





# Participant Profile

for the  
**Turkish-German Strategy Workshop 2006**  
**TÜBİTAK Marmara Research Center,**  
**Istanbul- Gebze Turkey**  
**13 – 15 December 2006**



International Bureau (IB)  
of the Federal Ministry of  
Education and Research  
(BMBF)

## Key publications (recent):

O. Vetterl, F. Finger, R. Carius, P. Hapke, L. Houben, O. Kluth, A. Lambertz, A. Mück, B. Rech, H. Wagner, Intrinsic microcrystalline silicon : a new material for photovoltaics, *Solar Energy Materials and Solar Cells* 62 (2000) 97

T. Roschek, T. Repmann, J. Müller, B. Rech, H. Wagner, Comprehensive study of microcrystalline silicon solar cells deposited at high rate using 13.56 MHz plasma-enhanced chemical vapor deposition, *Journal of Vacuum Science and Technology A* 20 (2002) 492

B. Rech, O. Kluth, T. Repmann, T. Roschek, J. Springer, J. Müller, F. Finger, H. Stiebig, H. Wagner, New materials and deposition techniques for highly efficient silicon thin film solar cells, *Solar Energy Materials and Solar Cells* 74 (2002) 439

F. Finger, R. Carius, T. Dylla, S. Klein, S. Okur and M. Günes, *On the stability of microcrystalline silicon for thin film solar cell applications*, IEE Proceedings - Circuits, Devices and Systems, 150 (2003) 300.

F. Finger, A. L. Baia Neto, R. Carius, T. Dylla and S. Klein, *Paramagnetic defects in undoped microcrystalline silicon*, *physica status solidi C*, 1 (2004) 1248.

S. Klein, T. Repmann, T. Brammer, Microcrystalline silicon films and solar cells deposited by PECVD and HWCVD, *Solar Energy* 77 (2004) 893

J. Müller, B. Rech, J. Springer, M. Vanecek, TCO and light trapping in silicon thin film solar cells, *Solar Energy* 77 (2004) 917

S. Klein, F. Finger, R. Carius and M. Stutzmann, *Deposition of microcrystalline silicon prepared by hot-wire chemical-vapor deposition: The influence of the deposition parameters on the material properties and solar cell performance*, *Journal of Applied Physics*, 98 (2005) 024905.

Y. Mai, S. Klein, R. Carius, H. Stiebig, X. Geng and F. Finger, *Open circuit voltage improvement of high-depositon-rate microcrystalline silicon solar cells by hot wire interface layers*, *Applied Physics Letters*, 87 (2005) 073503.

Y. Mai, S. Klein, R. Carius, J. Wolff, A. Lambertz, F. Finger and X. Geng, *Microcrystalline silicon solar cells deposited at high rates*, *Journal of Applied Physics*, 97 (2005) 114913.

M. van den Donker, B. Rech, F. Finger, W.M.M. Kessels, M.C.M. van de Sanden, Highly efficient microcrystalline silicon solar cells deposited from a pure SiH<sub>4</sub> flow, *Applied Physics Letters* 87 (2005) 263503



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## 2. Past and present research collaborations

Are you familiar  
with the European  
Framework  
Programme?

|   |                                    |
|---|------------------------------------|
| <input checked="" type="checkbox"/> <b>Yes</b>  | <input type="checkbox"/> <b>No</b> |
| <input checked="" type="checkbox"/> with Framework Programme 5<br><input checked="" type="checkbox"/> with Framework Programme 6<br><input type="checkbox"/> with Framework Programme 7 |                                    |

EU-projects you are  
involved in:  
Past projects

|   |  |
|---|--|
| <b>Programme title / contract number / title / acronym / your function (coordinator / partner / contractor)</b> |  |
| <b>FP-4 (JOULE III)</b>   | New and Enhanced Silicon Thin Film Solar Cell (NEST)                         |
| Project Type:   | Cost-sharing contracts; partner  |
| Project Reference:  | JOR3970145   |
| Duration:   | 01-06-1997 till 31-05-1999   |
| <b>FP-5:</b>  | Development of an Optimized Integrated Thin-film silicon solar module (DOIT) |
| Project Type:   | Cost-sharing contracts; partner  |
| Project Reference:  | ENK6-CT2000-00321  |
| Duration:   | 01-01-2001 till 31-12-2003   |

Present projects

|                    |  |
|--------------------|--|
| <b>FP-6:</b>       | Advanced Thin Film Technologies for Cost Effective Photovoltaic (ATHLET)   |
| Project Type:      | IP, partner  |
| Project Reference: | <a href="http://www.hmi.de/projects/athlet/">http://www.hmi.de/projects/athlet/</a>  |
| Duration:          | 01-01-2006 (4 years)   |
| <b>FP-6:</b>       | Roll-to-roll manufacturing technology for high efficiency multi-junction thin film silicon flexible photovoltaic modules (POWERFOIL) |
| Project Type:      | STREP, partner   |
| Duration:          | project start: 1 October 2006 (3 years)  |

Other international  
collaborations:

|  |   |
|--|---|
| <b>(BMFT/Germany &amp; TÜBİTAK/Turkey):</b>  |   |
| Project Type:  | Gap state spectroscopy on microcrystalline silicon  |
| Duration:  | Bilateral scientific-technical collaboration, coordinator<br>01-04-2001 till 31-03-2006             |
| <b>Innovatiesubsidie Samenwerkingsprojecten (IS), SenterNovem of the Dutch Ministry of Economic Affairs (The Netherlands):</b> |   |
| 1)   | High throughput process for large-area high-efficiency flexible photovoltaic modules (FAST FORWARD) |
| Project Type:  | Sub-Contractor  |
| Duration:  | 01-01-2005 till 31-12-2007  |
| 2)   | High-efficiency flexible photovoltaic modules (PUSH-UP)   |
| Project Type:  | Sub-Contractor  |
| Duration:  | 01-04-2005 till 31-03-2008  |

Name(s) and  
contact details of  
potential partners:

|   |  |
|---|--|
| <b>If you would like to suggest the participation of particular partners from the partner country based on existing contacts or collaboration experience, you are welcome to indicate their names and contact details below:</b>          |  |
| Prof. Dr. Mehmet Günes,<br>Department of Physics, Faculty of Sciences and Arts<br>Mugla University, Kötekli Yerleşkesi, Mugla, Turkey<br>Tel: +90-252-211 1605 e-mail: <a href="mailto:mehmet.gunes@mu.edu.tr">mehmet.gunes@mu.edu.tr</a> |  |



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### 3. Presentation at the Workshop

I will give a presentation at the workshop (approx. 10 min.) to present my institution, my expertise, and my collaboration interests. The contents of my presentations is summarised below (max. 1 page).

The work programme of the Institute of Photovoltaics (IPV) at the Forschungszentrum Jülich focuses on thin-film solar cells based on silicon and its alloys in the amorphous and microcrystalline form. The activities are part of the Helmholtz research programme "Renewable Energies". The aim of development is low-cost photovoltaic modules with a high efficiency. The attractiveness of this technology is the low material costs and the low-cost deposition processes on a variety of substrate materials at low process temperature. The work programme comprises the overall development from materials research through solar cell development and process technology up to the realization of solar modules. The technology is to be developed up to a stage close to industrial-scale production, so that it can be used by the industrial partners at low transfer costs.

Stacked cells (tandem and triple-junction cells) with adapted spectral absorption of the layers will be developed in order to utilize the solar spectrum as completely as possible. The deposition processes involve glow discharge, hot-wire technique and sputtering. The low deposition temperatures of 100-300 °C enable the use of cheap and flexible substrates such as glass, steel or plastic foils. Light trapping is to be improved by selectively roughened TCO layers, e.g. textured zinc oxide. Advanced concepts are aimed at achieving efficiencies of 14 % and more in the long term.

Collaboration interest covers all topics of research at the IPV with emphasis on photovoltaic materials and deposition process development.

**I agree with the publication of my data on the Workshop website!**

**PLEASE FILL IN THIS FORM UNTIL 22 SEPT. 2006 AND RETURN IT TO:**

**Internationales Buero des BMBF**  
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