

ACPV Workshop

June 20 - June 22, 2012

Registration

Tuesday, June 19, 19:00-20:00

Wednesday, June 20, 08:00-09:00

Wednesday, June 20

Opening Session

9:00 **Welcome, scope of the ACPV workshop**

Alexander Ulyashin, Jesper Friis and Tanja Pettersen, SINTEF

Opening Session Chair: Tanja Pettersen

9: 20 **Invited talk: "Thin crystalline silicon hybrid technologies"**

Sarah Kajari-Schroeder, ISFH

9:45 **Invited talk: "Increasing silicon solar cell efficiencies with advanced upconverter systems" (EU project "NanoSpec")**

Jan Christoph Goldschmidt, ISE Freiburg

10: 10 **Invited talk: "The SNAPSUN project: silicon nanocrystal synthesis by dry and wet processes"**

Etienne Quesnel, CEA Liten

10: 35 **Invited talk: "Crystalline Silicon based Tandem Solar Cells" (EU project "NASCEnT")**

Stefan Janz, ISE Freiburg

11:00 **Coffee break.**

EU project HiperSol

11.20 An introduction to the HiperSol project. Jesper Friis, SINTEF

11.30 Session on metallisation. Chair: Sara Olibet, ISC

11.35 *Characterisation of the contacting interface.* Sara Olibet, ISC

11.55 *What makes a good contact? Insights from atomistic modelling.* Keith Butler, University of Sheffield

12.15 *Modelling of contacting - from atomistic to macroscopic scale.* Ole Martin Løvvik, SINTEF

12.35 *Industry presentation.* Daniel Reinke, Sunways

13.00 Lunch

Chair: Jesper Friis, SINTEF

14:00 Invited talk: “Hybrid Solar Cells”

Martin Stutzmann, TUM

14.20 Session on passivation. Chair: Arthur Weeber, ECN

14.25 *Characterization of a-SiNx:H layer: bulk properties and interface with Si.*
Machteld Lamers, ECN

14.45 *Defects in amorphous silicon nitrides Si₃N₄-Si₃N_x.* Leif Eric Hintzsche, University of Vienna

15.05 *Phosphorous in silicon and silicon nitride.* Espen Flage-Larsen, SINTEF

15.15 *Calculation of life times.* Hans Ågren, KTH

15.35 *Industrial perspective for photovoltaic based on silicon solar cells.* Miguel Angel Vázquez, Isofoton

15.50 Discussions. Theme: current limitations and new possibilities

16.20 Coffee break

EU project ThinSi (Session 1)

Chair: Kris Van Nieuwenhuysen, IMEC

16:45 *ThinSi film based hybrid solar cells on low-cost substrates: EU Project ThinSi,*
Alexander Ulyashin, SINTEF

17:00 *Production of highly doped bi-product silicon powder for ThinSi solar cell*
substrates, Ronny Gløckner, ELKEM Solar

17:15 *Low cost Si substrates for advanced Photovoltaics,* Alexander Ulyashin, SINTEF

17:30 *Thermal Spray of Si powder for PV applications,* Michalis Vardavoulias,
Pyrogenesis

17:45 Group Photo

18:00 Coffee break, Poster session

20:00 – 22:00 Dinner

Thursday, June 21

EU project ThinSi (Session 2)

Chair: Ronny Gløckner, ELKEM Solar; Alexander Ulyashin, SINTEF

- 9:00 *Processing of low-grade silicon substrates for c-Si Thin-Film solar cells in the ThinSi project*, Stefan Reber, ISE Freiburg
- 9:15 *Vacuum Thin Film Deposition Technology for Development of Silicon Based Photovoltaics*, Louise Bailey, OIPT
- 9:30 *Non vacuum deposition of transparent conducting oxide thin films*, Kwang-Leong Choy, University of Nottingham
- 9:45 *Low cost production of ITO thin films*, Jimmy Hsu, IMPT
- 10:00 *Conductivity profiling of ultrathin AZO films by ellipsometry*, Anna Sytchkova / Danilo Zola
- 10:15 *Processing of solar cell structures and solar cells on low-cost substrates*, Kris Van Nieuwenhuysen, IMEC
- 10:30 *Nano-scale conductive and micro- Raman characterization of Si based Solar cells* Mingwen Tian, NT-MDT
- 10:45 *Cost models for silicon based PV*, Miguel Ángel Vázquez Rodríguez, ISOFOTON
- 11:00 Discussion. Si wafer equivalent and low-cost processing of Si based solar cells

11:30 **Coffee break.**

EU Project R2M-Si

12:00 Session 1 - R2M Si. Chair: Barbara Terheiden, University of Konstanz

12:05 **Invited talk: "Role and status of the c-Si thin-film solar cell concept in the current PV market"**

Stefan Reber, ISE Freiburg

12:30 *Idea and status of the EU project R2M-Si*, Stefan Reber, ISE Freiburg

12:45 *Ultra thin solar cells based on epitaxial foils obtained by porous-silicon-based layer transfer process*, Kris van Nieuwenhuysen, IMEC

13:00 **Lunch**

14:00 Session 2 - R2M Si. Chair: Stefan Reber, ISE Freiburg

14:05 *Anisotropy of porous silicon formation rate*, Ekaterina Astrova, IOFFE

14:20 *Optical constants of sintered porous Si – Overview of microstructure-based computation approaches with comparison to experimental estimations*, Gabriel Michard, Barbara Terheiden, University of Konstanz

14:35 *A composite wafer with crystalline film on a sintered Substrate for a low cost and a high efficiency cell technology*, Alain Straboni, S'Tile

14:50 Discussion. Si wafer equivalent: R2M processing

15:25 **Coffee break**

EU Project NanoPV (invited talks)

Chair: Alexander Ulyashin, SINTEF

15:50 **Invited talk: “Improved polycrystalline silicon modules on glass substrates” (EU project “PolySiMode”)**

Ivan Gordon, IMEC

16:15 **Invited talk: “Thin film solar cell concepts on glass substrates based on Si nanowires: materials synthesis and characterization and device integration (EU project RodSol)”**

Silke Christiansen, Max-Planck-Institut for the Science of Light, Erlangen

16:40 **Invited talk: "Progress in Nanostructure Formation on Silicon Surfaces Using Pure Hydrogen Radical Etching Reaction"**

Hiroshi Nagayoshi, Tokyo National Technical College, Japan

EU Project NanoPV (Session 1)

Chair: John van Roosmalen, ECN; Alexander Ulyashin, SINTEF

17:00 *Nanomaterials and nanotechnology for advanced photovoltaics: EU project nanoPV*, Alexander Ulyashin, SINTEF

17:15 *Si/SiO₂ nanostructures as hetero-emitter for photovoltaic applications*”, Jan Amaru Töfflinger, Maurizio Roczen, Caspar Leendertz, Lars Korte, Enno Malguth, Andreas Schöpke, HZB

17:30 *Au-nanoparticles doped plasmonic layers and highly luminescent semiconductor quantum dots for photovoltaic applications* Vladimir Chirvony, University of Valencia

17:45 *Black silicon for solar cells– morphological diversity and electronic quality*, S. Koynov, M. Algasinger, J. Paye, M. S.Brandt, M. Stutzmann

18:00 *Al₂O₃ thin films deposited by low temperature atomic layer deposition for silicon passivation*, G. Seguni, E. Cianci, C. Wiemer, M. Peregó, D.S. Saynova-Oosterling, J.A.M. van Roosmalen, CNR, Italy/ECN

18:15 *Si nanowire solar cells*, Fritz Falk, IPHT

18:30 **Coffee break, Poster session**

20:00-22:00 Dinner

Friday, June 22

EU Project nanoPV (Session 2)

Chair: Fritz Falk, IPHT; Alexander Ulyashin, SINTEF

8:30 **Invited talk: “Manufacturing of thin crystalline Si wafers by the Slim-cut process and solar cell production starting from thin Si wafers” (EU project “Sugar”)**
Ivan Gordon, IMEC

08:50 *Preparation of nanowires with the potential for solar cells*, Cigang Xu, OIPT, UK

09:05 *Nanostructures for advanced solar cells*, Branko Pivac, RBI

09:20 *Application of magnetron sputtering and chemical methods for deposition of thin film nanomaterials for Photovoltaics*, Doriana Dimova-Malinovska, P.Vitanov, Central Laboratory of Solar Energy and New Energy Sources Bulgarian Academy of Sciences

09:35 *Non vacuum processing of nanomaterials for advanced photovoltaics*. Kwang-Leong Choy, IMPT

09:50 *XIS, an innovative integrated crystalline silicon cell and module concept with low silicon and metal consumption*, John van Roosmalen, Paula Bronsveld, Agnes Mewe, Gaby Janssen, Maciej Stodolny, Esther Cobussen-Pool, Ian Bennett, Bart Geerligs, and Arthur Weeber, ECN

10:05 Discussion. Nanomaterials and nanotechnologies in PV

10:35 **Coffee break.**

Chair: Alexander Ulyashin, SINTEF

11:00 **Invited talk: “Crystallization, defects and characterization of solar cell silicon”**
Marisa Di Sabatino Lundberg, NTNU

11:25 **Invited talk: "Marie Curie Actions: funding opportunities for researchers of tomorrow"**
Renat Bilyalov, EU Commission

11:50 **Panel discussion and conclusions**
Alexander Ulyahin, Jesper Friis, Tanja Pettersen, SINTEF

13:00 **Lunch**

14:00 **End of the workshop**