

# ESF RESEARCH CONFERENCES

## Rapporteur Report

Partnership:	FWF, LFUI
Conference Title:	Nanotechnology for Sustainable Energy
Dates:	July 4-9 2010
Chair:	Prof. Michael Grätzel
Rapporteur:	Prof. Kenneth Ruud

### General Comments

Any general comments you might have concerning the conference, your role, the scientific area covered by this conference, etc.

The conference topic was very timely, the importance of nanotechnology for ensuring a sustainable supply and use of energy in our (future) society. The meeting gathered leading researchers in fields of relevance to the topic of the conference. This rapporteur works only indirectly in this field, being a theoretical chemist working on nonlinear optical properties and the development of ab initio theory, although a small overlap exists. Still, the organizers had done a great job in instructing the presenters to give lectures that both covered the basic problems within their own field of researchers, the methods used to address these challenges, as well as presented state-of-the-art results from their own research laboratories. As such, I learned a lot during this week, and I believe this is also a very good indication that the young researchers (as well as the more senior researchers) have benefitted greatly from attending this meeting.

### Quality of Scientific Programme, Presentations and Discussion

Comments on the balance and scope of the scientific programme, the scientific quality of the presentations and discussions.

The conference gathered leading experts in the field of nanotechnology in relation to different aspects of energy research, although perhaps with a slight bias towards photovoltaics. Still, all major areas of the research in this field was duly covered. The lectures were in general of very high quality, and without exception the lecturers had done an excellent job in both providing insight into the state of the art in their fields as well as give a general introduction and motivation suitable for the broad audience present at the meeting. It was particularly rewarding to observe that the high quality of the presentations also applied to the young researchers presenting their research.

The talks were followed by discussion sessions, and there was in general a very high degree of discussion after all talks. Indeed, it might have been advisable for the senior lecturers that their allocated time for the talks had been reduced to 40 minutes, allowing for 10 minutes of discussion instead of the 5 minutes set aside according to the program schedule. However, the session chairs allowed discussions to continue as long as needed rather than staying with a too tight program schedule, and I think this was a correct decision by the organizers/session chairs.

Two poster sessions were organized, and the posters were displayed during the entire conference. Three poster prizes were also awarded. Both poster sessions were well attended and stimulated further discussions between younger and senior researchers. I also noted a general interest and discussions at posters also outside of the organized poster sessions, demonstrating the quality of the science presented on the posters.

The overall structure of the program placed longer lectures by senior researchers in the morning sessions (before lunch), though with some shorter presentations by younger researchers, whereas the afternoon sessions in general involved younger researchers with shorter presentations. Although also the afternoon sessions were quite well attended, I think it would have been better to divide the sessions in such a manner that they consisted of one senior researcher giving a lecture followed by 2-3 shorter presentations. I believe this would in particular have been beneficial for the afternoon session as well as for the session on the last day, when many participants already started their departure.

### Informal Networking and Exchange; Atmosphere

Was the schedule and the atmosphere conducive to an easy exchange of information? Was there time and space for an informal discussion? Were younger researchers integrated?

The schedule for the talks encouraged discussions, though as noted above, some more time allowance for discussions may have been helpful considering the in general lively discussion sessions. However, the session chairs adapted to the level of discussions so that an appropriate level of discussion was achieved, even though the sessions on occasions went over time. The discussion were at a high level, allowing for both fundamental questions as well as more critical remarks to be voiced and responded to in a good informal atmosphere. Since the necessary time was allocated for completing discussions, both senior and young researchers were allowed good opportunities for asking questions, and the informal atmosphere led to a high level of involvement also by young researchers.

In connection with lunch, an extended break was provided, allowing the participants to take advantage of the beautiful surroundings and to allow for informal scientific and non-scientific discussions. The opportunities for hiking were utilized by many of the participants. It might be that further informal discussions could have been stimulated by on one of the days to organize 2-3 different joint hiking tours of different level of difficulty, ensuring that the participant also got to participate in non-scientific activities involving participants they may not have known prior to the meeting, and in this way further stimulate the informal discussions. This is not meant to imply that the extended lunch breaks did not serve their purpose as a means of informal discussion, but primarily as suggestion as to how to further encourage these informal discussions.

### Balance of Participants

Was there an appropriate balance between young and senior participants? Was a balance of national groups and researchers from different (sub)fields achieved?

There was a good balance between young researchers and more senior researchers in the field, and I am in particular impressed at the organizers ability to attract the leading experts in a wide range of topics related to sustainable energy to attend the conference. As far as I can evaluate, the most important areas of science within the scope of the conference was covered in the lectures, with a slight bias towards photovoltaics. It was noted during the discussions that there was a general lack of theoretical modelling at the conference, though this rapporteur (being a theoretician himself) did not find this to represent a major limitation in the scope of the conference. The distribution of nationalities for the participants was good.

### Outlook and Future Developments

Will new collaborations emerge from this conference? (How) could the conference outcomes be utilized further? Are there suitable (ESF) programmes or instruments to further the work of the conference?

The organizers organized a forward look session at the meeting. However, this was the part of the conference I felt was not properly handled. It is not clear whether this was due to lack of information prior to the meeting (though I received the information about the goals of the forward look session from the ESF office), or a failure of the organizers to properly plan this event. Indeed, the first forward look session ended up being a discussion as to whether there should be organized another meeting in this series, deciding on the next session chair and discussing the possibilities for securing future funding for this meeting from the ESF. From the perspective of the goals of the forward look session, there was no valuable feedback as to how the ESF should follow up on the scientific discussions at the conference. As per my request, a second Forward Look session was organized, but at this time many of the senior researchers had left the meeting, and focus quickly turned towards securing funding for the next conference from the ESF. The participants were encouraged to communicate their views on how to follow up the global perspectives of the conference to the organizers, who would then forward this information to me. I have not yet received any such summary from the conference organizers.

It should be noted that one of the participants proposed a global photosynthesis initiative, and a draft manuscript has been circulating among the interested conference participants with the planned goal of submission to Nature Nanotechnology or similar journals. The current status of this manuscript/project is currently unknown to me.

From the point of view of ESF, I found this part of the conference a disappointment, and should a similar conference be organized in the future with support from ESF and its partners, a closer dialogue with the organizers need to be ensured in order to get this Forward Look session into an appropriate form.

### Follow-up

What immediate and long-term follow-up would benefit collaborations and dialogues that may have begun at the conference?

As noted in the point above, there was very little direct outcome of relevance to the ESF in terms of how the ESF, or other funding agencies, may help this field move in the right direction, as based on the Forward Look session. This may also be due to the fact that the field in general benefits from a fairly high basic funding from both the EU and various national funding

agencies, reducing the need for the networking activities that the ESF can provide. At the same time, the potential political impact of the knowledge that the participants have in terms of the challenges in their fields, the need for further innovation and support of activities in this area is underutilized and undercommunicated in the view of this rapporteur, and it is unfortunate that the Forward Look session did not contribute to finding ways to communicate the knowledge of the community to the political level.

### **Organisation and Infrastructure**

Were venue, catering and accommodation appropriate for this conference? Were participants satisfied with the on-site administration and support?

The venue was excellent, as was the accommodation. The on-site support and administration worked very well, and I have noted nothing but praise for the practical organization of the conference.

### **Summary & Overall Assessment**

Was the conference successful; were its aims achieved?

From the point of view of science, the conference has to be summarized as being a great success. The organizers had assembled a great team of lecturers covering a broad spectrum, both in terms of age distribution, field of research within the scope of the conference topic, creating a stimulating atmosphere for scientific exchange of information and discussion, and for ensuring a broad geographical distribution of the participants. This opinion was also voiced by many of the participants at the Forward Look session, and they also noted the need for future meetings of this kind that provides a good blend between high scientific quality, breadth of scope and informal discussions. Several of the young participants I talked to also noted the great opportunity the meeting had represented for them to meet and discuss with the leading researchers in their field.

Assuming the ESF would like to have as an outcome a more clear strategy on how the field can benefit from follow-up activities in terms of RNPs or EUROCORES, or perhaps even Forward Look exercises, this was less successful, and a future meeting in this series would require a closer dialogue between the ESF and the conference organizers on the purpose and goals of the Forward Look session, if this is considered an important element of the ESF conference series.

## About ESF Research Conferences

### **The Scheme**

This conference is part of the European Science Foundation's (ESF) Research Conferences Scheme. The Scheme aims to promote scientific excellence and frontier level research throughout Europe and the rest of the world. Conferences aim to provide leading scientists and other participants, including young researchers, with a platform to present their work, to discuss the most recent developments in their fields of research and to network.

### **Conference Format**

The core activities should be based on lectures by invited speakers, who are leaders in their respective fields, followed by extensive discussion periods. An informal exchange of ideas, both inside and outside the lecture room, should be encouraged, and the number of sessions in the daily timetable should be limited in order to allow sufficient time for interaction between the participants. Time should be reserved for a 'Forward Look Plenary Discussion' about future developments in the field.

Participants can take all their meals together to encourage further contact and networking, which can be particularly beneficial to younger researchers who may be less outspoken in the formal lecture room setting. In order to gain optimum benefit from the conference, both the speakers and the participants are asked to stay for the whole duration.

### **Division of Tasks**

The Conference Chair is responsible for ensuring the quality of the scientific programme through the selection and invitation of speakers, and through the selection of participants.

The ESF Conferences Unit is responsible for managing all the logistical aspects of the conference organisation, including the provision of an on-site secretariat.

Further information: [www.esf.org/conferences](http://www.esf.org/conferences)