



אוניברסיטת בן-גוריון בנגב
Ben-Gurion University
of the Negev

Program

17th Sede Boqer Symposium on Solar Electricity Production October 24-26, 2011

George Evens Family Auditorium
Jacob Blaustein Institutes for Desert Research
Sede Boqer Campus

Sponsored by:



The Jacob Blaustein Center for Scientific Cooperation
The Jacob Blaustein Institutes for Desert Research
Ben-Gurion University of the Negev

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משרד התשתיות הלאומיות

Israel Ministry of National Infrastructures

Program

Monday, October 24, 2011

9:00 – 10:30 Arrival at the Evens Auditorium, Midreshet Ben-Gurion, **Registration & Reception**

10:30-11:00 **Opening Greetings**
(Chair: Prof. David Faiman, BGU Blaustein Institutes, Sede Boqer)

Prof. **Pedro Berliner**
Director, BGU Blaustein Institutes for Desert Research
Dr. **Shlomo Wald**, Chief Scientist, Ministry of National Infrastructures
Dr. **Ela Strauss**, Ministry of Science and Technology

11:00-12:00 **Session 1: Invited Keynote Lecture and Discussion**
(Chair: Prof. Yair Zarmi, Blaustein Institutes, BGU)

Basic Limitations to 3rd Generation PV Performance
Professor David Cahen
Weizmann Institute of Science, Rehovot, Israel

12:00-13:30 **Lunch** – Dining room, High School for Environmental Studies

13:30-15:00 **Session 2: Photovoltaics I**
(Chair: Prof. Gary Hodes, Weizmann Institute of Science)

1. *Interfacial charge separation in porphyrin/ITO bilayers: Effects of binding and peripheral substitutions*
Yulia Furmanskyy^{1,3}, Nurit Ashkenasy^{2,3} and Iris Visoly-Fisher^{1,3}
¹Dept. of Chemistry, ²Dept. of Materials Engineering and ³Ilse Katz Institute for Nanoscale Science and Technology, Ben-Gurion University
2. *Controlling morphology of PbS thin films for high efficiency solar cells*
Ronen Gurtman^{1,3}, Anna Osherov^{2,3} Yuval Golan^{2,3} and Iris Visoly-Fisher^{1,3}
¹Dept. of Chemistry, ²Dept. of Materials Engineering and ³Ilse Katz Institute for Nanoscale Science and Technology, Ben-Gurion University
3. *Inversion layer solar cells – lessons learned from molecular electronics*
Rotem Har-Lavan and David Cahen
Dept. of Materials and Interfaces, Weizmann Institute of Science
4. *Monitoring minority carrier lifetime in Si wafers during solar cell processing*
Chen Klein, Lev Kreinin, Ninel Bordin, Jack Broder and Naftali Eisenberg
Jerusalem College of Technology
5. *Strong efficiency enhancement of dye-sensitized solar cells using a La-modified TiCl₄ treatment of mesoporous TiO_s electrodes*
Shay Yahav, Sven Ruhle and Arie Zaban
Dept. of Chemistry, Bar Ilan University

15:00-15:30 **Coffee break**

15:30-17:00 Session 3: PV Systems

(Chair: Prof. Aaron Roy, Ben-Gurion University of the Negev)

1. *Switching algorithm for extending battery lifespan*
Ron Adany¹, Doron Aurbach² and Sarit Kraus¹
¹Computer Science Dept. and ²Dept. of Chemistry, Bar-Ilan University
2. *Development of a distinctive quick dynamic response MPPT algorithm for off-grid PV systems with a variable switching frequency of the DC/DC Converter*
Moshe Averbukh¹, Y. Ben-Galim² and A. Uhananov²
¹ Jacob Blaustein Institutes for Desert Research, Ben-Gurion University, ² Shamoon College of Engineering
3. *A normalization approach to solar panel parameter extraction based on the manufacturer's datasheet*
 Moshe Averbukh¹, S. Lineykin² and **A. Kuperman**³
¹ Jacob Blaustein Institutes for Desert Research, Ben-Gurion University, ² Dept. of Mechanical Engineering and ³Dept. of electrical Engineering and Electronics, Ariel University Center
4. *Approximation of external characteristics of a solar cell: An engineering approach*
 Alex Lidogoster¹, Vadim Stefin², **Michael A. Slonim**² and Gadi Vitner³
¹Electrical and Electronic Engineering Dept, Shamoon College of Engineering, ²Electrical and Electronic Engineering Dept., Ben-Gurion University, ³School of Engineering, Ruppin Academic Center
5. *Solar cell models at different illuminations*
 Raul Rabinovici¹, Yoram Horen², Pavel Strajnikov¹ and **Yotam Frechter**¹
¹Dept. of Electrical and Computer Engineering, Ben-Gurion University and ²Shamoon College of Engineering

17:00-18:30 Free time (final registration, room check-in)**18:30-20:00 Festive dinner - Dining room, High School for Environmental Studies****20:30 A Festive Concert – Evens Auditorium**

**20:30-22:00 Festive Concert: Some non-operatic vocal music by
Giacomo Meyerbeer (1791 – 1864)**

Sivan Rotem (Soprano) with **Jonathan Zak** (piano) and the
Collegium Singers, Avner Itai (conductor)

**Sponsored by Prof. Rivka Carmi,
President, Ben-Gurion University**

PROGRAM

Sivan Rotem (soprano) and Jonathan Zak (piano)

1. *Sceglia fra mille un core* - To choose one heart among thousands
2. *Da voi, da voi, cari lumi* – On you, on you, dear eyes
3. *Giura il nocchier* - The sailor swears

The Collegium Singers and Avner Itai (conductor)

4. *Morgenlied* – Morning song
5. *Dem Dreieinigkeit* - To the Trinity
6. *Vorbereitung zum Gottesdienst* - Preparation for the Divine Service
7. *Danklied* - Song of Thanksgiving

Sivan Rotem and Jonathan Zak

8. *Bei labbri che amore* - Beautiful lips that love
9. *Se non ti moro allato* - If I cannot die beside you
10. *Basta dir ch'io son amante* - It is enough to say that I am a lover

The Collegium Singers + Avner Itai

11. *Nach dem Abendmahl* - After Holy Communion
12. *Wach' auf, mein Herz* - Wake up, my Heart
13. *Jesus Christus wir sind hier* - Jesus Christ, We Are Here

Sivan Rotem + Jonathan Zak

14. *Chant de Mai* – Song of May
15. *Nella* - Nella

The Collegium Singers + Avner Itai

16. *Au Tombeau de Beethoven* - On Beethoven's Grave
17. *Pater Noster* - Our Father

The Collegium Singers + Avner Itai + Sivan Rotem

18. *Nice à Stephanie* – Nice's Tribute to Stephanie

Tuesday, October 25, 2011**9:00-10:30 Session 4: Photovoltaics II**
(Chair: Dr. Gitti Frey, The Technion)

1. *Nanocomposite fibers of conjugated polymers containing fullerene derivatives and carbon nanotubes for organic photovoltaics*
Celine Bonioux^{1,2}, Cheli Itzhak³, Ron Avrahami⁴, Eyal Zussman⁴, Joseph Frey⁵, Eugene A. Katz¹, Alex Shames⁶ and Rachel Yerushalmi-Rozen²
¹Blaustein Institutes of Desert Research, Ben-Gurion University; ² Albert Katz International School for Desert Studies, BGU; ³ Dept. of Chemical Engineering, BGU; ⁴ Dept. of Mechanical Engineering, Technion; ⁵ Dept. of Chemistry and Institute for Nanotechnology and Advanced Materials, Bar-Ilan University; ⁶Dept. of Physics, BGU
2. *Study of light intensity dependence of efficiency of organic photovoltaics by concentrated sunlight: towards optimization of charge collection in large-area solar cells*
Eugene A. Katz¹, Assaf Manor^{1,2}, Thomas Tromholt³, Frederik C. Krebs, Ronn Andriessen⁴ and Yulia Galagan⁴
¹ Blaustein Institutes of Desert Research, Ben-Gurion University; ² Albert Katz International School for Desert Studies, BGU; ³ Risø National Laboratory for Sustainable Energy, Technical University of Denmark; ⁴ Holst Centre, Eindhoven, the Netherlands
3. *Degradation study of polyfluorine F8BT: understanding organic solar cell degradation by studying degradation of the individual components*
Sivan Linde and Rafi Shikler
Electrical and Computer Engineering Dept., Ben-Gurion University
4. *ZnO hole-blocking layer in organic solar cells: a study aimed at enhancing functionality and stability*
Assaf Manor^{1,2}, Eugene A. Katz¹, Thomas Tromholt³ and Frederik C. Krebs³
¹Blaustein Institutes of Desert Research, Ben-Gurion University; ² Albert Katz International School for Desert Studies, BGU; ³ Risø National Laboratory for Sustainable Energy, Technical University of Denmark
5. *Light-induced degradation of the photoactive layer in organic solar cells*
Asaf Meschloff^{1,2}, Eugene A. Katz¹, Thomas Tromholt³ and Frederik C. Krebs³
¹ Blaustein Institutes of Desert Research, Ben-Gurion University; ² Albert Katz International School for Desert Studies, BGU; ³ Risø National Laboratory for Sustainable Energy, Technical University of Denmark

10:30-11:00 Coffee Break**11:00-12:30 Session 5: Invited Keynote Lecture and Discussion**
(Chair: Prof. Enrique Grunbaum, Tel Aviv University)*Nanostructures in high-efficiency photovoltaic cells***Dr. Ned Ekins-Daukes**

Imperial College of Science and Technology, London

12:30-13:30 Lunch – Dining room, High School for Environmental Studies

13:30-15:00 Session 6: Technical Tour – Ben-Gurion National Solar Energy Center

BGU solar research laboratories; Heliofocus (CSP)
Siemens (CSP); Soitec (CPV)

15:00-15:30 Coffee break

15:30-17:00 Session 7: Miscellaneous

(Chair: Prof. Daniel Feuermann, Blaustein Institutes, BGU)

1. *The characterization of organic and non-organic photovoltaic cells*
Guy Ankonina and Gitti Frey
The Technion Institute of Technology
2. *Teaching children to value solar energy*
Muhamad Hugerat
The Academic Arab College for Education in Israel - Haifa
3. *Photovoltaic System Implementation and the PV Industry in 2010*
Yona Siderer
Blaustein Institutes for Desert Studies, Ben-Gurion University
4. *Photovoltaic Station as an element of power system: new equivalent diagram based on results of short circuit and open circuit tests*
Michael A. Slonim¹ and Alexander A. Slonim²
¹Dept. of Electrical and Computer Engineering, Ben-Gurion University and
²Electrical and Electronic Engineering Dept., Shamoon College of Engineering
5. *Dynamics and control of the process of soiling on different surfaces*
Sergey Biryukov¹ and **Leonid Yarmolinsky**^{1,2}
¹Blaustein Institutes for Desert Research and ² Albert Katz School for Desert Studies, Ben-Gurion University

17:00-17:30 Coffee Break

17:30-19:00 Session 8: Power

(Chair: Prof. Moshe Levy, Weizmann Institute of Science)

1. *The potential of CSP thermal technologies for base load electricity generation*
Roman Adinberg
Solar Energy Research Facilities, Weizmann Institute of Science
2. *Camera monitoring of large photovoltaic fields*
Raul Rabinovici¹, Yotam Frechter¹, **Igor Marder**² and Tidhar Dagan²
¹ Dept. of Electrical and Computer Engineering and ² Dept. of Energy Engineering, Ben-Gurion University of the Negev
3. *New fundamental bounds for antenna harvesting of sunlight*
Heylal Mashall^{1,2} and Jeffrey M. Gordon^{1,3}
¹Jacob Blaustein Institutes for Desert Research, ² Albert Katz School for Desert Studies, ³ Dept. of Mechanical Engineering, Ben-Gurion University
4. *Impact of environmental dust on solar power production*
Sergey Biryukov¹ and **Pavel Pokrass**²
¹Blaustein Institutes for Desert Research and ² Albert Katz School for Desert Studies, Ben-Gurion University
5. *Dependence of grid-matching predictions for a CPV system on the time scale employed*
Ehud Strobach¹ and David Faiman²
¹ Albert Katz School for Desert Studies and ²Blaustein Institutes for Desert Research, Ben-Gurion University

19:00-21:00 Festive Dinner – followed by open discussion on

Can Israel Go Solar In A Big Enough Way?

Wednesday, October 26, 2011

9:00-10:30 Session 9: Concentrator Photovoltaics
(Chair: Dr. Eugene Katz, Blaustein Institutes, BGU)

1. *Modeling an actively-cooled CPV receiver*
Annemaria Buonomano¹ and David Faiman²
Dipartimento di Energetica Termofluidodinamica applicata e Condizionamenti ambientali, Università di Napoli "Federico II" and ²Blaustein Institutes for Desert Research, Ben-Gurion University
2. *The temperature dynamics of multijunction concentrator photovoltaic cells up to ultra-high irradiance*
Avi Braun¹, Baruch Hirsch¹, Alexis Vossier¹, Eugene A. Katz² and Jeffrey M. Gordon^{2,3}
¹Albert Katz International School for Desert Studies, ² Blaustein Institutes for Desert Research, ³Dept. of Mechanical Engineering, Ben-Gurion University
3. *Validation of a model for predicting the performance of a passively cooled grid-connected CPV system*
Ehud Strobach¹ and David Faiman²
¹ Albert Katz School for Desert Studies and ²Blaustein Institutes for Desert Research, Ben-Gurion University
4. *MST CPV tracker performance*
Roy Rosenstreich
MST Ltd.
5. *ZenithSolar: field experience*
Roy Segev
ZenithSolar Ltd.

10:30-11:00 Coffee Break

11:00-12:30 Session 10: Invited Keynote Lecture and Discussion
(Chair: Prof. David Faiman, Blaustein Institutes, BGU)

Concentrator Photovoltaics: The state of the Art

Dr. Kenji Araki

Daido Steel Corporation, Nagoya, Japan

12:30-12:45 Closing words

12:45-13:45 Lunch – Dining room, High School for Environmental Studies