



# EuroSun 2006

Glasgow, UK

27-30 June, 2006

# Conference Programme



the **SOLAR ENERGY** society



**ISES**

International  
Solar Energy  
Society





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**Sponsored by:**

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## **Welcome...**

...to Glasgow, Glasgow Caledonian University and EuroSun 2006. We hope that these notes will help you around the conference, and that you will have a pleasant stay in Glasgow and enjoy EuroSun 2006.

During the conference there will be a small army of volunteers, wearing distinctive T-shirts, to offer assistance. If you need any help, please do not hesitate to ask them. Alternatively, the registration desk in the Saltire Centre will be manned by conference staff most of the time during conference hours, and failing that, the conference office is located in room M129, on the first floor of the George Moore Building, close to the Saltire Centre.

Souvenir T-shirts are on sale at the registration desk, in various sizes. There is a limited quantity available, so get there early if you want one!

Most delegates are staying either at Caledonian Court, the University students' accommodation across the road from the University campus, or in selected hotels within a couple of minutes' walk from the campus. The campus itself is on the North edge of the city centre, and therefore there are many bars, restaurants, shops, clubs and other entertainment venues, etc., within a few minutes' walk, to the South (downhill) from the University.

### **No Smoking!**

Since March this year, there has been a ban in smoking in all public enclosed spaces throughout Scotland. This means that smoking is not permitted in any buildings on the University campus, nor in bars and restaurants. We would be obliged if you observed this regulation, to avoid embarrassment (or worse).

### **Speakers and Chairs of sessions (including Poster sessions)**

There are over 50 oral presentations on each day of the conference. Therefore, in order to make sure that oral sessions run smoothly, we ask that all speakers submit their presentations at least on the day prior to their presentation, or at the very latest, during the speakers' breakfast (see below) on the day of their presentation.

There will be a volunteer available to download your presentation onto a laptop computer at or close to the registration desk in the Saltire Centre, throughout each conference day. Volunteers will also be on hand to download presentations during the speakers' breakfasts.

**Note:** all presentations should be compatible with PowerPoint 2003, running under the UK version of Windows XP. If you wish to check your presentations prior to downloading, you may use the University computers in the Saltire Centre. If you wish to check your presentation after downloading and prior to the presentation, you may do this in the break prior to your presentation session, in the appropriate room.

**Speakers' Breakfasts:** All speakers (including plenary and keynote speakers) and chairs and co-chairs of sessions (including the poster sessions) should attend the speakers' breakfast on the day of their presentation. These take place at 8.00am, in the Hospitality Suite (W013) on the ground floor of the Hamish Wood Building, when coffee and croissants will be served. This is to confirm that all speakers are present and their presentations are available, to ensure that speakers and chairs understand their responsibilities, and also to communicate any last-minute information.

### **Posters**

Poster presentations are exhibited in the Refectory Extension (on the ground floor of the Hamish Wood Building). Posters will be displayed throughout the conference, and authors may make a brief presentation (maximum 3 minutes) about their poster, in the sessions as detailed in the programme, on Tuesday and Wednesday afternoons.

If you are presenting a poster, you have been allocated a space in the poster room. You should set up your poster in the morning or lunchtime on Tuesday, and take it down by the start of the afternoon session on Thursday. Posters should be attached to the poster stand using the self-adhesive Velcro strips which will be available in the poster room. Please note that, although it is not obligatory to make the brief oral presentation, you are expected to be present at your poster throughout the allocated session, to discuss your work with delegates.

### **Exhibition and Floor Art**

A trade exhibition is open for the duration of the conference in the Refectory Extension. Please feel free to browse the exhibition (and posters), especially during coffee, tea and lunch breaks.

At the entrance to the refectory extension you will see a display of artwork on the floor, by the Cypriot artist Nikos Kouroussis. Prints from the floor art are available to buy in the refectory extension or the registration desk.

### **EuroSun Education Events**

In addition to the normal schedule of technical sessions, posters and meetings, there are other educational events taking place during the conference:

- **Solnet** is a network of European Universities, funded by the European Commission to develop PhD education in solar heating technology. The inaugural meeting is scheduled to take place on Monday 26 June (more on page 32).
- **Solar Energy Masters Course:** up to 20 Masters students from various European countries are attending EuroSun to study various aspects of solar energy, and will present their findings at a special meeting on Saturday 1 July. The countries represented include Germany, Denmark and Austria.
- **The Solar Schools Forum** is intended to develop young people's understanding of solar energy, and schools were invited to enter an international competition, supported by the EC Altener programme. Prizes will be presented to the winners of the secondary schools' competition, from Romania, Hungary and the UK, on Wednesday 28 June, at the end of the morning plenary session. Various exhibits from the competition are on display in the Refectory Extension, and more details about the Forum are on page 29.
- **Solar Car Race:** Schools from Scotland were invited to enter teams to build and race a model solar car (sponsored by ScottishPower). This will take place at lunchtime, on Wednesday 28 June, in the courtyard in front of the Saltire Centre.

### **Lunches and other refreshments**

Included in the conference registration are lunch, and coffee and tea during the morning and afternoon breaks between sessions, served in the refectory and refectory extension (ground floor, Hamish Wood Building).

At other times, refreshments are generally available from the various cafes in the University (for example, on the ground floor of the Saltire Centre, and outside A005 (stream B) in the Govan Mbeki Building) at normal prices. There are also vending machines at various points throughout the University.

Apart from this, there are countless bars and restaurants around the city centre, serving a wide range of styles of food and drink.

**Breakfast for Caledonian Court delegates:** Delegates staying in the student accommodation in Caledonian Court and who have paid for a breakfast should go to the Staff Dining Room, at the far corner of the refectory, where a full range of breakfasts is available. Please don't forget to bring your breakfast voucher.

### **Civic Reception**

Glasgow City Council have cordially invited delegates to a Civic Reception, to be held at the City Chambers in George Square on Tuesday evening, at 7.00pm. George Square is 5 minutes' walk from the University – please refer to the Glasgow City map in your registration pack. All delegates and accompanying persons should have an invitation ticket in their registration packs – please enquire if you don't have one.

### **Conference Dinner**

Delegates who wish to attend the Conference Dinner on the Wednesday evening must have bought tickets in advance. The Dinner takes place in the Peoples' Palace, on Glasgow Green, with Magnus Magnussen as the guest after-dinner speaker.

The venue is about 40 minutes' walk from the University (please refer to the Glasgow City map in your registration pack). Alternatively, a shuttle bus service will

operate between the University (Cowcaddens Road, opposite the bus station) and Glasgow Green, from 6.30pm until 7.30 pm, and similarly from Glasgow Green to Cowcaddens Road at the end of the dinner. If you wish to go by taxi, a 'black cab' should cost about £5, and will take up to 5 passengers.

### **Technical tours**

Technical tours (Friday) will depart from Cowcaddens Road, outside the University, at 9.00am sharp. Please bring your tour ticket with you. Tours will return to the University by 5.00pm (the half-day tour is timed to return at 1.30pm). If you haven't booked on a technical tour yet, you may do so at the registration desk (subject to places still being available).

### **Accompanying Persons' programme**

The Accompanying Persons' programme includes a day ticket for the Glasgow City open-top tour bus and two day trips. The day trips depart from Cowcaddens Road, outside the University at 9.00am, and are timed to return to the University by 5.00pm. Please bring your Accompanying Persons' programme tickets with you. Delegates may sign up for individual tours on Wednesday and Thursday, for £30 per tour.

### **Access to computers and the internet**

The conference has negotiated access to the University computer system for delegates, via the open-access computers throughout the Saltire Centre, to review presentations, access the internet, etc. Note that no data can be stored on the hard drive of these computers, and therefore you should use a pen drive or other suitable medium to store any work. In order to log in to the network, you need a username and password. For security reasons, the password is changed daily, and therefore, if you wish to make use of the University computers, you should ask at the registration desk for these details.

There are only 30 logins available to the conference, and so please make sure that you log out when you have finished your session. Equally, if you find you can't log in, it may mean that there are many other delegates using the network at the time, and there are no more logins left – please try again later.

Alternatively, if you have a wireless-enabled laptop computer, you may access the University wireless network. This is available for both Windows and Mac users, under the network name GCU\_Guest, for internet access only – you will not have access to any other part of the University system. We cannot guarantee a clear signal in any part of the University, but the best reception is likely to be in the Saltire Centre and the Caledonian Court student accommodation.

**Note:** There are no printing facilities available for delegates via the University network.

**Please return your conference badges so that they can be recycled. There is a collection point at the registration desk – thank you.**

## Schedule of venues

Please refer to the plan of the campus on the inside back cover

	Room	Venue (GCU unless otherwise stated)
Conference Reception and Registration		First Floor, Saltire Centre
Plenary sessions	Carnegie Lecture Theatre C001	Ground Floor, Charles Oakley Building
Stream A	Carnegie Lecture Theatre C001	Ground Floor, Charles Oakley Building
Stream B	A005	Ground Floor, Govan Mbeki Building
Stream C	M001	Ground Floor, George Moore Building
Posters and Exhibition	Refectory Extension	Ground Floor, Hamish Wood Building
Workshops	M228	Second Floor, George Moore Building
Tea/Coffee and Lunches	Refectory and Refectory Extension	Ground Floor, Hamish Wood Building
Civic Reception (Tuesday evening)		City Chambers, George Square
Conference Dinner (Wednesday evening)		Peoples' Palace, Glasgow Green
Speakers' Breakfasts	Hospitality Suite W013	Ground Floor, Hamish Wood Building
Schools' solar car race (Wednesday lunchtime)		In front of the Saltire Centre (to be confirmed)
Conference Office	M129	First Floor, George Moore Building
ISES Committee room	M500	Fifth Floor, George Moore Building

## **Sunday 25 June**

0900 – 1800 ISES Board meeting: room M500

## **Monday 26 June**

0900 – 1430 ISES Board meeting: room M500

1200 – 1800 Solnet meeting: room M228

1500 – 1830 ISES-Europe Board meeting: room M500

**1600 – 2000 Registration: Saltire Centre**

**1800 – 1930 Welcome reception: Saltire Centre**



## Tuesday 27 June

### 0900 Opening Plenary

Carnegie Lecture Theatre (C001)

**Chair:** Stas Burek, *Glasgow Caledonian University, Scotland*

0900	Welcome and Opening Addresses Stas Burek, <i>EuroSun 2006 Conference Chair, Glasgow Caledonian University, Scotland</i> Despina Serghides, <i>President ISES-Europe, Higher Technical Institute, Cyprus</i> Professor Pamela Gillies, <i>Principal and Vice-Chancellor, Glasgow Caledonian University, Scotland.</i> John Thorp, <i>Chair UK-ISES, ecsc, London, UK</i>
0940	'Macro and Micro - integrating Solar into Social, Industrial, and Domestic energy demand scenarios' <i>Robin Harper MSP, Scottish Parliamentary Renewable Energy group (SPREG), Scotland</i>
1020	How Renewable Energy Industry Clusters Ensure Effective Technology Implementation <i>Brian Norton, President, Dublin Institute of Technology, Ireland</i>

1100 – 1130 Coffee: Refectory Extension

### 1130 – 1300 Session 1

Time	Stream A: Carnegie Lecture Theatre	Stream B: Room A005	Stream C: Room M001	
	<b>T01 Solar Thermal 1 (Building Integration)</b>	<b>T09 Solar Materials 1</b>	<b>T06 Energy Efficient Buildings 1</b>	<b>Posters, Meetings, Workshops, etc.</b>
	<b>Chair:</b> Klaus Vajen, <i>Kassel University, Germany</i>	<b>Chair:</b> Arne Roos, <i>Uppsala University, Sweden</i>	<b>Chair:</b> Paul Kenny, <i>University College Dublin, Ireland</i>	
1130	Building integration of solar energy systems <b>Invited Keynote</b> <i>Anne Grete Hestnes, National Technical University, Norway</i>	Solar Energy Materials of the future: Electrochromic Foils for Energy Efficiency and Indoor Comfort <b>Invited Keynote</b> <i>C.G. Granqvist, The Angström Laboratory, University of Uppsala, Sweden</i>	Energy and Environmental Quality of the Built Environment in Europe <b>Invited Keynote</b> <i>M Santamouris, National Kapodistrian University of Athens, Greece</i>	1130 – 1300: ISES Council meeting 'Scientific and Technical Affairs'. Room M500
1200	A Comparison of EU Capital Cities for Suitability for Solar Space Heating <i>K. MacGregor, MacGregor Solar, Scotland, UK</i>	Polyurethane-based Thickness Insensitive Spectrally Selective Paints for Coloured Solar Absorbers <i>B. Orel, H. Spreizer, A. Šurca Vuk, M. Fir, D. Merlini, M. Vodlan, M. Köhl, National Institute of Chemistry, Slovenia, COLOR d.d., Slovenia, Fraunhofer-Institute for Solar Energy Systems ISE, Germany</i>	Analysis of Household Cogeneration <i>N. Varming and S. Svendsen, Technical University of Denmark, Denmark</i>	

**Tuesday 27 June**
**1130 – 1300 Session 1 (cont.)**

<b>Time</b>	<b>Stream A: Carnegie Lecture Theatre</b>	<b>Stream B: Room A005</b>	<b>Stream C: Room M001</b>	
1215	Solar energy utilisation with a PREFA aluminium roof <i>H. Schranzhofer, P. Puschnig, P. Tesch, W. Streicher, H. Neumüller, E. Kroisenbrunner, D. Lackinger, W. Pacher, Graz University of Technology, PREFA Aluminium Products GmbH, Austria</i>	Optical Properties of Ethylene Copolymer Films for Solar Energy Conversion <i>G.Oreski and G.M.Wallner, Polymer Competence Center Leoben GmbH, and the University of Leoben, Austria</i>	Condensation tests on glass samples for Energy Efficient Windows <i>A.Werner A. Roos, The Ångström Laboratory, Sweden</i>	
1230	Sunspace Augmented Positive Input Ventilation of Buildings <i>J.I.Currie, Napier University, Scotland, UK</i>	Sol-gel ink-jet printing of photocatalytic systems for hydrogen production <i>A.P. Finlayson, A. Ball and B.A. Glowacki, University of Cambridge, UK</i>	New building with heating, cooling and ventilation bioclimatic system for energy saving and environmental comfort <i>V. Calderaro, Università "La Sapienza" di Roma, Italy</i>	
1245	Monitoring of a roof integrated solar heating system without storage <i>M. Belusko and W. Saman, University of South Australia, Australia</i>	Sol-gel deposition of nanostructured low refractive index materials on solar collector glazing <i>A. Schüler, D. Dutta, H. Chelawat, E. De Chambrier, C. Roecker, J.-L. Scartezzini, Ecole Polytechnique Fédérale de Lausanne EPFL, Switzerland and the Indian Institute of Technology IIT, India</i>	A Simple Energy Rating for Solar Shading Devices <i>T.R. Nielsen, J.L.J. Rosenfeld and S. Svendsen, Technical University of Denmark, Denmark</i>	

1300 – 1415 Lunch: Refectory

1300 – 1430 ISES Council meeting 'Membership Affairs': Room M500

**Tuesday 27 June**
**1415 – 1545 Session 2**

Time	Stream A: Carnegie Lecture Theatre T01 Solar Thermal 2 (Systems 1)	Stream B: Room A005 T01 / T13: Markets, Policy and Education 1	Stream C: Room M001 T03: Solar Cooling 1	Posters, Meetings, Workshops, etc.
	<b>Chair:</b> Kerr MacGregor, SSEG, Scotland	<b>Chair:</b> Lucy Aitchison, Sustainable Energy Installations, UK	<b>Chair:</b> Chris Bales, SERC, Dalarna University College, Sweden	
1415	New CPC Type Solar Cooker to be Integrated in the Kitchen Wall <i>M.P. Collares Pereira and J. Almeida, Instituto Nacional de Engenharia, Tecnologia e Inovação (INETI), Portugal</i>	Energy Policy in Education <b>Invited Keynote</b> <i>J. Thorp, ecsc, UK</i>	Solar cooling and air conditioning – thermodynamic analysis and overview about technical solutions <b>Invited Keynote</b> <i>H-M. Henning, Fraunhofer Institute for Solar Energy Systems ISE, Germany</i>	1415 – 1545: Poster Session 1 <b>Chair:</b> Matt Strobel, Loughborough University, UK (see below for details of posters) Refectory Extension
1430	Optimized Integration of solar heat into industrial processes by using the "pinch analysis" <i>C. Brunner, H. Schnitzer, T. Müller, W. Weiss, B. Slawitsch, JOANNEUM RESEARCH, Graz Univ. of Technology, AEE INTEC, Austria</i>			1430 – 1600: ISES Council meeting 'Public Affairs' Room M500
1445	Design method for solar heating systems in combination with pellet boilers/stoves <i>F. Fiedler, C. Bales, T. Persson, A. Thür, Dalarna University College, Sweden and Technical University of Denmark, Denmark.</i>	Solar Energy Possibilities in Latvia <i>L. Gramkow, T. Esbensen, P. Shipkovs, G. Kashkarova, Esbensen Consulting Engineers, Denmark and Latvian Academy of Sciences, Latvia</i>	Simulation based design methods and economical analysis for solar driven absorption cooling systems <i>D. Pietruschka, U. Eicker, J. Schumacher, V. Hanby, University of Applied Sciences Stuttgart, Germany and De Montfort University, UK</i>	1415: Workshop 1: Integrated Energy Design <i>Maria Gaardsted, Torben Esbensen, Esbensen Consulting Engineers, Denmark</i> <i>Anne Grete Hestnes, Norwegian National Technical University, Norway</i> Room M228
1500	Metal Roofs as Unglazed Solar Collectors, Coupled with Heat Pump and Ground Storage: Gains from Condensation, Basics for System Concepts <i>W. Eisenmann, O. Müller, F. Pujiula, G. Zienterra, Institut für Solarenergieforschung Hameln (ISFH), and RHEINZINK GmbH &amp; Co., Germany</i>	Developments in the last 5 years and the influence of the UK Government Clear Skies initiative <i>A. Book, Riomay Ltd., UK</i>	Comparison of Solar Cooling Dimension Methods <i>L.A. Bujedo, J. Rodríguez and P.J. Martínez, Fundación CATIF and Universidad Miguel Hernández, Spain</i>	

Tuesday 27 June

1415 – 1545 Session 2 (cont.)

Time	Stream A: Carnegie Lecture Theatre	Stream B: Room A005	Stream C: Room M001	
1515	Analytic determination of the expanded uncertainty for steady state and quasi dynamic collector tests under outdoor conditions <i>M.G. Kratzenberg, H. G. Beyer, S. Colle, Federal University of Santa Catarina, Brazil, University of Applied Science Magdeburg, Germany</i>	Solnet - First Structured International PhD-courses on Solar Heating <i>U. Jordan, K. Vajen, Universität Kassel, Germany</i>	Passive Cooling Effect of Water Evaporation in Perspirable Building <i>Yukio Ishikawa, MIE University, Japan</i>	
1530	Performance and Modelling of a PV Driven Transpired Solar Air Heater <i>T Grassie, Napier University, Scotland, UK</i>	Direct/Indirect Solar and Other Renewable Resources in a Powerplay between Illusionists and Rationalists <i>C. D.A. Porteous, R. A. Menon, Mackintosh Environmental Architecture Research Unit, Glasgow School of Art, Scotland, UK</i>	Optimisation of a Regenerator for Open Cycle Liquid Desiccant Air Conditioning Systems <i>M. Krause, W. Saman, K.Vajen, University of South Australia, Australia and Universität Kassel, Germany</i>	

1545 – 1615 Tea: Refectory Extension

1615 – 1745 Session 3

Time	Stream A: Carnegie Lecture Theatre T01: Solar Thermal 3 (Storage 1)	Stream B: Room A005 T09 / T10 Solar Materials 2 / Photovoltaics	Stream C: Room M001 T02: Solar Power	Posters, Meetings, Workshops, etc.
	<b>Chair:</b> Jan-Olof Dalenbäck, <i>Chalmers University, Sweden</i>	<b>Chair:</b> Claes Granqvist, <i>Uppsala University, Sweden</i>	<b>Chair:</b> Manuel Collares-Pereira, <i>INETI, Portugal</i>	
1615	The new Central Solar Heating Plants with Seasonal Storage in Germany <i>D. Mangold T. Schmidt, Steinbeis Research Institute for Solar and Sustainable Thermal Energy Systems, Germany</i>	Crystalline Silicon: present status and future developments <b>Invited Keynote</b> <i>F. Ferrazza, EniTecnologie S.p.A., Italy</i>	The European INDITEP project – Component development for collector fields with direct steam generation in parabolic troughs <i>M. Eck, E. Zarza, H. Schmidt, M. Eickhoff, T. Hirsch, J. Leon, L. Valenzuela, German Aerospace Center (DLR), Stuttgart, Germany and Cimat, Plataforma Solar de Almería, Spain</i>	1615 – 1745: Poster Session 2 <b>Chair:</b> Serge Younes, <i>Napier University</i> (see below for details of posters) Refectory Extension
1630	Study of an innovative Built-in Storage (Integrated Collector Storage) Solar Water Heater for Scottish Weather Conditions <i>T. Grassie; H. Junaidi; T. Muneer; J. Currie; D. Henderson, Napier University, Scotland, UK</i>		Cost Analysis of Solar Chimney Power Plants <i>T.P. Fluri, J.P. Pretorius, C. Van Dyk, T.W. Von Backström, D.G. Kröger and G.P.A.G. Van Zijl, University of Stellenbosch, South Africa</i>	1600 - 1900: ISES Council meeting 'Industries': Room M500

**Tuesday 27 June**
**1615 – 1745 Session 3 (cont.)**

<b>Time</b>	<b>Stream A: Carnegie Lecture Theatre</b>	<b>Stream B: Room A005</b>	<b>Stream C: Room M001</b>	
1645	Experimental Analysis of the Inserting Obstacle in Mantled Hot Water Storage Tank on Thermal Stratification <i>N. Altuntop N. Kaptan, V. Özceyhan, Erciyes Üniversitesi and Istanbul Teknik Üniversitesi, Turkey</i>	Optically functional surfaces for solar applications <i>A. Gombert, Fraunhofer Institute for Solar Energy Systems ISE, Germany</i>	Lessons learned from the experimental operation of a 10 kW EuroDish unit <i>A. Ferriere, G. Flamant, J-M. Gineste, B.Gagnepain, W. Reinalter, P. Heller, T. Keck, W. Schiel, PROMES-CNRS, France, ADEME Centre de Valbonne, France, German Aerospace Center (DLR), Plataforma Solar de Almería, Spain, Schlaich Bergemann und Partner, Stuttgart, Germany</i>	
1700	An Effective Application of an Open Adsorption Process for Solar Thermal Heat Storage <i>H. Kerskes, K. Sommer, H. Müller-Steinhagen, Universität Stuttgart, Germany</i>	Device Design and Process Optimisation for LGBC Solar Cells for Use Between 50X and 100X Concentration <i>K.C. Heasman, A. Cole, S. Roberts, A. Mellor, S. Devenport, I. Baistow, A. Parsons and T.M. Bruton, PV Technology Centre, NaREC, UK</i>	Study on the integrated utilization of seawater by solar chimney <i>Yiping Wang, Zhenlei Fang, Li Zhu, Tianjin University, China</i>	
1715	Numerical study of the transient convection inside solar domestic hot water storage tanks <i>I. Rodríguez, A. Oliva and C.D. Pérez-Segarra, Universitat Politècnica de Catalunya, Spain</i>	Anti-reflection treatment of TSSS paints for thermal solar absorbers <i>M. Lundh, T. Blom and E. Wäckelgård, The Ångström Laboratory, University of Uppsala, Sweden</i>		
1730	Fabric inlet stratifiers for solar tanks with different volume flow rates <i>E. Andersen, S. Furbo, Technical University of Denmark, Denmark</i>	Aging behavior of polymeric materials for solar-thermal applications – Effect on ultimate mechanical properties <i>S. Kahlen, G.M. Wallner, M.G. Meir, J. Rekstad, Polymer Competence Center Leoben, Austria, University of Leoben, Austria, University of Oslo, Norway</i>		

**1900 - 2030 Lord Provosts's Civic Reception: Glasgow City Chambers, George Square**

**Tuesday 27 June**

**1415 – 1545 Poster Session 1: Refectory Extension**

**Chair:** Matt Strobel, *Loughborough University, UK*

P1.01	Aspects of solar collector integration into building façade <i>T. Matuska, B. Sourek, Czech Technical University</i>
P1.02	Design and Construction of a Sun tracker for Use in Low Cost Small Scale Multipurpose Thermal Solar Energy Concentrating Syste <i>B. C. Cuamba, Eduardo Mondlane University</i>
P1.03	Experimental Study on Desalination System with Small Capacity using ETSC <i>Jeongbae Kim, Eung Sang Youn, Moon Chang Joo, Hee Youl Kwak, Korea Institute of Energy Research</i>
P1.04	Unglazed Elastomer-Metal-Absorbers (EMA) as Solar-Roof Collectors - Measurements of the First Pilot System in Nordstem <i>Erik Bertram, Wolfgang Eisenmann (Institut für Solarenergieforschung Hameln)</i>
P1.05	The Influence of Collector Slope and Pipe Diameter on the Stagnation Behaviour of Solar Thermal Collectors <i>Maik Kirchner, Jörn Scheuren, Wolfgang Eisenmann (Institut für Solarenergieforschung Hameln)</i>
P1.06	The Effect of the Volume Flow rate on the Efficiency of a Solar Collector <i>Jianhua Fan, Simon Furbo (Technical University of Denmark)</i>
P1.07	Application of Linear Fresnel Glass Lenses and Reflecting Optical Raster Made of Glass – Model and Real Building Comparison <i>Borivoj Sourek (Czech Technical University)</i>
P1.08	Simulation Study of the Operation of Solar Thermal Systems Consisting of Uncovered Collectors and/or an Air-to-Water Heat Exchanger <i>Elimar Frank, Janybek Orozaliev, Klaus Vajen (Universität Kassel)</i>
P1.09	Experimental and Theoretical Investigation of Unglazed Transpired Air Collectors in a Multicomponent Solar Thermal System <i>Elimar Frank, Christian Budig, Klaus Vajen (Universität Kassel)</i>
P1.10	Study of diurnal production of distilled water by using solar irradiation distribution about solar noon <i>A. Madhlopa (Malawi Polytechnic)</i>
P1.11	Design and Fabrication of a Portable Fresnel Reflector <i>Lim Say Yong, Chris Bales (Dalarna University College)</i>
P1.12	The latest solar development in Latvia on solar combisystem: Overtaking the barriers <i>Claudio Rochas, Dagnija Blumberga (Riga Technical University)</i>
P1.13	Solar Schools Forum (SSF) in Romania <i>Laurentiu Fara, Silvian Fara (Romanian Solar Energy Society)</i>
P1.14	European Solar Engineering School ESES - Past and Future <i>Eva Lindberg, Mats Rönnelid, Chris Bales, Frank Fiedler (Dalarna University College)</i>
P1.15	Performance Analysis of Francis Hydraulic Turbine <i>Chul-Hyung Lee, Chul-Ho Kim, Wan-Soon Park (Korea Institute of Energy Research)</i>
P1.16	An Energy Acquiring Method for Power Generation Systems Integrated Parallel-Connected Compact Wind Power Generators and PV Generation Systems <i>Nobuyoshi Mutoh, Atushi Nagasawa, Koki Oda (Graduate School of Tokyo Metropolitan University)</i>
P1.17	Laboratory Experimental Evaluation of an Autonomous Low-Temperature Solar Rankine Cycle System for Reverse Osmosis Desalination <i>D. Manolakos, Agricultural University of Athens, Greece</i>
P1.18	A double tank integrated solar collectorstorage system: design and optimization <i>H. Kessentini, C. Bouden, Ecole Nationale d'Ingénieurs de Tunis, Tunisia</i>

**Tuesday 27 June**
**1615 – 1745 Poster Session 2: Refectory Extension**
**Chair: Serge Younes, Napier University**

P2.01	Design guidelines for solar assisted district heating systems with a solar fraction of 35% <i>S. Raab, W. Heidemann, H. Müller-Steinhagen (University of Stuttgart)</i>
P2.02	Validation of a solar energy system performance simulation model, with simultaneous measurements from systems with different azimuths <i>M.Collares Pereira, J.Farinha Mendes, J.Pedro Almeida, Ricardo Aguiar, Rui Rodrigues (INETI/DER)</i>
P2.03	A Study on the Design and Analysis of District Solar Heating and Cooling System <i>Nam-Choon Baek (Korea Institute of Energy Research)</i>
P2.04	Development of a compact Solar Combisystem <i>Alexander Thür, Simon Furbo (Technical University of Denmark) Frank Fiedler</i>
P2.05	Identification of real solar systems. Simulation parameters <i>Juan Rodríguez Santiago, Luis Ángel Bujedo Nieto (CARTIF) Pedro Juan Martínez Beltrán</i>
P2.06	Increasing the solar gain by heat-fed and hot water-fed clothes washer and washing machines <i>Tomas Persson, Mats Rönnelid (Solar Energy Research Center)</i>
P2.07	Solar Thermal Space Heating Combined With Swimming Pool Heating – A Promising Solution for Southern Europe Climates <i>M. J. Carvalho, AN. eves (INETI)</i>
P2.08	Control sensor problems in a full plate solar thermal collector system. Measurements, theory and possible solutions <i>Bengt Perers (Lund Institute of Technology)</i>
P2.09	Estimate of solar luminous efficacy under cloudless conditions using artificial neural networks <i>Gabriel López (University of Huelva) Christian A. Gueymard</i>
P2.10	Design of prismatic pane for daylight control applied to a museum <i>N. Aste, M. Brasca, F. Frontini (Politecnico di Milano)</i>
P2.11	SOLABS: Development of a Novel Solar Thermal Façade Cladding System <i>Maria Cristina Munari Probst, Christian Roecker (EPFL-ENAC-LESO_PB)</i>
P2.12	Solar Planning for Suburban Areas <i>Ž. Kristl, A. Krainer (University of Ljubljana)</i>
P2.13	Thermal Performances of Sunspaces in Italy <i>Giuseppe Oliveti, Marilena de Simone, Salvatore Ruffolo (University of Calabria)</i>
P2.14	Thermal Performance Assessment of 1 <sup>st</sup> Phase Zero Energy Solar House in Korea <i>Jongho Yoon, N.C. Baek, C.K. Yu (Hanbat National University)</i>
P2.15	Thermodynamic Behaviour of a Solar Block of Flats with a Greenhouse and Thermo-Accumulative Concrete <i>Jasmina Radosavljevic, Mihailo Đurđanovic (University of Nis), Ivan Mijailovic</i>
P2.16	Enabling designers to see solar energy problems within the urban design process <i>John Page (University of Sheffield)</i>
P2.17	Metal Solar Roof Collectors for Passive Cooling <i>D. Büttner (ZAE Bayern)</i>
P2.18	Use of vegetation to reduce overheating in singular and conventional buildings <i>M. Soria, Universitat Politècnica de Catalunya, Spain</i>
P2.19	The natural ventilation for the improvement of the environmental comfort in the urban planning <i>V. Calderaro, Università "La Sapienza" di Roma, Italy</i>
P2.20	Potential of Process Integration in four Industrial Companies in Germany <i>U. Jordan, K. Vajen, B. Schmitt, P. Bruchhäuser, Kassel University, Germany</i>
P2.21	Numerical simulation of wind environment in urban residential district <i>Yiping Wang, Zhenlei Fang, Li Zhu, Tianjin University, China</i>
P2.22	Sustainable Housing Standards: use of simulation in design. <i>Tuohy Paul G, Clarke Joe A, Johnstone C, University of Strathclyde, Scotland</i>

**Wednesday 28 June**
**0900 Plenary 2**

Carnegie Lecture Theatre (C001)

 Chair: Colin Porteous, *Glasgow School of Art, Scotland*

0900	Solar energy training and education <i>Torben Esbensen, Esbensen Consulting Engineers, Denmark</i>
0935	Architectural Design and Sustainability from the viewpoint of an architect, <i>Alexandros Tombazis, Alexandros N. Tombazis and Associates, Greece</i>
1010	International energy scenarios: a key driver for new policies to accelerate renewable markets <i>Roberto Vigotti, Chair International Energy Agency Renewable Energy Working Party, ISES Board Member, Italy</i>
1050	Presentation of prizes for the Solar Schools Forum competition

1100 – 1130 Coffee: Refectory Extension

**1130 – 1300 Session 1**

Time	Stream A: Carnegie Lecture Theatre	Stream B: Room A005	Stream C: Room M001	
	<b>T01: Solar Thermal 4 (Collectors 1)</b>	<b>T10: Photovoltaics 1</b>	<b>T11: Meteorology</b>	<b>Posters, Meetings, Workshops, etc.</b>
	<b>Chair:</b> Wasim Saman, <i>University of South Australia, Australia.</i>	<b>Chair:</b> Francesca Ferrazza, <i>EniTecnologie S.p.A., Italy</i>	<b>Chair:</b> Tom Grassie, <i>Napier University, Scotland</i>	
1130	Experimental study of the influence of collector height and aspect ratio on the steady state performance of a passive solar air heater <b>Invited Keynote</b> <i>S. Burek, D. Ryan, Glasgow Caledonian University, Scotland</i>	Photovoltaic systems - key issues for development <b>Invited Keynote</b> <i>Nicola Pearsall, University of Northumbria, UK</i>	Climate challenges linked to our expanding solar industries <b>Invited Keynote</b> <i>J. Page, University of Sheffield, UK</i>	
1200	Comparison and Assessment of Numerical Models for Uncovered Collectors <i>E. Frank, K. Vajen, Universität Kassel, Germany</i>	Indoor and Outdoor Testing for a Hydrogen Generator PV System Based on Innovative PV Modules <i>C. Cancro, G. Flaminio, G. Graditi, M. Pellegrino, C. Privato, ENEA - Ente per le Nuove Tecnologie, l'Energia e l'Ambiente, Italy</i>	Models of the diffuse solar fraction <i>J. Boland B. Ridle, University of South Australia, Australia</i>	



**Wednesday 28 June**
**1130 – 1300 Session 1 (cont.)**

<b>Time</b>	<b>Stream A: Carnegie Lecture Theatre</b>	<b>Stream B: Room A005</b>	<b>Stream C: Room M001</b>	
1215	Heating with an Air Conditioner together with a Floor Heating System <i>Sadasuke Ito, Hiroyuki Tsukada, Naokatsu Miura, Kanagawa Institute of Technology, Japan</i>	A techno-economic experimental investigation of a direct coupled photovoltaic sea water reverse osmosis desalination system <i>Essam Sh. Mohamed, G. Papadakis, E. Mathioulakis, V. Belessiotis, Agricultural University of Athens and National Center for Scientific Research "Demokritos", Greece</i>	Normalization of the Solar Radiation Data obtained from Images of Geostationary Satellites for a Medium Geographical Region, with Data measured in a Single Solar Earth Station. - Case of Galicia (Spain) <i>J. M. Santos and M. Vázquez, University of Vigo, Spain</i>	
1230	A New Design-Wall Integrated Solar Water Collector <i>Li Zhu, Yong Cui, Yiping Wang, Tianjin University, China</i>	The building integration of photovoltaics: a methodological approach for controlling innovation in external envelopes <i>F. Iannone, Politecnico di Bari, Italy</i>	Improvements in broadband all-sky solar irradiance modelling based on cloud cover information: A case study for the UK <i>S. Younes, T. Muneer, Napier University, Scotland, UK</i>	
1245	Detailed Model for the Virtual Prototyping of Flat Plate Solar Thermal Devices <i>J. Cadafalch, R. Cónsul, A. Oliva, Universitat Politècnica de Catalunya, Spain</i>	PV Perception, lessons learnt for the future: Developer views on grid connected domestic PV systems in the UK <i>M. Munzinger, Building Research Establishment, UK</i>		

1200 – 1400 Solar Car Race (Schools' Event) – in front of the Saltire Centre

Schools taking part include:

Hillhead High School (Glasgow)  
 The High School of Glasgow  
 Lochend Community School (Glasgow)  
 Springburn Academy (Glasgow)  
 Bo'ness Academy  
 Balfron High School

1300 – 1415 Lunch: Refectory

1300 – 1415 ISES AGM: Room M228

**Wednesday 28 June**

1415 – 1545      Session 2

Time	Stream A: Carnegie Lecture Theatre T01: Solar Thermal 5 (Systems 2)	Stream B: Room A005 T01 / T13: Markets, Policy and Education 2	Stream C: Room M001 T04 / T06: Solar Architecture / Daylighting 1	Posters, Meetings, Workshops, etc.
	Chair: Philip Eames, <i>University of Ulster, UK</i>	Chair: Wolfgang Eisenmann, <i>Institut für Solarenergieforschung Hameln (ISFH), Germany</i>	Chair: John Gilbert, <i>John Gilbert Architects, Scotland</i>	
1415	Preheating for a District Heating Net with a Multicomponent Solar Thermal System <i>E. Frank, K. Vajen, A. Obozov, V. Borodin, Universität Kassel, Germany and Kyrgyz Technical University, Kyrgyzstan</i>	Training and Guidance Material in Renewable Energy and Energy Efficiency for SMEs and LAs <b>Invited Keynote</b> <i>L. Fara, J. Hopwood, G. Spinks, A. Rennie, A. Karner, M. Timmer, S. Scarpellini, S. Fara, National Agency for Renewable Energy (NARE), Romania, The Institution of Mechanical Engineers, UK, Multimedia Design Studio Ltd. UK, KWI Management Consultants GmbH, Austria, EUFORES, Belgium, CIRCE, Spain, Institute of Design and Automation, Romania</i>	Passive and Low Energy Houses in Europe <b>Invited Keynote</b> <i>Signe Antvorskov, Esbensen Consulting Engineers, Denmark</i>	1415 – 1545: Poster Session 3: <b>Chair:</b> Dylan Ryan, <i>Glasgow Caledonian University, Scotland</i> (see below for details of posters) Refectory Extension
1430	Comparison of different hydraulic small-scale absorber configurations <i>T. Matuska, Czech Technical University, Czech Republic</i>			1430 Workshop 2: Solar Schools' Forum. <i>Chris Jardine, Oxford University, UK</i> Room M228
1445	Integration of Solar Thermal in Natural Gas Fuelled CHP-plants. Connected to District Heating <i>P.A. Sørensen, L. Holm, N. Aage Jensen, P. Kristensen, PlanEnergi, Marstal Fjernvarme and Brædstrup Totalenergianlæg A/S, Denmark</i>	Energy Solutions for 60% Carbon Reduction <i>G. Taylor, G T Systems, UK</i>	Influence of the Performance of Antireflective Coatings in Electrochromic Windows <i>A. Jonsson, A. Roos, University of Uppsala, Sweden</i>	
1500	Optical Study of Double Tank ICS Solar Systems <i>M. Souliotis, Y. Tripanagnostopoulos, University of Patras, Greece</i>	Carbon and Energy Performance of Housing: A model and toolset for policy development applied to a local authority housing stock <i>P.G. Tuohy, P. Strachan, A. Marnie, University of Strathclyde, South Ayrshire Council, Scotland, UK</i>	Whole-Sky Luminance Distribution Maps from Calibrated Digital Photography <i>P. Kenny, J. Olley, J.O. Lewis, University College Dublin, Ireland</i>	

**Wednesday 28 June**
**1415 – 1545 Session 2 (cont.)**

Time	Stream A: Carnegie Lecture Theatre	Stream B: Room A005	Stream C: Room M001	
1515	Quality assurance of solar thermal systems with the ISFH-Input/Output-Procedure <i>P. Paerisch, K. Vanoli, Institut fuer Solarenergieforschung Hameln (ISFH), Germany</i>	The future is now: Demonstrating sustainability principles in practice linking local consumer education and the UN Decade of Education for Sustainable Development <i>H. Storey, Hornsby Shire Council, New South Wales, Australia</i>	Evaluation of the Daylight Performance of Advanced Optical Light Pipes Using an Innovative Experimental Setup <i>B.G. Martins-Mogo, L.O. Beltrán, Texas A&amp;M University, U.S.A.</i>	
1530	Modelling of Solar Thermal Systems (Factory Made Systems) and identification of the characteristic parameters for LTPP <i>A. Neves, M. J. Carvalho, INETI – Department of Renewable Energies, Portugal</i>	Nordic Energy Research Cooperation on Solar Combisystems <i>S. Furbo, A. Thür, F. Fiedler, C. Bales, J. Rekstad, M. Meir, D. Blumberga, C. Rochas, B. Karlsson, Technical University of Denmark, Dalarna University College, Sweden, University of Oslo, Norway, Riga Technical University, Latvia, Lund Institute of Technology, Sweden</i>	Asymmetrical awnings – a way to increase daylight in buildings without increasing the overheating <i>M. Rönnelid, C. Sondereen, Solar Energy Research Center, Borlänge, Sweden</i>	

1545 – 1615 Tea: Refectory Extension

**1615 – 1745 Session 3**

Time	Stream A: Carnegie Lecture Theatre	Stream B: Room A005	Stream C: Room M001	
	<b>T01: Solar Thermal 6 (Collectors 2)</b>	<b>(No Session)</b>	<b>T06: Energy Efficient Buildings 2</b>	<b>Posters, Meetings, Workshops, etc.</b>
	<b>Chair:</b> Steve Harrison, <i>Queens University, Canada</i>		<b>Chair:</b> Mattheos Santamouris, <i>University of Athens, Greece</i>	
1615	Reduction of Stagnation Load of Large-Scale Collector Arrays <i>J. Scheuren, M. Kirchner, W. Eisenmann, Institut fuer Solarenergieforschung Hameln (ISFH), Germany</i>		Thermally Activated Building Systems Using Phase-Change-Materials <i>D. Kalz, J. Pfafferoth, P. Schossig, S. Herkel, Fraunhofer Institute for Solar Energy Systems, Germany</i>	1615 – 1745: Poster Session 4: <b>Chair:</b> Paul Tuohy, <i>Strathclyde University, Scotland, UK</i> (see below for details of posters) Refectory Extension
1630	Hydraulic design of a collector loop including overheat protection by partial evaporation <i>B. Perers, Lund Institute of Technology, Sweden</i>		Fuzzy Control Approaches for Regulating Thermal and Optical Flows <i>M. Košir, Ž. Kristl, A. Krainer, University of Ljubljana, Slovenia</i>	

**Wednesday 28 June**
**1615 – 1745 Session 3 (cont.)**

<b>Time</b>	<b>Stream A: Carnegie Lecture Theatre</b>	<b>Stream B: Room A005</b>	<b>Stream C: Room M001</b>	
1645	A New Sky and Sun Compact Simulator <i>G.M. Podestà, M. Prati, Beta Nit srl, Italy</i>		Analysis of transient effects on the performance of advanced double and single skin facades including transparent insulation. Numerical study and experimental validation <i>D. Faggembauu, A. Oliva, M. Soria, Universitat Politècnica de Catalunya, Spain</i>	
1700	Evaluation of the Test Method for Efficiency for Flat Plate Solar Collectors <i>Jianhua Fan, S. Furbo, Technical University of Denmark, Denmark</i>		Energy retrofitting of old test hall as part of the EU project BRITA in PuBs <i>Ove C. Morck, Cenergia Energy Consultants, Denmark</i>	
1715	Real-time Efficiency and Thermal Yield Calculations for Solar Thermal Collectors using a Simplified Quasi-Dynamic Model <i>T.P. Williamson, J. McMullan, B. Bauer and R. Willis, Thermomax Ltd., Bangor, UK</i>		A Low Energy Consumption Building Using Material-type Solar Roofing <i>Zhu Li, Ren Jianbo, Wang Yiping, Tianjin University, China</i>	
1730	Transient Performance of a Solar Collector <i>D. Ryan, S. Burek, Glasgow Caledonian University, Scotland, UK</i>		Development and performance of cool colored coatings <i>A. Synnefa, M. Santamouris, National and Kapodistrian University of Athens, Greece</i>	

1730 – 1830 Young ISES meeting: Room M500

**1930 Conference Dinner: People's Palace, Glasgow Green**  
 After-dinner guest speaker: **Magnus Magnusson KBE**

**Wednesday 28 June**
**1415 – 1545 Poster Session 3: Refectory Extension**

 Chair: Dylan Ryan, *Glasgow Caledonian University, Scotland.*

P3.01	Solar-Hydrogen for Efficient, Continuous and Economic Power Generation <i>M.V. Bhaskara Rao, M. Pavan Kishore (Sir M. Visvesvaraya Institute of Technology)</i>
P3.02	New real-time high-accuracy tracking heliostat system for solar concentration applications <i>J. Giral (PROMES-CNRS)</i>
P3.03	Solar Air Conditioning goes mainstream-Experiences of Design, Installation and Operation of several plants world-wide <i>C. Holter, S.O.L.I.D., Austria</i>
P3.04	Evaluation and performance study of solar-powered triple-fluid Einstein refrigeration cycle <i>A. M. Qenawy, A. F. El-Dib, M. M. Ghoraba (Cairo University)</i>
P3.05	Performance of a concentrating pv-thermal system for domestic heating and cooling <i>Daniel Chemisana, Joan Ignasi Rosell, Manuel Ibáñez (University of Lleida)</i>
P3.06	Thermal Energy and Electrical Power from the Sun: the Multifunctional Roof of Casargo, Italy <i>N. Aste, G. Chiesa, L. Tagliabue (Politecnico di Milano)</i>
P3.07	Solar Powered Intelligent Air Conditioning System <i>Teo Lee Na, Balbir Singh Mahinder Singh (Universiti Teknologi PETRONAS)</i>
P3.08	Demonstration study of solar absorption cooling system with evacuated tubular solar collectors in Korea <i>Hee-Youl Kwak (Korea Institute of Energy Research), Chang-Yong Choi</i>
P3.09	Performance Simulation of a Solar Thermal Driven Air Conditioning System with the Evacuated Tubular Solar Collectors <i>Chang-Yong Choi (Jeonju University) Hee-Youl Kwak, U-Cheul Shin</i>
P3.10	A novel dynamic simulation model for absorption chillers in solar cooling systems <i>Paul Kohlenbach (CSIRO Division of Energy Technology)</i>
P3.11	Comparative numerical study of small scale solar assisted heating and cooling systems <i>Claudio Ginocchietti, Mario Motta, Michele Liziero (Politecnico di Milano)</i>
P3.12	Performance Analysis on R236 <sub>fa</sub> heat pump chiller <i>N.Shanmuga Priya (Siddaganga Institute of Technology)</i>
P3.13	Study of a novel heat recovery ventilator(HRV) <i>Yiping Wang, Yanhua Lu, Li Zhu (Tianjin University)</i>
P3.14	Environmentally Friendly and Rational Use of Energy with Heat Pumps <i>Ferenc Komlós (Building Engineer)</i>
P3.15	Weathering of Commercial Ethylene Copolymer Films - Spectroscopical Analysis of Aging Behaviour and Additive Diffusion <i>G. Oreski, G. M. Wallner (Polymer Competence Center Leoben GmbH), R. Eder, R. Krasser-Lamik</i>
P3.16	Accelerated ageing tests of optimized solution chemically derived selective solar thermal absorbers <i>T. Boström, E. Wäckelgård, G. Westin (Uppsala University)</i>
P3.17	Comparison of the optimized and experimental data for epitaxial Si solar cells <i>A. Giannakopoulos, V. Perraki (University of Patras)</i>
P3.18	Deposition of microcrystalline silicon films at over 16Å/s using VHF-PECVD <i>Guo Qunchao, Wei Changchun, Zhang Xiaodan, Zhao Ying, Geng Xinhua (Nankai University), Liu Guobiao</i>
P3.19	Solar Energy Storage and Use for Preheater for Domestic Hot Water Supply and Heat Pump System <i>G. Bajnóczy, A. Lovász, E. Gagyi-Pálffy, E. Prépostffy (Technical University of Budapest)</i>
P3.20	Assessment of daily solar irradiation in Brazilian semi arid localities by means of neural networks <i>Adalberto S. Nunes, Chigueru Tiba, Hansenclever de F. Bassini (Universidade Federal de Pernambuco)</i>
P3.21	Daylight availability for the Northeast of Brasil <i>Chigueru Tiba, Sergio da S A Leal, Elielza M S Barbosa, Rinaldo Mello (Universidade Federal de Pernambuco)</i>

**Wednesday 28 June**
**1415 – 1545 Poster Session 3 (cont.): Refectory Extension**

P3.22	Monthly and Yearly Maps of Daily Average Global Solar Radiation of Galicia (Spain), obtained from the Heliosat-II Method and Meteosat Images <i>M. Vazquez, M. T. Prado, J. M. Santos, D. Vazquez (University of Vigo)</i>
P3.23	Research and supply of wind and solar energy information in Hungary <i>Ildiko Dobi, Szabolcs Bella, Balint Varga, Ferenc Wantuch (Hungarian Meteorological Service)</i>
P3.24	Alternative methods for clear-sky conditions identification for solar irradiance modelling and their effect on the validation of models <i>S. Younes, T. Muneer (Napier University)</i>
P3.25	Optimum collector arrangement for solar domestic hot water heating systems <i>Hyunwoo Roh, Mitsuhiro Udagawa (Kogakuin University)</i>
P3.26	Optimum collector arrangement for solar space and hot water heating systems <i>Tadashi Aoki, Mitsuhiro Udagawa, Hyunwoo Roh (Kogakuin University)</i>

**1615 – 1745 Poster Session 4 Refectory Extension**
**Chair:** Paul Touhy, *Strathclyde University, Scotland, UK*

P4.01	Modelling of thermal stratification in a solar storage tank <i>P. Géczy-Vig, I. Farkas (Szent István University)</i>
P4.02	Practical design considerations for soil solarization: estimation of monthly accumulated hours of soil temperature <i>Chigueru Tiba, Rachel Ghini (Universidade Federal de Pernambuco)</i>
P4.03	Soil/Water Pit Heat Store with Direct Charging System <i>F. Ochs, W. Heidemann (Institute of Thermodynamics and Thermal Engineering), H. Müller-Steinhagen, H. Koch</i>
P4.04	Design and optimisation of hybrid latent/sensible storage devices for combined thermal solar energy applications ("HYDRA", CRAFT-1999-72475). <i>R. Cònsul, J. Cadafalch, A. Oliva (Universitat Politècnica de Catalunya)</i>
P4.05	Numerical Analysis of The Effects of Using Two Different Obstacles Inside the Solar Powered Hot Water Storage Tank On Thermal Stratification <i>Veysel Özceyhan (Erciyes Üniversitesi Mühendislik Fakültesi), Necmi Kaptan, Mevlüt Arslan, Necdet Altıntop</i>
P4.06	Testing of solar hot water stores by means of up- and down-scaling algorithms <i>H. Drück, S. Bachmann, H. Müller-Steinhagen (University of Stuttgart)</i>
P4.07	Operation of a Hybrid Solar Aeolic System in the São Francisco River Region – Northeast of Brasil <i>Elieza Moura de Souza Barbosa (Federal University of Pernambuco)</i>
P4.08	Thermal performance of an evacuated pv-thermal collector <i>Daniel Chemisana, Joan Ignasi Rosell, Manuel Ibáñez (University of Lleida)</i>
P4.09	Development of a 10 kWp photovoltaic system – installation and operational results <i>I. Seres, I. Farkas, J. Buzás (Szent István University), L. Kocsis</i>
P4.10	A PV Generation System Combined an Electric Double Layer Capacitor (EDLC) Controller with a High Speed MPPT Controller <i>Nobuyoshi Mutoh, Koki Oda, Masahiro Ohno (Graduate School of Tokyo Metropolitan University)</i>
P4.11	Hybrid Solar Collector – Experiences from Experiments in Germany <i>Niels Varming, Jørgen M. Schultz (Technical University of Denmark)</i>
P4.12	Antireflection treatment of glass covers for PV modules – what is gained? <i>Daniel Trier, Fredrik Nors, Ulrik Vølcker Andersen, Simon Furbo (Technical University of Denmark)</i>
P4.13	A PV-Clad Duct to Preheat Supply Air and Power Fans in a Mechanical Ventilation System <i>C.D.A. Porteous, T. R. Sharpe and R. A. Menon (Glasgow School of Art)</i>

## Wednesday 28 June

### 1615 – 1745 Poster Session 4 (cont) Refectory Extension

P4.14	Two-axis sun tracking system: design and simulation <i>S. Gagliano, N. Savalli, G. Tina, N. Pitrone (University of Catania)</i>
P4.15	Summary of PV Domestic Field Trial results and lessons learnt <i>Monika Munzinger, Frances Crick, (BRE) Nicola Pearsall, Chris Martin</i>
P4.16	Large Area LBIC Measurement System for Thin Film Photovoltaic Modules <i>P. Vorasayan, M. Bliss, T.R. Betts, R. Gottschalg, A.N. Tiwari (Loughborough University)</i>
P4.17	Two-positional exposure of solar collectors <i>Teolan Tomson (tallinn University of Technology)</i>
P4.18	Effect of Incidence Angle on PV Module Performance in Temperate Maritime Climate at High Latitude <i>S.R. Williams R. Gottschalg, D.G. Infield (Loughborough University)</i>
P4.19	Autonomous Desalination System Concepts for Sea Water and Brackish Water in Rural Areas with Renewable Energies – Potentials, Technologies, Field Experience, Socio-Technical and Socio-Economic Impacts <i>George Papadakis (Agricultural University of Athens)</i>
P4.20	N <sup>+</sup> /n Type Emitter Self-formation in Deep Grooves for Vertical Walls Solar Cell <i>Vida Janušonienė, Liudas Leonas, Tomas Brastavičius (Institute of Lithuanian Scientific Society)</i>
P4.21	Photovoltaic and Thermal Collector (PV/T) Hybrid System's Performance Optimization <i>D. Engin, M. Çolak (Ege University Solar Energy Institute)</i>
P4.22	Performance of a Building Integrating Hybrid Solar Façade <i>F. Butera, R.S. Adhikari, N. Aste (Politecnico di Milano)</i>
P4.23	Mechanically Ventilated Building Integrated PV Façade – Large scale Experiment and Numerical Modeling <i>K. Staněk, Czech Technical University in Prague, Czech Republic</i>
P4.24	Performance Analysis of De-central Water and Power Production by BWRO Integrating PV Solar Energy <i>Kamal Mohammedi (University M Bougara) Jürgen Rheinländer, Abdelkrim Sadi, Idir Belaidi</i>
P4.25	A strategic Study of Energy Efficient and Hybrid Energy System Options for a Multi-family building in Korea <i>Jae-Min Kim, University of Strathclyde</i>
P4.26	Solar Education in Europe – Solar Schools Forum Examples and experiences from 10 countries <i>R. Behringer, ISES, Freiburg, Germany</i>

### 1930 Conference Dinner: People's Palace, Glasgow Green

Guest after-dinner speaker: **Magnus Magnusson KBE**

**Thursday 29 June**
**0900 Plenary 3**

Carnegie Lecture Theatre (C001)

**Chair:** Jean Rosenfeld, *UK-ISES*

0900	The role of solar heating in the European heat demand <i>Lex Bosselaar, SenterNovem, The Netherlands</i>
0940	Implementation of Renewables at the Local Level <i>Ray Morgan, Thameswey, UK</i>
1020	Solar Energy in Developing Economies <i>Bernard McNelis, IT Power, UK</i>

1100 – 1130 Coffee: Refectory Extension

**1130 – 1300 Session 1**

Time	Stream A: Carnegie Lecture Theatre	Stream B: Room A005	Stream C: Room M001	
	<b>T01: Solar Thermal 7 (Storage 2)</b>	<b>T14: Education 1</b>	<b>T05 / T06: Solar Architecture / Daylighting 2</b>	<b>Posters, Meetings, Workshops, etc.</b>
	<b>Chair:</b> Lex Bosselaar, <i>Senter Novem, The Netherlands</i>	<b>Chair:</b> Despina Serghides, <i>ISES-Europe Chair, Cyprus</i>	<b>Chair:</b> Mike Wilson, <i>London Metropolitan University, UK</i>	
1130	Predicted Charging Efficiency of Paraffin Wax based Latent Heat Energy storage Systems Utilizing Selected Fin Arrangements <b>Invited Keynote</b>	Activities of solar schools in Hungary <i>I. Farkas, P. Géczy-Víg, Szent István University, Hungary</i>	Solar Energy in Architecture <b>Invited Keynote</b> <i>Tjerk Reijenga, BEAR Architects, The Netherlands</i>	1130: Workshop 3: Solar Makes Business. David Pitcher, <i>ecsc</i> Room M228
1145	<i>P.C. Eames, University of Ulster, UK</i>	New Committee of University Teachers Active in Renewable Energies <i>K. Vajen, F. Sick, V. Wesselack, Universität Kassel, FHTW Berlin, Fachhochschule Nordhausen, Germany</i>		



**Thursday 29 June**
**1130 – 1300 Session 1 (cont.)**

<b>Time</b>	<b>Stream A: Carnegie Lecture Theatre</b>	<b>Stream B: Room A005</b>	<b>Stream C: Room M001</b>
1200	Dimensionless parameters used to characterize water tank stratification <i>A. Castell, C. Solé, M. Medrano, C. Castellón, L.F. Cabeza, University of Lleida, Spain</i>	Designing multi-level RE education and awareness programs: Results from putting a generic methodology into practice <i>W. Miller, Queensland Sustainable Energy Industry Development Group, Australia</i>	Innovative technologies for the control of solar radiation in Mediterranean Areas: Analysis of solutions for transparent envelopes <i>F. Fiorito, Politecnico di Bari, Italy</i>
1215	Effective Thermal Conductivity of the Insulation of Buried Heat Stores During Operation <i>F. Ochs, W. Heidemann, H. Müller-Steinhagen, University of Stuttgart, DLR Stuttgart, Germany</i>	Sun Shines on Sustainable Engineering <i>D. Garlovsky, Schools &amp; Homes Energy Education Project, UK</i>	Evaluation of single and double glazed façades in a temperate climate <i>I.C. Ward, H. Altan, J. Mohelnikova, D. Plsek, University of Sheffield, UK, Brno University of Technology, Czech Republic</i>
1230	Simulation and Testing of Stratified Multi-Tank, Thermal Storages for Solar Heating Systems <i>C. A. Cruickshank, S. J. Harrison, Queen's University, Ontario, Canada</i>	Bringing Solar Heating Down To Earth <i>K. MacGregor, Scottish Solar Energy Group, Scotland, UK</i>	Monitoring Results and Overall Evaluation of a Multifunctional, Transparent, Coloured PV-Façade for the Energetic Rehabilitation of an Office Building in Barcelona <i>T. Masseck, Universitat Politècnica de Catalunya, Spain</i>
1245	Heat of Fusion Storage with High Solar Fraction for Solar Low Energy Buildings <i>J.M. Schultz, S. Furbo, Technical University of Denmark, Denmark</i>	SolarSchoolsForum Activities in Germany <i>S. Jannsen, Deutsche Gesellschaft für Sonnenenergie, Germany</i>	Analytical Study on Passive Stack Ventilation in a School Building <i>F. Butera, R.S. Adhikari, N. Aste, M. Buzzetti, Politecnico di Milano, Italy</i>

1300 – 1415 Lunch: Refectory

1300 – 1430 ISES Sections Forum: Room M500

**Thursday 29 June**
**1415 – 1545 Session 2**

Time	Stream A: Carnegie Lecture Theatre	Stream B: Room A005	Stream C: Room M001	
	<b>T01: Solar Thermal 8 (Systems 3)</b>	<b>T10: Photovoltaics 2</b>	<b>T03: Solar Cooling 2</b>	
	<b>Chair:</b> Tomas Matuska, <i>Czech Technical University, Czech Republic</i>	<b>Chair:</b> Nicola Pearsall, <i>Northumbria University, UK</i>	<b>Chair:</b> Hans-Martin Henning, <i>Fraunhofer Institute for Solar Energy Systems, Germany</i>	
1415	Investigations of medium sized solar combi systems <i>E. Andersen, S. Furbo, Technical University of Denmark, Denmark</i>	Remote performance check and automated failure identification for grid-connected PV systems – results and experiences from the test phase within the PVSAT-2 project <i>A. Drews, E. Lorenz, J. Betcke, A.C. de Keizer, W.G.J.H.M. van Sark, H.G. Beyer, W. Heydenreich, E. Wiemken, S. Stettler, P. Toggweiler, S. Bofinger, M. Schneider, G. Heilscher, D. Heinemann, Oldenburg University, Germany, Utrecht University, The Netherlands, University of Applied Sciences Magdeburg-Stendal (FH), Germany, Fraunhofer Institute for Solar Energy Systems, Germany, Enecolo AG, Switzerland, Meteocontrol GmbH, Germany</i>	Solar cooling systems: energetic performances and market perspectives in Italy <i>M. Liziero, M. Motta, C. Ginocchetti, Politecnico di Milano, Italy</i>	
1430	A Dynamic Collector Model for Simulation of the operation below the dewpoint in Heat Pump Systems <i>B. Perers, Lund Institute of Technology, Sweden</i>	The Performance of Domestic PV Systems in the UK – Results from the Domestic Field Trial <i>N.M. Pearsall, K.M. Hynes, M. Munzinger, F. J. Crick, C. Martin, Northumbria University, UK, Building Research Establishment, Garston, UK, EMC, Newport Pagnell, UK</i>	Phase Change Slurries as heat storage material for cooling applications <i>S. Gschwander, P. Schossig, Fraunhofer Institute für Solare Energiesysteme, Germany</i>	
1445	Optimisation of large scale solar thermal combisystems in theory and practice <i>A. Schenke, H. Drück, H. Müller-Steinhagen, Solar- und Wärmetechnik Stuttgart (SWT), University of Stuttgart, Germany</i>	BIPV System Performance under the Microscope: Analysis of High-Resolution Data <i>A. Driesse, S. Harrison, Queen's University, Ontario, Canada</i>	Experimental and Numerical Analysis of Non-Isothermal Flat-Plate Liquid-Desiccant Regenerators <i>L. C.S. Mesquita, S.J. Harrison, Queen's University, Ontario, Canada</i>	
1500	Performance assessment of a final solar dryer prototype for salt recovery from brine effluent of a desalination MED plant <i>M. Collares-Pereira, J. Farinha Mendes, P. Horta, INETI-Instituto Nacional de Tecnologia e Engenharia Industrial, Portugal</i>	Reducing the installed cost of PV systems: A UK installers' experience <i>L. A. Aitchison, P. Reed, Sustainable Energy Installations, UK</i>	Development of a Latent Heat Storage for a Solar Heating and Cooling System <i>H. Mehling, S. Hiebler, C. Schweigler, C. Keil, Bavarian Center of Applied Energy Research (ZAE Bayern), Germany</i>	

**Thursday 29 June**

**1415 – 1545 Session 2 (cont.)**

<b>Time</b>	<b>Stream A: Carnegie Lecture Theatre</b>	<b>Stream B: Room A005</b>	<b>Stream C: Room M001</b>
1515	Experiences from a Greek Solar Combisystem <i>N. Taoussanidis, Technological Education Institute of West Macedonia, Greece</i>	PV Integration in Shelters for Bicycles: Dissemination and Energy Policies in Italy <i>N. Aste, R.S. Adhikari, L.C. Tagliabue, Politecnico di Milano, Italy</i>	Construction of a pre-industrial prototype of an air-cooled H <sub>2</sub> O-LiBr absorption chiller for solar cooling applications <i>J. Castro, A. Oliva, C. Oliet, C. D. Pérez-Segarra, Universitat Politècnica de Catalunya, Spain</i>
1530	ICS solar water heater study using artificial neural networks <i>S. Kalogirou, M. Souliotis, Y. Tripanagnostopoulos, University of Patras, Greece</i>	Life cycle assessment of a medium sized PV facility in Edinburgh <i>T. Muneer, S. Younes, J. Kubie, Napier University</i>	Solar Cooling and Storage with the Thermo-Chemical Accumulator <i>C.M. Bales, Dalarna University College, Borlänge, Sweden</i>

1545 – 1615 Tea: Refectory Extension

**16.15 Closing Plenary**  
 Carnegie Lecture Theatre (C001)  
**Chair:** John Thorp, ecsc

Nicola Pearsall, *Chair of Scientific/Technical Committee:*  
 Presentation of prizes for best paper and best poster.

Closing addresses:  
 Despina Serghides, *President of ISES-Europe: on behalf of ISES-Europe*  
 Christine Horstein, *ISES Executive Director: future ISES activities and conferences.*

### REMINDER

**Please remember to return your conference badges so that they can be recycled.  
 There is a collection point at the registration desk.  
 Thank you.**

## **Friday 29 June**

**0900 – 1700 Technical Tours: depart from Cowcaddens Road, outside the University**

- Tour 1: Wind theme
- Tour 2: Wave theme
- Tour 3: Solar theme
- Tour 4: Whisky theme
- Tour 5: ½ day tour

## **Saturday 1 July**

**0900 – 1300 Solar Energy Master Class: Room M228**

## Accompanying Persons' Programme

### Tuesday 27 June

#### 0900 – 1700 Open-top Bus Tour of Glasgow

Open top buses depart from George Square. Tickets are valid for the whole day, and ticket-holders can get off the bus at any place on the tour to visit places of particular interest, for example, the Cathedral, museums, art galleries and shopping centres. They can continue the tour simply by getting on the next bus as it comes along!

### Wednesday 28 June

#### 0930 – 1730 Edinburgh Tour: departs from Cowcaddens Road, outside the University.

Excursion to Edinburgh with a short city tour and a visit to Edinburgh Castle and/or Holyrood House, with free time available to see other Edinburgh attractions. The tour will be accompanied by an English-speaking guide. **Note** that lunch and entrances to the castle and Holyrood House are NOT included in the cost.

### Thursday 29 June

#### 0930 – 1730 Tour of Stirling and the Trossachs

The tour departs Glasgow to Stirling for a visit to the Castle. After leaving Stirling, the tour continues into the Highlands with a stop in Callander for lunch. After lunch it travels along the banks of lochs and over mountain roads of the Trossachs to Aberfoyle. Here there is an opportunity to buy some Scottish souvenirs and watch the famous 'Sheep Show' before carrying on to visit Glengoyne Distillery on the road back to Glasgow. The tour will be accompanied by an English-speaking guide. **Note** that lunch and entrances to Stirling Castle, the Sheep Show and Glengoyne Distillery are NOT included in the cost.

Accompanying persons may take lunch at the University, with other conference delegates, if they choose not to take part in the scheduled activities. They are also invited to the Civic Reception (Tuesday evening), the Conference Dinner (Wednesday evening) and any of the technical tours (Friday)

Delegates may sign up for individual tours on Wednesday and Thursday.

## **ISES Meetings**

Venue: Room M500 *except* AGM (M228)

### **ISES Board Meeting**

Sunday, 25 June 2006, 09:00 - 18:00

Monday, 26 June 2006, 09:00 – 14:30

Room: M500

### **ISES-Europe Board Meeting**

Monday, 26 June 2006, 15:00 - 18:30

Room: M500

### **ISES Council Meeting “Scientific & Tech. Affairs”**

Tuesday, 27 June 2006, 13:00 – 14:30

Room: M500

### **ISES Council Meeting “Membership Affairs”**

Tuesday, 27 June 2006, 13:00 – 14:30

Room: M500

### **ISES Council Meeting “Public Affairs”**

Tuesday, 27 June 2006, 13:00 – 14:30

Room: M500

### **ISES Council Meeting “Industries”**

Tuesday, 27 June 2006, 18:00 – 19:30

Room: M500

### **ISES Annual General Meeting (AGM)**

Wednesday, 28 June 2006, 13:00 - 14:30

Room: M228

### **Young ISES Meeting**

Wednesday, 28 June 2006, 17:30 – 18:30

Room: M500

### **ISES Section Forum**

Thursday, 29 June 2006, 13:00 - 14:30

Room: M500



# **ISES**

International  
Solar Energy  
Society

## Schools Programme and the Solar Schools Forum

Wednesday 28 June 2006

1030	Pupils arrive at the conference
1050	Presentation of awards in plenary session of the conference
1200	Solar Car Race
1430	Solar Schools Forum Workshop

### **Solar Schools Forum International Competition**

The Solar Schools Forum is aimed at improving children's and young person's knowledge of energy efficiency and renewable energy issues, and using them for awareness raising among their parents and families. The project has three main goals: to disseminate good-practice on installing energy efficient or renewable technologies, distribution of educational materials in different languages and promotion of public awareness of energy issues. The project is based in countries from Eastern and Western Europe; Bulgaria, Germany, Hungary, Poland, Romania, the United Kingdom, Denmark, Norway, Finland, Italy and France. In addition, strong links have been created to Belgium, Switzerland, Sweden, Spain and the Netherlands.

A web-based database has been created as the central tool of this project, and contributing partners have uploaded teaching materials, advice on implementation, lists of renewable energy installations for class visits. Texts have also been translated into other country's languages, thereby allowing dissemination of teaching materials across the member countries, and allowing participating teachers to access a vast range of useful material in one website.

The website activities have been backed up by more-hands on activities. Member countries have hosted a series of workshops for teachers and educational officials to encourage more teaching of energy issues within the schools and to show practical examples of how to do this.

Teachers have also been engaged by the Solar Schools Forum competition. Each partner country hosted a national competition for primary and secondary school students in categories of the Arts and Science & Technology. Each country judged its own national winners - and the very high quality work can be seen presented in the Exhibition Hall.

The national winners were also entered into the pan-European International Solar Schools Forum competition. We are delighted to welcome the winners of the Secondary School competition here to join us in Glasgow, having travelled from Poland (Science and Technology winners) and Romania (Arts winners)

The overall winner of the national competition will be asked to present their work at EuroSun 2006 in Glasgow - a major solar energy conference to be held next year, and expected to attract 800 experts in the renewable energy field. The UK winners will compete against other student projects from Solar Schools Forum participants across Europe as part of the International Competition 2006, with the European winners announced at the conference.

## Solar Schools Forum International Competition Winners: Science and Technology

### 6-12 years

	Country	Participants	School	Topic	
1 <sup>st</sup>	Germany	30 pupils, Grad 3	Osterbach Grundschule	"Living with the Sun- Constructing a Solar Playground"	Model, photos, booklet
2 <sup>nd</sup>	Romania	10 pupils, grades 6, 7 and 8	School no. 308	"The Energy of the Future"	The school model and experimental devices
3 <sup>rd</sup>	Bulgaria	Nya Treiman	"Roerich" Private Primary and Secondary School, Sofia, Bulgaria	"Alternative Sources of Energy"	Paper

### 12-18 years

	Country	Participants	School	Topic	
1 <sup>st</sup>	Hungary	Szilárd Gergely, Krisztián Fülöp, Tamás Lucz, Xavér Orsós, Péter Fenyvesi, Ferenc Faggyas, Márk Sinkovics, Ottó Pölcz	Cserhádi Sándor Technical and Agricultural Secondary School, Nagykanizsa,	"Solar Dryer Kit"	Model
2 <sup>nd</sup>	Germany	Pupils from grade 5 – 13	Gerhart Hauptmann Schule	"On the Way to a Sustainable Future"	CDs, ppt
3 <sup>rd</sup>	Poland	Mateusz Rothaug, Michał Bach	Gimnazjum nr 13, ul. Zamenhofa 15, 41-200 SOSNOWIEC	"Solar schools"	Multimedia presentation
	Bulgaria	Ivan Chebaev, G.Georgiev – CD	"Pejo Iavorov" Primary and Secondary School, Varna	"Renewable Energy Sources"	Power Point Presentation, CD
	Romania	Balteanu Adrian, Ceregan Vlad, Gavrilesco Fabian, Slavici Andrei, Topirceanu Alexandru	"Nikolaus Lenau" Theoretical High School, Timisoara	"Solar Collector"	Model
Extra Certificate	Hungary	Zoltán Reegn	Pogány Frigyes Bilingual Technical and Grammar School, Budapest	"Solar architecture"	Study



**Solar Schools Forum International Competition Winners: Art**
**6-12 years**

	<b>Country</b>	<b>Participants</b>	<b>School</b>	<b>Topic</b>	
1 <sup>st</sup>	Romania	28 pupils, grades 4,5,6,7 and 8	School, no. 308,	"Terra, the heritage of mankind!"	Painting album, solar model and essay
2 <sup>nd</sup>	Poland	Dominika Kalinowska, Karolina Pawłowska, Agata. Pietrzak, Aleksandra Popis, Jakub Sokół, Jakub Strycharczuk, Karolina Zawadka, Lilianna Żukowska.	Szkoła Podstawowa nr 76, im. 13 Dywizji Piechoty Strzelców Kresowych	"Maciek on trials of Energy"	Short Stories
3 <sup>rd</sup>	Hungary	Zsófia Hahn	Teaching and Education Center, Pestújhely, Budapest	"A long time ago and today"	Drawing
	Bulgaria	Desislava Aleksieva, Julietta Mihialova, Leyla Sikander, Lora Kiulaflieva	"Roerich" Private Primary and Secondary School, Sofia	"A Story for the Two Suns"	Comics
	Germany	"Stadtspatzen", grad 3	Schillerschule	"Visionary Collages"	11 paper collagen
	UK	Class effort (Aged 4-11)	Brill CE Combined School	"Energy at Brill School"	Poster

**12 - 18 years**

	<b>Country</b>	<b>Participants</b>	<b>School</b>	<b>Topic</b>	
1 <sup>st</sup>	Romania	Maria Nitulescu, Grade 10	"Nicolae Tonitza" High School for Fine Arts	"Sustainable Vision"	Painting
2 <sup>nd</sup>	Hungary	Edina Döme, Edina Laksz, Gabriella Markovics, Kinga Vörös, József Darvas, Ádám Farkas, Roland Korosecz	Zsigmondy Vilmos & Széchenyi István Technical Secondary School, Nagykanizsa,	"Renewable Word-flowers I - II"	Two paintings
3 <sup>rd</sup>	Germany	Environmental Group, grad 5 - 9	Bismarckschule	"Sun - the First"	Movie
	Bulgaria	Eva Kuneva	"Roerich" Private Primary and Secondary School, Sofia	"The Four Elements"	Illustrated story
	UK	Hannah Ogg	Balfron High School	"How to combat climate change"	Leaflets
	Poland	Joanna Cieślak	Gimnazjum nr 94	"The Sun- Energy for the Future"	Poster

## Solnet

### Meeting At EuroSun 2006

**Date:** Monday 26 June 2006

**Time:** 12.00 – 6.00pm

**Location:** M228

**Contact:** Klaus Vajen, [vajen@uni-kassel.de](mailto:vajen@uni-kassel.de), Kassel University, ISES Vice President for Membership Affairs

### Detail

This will be the kick-off meeting of the Solnet-network. Solnet consists of nine universities in seven European countries. It is funded by the EU and shall develop from 2006 to 2010 the first coordinated PhD education in solar heating technology. Approximately 20 professors and PhD students from all over Europe will participate in the meeting. A contribution regarding Solnet has been sent in for EuroSun, for more details see [www.solar.uni-kassel.de/solnet](http://www.solar.uni-kassel.de/solnet).



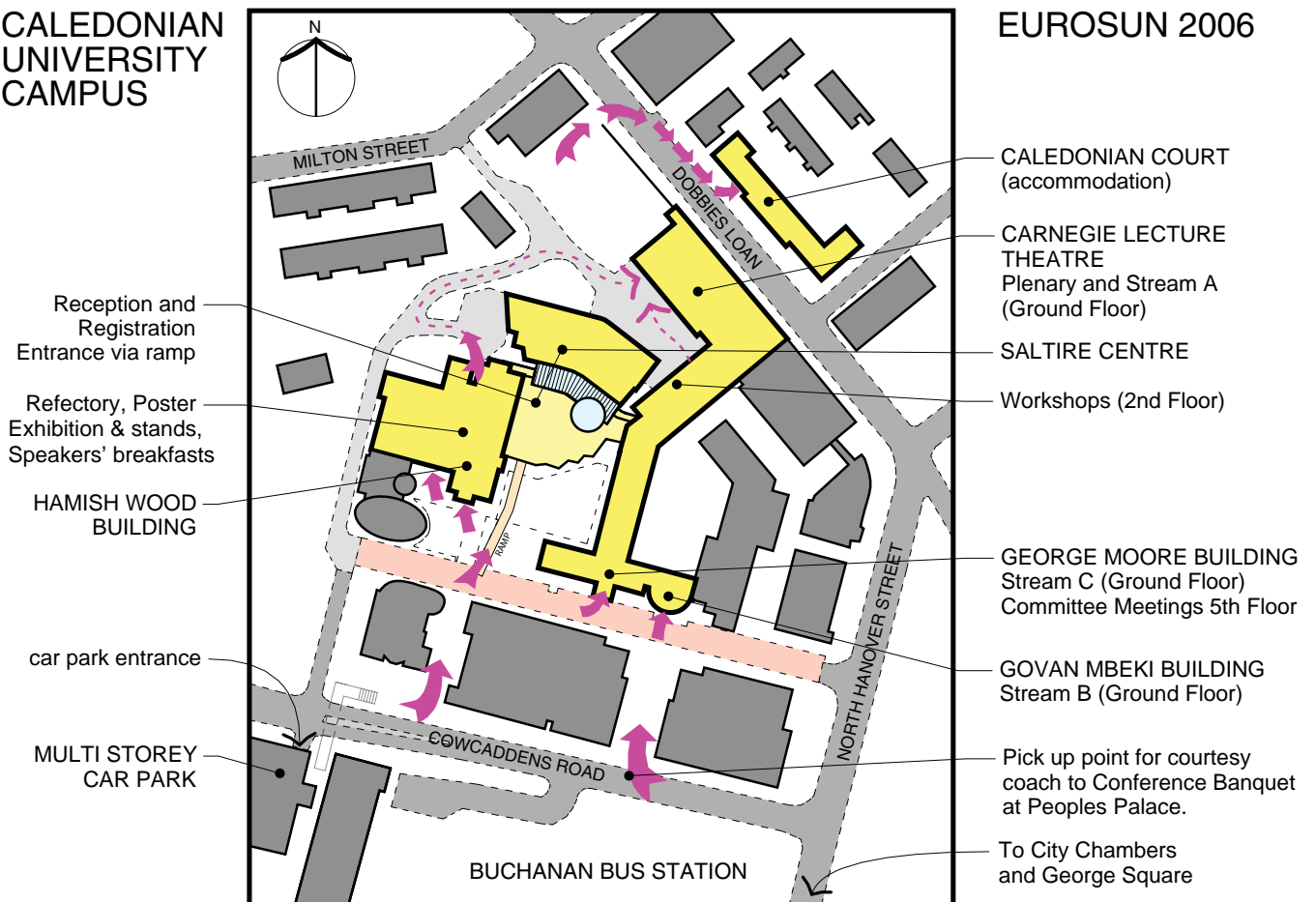
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1. Britannia Building 2. Real Learning Cafe & John Smith's Bookshop 3. Arc Health & Fitness Facility 4. North Hanover Street Building 5. Govan Mbeki Building  
 6. George Moore Building 7. Hamish Wood Building 8. Students' Association & SRC Offices 9. Occupational Health Unit 10. The Saltire Centre  
 11. Charles Oakley Laboratories 12. Nursery 13. Teaching Block 14. Milton Street Building 15. Caledonian Court

## CALEDONIAN UNIVERSITY CAMPUS

## EUROSUN 2006



# PROGRAMME AT A GLANCE

## TUESDAY 27<sup>TH</sup> JUNE 2006

0900 – 0940	<b>OPENING SESSION</b>			
0940 – 1100	<b>PLENARY SESSION 1</b>			
1100 – 1130	COFFEE BREAK			
1130 – 1300	SOLAR THERMAL 1: Building Integration	MATERIALS 1	ENERGY EFFICIENT BUILDINGS 1	
1300 – 1415	LUNCH	LUNCH	LUNCH	
1415 – 1545	SOLAR THERMAL 2: Systems I	MARKETS, POLICY AND EDUCATION 1	SOLAR COOLING 1	POSTER SESSION P11
1545 – 1615	TEA BREAK	TEA BREAK	TEA BREAK	TEA BREAK
1615 – 1745	SOLAR THERMAL 3: Storage I	SOLAR AND PV MATERIALS	SOLAR POWER 1	POSTER SESSION P2
				WORKSHOP 1

## WEDNESDAY 28<sup>TH</sup> JUNE 2006

	<b>PLENARY SESSION 2</b>			
1100 – 1130	COFFEE BREAK			
1130 – 1300	SOLAR THERMAL 4: Collectors I	PHOTOVOLTAICS 1	METEOROLOGY	
1300 – 1415	LUNCH	LUNCH	LUNCH	
1415 – 1545	SOLAR THERMAL 5: Systems II	MARKETS, POLICY AND EDUCATION 2	ARCHITECTURE AND DAYLIGHTING 1	POSTER SESSION P3
1545 – 1615	TEA BREAK	TEA BREAK	TEA BREAK	TEA BREAK
1615 – 1745	SOLAR THERMAL 6: Collectors II		ENERGY EFFICIENT BUILDINGS 2	POSTER SESSION P4
				WORKSHOP 2

## THURSDAY 30<sup>TH</sup> JUNE 2006

	<b>PLENARY SESSION 3</b>			
0900 – 1100	COFFEE BREAK			
1100 – 1130				
1130 – 1300	SOLAR THERMAL 7: Storage II	EDUCATION	ARCHITECTURE AND DAYLIGHTING 2	WORKSHOP 3
1300 – 1415	LUNCH	LUNCH	LUNCH	
1415 – 1545	SOLAR THERMAL 8: Systems III	PHOTOVOLTAICS 2	SOLAR COOLING 2	
1545 – 1615	TEA BREAK	TEA BREAK	TEA BREAK	
1615 – 1730	<b>CLOSING SESSION AND PRESENTATION OF PRIZES</b>			

## KEY TO ROOMS:

<b>PLENARY SESSIONS, OPENING AND CLOSING SESSIONS</b>	Carnegie Lecture Theatre C001	Ground Floor, Charles Oakley Building
<b>STREAM A</b>	Carnegie Lecture Theatre C001	Ground Floor, Charles Oakley Building
<b>STREAM B</b>	A005	Ground Floor, Govan Mbeki Building
<b>STREAM C</b>	M001	Ground Floor, George Moore Building
<b>POSTER SESSIONS</b>	Refectory Extension	Ground Floor, Hamish Wood Building
<b>WORKSHOPS</b>	M228	Second Floor, George Moore Building