



**July 1 - 11, 2012**

**Patras, Greece**

***The T.E.I. of Patras and its partner  
Universities***

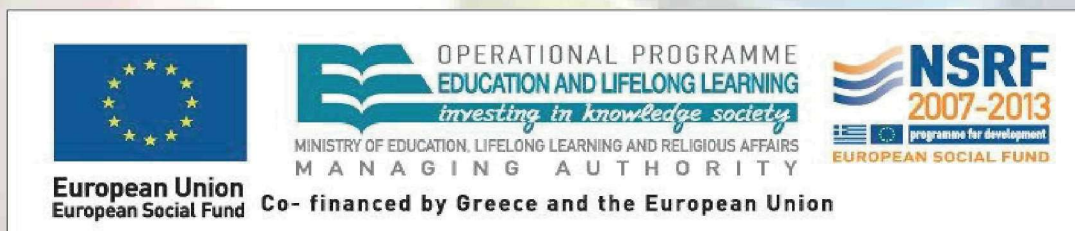
**Organize  
an International Event:  
The Innovation Week on R.E.S.**

**11 Days Intensive Learning  
& Exhibition of Innovation**

**on**

***PV Systems Engineering  
& the other Renewable Energy Systems  
and the Entrepreneurship spirit***

***T.E.I. of Patras  
Unit of Innovation & Entrepreneurship***



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**JOURNAL OF  
Engineering Science and  
Technology Review**

**Arrival Day: Sunday 1 July 2012, Arrival at Patras and Hotel registration**

**Monday 2 July, 2012**

*A bus will pick participants from the Hotel(s)*

08:30 Registration

09:00 Opening Address

- The Innovation Week on R.E.S. and related events within a Summer School on PV Systems Engineering & the other Renewable Energy Systems

**Session I : Fundamentals of Solar Radiation**

09:30 An Overview of R.E.S. from a spectrum of innovations and intelligent applications

*Prof. S. Kaplanis, Technological Institute of Patras, Greece*

10:30 Solar Geometry and Solar Radiation aspects; Polar Charts

*Prof. S. Kaplanis, Technological Institute of Patras, Greece*

11:00 Break

11:30 Solar Radiation: Direct & Diffuse; Measurements, Determination of Solar Radiation on any Inclined Surface

*Prof. S. Kaplanis, Technological Institute of Patras, Greece*

-Discussion

**Session II : Solar Thermal Engineering Applications**

12:00 Solar Cooling & Air-conditioning

*Prof. A. Argyriou, University of Patras, Greece*

12:30 Bioclimatic Buildings; Principles; Design; Performance; Parameters; Gain: Case Study: Building rehabilitation; from a conventional to a zero-energy building

*Prof. A. Argyriou, University of Patras, Greece*

13:00 Lunch

14:00 Saving Energy in protected buildings

*Dr. D. Roubien, Technological Institute of Patra, Greece*

15:00 Discussion: Arrangements for the R.E.S. Exhibition &

-Personal study and preparation: RES Lab & Library

19:00 Dinner



## Tuesday 3 July, 2012

### Session III : Solar Technologies in the Domestic sector (I)

- 09:00 Domotics related to Energy and R.E.S. Management:  
A Case Study how to innovate on the power consumption & management in buildings  
*Prof. P. Borza, Transilvania University in Brasov, Romania*
- 09:45 Smart Grids and Virtual Power Plant  
*Dr. Mihai Sanduleac, ECRO Bucuresti, Romania*
- 10:30 PV + Thermal Systems:  
Case Studies on the integrated design & performance of PV panels  
*Prof. Y. Tripanagnostopoulos, University of Patras, Greece*
- Discussion
- 11:00 Break
- 11:30 Hybrid R.E.S. Systems: Design, Performance  
*Prof. Y. Tripanagnostopoulos, University of Patras, Greece*
- 12:15 Environmental Management & Sustainability: A new field related to RES  
with an outline of Case Studies  
*Prof. M. Dassisti, Politecnico di Bari*
- Discussion
- 13:00 Lunch

### Session IV : Solar Technologies in the Domestic sector (II)

- 14:00 Experience from PV system performance including comparison of on roof and  
facade systems:  
Case Study on BIPV systems. A straight application which requires the attention  
of authorities & professionals for a proper design  
*Prof. V. Benda, Technical University of Prague, Czech Republic*
- 15:30 Discussion
- Assignment of project work to participants
  - Personal study & preparation in RES Lab & Library
- 19:00 Dinner

**Session V : PV cell technology & Applications**

09:00 PV cells: Physics of PV cells, fabrication; operation characteristics:  
New technological developments in the PV cell technology. Need for improvement.  
*Prof. V. Benda, Technical University Prague, Czech Republic*

09:45 Batteries, inverter and charger as parts of a stand – alone PV system  
*Prof. S. Kaplanis, Technological Institute of Patras, Greece*

11:00 Break

11:30 Organic Semiconductor-based Plastic Solar Cells OPVs.  
*Prof. E. Stathatos, Technological Institute of Patras, Greece*

-Discussion

13:00 Lunch

**Session VI : Biomass Energy & Innovations**

14:00 Biomass: Basics, Bio-conversion, crop and sewage treatment (Part I)  
*Dr. Sp. Alexopoulos, University of Applied Sciences, Aachen, Germany*

14:30 Biomass: Basics, Bio-conversion, crop and sewage treatment (Part II):  
Innovative & pilot projects on co-generators  
*Dr. Sp. Alexopoulos, University of Applied Sciences, Aachen, Germany*

-Discussion

15:00 a. Student oral presentation on R.E.S. Innovation & Intelligent Application  
b. Exhibition Room: Poster Presentation (Student Initiative)

16:00 Personal study & project preparation in the RES Lab & Library

19:00 Dinner



## Thursday 5 July, 2012

### Session VII : Advancements & new materials in the RES domain

- 09:00 Selected issues related to PV applications.  
*Prof. S. Kaplanis, Technological Institute of Patras, Greece*
- 09:45 Stand – alone PV systems for outdoor living:  
An application & practical experience from Bulgaria  
*Prof. M. Stoev, South – West University ‘Neophit Rilski’, Bulgaria*
- 10:15 -Discussion
- 11:00 Break
- 11:30 High efficient Dye sensitized and Organic solar cells: A new perspective to the solar energy conversion.  
A challenge for new market on PV cells  
*Prof. E. Stathatos, Technological Institute of Patras, Greece.*

### Session VIII : Simulation Techniques in Solar Thermal & PV Systems

- 13:00 Lunch
- 14:00 PV cell performance under high irradiation:  
Study on innovative design towards high power delivery over a PV cell  
*Prof. S. Kaplanis, Technological Institute of Patras, Greece*  
*Dr. E. Kaplani, Technological Institute of Patras, Greece*
- 14:30 a. Discussions with PV market representatives: Entrepreneurship challenges & perspectives for development & employment  
*Dipl. Ing. P. Fragkos, MSc, Aleo Solar Hellas*  
b. Student oral presentations on R.E.S. Innovation & Intelligent Applications  
c. Exhibition Room: Innovation Design & Products related to R.E.S. (Student Initiative)
- 19:00 Dinner

## Friday 6 July, 2012

### Session IX : Wind Energy & Applications

- 09:00 Solar Converters & Devices to Gain Thermal Energy and Power:  
Case Studies which show the importance of new designs and applications  
*Prof. S. Kalogirou, Cyprus University of Technology, Cyprus*
- 09:45 Renewable Energy Systems: A challenge to energy savings and clean environment: Applications  
*Prof. S. Kalogirou, Cyprus University of Technology, Cyprus*
- 10:30 R.E.S. Technologies in Buildings, Agro-economy, Industry:  
Case Studies with innovative designs to improve energy performance and savings  
*Prof. S. Kalogirou, Cyprus University of Technology, Cyprus*
- Discussion on Wind Technologies as a major RES technology for Sustainability

### Session X : Applications of RES technologies (PV & Bio-tech) to energy savings

- 11:00 Break
- 11:30 PV Sizing procedures; Simulation studies and L.C.A.:  
Case Study to a cost-effective PV SA installation  
*Prof. S. Kaplanis, Technological Institute of Patras, Greece*
- 12:15 Sizing of Hybrid (PV & Wind)  
*Prof. F. Hocaoglu, Afyon Kocatepe University, Turkey*
- 13:00 Lunch
- 14:00 Energy consumptions of traditional office buildings;  
Case Study on Energy Audits  
*Prof. P. Kadar, Ábuda University, Budapest, Hungary*
- 14:30 Wind Technologies; Estimation of Wind- Potential; software; Wind Turbine Technologies  
*Prof. P. Kadar, Ábuda University, Budapest, Hungary*
- 15:00 Parts of a Wind turbine; construction; design data;  
*Prof. P. Kadar, Ábuda University, Budapest, Hungary*
- 15:30 -Discussion with experts from the PV technologies market:  
Potentialities and Future markets  
*Mr. G. Koustas, Solar Cells Hellas Group*
- Discussion on the application of new technologies to the Building sector
- Student oral presentation on R.E.S. Innovation & Intelligent Application  
Exhibition Room: Innovation Design & Products related to R.E.S. (Student Initiative)
- 19:00 Dinner



**Monday 9 July, 2012**

**Session XII- 1 : Application of PV & Solar Thermal & Biomass systems in the Domestic, Agricultural & Industrial sector**

- 09:00 PV module performance at S.T.C. and field conditions  
*Dr. E. Kaplani, Technological Institute of Patras, Greece*
- 09:30 Ageing effects in PV cells and modules  
*Dr. E. Kaplani Technological Institute of Patras, Greece*
- 10:00 Integration of RES in AC Grid - Power Quality in Micro Grids:  
Practical examples  
*Prof. R. Magureanu, University Politehnica, Bucharest, Romania*
- Discussion
- 10:45 Break
- 11:00 PV Systems: Data collection and processing, quality and project management, ICT support  
*Prof. Martin Molhanec, Technical University of Prague, Czech Republic*
- 12:00 Experimental demonstration on PV i-V curves  
*Dr. E. Kaplani, Technological Institute of Patras, Greece*
- Discussion
- 13:00 Lunch

**Session XII- 2 : Application of PV Solar Thermal systems**

- 14:30 a. Student oral presentation on R.E.S. Innovation & Intelligent Application  
b. Exhibition Room: R.E.S. Innovations & Intelligent Application
- 16:00 Personal study & preparation for project defense: RES Lab & Library
- 19:00 Dinner

**Tuesday 10 July, 2012**

**Session XIII : Fuels & Environment**

- 09:00 Alternative Fuels in the 21<sup>st</sup> century  
*Prof. Georgi Cholakov, University of Chemical Technology and Metallurgy Sofia, Bulgaria*
- 09:45 Fossil Fuels in the 21<sup>st</sup> century  
*Prof. Georgi Cholakov, University of Chemical Technology and Metallurgy Sofia, Bulgaria*
- 10:30 Sustainable Development. Integrated Renewable Energy Systems – Holistic Modelling & Control.  
*Prof. D. Cotfas, Transylvania University, Brasov, Romania*
- Discussion
- 11:00 Break

**Session XIV : Measurements of PV cell Performance**

- 11:30 Measurements of Solar Radiation; Calibration of PV cells: An innovative competitive Design & construction  
*Prof. D. Cotfas, Transylvania University, Brasov, Romania*
- Determining the Parameters of the Solar Cells  
*Prof. D. Cotfas, Transylvania University, Brasov, Romania*
- Data acquisition and Noise in Solar Cells  
*Prof. D. Cotfas, Transylvania University, Brasov, Romania*
- Discussion
- 13:00 Lunch

**Session XV : Biomass & H<sub>2</sub> technology: Applications**

- 14:00 a. Student oral presentation on R.E.S. Innovation & Intelligent Application: Project Defence  
b. Exhibition Room: R.E.S. Innovations & Intelligent Application (Student Initiative)
- Discussion on Innovative Product Design: Requirements & Needs
- 19:00 Dinner



**Wednesday 11 July, 2012**

**Session XVI : Fuel cell technology**

- 09:00 Ceramic materials for SOFC: Current status.  
*Prof. Vl. Kozhukharov, University of Chemical Technology and Metallurgy Sofia, Bulgaria*
- 09:45 Solid Oxide Fuel Cells (SOFCs) : Physical-chemical Characterization Methods  
*Prof. Vl. Kozhukharov, University of Chemical Technology and Metallurgy Sofia, Bulgaria*
- 10:15 Break
- 10:45 State-of-the-art in SOFCs Science and Technology  
*Prof. Vl. Kozhukharov, University of Chemical Technology and Metallurgy Sofia, Bulgaria*
- 11:30 Student Presentations of Innovation Design, Products and Structures on R.E.S.:  
Students present and defend the projects assigned to them
- 13:00 Lunch
- 14:00 Award ceremony: Certificates & Innovations Awards

**-FAREWELL**