



NOBEL SYMPOSIUM NSI91:  
*Efficient Light to Electric Power  
Conversion for a Renewable  
Energy Future*

3-5 May 2023

SWEDISH  
COLLEGIUM  
*for* ADVANCED STUDY



UPPSALA  
UNIVERSITET



NOBEL SYMPOSIUM NSI91:

# *Efficient Light to Electric Power Conversion for a Renewable Energy Future*

3-5 May 2023

Venues:

SCAS, Linneanum, Thunbergsvägen 2, Uppsala (3-4 May)

Ångström Laboratory, Uppsala University, Lägerhyddsvägen 1, Uppsala (5 May)

PROGRAMME

**Wednesday, 3 May**

Venue: Thunberg Lecture Hall, SCAS & Linnaeus Hall (coffee/tea breaks and lunch)

## **Session: Inauguration, Keynote and Solar Cell Physics**

- 09:00 - 09.20 Inauguration of the symposium and welcome by the hosts: SCAS Principal **CHRISTINA GARSTEN** and Vice-Chancellor of Uppsala University, **ANDERS HAGFELDT**
- 09.20 - 10.00 Keynote, **MARTIN GREEN**, *Evolution of Silicon Solar Cell Efficiency*
- 10.00 - 10.30 **ELI YABLONOVICH**, *Counter Intuitively: The Greater the External Luminescence, the More Efficient the Photovoltaic Cell*
- 10.30 - 11.00 Coffee/tea break
- 11.00 - 11.30 **TED SARGENT**, *Photophysics-by-Design: Materials to Devices for Optical Energy Capture*
- 11.30 - 12.00 **JENNY NELSON**, *Optimising Solar Energy Conversion in Molecular Electronic Materials*
- 12.00 - 12.30 Panel discussion 1. Chairs: **ELLEN MOONS** and **TÖNU PULLERITS**
- 12.30 - 13.30 Lunch

## **Session: Perovskite Materials and Stability**

- 13.30 - 14.00 **DAVID MITZI**, *Organic-Inorganic Perovskites: A Perspective on Tailoring Hybrid Semiconductors for PV and Beyond*
- 14.00 - 14.30 **TOM MIYASAKA**, *Efficiency and Stability Development in Hybrid and Inorganic Perovskite Photovoltaic Cells*
- 14.30 - 15.00 **DAVID CAHEN**, *Sustainable Photovoltaics Needs Sustainable Materials: Self-repair and -healing in Si, CI(G)S and Pb-Halide Perovskites*
- 15.00 - 15.30 Coffee/tea break

- 15.30 - 16.00 **PRASHANT KAMAT**, *Overcoming Challenges of Ion Migration in Perovskite Solar Cells*
- 16.00 - 16.30 **MICHAEL SALIBA**, *Historic Overview and Design Principles for Optoelectronic Perovskite Materials*
- 16.30 - 17.00 Panel discussion 2. Chairs: **MAGNUS BORGSTRÖM** and **FENG GAO**
- 19.00 - Dinner (Venue: Norrlands nation, Västra Ågatan 14)

## Thursday, 4 May

Venue: Thunberg Lecture Hall, SCAS & Linnaeus Hall (coffee/tea breaks and lunch)

### Session: Basic Device Function, Perovskites and Chalcopyrites

- 09.00 - 09.10 Welcome, day 2
- 09.10 - 09.40 **MICHAEL GRÄTZEL**, *Molecular Photovoltaics and the Rise of Perovskite Solar Cells*
- 09.40 - 10.10 **NAM GYU PARK**, *Discovery of the Practical Perovskite Solar Cell*
- 10.10 - 10.40 Coffee/tea break
- 10.40 - 11.10 **UWE RAU**, *The Rise and the Decay of the Photovoltage and What It Tells Us about How Solar Cells Work*
- 11.10 - 11.40 **SUSANNE SIEBENTRITT**, *Efficiency Limitations in State-of-the-art Chalcopyrite Solar Cells and How to Overcome Them*
- 11.40 - 12.10 Panel discussion 3. Chairs: **ANDERS HAGFELDT** and **MARIKA EDOFF**
- 12.10 - 13.00 Lunch

### Session: Visit to the Carolina Rediviva Library and Function of Organic Solar Cells

- 13.00 Short walk to the Carolina Rediviva Library
- 13.15 - 14.45 Visit to the Carolina Rediviva Library
- 14.45 Short walk back to SCAS
- 15.00 - 15.30 Coffee/tea break
- 15.30 - 16.00 **JIANHUI HOU**, *Material Design and Device Engineering for Efficient Organic Photovoltaic Cells*
- 16.00 - 16.30 **RICHARD FRIEND**, *Coulomb Interactions in Organic Semiconductors*
- 16.30 - 17.00 **NATALIE BANERJI**, *Organic Semiconductors for Solar Cells and Bioelectronics*
- 17.00 - 17.30 Panel discussion 4. Chairs: **OLLE INGANÄS** and **FENG GAO**
- 17.30 - 18.00 **ULF DANIELSSON**, *The Nobel Prize*
- 19.00 - Dinner (Venue: the Orangery in the Linnaeus Garden)

## Friday, 5 May

Venues: Heinz-Otto Kreiss Lecture Hall, Ångström Laboratory & Evelyn Sokolowski Hall (coffee/tea breaks, lunch, poster session and photo session)

08.30 Bus from Suttungs gränd (Elite Hotel Academia) to the Ångström Laboratory

### Session: Device Design

09.00 - 09.10 Welcome, day 3

09.10 - 09.40 **HENRY SNAITH**, *The Discovery and Development of Metal Halide-perovskite Solar Cells*

09.40 - 10.10 **PAUL BLOM**, *Charge Transport in Hybrid Organic-Inorganic Solar Cells*

10.10 - 10.40 Coffee/tea break

10.40 - 11.10 **RENÉ JANSEN**, *Material and Device Design for Multijunction Perovskite Solar Cells*

11.10 - 11.40 **THUC-QUYEN NGUYEN**, *Organic Solar Cells for Energy Generation*

11.40 - 12.10 Panel discussion 5. Chairs: **EVA UNGER** and **TÖNU PULLERITS**

12.10 - 13.30 Lunch, poster session and photo session

### Open session: Solar Cells Producing Power at Large Scale

13.30 - 14.15 **RICHARD M SWANSON**, *A Chronicle of the Breakthroughs in Photovoltaic Technology and Understanding that Have Enabled the Remarkable Progress in Installed Power*

14.15 - 14.45 **LAURA MIRANDA PEREZ**, *Perovskite Solar: The Role of the Next Generation PV in Addressing the Climate and Energy Crisis*

14.45 - 15.15 **STEFANO AMADUCCI**, *The Challenge of Integrating Photovoltaics and Plant Production*

15.15 - 15.45 Coffee/tea break

15.45 - 16.15 **CHRISTOPH BRABEC**, *Accelerating Science and Technology of Solution Processed Photovoltaics*

16.15 - 17.00 Panel discussion 6. Chairs: **MARIKA EDOFF** and **ANDERS HAGFELDT**

17.00 - 17.10 Thank you & farewell, **CHRISTINA GARSTEN**

17.10 - 18.00 Free discussions, networking and lab tours

18:00 - Dinner (Venue: Evelyn Sokolowski Hall, Ångström Laboratory)

Bus to Suttungs gränd (Elite Hotel Academia)