

2010 35th IEEE Photovoltaic Specialists Conference

(PVSC 2010)

**Honolulu, Hawaii, USA
20 - 25 June 2010**

Pages 1 - 765



**IEEE Catalog Number: CFP10PSC-PRT
ISBN: 978-1-4244-5890-5**

TABLE OF CONTENTS

AREA 1: PLENARY, FUNDAMENTALS & NEW CONCEPTS

EXPERIMENTAL MEASUREMENT OF RESTRICTED RADIATIVE EMISSION IN QUANTUM WELL SOLAR CELLS	1
<i>J. G. J. Adams, W. Elder, P. N. Stavrinou, J. S. Roberts, M. Gonzalez, J. G. Tischler, R. J. Walters, J. Abell, I. Vurgaftman, J. R. Meyer, P. Jenkins, K. W. J. Barnham, N. J. Ekins-Daukes</i>	

AREA 2: ORALS, CIGS & CDTE: DEPOSITION & CHARACTERIZATION/WIDE BAND GAP & NOVEL MATERIALS-I

CORRELATIONS OF PHOTO-ELECTRO-THERMAL-LUMINESCENT IMAGING OF CU(IN,GA)SE₂ WITH DEVICE PERFORMANCE, DEFECTS, AND MICRO-STRUCTURAL PROPERTIES	6
<i>S. Johnston, I. Repins, R. Sundaramoorthy, K. M. Jones</i>	
MONOLITHICALLY INTEGRATED CIGS SUBMODULES FABRICATED ON FLEXIBLE SUBSTRATES	12
<i>S. Ishizuka, T. Yoshiyama, K. Mizukoshi, A. Yamada, S. Niki</i>	
LATEST RESULTS OF THE GERMAN JOINT PROJECT "FLEXIBLE CIGSE THIN FILM SOLAR CELLS FOR SPACE APPLICATIONS"	16
<i>K. Zajac, S. Brunner, C. A. Kaufmann, R. Caballero, H. W. Schock, A. Rahm, C. Scheit, H. Zachmann, F. Kessler, R. Wuerz, P. Schülke</i>	
DUAL ELECTROCHEMICAL AND PHOTOCHEMICAL ANILINE TREATMENT FOR CDTE SOLAR CELLS	20
<i>M. M. Tessema, K. Wieland, A. Compaan, D. M. Giolando</i>	
CHEMICAL STRUCTURE OF BURIED INTERFACES IN CDTE THIN FILM SOLAR CELLS	24
<i>S. Pookpanratana, F. Khan, Y. Zhang, C. Heske, L. Weinhardt, M. Bär, X. Liu, N. Paudel, A. Compaan</i>	

AREA 4: ORALS, CRYSTALLINE SILICON: DEVICES AND FABRICATION I

ENABLING DIELECTRIC REAR SIDE PASSIVATION FOR INDUSTRIAL MASS PRODUCTION BY DEVELOPING LEAN PRINTING-BASED SOLAR CELL PROCESSES	28
<i>T. Lauer mann, T. Lüder, S. Scholz, B. Raabe, G. Hahn, B. Terheiden</i>	
TOWARDS 19% EFFICIENT INDUSTRIAL PERC DEVICES USING SIMULTANEOUS FRONT EMITTER AND REAR SURFACE PASSIVATION BY THERMAL OXIDATION	34
<i>S. Mack, U. Jäger, G. Kästner, E. A. Wotke</i>	
TOWARDS HIGH EFFICIENCY ON FULL WAFER A-SI:H/C-SI HETEROJUNCTION SOLAR CELLS: 19.6% ON 148CM²	39
<i>D. Munoz, A. S. Ozanne, S. Harrison, A. Danel, F. Souche, C. Denis, A. Favier, T. Desrues, S. Martin de Nicolás, N. Nguyen, P. E. Hickel, P. Mur, T. Salvetat, H. Moriceau, Y. Le-Tiec, M. S. Kang, K. M. Kim, R. Janin, C. Pesenti, D. Blin, T. Nolan, I. Kashkoush, P. J. Ribeyron</i>	
EXCELLENT REAR SIDE PASSIVATION ON MULTI-CRYSTALLINE SILICON SOLAR CELLS WITH 20 NM UNCAPPED AL₂O₃ LAYER: INDUSTRIALIZATION OF ADK FOR SOLAR CELL APPLICATIONS	44
<i>I. Cesar, E. Granneman, P. Vermont, E. Tois, P. Manshanden, L. J. Geerligs, E. E. Bende, A. R. Burgers, A. A. Mewe, Y. Komatsu, A. W. Weber</i>	
N-TYPE SILICON - ENABLING EFFICIENCIES > 20% IN INDUSTRIAL PRODUCTION	50
<i>S. W. Glunz, J. Benick, D. Biro, M. Bivour, M. Hermle, D. Pysch, M. Rauer, C. Reichel, A. Richter, M. Rüdiger, C. Schmiga, D. Suwito, A. Wolf, R. Preu</i>	

AREA 1: ORALS, FUNDAMENTALS & NEW CONCEPTS: **FUNDAMENTAL MECHANISMS**

HOT CARRIER SOLAR CELLS: CHALLENGES AND RECENT PROGRESS	57
<i>M. A. Green, G. Conibeer, D. König, S. Shrestha, S. Huang, P. Aliberti, L. Treiber, R. Patterson, B. P. Veetil, A. Hsieh, Y. Feng, A. Luque, A. Marti, P. G. Linares, E. Cánovas, E. Antolin, D. F. Marron, C. Tablero, E. Hernandez, J. F. Guillemoles, L. Huang, A. Bris, T. Schmidt, R. Clady, M. Tayebjee</i>	
HOT CARRIER SOLAR CELL EFFICIENCY SIMULATION WITH CARRIER EXTRACTION THROUGH NON IDEAL SELECTIVE CONTRACTS	61
<i>A. Bris, J. F. Guillemoles</i>	
ADVANCES IN QUANTUM DOT INTERMEDIATE BAND SOLAR CELLS	65
<i>E. Antolin, A. Marti, P. G. Linares, I. Ramiro, E. Hernandez, C. D. Farmer, C. R. Stanley, A. Luque</i>	
SELF-CONSISTENT DRIFT-DIFFUSION ANALYSIS OF INTERMEDIATE BAND SOLAR CELL (IBSC): EFFECT OF ENERGETIC POSITION OF IB ON CONVERSION EFFICIENCY	71
<i>K. Yoshida, Y. Okada, N. Sano</i>	
LIMIT OF NANOPHOTONIC LIGHT-TRAPPING IN SOLAR CELLS	76
<i>Z. Yu, A. Raman, S. Fan</i>	

AREA 6: ORALS, ORGANIC PHOTOVOLTAICS: BULK **HETEROJUNCTION ORGANIC SOLAR CELLS**

DETERMINATION OF RECOMBINATION MECHANISMS IN ORGANIC SOLAR CELLS	79
<i>R. A. Street, M. Schoendorf</i>	
MORPHOLOGY DEPENDENT SHORT CIRCUIT CURRENT IN BULK HETEROJUNCTION SOLAR CELL	85
<i>B. Ray, P. R. Nair, M. A. Alam</i>	
EFFICIENT BULK HETEROJUNCTION SOLAR CELLS INCORPORATING CORBON NANOTUBES AND WITH ELECTRON SELECTIVE INTERLAYERS	90
<i>G. Kalita, K. Wakita, M. Umeno</i>	
ROLE OF SINGLE WALLED CARBON NANOTUBES IN IMPROVING THE EFFICIENCY OF P3HT:PCBM SOLAR CELLS-	95
<i>A. T. Mallajosyula, S. S. K. Lyer, B. Mazhari</i>	
OPTIMIZATION OF ORGANIC PHOTOVOLTAIC DEVICES USING TUNED MIXED METAL OXIDE CONTACT LAYERS	102
<i>K. X. Steirer, N. E. Widjonarko, A. K. Sigdel, M. T. Lloyd, D. S. Ginley, D. C. Olson, J. J. Berry</i>	

AREA 7: ORALS, SPACE TECHNOLOGIES: **SPACE MATERIALS AND DEVICES**

DEVELOPMENT OF A FOUR SUB-CELL INVERTED METAMORPHIC MULTI-JUNCTION (IMM) HIGHLY EFFICIENT AM0 SOLAR CELL	105
<i>A. B. Cornfeld, D. Aiken, B. Cho, A. V. Ley, P. Sharps, M. Stan, T. Varghese</i>	
IMM EXPERIMENTATION IN THE NEXT FRONTIER: EMCORE'S PARTICIPATION IN THE MISSE-8 PROGRAM	110
<i>B. Cho, R. Lutz, J. Pappan, E. Downard, A. Cornfeld, N. Fatemi, M. A. Stan, P. Sharps, C. Su, S. Billets, S. Gasner, A. Howard</i>	
PATH TO A DROP-IN REPLACEMENT FOR CURRENT TECHNOLOGIES WITH THE 33% LARGE AREA, IMM CELL	113
<i>D. Chumney, D. Aiken, B. Cho, A. Cornfield, J. Diaz, V. Ley, J. Mittman, F. Newman, P. Sharps, M. Stan, T. Varghese</i>	
DEVELOPMENT OF RADIATION HARD GA0.50P/GA0.99IN0.01AS/GE SPACE SOLAR CELLS WITH MULTI QUANTUM WELLS	117
<i>R. Kellenbenz, R. Hoheisel, P. Kailuweit, W. Guter, F. Dimroth, A. W. Bett</i>	
DEVELOPMENT OF ADVANCED SPACE SOLAR CELLS AT SPECTROLAB	123
<i>J. Boisvert, D. Law, R. King, D. Bhusari, X. Liu, A. Zakaria, W. Hong, S. Mesropian, D. Larrabee, R. Woo, A. Boca, K. Edmondson, D. Krut, D. Peterson, K. Rouhani, B. Benedikt, N. H. Karam</i>	

JAXA'S STRATEGY FOR DEVELOPMENT OF HIGH-PERFORMANCE SPACE PHOTOVOLTAICS	128
<i>M. Imaizumi, M. Takahashi, T. Takamoto</i>	

AREA 10: PROGRAMS AROUND THE GLOBE

THE PHOTOVOLTAIC TECHNOLOGY INCUBATOR PROJECT	132
<i>K. VanSant, M. Symko-Davies, R. Mitchell, B. Keyes, H. Ullal, B. Von-Roedern, S. Stephens</i>	
PV TRENDS IN JAPAN - PROGRESS OF THE PV MARKET BY NEW SUPPORT MEASURES	136
<i>I. Kaizuka, T. Ohigashi, H. Matsukawa, O. Ikki</i>	

AREA 5: ORALS, AMOPPHOUS, NC, & FILM SILICON: FUNDAMENTAL FILM PROPERTIES

STAEBLER-WRONSKI DEFECTS: CREATION EFFICIENCY, STABILITY, AND EFFECT ON A-SI:H SOLAR CELL DEGRADATION	142
<i>P. Stradins</i>	
DEPENDENCE OF RECOMBINATION IN PROTOCRYSTALLINE A-SI:H FILMS AND CELL ON THEIR DIFFERENT LIGHT INDUCED GAP STATES	146
<i>C. Wronski, J. Deng, X. Niu, A. H. M. Smets</i>	
VOC-LIMITING RECOMBINATION MECHANISMS IN THIN FILM SILICON ON GLASS SOLAR CELLS	152
<i>J. Wong, J. Huang, M. Keevers, M. Green</i>	
MICROSTRUCTURAL EVOLUTION IN SHI-XGEX:H THIN FILMS FOR PHOTOVOLTAIC APPLICATIONS	158
<i>N. J. Podraza, D. B. S. John, R. Li, C. R. Wronski, E. C. Dickey, R. W. Collins</i>	

AREA 2: ORALS, CIGS & CDTE: MODULES, MANUFACTURING, AND RELIABILITY

ACHIEVEMENT OF 16% MILESTONE WITH 30CMX30CM-SIZED CIS-BASED THIN-FILM SUBMODULES	164
<i>Y. Chiba, S. Kijima, H. Sugimoto, Y. Kawaguchi, M. Nagahashi, T. Morimoto, T. Yagioka, T. Miyano</i>	
FLEXIBLE CELLS AND MODULES PRODUCED USING ROLL-TO-ROLL ELECTROPLATING APPROACH	169
<i>M. Pinarbasi, S. Aksu, J. Freitag, T. Boone, H. Zolla, J. Vasquez</i>	
COPPER INDIUM GALLIUM SELENIDE PHOTOVOLTAIC MODULES MANUFACTURED BY REACTIVE TRANSFER	175
<i>D. Lu, B. Sang, Y. Deng, B. J. Stanbery, L. Eldada</i>	
CIGS P1, P2, AND P3 LASER SCRIBING WITH AN INNOVATIVE FIBER LASER	179
<i>R. Murison, C. Dunskey, M. Rekow, C. Dinkel, J. Pern, L. Mansfield, T. Panarello, S. Nikumb</i>	
DRIVING DOWN CIGS COST OF OWNERSHIP WITH HIGH VOLUME THERMAL DEPOSITION SYSTEMS	185
<i>J. Patrin, C. Conroy, J. G. Wen, D. Brown, D. Brown, K. Pfeiffer, D. Fobare, J. Novak, J. Amadon, D. Metacarpa</i>	

AREA 3: ORALS, III-V'S & CONCENTRATORS: III-V CONCENTRATOR SOLAR CELLS AND RECEIVERS

STATUS OF 40% PRODUCTION EFFICIENCY CONCENTRATOR CELLS AT SPECTROLAB	189
<i>R. K. Jones, P. Hebert, P. Pien, R. R. King, D. Bhusari, R. Brandt, O. Taher, C. Fetzer, J. Ermer, A. Boca, D. Larrabee, X. B. Liu, N. Karam</i>	
DEVELOPMENT, COST REDUCTION AND CUSTOMIZED DESIGN OF INDUSTRIAL CONCENTRATOR SOLAR CELLS WITH EFFICIENCIES APPROACHING 40% AND ABOVE	196
<i>W. Guter, W. Bensch, R. Kern, W. Kostler, M. Meusel, G. Strobl, S. V. Riesen, T. Gerstmaier, A. Gombert, F. Dimroth, A. W. Bett</i>	

SIMULATION OF NONUNIFORM IRRADIANCE IN MULTIJUNCTION III-V SOLAR CELLS	201
<i>J. M. Olson</i>	
SELF-ASSEMBLED SiO₂ PARTICLE COATING ON 2 LAYER ANTI-REFLECTION FILMS FOR EFFICIENCY ENHANCEMENT OF GaAs PV CELLS	205
<i>K. Watanabe, A. Higo, M. Sugiyama, Y. Nakano</i>	
EMCORE RECEIVERS FOR CPV SYSTEM DEVELOPMENT	209
<i>J. S. Foresi, L. Yang, P. Blumenfeld, J. Nagyvary, G. Flynn, D. Aiken</i>	
HEAT TRANSFER MODELING OF CONCENTRATOR MULTIJUNCTION SOLAR CELL ASSEMBLIES USING FINITE DIFFERENCE TECHNIQUES	213
<i>H. Cotal, J. Frost</i>	

AREA 8: ORAL PV CHARACTERIZATION: DEFECT STATES

NOVEL APPLICATIONS OF NEAR-FIELD SCANNING OPTICAL MICROSCOPY: MICROLUMINESCENCE FROM LOCAL JUNCTION BREAKDOWN IN SOLAR CELLS	219
<i>M. J. Romero</i>	
PHOTOVOLTAIC DEVICE CHARACTERIZATION WITH OPTICAL SECOND HARMONIC GENERATION	223
<i>L. He, C. T. Rogers, M. Page, E. Iwaniczko, K. Alberi, C. Beall, A. Kanevce, L. Roybal, H. M. Branz, C. W. Teplin</i>	
DIFFUSED JUNCTIONS IN MULTICRYSTALLINE SILICON SOLAR CELLS STUDIED BY COMPLEMENTARY SCANNING PROBE MICROSCOPY AND SCANNING ELECTRON MICROSCOPY TECHNIQUES	227
<i>J. T. Heath, C. S. Jiang, M. M. Al-Jassim</i>	
SCANNING TUNNELING MICROSCOPY AS A PROBE OF DEFECTS IN CULNSE2	233
<i>M. Mayer, P. Martin, J. Lyding, A. A. Rockett</i>	
DEFECT CHARACTERIZATION BY ADMITTANCE SPECTROSCOPY TECHNIQUES BASED ON TEMPERATURE-RATE DUALITY	239
<i>J. V. Li, Y. Yan, A. J. Ptak, I. L. Repins, D. H. Levi</i>	

AREA 9: ORALS, PV MODULES & SYSTEMS: PV MODULES AND MATERIALS

TEST-TO-FAILURE OF CRYSTALLINE SILICON MODULES	244
<i>P. Hacke, K. Terwilliger, S. Glick, D. Trudell, N. Bosco, S. Johnston, S. Kurtz</i>	
FAILURE ANALYSIS OF MODULE DESIGN QUALIFICATION TESTING - III: 1997-2005 VS. 2005-2007 VS. 2007-2009	251
<i>G. Tamizhmani, B. Li, T. Arends, J. Kuitche, B. Raghuraman, W. Shisler, K. Farnsworth, A. Voropayev, D. Parker</i>	
EVALUATION AND MODELING OF EDGE-SEAL MATERIALS FOR PHOTOVOLTAIC APPLICATIONS	256
<i>M. D. Kempe, A. A. Dameron, T. J. Moricone, M. O. Reese</i>	
CREEP IN PHOTOVOLTAIC MODULES: EXAMINING THE STABILITY OF POLYMERIC MATERIALS AND COMPONENTS	262
<i>D. C. Miller, M. D. Kempe, S. H. Glick, S. R. Kurtz</i>	
AN OPTICAL COMPARISON OF SILICONE AND EVA ENCAPSULANTS UNDER VARIOUS SPECTRA	269
<i>K. R. McIntosh, J. N. Cotsell</i>	

AREA 4: PLENARY, CRYSTALLINE SILICON

GENERATION 3: IMPROVED PERFORMANCE AT LOWER COST	275
<i>P. J. Cousins, D. D. Smith, H. C. Luan, J. Manning, T. D. Dennis, A. Waldhauer, K. E. Wilson, G. Harley, W. P. Mulligan</i>	

AREA 5: PLENARY, AMORPHOUS, NC, & FILM SILICON

THIN-FILM POLYCRYSTALLINE SILICON SOLAR CELLS WITH LOW INTRAGRAIN DEFECT DENSITY MADE VIA LASER CRYSTALLIZATION AND EPITAXIAL GROWTH	279
<i>D. Van-Gestel, M. Chahal, P. C. Van-Der-Wilt, Y. Qiu, I. Gordon, J. S. Im, J. Poortmans</i>	

JOINT SESSION AREAS 9 & 10 ORAL: HIGH PENETRATION PV: HAWAIIAN SYSTEMS EXPERIENCE

LANAI HIGH-DENSITY IRRADIANCE SENSOR NETWORK FOR CHARACTERIZING SOLAR RESOURCE VARIABILITY OF MW-SCALE PV SYSTEM	283
<i>S. Kuszamaul, A. Ellis, J. Stein, L. Johnson</i>	
METHODS OF INTEGRATING A HIGH PENETRATION PHOTOVOLTAIC POWER PLANT INTO A MICRO GRID	289
<i>R. Johnson, L. Johnson, L. Nelson, C. Lenox, J. Stein</i>	

AREA 5: ORALS, AMORPHOUS, NC, & FILM SILICON: LIGHT MANAGEMENT, TCOS AND ALTERNATIVE MULTIJUNCTIONS

IMPACT OF FRONT AND REAR-SIDE TEXTURING ON LIGHT TRAPPING IN THIN-FILM SILICON SOLAR CELLS.....	295
<i>H. Sai, M. Kondo</i>	
COMPREHENSIVE EXPERIMENTAL AND NUMERICAL OPTIMIZATION OF SURFACE MORPHOLOGY OF TRANSPARENT CONDUCTIVE OXIDE FILMS FOR TANDEM THIN FILM PHOTOVOLTAIC CELLS	301
<i>M. Agrawal, M. Frei, Y. Bhatnagar, T. Repmann, K. Witting, J. Schroeder, C. Eberspacher</i>	
ELECTRODEPOSITION OF LOW-RESISTIVITY Y-DOPED ZNO AND ITS THERMAL STABILITY	305
<i>X. Han, M. Tao</i>	
APPLICATION OF MICROCRYSTALLINE SI1-XGEX INFRARED ABSORBERS IN TRIPLE JUNCTION SOLAR CELLS.....	311
<i>T. Matsui, H. Jia, M. Kondo, K. Mizuno, S. Tsuruga, S. Sakai, Y. Takeuchi</i>	
SILICON BASED MULTIJUNCTION SOLAR CELLS WITH WIDE-GAP A-SI1-XCX:H TOP CELL: EXPERIMENTAL AND NUMERICAL APPROACHES	317
<i>I. A. Ynaz, S. Miyajima, M. Konagai</i>	

AREA 2: ORALS, CIGS & CDTE: DEVICE PROPERTIES AND MODELING/CHARACTERIZATION

ASSESSING POSSIBILITIES & LIMITS FOR THIN FILM SOLAR CELLS.....	323
<i>D. Cahen, L. Barnea</i>	
DEVICE CHARACTERIZATION OF (AGCU)(INGA)SE2 SOLAR CELLS	325
<i>W. Shafarman, C. Thompson, J. Boyle, G. Hanket, P. Erslev, J. D. Cohen</i>	
CIGS THIN FILM SOLAR CELLS ON POLYIMIDE FOILS	330
<i>T. Nakada, T. Kuraishi, T. Inoue, T. Mise</i>	
COMPARISON OF CDS/CDTE SUPERSTRATE AND SUBSTRATE DEVICES FABRICATED WITH A ZNTE: CU CONTACT INTERFACE	335
<i>T. A. Gessert, R. G. Dhere, J. N. Duenow, J. V. Li, S. E. Asher, M. R. Young</i>	
THE EFFECT OF CDTE DEPOSITION TEMPERATURE ON DEVICE PROPERTIES OF DIFFERENT TCOS AND GLASS SUBSTRATES	340
<i>R. Dhere, M. Bonnet-Eymard, E. Charlet, E. Peter, J. Duenow, H. Moutinho, J. V. Li, M. Scott, D. Albin, T. Gessert</i>	

AREA 4: ORALS, CRYSTALLINE SILICON: DEFECT PASSIVATION

IMPACT OF DEFECT TYPE ON HYDROGEN PASSIVATION EFFECTIVENESS IN MULTICRYSTALLINE SILICON SOLAR CELLS	345
<i>M. I. Bertoni, S. Hudelson, B. K. Newman, S. Bernardis, D. P. Fenning, H. F. W. Dekkers, E. Cornagliotti, A. Zuschlag, G. Micard, G. Hahn, G. Coletti, B. Lai, T. Buonassisi</i>	
μXRF INVESTIGATIONS ON THE INFLUENCE OF SOLAR CELL PROCESSING STEPS ON IRON AND COPPER PRECIPITATES IN MULTICRYSTALLINE SILICON	347
<i>A. Zuschlag, S. Ohl, J. Bernhard, H. Morhenn, J. Ebser, J. Junge, S. Seren, G. Hahn</i>	
BORON, PHOSPHORUS AND ALUMINUM GETTERING OF IRON IN CRYSTALLINE SILICON: EXPERIMENTS AND MODELLING	352
<i>S. P. Phang, D. Macdonald</i>	
STRESS AND TEMPERATURE COUPLING EFFECTS ON DISLOCATION DENSITY REDUCTION IN MULTICRYSTALLINE SILICON	357
<i>S. Castellanos, M. I. Bertoni, M. Vogl, A. Fecych, T. Buonassisi</i>	
INFLUENCE OF EMITTER PROFILE CHARACTERISTICS ON THERMAL STABILITY AND PASSIVATION QUALITY OF A-SI/SINX-PASSIVATED BORON EMITTERS	359
<i>M. Kessler, S. Gatz, P. Altermatt, N. P. Harder, R. Brendel</i>	

AREA 1: ORALS, FUNDAMENTALS & NEW CONCEPTS: MULTIPLE QUANTUM WELL OR DOT SOLAR CELLS

TEMPERATURE DEPENDENT PHOTOLUMINESCENCE SPECTROSCOPY OF INAS/GAAS SOLAR CELLS	364
<i>C. G. Bailey, S. J. Polly, J. Okvath, D. V. Forbes, C. D. Cress, S. M. Hubbard, R. P. Raffaele</i>	
THIRD GENERATION PHOTOVOLTAICS: MULTIPLE EXCITON GENERATION IN COLLOIDAL QUANTUM DOTS, QUANTUM DOT ARRAYS, AND QUANTUM DOT SOLAR CELLS	370
<i>M. C. Beard, J. M. Luther, A. G. Midgett, O. E. Semonin, J. C. Johnson, A. J. Nozik</i>	
HOW SHALL WE PUT MULTIPLE QUANTUM WELLS IN P-I-N STRUCTURE FOR EFFICIENCY ENHANCEMENT?	376
<i>M. Sugiyama, Y. Wang, S. Choi, Y. Wen, Y. Nakano</i>	
MODELING OF 1 EV DILUTE NITRIDE MULTI-QUANTUM WELL SOLAR CELL	380
<i>G. K. Vijaya, A. Alemu, A. Freundlich</i>	
STRAIN-COMPENSATED MULTIPLE STEPPED QUANTUM WELLS (SC-MSQWS) CELL FOR ENHANCED SPECTRAL RESPONSE AND CARRIER TRANSPORT	385
<i>Y. Wen, Y. Wang, M. Sugiyama, Y. Nakano</i>	

AREA 9: ORALS, PV MODULES & SYSTEMS: INVERTERS AND OTHER BOS COMPONENTS

SIMULATION OF PV SYSTEMS WITH POWER OPTIMIZERS AND DISTRIBUTED POWER ELECTRONICS	389
<i>P. Tsao</i>	
PARTIALLY SHADED OPERATION OF MULTI-STRING PHOTOVOLTAIC SYSTEMS	394
<i>C. Deline</i>	
ENERGY-EFFICIENT COST-EFFECTIVE INVERTER CONFIGURATION FOR RESIDENTIAL PHOTOVOLTAIC SYSTEMS	400
<i>O. A. Bassioumy, S. V. Dhople, A. Davoudi, P. L. Chapman</i>	
FIRMWARE IMPLEMENTATION OF AN ADAPTIVE SOLAR CELL MAXIMUM POWER POINT TRACKING BASED ON PSOC	407
<i>W. S. Jwo, C. C. Tong, C. J. Chao</i>	

AREA 7: PLENARY, SPACE TECHNOLOGIES

WORLD'S HIGHEST EFFICIENCY TRIPLE-JUNCTION SOLAR CELLS FABRICATED BY INVERTED LAYERS TRANSFER PROCESS	412
<i>T. Takamoto, T. Agui, A. Yoshida, K. Nakaido, H. Juso, K. Sasaki, K. Nakamura, H. Yamaguchi, T. Kodama, H. Washio, M. Imaizumi, M. Takahashi</i>	

AREA 8: PLENARY, PV CHARACTERIZATION

ELECTRON BACKSCATTER DIFFRACTION: EXPLORING THE MICROSTRUCTURE IN CU(IN, GA)(S, SE)₂ AND CDTE THIN-FILM SOLAR CELLS	418
<i>D. Abou-Ras, R. Caballero, J. Kavalakkatt, M. Nichterwitz, T. Unold, H. W. Schock, S. Bucheler, A. N. Tiwari</i>	

AREA 9: PLENARY, PV MODULES & SYSTEMS

THE SOLAR EUROPE INDUSTRY INITIATIVE: RESEARCH, TECHNOLOGY DEVELOPMENT AND DEMONSTRATION IN SUPPORT OF 2020 AND LONG-TERM TARGETS	424
<i>W. C. Sinke, D. F. Montoro, E. Despotou, S. Nowak, E. Perezagua</i>	

AREA 4: ORALS, CRYSTALLINE SILICON: MATERIAL AND DEVICE CHARACTERIZATION

SYNCHROTRON-BASED MICROANALYSIS OF IRON DISTRIBUTION AFTER THERMAL PROCESSING AND PREDICTIVE MODELING OF RESULTING SOLAR CELL EFFICIENCY	430
<i>D. P. Fenning, J. Hofstetter, M. I. Bertoni, J. F. Lelievre, C. Canizo, T. Buonassisi</i>	
CAUSE OF INCREASED CURRENTS UNDER REVERSE-BIAS CONDITIONS OF UPGRADED METALLURGICAL GRADE MULTICRYSTALLINE SILICON SOLAR CELLS	432
<i>W. Kwapil, M. Wagner, M. C. Schubert, W. Warta</i>	
IRON IMAGING IN MULTICRYSTALLINE SILICON WAFERS VIA PHOTOLUMINESCENCE	439
<i>Y. C. Fan, J. Tan, S. P. Phang, D. Macdonald</i>	
TRAPPING-RELATED RECOMBINATION OF CHARGE CARRIERS IN SILICON	443
<i>R. Gogolin, N. P. Harder, R. Brendel</i>	
APPEARANCE OF RIFT STRUCTURES CREATED BY ACIDIC TEXTURIZATION AND THEIR IMPACT ON SOLAR CELL EFFICIENCY	447
<i>J. Nievendick, M. Demant, J. Haunchild, A. Krieg, F. M. M. Souren, S. Rein, M. Zimmer, J. Rentsch</i>	

AREA 1: ORALS, FUNDAMENTALS & NEW CONCEPTS: NEW PV MATERIALS II

AMORPHOUS SILICON CORE-SHELL NANOWIRE SCHOTTKY SOLAR CELLS	453
<i>J. Zhu, Y. Xu, Q. Wang, Y. Cui</i>	
REALIZATION OF INGAN SOLAR CELLS ON (111) SILICON SUBSTRATE	457
<i>B. Jampana, T. Xu, A. Melton, M. Jamil, R. Opila, C. Honsberg, I. Ferguson</i>	
HIGH EFFICIENCY CDSE QUANTUM-DOT SENSITIZED SOLAR CELLS	461
<i>Z. Zheng, L. Zhao, M. Wang, M. Liu, M. S. Marcus, Y. Liu</i>	
RESONANCE ENERGY TRANSFER IN LUMINESCENT SOLAR CONCENTRATORS	467
<i>R. Bose, M. Gonzalez, P. Jenkins, R. Walters, J. Morsemann, M. Moss, C. McLain, P. Linsert, A. Buchtemann, A. J. Chatten, K. W. J. Barnham</i>	
BIOMIMETIC ANTIREFLECTION COATING FOR EFFICIENCY ENHANCEMENT OF TRIPLE-JUNCTION SOLAR CELLS UTILIZING NANOSPHERE LITHOGRAPHY	471
<i>M. Y. Chiu, F. Y. Chang, C. H. Chang, M. A. Tsai, P. Yu</i>	

AREA 3: ORALS, III-V'S & CONCENTRATORS: CONCENTRATOR MODULES AND SYSTEM COMPONENTS

A HIGH CONCENTRATION PHOTOVOLTAIC MODULE UTILIZING MICRO-TRANSFER PRINTING AND SURFACE MOUNT TECHNOLOGY	475
<i>B. Furman, E. Menard, A. Gray, M. Meitl, S. Bonafede, D. Kneeburg, K. Ghosal, R. Bukovnik, W. Wagner, J. Gabriel, S. Seel, S. Burroughs</i>	
HCPV TRACKER ACCELERATED RELIABILITY TESTS	481
<i>J. G. Elerath</i>	
THE PATH TO VOLUME PRODUCTION FOR CPV OPTICS	487
<i>T. Luce, J. Cohen</i>	
MICRO-OPTIC SOLAR CONCENTRATION AND NEXT-GENERATION PROTOTYPES.....	493
<i>J. H. Karp, E. J. Tremblay, J. E. Ford</i>	
MULTI RECEIVER CONCENTRATOR PHOTOVOLTAIC TESTING AT EXTREME CONCENTRATIONS	498
<i>T. Van-Kessel, A. Abduljabar, A. Alyahya, B. Alyousel, A. Badahdah, H. Khonkar, P. Kirchner, Y. Martin, D. Manzer, N. Moumen, A. Prabhakar, T. Picunko, R. Sandstrom, Y. Al-Saaedi, B. Wacaser, S. Guha</i>	

AREA 6: ORALS, ORGANIC PHOTOVOLTAICS: SMALL MOLECULE BASED AND DYE-SENSITIZED SOLAR CELLS

SMALL MOLECULE ORGANIC SOLAR CELLS WITH ENHANCED NEAR-IR PHOTOACTIVITY: THE ROLE OF TEXTURING AND MOLECULAR ARCHITECTURE OF THE ACTIVE LAYERS ON SOLAR CELL PERFORMANCE	503
<i>N. R. Armstrong, D. Placencia, D. Manglesdorf, W. Wang</i>	
ROLE OF EXCITON BLOCKING LAYERS AS OPTICAL SPACER IN CUPC/C60 BASED ORGANIC SOLAR CELLS	508
<i>D. Datta, S. S. K. Iyer, S. Kumar</i>	
OPTIMIZATION OF ORGANIC TANDEM SOLAR CELLS BASED ON SMALL MOLECULES.....	513
<i>M. Riede, C. Uhrich, R. Timmreck, J. Widmer, D. Wynands, M. Levichkova, M. Furno, G. Schwartz, W. Gnehr, M. Pfeiffer, K. Leo</i>	
TCO-LESS 3D-DYE-SENSITIZED SOLAR CELLS CONSISTING OF CHARGE SEPARATION SHEET AND DIRECTION TO HIGH EFFICIENCY CELLS BY USING TCO-LESS STRUCTURE.....	518
<i>J. Usagawa, K. Uzaki, S. S. Pandey, Y. Ogomi, Y. Yamaguchi, M. Kono, S. Hayase</i>	

AREA 9: ORALS, PV MODULES & SYSTEMS: INTEGRATION OF GRID CONNECTED SYSTEMS

SOLAR ENERGY GRID INTEGRATION SYSTEM (SEGIS) PROACTIVE INTELLIGENT ADVANCES FOR PHOTOVOLTAIC SYSTEMS	523
<i>W. Bower, S. Kuszmaul, S. Gonzalez, A. Akhil</i>	
THE LEVELIZED COST OF ENERGY FOR DISTRIBUTED PV: A PARAMETRIC STUDY	529
<i>C. P. Cameron, A. C. Goodrich</i>	
POWER OUTPUT VARIABILITY OF PV SYSTEM FLEETS IN THREE UTILITY SERVICE TERRITORIES IN NEW JERSEY AND CALIFORNIA.....	535
<i>A. Golnas, S. Voss</i>	
ESTIMATION OF BATTERY CAPACITY FOR SUPPRESSION OF A PV POWER PLANT OUTPUT FLUCTUATION	540
<i>M. Akatsuka, R. Hara, H. Kita, T. Ito, Y. Ueda, Y. Saito</i>	
EVALUATING FUTURE STANDARDS AND CODES WITH A FOCUS ON HIGH PENETRATION PHOTOVOLTAIC (HPPV) SYSTEM DEPLOYMENT.....	544
<i>M. H. Coddington, B. D. Kroposki, T. S. Basso</i>	

JOINT AREA 2 & 10: PANEL DISCUSSION, PV VELOCITY FORUM: SUPPLY AND ECONOMICS IN THIN-FILM PV MATERIALS

PRICE AND SUPPLY CONSTRAINTS ON TE AND IN PHOTOVOLTAICS	550
<i>M. A. Green</i>	
INDIUM MARKET FORCES, A COMMERCIAL PERSPECTIVE	556
<i>B. O'Neill</i>	
PREDICTING INDIUM AND TELLURIUM AVAILABILITY	560
<i>L. V. Maness</i>	

AREA 5: ORALS, AMORPHOUS, NC, & FILM SILICON: PROCESSING ISSUES FOR FILMS AND DEVICES

CHALLENGES AND OPPORTUNITIES OF ELECTRON BEAM EVAPORATION IN THE PREPARATION OF POLY-SI THIN FILM SOLAR CELLS	614
<i>T. Sontheimer, C. Becker, F. Ruske, C. Klimm, U. Bloeck, S. Gail, O. Kunz, T. Young, R. Egan, J. Hupkes, B. Rech</i>	
EFFECTS OF SPC TEMPERATURE ON PROPERTIES OF EVAPORATED POLY-SI THIN FILMS AND SOALR CELLS	620
<i>Y. Tao, S. Varlamov, J. Wong, O. Kunz, R. Egan</i>	
TOWARD FILM-SILICON SOLAR CELLS ON DISPLAY GLASS	626
<i>D. L. Young, K. Alberi, C. Teplin, I. Martin, P. Stradins, M. Shub, C. Beall, E. Iwaniczko, H. Guthrey, M. J. Romero, T. K. Chuang, E. Mozdy, H. M. Branz</i>	
APPLICATION OF REAL TIME SPECTROSCOPIC ELLIPSOMETRY FOR ANALYSIS OF ROLL-TO-ROLL FABRICATION OF SI:H SOLAR CELLS ON POLYMER SUBSTRATES	631
<i>L. R. Dahal, Z. Huang, D. Atygalle, M. N. Sestak, C. Salupo, S. Marsillac, R. W. Collins</i>	
EXPANDING THERMAL PLASMA DEPOSITED A-SI:H THIN FILMS FOR SURFACE PASSIVATION OF C-SI WAFERS	637
<i>A. Illiberi, K. Sharma, M. Creatore, W. M. M. Kessels, M. C. M. Van-Sanden</i>	

AREA 2: ORALS, CIGS & CDTE: DEPOSITION & CHARACTERIZATION/ WIDE BAND GAP & NOVEL MATERIALS-II

TOWARDS MARKETABLE EFFICIENCY SOLUTION-PROCESSED KESTERITE AND CHALCOPYRITE PHOTOVOLTAIC DEVICES	640
<i>D. B. Mitzi, T. K. Todorov, O. Gunawan, M. Yuan, Q. Cao, W. Liu, K. B. Reuter, M. Kuwahara, K. Misumi, A. J. Kellock, S. J. Chey, T. G. Monsabert, A. Prabhakar, V. Deline, K. E. Fogel</i>	
CU ₂ ZNSNS ₄ THIN-FILM SOLAR CELL ABSORBER COMPOSITION REVEALED BY ENERGY-DISPERSIVE AND SOFT X-RAY EMISSION SPECTROSCOPY	646
<i>M. Bar, B. Schubert, B. Marsen, T. Unold, R. G. Wilks, H. W. Schock, S. Pookpanratana, M. Blum, S. Krause, Y. Zhang, C. Heske, W. Yang, L. Weinhardt</i>	
COMBINATORIAL STUDY OF THIN-FILM CU ₂ ZNSNS ₄ SYNTHESIS VIA METAL PRECURSOR SULFURIZATION	650
<i>G. Teeter, H. Du, J. E. Leisch, M. Young, F. Yan, S. W. Johnston, P. Dippo, D. Kuciauskas, M. J. Romero, P. Newhouse, S. E. Asher, D. S. Ginley</i>	
OPTIMIZATION OF COMPOSITION GRADING IN CU(IN,GA)SE ₂ FOR FLEXIBLE SOLAR CELLS AND MODULES	656
<i>A. Chirila, D. Guettler, P. Bloesch, S. Nishiwaki, S. Seyrling, S. Buecheler, R. Verma, F. Pianezzi, Y. E. Romanyuk, G. Bilger, R. Ziltener, D. Bremaud, A. N. Tiwari</i>	
CU(INGA)SE ₂ PHOTOVOLTAICS ON INSULATED STAINLESS STEEL WEB SUBSTRATE	661
<i>E. Eser, S. Fields, W. K. Kim, E. McQuiston, K. Kim, W. N. Shafarman</i>	

AREA 4: ORALS, CRYSTALLINE SILICON: CONTACTS AND DEVICE STRUCTURES

INDUSTRIAL LCP SELECTIVE EMITTER SOLAR CELLS WITH PLATED CONTACTS	667
<i>D. Kray, N. Bay, G. Cimiotti, S. Kleinschmidt, N. Kosterke, A. Losel, M. Sailer, A. Trager, H. Kuhnlein, H. Nussbaumer, C. Fleischmann, F. Granek</i>	

FUNDAMENTAL STUDIES ON THE FRONT CONTACT FORMATION RESULTING IN A 21% EFFICIENCY SILICON SOLAR CELL WITH PRINTED REAR AND FRONT CONTACTS	672
<i>M. Horteis, J. Benick, J. Nekarda, A. Richter, R. Preu, S. W. Glunz</i>	
20% EFFICIENT SCREEN PRINTED LBSF CELL FABRICATED USING UV LASER FOR REAR DIELECTRIC REMOVAL	678
<i>S. Ramanathan, A. Das, I. B. Cooper, A. Rohatgi, A. Payne, I. Koehler</i>	
HIGH EFFICIENCY SILICON HETEROJUNCTION SOLAR CELL USING NOVEL STRUCTURE	683
<i>T. Mueller, S. Schwertheim, N. Mueller, K. Meusinger, B. Wdowiak, O. Grewe, W. Fahrner</i>	
18.5% LASER-DOPED SOLAR CELL ON CZ P-TYPE SILICON	689
<i>A. Sugianto, J. Bovatsek, S. Wenham, B. Tjahjono, G. Xu, Y. Yao, B. Hallam, X. Bai, N. Kuepper, C. M. Chong, R. Patel</i>	

AREA 8: ORALS, PV CHARACTERIZATION: DEFECTS AND MULTIJUNCTION DEVICE PERFORMANCE S

IN SITU 3D X-RAY RECIPROCAL SPACE MAPPING DURING LATTICE-MISMATCHED INGAAS/GAAS GROWTH	695
<i>T. Sasaki, H. Suzuki, A. Sai, Y. Ohshita, M. Yamaguchi</i>	
STRESSES AND THEIR RELATION TO DEFECTS IN MULTICRYSTALLINE SOLAR SILICON	699
<i>G. Sarau, A. Bochmann, S. Christiansen, S. Schonfelder</i>	
EXTERNAL QUANTUM EFFICIENCY MEASUREMENTS OF GERMANIUM BOTTOM SUBCELLS: MEASUREMENT ARTIFACTS AND CORRECTION PROCEDURES	704
<i>G. Siefer, C. Baur, A. W. Bett</i>	
CAPACITANCE MEASUREMENTS FOR SUBCELL CHARACTERIZATION IN MULTIJUNCTION SOLAR CELLS	708
<i>C. M. Ruiz, I. Rey-Stolle, I. Garcia, E. Barrigon, P. Espinet, V. Bermudez, C. Algora</i>	
ANALYSIS OF SPECTRAL PHOTOCURRENT RESPONSE FROM MULTI-JUNCTION SOLAR CELLS UNDER VARIABLE VOLTAGE BIAS	712
<i>S. H. Lim, K. O'Brien, E. H. Steenbergen, J. J. Li, D. Ding, Y. H. Zhang</i>	

AREA 7: ORALS, SPACE TECHNOLOGIES: SPACE SYSTEMS

THE SOLAR PROBE PLUS SOLAR ARRAY DEVELOPMENT AND DESIGN	717
<i>E. Gaddy, R. Decker, M. K. Lockwood, L. Roufberg, G. Knutzen, D. Marsh</i>	
IBIS (INTEGRATED BLANKET/INTERCONNECT SYSTEM), BOEING'S SOLUTION FOR IMPLEMENTING IMM (INVERTED METAMORPHIC) SOLAR CELLS ON A LIGHT-WEIGHT FLEXIBLE SOLAR PANEL	723
<i>M. L. Breen, A. Streett, D. Cokin, R. Stribling, A. Mason, S. Sutton</i>	
PROGRESS IN DEVELOPMENT OF ULTRA-LIGHTWEIGHT SOLAR PANEL USING SPACE SOLAR SHEET	725
<i>K. Shimazaki, Y. Kobayashi, M. Takahashi, M. Imaizumi, T. Takamoto, T. Ito, Y. Nozaki</i>	
A CASE STUDY: INTEGRATING TRIPLE-JUNCTION SOLAR CELLS INTO FLAT-FOLDING FLEXIBLE SOLAR ARRAY PANELS	731
<i>J. Gibb, S. Billets</i>	

AREA 10: GIAWATT SCALE MANUFACTURING

PV MANUFACTURING SCALING TO GIGA-WATT CAPACITY: LESSONS LEARNED FROM THE SEMICONDUCTOR AND FLAT PANEL DISPLAY INDUSTRIES	736
<i>D. T. Krick, H. Weinzerl, T. Behrens</i>	
LIFE-CYCLE ASSESSMENT OF ORGANIC SOLAR CELL TECHNOLOGIES	742
<i>A. Ancil, C. Babbitt, B. Landi, R. P. Raffaele</i>	

AREA 5: ORALS, AMORPHOUS, NC, & FILM SILICON: NOVEL CONCEPTS FOR SOLAR CELL DEVICES

A-SI:H SOLAR CELLS WITH EMBEDDED SILVER NANOPARTICLES	748
<i>R. Santbergen, R. Liang, M. Zeman</i>	
LIGHT SCATTERING AT NANO-TEXTURED SURFACES IN THIN FILM SILICON SOLAR CELLS	754
<i>F. J. Haug, C. Bottaglia, D. Domine, C. Ballif</i>	
PLASMONIC LIGHT TRAPPING FOR THIN FILM A-SI:H SOLAR CELLS	760
<i>V. E. Ferry, M. A. Verschuuren, H. B. T. Li, E. Verhagen, R. J. Walters, R. I. Schropp, H. A. Atwater, A. Polman</i>	
HIGH OPEN-CIRCUIT VOLTAGE OXYGEN-CONTAINING SILICON QUANTUM DOTS SUPERLATTICE SOLAR CELLS	766
<i>S. Yamada, Y. Kurokawa, S. Miyajima, A. Yamada, M. Konagai</i>	

AREA 2: ORALS, CIGS & CDTE: ADVANCED PROCESSES: ATMOSPHERIC AND VACUUM

COMMERCIAL-SCALE SOURCES FOR THE EVAPORATION OF ELEMENTAL Cu, Ga, AND In: MODELING, DESIGN, AND VALIDATION	770
<i>G. M. Hanket, R. W. Birkmire, S. Fields, E. Eser</i>	
LINEAR SOURCE TECHNOLOGY REVIEW FOR CIGS CO-EVAPORATION ON GLASS AND FLEXIBLE SUBSTRATES	776
<i>K. Pfeiffer, C. Conroy, J. G. Weng, D. Brown, R. Chandrasekaran, D. Fobare, D. Metacarpa, J. Patrin</i>	
CONTINUOUS IN-LINE PROCESSING OF CDS/CDTE DEVICES: PROCESS CONTROL USING XRF AND EFFICIENT HEATING	780
<i>P. S. Kobayakov, N. Schuh, K. Walkers, V. Manivannan, W. S. Sampath</i>	
CIGS THIN FILMS PREPARED BY SPUTTERING AND SELENIZATION BY USING IN₂SE₃, GA₂SE₃ AND CU AS SPUTTERING TARGETS	786
<i>N. Romeo, A. Bosio, S. Mazzamuto, D. Menossi, A. Romeo</i>	
THIN SPECIALTY GLASS FOR RELIABLE THIN FILM PV MODULES	789
<i>J. E. Webb, S. H. Kim, D. I. Wilcox, K. L. Wasson, S. T. Gulati, G. Bitsuamlak</i>	
ELECTRODEPOSITION OF CU-IN-GA FILMS FOR THE PREPARATION OF CIGS SOLAR CELLS	794
<i>S. Aksu, M. Pinarbasi</i>	

AREA 4: ORALS, CRYSTALLINE SILICON: FEEDSTOCK AND CRYSTALLIZATION

MULTICRYSTALLINE SOLAR GRADE SILICON SOLAR CELLS	799
<i>K. Peter, R. Kopecek, M. Wilson, J. Lagowski, E. Enebakk, A. Soiland, S. Grandum</i>	
IMPACT OF METAL CONTAMINATION IN MULTICRYSTALLINE SILICON SOLAR CELLS: CASE STUDY FOR IRON	806
<i>G. Coletti</i>	
FORMATION MECHANISM OF TWIN BOUNDARIES IN SILICON MULTICRYSTALS DURING CRYSTAL GROWTH	810
<i>K. Kutsukake, T. Abe, N. Usami, K. Fujiwara, K. Morishita, K. Nakajima</i>	
QUALITY CONTROL USING LUMINESCENCE IMAGING IN PRODUCTION OF MC-SILICON SOLAR CELLS FROM UMG FEEDSTOCK	812
<i>J. Huanschield, M. Glatthaar, S. Riepe, S. Rein</i>	
HIGH EFFICIENCY SOLAR CELLS OBTAINED FROM SMALL SIZE INGOTS WITH 30 CM Φ BY CONTROLLING THE DISTRIBUTION AND ORIENTATION OF DENDRITE CRYSTALS GROWN ALONG THE BOTTOM OF THE INGOTS	817
<i>K. Nakajima, K. Kutsukake, K. Fujiwara, N. Usami, S. Ono</i>	

AREA 3: ORALS, III-V'S & CONCENTRATORS: HIGH AND LOW CONCENTRATION PV SYSTEMS AND PLANTS

AMONIX CPV SOLAR POWER PLANTS	820
<i>G. S. Kinsey, K. Stone, J. Brown, V. Garboushian</i>	
SIMULATION AND CHARACTERIZATION OF HIGH EFFICIENCY BACK CONTACT CELLS FOR LOW-CONCENTRATION PHOTOVOLTAICS	823
<i>M. M. Bunea, K. W. Johnston, C. M. Bonner, P. Cousins, D. D. Smith, D. H. Rose, W. P. Mulligan, R. M. Swanson</i>	
THE VALIDATION AND VERIFICATION OF CFD MODELS OF HEAT TRANSFER AND AIRFLOW WITHIN CPV MODULES	827
<i>D. A. Adkins</i>	
A 20-SUN HYBRID PV-THERMAL LINEAR MICRO-CONCENTRATOR SYSTEM FOR URBAN ROOFTOP APPLICATIONS	831
<i>D. Walters, V. Everett, A. Blakers, M. Vivar, J. Harvey, J. Muric-Nesic, T. Ratcliff, S. Surve, R. Van-Scheppingen, P. Lievre, M. Greaves, A. Tanner</i>	

AREA 8: ORALS, PV CHARACTERIZATION: RECOMBINATION RATE AND TRAP MEASUREMENTS

EFFORTS TO DEVELOP EXCESS-CARRIER RECOMBINATION LIFETIME MEASUREMENT STANDARDS FOR SILICON PV	837
<i>R. A. Sinton</i>	
A NEW LIFETIME DIAGNOSTIC SYSTEM FOR PHOTOVOLTAIC MATERIALS	842
<i>R. K. Ahrenkiel, D. J. Dunlavy, B. Simonds</i>	
SIMULTANEOUS DETERMINATION OF CARRIER LIFETIME AND NET DOPANT CONCENTRATION OF SILICON WAFERS FROM PHOTOLUMINESCENCE	847
<i>J. A. Giesecke, D. Walter, F. Kopp, P. Rosenits, M. C. Schubert, W. Warta</i>	
NEXT GENERATION INLINE MINORITY CARRIER LIFETIME METROLOGY ON MULTICRYSTALLINE SILICON BRICKS FOR PV	852
<i>N. Schuler, D. Mittelstrass, K. Dornich, J. R. Niklas, H. Neuhaus</i>	
STUDY OF SILICON-SILICON NITRIDE INTERFACE PROPERTIES ON FLAT AND TEXTURED SURFACES BY DEEP LEVEL TRANSIENT SPECTROSCOPY	858
<i>C. Gong, E. Simoen, L. Zhaou, N. E. Posthuma, E. Van-Kerschaver</i>	

AREA 2: ORALS, CIGS & CDTE: DEPOSITION & CHARACTERIZATION/ WIDE BAND GAP & NOVEL MATERIALS-III

CRITICAL ISSUES FOR HIGH-EFFICIENCY LOW-COST CIGS SOLAR CELLS AND MODULES	863
<i>S. Niki, S. Ishizuka, H. Komaki, Y. Kamikawa-Shimizu, S. Furue, S. W. Choi, K. Matsubara, H. Shibata, A. Yamada, H. Nakanishi, N. Terada, T. Sakurai, K. Akimoto</i>	
IN-SITU STUDY OF CIGS DIELECTRIC FUNCTION AS A FUNCTION OF COPPER CONTENT	866
<i>S. Marsillac, V. Ranjan, S. Little, R. W. Collins</i>	
P-TO N-TYPE CONVERSION WITH SODIUM ADDITION IN BRIDGMAN-GROWN CULNSE2	869
<i>H. F. Myers, C. H. Champness, Y. H. Yan, I. Shih</i>	
EFFECTS OF AS-DEPOSITED CDTE MICROSTRUCTURE ON SOLAR CELL PERFORMANCE	873
<i>M. N. Sestak, J. Li, J. Chen, R. W. Collins</i>	
LOCAL CHARGE NEUTRALITY CONDITION, FERMI LEVEL, AND CARRIER COMPENSATION OF CDTE POLYCRYSTALLINE THIN FILM IN CDS/CDTE SOLAR CELLS	878
<i>K. K. Chin, S. H. Wei</i>	

AREA 4: ORALS, CRYSTALLINE SILICON: SURFACE PASSIVATION

SILICON SURFACE PASSIVATION BY ULTRATHIN Al₂O₃ FILMS AND Al₂O₃/SiNx STACKS	885
<i>J. Schmidt, B. Veith, F. Werner, D. Zielke, R. Brendel</i>	

EFFECT OF A POST-DEPOSITION ANNEAL ON AL₂O₃/SI INTERFACE PROPERTIES	891
<i>J. Benick, A. Richter, T. T. A. Li, N. E. Grant, K. R. McIntosh, Y. Ren, K. J. Weber, M. Hermle, S. W. Glunz</i>	
CHARGE STABILITY IN LPCVD SILICON NITRIDE FOR SURFACE PASSIVATION OF SILICON SOLAR CELLS	897
<i>Y. Ren, N. M. Nursam, D. Wang, K. J. Weber</i>	
ADVANCED APPROACH FOR SURFACE DECOUPLING IN CRYSTALLINE SILICON SOLAR CELLS	902
<i>V. Prajapati, J. John, J. Poortmans, R. Mertens</i>	
PRACTICAL CHALLENGES OF ACHIEVING HIGH EFFICIENCY BORON BACK SURFACE FIELD SOLAR CELLS	906
<i>A. Das, S. Ramanathan, A. Upadhyaya, V. Meemongkolkiat, A. Rohatgi</i>	

AREA 1: ORALS, FUNDAMENTALS & NEW CONCEPTS: NANOWIRE SOLAR CELLS

WIRE-TEXTURED SILICON SOLAR CELLS	913
<i>K. Wang, O. Gunawan, N. Moumen, G. Tulevski, H. Mohamed, B. Fallah, E. Tutuc, S. Guha</i>	
GAP/SI WIRE ARRAY SOLAR CELLS	918
<i>A. C. Tamboli, D. B. Turner-Evans, M. Malhotra, M. D. Kelzenberg, H. A. Atwater</i>	
A STUDY OF LATERAL COLLECTION SINGLE JUNCTION A-SI:H SOLAR CELL DEVICES USING NANO-SCALE COLUMNAR ARRAY	923
<i>W. J. Nam, T. Liu, S. Wagner, S. Fonash</i>	
STRAIN BALANCED QUANTUM POSTS FOR INTERMEDIATE BAND SOLAR CELLS	928
<i>D. Alonso-Alvarez, B. Alen, J. M. Ripalda, A. G. Taboada, J. M. Llorens, Y. Gonzalez, L. Gonzalez, F. Briones, E. Antolin, I. Ramiro, A. Marti, A. Luque, M. A. Rolan, J. Hernandez-Saz, M. Herrera, S. I. Molina</i>	
SILICON NANOWIRE HYBRID PHOTOVOLTAICS	934
<i>E. C. Garnett, C. Peters, M. Brongersma, Y. Cui, M. McGehee</i>	

AREA 6: ORALS, ORGANIC PHOTOVOLTAICS: HYBRID AND ADVANCED CONCEPT ORGANIC SOLAR CELLS

PLASMONIC-ENHANCED POLYMER PHOTOVOLTAIC DEVICES INCORPORATING AU NANOPARTICLES	939
<i>J. L. Wu, C. L. Lee, F. C. Chen, C. H. Kuo, M. H. Huang</i>	
HYBRID SOLAR CELLS USING GAAS NANOPILLARS	943
<i>R. B. Laghumavarapu, G. Mariani, B. T. Villers, J. Shapiro, P. Senanayake, A. Lin, B. J. Schwartz, D. L. Huffaker</i>	
GAAS NANOWIRE/PEDOT:PSS HYBRID SOLAR CELLS: MORPHOLOGICAL AND PERFORMANCE CHARACTERIZATION	946
<i>J. J. Chao, S. C. Chiu, C. F. Lin</i>	
EFFECT OF NANOWIRE LENGTHS ON POLYMER-SI NANOWIRE HYBRID SOLAR CELLS	949
<i>D. H. Lin, S. C. Shiu, J. S. Huang, C. F. Lin</i>	
PHOSPHONATE SELF-ASSEMBLED MONOLAYERS AS ORGANIC LINKERS IN SOLID-STATE QUANTUM DOT SENSITIZED SOLAR CELLS	951
<i>P. Ardalan, T. P. Brennan, J. R. Bakke, S. F. Bent</i>	
NEW MICROSCALE VERTICALLY ORIENTED ORGANIC PHOTOVOLTAICS CELLS	955
<i>S. A. Curran, J. Glennie, J. Dewald, S. Dias, S. D. Yambem, N. J. Alley, A. Haldar, K. S. Liao</i>	

AREA 9: ORALS, PV MODULES & SYSTEMS: IMPROVING PERFORMANCE OF PV SYSTEMS

COMPRESSED-AIR ENERGY STORAGE SYSTEMS FOR STAND-ALONE OFF-GRID PHOTOVOLTAIC MODULES	962
<i>D. Villela, V. V. Kasinathan, S. Valle, M. Alvarez, G. Frantziskonis, P. Dymier, K. Muralidharan</i>	
DYNAMIC POWER OPTIMIZATION OF CONTOURED FLEXIBLE PV ARRAY UNDER NON-UNIFORM ILLUMINATION CONDITIONS	968
<i>P. Sharma, B. Patnaik, S. P. Dutttagupta, V. Agarwal</i>	

MEASURING AND MODELING THE EFFECT OF SNOW ON PHOTOVOLTAIC SYSTEM PERFORMANCE	973
<i>L. Powers, J. Newmiller, T. Townsend</i>	
LIGHT MANAGEMENT FOR REDUCTION OF BUS BAR AND GRIDLINE SHADOWING IN PHOTOVOLTAIC MODULES	979
<i>J. Jaus, H. Pantisar, J. Eckert, M. Duell, H. Herfurth, D. Doble</i>	
TEMPERATURE TESTING AND ANALYSIS OF PV MODULES PER ANSI/UL 617030 STANDARDS	984
<i>J. Oh, G. TamizhMani</i>	

AREA 2: ORALS, CIGS & CDTE: TRANSPARENT CONDUCTORS, BUFFERS, AND CONTACTS

AMORPHOUS TRANSPARENT CONDUCTORS FOR PV APPLICATIONS	989
<i>J. D. Perkins, T. Gennett, J. E. Leisch, R. Sundaramoorthy, I. L. Repins, M. F. A. M. Van-Hest, D. S. Ginley</i>	
HIGHLY IMPROVED TRANSPARENT CONDUCTORS BY COMBINATION OF TCOS AND METALLIC GRIDS	992
<i>J. Van-Deelen, H. Rendering, H. Mannetje, B. H. Veld, M. Theelen, Z. Vroon, P. Poodt, A. Hovestad</i>	
APPLICATION OF ZNO1-XXSAS WINDOW LAYER IN CADMIUM TELLURIDE SOLAR CELLS	995
<i>J. Perrenoud, S. Buecheler, L. Kranz, C. Fella, J. Skarp, A. N. Tiwari</i>	
EFFECTS OF BACK-CONTACTING METHOD AND TEMPERATURE ON CDTE/CDS SOLAR CELLS	1001
<i>J. N. Duenow, R. G. Dhere, J. V. Li, M. R. Young, T. A. Gessert</i>	
REACTION KINETICS AND PATHWAYS OF MOSE2	1006
<i>R. Krishnan, E. A. Payzant, R. K. Acnyzki, U. Schoop, J. Britt, R. Noufi, T. J. Anderson</i>	
EFFECTS OF CU AND CDCI2 TREATMENT ON THE STABILITY OF SPUTTERED CDS/CDTE SOLAR CELLS	1009
<i>N. R. Paudel, D. Kwon, M. Young, K. A. Wieland, S. Asher, A. D. Compaan</i>	

AREA 4: ORALS, CRYSTALLINE SILICON: DEVICES AND FABRICATION II

PILOT LINE PROCESSING OF 18.6% EFFICIENT REAR SURFACE PASSIVATED LARGE AREA SOLAR CELLS	1014
<i>A. Wolf, E. A. Wotke, A. Walczak, S. Mack, B. Bitnar, C. Koch, R. Preu, D. Biro</i>	
IMPROVING SOLAR CELL PERFORMANCE BY FULL ALUMINUM BACK SURFACE FIELD	1019
<i>T. Pham, W. Zhang</i>	
LARGE AREA INDUSTRIAL SOLAR CELLS ON LOW COST 100% MC SOG SI SUBSTRATES: EFFICIENCIES EXCEEDING 16%	1023
<i>A. Halm, J. Jourdan, S. Nichol, B. Rynningen, H. Tathgar, R. Kopecek</i>	
IN-LINE AND VERTICAL TEXTURING OF MONO-CRYSTALLINE SOLAR CELLS	1028
<i>M. Moynihan, C. O'Connor, B. Barr, S. Tiffany, W. Braun, G. Allardyce, J. Rentsch, K. Birmann</i>	
DECOUPLING CHARGE CARRIER COLLECTION AND METALLIZATION GEOMETRY OF BACK-CONTACTED BACK-JUNCTION SILICON SOLAR CELLS BY USING INSULATING THIN FILMS	1034
<i>C. Reichel, M. Reusch, F. Granek, M. Hermle, S. W. Glunz</i>	

AREA 1: ORALS, FUNDAMENTALS & NEW CONCEPTS: NEW PV MATERIALS I

MG DOPING AND ALLOYING IN ZN3P2 HETEROJUNCTION SOLAR CELLS	1039
<i>G. M. Kimball, N. S. Lewis, H. A. Atwater</i>	
PROGRESS ON III-NITRIDE/SILICON HYBRID MULTIJUNCTION SOLAR CELLS	1044
<i>L. A. Reichertz, L. Gherasoiu, K. M. Yu, J. W. Ager, V. M. Kao, W. Walukiewicz</i>	
NOVEL, SINGLE-CRYSTALLINE-LIKE TEMPLATES ON LOW-COST, FLEXIBLE SUBSTRATES FOR HIGH EFFICIENCY PHOTOVOLTAICS	1048
<i>V. Selvamanickam, S. Sambandam, A. Sundaram, S. Lee, G. Majkic, A. Rar, A. Freundlich</i>	

NOVEL TRANSPARENT CONDUCTING BARRIERS FOR PHOTOVOLTAICS	1052
<i>L. J. Simpson, A. Dameron, S. Christensen, T. Gennett, M. Reese, J. Berry, J. Perkins, D. Ginley</i>	
OPTICAL META-STRUCTURES FOR TRAPPING LIGHT IN THIN SI SOLAR CELLS.....	1057
<i>V. V. Aradan, L. Ji</i>	

AREA 6: ORALS, ORGANIC PHOTOVOLTAICS: STABILITY, PROCESSING AND PACKAGING OF ORGANIC SOLAR CELLS

ENHANCED LIFETIME IN UNENCAPSULATED ORGANIC PHOTOVOLTAICS WITH AIR STABLE ELECTRODES	1060
<i>M. T. Lloyd, D. C. Olson, J. J. Berry, N. Kopidakis, M. O. Reese, K. X. Steirer, D. S. Ginley</i>	
LARGE AREA MODULES BASED ON LOW BAND GAP POLYMERS	1064
<i>E. Bundgaard, F. C. Krebs</i>	
EFFICIENT POLYMER SOLAR CELLS VIA AN ALL-SPRAY-COATED DEPOSITION	1068
<i>C. Girotto, D. Moia, B. P. Rand, T. Aernouts, P. Heremans</i>	
HIGHLY-STABLE AND EFFICIENT POLYMER SOLAR CELLS INCORPORATING NANOSCALE BUFFER LAYERS INDUCED BY SPONTANEOUS VERTICAL PHASE SEPARATION	1073
<i>S. C. Chien, H. C. Yang, F. C. Chen</i>	

AREA 9: ORALS, PV MODULES & SYSTEMS: PREDICTIVE PERFORMANCE MODELING

A STANDARDIZED APPROACH TO PV SYSTEM PERFORMANCE MODEL VALIDATION	1079
<i>J. S. Stein, C. P. Cameron, B. BOurne, A. Kimber, J. Posbic, T. Jester</i>	
ASSESSING TECHNICAL POTENTIAL FOR CITY PV DEPLOYMENT USING NREL'S IN MY BACKYARD TOOL.....	1085
<i>K. H. Anderson, M. H. Coddington, B. D. Kroposki</i>	
IMPACT OF MICROCLIMATES ON SOLAR RESOURCE: CASE STUDY OF THE SOLAR RESOURCE IN SAN FRANCISCO	1091
<i>L. Mitchell, J. Seidel, R. Ocampo, S. Wilson, J. Andrews</i>	
RATING OF ANNUAL ENERGY YIELD MORE SENSITIVE TO REFERENCE POWER THAN MODULE TECHNOLOGY.....	1095
<i>B. Zinßer, G. Makrides, M. B. Schubert, G. E. Georghiou, J. H. Werner</i>	

AREA 7: ORALS, SPACE TECHNOLOGIES: FLIGHT PERFORMANCE AND ENVIRONMENTAL EFFECTS

MODELING OF THE DEGRADATION OF III-V TRIPLE-JUNCTION CELLS DUE TO PARTICLE IRRADIATION ON THE BASIS OF COMPONENT CELLS	1100
<i>C. Baur, A. W. Bett</i>	
SCREAM: A NEW CODE FOR SOLAR CELL DEGRADATION PREDICTION USING THE DISPLACEMENT DAMAGE DOSE APPROACH	1106
<i>S. R. Messenger, E. M. Jackson, J. H. Warner, R. J. Walters</i>	
DURABILITY EVALUATION OF INGAP/GAAS/GE TRIPLE-JUNCTION SOLAR CELLS IN HIHT ENVIRONMENTS FOR MERCURY EXPLORATION MISSION.....	1112
<i>T. Shimada, H. Toyota, A. Kukita, M. Imaizumi, K. Hirose, M. Tajima, H. Ogawa, H. Hayakawa, A. Okamoto, Y. Nozaki, H. Watabe, T. Hisamatsu</i>	
ELECTROSTATIC DISCHARGE TEST WITH SIMULATED COVERGLASS FLASHOVER FOR MULTI-JUNCTION GAAS/GE SOLAR ARRAY DESIGN.....	1118
<i>B. Hoang, F. Wong, V. V. Funderburk, M. Cho, K. Toyoda, H. Masui</i>	
INITIAL RESULTS FROM THE SECOND FORWARD TECHNOLOGY SOLAR CELL EXPERIMENT	1124
<i>P. P. Jenkins, R. J. Walters, M. Gonzalez, J. H. Warner, J. R. Lorentzen, J. M. Flatico, L. C. Greer, M. J. Krasowski</i>	

PERFORMANCE OF THE FIRST FLIGHT EXPERIMENT WITH DEDICATED SPACE CIGS CELLS ONBOARD THE DELFI-C3 NANOSATELLITE	1128
<i>T. Jansen, A. Reinders, G. Oomen, J. Bouwmeester</i>	

AREA 5: ORALS, AMORPHOUS, NC, & FILM SILICON: DEVICES AND MODULES

FABRICATION TECHNOLOGY FOR THIN FILM SILICON HYBRID SOLAR CELLS AND MODULES	1134
<i>T. Sasaki, N. Kadota, M. Gotoh, K. Shimizu, T. Takahashi, T. Sawada, S. Fukuda, M. Yoshimi, K. Yamamoto, T. Nomura, A. Nakajima</i>	
LARGE AREA NANOCRYSTALLINE SILICON BASED MULTI-JUNCTION SOLAR CELLS WITH SUPERIOR LIGHT SOAKING STABILITY	1141
<i>X. Xu, T. Su, S. Ehlert, G. Pietka, D. Bobela, D. Beglau, J. Zhang, Y. Li, G. DeMaggio, C. Worrel, K. Lord, G. Yue, B. Yan, K. Beernink, F. Liu, A. Banerjee, J. Yang, S. Guha</i>	
PROGRESS OF SANYO'S R&D ON THIN FILM SILICON SOLAR MODULE	1147
<i>T. Sekimoto, H. Katayama, K. Murata, M. Matsumoto, A. Kitahara, M. Hishida, Y. Aya, W. Shinohara, M. Nakagawa, A. Terakawa, M. Tanaka</i>	
FLEXIBLE AMORPHOUS SILICON SOLAR CELLS ON GLASS-FABRIC REINFORCED COMPOSITE FILMS IN THE SUPERSTRATE CONFIGURATION.....	1151
<i>J. W. Jeon, J. S. Im, S. Park, L. Fang, J. Jin, J. S. Kim, J. H. Ko, S. Yang, B. S. Bae, K. S. Lim</i>	
THE USE OF 2ND AND 3RD LEVEL CORRELATION ANALYSIS FOR STUDYING DEGRADATION IN POLYCRYSTALLINE THIN-FILM SOLAR CELLS.....	1155
<i>D. S. Albin, J. A. Cueto, S. H. Dentsu, S. Bansal</i>	
INTRINSIC STABILITY OF THIN-FILM CDS/CDTE MODULES.....	1161
<i>S. Dentsu, S. Bansal, D. Albin</i>	
DAMP-HEAT INSTABILITY AND MITIGATION OF ZNO-BASED THIN FILMS FOR CULNGASE2 SOLAR CELLS.....	1166
<i>F. J. Pern, S. H. Glick, R. Sundaramoorthy, B. To, X. Li, C. DeHart, S. Glynn, T. Gennett, R. Noufi, T. Gessert</i>	
BARRIER TECHNOLOGY PROVIDING EXCEPTIONAL STABILITY OF CIGS DEVICES UNDER ACCELERATED DAMP HEAT CONDITIONS	1172
<i>M. W. DeGroot, P. R. Elowe, M. Stempki</i>	
ENCAPSULATION OF CU(INGA)SE2 SOLAR CELLS WITH ALD AI2O3 FLEXIBLE THIN-FILM MOISTURE BARRIER: STABILITY UNDER 1000 HOUR DAMP HEAT AND UV EXPOSURE	1178
<i>S. Hegedus, P. F. Carcia, R. S. McLean, B. Culver</i>	

AREA 4: ORALS, CRYSTALLINE SILICON: MANUFACTURING AND NEW CONCEPTS

KERF-FREE WAFERING: TECHNOLOGY OVERVIEW AND CHALLENGES FOR THIN PV MANUFACTURING.....	1184
<i>F. J. Henley</i>	
ALL SCREEN PRINTED MASS PRODUCED SILICON INK SELECTIVE EMITTER SOLAR CELLS.....	1193
<i>H. Antoniadis, F. Jiang, W. Shan, Y. Liu</i>	
REACHING GRID PARITY USING BP SOLAR CRYSTALLINE SILICON TECHNOLOGY*.....	1197
<i>D. W. Cunningham, J. H. Wohlgemuth, R. F. Clark, J. P. Posbic, J. M. Zahler, M. Gleaton, D. E. Carlson, Z. Xia, J. Miller, L. Maisano</i>	
A HIGH-THROUGHPUT SILICON EPITAXY SYSTEM FOR PHOTOVOLTAIC APPLICATION	1203
<i>J. Fu, Y. Rozenzon, P. Ding, R. Anderson, R. Trujillo, S. Beese, D. Z. Chen, B. Chung, H. Hu, L. Ginzburg, M. Mandelboym, J. Tang, C. Yu, B. Heng, G. Song, Z. Xu</i>	
EFFECT OF SIO2 THICKNESSES IN THERMAL-SIO2/PECVD-SIN STACKS ON SURFACE PASSIVATION OF N-TYPE CZ SILICON SUBSTRATES	1207
<i>L. Ye, N. P. Harder, R. Brendel</i>	

AREA 1: ORALS, FUNDAMENTALS & NEW CONCEPTS: QUANTUM DOT SOLAR CELLS

STUDY OF GAAS(TI) THIN FILMS AS CANDIDATES FOR IB SOLAR CELLS MANUFACTURING	1210
<i>S. Silvestre, A. Boronat, L. Castaner, D. F. Marron, A. Marti, A. Luque</i>	
FABRICATION OF RESONANT TUNNELING STRUCTURES FOR SELECTIVE ENERGY CONTACT OF HOT CARRIER SOLAR CELL BASED ON III-V SEMICONDUCTORS	1213
<i>S. Yagi, Y. Okada</i>	
INAS QUANTUM DOT ENHANCEMENT OF GAAS SOLAR CELLS	1217
<i>S. M. Hubbard, C. Plourde, Z. Bittner, C. G. Bailey, M. Harris, T. Bald, M. Bennett, D. V. Forbes, R. Raffaele</i>	
HIGH-DENSITY AND WELL-ORDERED SI-NANODISK ARRAY WITH CONTROLLABLE BAND GAP ENERGY AND HIGH PHOTON ABSORPTION COEFFICIENT FOR ALL-SILICON TANDEM SOLAR CELL APPLICATIONS	1223
<i>C. H. Huang, M. Igarashi, M. F. B. Budiman, X. Y. Wang, R. Oshima, I. Yamashita, Y. Okada, S. Samukawa</i>	
EVIDENCE OF INTRA-BAND ASSISTED ESCAPE IN MULTI-QUANTUM WELL SOLAR CELLS	1228
<i>A. Alemu, A. Freundlich</i>	

AREA 3: ORALS, III-V'S & CONCENTRATORS: ADVANCED III-V CONCENTRATOR CELLS

PROMISES OF ADVANCED MULTI-JUNCTION SOLAR CELLS FOR THE USE IN CPV SYSTEMS	1231
<i>F. Dimroth, S. P. Philipps, G. Peharz, E. Welsler, R. Kellenbenz, T. Roesener, V. Klinger, E. Oliva, M. Steiner, M. Meusel, W. Guter, A. W. Bett</i>	
RECENT R&D TOPICS ON CONCENTRATOR MULTI-JUNCTION SOLAR CELLS AND MATERIALS UNDER INNOVATIVE SOLAR CELLS'S PROJECT	1237
<i>M. Yamaguchi, H. Suzuki, Y. Ohshita, N. Kojima, T. Takamoto</i>	
INVERTED THIN FILM INGAP/GAAS TANDEM SOLAR CELLS FOR CPV APPLICATIONS USING EPITAXIAL LIFT OFF	1243
<i>G. J. Bauhuis, P. Mulder, E. J. Haverkamp, J. J. Schermer, L. J. Nash, D. J. F. Fulgoni, I. M Ballard, G. Duggan</i>	
BACK-CONTACTED AND SMALL FORM FACTOR GAAS SOLAR CELL	1248
<i>J. L. Cruz-Campa, G. N. Nielson, M. Okandan, M. W. Wanlass, C. A. Sanchez, P. J. Resnick, P. J. Clews, T. Plum, V. P. Gupta</i>	
MEASUREMENT OF HIGH EFFICIENCY 1 CM2 AIGAINP/INGAAS/GE SOLAR CELLS WITH EMBEDDED INAS QUANTUM DOTS AT UP TO 1000 SUNS CONTINUOUS CONCENTRATION	1253
<i>C. E. Valdivia, S. Chow, S. Fafard, O. Theriault, M. Yandt, J. F. Wheeldon, A. J. Spring-thorpe, B. Rioux, D. McMeekin, D. Masson, B. Riel, V. Aimez, R. Ares, J. Cook, T. J. Hall, F. Shepherd, K. Hinzer</i>	
INGAP/GAAS/INGAAS 41% CONCENTRATOR CELLS USING BI-FACIAL EPIGROWTH	1259
<i>S. Wojtczuk, P. Chiu, X. Zhang, D. Derkacs, C. Harris, D. Pulver, M. Timmons</i>	

AREA 8: ORALS, PV CHARACTERIZATION: MODULE AND MODULE MATERIAL CHARACTERIZATION

PERFORMANCE CHARACTERISATION OF PHOTOVOLTAIC MODULES	1265
<i>R. Gottschalg</i>	
MEASURING DEGRADATION RATES WITHOUT IRRADIANCE DATA	1271
<i>S. Pulver, D. Cormode, A. Cronin, D. Jordan, S. Kurtz, R. Smith</i>	
QUANTITATIVE ANALYSIS AND EXTRACTION OF CELL PARAMETERS FROM INTERCONNECTED THIN-FILM SOLAR MODULES THROUGH LBIC-VOLTAGE SWEEPS	1277
<i>J. M. Frey, S. S. Hegedus, C. P. Thompson</i>	
RELIABILITY OF COPPER -RIBBONS IN PHOTOVOLTAIC MODULES UNDER THERMO- MECHANICAL LOADING	1283
<i>R. Meier, F. Kraemer, S. Wiese, K. J. Wolter, J. Bagdahn</i>	

INFRARED BIREFRINGENCE IMAGING OF RESIDUAL STRESS AND BULK DEFECTS IN MULTICRYSTALLINE SILICON	1289
<i>V. Ganapati, S. Schoenfelder, S. Castellanos, S. Oener, T. Buonassisi</i>	

AREA 4: POSTERS, CRYSTALLINE SILICON: DEVICE FABRICATION AND CHARACTERIZATION

ION IMPLANTATION AS A POTENTIAL ALTERNATIVE FOR THE FORMATION OF FRONT SURFACE FIELDS FOR IBC SILICON SOLAR CELLS	1291
<i>M. Aleman, E. Rosseel, K. Van-Wichelen, B. J. Pawlak, T. Janssens, F. Dross, N. E. Posthuma, J. Poortmans</i>	
EFFECT OF JUNCTION INTERFACE MODIFICATION OF SILICON HETEROJUNCTION SOLAR CELLS	1295
<i>J. Appel, L. Zhang, U. Das, S. Hegedus, S. Mudigonda, R. Birkmire, J. Rand</i>	
COPPERAS CONDUCTING LAYER IN ADVANCED FRONT SIDE METALLIZATION PROCESSES FOR CRYSTALLINE SILICON SOLAR CELLS, EXCEEDING 20% ON PRINTED SEED LAYERS	1299
<i>J. Bartsch, A. Mondon, C. Schetter, M. Horteis, S. W. Glunz</i>	
N-TYPE SILICON SOLAR CELLS WITH AMORPHOUS/CRYSTALLINE SILICON HETEROJUNCTION REAR EMITTER	1304
<i>M. Bivour, C. Meinhardt, D. Pysch, C. Reichel, K. U. Ritzau, M. Hermle, S. W. Glunz</i>	
THE ETCHBACK SELECTIVE EMITTER TECHNOLOGY AND ITS APPLICATION TO MULTICRYSTALLINE SILICON	1309
<i>F. Book, S. Braun, A. Herguth, A. Dastgheib-Shirazi, B. Raabe, G. Hahn</i>	
HIGH-RAMP INDUSTRIAL FIRING PROCESSES FOR THE METALLIZATION OF CRYSTALLINE SILICON SOLAR CELLS	1315
<i>F. J. Bottari, W. Montanez-Ortiz, D. C. Wong, P. J. Richter, F. C. Dimock, M. Bowers, T. Bao</i>	
CHARACTERISTICS OF MIS SOLAR CELLS USING SPUTTERING SiO₂ INSULATING LAYERS	1318
<i>T. Y. Chang, C. L. Chang, H. Y. Lee, P. T. Lee</i>	
TWO STEP Ni/Cu METALLIZATION FOR COMMERCIAL C-Si SOLAR CELLS: 1 TO 10 SUNS	1322
<i>V. A. Chaudhari, C. S. Solanki</i>	
12,4% EFFICIENT FREESTANDING 30μm ULTRA-THIN SILICON SOLAR CELL USING A-Si/C-Si HETEROSTRUCTURE	1325
<i>B. Chhabra, R. L. Opila, C. B. Honsberg</i>	
FABRICATION OF METAL GRID ON SILICON-BASED SOLAR CELL BY ELECTROCHEMICAL DEPOSITION AND MICROCONTACT PRINT	1330
<i>C. H. Lin, W. L. Chen, C. H. Du, C. C. Wan, Y. Y. Wang</i>	
IMPROVEMENTS OF VOC BY SELECTIVE EMITTER PATTERN OPTIMIZATION IN SCREEN PRINTED CRYSTALLINE Si SOLAR CELLS	1335
<i>K. Y. Cho, I. H. Kim, D. J. Oh, J. M. Shim, E. J. Lee, H. W. Lee, J. Y. Choi, J. S. Kim, J. E. Shin, S. H. Lee</i>	
INVESTIGATION OF THE EFFECT OF COMPENSATION RATIO (RC) ON SOLAR CELLS FABRICATED WITH SOLAR GRADE (SOG) CZOCHRALSKI SILICON	1339
<i>J. Camacho-Cuadrado, I. B. Cooper, A. Ebong, G. Bausch, W. Tulloch, G. Beaucarne, E. Good, A. Rohatgi</i>	
HIGH SPEED NON-CONTACT PRINTING FOR SOLAR CELL FRONT SIDE METALLIZATION	1343
<i>X. Chen, K. Church, H. Yang</i>	
THIN AND SMALL FORM FACTOR CELLS: SIMULATED BEHAVIOR	1348
<i>J. L. Cruz-Campa, D. Zubia, M. Okandan, P. J. Resnick, R. K. Grubbs, P. Clews, T. Plum, R. W. Young, V. P. Gupta, G. N. Nielson</i>	
CRYSTALLINE SILICON SOLAR CELLS WITH DOPED EPITAXIAL SILICON FILMS OBTAINED AT LOW-TEMPERATURE BY PECVD	1352
<i>J. Damon-Lacoste, M. Labrune, S. Granata, D. Daineka, P. R. I. Cabarrocas</i>	
INVESTIGATION OF HETERO-INTERFACE AND JUNCTION PROPERTIES IN SILICON HETEROJUNCTION SOLAR CELLS	1358
<i>U. Das, S. Hegedus, L. Zhang, J. Appel, J. Rand, R. Birkmire</i>	
HIGH EFFICIENCY SILICON SOLAR CELLS WITH INK JETTED SEED AND PLATED GRID ON HIGH SHEET RESISTANCE EMITTER	1363
<i>A. Ebong, B. Rounsaville, I. B. Cooper, K. Tate, A. Rohatgi, S. Glunz, M. Horteis, A. Mettle, M. Gundermann</i>	

ELECTRONIC SURFACE PASSIVATION OF CRYSTALLINE SILICON SOLAR CELLS BY A-SI:H	1368
<i>C. Ehling, D. Treptow, G. Bilger, F. Einsele, M. B. Schubert</i>	
SPACE CHARGE LIMITED CURRENT EFFECT ON PHOTOCONDUCTIVE DECAY IN SILICON AT HIGH INJECTION LEVELS	1374
<i>A. D. Feldman, R. K. Ahrenkiel</i>	
PHOTOGRAPHIC DISTINCTION OF DEFECTS IN POLYCRYSTALLINE SI BY SPECTROSCOPIC ELECTROLUMINESCENCE	1380
<i>T. Fuyuki, A. Tani, S. Tsujii, E. Sugimura</i>	
EXPLANATION OF THE DEVICE OPERATION PRINCIPLE OF AMORPHOUS SILICON/CRYSTALLINE SILICON HETEROJUNCTION SOLAR CELL AND ROLE OF THE INVERSION OF CRYSTALLINE SILICON SURFACE	1383
<i>K. Ghosh, C. J. Tracy, S. Herasimenka, C. Honsberg, S. Bowden</i>	
PHOTOTHERMAL CHARACTERIZATION BY ATOMIC FORCE MICROSCOPY AROUND GRAIN BOUNDARY IN MULTICRYSTALLINE SILICON MATERIAL	1387
<i>K. Hara, T. Takahashi</i>	
2D MODELING OF SILICON HETEROJUNCTION INTERDIGITATED BACK CONTACT SOLAR CELLS	1390
<i>S. Herasimenka, K. Ghosh, S. Bowden, C. Honsberg</i>	
FAST AND PRECISE RESISTANCE CHARACTERISATION OF LASER DRILLED AND METALLIZED VIAS	1395
<i>M. Menkoe, H. Reitenbach, R. Hoenig, F. Clement, D. Biro, R. Preu</i>	
BEAM SHAPING - THE KEY TO HIGH THROUGHPUT SELECTIVE EMITTER LASER PROCESSING WITH A SINGLE LASER SYSTEM	1401
<i>U. Jager, P. Oesterlin, A. Kimmerle, R. Preu</i>	
A STUDY INTO THE FORMATION AND CHARACTERISATION OF ELECTROLESS NICKEL SILICIDE FOR LASER DOPED SOLAR CELLS	1406
<i>A. Karpour, S. R. Wenham</i>	
THE IMPORTANCE OF SURFACE ROUGHNESS IN THE ADHESION OF ELECTROLESS-PLATED METAL IN INKJET PRINTED GROOVES	1410
<i>A. Karpour, S. R. Wenham</i>	
TRANSPARENT SILICON SOLAR CELLS: DESIGN, FABRICATION, AND ANALYSIS	1414
<i>C. Kerestes, Y. Wang, K. Shreve, A. Barnett</i>	
ELECTRICAL PROPERTIES AND BOUNDARY STRUCTURES IN CAST-GROWN POLYCRYSTALLINE SILICON	1419
<i>T. Kojima, Y. Ohshita, T. Tachibana, A. Ogura, M. Yamaguchi</i>	
INDUSTRIAL LARGE AREA N-TYPE SOLAR CELLS WITH ALUMINUM REAR EMITTER WITH STABLE EFFICIENCIES	1423
<i>R. Kopecek, A. Halm, L. Popescu, K. Peter, M. A. Vazquez</i>	
HIGH PERFORMANCE SOLAR CELLS MADE FROM 100% UMG SILICON OBTAINED VIA THE PHOTOSIL PROCESS	1427
<i>J. Kraiem, B. Drevet, F. Cocco, N. Enjalbert, S. Dubois, D. Camel, D. Grosset-Bourbange, D. Pelletier, T. Margaria, R. Einhaus</i>	
LOW TEMPERATURE SILICON EPITAXY USING RAPID THERMAL CHEMICAL VAPOR DEPOSITION (RTCVD) FOR SOLAR CELL APPLICATION	1432
<i>D. Lai, Y. H. Yan, D. Y. Ong, C. S. Tan</i>	
THE POTENTIAL EFFICIENCY OF LASER DOPED SOLAR CELLS USING PHOTOLUMINESCENCE IMAGING	1436
<i>E. Lee, H. Lee, I. Kim, J. Choi, D. Oh, J. Shim, K. Cho, J. Kim, H. S. Lee, S. Lee, B. Hallam, S. R. Wenham</i>	
HIGH EFFICIENCY SELECTIVE EMITTER ENABLED THROUGH PATTERNED ION IMPLANTATION	1440
<i>R. Low, A. Gupta, N. Bateman, D. Ramappa, P. Sullivan, W. Skinner, J. Mullin, S. Peters, H. Weiss-Waltrath</i>	
REAR-SIDE POINT-CONTACTS BY INLINE THERMAL EVAPORATION OF ALUMINUM	1446
<i>C. Mader, J. Muller, S. Gatz, T. Dullweber, R. Brendel</i>	
HW-CVD DEPOSITED μC-SI:H FOR THE INVERTED HETEROJUNCTION SOLAR CELL	1450
<i>J. Matsumoto, M. Ortega, V. M. Sanchez, F. Wunsch, J. A. Urbano</i>	
IMPACT OF METAL CONTACT MISALIGNMENT IN SILICON INK SELECTIVE EMITTER SOLAR CELLS	1456
<i>A. Meisel, M. Burrows, M. Abbott, F. Lemmi, H. Antoniadis</i>	
PV CONCENTRATOR CELLS COMPLEX IMPEDANCE UNDER THE BIAS IN THE DARK	1461
<i>M. Perny, M. Kusko, V. Saly, J. Packa</i>	

LOCALIZED DOPING USING SILICON INK TECHNOLOGY FOR HIGH EFFICIENCY SOLAR CELLS	1465
<i>K. Alberi, G. Scardera, H. Mountinho, R. C. Reedy, M. J. Romero, E. Rogojina, M. Kelman, D. Poplavskyy, D. L. Young, F. Lemmi, H. Antoniadis</i>	
HIGH-EFFICIENCY CRYSTALLINE SI THIN FILM SOLAR CELLS WITH SI NANOPILLAR ARRAY TEXTURED SURFACES	1469
<i>J. Li, S. M. Wong, Y. Li, H. Yu</i>	

AREA 5: POSTERS, AMORPHOUS, NC, & FILM SILICON: DEVICES, MODULES, AND NOVEL CONCEPTS

MODIFICATION OF LIGHT SCATTERING PROPERTIES OF BORON DOPED ZINC OXIDE GROWN BY LOW PRESSURE CHEMICAL VAPOUR DEPOSITION USING WET CHEMICAL ETCHING	1474
<i>S. Calnan, C. David, A. Neumann, N. Papathanasiou, R. Schlatmann, B. Rech</i>	
OPTIMIZATION OF ZNO/AG BACK-REFLECTORS FOR SILICON THIN FILM SOLAR CELL APPLICATIONS	1479
<i>J. S. Cho, S. Baek, J. C. Lee, S. H. Park, J. Song, K. H. Yoon</i>	
AMORPHOUS SILICON SOLAR CELLS ON PLASTIC BASED PHOTONIC STRUCTURES	1483
<i>S. Pattnaik, R. Biswas, V. L. Dalal, D. Slafer, J. Ji</i>	
EFFECTS OF BULK AND GRAIN BOUNDARY RECOMBINATION ON THE EFFICIENCY OF COLUMNAR-GRAINED CRYSTALLINE SILICON FILM SOLAR CELLS	1487
<i>M. G. Deceglie, M. D. Kelzenberg, H. A. Atwater</i>	
HIGH RATE DEPOSITION OF A-SI AND A-SIGE SOLAR CELLS NEAR DEPLETION CONDITION	1491
<i>Q. H. Fan, G. Hou, X. Liao, X. Xiang, C. Chen, W. Ingler, N. Adiga, S. Zhang, X. Cao, W. Du, X. Deng</i>	
TUNGSTEN OXIDE AS A P-TYPE WINDOW MATERIAL IN AMORPHOUS SILICON SOLAR CELLS	1496
<i>L. Fang, S. J. Baik, J. W. Kim, S. H. Yoo, J. W. Jeon, S. J. Kang, Y. H. Kim, K. S. Lim</i>	
OPTIMIZATION OF SEMI-TRANSPARENT AMORPHOUS SILICON SOLAR CELLS FOR BUILDING INTEGRATED APPLICATIONS	1500
<i>E. Fathi, A. Sazonov</i>	
PHOTOCURRENT ENHANCEMENTS IN AMORPHOUS SILICON SOLAR CELLS BY EMBEDDED METALLIC NANOPARTICLES	1505
<i>C. I. Ho, C. H. Yang, C. J. Huang, D. J. Yeh, Y. S. Chu, C. Y. Hsueh, W. C. Tu, T. Y. Ma, S. C. Lee</i>	
ZNO FILMS PREPARED BY TWO-STEP MOCVD PROCESS FOR USE AS FRONT TCO IN SILICON-BASED THIN FILM SOLAR CELLS	1508
<i>A. Hongsingthong, I. A. Yunaz, S. Miyajima, M. Konagai</i>	
DEVICE MODELING OF A MICROMORPH TANDEM SOLAR CELL USING AMPS-1D	1512
<i>J. Y. Huang, C. W. Hsu, J. M. Shieh, P. Yu</i>	
OPTICAL DESIGN OF MULTI-STACKED INTERMEDIATE LAYERS WITH WAVELENGTH-SELECTIVE REFLECTANCE FOR A-SI:H/μC-SI:H TANDEM SOLAR CELLS	1516
<i>B. Janthong, I. A. Yunaz, H. Tokioka, S. Miyajima, M. Konagai</i>	
EFFECT OF BORON-DOPING ON TRANSPARENT CONDUCTING AL DOPED ZNO FILMS FOR THIN FILM SOLAR CELLS	1521
<i>D. W. Kang, S. H. Kuk, S. H. Choi, T. H. Moon, H. M. Lee, M. K. Han</i>	
AMORPHOUS SILICON SOLAR CELLS WITH NOVEL MESH SUBSTRATES FOR CONCENTRATOR PHOTOVOLTAIC APPLICATIONS	1527
<i>S. Kasashima, R. Uzawa, I. A. Yunaz, Y. Kakiyama, S. Miyajima, A. Yamada, M. Konagai</i>	
HETERO-JUNCTION MICROCRYSTALLINE SILICON SOLAR CELLS WITH WIDE-GAP P-μC-SI-H-XOX:H LAYER	1531
<i>T. Krajangsang, S. Kasashima, I. A. Yunaz, S. Miyajima, M. Konagai</i>	
OPTICAL MODELING OF LIGHT TRAPPING IN THIN FILM SILICON SOLAR CELLS USING THE FDTD METHOD	1535
<i>J. Lacombe, K. Chakanga, S. Geißendorfer, K. Von-Maydell, C. Agert</i>	
NUMERICAL SIMULATION AND EXPERIMENTAL INVESTIGATION OF A-SI/A-SIGE TANDEM JUNCTION SOLAR CELLS	1540
<i>Q. H. Fan, X. Liao, C. Chen, X. Xiang, G. Hou, W. Ingler, N. Adiga, S. Zhang, W. Du, X. Cao, X. Deng</i>	

FABRICATION AND CHARACTERIZATION SILICON THIN FILM SOLAR CELLS DEPOSITED BY HF-PECVD	1545
<i>S. Y. Lien, Y. C. Ou, Y. S. Cho, C. C. Wang, C. F. Chen, W. C. Sun, D. S. Wu</i>	
MODELING THE HAZE OF HIGHLY TEXTURED TRANSPARENT CONDUCTING OXIDE	1549
<i>C. Lin, W. L. Liu, C. Y. Hsieh</i>	
CO-RELATION BETWEEN CAPACITANCE-VOLTAGE, CONDUCTANCE-VOLTAGE AND PHOTOCONDUCTIVE PROPERTIES OF THE AS-DEPOSITED AND ANNEALED A-SI/SiNx MULTILAYER FILMS PREPARED USING HOT-WIRE CVD	1553
<i>A. K. Panchal, D. K. Rai, M. Mathew, C. S. Solanki</i>	
LIGHT ABSORPTION ENHANCED STRUCTURE OF THIN FILM SILICON SOLAR CELL	1557
<i>S. Park, B. Kim, H. Jin, C. Keum, Y. Heo, B. S. Bae</i>	
CHARACTERIZATION OF EXPERIMENTAL TEXTURED ZNO:Al FILMS FOR THIN FILM SOLAR CELL APPLICATIONS AND COMPARISON WITH COMMERCIAL AND PLASMONIC ALTERNATIVES	1560
<i>D. N. R. Payne, S. A. Boden, O. D. Clark, A. E. Delahoy, D. M. Bagnall</i>	
IMPLEMENTATION OF NANOCCLUSERS IN INTERMEDIATE REFLECTIVE LAYERS	1565
<i>M. V. Ponomarev, H. T. Beyene, M. Creatore, M. C. M. Van-De-Sanden</i>	
INTERNAL ELECTRIC FIELD AND FILL FACTOR OF AMORPHOUS SILICON SOLAR CELLS	1569
<i>M. Stuckelberger, A. Shah, J. Krc, M. Despeisse, F. Meillaud, C. Ballif</i>	
EFFICIENT LIGHT TRAPPING STRUCTURE IN THIN FILM SILICON SOLAR CELLS	1575
<i>X. Sheng, J. Liu, I. Kozinsky, A. M. Agarwal, J. Michel, L. C. Kimerling</i>	
OMNIDIRECTIONAL OPTICAL TRANSMISSION BY OPTIMIZED NANO-STRUCTURES OF SOLAR CELLS	1577
<i>J. Son, L. K. Verma, A. J. Danner, C. S. Bhatia, H. Yang</i>	
THE LOW-LOSS PLASMONIC MODE FOR LIGHT CONFINEMENT IN SILICON-BASED THIN-FILM SOLAR CELLS	1581
<i>F. J. Tsai, J. H. Wang, C. H. Yeh</i>	
ORIENTATION SELECTED EPITAXY FOR GRAIN ENLARGEMENT OF AlC POLY-Si SEED LAYERS	1586
<i>S. Y. Wei, S. M. Yu, H. H. Lin, W. Chen, C. J. Chen, T. S. Lin, C. H. Tsai, F. R. Chen</i>	
BLAZE GRATINGS AS LIGHT TRAPPING STRUCTURES FOR ENHANCING CELL EFFICIENCY OF THIN-FILM CRYSTALLINE SILICON SOLAR CELLS	1589
<i>Y. P. Chiou, S. Y. Wu, C. Y. Chen</i>	
ZNO FILMS WITH VERY HIGH HAZE RATIO PREPARED BY MOCVD TECHNIQUE	1592
<i>I. A. Yunaz, A. Hongsingthong, L. Zhang, S. Miyajima, M. Konagai</i>	
OPTICAL ABSORPTION IN MICROSTRUCTURED CRYSTALLINE SILICON THIN FILMS	1597
<i>S. G. Sandoval, M. Khizar, D. Modisette, J. Anderson, R. Manginell, N. Amin, K. Sopian, S. H. Zaidi</i>	

AREA 6: POSTERS, ORGANIC PHOTOVOLTAICS: **ORGANIC PHOTOVOLTAICS**

NEW CANDIDATES FOR NEAR-INFRA-RED-ABSORBING ACTIVE LAYERS IN MULTI-JUNCTION ORGANIC PHOTOVOLTAICS: CHARACTERIZATION AND PERFORMANCE	1601
<i>C. J. Collison, S. D. Spencer, A. Monfette, J. Alexander, J. Staub</i>	
TRIPHENYLAMINE-BASED STAR-SHAPED ABSORBERS WITH TUNABLE ENERGY LEVELS FOR ORGANIC PHOTOVOLTAICS	1607
<i>S. R. Hammond, A. Garcia, A. Nardes, E. Knoll, M. Kose, R. Larsen, N. Kupidakis, Z. Owczarczyk, D. C. Olson, D. S. Ginley</i>	
BULK P-I-N HETEROJUNCTION SOLAR CELLS MADE FROM HYPERBRANCHED PHTHALOCYANINE POLYMERS	1611
<i>Y. Li, R. Dhakal, T. Xu, D. Galipeau, X. Yan</i>	
PHOTO-CARRIER DYNAMICS OF BLENDED AND MULTI-LAYERED FILMS OF ZINC PHTHALOCYANINE AND C60 MEASURED BY TIME-RESOLVED TERAHERTZ SPECTROSCOPY	1616
<i>J. S. Melinger, P. Lane, O. Esenturk, E. Heilweil</i>	
IMPROVEMENT OF PHOTO-CURRENT DENSITY BY ALTERNATIVE DEPOSITION METHOD FOR ORGANIC PHOTOVOLTAIC CELL	1621
<i>Y. Taima, Y. Shibata, J. Sakai, T. Miyadeara, T. Yamanari, Y. Yoshida</i>	

IMPROVED PERFORMANCE OF INVERTED-TYPE ORGANIC SOLAR CELLS BY SURFACE MODIFICATION ON POLYMER THIN FILM.....	1624
<i>I. J. Wang, S. C. Shiu, M. Y. Lin, Y. H. Lin, C. F. Lin</i>	
PHOTO-DEGRADATION AND ITS RECOVERY BY THERMAL ANNEALING IN POLYMER-BASED ORGANIC SOLAR CELLS	1628
<i>T. Yamanari, H. Ogo, T. Taima, J. Sakai, J. Tsukamoto, Y. Yoshida</i>	
EMPLOYING TiO₂ NANORODS TO IMPROVE INVERTED POLYMER SOLAR CELLS	1632
<i>Y. H. Lin, J. S. Huang, I. J. Wang, W. H. Wu, M. Y. Lin, G. D. Huang, W. F. Su, C. F. Lin</i>	
INORGANIC/ORGANIC HETEROJUNCTION SOLAR CELL FABRICATED WITH ZNO NANOWIRES	1636
<i>S. H. Kim, S. H. Park, K. Lee, S. M. Kim, J. W. Cho</i>	
PEDOT:PSS LAYERS AS REPLACEMENTS FOR THE TRANSPARENT CONDUCTIVE COATINGS OF ORGANIC SOLAR CELLS.....	1639
<i>S. Schwertheim, O. Grewe, I. Hamm, T. Mueller, R. Pichner, W. R. Fahrner</i>	
INCREASED PHOTON ABSORPTION AND CONVERSION IN TERNARY BULK HETEROJUNCTION SYSTEMS OF CDCl₂/CDS CORE-SHELL NANOPARTICLES/METHYL VIologen COMPOSITES, CONJUGATED POLYMERS, AND FULLERENES	1643
<i>E. D. Peterson, M. G. Smith, M. Fu, C. R. Coffin, D. R. Adams, L. D. Carroll</i>	
ALL-SOLUTION-PROCESSED-INVERTED POLYMER SOLAR CELLS ON PET SUBSTRATES WITH CUOX THIN FILM AS AN ANODE INTERLAYER.....	1648
<i>M. Y. Lin, C. Y. Lee, S. C. Shiu, J. Y. Sun, Y. H. Lin, W. H. Wu, C. F. Lin</i>	
ELECTRICAL CONDUCTION PROPERTIES OF MG-DOPED C₆₀ FILMS.....	1650
<i>N. Kojima, M. Natori, C. Morales, S. Nishi, M. Yamaguchi</i>	
GROWTH TEMPERATURE DEPENDENCE OF STRUCTURE IN MG-DOPED C₆₀ FILMS	1653
<i>S. Nishi, M. Natori, N. Kojima, C. Morales, M. Yamaguchi</i>	
THIN FILM ENCAPSULATION FOR FLEXIBLE ORGANIC SOLAR CELLS.....	1657
<i>J. Park, H. Ham, J. Lee, T. Kim</i>	

AREA 8: POSTERS, PV CHARACTERIZATION: MATERIALS AND DEVICES

NOVEL METHOD AND SYSTEM FOR MONITORING CPV CELL AND MODULE TEMPERATURE	1660
<i>D. A. Adkins</i>	
MEASUREMENT OF STRAIN DISTRIBUTION IN MULTI-CRYSTALLINE SILICON SUBSTRATES FOR SOLAR CELLS USING SYNCHROTRON RADIATION.....	1666
<i>K. Arafune, S. Miki, M. Monden</i>	
APPLICATION OF MICROWAVE SCANNING PROBES TO PHOTOVOLTAIC MATERIALS*.....	1669
<i>K. A. Bertness, J. B. Schlager, N. A. Sanford, A. Imtiaz, T. M. Wallis, J. C. Weber, P. Kabos, L. M. Mansfield</i>	
A FULLY AUTOMATED SYSTEM FOR LOCAL SPECTRAL CHARACTERIZATION OF PHOTOVOLTAIC STRUCTURES.....	1675
<i>R. Ciocan, Z. Li, D. Han, D. Assalone, F. Yang, T. Bilir, E. Ciocan, K. Emery</i>	
OPTICAL MAPPING OF LARGE AREA THIN FILM SOLAR CELLS.....	1678
<i>Z. Huang, J. Chen, M. N. Sestak, D. Attygalle, L. R. Dahal, M. R. Mapes, D. A. Strickler, K. R. Kormanyos, C. Salupo, R. W. Collins</i>	
OPTICAL METROLOGY OF THIN FILM SOLAR CELLS FROM 0.2 TO 30 μM.....	1684
<i>D. Attygalle, Z. Huang, P. Koirala, P. Aryal, M. N. Sestak, L. R. Dahal, M. R. Mapes, C. Salupo, R. W. Collins</i>	
DIRECT ASSESSMENT OF SERIES RESISTANCE IN THIN FILM SOLAR CELLS UTILIZING ELECTROLUMINESCENCE	1689
<i>A. Tani, T. Fuyuki</i>	
CAPACITANCE ANALYSIS OF WIRE-ARRAY SOLAR CELL.....	1692
<i>O. Gunawan, B. Fallahazad, E. Tutuc, S. Guha</i>	
RECOMBINATION ACTIVITY ENHANCEMENT BY STRESS IN SILICON	1696
<i>P. Gundel, M. C. Schubert, F. D. Heinz, W. Warta</i>	
PHOTOLUMINESCENCE IMAGING OF CHROMIUM IN CRYSTALLINE SILICON	1701
<i>H. Habenicht, M. C. Schubert, G. Coleti, W. Warta</i>	
ECONOMIC IMPACTS AND APPROACHES TO ADDRESS HOT-SPOT DEFECTS IN PHOTOVOLTAIC DEVICES.....	1706
<i>J. Hudson, L. Vasilyev, J. Schmidt, G. Horner</i>	
CHARACTERIZATION AND GAUGE STUDY OF A HIGH SPEED QUANTUM EFFICIENCY APPARATUS.....	1710
<i>J. Schmidt, L. A. Vasilyev, J. E. Hudson, G. S. Horner, E. A. Good, M. Dybiec</i>	

HIGH-RESOLUTION X-RAY AND LIGHT BEAM INDUCED CURRENT (LBIC) MEASUREMENTS OF MULTICRYSTALLINE SILICON SOLAR CELLS.....	1715
<i>G. E. Jellison, J. D. Budai, C. J. C. Bennett, J. Z. Tischler, C. E. Duty, V. Yelundur, A. Rohatgi</i>	
CHARACTERIZATION OF LASER EDGE ISOLATION IN MULTICRYSTALLINE SILICON SOLAR CELLS	1721
<i>C. S. Jiang, H. R. Moutinho, S. Johnston, Y. Yan, M. M. Al-Jassim, J. Gorman, A. Blossie</i>	
APPLICATIONS OF IMAGING TECHNIQUES TO SI, CU(IN, GA)SE₂, AND CDTE AND CORRELATION TO SOLAR CELL PARAMETERS.....	1727
<i>S. Johnston, I. Repins, N. Call, R. Sundaramoorthy, K. M. Jones</i>	
CHARACTERIZATION OF DEFECTS IN PHOTOVOLTAICS USING THERMOREFLECTANCE AND ELECTROLUMINESCENCE IMAGING	1733
<i>D. Kendig, G. B. Alers, A. Shakouri</i>	
EVALUATION OF EMITTER PROFILES AND LATERAL UNIFORMITY ON CRYSTALLINE SILICON PHOTOVOLTAIC CELLS USING SCANNING CAPACITANCE MICROSCOPY.....	1737
<i>L. Kosbar, J. Nxumalo, J. Nalaskowski, L. Hupka, C. Molella, J. Liu, G. Totir, K. Fisher, J. Cotte, M. Hopstaken</i>	
MEASUREMENT OF THE SODIUM CONCENTRATION IN CIGS SOLAR CELLS VIA LASER INDUCED BREAKDOWN SPECTROSCOPY	1742
<i>J. M. D. Kowalczyk, J. Perkins, J. Kaneshiro, N. Gaillard, Y. Chang, A. DeAngelis, S. A. Mallory, D. Bates, E. Miller</i>	
A METHOD TO DETERMINE THE ABSORPTANCE OF THIN FILMS FOR PHOTOVOLTAIC TECHNOLOGY*	1745
<i>N. A. Tomlin, J. H. Lehman, K. E. Hurst, D. B. Tanner, K. Kamaras, A. Pekker</i>	
COORDINATED ELECTRICAL CHARACTERIZATION SYSTEM FOR PHOTOVOLTAIC DEVICES	1749
<i>J. V. Li, J. Tynan, H. C. Yuan, Q. Wang, D. S. Albin, X. Li, D. h. Levi</i>	
APPLICATION OF CL/EBIC-SEM TECHNIQUES FOR CHARACTERIZATION OF IRRADIATION INDUCED DEFECTS IN TRIPLE JUNCTION SOLAR CELLS.....	1753
<i>S. I. Maximenko, S. R. Messenger, C. Cress, M. Gonzalez, J. A. Freitas, R. J. Walters</i>	
APPLICATION OF X-RAY COMPUTED TOMOGRAPHY IN SILICON SOLAR CELLS	1759
<i>V. A. Popovich, W. Verwaal, M. Janssen, I. J. Bennett, I. M. Richardson</i>	
PV MODULE DEFECT DETECTION BY COMBINATION OF MECHANICAL AND ELECTRICAL ANALYSIS METHODS.....	1765
<i>M. Sander, B. Henke, S. Schweizer, M. Ebert, J. Bagdahn</i>	
FUTURE OF RAMAN IN PV DEVELOPMENT	1770
<i>G. Sarau, S. Christiansen</i>	
HIGH RESOLUTION INLINE DETECTION OF CHANGES IN THE CONDUCTION TYPE OF MULTICRYSTALLINE SILICON BY CONTACT LESS PHOTOCONDUCTIVITY MEASUREMENTS	1776
<i>N. Schuler, D. Mittelstrass, K. Dornich, J. R. Niklas</i>	
TRANSIENT ABSORPTION FOR CHARACTERIZATION OF INTERMEDIATE BAND SOLAR CELLS	1780
<i>P. Kolla, A. Norman, S. Smith</i>	
ELECTROLUMINESCENCE IMAGING OF III-V MULTI-JUNCTION SOLAR CELLS	1783
<i>C. G. Zimmermann</i>	

AREA 1: POSTERS, FUNDAMENTALS & NEW CONCEPTS:
NANOSTRUCTURES

FABRICATION AND OPTIMIZATION OF AL-DOPED ZINC OXIDE LAYER FOR APPLICATION IN RADIAL P-N JUNCTION SILICON SOLAR CELLS	1788
<i>S. H. Baek, J. H. Kim, J. K. Shin</i>	
MONOLITHIC III-V NANOWIRE PV FOR PHOTOELECTROCHEMICAL HYDROGEN GENERATION	1793
<i>X. Y. Bao, B. A. Pinaud, J. Parker, S. Aloni, T. F. Jaramillo, H. S. P. Wong</i>	
ABSORPTION COEFFICIENTS OF QUANTUM DOT INTERMEDIATE BAND MATERIAL WITH NEGLIGIBLE VALENCE BAND OFFSETS.....	1797
<i>S. N. Bahal, K. Y. Ban, C. Honsberg</i>	
NUMERICAL MODELING OF HOT ELECTRON GAAS/AIXGA₁-XAS QUANTUM WELL PHOTOVOLTAIC	1800
<i>H. Z. Fardi</i>	

SUBSTRATE ORIENTATION EFFECTS ON QUANTUM DOT ENHANCED GAAS SOLAR CELLS	1804
<i>D. V. Forbes, C. G. Bailey, S. Polly, C. Plourde, J. Okvath, S. M. Hubbard, R. P. Rraffaelle</i>	
ENERGY BAND STRUCTURE AND ABSORPTION COEFFICIENTS IN THE QUANTUM-DOT INTERMEDIATE BAND SOLAR CELLS	1808
<i>W. G. Hu, T. Inoue, O. Kojima, T. Kita</i>	
ANALYSIS AND FABRICATION OF SUBMICRON PBT/ZNTE THIN FILMS FOR SUPERLATTICE STRUCTURED SOLAR CELLS	1814
<i>A. Kabalan, S. Jain, P. Singh</i>	
NANOSTRUCTURED TiO₂ AND ZNO SOLAR CELLS USING CDS AS SENSITIZER: STABILITY INVESTIGATION	1819
<i>B. Wang, L. L. Kerr</i>	
INTRABAND RELAXATION OF PHOTOEXCITED CARRIERS IN MULTIPLE STACKED QUANTUM DOTS AND QUANTUM DOTS CHAINS	1823
<i>O. Kojima, M. Mamizuka, T. Kita, O. Wada</i>	
SILICON QUANTUM DOT OPTICAL PROPERTIES AND SYNTHESIS: IMPLICATIONS FOR PHOTOVOLTAIC DEVICES	1827
<i>B. G. Lee, B. N. Jariwala, R. T. Collins, S. Agarwal, P. Stradins</i>	
ZNO-ZNTE NANOCONE HETEROJUNCTIONS FOR EFFICIENT CARRIER TRANSPORT FOR PHOTOVOLTAIC CONVERSION	1830
<i>S. H. Lee, X. G. Zhang, B. Smith, J. Howe, J. Xu</i>	
MULTI-STACKED INAS/GANAS QUANTUM DOTS WITH DIRECT SI DOPING FOR USE IN INTERMEDIATE BAND SOLAR CELLS	1834
<i>T. Morioka, R. Oshima, A. Takata, Y. Shoji, T. Inoue, T. Kita, Y. Okada</i>	
STUDY ON SPECTRAL RESPONSE OF SCHOTTKY-TYPE MULTI-STACK HIGH DENSITY QUANTUM DOT MOLECULE PHOTOVOLTAIC CELLS AT CONCENTRATED LIGHT	1838
<i>O. Tangmettjittakul, S. Thainoi, P. Changmoang, S. Kanjanachuchai, S. Rattanathamaphan, S. Panyakeow</i>	
PHONON DECAY IN NANOSTRUCTURES: COMPUTATIONAL STUDY	1843
<i>R. Patterson, Z. Wan, B. P. Veetil, D. Konig, G. Conibeer</i>	
FACETING AND DISORDER IN NANOWIRE SOLAR CELL ARRAYS	1848
<i>E. Pickett, A. Gu, Y. Huo, E. Garnett, S. Hu, T. Sarmiento, S. Thombare, D. Liang, S. Li, Y. Ciu, M. McGehee, P. McIntyre, J. Harris</i>	
FLUORESCENT MANGANESE-DOPED ZINC SULPHIDE NANOPARTICLES FOR SPECTRAL SHIFTING	1854
<i>S. Sen, P. Sharma, C. S. Solanki, R. Bandyopadhyaya</i>	
MULTI-STACKED INGAAS/GANAS QUANTUM DOT SOLAR CELL FABRICATION ON GAAS (311)B SUBSTATE	1859
<i>Y. Shoji, R. Oshima, A. Takata, T. Morioka, Y. Okada</i>	
CHARACTERISTICS OF HIGHLY STACKED QUANTUM DOT SOLAR CELLS FABRICATED BY INTERMITTENT DEPOSITION OF INGAAS	1863
<i>T. Sugaya, S. Furue, O. Numakami, T. Amano, M. Mori, K. Komori, Y. Okano, S. Niki</i>	
TOWARDS SILICON NANOCRYSTALS BASED SOLAR CELLS: MORPHOLOGICAL PROPERTIES AND CONDUCTION PHENOMENA	1868
<i>K. Surana, H. Lepage, D. Bellet, G. Carval, M. Baudrit, P. Thony, P. Mur</i>	
ENHANCED PHOTOVOLTAIC EFFECT OF NANOCSECOND-LASER PRODUCED SILICON NANOCRYSTALS EMBEDDED INTO TiO₂ NANOTUBES	1873
<i>V. Svrcek, I. Turkevych, K. Hara, M. Kondo</i>	
FABRICATION OF 100 LAYER-STACKED INAS/GANAS STRAIN-COMPENSATED QUANTUM DOTS ON GAAS (001) FOR APPLICATION TO INTERMEDIATE BAND SOLAR CELL	1877
<i>A. Takata, R. Oshima, Y. Shoji, K. Akahane, Y. Okada</i>	
HIGH S/N CRYSTALLINITY MEASUREMENT AND EFFECTIVE DEFECT PASSIVATION IN SILICON NANOSTRUCTURES FOR THIRD GENERATION PHOTOVOLTAICS	1881
<i>K. Watanabe, T. Mine, R. Tsuchiya, M. Hatano</i>	
STACKING GROWTH OF IN-PLANE INAS QUANTUM-DOT SUPERLATTICES ON GAASSB/GAAS(001) FOR SOLAR CELL APPLICATIONS	1885
<i>T. Inaji, J. Ohta, K. Yamaguchi</i>	
PHOTOVOLTAIC EFFECT IN GE NANOCRYSTALS/C-SILICON	1889
<i>Y. Yao, B. Zhang, M. A. Green, G. Conibeer, S. K. Shrestha</i>	

AREA 2: POSTERS, CIGS & CDTE: CDTE: CDTE AND OTHER MATERIALS

BAND GAP DETERMINATION OF CU₂ZNSNSE₄ THIN FILMS	1894
<i>S. Ahn, S. Jung, J. Gwak, A. Cho, K. Shin, K. Yoon, J. H. Yun</i>	
SPUTTER DEPOSITED ZNTE/ZNSE/ZNO HETEROJUNCTIONS FOR PHOTOVOLTAIC APPLICATIONS	1897
<i>O. Akpa, S. Shaik, T. Thompson, T. Isaacs-Smith, P. Anderson, S. Seraphin, K. Das</i>	
INEXPENSIVE, ABUNDANT, NON-TOXIC THIN FILMS FOR SOLAR CELL APPLICATIONS GROWN BY REACTIVE SPUTTERING	1902
<i>V. Chawla, B. Clemens</i>	
SULFURIZATION STUDIES OF THE POTENTIAL THIN FILM SOLAR ABSORBER CU₂ZNSNS₄	1906
<i>A. J. Cheng, M. Manno, R. Frakie, R. Hoffman, C. Leighton, E. Aydil, S. A. Campbell</i>	
WORK QUANTUM EFFICIENCY OF CDTE SOLAR CELL	1912
<i>Z. Cheng, K. Lo, H. Opyrchal, J. Pan, D. Chen, T. Zhou, Q. Wang, G. E. Georgiou, K. K. Chin</i>	
THE ROLES OF CU IMPURITY STATES IN CDTE THIN FILM SOLAR CELLS	1915
<i>K. K. Chin, T. A. Gessert, S. H. Wei</i>	
IN-SITU XRD INVESTIGATION ON PHASE TRANSITION OF CDTE THIN FILMS DURING A CDCI₂ HEAT TREATMENT	1919
<i>M. Kim, S. Lee, S. Sohn</i>	
INFRARED PL STUDIES OF SPUTTERED CDTE FILMS AND CELLS	1923
<i>D. Kwon, X. Liu, N. R. Paudel, K. A. Weiland, A. D. Compaan</i>	
COMPARATIVE STUDY OF CDTE THIN FILM SOLAR CELLS WITH WET AND DRY CDCI₂ TREATMENT PROCESS	1927
<i>J. Lee, H. Ryu, D. Lim, K. Yang, W. Choi, J. Yi</i>	
STRUCTURE STUDY OF CADMIUM TIN OXIDE THIN-FILMS PREPARED BY LINEAR COMBINATORIAL SYNTHESIS	1933
<i>X. Li, T. Coutts, T. A. Gessert</i>	
INTERFACE ANALYSIS IN CDTE/CDS SOLAR CELLS	1937
<i>B. Lita, M. J. Pavol, K. Dovidenko, L. A. Tarte, D. Ellis, T. Barbuto, S. Bansal, V. S. Smenthowski, M. Young, S. E. Asher</i>	
A REVISED VERSION OF THE AMPS SIMULATION CODE	1943
<i>Y. Liu, D. Heinzl, A. Rockett</i>	
INVESTIGATING SPUTTERED CU₂SI₁-XSNXS₃ [CSTS] FOR EARTH ABUNDANT THIN FILM PHOTOVOLTAICS	1948
<i>E. A. Lund, J. L. Johnson, W. M. H. Oo, M. A. Scarpulla</i>	
EFFECT OF CHEMICAL TREATMENT ON THE OPTICAL PROPERTIES OF A CDTE PHOTOVOLTAIC DEVICE INVESTIGATED BY SPECTROSCOPIC ELLIPSOMETRY	1951
<i>S. Kohli, V. Manivannan, J. N. Hilfiker, P. R. McCurdy, R. A. Enzenroth, K. L. Barth, W. P. Smith, R. Luebs, J. Kephart, W. S. Sampath</i>	
ELECTRICAL PROPERTIES OF DC₂TE/CDS AND CDTE/SNO₂ SOLAR CELLS STUDIED WITH SCANNING KELVIN PROBE MICROSCOPY	1955
<i>H. R. Moutinho, R. G. Dhere, C. S. Jiang, D. S. Albin, M. M. Al-Jassim</i>	
STRUCTURAL PROPERTIES OF CDTE AND ZNTE THIN FILMS DEPOSITED ON FLEXIBLE FOIL SUBSTRATES	1960
<i>V. Palekis, D. Shen, D. Hodges, S. Bhandaru, E. Stefanakos, D. L. Morel, C. S. Ferekides</i>	
ULTRASONIC SPRAY PYROLYSIS OF CZTS SOLAR CELL ABSORBER LAYERS AND CHARACTERIZATION STUDIES	1964
<i>T. Prabhakar, J. Nagaraju</i>	
OPTICAL PROPERTIES OF CDS THIN FILMS OBTAINED BY CSVT UNDER DIFFERENT GROWTH CONDITIONS AND THEIR INFLUENCE IN PROTOTYPE PV DEVICES	1970
<i>J. Sastre-Hernandez, G. Contreras-Puente, R. Mendoza-Perez, J. Aguilar-Hernandez, G. Ortega-Cervantes, O. Vigil-Galan, W. Chicana-Nuncebay, L. Znaidi</i>	
TELLURIDES AS BACK CONTACTS FOR SUBSTRATE CDTE THIN FILM SOLAR CELLS ON FLEXIBLE FOIL SUBSTRATES	1973
<i>D. Shen, V. Palekis, D. Hodges, S. Bhandaru, V. Guntur, E. Stefanakos, D. Morel, C. Ferekides</i>	
GROWTH OF HIGH QUALITY CU₂ZNSNS₄ THIN FILMS ON GAN BY CO-EVAPORATION	1977
<i>H. F. Lui, K. K. Leung, W. K. Fong, C. Surya</i>	
CHEMICAL ETCHING OF CU₂ZNSN(S,SE)₄ MONOGRAN POWDER	1982
<i>K. Timmo, M. Altosaar, J. Raudoja, M. Grossberg, M. Danilson, O. Volobujeva, E. Mellikov</i>	

A CHEMICAL BATH PROCESS FOR DEPOSITING CU₂ZNSNS₄ PHOTOVOLTAIC ABSORBERS	1986
<i>A. Wangperawong, J. S. King, S. M. Herron, B. P. Tran, K. Pangan-Okimoto, S. F. Bent</i>	
MODELING OF CDZNT₂ AND CIGS AND TANDEM SOLAR CELLS	1990
<i>Y. G. Xiao, Z. Q. Li, M. Lestrade, Z. M. S. Li</i>	

AREA 3: POSTERS, III-V'S & CONCENTRATORS:
III-V CONCENTRATOR CELLS

QUALIFICATION TESTING OF 40% METAMORPHIC CPV SOLAR CELLS	1995
<i>O. Taher, R. Cravens, P. Pien, R. Jones, J. Ermer, P. Hebert, J. Chin</i>	
TRAPS IN AIGAINP MATERIALS AND DEVICES LATTICE MATCHED TO GAAS FOR MULTI-JUNCTION SOLAR CELLS	1999
<i>A. R. Arehart, M. R. Brenner, Z. Zhang, K. Swaminathan, S. A. Ringel</i>	
A NEW CIRCULAR CONTACT GRID PATTERN, DESIGNED FOR SOLAR CELLS IN A MECHANICAL STACK	2002
<i>G. M. M. W. Bissels, M. A. H. Asselbergs, J. J. Schermer, E. J. Haverkamp, N. J. Smeenk, E. Vlieg</i>	
FAST GROWTH RATE GAAS AND INGAP FOR MOCVD GROWN TRIPLE JUNCTION SOLAR CELLS	2007
<i>C. Ebert, A. Parekh, Z. Pulwin, W. Zhang, D. Lee, D. Byrnes</i>	
TANDEM SOLAR CELLS INVOLVING III-V AND IV SEMICONDUCTOR JUNCTIONS	2012
<i>M. Emziane</i>	
OXIDATION AND CHARACTERIZATION OF AIINP UNDER LIGHT-SOAKED, DAMP HEAT CONDITIONS	2016
<i>R. France, M. A. Steiner, T. G. Deutsch, E. A. Brucker, C. S. Jiang, A. G. Norman</i>	
CELL-LEVEL THERMAL MANAGEMENT ISSUES IN CONCENTRATOR III-V MULTI-JUNCTION SOLAR CELLS	2021
<i>J. F. Geisz, D. J. Friedman, S. R. Kurtz, M. A. Steiner, W. E. McMahon, L. Gedvilas, A. Duda, M. Young, W. Olavarria</i>	
DEFECT STATES WITH AN OCCUPATION-DEPENDENT LATTICE CONFIGURATION IN ZINC-DOPED GA_{0.58}IN_{0.42}P ON GAAS	2026
<i>T. H. Gfroerer, D. G. Hampton, M. W. Wanlass</i>	
METAMORPHIC GAASP AND INGAP PHOTOVOLTAIC MATERIALS ON SI FOR HIGH-EFFICIENCY III-V/SI MULTI-JUNCTION SOLAR CELLS	2029
<i>T. J. Grassman, A. M. Carlin, S. A. Ringel</i>	
DESIGN AND GROWTH OF III-V NANOWIRE SOLAR CELL ARRAYS ON LOW COST SUBSTRATES	2034
<i>A. Gu, Y. Huo, S. Hu, T. Sarmiento, E. Pickett, D. Liang, S. Li, A. Lin, S. Thombare, Z. Yu, S. Fan, P. McIntyre, Y. Cui, J. Harris</i>	
DESIGN OF 2- AND 3-TERMINAL GALNP/GAAS CONCENTRATOR CELLS FOR MAXIMUM YEARLY ENERGY OUTPUT	2038
<i>A. W. Haas, J. R. Wilcox, J. L. Gray, R. J. Schwartz</i>	
A DISTRIBUTED EMITTER MODEL FOR SOLAR CELLS: EXTRACTING AN EQUIVALENT LUMPED SERIES RESISTANCE	2044
<i>A. W. Haas, J. R. Wilcox, J. L. Gray, R. J. Schwartz</i>	
ENHANCED N INCORPORATION AND IMPROVED OPTICAL PROPERTIES IN GAASN EPILAYERS BY USING HIGH-INDEX GAAS SUBSTRATES	2050
<i>X. Han, H. Suzuki, J. H. Lee, M. Inagaki, N. Kojima, Y. Ohshita, M. Yamaguchi</i>	
IMPROVEMENT OF MINORITY-CARRIER LIFETIME IN GAASN GROWN BY CHEMICAL BEAM EPITAXY	2053
<i>T. Honda, M. Inagaki, H. Suzuki, N. Kojima, Y. Ohshita, M. Yamaguchi</i>	
EFFECT OF CELL SIZE ON GAAS CONCENTRATORS WITH INAS QUANTUM DOTS	2057
<i>S. J. Polly, M. L. Harris, Z. Bittner, C. R. Plourde, C. G. Bailey, D. V. Forbes, S. M. Hubbard</i>	
ORIGIN OF NEAR-BAND-EDGE PHOTOLUMINESCENCE OF GAASN	2062
<i>M. Inagaki, H. Suzuki, N. Kojima, Y. Ohshita, M. Yamaguchi</i>	
NUMERICAL SIMULATIONS OF TRIPLE-JUNCTION GAINP/GAAS/GE SOLAR CELLS TO PROVIDE INSIGHT INTO FILL-FACTOR LOSSES AT HIGH CONCENTRATION	2066
<i>A. Kanevce, J. M. Olson, W. K. Metzger</i>	
LOW TEMPERATURE GROWTH GAAS ON GE BY CHEMICAL BEAM EPITAXY	2070
<i>J. H. Lee, H. Suzuki, X. Han, M. Inagaki, K. Ikeda, N. Kojima, Y. Ohshita, M. Yamaguchi</i>	

CONTACT OPTIMIZATION FOR CONCENTRATOR SOLAR CELLS	2074
<i>J. J. Li, D. Ding, S. H. Lim, Y. H. Zhang</i>	
WIDE BAND GAP GALLIUM PHOSPHIDE SOLAR CELLS FOR MULTI-JUNCTION SOLAR CELL SYSTEM	2079
<i>X. Lu, S. R. Huang, M. Diaz, R. L. Opila, A. Barnett</i>	
ANTIMONY ENHANCED HOMOGENEOUS NITROGEN INCORPORATION INTO GALNNAS FILMS GROWN BY ATOMIC HYDROGEN-ASSISTED MOLECULAR BEAM EPITAXY	2084
<i>N. Miyashita, N. Ahsan, Y. Okada</i>	
OPTIMIZATION OF THE P-GAN WINDOW LAYER FOR INGAN/GAN SOLAR CELLS	2089
<i>C. J. Neufeld, Z. Chen, S. C. Cruz, N. G. Toledo, S. P. DenBaars, U. K. Mishra</i>	
TEMPERATURE CHARACTERISTICS ANALYSIS OF INGA/INGAAS/GE TRIPLE-JUNCTION SOLAR CELL UNDER CONCENTRATED LIGHT USING SPICE DIODE MODEL	2093
<i>Y. Ota, Y. Sakurada, K. Nishioka</i>	
STRUCTURE AND COMPOSITION OF LATTICE-MISMATCHED III-V EPILAYERS FOR HIGH-EFFICIENCY PHOTOVOLTAICS	2097
<i>M. Rathi, S. P. Ahrenkiel, J. J. Carapella, M. W. Wanlass, M. Steiner</i>	
CELL EFFICIENCY DEPENDENCE ON SOLAR INCIDENCE ANGLE	2102
<i>C. Seshan</i>	
METAMORPHIC INGA ON GAAS AND GAP FOR WIDE-BANDGAP PHOTOVOLTAIC JUNCTIONS	2106
<i>J. Simon, S. Tomasulo, P. J. Simmonds, M. Romero, M. L. Lee</i>	
2.0-2.1 EV GAXINI-XP SOLAR CELLS GROWN ON RELAXED GAASP STEP GRADES	2111
<i>S. A. Steiner, R. M. France, M. W. Wanlass, J. F. Geisz, W. J. Olavarria, J. J. Carapella, A. Duda, M. J. Romero, C. R. Osterwald, P. Cizek, D. Kuciauskas</i>	
STUDY OF GAASN THIN FILM STRUCTURES BY X-RAY RECIPROCAL SPACE MAPPING FOR MULTI-JUNCTION SOLAR CELL APPLICATION	2117
<i>H. Suzuki, N. Kojima, Y. Ohshita, M. Yamaguchi</i>	
IDENTIFICATION OF N-H RELATED DEFECTS IN GAASN GROWN BY CHEMICAL BEAM EPITAXY	2120
<i>T. Tanaka, H. Suzuki, N. Kojima, Y. Ohshita, M. Tamaguchi</i>	
INGAP / GAAS / INGAAS INVERTED METAMORPHIC (IMM) SOLAR CELLS ON 4" EPITAXIAL LIFTED OFF (ELO) WAFERS	
R. Tatavarti, A. Wibowo, G. Martin, F. Tuminello, C. Youtsey, G. Hillier, N. Pan	2125
<i>T. Tanaka, H. Suzuki, N. Kojima, Y. Ohshita, M. Tamaguchi</i>	
EFFICIENCY ENHANCEMENT IN SINGLE JUNCTION INGA SOLAR CELLS BY USING SELF-ASSEMBLED NANOSPHERES	2129
<i>H. C. Chen, Y. L. Tsai, H. W. Wang, M. A. Tsai, P. C. Tseng, C. Y. Jang, P. Yu, H. C. Kuo</i>	
EFFICIENCY ENHANCEMENT INGA/GAAS DUAL-JUNCTION SOLAR CELL WITH SUB-WAVELENGTH ANTIREFLECTION NANOROD ARRAYS	2132
<i>H. W. Wang, M. A. Tsai, H. C. Chen, Y. L. Tsai, P. C. Tseng, C. Y. Jang, P. Yu, H. C. Kuo</i>	
CHARACTERIZATION OF THIN GAAS FILMS GROWN ON NANOSTRUCTURED SILICON SUBSTRATES	2135
<i>S. G. Sandoval, M. Khizar, J. Anderson, R. P. Manginell, G. M. Peake, N. Amin, K. Sopian, T. Rotter, G. Balkrishnan, S. R. J. Brueck, S. H. Zaidi</i>	

AREA 4: POSTERS, CRYSTALLINE SILICON: CRYSTALLIZATION, MODELLING AND CHARACTERIZATION

PROGRESS ON THE CONTINUOUS OPTICAL FAST CVD SYSTEM TO GROW SILICON RIBBONS FOR SOLAR CELLS VIA SDS PROCESS	2139
<i>A. Augusto, J. M. Serra, A. M. Vallera</i>	
INKJET PLATING RESIST FOR IMPROVED CELL EFFICIENCY	2142
<i>H. Dong, R. Barr, P. Hinkley</i>	
LOW COST, LOW CO₂ EMISSION SOLAR GRADE SILICON	2147
<i>J. R. Mott, J. A. Bragagnolo, M. P. Hayes</i>	
FLOATING CRYSTALLINE SI-FOILS FOR PHOTOVOLTAIC APPLICATIONS	2151
<i>U. Cohen, M. Roitberg</i>	
AN INVESTIGATION OF THE THERMAL GRADIENTS IN SILICON DURING MULTICRYSTALLINE INGOT CASTING	2157
<i>H. Dalaker, M. Syvertsen, E. Ovrelid</i>	

BORON - NITROGEN INTERACTIONS IN LIQUID SILICON	2162
<i>H. Dalaker, M. Tangstad</i>	
A NEW DSS FURNACE FOR ENERGY SAVING IN THE PRODUCTION OF MULTI-CRYSTALLINE SILICON	2165
<i>F. Dughiero, M. Forzan, D. Ciscato</i>	
PV MODULE POWER GAIN DUE TO BIFACIAL DESIGN. PRELIMINARY EXPERIMENTAL AND SIMULATION DATA	2171
<i>L. Kreinin, N. Bordin, A. Karsenty, A. Drori, D. Grobgeld, N. Eisenberg</i>	
ULTRA-HIGH MATERIAL-QUALITY SILICON PILLARS ON GLASS	2176
<i>F. Liu, M. M. Al-Jassim, D. L. Young</i>	
THERMAL CURING OF CRYSTALLOGRAPHIC DEFECTS ON A SLIM-CUT SILICON FOIL	2180
<i>A. Masolin, J. Vaes, F. Dross, J. Poortmans, R. Mertens</i>	
A FREEWARE PROGRAM FOR PRECISE OPTICAL ANALYSIS OF THE FRONT SURFACE OF A SOLAR CELL	2184
<i>S. C. Baker-Finch, K. R. McIntosh</i>	
A FREEWARE 1D EMITTER MODEL FOR SILICON SOLAR CELLS	2188
<i>K. R. McIntosh, P. P. Altermatt</i>	
BORON REMOVAL FROM UMG-SI BY HYBRID MELTING UTILIZING STEAM PLASMA TORCH AND EMCM	2194
<i>B. M. Moon, H. M. Lee, B. K. Kim, D. Park, T. U. Yu</i>	
PRODUCTION OF LOW-COST SOLAR-GRADE SILICON BY REDUCTION OF SiF₄ GAS WITH SODIUM: TECHNICAL AND INDUSTRIAL DEVELOPMENT STATUS	2198
<i>J. Perez-Mariano, L. Moro, K. Lau, M. Hombostel, A. Nagar, B. Xie, J. Bao, G. Krishnan, A. Sanjurjo</i>	
DIAGNOSTIC STRUCTURES FOR EPITAXIAL THIN SILICON SOLAR CELLS	2204
<i>C. P. Murcia, R. Hao, T. Creazzo, K. Shreve, A. Lochtefeld, M. Curtin, A. Barnett</i>	
LIGHT TRAPPING ENHANCEMENT IN THIN SILICON SOLAR CELLS USING PHOTONIC CRYSTALS	2208
<i>J. G. Mutitu, S. Shi, A. Barnett, D. W. Prather</i>	
DESIGN ANALYSIS OF ZNO/CSI HETEROJUNCTION SOLAR CELL	2213
<i>M. Nawaz, E. S. Marstein, A. Holt</i>	
CHARACTERIZATION OF POLYCRYSTALLINE SILICON FILMS PRODUCED BY ALUMINUM-INDUCED LAYER EXCHANGE FOR THE VARIOUS THICKNESSES OF AN ALUMINUM OXIDE LAYER	2219
<i>H. Jeong, K. H. Oh, J. H. Lee, S. Boo</i>	
EFFECT OF MICROSTRUCTURE AND PROCESSING PARAMETERS ON MECHANICAL STRENGTH OF MULTICRYSTALLINE SILICON SOLAR CELLS	2222
<i>V. A. Popovich, A. Yunus, M. Janssen, I. J. Bennett, I. M. Richardson</i>	
TWO DIMENSIONAL NUMERICAL MODELING OF A SILICON SOLAR CELL WITH SELECTIVE EMITTER CONFIGURATION	2227
<i>K. Rapolu, P. Singh, S. P. Shea</i>	
INFLUENCE OF DEFECTS AND DEFECT DISTRIBUTIONS IN MULTICRYSTALLINE SILICON ON SOLAR CELL PERFORMANCE	2233
<i>B. Sopori, P. Rupnowski, S. Shet, V. Budhraj, N. Call, S. Johnston, M. Seacrist, G. Shi, J. Chen, A. Deshpande</i>	
A REFLECTANCE SPECTROSCOPY-BASED TOOL FOR HIGH-SPEED CHARACTERIZATION OF SILICON WAFERS AND SOLAR CELLS IN COMMERCIAL PRODUCTION	2238
<i>B. Sopori, P. Rupnowski, D. Guhabiswas, S. Devayajanam, S. Shet, C. P. Khattak, M. Albert</i>	
CHARACTERIZATION OF A VERY LOW-COST SILICON CATHODE-ZINC ELECTROLYTE SOLAR CELL	2242
<i>B. Tousif, S. Pourkamali</i>	
CLASSIFICATION OF DEFECTS IN POLYCRYSTALLINE SI BY TEMPERATURE DEPENDENCE OF ELECTROLUMINESCENCE UNDER FORWARD AND REVERSE-BIASES	2247
<i>S. Tsujii, E. Sugimura, K. Hirata, T. Saito, A. Tani, T. Hatayama, H. Yano, T. Fuyuki</i>	
AMORPHOUS/CRYSTALLINE SILICON HETEROJUNCTIONS UNDER INTENSIVE ILLUMINATION	2250
<i>Q. Wang, M. R. Page, E. Iwaniczko, Y. Q. Xu, L. Roybal, A. Duda, F. Hasoon, S. Ward, D. Wang, P. R. Yu</i>	
MICROSTRUCTURE AND SURFACE CHEMISTRY OF NANOPOROUS "BLACK SILICON" FOR PHOTOVOLTAICS	2255
<i>Y. Yan, H. C. Yuan, V. E. Yost, K. Jones, M. Al-Jassim, H. M. Branz</i>	
THE DISLOCATION DISTRIBUTION CHARACTERISTICS OF A MULTI-CRYSTALLINE SILICON INGOT AND ITS IMPACT ON THE CELL EFFICIENCY	2258
<i>D. You, J. Du, Y. Zhang, Y. Wan, W. Shan, L. Wang, D. Yang</i>	

2.D NUMERICAL SIMULATION AND MODELING OF MONOCRYSTALLINE SELECTIVE EMITTER SOLAR CELLS	2262
<i>M. Zanucoli, P. F. Bresciani, M. Frei, H. W. Guo, H. Fang, M. Agrawal, C. Fiegna, E. Sangiorgi</i>	
PURIFICATION OF SOLAR GRADE SILICON USING ELECTROMAGNETIC FIELD	2266
<i>A. Dong, L. N. W. Damoah, L. Zhang, H. Zhu</i>	
NON-METALLIC PARTICLES IN SOLAR GRADE SILICON (SOG-SI)	2270
<i>L. N. W. Damoah, A. Dong, L. Zhang, H. Zhu</i>	

AREA 9: POSTERS, PV MODULES & SYSTEMS:
PERFORMANCE AND SYSTEMS

LONG TERM PERFORMANCE OF PV HYBRID SYSTEM IN THE GOBI DESERT OF MONGOLIA	2275
<i>A. Adiyabat, K. Otani, N. Enebish, N. Ivanov, B. Dagva</i>	
DATA ANALYSIS OF SOLAR POWER INSTALLATION PROJECT FOR LEE COUNTY'S T.K. DAVIS JUSTICE CENTER	2279
<i>J. A. Rdiek, S. R. Best, H. W. Brandhorst</i>	
LONG-TERM PERFORMANCE OF THE FIRST GRID-CONNECTED, BUILDING-INTEGRATED AMORPHOUS SILICON PV INSTALLATION IN BRAZIL	2283
<i>R. Ruther, L. Nascimento, J. Urbanetz, P. Pfitscher, T. Viana</i>	
PERFORMANCE ASSESSMENT OF A MICROCRYSTALLINE SI PV INSTALLATION IN A WARM CLIMATE	2287
<i>R. Ruther, L. Nascimento, J. Urbanetz, P. Pfitscher, T. Viana</i>	
COMPARISON ANALYSIS OF MEASURED AND ESTIMATED YIELD OF GRID-CONNECTED PV SYSTEM	2291
<i>J. H. So, H. M. Hwang, B. G. Yu, J. S. Yoo, G. J. Yu, J. Y. Choi</i>	
LARGE SCALE PV SYSTEM MONITORING - MODULES TECHNOLOGY INTERCOMPARISON	2295
<i>M. Krawczynski, M. B. Strobel, B. Goss, N. Bristow, M. Bliss, T. R. Betts, R. Gottschalg</i>	
EFFICIENCY VS. IRRADIANCE CHARACTERIZATION OF PV MODULES REQUIRES ANGLE-OF-INCIDENCE AND SPECTRAL CORRECTIONS	2301
<i>M. Donovan, B. Bourne, J. Roche</i>	
COMPARING PV SIMULATION MODELS AND METHODS WITH OUTDOOR MEASUREMENTS	2306
<i>S. Ransome</i>	
DEVELOPING A COMPUTATIONAL TOOL TO ASSESS SHADOW PATTERN ON A HORIZONTAL PLANE, PRELIMINARY RESULTS	2312
<i>R. Soler-Bientz, F. Gomez-Castro, L. Omar-Ricalde</i>	
IDENTIFYING CAUSES OF POWER REDUCTION IN PHOTOVOLTAIC SYSTEMS	2318
<i>S. Silvestre, A. Chouder</i>	
A SIMPLE NON-LINEAR MODEL FOR THE EFFECT OF PARTIAL SHADE ON PV SYSTEMS	2321
<i>N. Thakkar, D. Cormode, V. P. A. Lonij, S. Pulver, A. D. Cronin</i>	
EFFECT OF SMALL CONTINUOUS LOADS ON SYSTEM EFFICIENCY	2327
<i>B. Chhabra, R. Kamada, R. L. Opila, C. B. Honsberg</i>	
DEGRADATION OF DIFFERENT PHOTOVOLTAIC TECHNOLOGIES UNDER FIELD CONDITIONS	2332
<i>G. Makrides, B. Zinsser, G. E. Georghiou, M. Schubert, J. H. Werner</i>	
DEVELOPMENT AND IMPLEMENTATION OF A HYBRID PHOTOVOLTAIC SYSTEM FOR ENERGY BACK-UP	2338
<i>J. Patino, J. Tello, J. Hernandez, C. A. Arredondo, G. Gordillo</i>	
BUILDING INTEGRATED SOLAR POWER GENERATION ON ROOF	2342
<i>G. Yu, H. Xu, J. Ding, H. Xu, X. Xiang, X. Liao</i>	
A HIGH-PERFORMANCE STAND-ALONE SOLAR PV POWER SYSTEM FOR LED LIGHTNING	2346
<i>B. J. Huang, P. C. Hsu, M. S. Wu, K. Y. Chen</i>	
DIFFUSION OF GRID-CONNECTED PV IN INDIA: AN ANALYSIS OF VARIATIONS IN CAPACITY FACTOR	2349
<i>S. Doolla, R. Banerjee</i>	

ENVIRONMENTAL BENEFITS OF PV POWERED LIGHTNING PRODUCTS FOR RURAL AREAS IN SOUTH EAST ASIA: A LIFE CYCLE ANALYSIS WITH GEOGRAPHIC ALLOCATION	2353
<i>B. Durlinger, A. Reinders, M. Toxopeus</i>	
A COST ANALYSIS OF PHOTOVOLTAIC TECHNOLOGIES UNDER JAMAICA'S CLIMATIC CONDITIONS	2358
<i>D. A. Field, C. McNamara</i>	
SOLAR RADIATION IN YUCATÁN PENINSULA, PRELIMINARY ANALYSIS	2363
<i>R. Soler-Bientz, L. Ricalde-Cab</i>	
SOLUTIONS FOR DEPLOYING PV SYSTEMS IN NEW YORK CITY'S SECONDARY NETWORK SYSTEM	2368
<i>M. H. Coddington, B. D. Kroposki, K. H. Anderson</i>	
STATISTICAL MODELING FOR GLOBAL SOLAR RADIATION FORECASTING IN BOGOTÁ	2374
<i>R. Perdomo, E. Banguero, G. Gordillo</i>	
A COMPARISON BETWEEN THIN FILM AND C-SI PV TECHNOLOGIES	2380
<i>A. Doni, F. Dughiero, A. Lorenzoni</i>	
FIELD DATA COLLECTION FOR QUANTIFICATION OF RELIABILITY AND AVAILABILITY FOR PHOTOVOLTAIC SYSTEMS	2386
<i>E. Collins, J. Mahn, M. Mundt, J. Granata, M. Quintana</i>	

AREA 10: POSTERS, PV VELOCITY FORUM-STREAMLINING PATHS TO MARKETS

STRATEGIES TO TARGET RURAL PV MARKET IN DEVELOPING COUNTRIES - A PERSPECTIVE	2392
<i>C. S. Solanki, S. Mudaliar</i>	
PROGRESS OF DEVELOPMENT OF PV SYSTEMS IN SOUTH-EASTERN POLAND	2397
<i>J. M. Olchowik, K. Cieslak, S. Gulkowski, J. Mucha, M. Sordyl, K. Zabielski, D. Szymczuk, A. Zdyb</i>	
THE COMMERCIALIZATION OF THIN FILM TECHNOLOGIES: PAST, PRESENT AND FUTURE	2400
<i>P. Mints</i>	

AREA 2: POSTERS, CIGS & CDTE: CIGS I AND TCOS

EFFECT OF ANNEALING FOR AG-IN-S THIN FILMS PREPARED BY A VACUUM EVAPORATION METHOD	2405
<i>Y. Akaki, K. Yamashita, T. Yashitake, S. Nakamura, S. Seto, T. Tokuda, K. Yoshino</i>	
RF-SPUTTERED ITO AND ITO:ZR STUDIED BY IN SITU SPRECTROSCOPIC ELLIPSOMETRY	2408
<i>J. M. Burst, T. J. Peshek, T. A. Gessert, T. J. Coutts, X. Li, D. Levi, S. M. Weiss, B. R. Rogers</i>	
ROOM-TEMPERATURE FABRICATION OF HIGHLY TRANSPARENT CONDUCTIVE ALUMINUM-DOPED ZINC OXIDE FILMS	2413
<i>C. H. Chen, Y. C. Chen, S. F. Hong, C. L. Wang, W. C. Shih, C. P. Tsai, Y. C. Wu, C. H. Lai, C. N. Wei, H. Y. Bor</i>	
SUPPRESSION OF DEEP LEVEL DEFECTS IN CIGS SOLAR CELLS USING PROTON IMPLANTATIONS	2418
<i>M. S. Seol, D. H. Kim, D. W. Kwak, D. W. Lee, J. H. Jeong, W. S. Kim, H. Y. Cho</i>	
PROGRESS TOWARD A STABILIZATION AND PRECONDITIONING PROTOCOL FOR POLYCRYSTALLINE THIN-FILM PHOTOVOLTAIC MODULES	2423
<i>J. A. Cueto, C. A. Deline, S. R. Rummel, A. Anderberg</i>	
FORMATION OF A CONDUCTIVE GRID ON THIN FILM MODULES GLASS BY LASER-PATTERNING	2429
<i>J. Jaus, H. Pantisar, O. F. Adurodija, B. Li, B. Regaard, H. Herfurth, D. Doble</i>	
STUDY OF ELECTRICAL AND MORPHOLOGICAL PROPERTIES OF AGINSE2 THIN FILMS GROWN BY CO-EVAPORATION	2433
<i>C. A. Arredondo, F. Mesa, G. Gordillo</i>	
HIGH PERFORMANCE DIELECTRIC AND BARRIER COATINGS FOR PHOTOVOLTAIC SYSTEMS	2439
<i>T. J. Gudgel, S. Govindarajan, S. Sambasivan</i>	

EFFECT OF THE MO BACK CONTACT MICROSTRUCTURE ON THE PREFERRED ORIENTATION OF CIGS THIN FILMS.....	2443
<i>J. H. Yoon, K. H. Yoon, J. K. Kim, W. M. Kim, J. K. Park, T. S. Lee, Y. J. Baik, T. Y. Seong, J. H. Jeong</i>	
COPPER-SILVER CHALCOPYRITES AS TOP CELL ABSORBERS IN TANDEM PHOTOVOLTAIC AND HYBRID PHOTOVOLTAIC/PHOTOELECTROCHEMICAL DEVICES	2448
<i>J. Kaneshiro, A. Deangelis, N. Gaillard, Y. Chang, J. Kowalczyk, E. Miller</i>	
ZNO GROWN BY CHEMICAL SOLUTION DEPOSITION	2452
<i>M. Kauk, K. Muska, M. Altosaar, M. Danilson, K. Ounpuu, T. Varema, O. Volobujeva</i>	
ADVANCED SUPERIMPOSED SPUTTERING OF AMORPHOUS INDIUM ZINC OXIDE TRANSPARENT CONDUCTORS FOR ENERGY APPLICATIONS	2457
<i>J. E. Leisch, M. C. Gallante, J. J. Berry, T. Gennett, J. D. Perkins, D. S. Genley</i>	
HEAT RESISTANCE OF GA-DOPED ZNO FILMS DEPOSITED BY ION-PLATING WITH DC-ARC DISCHARGE: IMPACT OF O₂ FLOW RATE DURING DEPOSITION	2459
<i>H. Makino, T. Yamada, N. Yamamoto, Y. Yamamoto</i>	
IN-SITU AND EX-SITU STUDIES OF MOLYBDENUM THIN FILMS DEPOSITED BY RF AND DC MAGNETRON SPUTTERING	2463
<i>H. Khatri, R. W. Collins, S. Marsillac</i>	
OPTICAL AND ELECTRICAL PROPERTIES OF CU-IN-TE BASED THIN FILMS AND SOLAR CELLS.....	2466
<i>T. Mise, T. Nakada</i>	
SOLUTION DEPOSITION OF AMORPHOUS IZO FILMS BY USING ULTRASONIC SPRAY.....	2471
<i>R. Pasquarelli, M. Van-Hest, A. Miedaner, C. Curtis, J. Perkins, R. O'Hayre, D. Ginley</i>	
INFLUENCES OF THE SUBSTRATE STRUCTURE ON THE GROWTH OF CUINSE₂ AND IN₂SE₃ THIN FILMS	2474
<i>D. C. Perng, M. S. Tsai, P. Y. Wu, J. F. Fang</i>	
CORRELATION BETWEEN PREPARATION PARAMETERS AND PROPERTIES OF MOLYBDENUM BACK CONTACT LAYER FOR CIGS THIN FILM SOLAR CELL.....	2478
<i>E. Takahashi, S. A. Pethe, N. G. Dhere</i>	
ENHANCED RELIABILITY OF MOLYBDENUM BY AL DOPING AFTER DAMP-HEAT EXPOSURE FOR CIGS SOLAR CELLS	2483
<i>C. L. Wang, W. C. Shih, C. H. Chen, Y. C. Chen, S. F. Hong, C. P. Tsai, Y. C. Wu, C. H. Lai</i>	
STRUCTURE OPTIMIZATION FOR A HIGH EFFICIENCY CIGS SOLAR CELL.....	2488
<i>S. H. Song, K. Nagaich, E. S. Aydil, R. Feist, R. Haley, S. A. Campbell</i>	
IMPACTS OF HUMIDITY AND TEMPERATURE ON THE PERFORMANCE OF TRANSPARENT CONDUCTING ZINC OXIDE	2493
<i>M. A. Yaklin, D. A. Schneider, K. Norman, J. E. Granata, C. L. Staiger</i>	
DATA-MINING-AIDED MAPPING OF STRUCTURE-PROPERTY RELATIONSHIPS FOR COMBINATORIALLY GENERATED CO-DOPED ZNO THIN FILMS	2497
<i>C. Suh, C. W. Gorrie, J. D. Perkins, P. A. Graf, W. B. Jones</i>	
STRUCTURAL QUALITY OF CIGS ABSORBER LAYERS VIA POWDER EVAPORATION AND SOLUTION SPRAY DEPOSITION	2503
<i>J. D. Suh, K. B. Song, E. J. Bae, J. M. Cho</i>	
GLASS CLEANING AND ITS EFFECTS ON THE DAMP-HEAT STABILITY OF MOLYBDENUM ON SODA-LIME GLASS.....	2506
<i>R. Sundaramoorthy, F. J. Pern, A. L. Lazcano, S. Glynn, C. DeHart, B. To, J. Pankow, T. Gessert</i>	
BAND PROFILE AROUND GRAIN BOUNDARY OF CU(IN,GA)SE₂ SOLAR CELL MATERIAL CHARACTERIZED BY SCANNING PROBE MICROSCOPY	2512
<i>M. Takihara, T. Minemoto, Y. Wakisaka, T. Takahashi</i>	
FABRICATION AND CHARACTERIZATION OF CU(IN,GA)SE₂ THIN-FILM SOLAR CELLS PREPARED VIA A SOLUTION PROCESS	2516
<i>C. H. Wu, C. H. Lu</i>	
SIO₂ AS BARRIER LAYER FOR NA OUT-DIFFUSION FROM SODA-LIME GLASS.....	2519
<i>Y. Yan, X. Li, R. Dhere, M. Al-Jassim, K. Jones, M. Young, M. Scott</i>	

AREA 7: POSTERS, SPACE TECHNOLOGIES

INGAN DEVICES FOR HIGH TEMPERATURE PHOTOVOLTAIC APPLICATIONS	2522
<i>C. Boney, I. Hernandez, R. Pillai, D. Starikov, A. Bensaoula</i>	
STUDY THE EFFECTS OF PROTON IRRADIATION ON GAAS/GE SOLAR CELLS.....	2528
<i>D. Elfiky, M. Yamaguchi, Y. Sasaki, T. Takamoto, C. Morioka, M. Imaizumi, T. Ohshima, S. I. Sato, M. Elnawawy, T. Eldesuky, A. Ghitas</i>	

INVESTIGATION AND MODELING OF SPACE RADIATION EFFECTS IN QUANTUM DOT SOLAR CELLS	2533
<i>A. I. Fedoseyev, M. Turowski, A. Raman, E. W. Taylor, S. Hubbard, S. Polly, A. A. Balandin</i>	
SPACE SOLAR CELL EDGE, INTERCONNECT, AND COVERGLASS DESIGNS AND THEIR EFFECT ON SPACECRAFT CHARGING AND PLASMA INTERACTIONS	2537
<i>D. C. Ferguson</i>	
SINGLE CRYSTALLINE GALLIUM ARSENIDE PHOTOVOLTAICS ON FLEXIBLE METAL SUBSTRATES	2543
<i>A. Freundlich, C. Rajapaksha, A. Alemu, A. Mehrotra, M. C. Wu, S. Sambandam, V. Selvamanickam</i>	
THE EFFECT OF DEPOSITION CONDITIONS ON THE ATOMIC OXYGEN INDUCED DEGRADATION OF MGF2 ANTI-REFLECTIVE COATINGS	2546
<i>N. J. Ianno, D. M. Speckman</i>	
NUCLEAR WEAPONS EFFECTS TESTING OF SOLAR CELLS USING THE NATIONAL IGNITION FACILITY (NIF)	2550
<i>P. P. Jenkins, K. M. Trautz, R. J. Walters, J. R. Lorentzen, J. H. Fisher, R. Horton, C. D. Newlander, J. F. Davis, W. Seiler, K. B. Fournier, V. Rekow, B. Cho, M. I. Eskenazi</i>	
FINAL QUALIFICATION TEST RESULTS OF XTJ TRIPLE JUNCTION SPACE SOLAR CELL TO AIAA - S-111 - 2005 AND SPECTROLAB TEST STANDARDS	2554
<i>B. Jun, C. M. Feizer, K. Rouhani, W. G. Wise, D. Krut, K. Bui, D. Hom, C. J. Cho, J. Z. Wu, R. Anaya, R. Bardfield, D. A. Russell, P. Leung, M. Gillanders, S. K. Sharma, J. P. Hanley</i>	
THERMAL ANNEALING STUDY OF RADIATION INDUCED DEFECTS IN NITRIDE-BASED MULTI-JUNCTION SOLAR CELL STRUCTURES USING DEEP LEVEL TRANSIENT SPECTROSCOPY	2560
<i>A. Khan, D. A. Rahman, S. Alsharif, J. Gou, A. Gapud, T. Sasaki, M. Imaizumi, M. Yamaguchi</i>	
EFFECTS OF CONTAMINATION ON SOLAR CELL COVERGLASS	2563
<i>D. L. Liu, S. H. Liu, C. J. Panetta, K. R. Olson, S. M. Hong, D. R. Alaan, C. J. Mann, K. T. Luey</i>	
ANALYSIS OF RECORD PHOTOVOLTAIC EFFICIENCIES FROM 1954 TO 2009	2569
<i>E. McClure, E. Gaddy</i>	
OPTIMIZED DEVICE DESIGN FOR RADIATION RESISTANCE AND HIGH DISLOCATION SOLAR CELLS FOR SPACE	2574
<i>A. Mehrotra, A. Freundlich, A. Alemu</i>	
LOW ENERGY PROTON IMPLANTATION TECHNIQUES FOR COVERGLASS IRRADIATION QUALIFICATION	2578
<i>S. R. Messenger, K. Trautz, R. J. Walters, G. Jones, J. Hall, J. Schuur</i>	
MONTE CARLO ANALYSIS OF THE NEO BEAM ELECTRON BEAM FACILITY	2584
<i>S. R. Messenger, J. H. Warner, K. Trautz, R. Uribe, R. J. Walters</i>	
SOLAR SIMULATOR AIR MASS ZERO CALIBRATION METHOD	2590
<i>J. C. Nocerino, S. H. Liu</i>	
CHANGE IN THE ELECTRICAL PERFORMANCE OF INGAAS QUANTUM DOT SOLAR CELLS DUE TO IRRADIATION	2594
<i>T. Ohshima, S. Sato, C. Morioka, M. Imaizumi, T. Sugaya, S. Niki</i>	
CHARACTERIZATION OF SOLAR CELL DEGRADATION DUE TO ELECTROSTATIC DISCHARGE ON MULTI-JUNCTION SOLAR CELL	2599
<i>T. Okumura, M. Imaizumi, K. Toyoda, M. Cho</i>	
SWITCHED CAPACITOR DC-DC CONVERTER BASED MAXIMUM POWER POINT TRACKING OF A PV SOURCE FOR NANO SATELLITE APPLICATIONS	2604
<i>P. K. Pradeep, V. Agarwal</i>	
SPACE FLIGHT EXPERIMENT: ADVANCED SOLAR CELLS & PROTECTIVE MATERIALS ON THE ISS EXTERIOR	2610
<i>T. D. Sahlstrom, P. E. Hausgen, D. M. Wilt, A. D. Howard, M. D. Anderson, N. A. Snyder</i>	
EFFECTS OF IRRADIATION BEAM CONDITIONS ON RADIATION DEGRADATION OF SOLAR CELLS	2616
<i>M. Saito, M. Imaizumi, T. Ohshima, Y. Takeda</i>	
PHOTO-AND DARK CONDUCTIVITY VARIATIONS OF SOLAR CELL QUALITY A-SI:H THIN FILMS IRRADIATED WITH PROTONS	2620
<i>S. I. Sato, H. Sai, T. Ohshima, M. Imaizumi, K. Shimazaki, M. Kondo</i>	
AIR FORCE MANTECH QUALIFICATION OF THE 30% CLASS GALNP2/GA(IN)AS/GE SOLAR CELL TO THE AIAA S-111 STANDARD: RESULTS AND RECOMMENDATIONS	2625
<i>M. Stan, B. Cho, B. Guzie, G. Smith, P. Sharps, T. Varghese</i>	
THE MARS SURFACE ENVIRONMENT AND SOLAR ARRAY PERFORMANCE	2631
<i>P. M. Stella, J. A. Herman</i>	

SPACE RADIATION RESISTANT HYBRID AND POLYMER MATERIALS FOR SOLAR CELLS	2636
<i>E. W. Taylor, R. Pirich, J. Weir, D. Leyble, S. Chu, L. R. Taylor, M. Velderrain, V. Malave, M. Barahman, A. Lyons</i>	
DEGRADATION ANALYSIS OF INGAP/GAA/GE TRIPLE-JUNCTION SOLAR CELLS IN HIGH-TEMPERATURE AND HIGH-LIGHT-INTENSITY ENVIRONMENTS BY LUMINESCENCE TECHNIQUES	2642
<i>H. Toyota, T. Iwai, Y. Shimada, M. Imaizumi, K. Tanaka, M. Tajima</i>	
ELECTRICAL CHARACTERIZATION OF ELECTRON AND PROTON-INDUCED DEFECTS IN P+N GAAS PHOTODIODES: EBIC STUDY	2646
<i>J. H. Warner, S. I. Maximenko, S. R. Messenger, R. J. Walters, S. A. Ringel, M. R. Brenner, A. M. Carlin</i>	
ADVANCES IN CELL EFFICIENCY OF A-SI:H AND NC-SI:H-BASED MULTI-JUNCTION SOLAR CELLS FOR SPACE AND NEAR-SPACE APPLICATIONS	2651
<i>A. Banerjee, X. Xu, K. Beernink, F. Liu, K. Lord, G. DeMaggio, B. Yan, T. Su, G. Pietka, C. Worrel, S. Ehlert, D. Beglau, J. Yang, S. Guha</i>	

AREA 8: POSTERS, PV CHARACTERIZATION: MODULE CHARACTERIZATION, MODELING AND IN-SITU PROCESS CONTROL

LONG TERM PERFORMANCE ANALYSIS OF PV MODULE IN THE GOBI DESERT OF MONGOLIA	2656
<i>A. Adiyabat, K. Otani, N. Enebish, N. Enkhmaa</i>	
PERFORMANCE MEASUREMENTS AT VARYING IRRADIANCE SPECTRUM, INTENSITY AND MODULE TEMPERATURE OF AMORPHOUS SILICON SOLAR CELLS	2660
<i>M. Bliss, T. R. Betts, R. Gottschalg</i>	
COMPARISON OF PHOTOVOLTAIC MODULE PERFORMANCE AT PU'U WA'A WA'A	2666
<i>S. Busquet, J. Torres, M. Dubarry, M. Ewan, B. Y. Liaw, L. Cutshaw, R. Rocheleau</i>	
INLINE PHOSPHORIC ACID THICKNESS & UNIFORMITY MEASUREMENT SYSTEM	2672
<i>D. A. Dorn, S. McCuldroch</i>	
REAL-TIME METROLOGY OF SELF-ASSEMBLED EPITAXIAL QUANTUM DOTS BY RHEED	2676
<i>C. Rajapaksha, A. Freundlich</i>	
DETERMINATION OF CHARGED STATE DENSITY AT THE INTERFACE BETWEEN AMORPHOUS SILICON AND CRYSTALLINE SILICON BY LATERAL CONDUCTANCE MEASUREMENT	2680
<i>K. Ghosh, C. J. Tracy, B. Dauksher, S. Herasimenka, C. Honsberg, S. Bowden</i>	
INFLUENCE OF NONUNIFORMITY OF IRRADIANCE WITHIN A CELL ON THE ACCURATE I-V CURVE MEASUREMENT UNDER 1 SUN ILLUMINATION	2684
<i>Y. Hishikawa, H. Shimura, Y. Tsuno</i>	
ANALYTICAL IMPROVEMENTS IN PV DEGRADATION RATE DETERMINATION	2688
<i>D. C. Jordan, S. R. Kurtz</i>	
OUTDOOR PV DEGRADATION COMPARISON	2694
<i>D. C. Jordan, R. M. Smith, C. R. Osterwald, E. Gelak, S. R. Kurtz</i>	
TEMPERATURE OF SOLAR CELLS IN REVERSE BIAS: THEORY AND APPLICATIONS	2698
<i>S. Rim, M. Bald, M. Morse</i>	
ENERGY RATING OF VARIOUS PV MODULE TECHNOLOGIES IN TWO EXTREME CLIMATES, TROPICAL AND COLD-ARID CLIMATE	2701
<i>K. Otani</i>	
EFFECTS OF LOAD CONNECTION IN ACCELERATED AGING OF A-SI:H SOLAR CELL FOR LONG TERM RELIABILITY TEST	2705
<i>S. H. Park, K. M. Kim, J. S. Cho, J. C. Lee, G. H. Kang, D. K. Choi, K. H. Yoon, J. Song</i>	
ESTIMATION OF DUAL - JUNCTION SOLAR CELL CHARACTERISTICS USING NEURAL NETWORKS	2709
<i>J. C. Patra, D. L. Maskell</i>	
OBSERVATIONS ON THE SPECTRAL CHARACTERISTICS OF DEFECT LUMINESCENCE OF SILICON WAFER SOLAR CELLS	2714
<i>M. P. Peloso, P. Chaturvedi, P. Wurfel, B. Hoex, A. G. Aberle</i>	
THE EFFECT OF UNCERTAINTY IN MODELING COEFFICIENTS USED TO PREDICT ENERGY PRODUCTION USING THE SANDIA ARRAY PERFORMANCE MODEL	2718
<i>L. Pratt, D. L. King</i>	

FROM AN EXISTING LARGE AREA PULSED SOLAR SIMULATOR TO A HIGH INTENSITY PULSED SOLAR SIMULATOR: CHARACTERIZATION, STANDARD CLASSIFICATION AND FIRST RESULTS AT ESTI	2724
<i>M. Pravettoni, R. Galleano, T. Aitasalo, R. P. Kenny, E. D. Dunlop, K. W. J. Barnham</i>	
ELECTRICAL CHARACTERIZATION OF CONCENTRATOR PV CELLS: A COMPARISON BETWEEN OUTDOOR TESTING UNDER DIRECT SOLAR RADIATION AND INDOOR MEASUREMENTS ON A HIGH INTENSITY SOLAR SIMULATOR	2729
<i>M. Pravettoni, M. Norton, T. Aitasalo, R. Galleano, G. Georghiou, R. P. Kenny, K. W. J. Barnham</i>	
GLOBAL TEST SITE NETWORK PAVES THE WAY TO THE OPTIMAL SITE-RELATED PHOTOVOLTAIC SOLUTION	2735
<i>M. Wittner, T. Weber, W. Richardson, B. Striner, N. Baggio</i>	
AREA DEPENDENT SIMULATION MODEL FOR THE DOUBLE EXPONENTIAL EFFECT IN I(V)-CHARACTERISTICS OF SOLAR CELLS	2740
<i>M. Sams, C. Lackner, T. Ostermann</i>	
ONE LATERAL SPECTRUM SPLITTING CONCENTRATOR PHOTOVOLTAIC ARCHITECTURE: MEASUREMENTS OF CURRENT ASSEMBLIES AND ANALYSIS OF PATHWAYS TO 40% EFFICIENT MODULES	2745
<i>X. Wang, A. Barnett</i>	
FUNDAMENTAL PARAMETERS EXTRACTION FROM DARK I-V CHARACTERISTICS: A COMPREHENSIVE STUDY ON AMORPHOUS/CRYSTALLINE SILICON HETERO-JUNCTION SOLAR CELL	2751
<i>D. C. Wu, J. C. Shiao, C. H. Lin, C. H. Chen, C. H. Liao, W. C. Hsu, W. H. Lu, C. W. Lan</i>	
EXTRACTING PARAMETERS FROM SEMI-LOG PLOTS OF POLYCRYSTALLINE SILICON PV MODULES OUTDOORS I-V DATA: DOUBLE-EXPONENTIAL MODEL REVISITED	2756
<i>G. H. Yordanov, O. M. Midtgard, T. O. Saetre</i>	

**AREA 9: POSTERS, PV MODULES & SYSTEMS:
MODULES, INVERTERS AND BOS COMPONENTS**

GRID-TIED PV SYSTEM ENERGY SMOOTHING	2762
<i>T. D. Hund, S. Gonzalez, K. Barrett</i>	
FIELD RELIABILITY ANALYSIS METHODS FOR PHOTOVOLTAIC INVERTERS	2767
<i>J. M. Fife, M. Scharf, S. G. Hummel, R. W. Morris</i>	
PREDICTION OF PV MODULE NOMINAL OPERATING CELL TEMPERATURE USING ELECTROMAGNETIC WAVE MODELING	2773
<i>B. Li, M. Duell, T. Schuhmacher, D. M. J. Doble</i>	
PRELIMINARY RESULTS OF A COMPUTATIONAL TOOL TO MODEL LOW CONCENTRATION PV MODULES	2779
<i>R. Soler-Bientz, F. Gomez-Castro, L. Omar-Ricalde</i>	
THE SOLAR BREEDER FACTORY: MINIMIZING THE COST OF PHOTOVOLTAIC ENERGY GENERATION	2785
<i>R. Little, M. Nowlan, R. Bradford, D. Hebert</i>	
TEFLON® FEP FRONTSHEETS FOR PHOTOVOLTAIC MODULES: IMPROVED OPTICS LEADING TO HIGHER MODULE EFFICIENCY	2788
<i>S. L. Samules, N. J. Glassmaker, G. A. Andrews, M. J. Brown, M. E. Lewittes</i>	
IMPROVED SPECTRAL RESPONSE OF SILICONE ENCAPSULATED PHOTOVOLTAIC MODULES	2791
<i>N. E. Powell, B. K. Hwang, A. W. Norris, B. M. Ketola, G. Beaucame, K. R. Mcintosh</i>	
MODULE EFFICIENCY INCREASE BY COLORED CELL CONNECTORS	2795
<i>L. Proenneke, M. Reuter, G. C. Glaeser, J. H. Werner</i>	
ION BEAM SURFACE MODIFICATION OF SOLAR MODULES GLASS FOR REDUCED REFLECTANCE	2798
<i>M. B. Spitzer, J. England</i>	
WORLD FIRST 17% EFFICIENT MULTI-CRYSTALLINE SILICON MODULE	2802
<i>C. Tjengdrawira, M. W. P. E. Lamers, I. J. Bennett, P. C. Jong</i>	
INVESTIGATION OF REVERSE CURRENT FOR CRYSTALLINE SILICON SOLAR CELLS--- NEW CONCEPT FOR A TEST STANDARD ABOUT THE REVERSE CURRENT	2806
<i>H. Yang, W. Xu, H. Wang, M. Narayanan</i>	
A NOVEL PHOTOVOLTAIC MODULE ASSEMBLED THREE-DIMENSIONAL	2811
<i>A. Yuji, T. Yachi</i>	

POTENTIAL INDUCED DEGRADATION OF SOLAR CELLS AND PANELS	2817
<i>S. Pingel, O. Frank, M. Winkler, S. Daryan, T. Geipel, H. Hoehne, J. Berghold</i>	
PERFORMANCE OF METAL WRAPPED THROUGH SOLAR MODULE	2823
<i>H. H. Hsieh, W. K. Lee, F. M. Lin, D. C. Wu</i>	
OUTDOOR ENERGY RATINGS AND SPECTRAL EFFECTS OF PHOTOVOLTAIC MODULES	2827
<i>R. Lad, J. Wohlgemuth, G. Tamizhmani</i>	
MONOLITHIC INTEGRATED SOLAR ENERGY HARVESTING SYSTEM	2833
<i>E. Mendez-Delgado, G. Serrano, E. I. Ortiz-Rivera</i>	
TEST-TO-FAILURE OF PV MODULES: HOTSPOT TESTING	2839
<i>J. K. Mathew, J. Kuitche, G. Tamizhmani</i>	
A NOVEL TECHNIQUE FOR THD CONTROL IN GRID CONNECTED PHOTOVOLTAIC SYSTEMS USING STEP VARIABLE INDUCTOR APPROACH	2844
<i>R. G. Wandhare, V. Agarwal</i>	
PV ARRAY SIMULATOR DEVELOPMENT AND VALIDATION	2849
<i>S. Gonzalez, S. Kuszmaul, D. Deuel, R. Lucca</i>	
A LOW COST HIGH EFFICIENCY INVERTER FOR PHOTOVOLTAIC AC MODULE APPLICATION	2853
<i>Y. Li, R. Oruganti</i>	
AN EFFICIENT CASCADED MULTILEVEL INVERTER SUITED FOR PV APPLICATION	2859
<i>H. Patangia, D. Gregory</i>	
INVERTER-UTILITY RESONANT STABILITY IN PV SYSTEMS	2864
<i>E. Seymour</i>	
IMPACT OF MATERIALS ON BACK-CONTACT MODULE RELIABILITY	2869
<i>M. Guichoux, C. Tjegdrowira, D. Veldman, P. C. Jong</i>	
MATERIALS CONSIDERATIONS FOR PV MARKETS: GUIDEPOSTS FOR TECHNOLOGY DIRECTIONS	2873
<i>I. J. Malik, E. Ryabova, A. Skumanich</i>	
MATERIALS AND MANUFACTURING PROCESSES FOR HIGH-EFFICIENCY FLEXIBLE PHOTOVOLTAIC MODULES	2877
<i>E. Thomsen, J. Muric-Nesic, V. Everett, M. Brauers, E. Davies, T. Ratcliff, C. Samundsett, I. Skryabin, L. Xia, A. Blakers</i>	
PV TECHNOLOGY ROADMAP: MARKET AND MANUFACTURING CONSIDERATIONS	2883
<i>A. Skumanich, E. Ryabova, I. J. Malik, S. Reddy, L. Sabnani</i>	
MICROGRID EFFICIENCY ENHANCEMENT BASED ON NEURO-FUZZY MPPT CONTROL FOR PHOTOVOLTAIC GENERATOR	2889
<i>A. Chaouachi, R. M. Kemal, K. Nagasaka</i>	
360° SUN TRACKING WITH AUTOMATED CLEANING SYSTEM FOR SOLAR PV MODULES	2895
<i>R. Tejwani, C. S. Solanki</i>	
COMPARATIVE STUDY OF VARIOUS PV TECHNOLOGIES IN TERMS OF ENERGY YIELD AND ANNUAL DEGRADATION	2899
<i>N. G. Dhere, S. A. Pethe, A. Kaul</i>	
A METHOD FOR INSTANTANEOUS MEASUREMENT OF PV V-I CHARACTERISTICS AND ITS APPLICATION FOR MPPT CONTROL	2904
<i>D. Wang</i>	

AREA 1: POSTERS, FUNDAMENTALS & NEW CONCEPTS: NOVEL MECHANISMS AND MATERIALS

A SEMI-ANALYTICAL MODEL FOR SEMICONDUCTOR SOLAR CELLS: FROM DETAILED BALANCE TO PRACTICAL DEVICES	2908
<i>D. Ding, S. R. Johnson, Y. H. Zhang</i>	
GENERALIZED CHARGE TRANSPORT MODEL FOR ORGANIC/INORGANIC MATERIAL SYSTEMS	2912
<i>S. S. Mottaghian, M. F. Baroughi, K. Bayat, M. Biesecker, J. H. Kimn</i>	
GOLD NANOPARTICLE-PVP BASED COATING FOR EFFICIENCY ENHANCEMENT OF SOLAR CELLS	2916
<i>I. Sear, M. Gasulla, A. Alemu, A. Freundlich</i>	
PEAK EFFICIENCY OF MULTI-JUNCTION PHOTOVOLTAIC SYSTEMS	2919
<i>J. L. Gray, J. M. Schwarz, J. R. Wilcox, A. W. Haas, R. J. Schwartz</i>	

DESIGN OPTIMIZATION OF SERIES-PARALLEL TRIPLE-JUNCTION SOLAR CELLS	2924
<i>T. W. Hsieh, P. Yu</i>	
PHONON-ASSISTED ABSORPTION ENHANCEMENT IN AMORPHOUS SI SOLAR PHOTOVOLTAIC	2928
<i>J. Kim, M. Kaviyani</i>	
DETAILED BALANCE CALCULATIONS OF MULTIPLE EXCITON GENERATION AND TANDEM HYBRID SOLAR CELLS	2932
<i>J. Lee, C. Honsberg</i>	
ENHANCEMENT OF ELECTROMAGNETIC FIELD INTENSITY BY METALLIC PHOTONIC CRYSTAL FOR EFFICIENT UPCONVERSION	2938
<i>H. P. Paudel, K. Bayat, M. F. Baroughi, S. May, D. W. Galipeau</i>	
METAL-INSULATOR-METAL POINT-CONTACT DIODES AS A RECTIFIER FOR RECTENNA	2943
<i>P. Periasamy, J. D. Bergeson, P. A. Parilla, D. S. Ginley, R. P. O'Hayre</i>	
DOPED BI-SE THIN FILMS FOR PHOTOVOLTAIC APPLICATIONS	2946
<i>S. Phok, P. Parilla, R. N. Kini, R. Bhattacharya, B. To, J. Pankow</i>	
BROADBAND CHARACTERISTICS OF SURFACE PLASMON ENHANCED SOLAR CELLS	2952
<i>B. Roberts, P. C. Ku</i>	
UNIFORM EMBEDMENT OF CDSE/ZNS QUANTUM DOT ARRAYS IN THIN OXIDE LAYERS FOR LUMINESCENCE DOWN SHIFTING IN PV DEVICES	2955
<i>B. Sadeghimakki, S. Sivoththaman</i>	
NOVEL BACK SURFACE FIELD (BSF) STRUCTURE FORMATION BY MODIFIED SOLUTION DERIVED NANOCOMPOSITE (SDN) METHOD FOR LOW COST NEW CELL CONCEPT IMPLEMENTATION	2960
<i>E. Ryabova, A. Skumanich, I. J. Malik, M. Shkolnikov</i>	
CHEMICAL BATH DEPOSITION (CBD) OF IRON SULFIDE THIN FILMS FOR PHOTOVOLTAIC APPLICATIONS, CRYSTALLOGRAPHIC AND OPTICAL PROPERTIES	2965
<i>P. Prabukanthan, R. J. Soukup, N. J. Ianno, A. Sarkar, S. Kment, H. Kmentova, C. A. Kamler, C. L. Exstrom, J. Olejnicek, S. A. Darveau</i>	
PHOTORESPONSE PROPERTIES OF BASI2 FILMS ON N+ -BASI2/P+ -SI TUNNEL JUNCTION FOR HIGH EFFICIENCY THIN FILM SOLAR CELLS	2970
<i>T. Saito, U. Matsumoto, T. Suemasu, N. Usami</i>	
DEVELOPMENT OF ZNTE1-XOX INTERMEDIATE BAND SOLAR CELLS	2974
<i>T. Tanaka, K. M. Yu, P. Stone, J. W. Beeman, O. Dubon, L. A. Reichertz, V. M. Kao, M. Nishio, W. Walukiewicz</i>	
EFFICIENCY OF A LATERALLY ENGINEERED ARCHITECTURE FOR PHOTOVOLTAICS	2978
<i>E. R. Torrey, J. Krohn, P. P. Ruden, P. I. Cohen</i>	
EVALUATION OF MINORITY CARRIER LIFETIME IN BASI2 AS A NOVEL MATERIAL FOR EARTH-ABUNDANT HIGH EFFICIENCY THIN FILM SOLAR CELLS	2984
<i>N. Usami, T. Saito, A. Nomura, T. Shishido, T. Suemasu</i>	
OPTIMIZATION OF MULTI-JUNCTION SOLAR CELL PERFORMANCE AT INFRARED LIGHT APPLICATION OF THIN FILM SI:GE SOLAR CELL	2987
<i>Y. Wang, A. Lochtefeld, J. S. Park, C. Kerestes, R. Opila, A. Barnett</i>	
PHOTOVOLTAIC APPLICATIONS OF FLUORINE-CONTAINING AR COATING	2992
<i>T. Yoshida, Y. Kishimoto</i>	

AREA 3: POSTERS, III-V'S & CONCENTRATORS:

ANALYSIS OF SHADOW BY HCPV PANELS FOR AGRICULTURE APPLICATIONS	2994
<i>K. Araki, A. Akisawa, I. Kumagai, H. Nagai, D. Steel</i>	
COMPARATIVE THERMAL ANALYSIS OF SOLAR CELLS MOUNTED ON CERAMIC AND METALLIC CARRIERS AND THEIR OPTIMIZATION FOR CPV APPLICATIONS	2998
<i>O. Arenas, L. M. Collin, S. Chow, J. F. Wheeldon, C. E. Valdivia, K. Hinzer, L. Frechette, V. Aimez, R. Ares</i>	
LOW COST CPV = EMBEDDED CPV WITH INTERNAL TRACKER	3003
<i>R. Campbell, M. Machado</i>	
VARIATION IN SPECTRAL IRRADIANCE AND THE CONSEQUENCES FOR MULTI-JUNCTION CONCENTRATOR PHOTOVOLTAIC SYSTEMS	3008
<i>N. Chan, T. Young, H. Brindley, B. Chaudhuri, N. J. Ekins-Daukes</i>	
SOLAR FLUX DISTRIBUTION ANALYSIS OF NON-IMAGING PLANAR CONCENTRATOR FOR THE APPLICATION IN CONCENTRATOR PHOTOVOLTAIC SYSTEM	3013
<i>K. K. Chong, C. W. Wong, F. L. Siaw, T. K. Yew</i>	

OPEN-LOOP AZIMUTH-ELEVATION SUN-TRACKING SYSTEM USING ON-AXIS GENERAL SUN-TRACKING FORMULA FOR ACHIEVING TRACKING ACCURACY OF BELOW 1 MRAD	3019
<i>K. K. Chong, C. W. Wong</i>	
PORTABLE CONCENTRATING SOLAR POWER SUPPLIES	3025
<i>L. Fraas, L. Minkin, J. Avery, H. X. Huang, J. Fraas, P. Uppal</i>	
A METHOD OF OPTICAL DESIGN AND CONSTRUCTION FOR LOW-COST CASSEGRANIAN TYPE SOLAR CONCENTRATORS.....	3030
<i>D. Gordon, A. P. Morrison</i>	
NUMERICAL ANALYSIS OF DIRECT LIQUID-IMMERSED SOLAR CELL COOLING OF A LINEAR CONCENTRATING PHOTOVOLTAIC RECEIVER.....	3033
<i>X. Han, V. Everett, Y. Wang, L. Zhu</i>	
AN INNOVATIVE SOLAR SYSTEM WITH HIGH EFFICIENCY AND LOW COST	3039
<i>D. Wagner, L. He</i>	
SITE DATA ANALYSIS OF CPV PLANTS.....	3043
<i>C. King</i>	
OPTIMAL CELL CONNECTIONS FOR IMPROVED SHADING, RELIABILITY, AND SPECTRAL PERFORMANCE OF MICROSYSTEM ENABLED PHOTOVOLTAIC (MEPV) MODULES	3048
<i>A. L. Lentine, G. N. Nielson, M. Okandan, W. C. Sweatt, J. L. Cruz-Campa, V. Gupta</i>	
EVALUATION OF A CPV SYSTEM WITH BEAM-SPLITTING FEATURES FOR HYDROGEN GENERATION	3055
<i>A. Mokri, M. Emziane</i>	
A GRAVITY INDEPENDENT INTEGRATED PASSIVE COOLER FOR SOLAR CELL EFFICIENCY IMPROVEMENT.....	3059
<i>L. Montes, B. Bercu</i>	
3-DIMENSIONAL SIMULATOR FOR CONCENTRATOR PHOTOVOLTAIC MODULES USING RAY-TRACE AND CIRCUIT SIMULATOR	3065
<i>Y. Ota, K. Nishioka</i>	
AGGREGATED TOTAL INTERNAL REFLECTION OPTICS FOR SOLAR: ELECTRICAL PERFORMANCE AND THERMAL VALIDATION FOR A 7X CONCENTRATOR MODULE.....	3069
<i>C. Grimmer, D. Schultz, K. Fine, H. Mack, D. Lari</i>	
CPV: NOT JUST FOR HOT DESERTS!	3075
<i>C. Seshan</i>	
CONCENTRATING PHOTOVOLTAIC MULTI-JUNCTION (CPVM) MODULE ELECTRICAL LAYOUT OPTIMISATION BY A NEW THEORETICAL AND EXPERIMENTAL "MISMATCH" ANALYSIS INCLUDING SERIES RESISTANCE EFFECTS	3081
<i>A. Minuto, G. Timo, P. Groppelli, M. Sturm</i>	
CONCEPT AND DESIGN OF "FLAT-PLATE" CPV MODULE BASED ON RING-ARRAY CONCENTRATOR.....	3087
<i>S. V. Vasylyev, V. P. Vasylyev, V. A. Sergeev</i>	
A HYBRID SOLAR LINEAR CONCENTRATOR PROTOTYPE IN INDIA	3092
<i>M. Vivar, J. Daniel, I. L. Skryabin, V. A. Everett, A. W. Blakers, L. Suganthi, S. Iniyar</i>	
INTEGRATING THE DESIGN AND RELIABILITY ASSESSMENT OF A HYBRID PV-THERMAL MICROCONCENTRATOR SYSTEM	3098
<i>M. Vivar, R. Van-Scheppingen, M. Clarke, V. Everett, D. Walter, J. Harvey, S. Surve, J. Muric-Nesic, A. Blakers</i>	
A SOLAR CELL MODEL FOR USE IN OPTICAL MODELING OF CONCENTRATING MULTI-JUNCTION PHOTOVOLTAIC SYSTEMS.....	3104
<i>J. R. Wilcox, A. W. Haas, J. L. Gray, R. J. Schwartz</i>	

AREA 4: POSTERS, CRYSTALLINE SILICON: DEFECT PASSIVATION AND ADVANCED OPTICS

ENHANCED ANGULAR RESPONSE OF POWER CONVERSION EFFICIENCY FOR SILICON SOLAR CELLS UTILIZING A UNIFORMLY DISTRIBUTED NANO-WHISKER MEDIUM.....	3109
<i>C. H. Chang, M. H. Hsu, W. L. Chang, W. C. Sun, C. W. Wu, P. Yu</i>	
IMPROVED LIGHT TRAPPING STRUCTURE FOR MONOCRYSTALLINE SILICON SOLAR CELLS.....	3112
<i>H. S. Chang, H. C. Jung, H. T. Kim</i>	

NITROGEN EFFECT ON NEGATIVE FIXED CHARGES OF Al₂O₃ PASSIVATION FILM IN CRYSTALLINE SI SOLAR CELLS	3114
<i>C. H. Shin, D. W. Kwak, D. H. Kim, D. W. Lee, S. Huh, K. S. Park, H. Y. Cho</i>	
COMPARISON BETWEEN ALUMINUM OXIDE SURFACE PASSIVATION FILMS DEPOSITED WITH THERMAL ALD, PLASMA ALD AND PECVD	3118
<i>G. Dingemans, P. Engelhart, R. Seguin, M. M. Mandoc, M. C. M. Van-Sanden, W. M. M. Kessles</i>	
LARGE AREA MACROPOROUS SILICON LAYERS FOR MONOCRYSTALLINE THIN-FILM SOLAR CELLS	3122
<i>M. Ernst, R. Brendel</i>	
INKJET STRUCTURED EWT SILICON SOLAR CELLS WITH EVAPORATED ALUMINUM METALLIZATION AND LASER-FIRED CONTACTS.....	3125
<i>A. Fallisch, D. Stuwe, R. Neubauer, D. Wagenmann, R. Keding, J. Nekarda, R. Preu, D. Biro</i>	
BACK-CONTACT SOLAR CELLS IN THIN CRYSTALLINE SILICON	3131
<i>J. G. Fossum, D. Sarkar, L. Mathew, R. Rao, D. Jawarani, M. E. Law</i>	
HIGH-PERFORMANCE HIT SOLAR CELLS FOR THINNER SILICON WAFERS	3137
<i>D. Fujishima, H. Inoue, Y. Tsunomura, T. Asaumi, S. Taira, T. Kinoshita, M. Taguchi, H. Sakata, E. Maruyama</i>	
N-TYPE AND P-TYPE C-SI SURFACE PASSIVATION BY REMOTE PECVD AIOX FOR SOLAR CELLS	3141
<i>Q. Shang, W. Seaman, M. Whitney, M. George, J. Madocks, R. Ahrenkiel</i>	
HIGH EFFICIENT N-TYPE INTERDIGITATED BACK CONTACT SILICON SOLAR CELLS WITH SCREEN-PRINTED AL-ALLOYED EMITTER.....	3145
<i>C. Gong, E. Van-Kerschaver, J. Robbelein, N. E. Posthuma, S. Singh, J. Poortmans, R. Mertens</i>	
THIN SI SOLAR CELL WITH N TYPE ABSORBER BASED ON EPITAXIAL LATERAL OVERGROWTH.....	3149
<i>R. Hao, C. P. Murcia, K. Shreve, A. Lochtefeld, J. S. Park, M. Curtin, T. Creazzo, A. Barnett</i>	
LASER DOPING TECHNIQUE USING CONTINUOUS WAVE LASER IN MULTI-CRYSTALLINE SILICON SOLAR CELL PROCESS	3154
<i>M. Hasegawa, K. Hirata, T. Saitoh, T. Takayama, T. Funatani, E. Sugimura, S. Tsujii, A. Tani, T. Fuyuki</i>	
LASER ABLATION AND CONTACT FORMATION FOR CU-PLATED LARGE AREA C-SILICON INDUSTRIAL SOLAR CELLS	3158
<i>J. L. Hernandez, C. Allebe, L. Tous, J. John, J. Poortmans</i>	
THERMAL OXIDE, Al₂O₃ AND AMORPHOUS-SI PASSIVATION LAYERS ON SILICON	3163
<i>W. S. Ho, Y. Y. Chen, T. H. Cheng, J. Y. Chen, J. A. Lu, P. L. Huang, C. W. Liu</i>	
PASTE DEVELOPMENT FOR SCREEN PRINTED MC-SI MWT SOLAR CELLS EXCEEDING 17% EFFICIENCY.....	3167
<i>R. Hoenig, F. Clement, M. Menkoe, M. Retzlaff, D. Biro, R. Preu, M. Neidert, A. Henning, C. Mohr, W. Zhang</i>	
COMPARISON OF BACK INTERFACE STRUCTURE ALTERNATIVES USING TWO SIDED OPTICAL EXCITATION.....	3173
<i>H. J. Hovel, J. P. De-Souza, E. D. Marshall</i>	
CONTACTS TO SILICON USING A SILVER PASTE CONTAINING A PHOSPHORUS SOURCE	3179
<i>A. S. Lonkin, B. M. Fish, Z. R. Li, F. Gao, L. K. Cheng, K. Mikeska, C. Torardi, M. Lewittes, P. VerNooy, S. D. Ittel, L. Liang, R. Getty, D. H. Roach, J. G. Pepin, W. J. Borland</i>	
EFFECT OF ATOMIC HYDROGEN TREATMENT ON PASSIVATION QUALITY OF ALUMINUM OXIDE FOR P-TYPE CRYSTALLINE SILICON	3181
<i>J. Irikawa, S. Kida, S. Miyajima, A. Yamada, M. Konagai</i>	
INFLUENCE OF DOPING PROFILE OF HIGHLY DOPED REGIONS FOR SELECTIVE EMITTER SOLAR CELLS.....	3185
<i>U. Jager, S. Mack, A. Kimmerle, A. Wolf, R. Preu</i>	
SURFACE PASSIVATION PROPERTIES OF BORON AND PHOSPHOR-DOPED A-SI:H FILMS WITH MULTI-STEP DEPOSITION FOR SI HETEROJUNCTION SOLAR CELLS	3190
<i>K. S. Ji, J. Choi, W. S. Choi, H. M. Lee, D. Kim</i>	
A PROCESS TECHNOLOGY TOOLBOX FOR NEXT GENERATION - LARGE AREA CRYSTALLINE SILICON SOLAR CELLS	3193
<i>J. Joachim, V. Prajapati, C. Allebe, A. U. Castro, J. L. Hernandez, B. Vermang, A. Rothschild, A. Lorenz, B. T. Chan, K. Baert, J. Poortmans</i>	
REDUCTION OF LIGHT INDUCED DEGRADATION (LID) IN B-DOPED CZ-SI SOLAR BY SIH₄-FREE SiCN_x FILM.....	3196
<i>M. H. Kang, J. Hong, A. Ebong, B. Rounsaville, V. Upadhyaya, A. Rohatgi</i>	
CORONA CHARGING AND OPTICAL SECOND-HARMONIC GENERATION STUDIES OF THE FIELD-EFFECT PASSIVATION OF C-SI BY Al₂O₃ FILMS	3200
<i>M. M. Mandoc, M. L. C. Adams, G. Dingemans, N. M. Terlinden, M. C. M. Van-Sanden</i>	

PROTECTION OF SI-SIO₂ INTERFACES FROM DAMP HEAT BY OVERLYING SINX AND SI₃N₄ COATINGS	3205
<i>X. Dai, K. R. Mcintosh</i>	
DEEP LEVEL TRANSIENT SPECTROSCOPY STUDIES OF ELECTRICALLY ACTIVE CENTERS IN SOLAR-GRADE SI	3210
<i>E. Monakhov, M. Syre, C. K. Tang, J. Mayandi, B. Olaisen, R. Sondena, B. G. Svensson, A. Holt</i>	
CHARACTERIZATION OF BORON SURFACE DOPING EFFECTS ON PECVD SILICON NITRIDE PASSIVATION	3214
<i>N. M. Nursam, K. J. Weber, Y. Ren</i>	
SURFACE TREATMENT OF CRYSTALLINE SILICON REALIZING EXTREMELY LOW SURFACE RECOMBINATION VELOCITY USING CATALYTICALLY GENERATED RADICALS	3220
<i>K. Ohdaira, M. Miyamoto, K. Koyama, H. Matsumura</i>	
ALTERNATIVE APPROACHES FOR LOW TEMPERATURE FRONT SURFACE PASSIVATION OF INTERDIGITATED BACK CONTACT SILICON HETEROJUNCTION SOLAR CELL	3223
<i>B. Shu, U. Das, J. Appel, B. McCandless, S. Hegedus, R. Birkmire</i>	
ANGLE-RESOLVED REFLECTANCE SPECTROSCOPY OF PASSIVATED TRAPEZOID-CORN NANOSTRUCTURES FOR CRYSTALLINE SILICON PHOTOVOLTAICS	3229
<i>P. C. Tseng, H. C. Chen, M. A. Tsai, H. C. Kuo, P. Yu</i>	
INVERTED PYRAMID TEXTURISATION WITHOUT PHOTOLITHOGRAPHY FOR MULTICRYSTALLINE SOLAR CELL	3233
<i>D. C. Wu, D. Z. Dimitrov, C. H. Lin, C. H. Du, W. C. Hsu, W. H. Lu, C. W. Lan</i>	
THE THERMAL STABILITY OF ATOMIC H PLASMA PRODUCED INTERFACE DEFECTS ON SI-SIO₂ STACK	3237
<i>C. Zhang, K. J. Weber</i>	
EFFECT OF PLASMA TREATMENT WITH VARIOUS GASES ON NANOCRYSTALLINE TIO₂ FOR DYE-SENSITIZED SOLAR CELL (DSSC)	3242
<i>J. Kim, M. J. Sin, H. J. Kim, B. Hong</i>	
OVERVIEW OF ATOMIC LAYER DEPOSITED METAL OXIDES FOR TREATING NANOPOROUS TIO₂ PHOTOELECTRODE FOR DYE SENSITIZED SOLAR CELLS	3248
<i>M. Shanmugam, B. Bills, M. F. Baroughi</i>	
SYNTHESIS OF TIO₂ NANODENDRITE FOR DYE-SENSITIZED SOLAR CELL APPLICATION	3253
<i>W. P. Liao, J. J. Wu</i>	
ELECTRON TRANSPORT IN DYE SENSITIZED SOLAR CELLS WITH TIO₂/ZNO CORE-SHELL PHOTOELECTRODE	3256
<i>M. Shanmugam, B. Bills, M. F. Baroughi, D. Galipeau</i>	
ZINC OXIDE NANOSTRUCTURED MATERIAL FOR DYE SENSITIZED SOLAR CELLS	3260
<i>G. Rey, N. Karst, V. Consonni, C. Jimenez, L. Rapenne, B. Doisneau, C. Ternon, D. Bellet</i>	
NANOWIRE DYE-SENSITIZED SOLAR CELL WITH A NOVEL LIGHT-SCATTERING LAYER	3264
<i>Y. R. Chen, W. P. Liao, C. T. Wu, J. J. Wu</i>	
THREE-DIMENSIONAL ZNO NANODENDRITE/NANOPARTICLE COMPOSITE SOLAR CELLS	3267
<i>C. T. Wu, J. J. Wu</i>	
SUPERIMPOSED RF/DC MAGNETRON SPUTTERING OF TRANSPARENT GA:ZNO WITH HIGH CONDUCTIVITY FOR PHOTOVOLTAIC CONTACTS APPLICATIONS	3270
<i>A. K. Sigdel, P. F. Ndione, Y. Ke, N. E. Widjonarko, J. D. Perkins, M. F. A. M. Van-Hest, S. E. Shaheen, T. Gennett, D. S. Ginley, J. J. Berry</i>	
FABRICATION OF DYE SENSITIZED SOLAR CELL WITH SURFACE TEXTURED SUBSTRATES	3275
<i>L. Chen, M. M. Alkaisi, M. Y. Liao</i>	
HAFNIUM (IV) AND ZIRCONIUM (IV) PORPHYRINOID DIACETATE COMPLEXES AS NEW DYES FOR SOLAR CELLS	3280
<i>I. Radivojevic, M. Sfeir, C. Y. Nam, B. P. Burton-Pye, A. Falber, C. T. Black, C. M. Drain</i>	
FABRICATION OF TCO-LESS DYE-SENSITIZED SOLAR CELLS WITH TI ELECTRODES BY ELECTRON-BEAM EVAPORATION PROCESS	3285
<i>Y. G. Kim, C. H. Shim, H. G. Kim, D. H. Kim, H. J. Lee, C. H. Park, H. J. Lee</i>	
DEVELOPMENT OF SOLID POLYMERIC ELECTROLYTE FOR DSSC DEVICE	3288
<i>K. F. Chen, C. H. Liou, C. H. Lee, F. R. Chen</i>	
IN-SITU POLYMERIZED POLY(3-HEXYLTHIOPHENE) AND TIO₂ NANOCOMPOSITES FOR ORGANIC SOLAR CELLS	3291
<i>T. Xu, J. Li, H. Rohwer, J. D. Hoefelmeyer, D. Galipeau, Q. Qiao</i>	

ENHANCED CARRIER COLLECTION AND LIGHT HARVESTING OF POLYMER SOLAR CELLS USING EMBEDDED INDIUM-TIN-OXIDE NANO-ELECTRODES	3295
<i>M. H. Hsu, C. H. Chang, J. H. Huang, C. W. Chu, P. Yu</i>	
LARGE-AREA ORGANIC SOLAR CELLS WITH METAL SUB-ELECTRODE ON ITO ANODE	3299
<i>J. W. Kang, S. Y. Park, D. G. Kim, J. K. Kim</i>	

AREA 1: POSTERS, FUNDAMENTALS & NEW CONCEPTS

FABRICATION OF PECVD GROWN N-I-P SILICON NANOWIRE SOLAR CELLS	3302
<i>M. M. Adachi, K. S. Karim</i>	
DETERMINATION OF A SB COMPOSITION IN INAS/GAASSB FOR NEGLIGIBLE VALENCE BAND OFFSET	3306
<i>K. Y. Ban, D. Kuciauskas, S. P. Bremnerand, C. B. Honsberg</i>	
CARBON NANOTUBE-COMPOSITE WAFER BONDING FOR ULTRA-HIGH EFFICIENCY III-V MULTI-JUNCTION SOLAR CELLS	3310
<i>A. Boca, J. C. Boisvert, D. C. Law, S. Mesropian, N. H. Karam, W. D. Hong, R. L. Woo, D. M. Bhusari, E. Turevskaya, P. Mack, P. Glatkowski</i>	
GROWTH AND CHARACTERIZATION OF INGAN FOR PHOTOVOLTAIC DEVICES	3316
<i>C. Boney, I. Hernandez, R. Pillai, D. Straikov, A. Bensaoula, M. Henini, M. Syperek, J. Misiewicz, R. Kudrawiec</i>	
AMORPHOUS GANI-XASX ALLOYS FOR MULTI-JUNCTION SOLAR CELLS	3322
<i>R. Broesler, K. M. Yu, S. V. Novikov, Z. Liliental-Weber, E. E. Haller, W. Walukiewicz, C. T. Foxon</i>	
DESIGN OF A FUNCTIONAL RARE EARTH OXIDE UP-CONVERSION LAYER FOR BULK SILICON CELLS	3327
<i>A. Clark, D. Williams, E. Arkun, R. Smith, S. Semans, A. Jamora</i>	
CDSE THIN FILM SOLAR CELLS UTILIZING A NANOSTRUCTURED BACK CONTACT	3331
<i>D. J. Flood</i>	
FABRICATION AND CHARACTERIZATION OF ELECTRODEPOSITED CU₂O P-N HOMOJUNCTION SOLAR CELLS	3334
<i>K. Han, X. Han, M. Tao</i>	
SILICON QUANTUM DOTS IN AN OXIDE MATRIX FOR THIRD GENERATION PHOTOVOLTAIC SOLAR CELLS	3338
<i>L. Han, J. Wang, R. Liang</i>	
GALLIUM PHOSPHIDE EPITAXIAL FILMS FOR SILICON-BASED MULTI-JUNCTION SOLAR CELLS GROWN BY LIQUID PHASE EPITAXY	3343
<i>S. R. Huang, X. Lu, A. Barnett, R. L. Opila</i>	
SI QUANTUM DOT-SENSITIZED SOLAR CELLS USING SI NANOPARTICLES PRODUCED BY PLASMA CVD	3347
<i>Y. Kawashima, K. Yamamoto, M. Sato, K. Nakahara, T. Matsunaga, W. M. Nakamura, D. Yamashita, H. Matsuzaki, G. Uchida, K. Kamataki, N. Itagaki, K. Koga, M. Shiratani, M. Kondo</i>	
TECHNICAL ADVANTAGES AND CHALLENGES FOR CORE-SHELL MICRO/ NANOWIRE LARGE AREA PV DEVICES	3352
<i>B. A. Wacaser, M. M. Khayyat, M. C. Reuter, D. K. Sadana, F. M. Ross</i>	
SILICON NANOWIRE-SCHOTTKY SOLAR CELL BY LIQUID PROCESSES	3357
<i>J. Kim, J. H. Yun, Y. C. Park, C. S. Han, Y. J. Cho, J. Park</i>	
SEMICONDUCTING β-FESi₂ FOR HIGH EFFICIENCY AND LOW COST PHOTOVOLTAICS	3359
<i>A. Kumar, D. Chi, L. K. Verma, A. J. Danner, H. Yang, C. S. Bhatia</i>	
POLYMER - CUINS₂ HYBRID SOLAR CELLS OBTAINED BY AN IN-SITU FORMATION ROUTE	3365
<i>E. Maier, W. Haas, A. J. Santis-Alvarez, T. Rath, F. Hofer, F. Stelzer, G. Trimmel</i>	
MOVING PAST 2.0 EV: ENGINEERED ZNSE-GAAS ALLOYS FOR MULTI-JUNCTION SOLAR CELLS	3369
<i>K. H. Montgomery, J. M. Woodall</i>	
OPTICAL CHARACTERIZATION AND MODELING OF THE LEAD CHALCOGENIDE QUANTUM DOT SOLAR CELL: A RATIONAL APPROACH TO DEVICE DEVELOPMENT AND MULTIPLE EXCITON GENERATION	3374
<i>O. E. Semonin, S. Choi, J. M. Luther, M. C. Beard, A. J. Nozik</i>	
MODELING OF INGAN PIN SOLAR CELLS WITH DEFECT TRAPS AND POLARIZATION INTERFACE CHARGES	3378
<i>Y. G. Xiao, Z. Q. Li, M. Lestrade, Z. M. S. Li</i>	

INGAAS/GAASP STRAIN-COMPENSATED SUPERLATTICE SOLAR CELL FOR ENHANCED SPECTRAL REPOSE	3383
<i>Y. Wang, Y. Wen, M. Sugiyama, Y. Nakano</i>	

AREA 2: POSTERS, CIGS & CDTE: CIGS II

CRYOGENIC CATHODOLUMINESCENCE FROM CUXAG1-XINSE2 THIN FILMS	3386
<i>A. R. Aquino, A. A. Rockett, S. A. Little, S. Marsillac</i>	
PREPARING OF CIGS NANOPARTICLES AND THIN FILMS BY ONE STEP NON-VACUUM DEPOSITION METHODS	3391
<i>E. J. Bae, J. M. Cho, J. D. Suh, C. W. Ham, K. B. Song</i>	
ULTRASONICALLY SPRAYED ZINC SULFIDE BUFFER LAYERS FOR CU(IN,GA)(S,SE)2 SOLAR CELLS	3394
<i>C. Fella, S. Buecheler, D. Guettler, J. Perrenoud, A. Uhl, A. N. Tiwari</i>	
FABRICATION AND CHARACTERISTICS OF CULNSE2/CULN(SEXS1-X)2 STRUCTURE BY THE SULFURIZATION OF CULNSE2 THIN FILM	3398
<i>J. W. Guo, T. P. Hsieh, C. S. Wu, J. C. Chang, S.C. Hsu, P. S. Sheng, C. C. Chuang</i>	
THE THICKNESS EFFECT OF SIOX LAYER IN CIGS THIN-FILM SOLAR CELLS FABRICATED ON STAINLESS-STEEL SUBSTRATE	3401
<i>Y. D. Chung, D. H. Cho, W. S. Han, N. M. Park, K. S. Lee, S. Y. Oh, J. Kim</i>	
ROOM TEMPERATURE NON-VACUUM PREPARATION OF NANOCRYSTALLINE CUINSE2 EMPLOYING AQUEOUS SOLVENTS	3403
<i>C. L. Exstrom, S. A. Darveau, M. A. Ingersoll, M. R. Jensen, C. Cook, L. E. Slaymaker, R. J. Soukup, N. J. Ianno</i>	
LOW-TEMPERATURE INDIUM MOLYBDENUM OXIDE AS A WINDOW LAYER IN CIGS PHOTOVOLTAIC DEVICES	3407
<i>A. DeAngelis, J. Kaneshiro, N. Gaillard, Y. Chang, J. Kowalczyk, S. A. Mallory, E. Miller</i>	
THERMAL DEGRADATION AND LIGHT CAPTURE PERFORMANCE OF CULNGASE2 (CIGS) AND C-SI PHOTOVOLTAIC DEVICES	3411
<i>R. Feist, M. Mills, S. Rozeveld, C. Wood, K. Thompson</i>	
SOLAR CELLS VIA SELENIZATION OF CUINS2 NANOCRYSTALS: EFFECTS OF SYNTHESIS PRECURSOR	3417
<i>G. M. Ford, Q. Guo, R. Agrawal, H. W. Hillhouse</i>	
INFLUENCE OF NAF INCORPORATION DURING CU(IN,GA)SE2 GROWTH ON MICROSTRUCTURE AND PHOTOVOLTAIC PERFORMANCE	3420
<i>D. Guttler, A. Chirila, S. Seyrling, P. Blosch, S. Buecheler, X. Fontane, V. Izquierdo-Roca, L. Calvo-Barrio, A. Perez-Rodriguez, J. R. Morante, E. Eicke, A. N. Tiwari</i>	
WIDE-BANDGAP (AgCu)(InGa)Se2 ABSORBER LAYERS DEPOSITED BY THREE-STAGE CO-EVAPORATION	3425
<i>G. M. Hanket, J. H. Boyle, W. N. Shafarman, G. Teeter</i>	
FIELD ASSISTED SIMULTANEOUS SYNTHESIS AND TRANSFER FASST® METHOD USING IN CONJUNCTION WITH LIQUID PRECURSORS TO PRODUCE CIGS SOLAR CELLS	3430
<i>P. A. Hersh, C. J. Curtis, M. F. A. M. Van-Hest, S. E. Habas, A. Miedaner, D. S. Ginley, B. J. Stanbery, L. Eldada</i>	
SYNTHESIS AND PHYSICAL PROPERTIES OF CU(IN,GA)SE2 NANOPARTICLES AND CUGASE2 THIN-FILMS FOR TANDEM CELL PHOTOVOLTAIC APPLICATIONS	3432
<i>A. R. Jeong, R. H. Shin, W. Jo, M. Song, S. Yoon</i>	
WATER VAPOR DELIVERY FOR CIGSE AND OTHER THIN FILM VACUUM PROCESSES	3435
<i>J. Spiegelman, S. Boumsellek</i>	
PREPARATION OF β-CU (IN,GA)3 SE5 THIN FILMS FOR WIDE BAND GAP ABSORBER FOR TOP CELL IN GICS TANDEM STRUCTURE	3439
<i>J. H. Kim, Y. M. Shin, B. T. Ahn</i>	
GROWTH OF SPRAYED CIS FILM AND POST-SULFURIZATION EFFECTS	3443
<i>D. Y. Lee, H. Yoo, K. B. Song, J. H. Yun, K. Yoon, J. Kim</i>	
CIS LOW-COST THIN-FILM SOLAR CELLS MADE FROM ELEMENTAL METALLIC NANOPARTICLES: COMPARISON OF SELENIZATION PARAMETERS	3446
<i>I. Klugius, C. Gemmel, A. Quintilla, V. Haug, E. Ahlswede</i>	
EFFECTS OF SUBSTRATE TEMPERATURE ON THE OPTICAL PROPERTIES OF POLYCRYSTALLINE CULNSE2 THIN FILMS	3450
<i>J. Li, I. Repins, B. To, L. Mansfield, S. Choi, M. Contreras, F. L. Terry, D. Levi</i>	
GRAIN BOUNDARY RECOMBINATION ACTIVITY IN CU(IN,GA)SE2 SOLAR CELLS WITH ION-POLISHED FLAT SURFACE	3456
<i>T. Minemoto, Y. Wakasaki, H. Takakura</i>	

SELENIZATION PATHWAYS TO 2SSS CIGS MANUFACTURING	3460
<i>K. Jayadevan, R. Anders, S. Zafar, C. S. Ferekides, D. L. Morel</i>	
INVESTIGATION OF DIFFERENCES BETWEEN HIGH AND LOW EFFICIENCY CIGS SOLAR CELL STRUCTURES USING SURFACE ANALYTICAL TECHNIQUES	3466
<i>G. Mount, T. Buyuklimanli, R. Michel, J. Moskitto</i>	
OPTIMIZATION STUDY OF COPPER PRECURSORS FOR HIGH QUALITY CUINSE2 NANOPARTICLES BY WET CHEMICAL ROUTE	3472
<i>U. Farva, J. Lee, J. Y. Park, R. Kirshnan, T. J. Anderson, C. Park</i>	
A STUDY OF THE STRUCTURE AND ELECTRICAL PROPERTIES OF CUINSE2/CU-SUBSTRATE	3474
<i>S. Y. Park, E. W. Lee, S. H. Lee, S. W. Park, J. S. Han, C. W. Jeon</i>	
ALL-LASER SCRIBING FOR THIN-FILM CUINGASE2 SOLAR CELLS	3479
<i>F. J. Pern, L. Mansfield, S. Glynn, B. To, C. DeHart, S. Nikumb, C. Dinkel, M. Rekow, R. Murison, T. Panarello, C. Dunskey</i>	
MANUFACTURING RAMP-UP OF FLEXIBLE CIGS PV	3485
<i>S. Wiedeman, S. Albright, J. S. Britt, U. Schoop, S. Schuler, W. Stoss, D. Verebelyi</i>	

AREA 4: POSTERS, CRYSTALLINE SILICON: DEVICE FABRICATION AND MANUFACTURING

NOVEL FRONT METAL CONTACT PATTERNING SCHEME FOR C-SI SOLAR CELLS	3491
<i>A. P. Sastry, V. A. Chaudhary, C. S. Solanki</i>	
INTERACTION BETWEEN POST WIRE SAW CLEANING AND THE SUBSEQUENT CELL FABRICATION SAW DAMAGE ETCH AND TEXTURE PROCESS	3494
<i>G. Allardyce, R. Barr, R. Chan, M. Moynihan, C. O'Connor, T. Ridler</i>	
NEW PRINTING PATTERN DESIGN AND PROCESSING OF MWT SOLAR CELLS FOR PILOT-LINE	3498
<i>S. Y. Chen, C. P. Huang, B. C. Chen, D. C. Wu, W. C. Hsu, C. H. Du</i>	
SURFACE STRUCTURE OF MONO-CRYSTALLINE SILICON WAFERS PRODUCED BY DIAMOND WIRE SAWING AND BY STANDARD SLURRY SAWING BEFORE AND AFTER ETCHING IN ALKALINE SOLUTIONS	3501
<i>A. Holt, A. Thogersen, C. Rohr, J. I. Bye, G. Helgesen, O. Nordseth, S. A. Jensen, L. Northeim, O. Nielsen</i>	
UNDERSTANDING METALLIC AND IONIC CONTAMINATION IN PHOTOVOLTAIC WET CHEMISTRIES FROM CHEMICAL DELIVERY SYSTEMS	3505
<i>M. W. Johnson</i>	
THERMAL PROFILING OF SILICON SOLAR CELLS DURING THE METALLIZATION PROCESS	3510
<i>C. Kazierowicz, B. Dahle, U. Kumar, E. Graddy</i>	
HIGH EFFICIENT SI NANO-TEXTURED LIGHT-EMITTING DIODES AND SOLAR CELLS WITH OBVIOUS PHOTONIC CRYSTAL EFFECTS	3514
<i>M. H. Liao, W. C. Wang, H. R. Tsai, S. T. Chang</i>	
THE INVESTIGATION OF OPTIMAL SI-SIGE HETERO-STRUCTURE THIN-FILM SOLAR CELL WITH THEORETICAL CALCULATION AND QUANTITATIVE ANALYSIS	3518
<i>M. H. Liao, W. S. Ho, Y. Y. Chen, S. T. Chang</i>	
CHARACTERIZATION OF SELECTIVE-EMITTER SOLAR CELLS CONSISTS OF LASER OPENED WINDOW AND SUBSEQUENTLY SCREEN-PRINTED ELECTRODES	3523
<i>C. H. Lin, S. P. Hsu, J. J. Liou, C. P. Chuang, W. H. Lu, W. L. Chang</i>	
PURIFIED STEAM FOR INDUSTRIAL THERMAL OXIDATION PROCESS	3527
<i>S. Mack, D. Biro, A. Wolf, B. Thaidigsmann, A. Walczak</i>	
ALL SCREEN-PRINTED INDUSTRIAL N-TYPE CZOCHRALSKI SILICON SOLAR CELLS WITH ALUMINIUM REAR EMITTER AND SELECTIVE FRONT SURFACE FIELD	3531
<i>K. Meyer, C. Schmiga, R. Jesswein, M. Dupke, J. Lossen, H. J. Krokoszinski, M. Hermle, S. W. Glunz</i>	
DEVELOPMENT OF NO-RINSE SCREEN PRINTABLE ETCH PASTE FOR CONTACT VIA IN DIELECTRICA FILMS	3536
<i>R. Mishra, L. Zhao, Z. Zhang, H. W. Guo, P. Kumar, H. Mungekar, M. Stewart, T. Weidman, S. Parikh</i>	
LOW-COST SOLAR-GRADE SILICON: PURIFICATION AND CONSOLIDATION OF SILICON FINES FROM WAFERING	3540
<i>L. Moro, X. Xie, J. Perez-Mariano, K. Lau, L. H. Dubois, B. Lochtenberg, A. Sanjurjo</i>	
ANALYSIS OF INTERNAL REFLECTIVITY OF SILICON ELO PV CELLS OBTAINED BY LPE	3546
<i>J. M. Olchowik, K. Ciestlak, S. Gulkowski, A. Kaminski, A. Fave</i>	

INTERDIGITATED REAR CONTACT SOLAR CELLS WITH AMORPHOUS SILICON HETEROJUNCTION EMITTER.....	3549
<i>B. J. O'Sullivan, T. Bearda, Y. Qiu, J. Robbelein, C. Gong, N. E. Posthuma, I. Gordon, J. Poortmans</i>	
LASER PROCESS OPTIMIZATION FOR IMPROVING EMITTER WRAP THROUGH DRILLING RATES.....	3553
<i>H. Pantsar, T. Eisenbeis, H. Herfurth, S. Heinemann, M. Rekow, R. Murison</i>	
DEVELOPMENT AND CHARACTERIZATION OF ADVANCED PROCESS TECHNOLOGIES FOR THE FABRICATION OF CRYSTALLINE-SI SOLAR CELLS.....	3559
<i>S. S. P. Rao, K. Fisher, D. Neumayer, Q. Huang, K. Kwietniak, J. Liu, J. Vichiconti, J. Nalaskowski, J. Newbury, A. Pyzyna, S. Rossnagel, G. Totir, N. Fuller</i>	
SILICON INK SELECTIVE EMITTER PROCESS: OPTIMIZATION OF SELECTIVELY DIFFUSED REGIONS FOR SHORT WAVELENGTH RESPONSE.....	3565
<i>D. Poplavskyy, G. Scardera, M. Abbott, A. Meisel, X. Chen, S. Shah, E. Tai, M. Terry, F. Lemmi</i>	
COMPARISON OF INTRINSIC AMORPHOUS SILICON BUFFER LAYERS FOR SILICON HETEROJUNCTION SOLAR CELLS DEPOSITED WITH DIFFERENT PECVD TECHNIQUES.....	3570
<i>D. Pysch, C. Meinhardt, K. U. Ritzau, M. Bivour, K. Zimmermann, C. Schetter, M. Hermle, S. W. Glunz</i>	
INVESTIGATION OF LASER ABLATION OF SILICON NITRIDE PASSIVATION WITH SELF-DOPING PASTE FOR SOLAR CELL CONTACTS.....	3577
<i>A. M. Payne, K. Rapolu, P. Davis, V. Chandrasekaran, D. Meier, B. Xu, J. Zesch, K. Littau</i>	
21.1% EFFICIENT PERCC SILICON SOLAR CELLS ON LARGE SCALE BY USING IN-LINE SPUTTERING FOR METALLIZATION.....	3582
<i>D. Reinwand, J. Specht, D. Stuwe, S. Seitz, J. F. Nekarda, D. Biro, R. Preu, R. Trassl</i>	
TOWARDS INDUSTRIALLY FEASIBLE HIGH-EFFICIENCY N-TYPE SI SOLAR CELLS WITH BORON-DIFFUSED FRONT SIDE EMITTER - COMBINING FIRING STABLE AI2O3 PASSIVATION AND FINE-LINE PRINTING.....	3587
<i>A. Richter, M. Horteis, J. Benick, S. Henneck, M. Hermle, S. W. Glunz</i>	
PSG TRAPPING OF METAL CONTAMINANTS DURING BELT FURNACE INLINE PHOSPHORUS DIFFUSION IN CRYSTALLINE SI WAFERS.....	3593
<i>P. J. Richter, F. J. Bottari, D. C. Wong</i>	
30 μM WIDE CONTACTS ON SILICON CELLS BY LASER TRANSFER.....	3597
<i>T. C. Roder, E. Hoffmann, J. R. Kohler, J. H. Werner</i>	
SCREEN PRINTABLE AG-AI METAL PASTES FOR P+ SILICON APPLICATION IN SOLAR CELLS.....	3600
<i>S. Seyedmohammadi, E. Graddy, A. Shaikh</i>	
FABRICATION OF SCREEN-PRINTED MULTI-CRYSTALLINE SILICON SOLAR CELLS EXCEEDING 16% EFFICIENCY USING DOUBLE LAYER ANTI-REFLECTIVE COATING.....	3604
<i>J. M. Shim, I. H. Kim, D. J. Oh, K. Y. Cho, E. J. Lee, H. W. Lee, J. Y. Choi</i>	
IMPROVEMENT IN AL-ALLOYED EMITTER OF REAR-JUNCTION N-TYPE MC-SI CELLS USING A STACK OF PURE AI AND SCREEN-PRINTED AI PASTE.....	3608
<i>S. Singh, N. E. Posthuma, F. Dross, J. Poortmans, R. Mertens</i>	
INVESTIGATION OF TRANSPARENT CONDUCTING OXIDE/SI JUNCTION FOR THE EMITTER WRAP THROUGH SOLAR CELLS.....	3611
<i>J. S. Song, J. Y. Yang, J. S. Lee, J. P. Hong, J. H. Ha</i>	
USING SILICON INJECTION PHENOMENON DURING FIRE-THROUGH CONTACT FORMATION TO IMPROVE PROCESS CONTROL AND PERFORMANCE OF SCREEN-PRINTED MULTICRYSTALLINE-SILICON SOLAR CELLS.....	3614
<i>B. Sopori, V. Mehta, R. Reedy</i>	
ALL SCREEN-PRINTED 18% HOMOGENEOUS EMITTER SOLAR CELLS USING HIGH VOLUME MANUFACTURING EQUIPMENT.....	3618
<i>M. L. Terry, A. Meisel, E. Rosenfeld, S. Shah, E. Tai, X. Chen, T. Du</i>	
LARGE-SCALE AND ENHANCED EFFICIENCY C-SI SOLAR CELL WITH MOTH-EYE-LIKE BY USING SELF-ASSEMBLED LITHOGRAPHY.....	3623
<i>M. A. Tsai, H. C. Chen, H. W. Wang, Y. L. Tsai, P. C. Tseng, C. Y. Jang, P. Yu, H. C. Kuo</i>	
DIRECT WRITE METALLIZATION FOR PHOTOVOLTAIC CELLS AND SCALING THEREOF.....	3626
<i>M. F. A. M. Van-Hest, S. E. Habas, J. M. Underwood, R. M. Pasquarelli, P. Hersh, A. Miedaner, C. J. Curtis, D. S. Ginley</i>	
EFFICIENT DICING OF SILICON INGOTS FOR PHOTOVOLTAIC APPLICATIONS.....	3629
<i>G. D. Ganesh, C. Vesvikar, R. K. Singh, S. S. Joshi</i>	
PRODUCTION READY NOVEL TEXTURE ETCHING PROCESS FOR FABRICATION OF SINGLE CRYSTALLINE SILICON SOLAR CELLS.....	3635
<i>K. Wijekoon, T. Weidman, S. Paak, K. MacWilliams</i>	

EFFECT OF HANDLING STRESS ON RESONANCE ULTRASONIC VIBRATIONS IN THIN SILICON WAFERS	3642
<i>H. Wu, S. N. Melkote, A. Belyaev, I. Tarasov, D. Cruson, S. Ostapenko</i>	
CHARACTERIZATION OF DIELECTRIC LAYER, LASER DAMAGE AND EDGE RECOMBINATION IN MINIATURE SILICON SOLAR CELLS	3647
<i>N. S. Zin, A. Blakers</i>	

AREA 5: POSTERS, AMORPHOUS, NC, & FILM SILICON: FUNDAMENTAL MATERIAL PROPERTIES AND PROCESSING ISSUES

METAL INDUCED CRYSTALLIZATION OF AMORPHOUS SILICON USING LAYER-BY-LAYER TECHNIQUE WITH GOLD ULTRA THIN LAYER	3654
<i>M. Aono, H. Takiguchi, T. Endo, Y. Okamoto, H. Miyazaki, J. Morimoto, N. Kitazawa, Y. Watanabe</i>	
TEXTURED AZO ON SILICON OXY-NITRIDE BARRIER FILMS FOR ENHANCED LIGHT TRAPPING IN MICROMORPH TANDEM JUNCTION SOLAR CELLS	3660
<i>Y. Bhatnagar, B. McComb, J. Tang, M. Subramani, W. D. Wang, H. Zhang, S. Wang, T. Hsu, D. Severin, K. Schuegraf, H. Ponnekanti</i>	
DYNAMICS AND BONDING OF BOND-CENTERED HYDROGEN IN AMORPHOUS HYDROGENATED SI: VIBRATIONAL AND OPTICAL SIGNATURES	3663
<i>A. I. Shkrebtii, Z. A. Ibrahim, I. M. Kupchak, T. Teatro, F. Gaspari, D. V. Korbutiak</i>	
ALUMINUM DOPED HYDROGENATED NANOCRYSTALLINE CUBIC SILICON CARBIDE FILMS DEPOSITED BY VHF-PECVD FOR P-TYPE WINDOW LAYER OF SILICON BASED THIN-FILM SOLAR CELLS	3667
<i>D. Hamashita, S. Miyajima, A. Yamada, M. Konagai</i>	
CORRELATION OF A-SI:H PROPERTIES WITH HYDROGEN DISTRIBUTION	3671
<i>F. Gaspari, A. Shkrebtii, I. Kupchak, T. Teatro, Z. A. Ibrahim</i>	
BRIGHT EMISSION FROM AMORPHOUS SICN THIN FILMS	3676
<i>V. I. Ivashchenko, O. K. Porada, L. A. Ivashchenko, P. M. Lytvyn, I. M. Hatsevych</i>	
OXYGEN ELIMINATION EFFECT IN SILICON THIN FILM BY NEUTRAL BEAM ASSISTED CVD SYSTEM AT ROOM TEMPERATURE	3681
<i>J. N. Jang, B. C. Song, D. H. Lee, D. Kim, S. J. Yoo, B. Lee, M. Hong</i>	
DEVELOPMENT, CHARACTERIZATION AND INTERFACE ENGINEERING OF FILMS FOR ENHANCED AMORPHOUS SILICON SOLAR CELL PERFORMANCE	3686
<i>P. Joshi, S. Steen, K. Sivakumar, W. K. Yang, S. Rossnagel, S. Mittal, M. Steiner, D. Neumayer, Y. H. Kim, D. Nagalingam, L. Meng, C. S. Bhatia, J. C. H. Phang</i>	
SYNTHESIS OF SI NANOPARTICLES FROM FREESTANDING POROUS SILICON (PS) FILM USING ULTRASONICATION	3692
<i>P. G. Kale, C. S. Solanki</i>	
A NOVEL LOW THERMAL BUDGET THIN-FILM POLYSILICON FABRICATION PROCESS FOR LARGE-AREA, HIGH-THROUGHPUT SOLAR CELL PRODUCTION	3698
<i>Y. Kuo, C. H. Lin, M. Zhu</i>	
RELATIVE CRYSTALLITE SIZES FOR THERMALLY ANNEALED HWCVD A-SI:H FILMS WITH AND WITHOUT A SUB-THRESHOLD LASER FLUENCE	3702
<i>M. S. Dabney, B. To, H. Moutinho, P. C. Dippo, Y. Yan, P. A. Parilla, A. H. Mahan, D. S. Ginley</i>	
MC-SI THIN FILMS BY HYDROGEN PLASMA ASSISTED VACUUM EVAPORATION	3706
<i>D. O. Miranda, T. D. O. Moura, R. J. Santana, G. R. Guimaraes, E. R. S. Karger, A. S. A. C. Diniz, J. R. T. Branco</i>	
ENHANCEMENT OF CRYSTALLINITY IN ZNO:AI FILMS USING A TWO-STEP PROCESS INVOLVING THE CONTROL OF THE OXYGEN PRESSURE	3709
<i>T. Moon, W. Yoon, K. S. Ji, S. W. Ahn, M. Joo, H. Y. Shin, K. Park, H. M. Lee</i>	
POLYCRYSTALLINE SILICON FILM AND SOLAR CELLS BY FBR-CVD	3713
<i>L. Moro, J. Perez-Mariano, A. Sanjurjo, K. Lau</i>	
EFFECTS OF HYDROGEN DILUTION ON ELECTRON DENSITY IN MULTI-HOLLOW DISCHARGES WITH MAGNETIC FIELD FOR A-SI:H FILM DEPOSITION	3718
<i>K. Koga, Y. Kawashima, K. Nakahara, T. Matsunaga, W. M. Nakamura, M. Shiratani</i>	
DEPOSITION OF CLUSTER-FREE P-DOPED A-SI:H FILMS USING A MULTI-HOLLOW DISCHARGE PLASMA CVD METHOD	3722
<i>K. Nakahara, Y. Kawashima, M. Sato, T. Matsunaga, K. Yamamoto, W. M. Nakamura, D. Yamashita, H. Matsuzaki, G. Uchida, K. Kamataki, N. Itagaki, K. Koga, M. Shiratani</i>	
CARRIER TRANSPORT PROPERTIES OF FLASH-LAMP-CRYSTALLIZED POLY-SI FILMS	3726
<i>K. Ohdaira, T. Nishikawa, S. Ishii, N. Tomura, H. Matsumura</i>	

MECHANISM OF <110> PREFERENTIAL ORIENTATION IN MICROCRYSTALLINE SILICON GROWTH AND ITS INFLUENCE ON POST-OXIDATION PROPERTY	3729
<i>K. Saito, M. Kondo</i>	
ANOMALOUS CONDUCTIVITY BEHAVIOR OF MICROCRYSTALLINE SILICON	3735
<i>R. W. Lof, R. E. I. Schropp</i>	
CONTINUOUS IN-LINE HOT-WIRE CHEMICAL VAPOR DEPOSITION OF THIN FILM SILICON P-I-N SOLAR CELLS	3739
<i>R. E. I. Schropp, C. O. Van-Bommel, C. H. M. Van-Der-Werf, Y. Liu, J. Xin</i>	
GENERATION RATE DEPENDENCE OF CARRIER LIFETIME MEASUREMENTS IN NANOCRYSTALLINE SILICON USING TRANSMISSION MODULATED PHOTOCONDUCTIVE DECAY	3743
<i>B. J. Simonds, B. Yan, G. Yue, R. K. Ahrenkiel, P. C. Taylor</i>	
CONTROL OF CRYSTALLINE VOLUME FRACTION OF μC-SI THIN FILM USING 40.68 MHZ PECVD SYSTEM FOR SOLAR CELL APPLICATION	3748
<i>F. C. Tung, M. C. Huang, T. S. Chin, N. C. Lang, P. S. Wu, E. Yi-Chang, J. H. Huang</i>	
RAMAN STUDY OF STRESS EFFECT IN SILICON RICH CARBIDE (SICX) FILM BY FURNACE AND RAPID THERMAL ANNEALING FOR PHOTOVOLTAIC APPLICATION	3752
<i>Z. Wan, S. Huang, M. A. Green, G. Conibeer</i>	
ON THE BANDGAP OF HYDROGENATED NANOCRYSTALLINE SILICON THIN FILMS	3755
<i>B. Yan, G. Yue, L. Sivec, C. S. Jiang, Y. Yan, K. Alberi, J. Yang, S. Guha</i>	
Author Index	