. Aberle*
*University of NSW, Australia **ANTEC GmbH, Germany

P-84 [Promotion of Microcrystallization by Argon in Moderately Hydrogen Diluted Silane Plasma](#)

M. Jana, D. Das and A. K. Barua
Indian Association for the Cultivation of Science, India

P-85 [High Efficiency Microcrystalline Silicon Solar Cells at High Deposition Rates](#)

K. Saito, M. Sano, A. Sakai, R. Hayahi and K. Ogawa
Canon Inc., Japan

P-86 [Conversion Efficiency Estimate of Thin Film Polycrystalline Silicon Solar Cells](#)

H. Fukushima*, T. Ito*, K. Yamaguchi**, Y. Ohshita** and M. Yamaguchi**
*Toyota Central R&D Lab., Japan **Toyota Technological Institute, Japan

P-87 [Thin Film Poly-Si Solar Cells Using PECVD Method and Cat-CVD Method](#)

K. Niira, H. Senta, H. Hakuma, M. Komoda, H. Okui, K. Fukui, H. Arimune and K. Shirasawa
Kyocera Corporation, Japan

P-88 [Plasma Enhanced Hot-Wire CVD Grown Microcrystalline Silicon Films for Photovoltaic Device Applications](#)

J. S. Yoo*, D. G. Lim*, J. H. Lee*, J. K. Ko*, J. H. Park*, D. W. Kim**, S. H. Lee** and J. Yi*
*Sungkyunkwan University, Korea **Samsung SDI, Korea

P-89 [Crystallographic Analysis of High Quality Poly-Si Thin Films Deposited by Atmospheric Pressure Chemical Vapor Deposition](#)

Y. Ishikawa, H. Yamamoto, Y. Yamamoto, T. Hatayama, Y. Uraoka and T. Fuyuki
Nara Institute of Science and Technology, Japan

P-90 [Effects of Grain Boundaries on Cell Performance of Poly-Silicon Thin Film Solar Cells by 2-D Simulation](#)

T. Fujisaki, A. Yamada and M. Konagai
Tokyo Institute of Technology, Japan

P-91 [Temperature Dependence of Absorption Coefficient Spectra for \$\mu\$ c-Si Films by Resonant Photothermal Bending Spectroscopy](#)

T. Kunii, J. Kitao, N. Yoshida and S. Nonomura
Gifu University, Japan

P-92 [Effects of Electrons and Ions Used in Electron-Beam-Excited Plasma-Assisted CVD on Nanocrystalline Silicon Film Properties](#)

H. Motegi, Y. Ohshita, K. Yamaguchi and M. Yamaguchi
Toyota Technological Institute, Japan

P-93	Low-Temperature Growth of Microcrystalline Silicon Films From Chlorinated Materials H. Shirai, K. Shiojiri, Y. Hashimoto, S. Jung, H. Fujimura, H. Liu Saitama University, Japan
P-94	High Efficiency $\mu\text{-Si(p)/c-Si(n)}$ Heterojunction Solar Cells H. Yamamoto, Y. Takaba, Y. Komatsu, M. J. Yang, T. Hayakawa, M. Shimizu and H. Takiguchi Sharp Corporation, Japan
P-95	Structural Change of Microcrystalline Silicon Films with Double Layer Structure Y. Yoshioka, A. Takeuchi, T. Ishitani and K. Kamisako Tokyo University of Agriculture and Technology, Japan
P-96	Influence of Substrate Temperature on Microcrystallization of Silicon Films T. Shirasawa, K. Kimura, K. Hayashi and K. Kamisako Tokyo University of Agriculture and Technology, Japan
P-97	Low Cost Polycrystalline Si Thin Film Solar Cells Prepared by SSP and RTCVD Technology H. Shen*, B. Ai**, Z.C Liang*, X.B Liao** and J.H Li* *Guangzhou Institute of Energy Conversion, CAS, China **Institute of Semiconductors, CAS, China
P-98	Improvement of Voc using Carbon Added Microcrystalline Si p-Layer in Microcrystalline Si Solar Cells T. Wada*, M. Kondo** and A. Matsuda** *Fuji Electric Corporate Research and Development Ltd., Japan **National Institute of Advanced Industrial & Technology, Japan
P-99	Effective Plasma Hydrogen Passivation of mc-Si Solar Cells after Finishing Contacts Z. Hu, Z. Liu, T. Chen, H. Liao and Y. Li Yunnan Normal University, China
P-100	Plasma Deposition of Thin Film Silicon: CINETICS Monitored by Optical Emission Spectroscopy L. Feitknecht*, J. Meier*, P. Torres**, J. Zürcher* and A. Shah *Institute of Microtechnology, Switzerland **VHF-Technologies SA, Switzerland
P-101	Formation of Large Crystalline Grain Silicon Thin Films by Electrical Current-Induced Joule Heating N. Andoh and T. Sameshima Tokyo University of Agriculture and Technology, Japan
P-102	Optical Properties of Carbon-Based Superlattice Structures for Solar Cells Applications N. Kojima and M. Yamaguchi Toyota Technological Institute, Japan
P-103	Enhanced Low-Temperature Crystallization of Amorphous Si Films Using AlCl_3 Vapor J. H. Ahn*, J. H. Eom*, B. T. Ahn* and K. H. Yoon* Korea Advanced Institute of Science and Technology, Korea Korea Institute of Energy Research, Korea
P-104	Polycrystalline Si Films Formed by Al-Induced Crystallization(AIC) Process without Al Oxides at Al/a-Si Interface H. N. Kim, D. W. Kim, G. Y. Lee, D. S. Kim and S. H. Lee Samsung SDI, Korea

[▲ Back to TOP](#)

■ **Poster Session II - Thin Film**

P-105	Role of Grain Boundaries in $\mu\text{-Si}$: H.J. Kočka, H. Stuchlíková, J. Stuchlík, B. Rezek, T. Mates and A. Fejfar Academy of Sciences of the Czech Republic, Czech Republic
P-107	Modified SnO_2-Based TCO for p-i-n Microcrystalline Silicon Solar Cells T. Yamamoto*, M. Kondo** and A. Matsuda** *Nippon Sheet Glass Corporation, Japan **National Institute of Advanced Industrial Science & Technology, Japan
P-108	Microcrystalline Silicon Solar Cells Fabricated on Polymer Substrate

	H. Mase*, M. Kondo** and A. Matsuda** *Mitsui Chemical Inc., Japan **National Institute of Advanced Industrial Science and Technology, Japan
P-109	Promising Window Layer of Thin Film Si Solar Cell with p-i-n Structure Prepared by Using SiH₂Cl₂ T. Nakashima*, M. Kondo** and A. Matsuda** *SANYO Electric Co., Ltd., Japan, **National Institute of Advanced Industrial Science and Technology, Japan
P-110	Polycrystalline Silicon Thin Films on Foreign Substrates by Liquid Phase Epitaxy K. Y. Lee, D. W. Kim, H. N. Kim and S. H. Lee Samsung SDI, Korea
P-111	Heterogeneous Growth of Microcrystalline Silicon Germanium J. K. Rath*, F. D. Tichelaar** and R. E. I. Schropp* *Utrecht University, The Netherlands **University of Technology, The Netherlands

[▲ Back to TOP](#)

■ **Poster Session II - CIS**

P-112	Electrodeposited CuInS₂-based Thin Film Solar Cells S. Nakamura* and A. Yamamoto** *Tsuyama National College of Technology, Japan **Fukui University, Japan
P-113	Thin Films of Cu(In,Ga)Se₂ and Ordered Vacancy Compound Prepared by Thermal Crystallization and Their Photovoltaic Applications T. Yamaguchi*, T. Kobata**, S. Niiyama**, T. Nakamura** and A. Yoshida*** *Wakayama College of Technology, Japan **Wakayama Industrial Technology Center, Japan ***Toyohashi University of Technology, Japan
P-114	Structural and Optical Properties of CuInS₂ Thin Films by Electron Beam Evaporation G. C. Park*, H. D. Chung*, C. D. Kim*, H. R. Park*, W. J. Jeong** and H. B. Gu*** *Mokpo National University, Korea **Hanlyo University, Korea ***Chonnam National University, Korea
P-115	Structural and Electrical Properties of CuGa₂ Thin Films by Electron Beam Evaporation G. C. Park*, J. Lee*, C. D. Kim*, H. R. Park*, W. J. Jeong** and H. B. Gu*** *Mokpo National University, Korea **Hanlyo University, Korea ***Chonnam National University, Korea
P-116	ILGAR-ZnO WEL Versus CBD-CdS Buffer: Progresses in Thin Film Cu(In, Ga)(S, Se)₂ Solar Cells based on the Novel Window Extension Layer Concept M. Bär*, C. Fischer*, H. J. Muffler*, S. Zweigart**, F. Karg** and M. C. Lux-Steiner* *Hahn-Meitner-Institut, Germany **Siemens & Shell Solar GmbH, Germany
P-117	Implantation of Chlorine Ion into CuInSe₂ Thin Films T. Tanaka*, T. Yamaguchi**, T. Ohshima***, H. Itoh***, A. Wakahara**** and A. Yoshida**** *Saga University, Japan **Wakayama College of Technology, Japan ***Japan Atomic Energy Research Institute, Japan ****Toyohashi University of Technology, Japan
P-118	Effect of 8MeV-Electron Irradiation on Electrical Properties of CuInSe₂ Thin Films T. Tanaka*, T. Yamaguchi**, R. Taniguchi***, Y. Matsuda***, M. Fujishiro***, A. Wakahara**** and A. Yoshida**** *Saga University, Japan **Wakayama College of Technology, Japan ***Osaka Prefecture University, Japan ****Toyohashi University of Technology, Japan
P-119	Control of Conduction Band Offset in Wide-Gap Cu(In, Ga)Se₂ Solar Cells T. Minemoto*, Y. Hashimoto**, T. Satoh**, W. Shams-Kolahi*, T. Negami**, H. Takakura* and Y. Hamakawa*. *Ritsumeikan University, Japan **Matsushita Electric Industrial Co., Ltd., Japan
P-121	Changes in the Characteristics of CuInGaSe₂ Solar Cells under Light Irradiation and Its Recovery by Applied Reverse Voltage T. Yanagisawa, T. Kojima, T. Koyanagi, K. Takahisa and K. Nakamura National Institute of Advanced Industrial Science and Technology, Japan
P-122	Preparation of CuGaSe₂ Thin Films by Several Physical Vapor Deposition Methods for Application to Solar Cells W. Shams-Kolahi*, T. Minemoto**, T. Satoh*, Y. Hashimoto*, S. Shimakawa*, S. Hayashi* and T. Negami* *Matsushita Electric Industrial Co., Ltd., Japan **Ritsumeikan University, Japan

P-123	Microdefects and Point Defects Optically in Cu(In, Ga)Se₂ Thin Film Solar Cells Exposed to the Damp and Heating G. A. Medvedkin*, E. I. Terukov*, Y. Hasegawa**, K. Hirose** and K. Sato** *Ioffe Physico-Technical Institute, Russia **Tokyo University of Agriculture and Technology, Japan
P-124	Study of Point Defects in CuGaSe₂ Single Crystals by means of Electron Paramagnetic Resonance and Photoluminescence G. A. Medvedkin*, T. Nishi**, Y. Katsumata**, K. Sato** and H. Miyake*** *Ioffe Physico-Technical Institute, Russia **Tokyo University of Agriculture and Technology, Japan ***Mie University, Japan
P-126	Epitaxial Growth of Cu(In,Ga)Se₂ Thin Films for Solar Cells on Mo Thin Layers Epitaxially-Grown on Sapphire Substrates H. Masuko and T. Nakada Aoyama Gakuin University, Japan
P-127	Preparation of CuIn_{1-x}Ga_xSe₂ Thin Films by Sputtering and Selenization Process H. K. Song*, S. G. Kim*, H. J. Kim*, S. K. Kim**, K. W. Kang**, J. C. Lee** and K. H. Yoon** *Seoul National University, Korea **Korea Institute of Energy Research, Korea
P-128	Preparation of CuInSe₂ Thin Films on SnO₂ or ITO/Glass Substrates by Metal-Organic Decomposition S. Ando, J. Miyachi, K. Azumada, T. Imai and T. Tsukamoto Science University of Tokyo, Japan
P-129	Growth and Characterization of CuInSe₂ Thin Films by Close-Spaced Vapor Transport Method A. Shoji, N. Kumasaki, S. Ando and S. Endo Science University of Tokyo, Japan
P-130	The Properties of Sputter Deposited Molybdenum Back Contacts for Cu(InGa)Se₂ Solar Cells S. K. Kim*, K. H. Kang*, J. C. Lee*, K. H. Yoon*, I. J. Park*, J. Song* and S. O. Han** *Korea Institute of Energy Research, Korea **ChungNam National University, Korea
P-131	Electrical and Optical Properties of Cu₂ZnSnS₄ Thin Films Prepared by R.F. Magnetron Sputtering Process J. S. Seol, S. Y. Lee, J. C. Lee, K. H. Kim, and H. D. Nam Yeungnam University, Korea
P-132	In-Situ Stress Analysis of CdTe Films During Heat Treatment D. H. Kim*, M. Ger** and D. L. Williamson*** *Korea University, Korea **University of Michigan, USA ***Colorado School of Mines, USA
P-133	Influence of ITO Surface Modification on the Growth of CdS and the Performance of CdTe Solar Cells J. E. Heo, H. K. Ahn, R. W. Lee, Y. Gu. Han and D. H. Kim Korea University, Korea
P-206	MOCVD-ZnO Windows for 30cmx30cm CIGS-based Modules B. Sang*, Y. Nogoya**, K. Kushiya** and O. Yamase*, ** *K. K. SVC Tokyo, Japan **Showa Shell Sekiyu K. K., Japan

[▲ Back to TOP](#)

■ **Poster Session II - CdTe**

P-134	Improvement in the Efficiency of Cu-Doped CdS/non-Doped CdS Photovoltaic Cells Fabricated by an All-Vacuum Process Y. Kashiwaba, K. Isojima and K. Ohta Iwate University, Japan
P-135	Thin CdS Films Produced by Metalorganic Chemical Vapor Deposition H. Uda, Y. Ohtsubo, H. Yonezawa and H. Sonomura Kinki University, Japan
P-136	The Effect of CdCl₂ Treatment Conditions and Stoichiometry on the Deep Level Density, Carrier Lifetime and Conversion Efficiency of CdTe Thin Film Solar Cells K. Kobayashi*, A. Sandhu*, T. Okamoto**, A. Yamada**, M. Konagai** *Tokai University, Japan **Tokyo Institute of Technology, Japan
P-137	Effects of the Growth Temperature on Structural, Electrical and Optical Properties of CdTe Films

	J. H. Lee*, W. C. Song*, J. H. Kim*, J. S. Yi*, Y. K. Park* and K. J. Yang** *Sungkyunkwan University, Korea **Chungju National University, Korea
P-138	Characteristics of the Cd_{1-x}Zn_xS Thin Film Doped by Thermal Diffusion of Vacuum Evaporated Indium Films W. C. Song*, J. H. Lee*, J. S. Yi*, Y. K. Park*, K. J. Yang** and Y. S. Yoo*** *Sungkyunkwan University, Korea **Chungju National University, Korea ***Yeoo Institute of Technology, Korea
P-139	CdTe Thin Film Solar Cells by Close-Spaced Sublimation with Evaporated Source S. Kitamoto, F. Koga, T. Okamoto, A. Yamada and M. Konagai Tokyo Institute of Technology, Japan
P-140	Cathodoluminescence Study of Highly Efficient CdTe Thin Film Solar Cells T. Okamoto*, A. Yamada*, M. Konagai* and U. Jahn** *Tokyo Institute of Technology, Japan **Paul-Drude-Institut für Festkörperelektronik, Germany
P-141	X-Ray Diffraction Analysis of CdTe Films with Different Compositions Fabricated by CMBD in Hydrogen Flow T. M. Razykov*, K. Sato**, T. Shimizu**, N. F. Khusainova*, K. M. Kouchkarov*, A. F. Troushin* and A. A. Usmanov* *Physical- Technical Institute, Uzbekistan **Tokyo University of Agriculture and Technology, Japan
P-142	High Temperature Growth of Thin Film Microcrystalline Silicon on Silicon Carbide Using EBEP-CVD M. Boreland* and M. Isogami** *Toyota Technological Institute, Japan **Toyota Central R&D Labs., Japan
P-143	Cu₂Te Back Contact for CdTe Solar Cells J. H. Yun, D. Y. Lee and B. T. Ahn Korea Advanced Institute of Science and Technology, Korea
P-144	Improved Performance of CIGS-Based Submodules with a Stacked Structure of ZnO Window Prepared by Sputtering Y. Nagoya*, B. Sang**, Y. Fujiwara*, K. Kushiya* and O. Yamase* *Showa Shell Sekiyu K.K., Japan **NEDO, Japan

[▲ Back to TOP](#)

■ **Poster Session III - III - V**

P-145	Extreme Radiation Hardness and Light Weighted Thin Film n_{-i-p}-InP Solar Cell and Its Computer Simulation G. Li*, Q. Yang*, Z. Yan*, W. Li*, S. Zhang*, J. Freeouf**, J. M. Woodall *** *Shijiazhuang Railway Institute, China **Interface Studies Inc., USA ***Yale University, USA
P-146	Raman Characterization of Lattice-Matched GaInAsN Layers Grown on GaAs(001) Substrates A. Hashimoto*, T. Kitano*, A. K. Nguyen*, A. Masuda**, A. Yamamoto*, S. Tanaka***, M. Takahashi****, A. Moto***, T. Tanabe*** and S. Takagishi*** *Fukui University, Japan **JAIST, Japan ***Basic High-Technology Laboratories, Japan ****Opto-Electronics Laboratories, Japan
P-147	Radiation Tolerance of Both-Side-Junction Solar Cell O. Anzawa*, M. Imaizumi*, S. Matsuda*, T. Ohshima**, H. Itoh** and T. Saga*** *NASDA, Japan **Japan Atomic Energy Research Institute, Japan ***SHARP Corporation, Japan
P-148	Analysis of Generated Power of ETS-VII during Solar Activity Maximum Period R. Fujita*, M. Imaizumi**, K. Aoyama**, S. Matsuda** and S. Tokunaga* *Space Engineering Development Co., Ltd. Japan **NASDA, Japan
P-149	Betacells Based on AlGaAs/GaAs and AlGaP/ GaP Heterostructures V. M. Andreev*, A. G. Kavetsky**, V. S. Kalinovsky*, V. P. Khvostikov*, V. R. Larionov*, V. G. Nikitin*, E. V. Yakimova*, V. A. Ustinov**, O. V. Pakkonen* and M. Z. Shvarts* *Ioffe Physico-Technical Institute, Russia **Khlopin Radium Institute, Russia
P-150	Composite Fresnel Lens Panels for Terrestrial Concentrator Modules with III-V Solar Cells V. D. Romyantsev, V. A. Grilikhes, N. A. Sadchikov, A. A. Soluyanov and M. Z. Shvarts Ioffe Physico-Technical Institute, Russia
P-151	Defect Passivation of In_{0.49}Ga_{0.51}P Grown on Si substrate by PH₃/H₂ Plasma Exposure Towards High Conversion Efficiency Solar Cell

	G. Wang, K. Akahori, T. Soga, T. Jimbo and M. Umeno Nagoya Institute of Technology, Japan
P-152	Electrical Characteristics of GaAs on Si Substrates by Bonding Using Selenium Sulphide – A Study for Solar Cells Applications J. Arokiaraj*, H. Taguchi**, K. Itakura*, T. Soga*, T. Jimbo* and M. Umeno* *Nagoya Institute of Technology, Japan **Sanyo Electric Works, Japan
P-153	The Properties of the PH₃/H₂ Plasma-Exposed GaAs Solar Cells Grown on Si Substrate K. Murase, K. Hori, T. Ogawa, G. Wang, T. Soga**, T. Jimbo **and M. Umeno*** Nagoya Institute of Technology, Japan
P-154	Investigation of Carrier Removal Effect in 10 MeV Proton and 1 MeV Electron Irradiated InGaP Space Solar Cells A. Khan*, M. Yamaguchi*, N. Dharmarasu*, J. C. Bourgoin**, T. Takamoto***, H. Itoh****, T. Ohshima****, M. Imaizumi***** and S. Matsuda***** *Toyota Technological Institute, Japan **Université Pierre et Marie, France ***Japan Energy Corporation, Japan ****Japan Atomic Energy Research Institute, Japan *****NASA, Japan
P-155	Proton Irradiation Effects in Single and Tandem InGaP Solar Cells N. Dharmarasu*, A. Khan*, M. Yamaguchi*, T. Takamoto**, T. Ohshima***, H. Itoh***, M. Imaizumi**** and S. Matsuda**** *Toyota Technological Institute, Japan **Japan Energy Corporation, Japan ***Japan Atomic Research Institute, Japan ****National Space Development Agency of Japan, Japan
P-156	Low Energy Proton Induced Defects on n+/p InGaP Solar Cell Structure N. Dharmarasu*, A. Khan*, M. Yamaguchi*, T. Takamoto**, T. Ohshima***, H. Itoh***, M. Imaizumi**** and S. Matsuda**** *Toyota Technological Institute, Japan **Japan Energy Corporation, Japan ***Japan Atomic Energy Research Institute, Japan ****National Space Development Agency of Japan, Japan
P-157	Study on the 3 MeV Proton Irradiated Si Single Crystal J. S. You*, J. M. Kang**, D. H. Kim**, J. H. Pak** and C. S. Kang* *Seoul National University, Korea **Korea University, Korea

[▲ Back to TOP](#)

■ Poster Session III - Modules, System and Applications

P-158	Photovoltaic and Power Consumption of the Energy Saving Housing J. Itsumi Sojo University, Japan
P-159	Investigation on Abundant Electric Energy Generated by 40kW PV System in Wakayama National College of Technology T. Yamaguchi, Y. Okamoto and M. Taberi Wakayama College of Technology, Japan
P-160	Concentrating Solar Module with Horizontal Reflectors T. Matsushima, T. Setaka and S. Muroyama R&D Dept., NTT Facilities, Japan
P-161	Portable Measuring Apparatus for Solar Cell Module F. Kong and J. Shi Tianjin Institute of Power Sources, China
P-162	Study of 5 kW Hybrid Wind/Solar System S. Karabanov and B. Sazhim Ryazan Metal Ceramics Instrumentation Plant, Russia
P-163	A Diagnostics Method of Generating Power by Utilizing the Rated Value of a Photovoltaic Module N. Yonekura, K. Naka, H. Kawamura, S. Yamanaka, H. Ohono, Hideaki. Kawamura and K. Naito Meijo University, Japan
P-164	Simulation of I-V Characteristics of a PV Module with Shaded PV Cells K. Naka, N. Yonekura, Hajime. Kawamura, S. Yamanaka, Hideaki Kawamura, H. Ohno and K. Naito Meijo University, Japan
P-165	Error Analysis of Solar Simulator Calibration Method of NASDA

	K. Aoyama*, M. Imaizumi*, S. Matsuda*, Y. Matsumoto**, Y. Kiyota***, Y. Uchida*** and T. Okura**** *NASDA, Japan **Advanced Engineering Services Co., Ltd., Japan ***SHARP Corporation, Japan ****Maki Manufacturing Co., Ltd., Japan
P-166	Highly Accurate Simulation Method Using Energy Flow Model for Photovoltaic Module Characteristic T. Setaka, H. Shima, and T. Matsushima R&D Dept., NTT Facilities, Japan
P-167	Performance Monitoring of Photovoltaic Arrays Installed on Building Sidewalls K. Yoshioka*, K. Miyanoiri*, T. Saitoh* and S. Yatabe** *Tokyo University of Agriculture and Technology, Japan **Shirouma Science Co., Ltd.. Japan
P-168	Performance Improvement of a Static Concentrator Module with an Asymmetric V-Groove Backsheet Structure K. Koizumi*, K. Sugita**, K. Yoshioka* and T. Saitoh* *Tokyo University of Agriculture and Technology, Japan **Japan Advanced Institute of Science and Technology, Japan
P-169	Study of AC-Module Inverters Under Extreme Desert Conditions D. Faiman*, D. Berman*, E. de Held** and H. Oldenkamp*** *Ben-Gurion University, Israel **NKF, The Netherlands ***OKE-Services, The Netherlands
P-170	PV Modules in Unintended Construction J. Close University of Hong Kong, Hong Kong
P-171	Monitoring of Two Photovoltaic Systems in Thailand W. Rakwichian and N. Ketjoy Naresuan University, Thailand
P-172	Flexible Thin Membrane PV Modules for Membrane Structures S. Yoshinaka*, H. Tsubota*, H. Fujii** and J. Imanaka*** *Kajima Technical Research Institute, Japan **Fuji Electric Co., Ltd., Japan ***Fuji Electric Corporate Research and Development, Ltd., Japan ****Taiyo Kogyo Corporation, Japan
P-173	Development of Low-Cost and High-Efficiency Silicon Solar Cells and Modules M. Hagino, Y. Funakoshi, K. Kawano, M. Kaneiwa and T. Saga SHARP Corporation, Japan
P-174	A Voltage Regulation Method for Dispersed Grid-Connected PV Systems Under High-Density Connection N. Okada and K. Takigawa Central Research Institute of Electric Power Industry, Japan
P-175	New Type of Photovoltaic Module Integrated with Roofing Material (Highly Fire-Resistant PV Tile) K. Murata, T. Yagiura, K. Takeda, M. Tanaka and S. Kiyama Sanyo Electric Co., Ltd., Japan
P-176	Diagnostic Technology and Expert System for Photovoltaic Systems Using the Learning Method Y. Yagi, H. Kishi, R. Hagihara, T. Tanaka, S. Kozuma, T. Ishida, M. Waki, M. Tanaka and S. Kiyama Sanyo Electric Co., Ltd., Japan
P-177	Field-Test Analysis of PV System Output Characteristics Focusing Upon Module Temperature K. Nishioka*, T. Hatayama*, Y. Uraoka*, T. Fuyuki*, R. Hagihara** and M. Watanabe*** *Nara Institute Science and Technology, Japan **Sanyo Electric Corporation, Japan ***SHARP Corporation, Japan
P-178	Evaluation of the Performance of the Photovoltaic System with Maximum Power Point (MPP) H. Hadi*, S. Tokuda** and S. Rahardjo* *Energy Technology Laboratory, Indonesia **Kochi University of Technology, Japan
P-179	Photovoltaic Sunshade System E. J. Lee Semyung University, Korea
P-180	3kW Utility Interactive Residential Photovoltaic System of Chosun University in Korea

	H. L. Baek, K. B. Kim, S. K. Park, K. Y. Lee, Y. O. Choi and G. B. Cho Chosun University, Korea
P-181	New Control Method of Maximum Power Controller for Photovoltaic Power System G. B. Cho*, K. S. Seo*, H. W. Lim*, H. L. Baek* and D. H. Kim** *Chosun University, Korea **Yosu Technical College, Korea
P-182	Yield Issues on the Fabrication of 30cm x 30cm-Sized Cu(InGa)Se₂-Based Thin-Film Modules K. Kushiya*, M. Ohshita*, I. Hara*, Y. Tanaka*, B. Sang**, Y. Nagoya*, M. Tachiyuki* and O. Yamase* *Showa Shell Sekiyu K. K., Japan **NEDO, Japan
P-183	Reflection and Absorption Characteristics of Electromagnetic Waves for PV Modules A. Yamaguchi, K. Kurokawa, T. Uno and M. Takahashi Tokyo University of Agriculture and Technology, Japan
P-184	Shading Loss Analysis of PV Systems in Urban Area K. Otani*, K. Sakuta*, T. Tomori** and K. Kurokawa** *AIST, Japan **Tokyo University of Agriculture and Technology, Japan
P-185	The Evaluation Method of PV Systems T. Oozeki*, T. Izawa*, K. Otani** and K. Kurokawa* *Tokyo University of Agriculture and Technology, Japan **National Institute of Advanced Industrial Science and Technology, Japan
P-186	Estimation of Equivalent Circuit Model Parameters of PV Module and Its Temperature Coefficients M. Teramoto, F. Nakanishi, T. Ikegami, Y. Yamagata and K. Ebihara Kumamoto University, Japan
P-187	A Maximum Power Point Tracking for Photovoltaic-SPE System Using Maximum Current Controller R. Muhida, N. Park and K. Matsuura Osaka University, Japan
P-188	High-Frequency DC Link Inverter for Utility Interactive Photovoltaic System Y. S. Jung*, G. J. Yu* and S. H. Lee** *KIER, Korea **Samsung SDI, Korea
P-189	Evaluation of Long Term Operation of 50kW Class Grid-Connected Photovoltaic Power Generation System K. S. Ahn*, H. C. Lim and I. H. Hwang** *Korea Electric Power Research Institute, Korea **Chungbuk Provincial University of Science & Technology, Korea
P-190	Performance of a Small Utility-Interactive PV System with Single Phase Inverter I. H. Hwang*, K. S. Ahn**, H. C. Lim** and S. S. Kim*** *Chungbuk Provincial University of Science & Technology, Korea **Korea Electric Power Research Institute, Korea ***Hwx Power System Co., Korea
P-191	Spectrum Fill Factor for High Efficiency PV Modules K. Araki and M. Yamaguchi Toyota Technological Institute, Japan
P-192	Sunshine Environment and Spectrum Analysis for Concentrator PV Systems in Japan K. Araki and M. Yamaguchi Toyota Technological Institute, Japan
P-193	Long Term Degradation Phenomena of Crystalline Si Solar Modules A. Kitamura and H. Matsuda The Kansai Electric Power Company, Japan
P-194	Current State and Future Prospects of PV System A. Kitamura The Kansai Electric Power Company, Japan
P-195	The New Technique for Large Area Thin Film CdS/CdTe Solar Cells

	A. Aramoto, F. Adurodija, Y. Nishiyama, T. Arita, A. Hanafusa, K. Omura and A. Morita Matsushita Battery Industrial Co., Ltd., Japan
P-196	Evaluation of a Proper Controller Performance for Maximum-Power Point Tracking of a Stand-Alone PV System A. El-Shafy*, F. H. Fahmy* and E. M. A. El-Zahab** *Electronics Research Institute, Egypt **Cairo University, Egypt
P-207	Effectiveness of Dark Measurements Techniques to Characterise PV Modules M. Pellegrino, G. Flaminio and A. Sarno ENEA Centro Ricerche, Italy

[▲ Back to TOP](#)

■ **Poster Session III - National Programs**

P-197	Hammarby Sjöstad-An Interdisciplinary Case Study of the Integration of Photovoltaics in a New Ecologically Sustainable Residential Area in Stockholm M. Borgren* and A. Green** *Uppsala University, Sweden **Linköping University, Sweden
P-198	Measurements, Analysis and Evaluation of Residential PV Systems by Japanese Monitoring Program T. Sugiura*, T. Yamada*, H. Nakamura*, M. Umeya*, K. Sakuta** and K. Kurokawa*** *Solar Techno Center, Japan **National Institute of Advanced Industrial Science and Technology, Japan ***Tokyo University of Agriculture and Technology, Japan
P-199	Tilt Angle Dependence of Output Power in an 80kWp Hybrid PV System Installed at Shiga in Japan S. Hiraoka, T. Fujii, H. Takakura and Y. Hamakawa Ritsumeikan University, Japan
P-200	The Project to honor His Majesty King Bhumibol Adulyadej on the Auspicious Occasion of His Majesty's Sixth-Cycle(72nd) Birthday Anniversary. Regarding the Utilization of Solar for Conservation of Energy and Environment at the Royal Development Projects P. Chandrasurin* and D. Kruangam** *The House of Representatives, Thailand **Chulalongkorn University, Thailand
P-201	Next Generation Russian Solar Arrays for Geostationary Spacecraft with 10-15 Years Lifetime V. A. Letin*, M. B. Kagan*, V. P. Nadorov*, G. D. Evenov**, E. N. Korchagin** and A. G. Kozlov** **"KVANT" SPRE, Russia **NPO PM, Russia
P-202	Electricfication for Remote Areas with Renewable Energy in Vietnam Duong Duy Hoat Institute of materials Science, Vietnam
P-203	Assessment of Centralized, Rural-Based Photovoltaic Battery Charging Stations in Thailand R. Songprakorp, T. Somsak, S. Thepa and K. Kirtikara King Mongkut's University of Technology, Thailand
P-204	Hierarchical Technique for Hydropower Plants at the New Valej of Egypt and Toshka Area Faten H. Fahmy Electronics Research Institute, Egypt

[▲ Back to TOP](#)

■ **Symposium 1 : Potential VLS-PV on Desert**

S-1	International Symposium on "Potential of Very Large Scale Power Generation System on Desert" J. Song*, K. Kurokawa**, P. Menna***, K. Kato****, N. Enbish*****, D. Collier***** and S. C. Shin* *Korea Institute of Energy Research, Korea **Tokyo University of Agriculture and Technology, Japan ***ENEA, Italy ****NEDO, Japan *****Post and Telecommunication Authority of Mongolia, Mongolia *****SMUD, USA
S-2	International Cooperation Project to Realize VLS-PV S. C. Shin and J. Song KIER, Korea

[▲ Back to TOP](#)

■ **Symposium 2 : The Role of NGO for PV Dissemination**

S-3	The Role of NGOs for Alternative Energy
-----	---

	S. J. Lim Green Korea United, Korea
S-4	Commercialization of PV in Korea : Barriers and Challenges J. D. Kim Kyungpook National University, Korea
S-5	Strategies for the development of REA (Renewable Energy for All) System O.H.Lee Chungbuk National University, Korea

[▲ Back to TOP](#)

■ **Closing Session**

	PVSEC Paper Award Presentation J. Jang, Program Committee Chair KyungHee University
	Summary & Closing Remarks J. Jang, Program Committee Chair KyungHee University

[◀ Back to Previous Page](#)

[▲ Back to TOP](#)