



**This is an invitation to attend :**

## **Energy: A challenge for 21<sup>st</sup> century physics**

**An EPS/SFP conference**  
June 2<sup>nd</sup> to 5<sup>th</sup> 2008; Les Houches, France

### **Background and goal:**

Energy is certainly one of the central problems of the 21<sup>st</sup> century. Energy scarcity, geopolitical frictions, security of supply and climate change are issues which dominate many political and economic debates. Modern energy technologies rely in many aspects on the insights and findings of physics. This is expected to be also true for new systems, which are currently under development or will be developed in the future. The relation of physics to the energy system in general and energy technologies in particular will be the main focus of the conference.

Organised as a dialogue between researchers from public and private institutions, it is aimed at demonstrating the impact of physics on all energy related issues (production, saving, handling, wastes, environmental impact). Energy technologies are to be scrutinised according to their basic potential if more research and development is provided. The benefits of more research will be evaluated in all cases. The interface between the physics potentials and the expected technological and economic performance is to be analysed.

### **Organizing committee**

Prof. H. Bruhns, DPG Energie-Arbeitskreis, Dr. Taj Panesor, IOP, Prof. J. Vaagen, Head of Technology Group, EPS, Dr Michèle Leduc, President S.F.P., Prof. Jacques Treiner (U. Paris 6), Dr Sylvain David, SFP energy and environment group, Dr Claude Stephan, IPN Orsay, Dr. Thomas Hamacher, Coordinator of EPS energy working group, Prof. Jean-Louis Bobin (U. Paris 6)

## Programme (subject to minor changes)

### Monday June 2nd

#### Introduction to the energy and climate debate

11h	Welcome	M. Leduc, F. Wagner
11h 15	Introduction : Goals of the EPS energy working group	Th. Hamacher
11h 45	Challenges of the energy system	<b>J. Sample<sup>1</sup></b> , SHELL
16h	Geopolitics	<b>F. Müller</b> , S. W. P., Berlin
16h 45	Energy and Environment	<b>H. Nifenecker</b> , LPSC/CNRS, Grenoble
17h 30	Gas, Oil and uranium resources	<b>B. Cramer</b> , BGR
18h 15	The relation between economic growth and electricity demand	<b>T. Traber</b> DIW

*After dinner*

#### Historical perspective

45 min	200 years after the industrial revolution, what was the role of energy	<b>J. Streb</b> , Uni Hohenheim
45 min	Historical overview about the role of physics in the development of energy technologies	<b>R. Balian</b> , Académie des Sciences, Paris

### Tuesday June 3d

#### Environment

9h	200 years after Fourier and Saussure, the status of the climate debate	<b>P. Bessemoulin</b> , Meteo France, Toulouse
9h 45	Observation of the climate	<b>J. Burrows</b> , Uni Bremen
11h	Climate Models	<b>H. Held</b> , Potsdam Institut für Klimafolgenforschung
11h 45	Back to the future: advanced coal power plants	<b>H. Spliethoff</b> , TU München
15h 00	The physics of roadtransport	<b>M. Schreckenber</b> , Uni Duisburg-Essen
15h 45	Air quality and related questions	<b>M. Beekmann</b> , Uni Paris
16h 30	Renewable energies and weather	<b>D. Heinemann</b> , Uni Oldenburg
17h 15	Radioactive waste	<b>CEA</b>
18h	Energy and climate	<b>Panel discussion</b>

*After dinner*

45 min	The future role of superconductivity	<b>M. Noe</b> , KIT
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<sup>1</sup> **Boldface** means confirmed. TBA = to be announced

## Wednesday June 4th

### Electricity networks and generation

9h	Heat and electricity demand of industry	<b>M. Patel</b> , Uni Utrecht
9h 45	Global Link: a global electricity network	<b>Ch. Krane</b> , RWTH Aachen
11h	Renewables	<b>E. Lundtang</b> , Risö
11h 45	Solar photovoltaic	<b>J.F. Guillemoles</b> ENSCP/EDF

### Nuclear electricity

16h 45	The future of conventional nuclear power	<b>D. Knoche</b> , Westinghouse
17h 30	From generation IV to an integrated nuclear system	<b>O. Meplan</b> , IPNO
18h 15	Fusion	<b>D. Ward</b> , UKAEA Culham

*After dinner*

### Houses and heat networks

45 min	The physics of houses: how to build a house without heat demand	<b>R. Hastings</b> , AEU, GmbH
45 min	Heating technologies: from micro generation to advanced heat pumps	<b>C. Schweigler</b> , ZAE Bayern, Garching

## Thursday June 5th

9h	More electricity for less CO <sub>2</sub> : hints for research	<b>Y. Bamberger</b> , EDF
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### Hydrogen, storage

9h 45	Hydrogen cycle overview	<b>M. Fontecave</b> , (N. Bardi) Uni Grenoble
11h	Hydrogen economy	<b>Th. Alleau</b> , AFH
11h 45	Fuel cells	<b>W. Lehnert</b> , FZJ
14h	Lithium batteries	<b>G. Hörpel</b> , EVONIK

### Transport

14h 45	High speed trains	<b>J. Siegmann</b> , TU Berlin
15h 30	Future of aviation	<b>G. Ville</b> , Académie Nationale de l'Air et de l'Espace

Posters are foreseen to be displayed during the conference.

## Sponsorship

The organisers are grateful for the support they received from the following institutions and firms:

Deutsche Bank: [http://www.deutsche-bank.de/index.htm?ghpmeta=DEU\\_home](http://www.deutsche-bank.de/index.htm?ghpmeta=DEU_home)



# Practical Informations

**More information and registration :**

[http://www.sfpnet.fr/front\\_office/actu\\_en\\_detail.php?id\\_actu=297](http://www.sfpnet.fr/front_office/actu_en_detail.php?id_actu=297)

## How to contact the School?

**Website :**

<http://w3houches.ujf-grenoble.fr/>

**Telephone** (from Monday to Friday at office hours): from abroad: **+33 4 50 54 40 69**, from France: **04 50 54 40 69** , **Fax:** from abroad: **+33 4 50 55 53 25**, from France: **04 50 55 53 25** , **E-mail:** [secretariat.houches@ujf-grenoble.fr](mailto:secretariat.houches@ujf-grenoble.fr)

**Mail:** Ecole de Physique des Houches , La Côte des Chavants, F-74310 Les Houches FRANCE

You may contact participants at meals hours (12h30-13h30) (19h30-20h30) by calling the restaurant at **+33 4 50 54 41 24**.

## Facilities

- a library with the main scientific journals (paper version or online) and some reference books
- three working rooms with blackboards
- projectors for standard slides and for transparencies
- a video-tape recorder VHS + monitor multi-system (NTSC, PAL, SECAM)
- a video projector
- a photocopying machine
- a fax
- an Internet link, currently 2 Mb/s
- desktop computers (10 PCs + 2 Macs) and a B&W Laser Printer
- hubs to connect laptops to the local network
- a wireless network.



## Your Stay

Meals are taken at the school dining room. Drinks are not included. Coffee, tea (free!) and liqueurs are available at the cafeteria. Breakfast: 8:00 am to 8:45 am ; Lunch: 12:30 am ; Dinner: 7:30 pm. Accompanying persons who have registered can take their meals at the restaurant (8 euros per meal). The cafeteria has a piano, baby-foot and table tennis.

Participants are housed in "chalets" in individual bedrooms (electricity: AC, 50Hz, 220V).

A flashlight is handy at night ; the school chalets are scattered on the mountainside and outside lights may be poor (power failures, storms,...).

## Weather

The altitude of the school is 1150 m. Temperature may range from -15 to 5°C in winter and from 5 to 25°C in summer. Sport clothes are preferable. Warm sweater(s), rain gear, good walking shoes and home shoes are necessary. [weather forecast for the next days](#)

## Access (check updated links in the "Venir aux Houches" page on our french website)

**By plane:** Geneva Airport is 1 hour drive from les Houches.

- The simplest way is to use a private limousine service (approximately 40 euros up to the school). See for example <http://www.act-chamonix.com>, <http://www.a-t-s.net> or <http://www.chamonixshuttles.com/> (book at least three days in advance)
- There is a regular bus service between Geneva and Les Houches (only once or twice a day): <http://www.coach-station.com>. One should then take a taxi for the last 5 kms from the Les Houches village to the school (the total cost is similar to that of the limousine).
- One can also travel from Geneva to Les Houches by train (+ taxi from the train station to the School), but it is quite complicated (3 connections) and long (go through Annemasse on the French side or through Martigny on the Swiss side).

**By train:** arrival at the Les Houches station, with one change at Saint-Gervais (from France), or at Martigny (from Switzerland). There are about 10 trains per day between St Gervais and Les Houches ([schedules](#), 20mn trip). Then we strongly advise you to take a taxi (tel. +33 (0) 6.12.35.30.72 or +33 -4-50 54 41 09) to go up to the school (5km). **By road:** Les Houches are easily accessible from France (A41 highway), from Switzerland (Martigny and Col des Montets) and from Italy through the Mont Blanc Tunnel.

- From Geneva and Le Fayet: 8km before Chamonix, 300 m after passing under the tunnel, bear right by the first road out for "Les Houches Bellevue". When arriving at the cable car station "Bellevue", turn right and continue upwards (roughly 2 km starting from the teleferic). 500m after the cable car station "Prarion", turn left and follow small arrows at crossroads. Continue up to the end of Route de la Côte des Chavants. Here you are!
- From Chamonix: bear right for "Les Houches-Chef-Lieu", turn right in Les Houches, go ahead at the cable car station "Bellevue". Then proceed as above.
- Cars may be rented from Geneva and from Chamonix, it is useful to make a reservation.