

Main Topic: Overview of the International Activities in 2011

Events in the Department

INTERNATIONAL EXPERIENCE 4 YOU



Upper Left: Prof. Benim opening the event „International Experience 4 You“, Uper Right: A view of the audience
Lower Left: Sinem & Gizem on the Stage, Lower right: Bianca, Farouk, Ugur, Osman during the break.

The event „**International Experience 4 You**“ took place in May 2011 in Café Freiraum. The purpose was information exchange between domestic and exchange students in an informal and enjoyable atmosphere, with live music, drinks, foods and shows. The exchange students from **France** and **Turkey** (Erasmus) have provided information on their home university and country in four amusing presentations (one from France, and three from Turkey). A Turkish student (Cigdem Turanli) made a presentation on her experiences in Germany. In return, one of our students (Melis Adigüzel), who stayed in Turkey as exchange student for one semester (DAAD), reported on her experiences in a nice presentation and with a very nice short film on Istanbul, which won the second prize in a contest in Turkey.

Incomings



In the Summer Semester 2011, we had 3 incoming students from **France**, 1 from **India** and 9 from **Turkey**.

In the Winter Semester 2011/2012, we hosted 6 students from **Turkey**.

In addition to the exchange students who stay and study in Düsseldorf for at least one semester, we are hosting groups of students, every now and then, who visit us for one day for a short information exchange. In 2011, we had two such groups from **USA** and **Russia**. Both visits were organized by Prof. Jahr.

Photo: Back: Prof. Ziegler, Prof. Benim, C. Gautier, M. Berntssen, F. Kaboche. Front: S. Hochain, H. Rüping, S. Gültekin, C. Turanli

Outgoings



Derya



Havva



Mehmet

Ms. Derya Cobanoglu, Ms. Havva Yavuz and Mr. Mehmet Celik, (Wirtschaftsingenieurwesen/Industrial Engineering) visited Yildiz Technical University in Istanbul, **Turkey**, for two semesters in 2011 (SS 2011 and WS 2011/2012) within the framework of the Erasmus program.



Hunn

Mr. Hunn Sim (Mechanical and Process Engineering, PP) visited **Korea** for three months for a practical training at the company KCC Pneumatics & Hydraulics in Seoul. The trainee position at the company was communicated by Prof. Suh (Soongsil University, Seoul) who was a visiting professor in our department in WS11/12.

New Partnerships

The existing cooperation agreements with different universities from different countries are extended (Please check the IO or department website for the full list).

New partnerships are established with the following institutions:

IGCHE: Our university (Mechanical and Process Engineering Department) joined the "**Indo German Centre for Higher Education**" (IGCHE). Further German members of the consortium are: Bochum University of Applied Sciences, Bonn-Rhine-Sieg University of Applied Sciences, Westfälische Hochschule University of Applied Sciences, Zittau/Görlitz University of Applied Sciences, Kiel University of Applied Sciences. **Indian** partner institutions are: **PSG College of Technology** in **Coimbatore** and **SRM University** in **Chennai**. For details, please check the website www.igche.de. Prof. Benim and Prof. Jahr are representing our department in IGCHE.

New **Erasmus** cooperation agreements are undersigned with the **Universidad Politécnica de Valencia, Spain** (initiated by Prof. Jahr) **Kaunas University of Technology** (initiated by Prof. Reichardt), **Lithuania** and **Zurich University of Applied Sciences, Switzerland** (initiated by Prof. Reichardt).

Following the initiative of Prof. Jahr, a bilateral cooperation agreement is undersigned with the **Novosibirsk State Technical University, Russia**.

Prof. Neef visited **Glyndwr University** in Wrexham, **UK**, and negotiated on possible forms of cooperation (please contact Prof. Neef for details).



Following the invitation of Prof. Benim, Prof. Dr. Richard Bennett, the head of the Office of International Programs of **Southern Polytechnic State University, (SPSU) in Marietta, GA, USA** visited our department in Summer 2011. Following this visit, a bilateral cooperation agreement is undersigned with the **SPSU, Marietta, GA, USA**.

Left: Prof. Dr. Richard Bennett, Head of the Office of International Programs, Southern State Polytechnic University, Marietta, GA, USA.

Internationalization in Teaching

Incomings are good in English, but mostly not in German. For this reason, and for training our students (Internationalization@Home), the number of courses in English are increased. Master courses in English:

- Computational Fluid Dynamics I (Prof. Benim)
- Computational Fluid Dynamics II (Prof. Benim)
- Modeling and Simulation (Prof. Reichardt)
- Process Plant Simulation (Prof. Müller)

Bachelor courses in English:

- Biofluid Dynamics (Prof. Benim)
- Computer Oriented Technical Mechanics (Prof. Jahr)
- Heat Transfer II (Prof. Benim)
- Selected Topics in Energy Technology (Prof. Adam, Prof. Benim, Prof. Neef, Prof. Oesterwind)
- Technical Combustion (Prof. Benim)

Within the framework of the course "Freshman Project" (**Erstsemesterprojekt**), Prof. Benim initiated a project series with the title "**Ingenieure ohne Grenzen**", where different themes of internationalization are handled by a group of freshman students.

Acceptance conditions to our Master studies have been modified for achieving a fairer regulation for foreign students.

Teaching Staff Mobility



*Prof. Dr. K. Sutiene
(KTU, Lithuania)
and Prof. Reichardt*

Prof. Dr. Kristina Sutiene of the Kaunas Technical University, **Lithuania** visited our department in September 2011 for one week, within the framework of Erasmus teaching staff mobility.

She contributed to the courses of Prof. Reichardt, who invited Prof. Sutiene, in the field of numerical methods and simulation.

Invited by Prof. Benim and the Faculty, Prof. Dr. Sang-Ho Suh of the Soongsil University (Mechanical Engineering Department), Seoul, **Korea** visited our department for three months in the WS 2011/2012. He held the elective Bachelor course "Biofluid Dynamics" in English.

Approx. 12 students attended the course and, 8 of them took the examination.



*Prof. Dr. S. H. Suh
Soongsil University
Seoul, Korea*



Prof. Benim visited the Technical University of Cracow (TU Cracow) in **Poland** for two weeks in 2011, upon an invitation extended by the Institute for Energy Technology (Head: Prof. Dr. Jan Taler) of the Mechanical Engineering Department of the university.

At the TU Cracow, Prof. Benim held a series of lectures for the graduate students with the topic "Turbulence Modelling"

Left: Prof. Dr. A. C. Benim and Prof. Dr. Jan Taler (TU Cracow)

International Research



Prof. Weber with his instruments

Prof. Weber continued his research on dust and pollutant gas emissions from volcanos. With his team, Prof. Weber performed numerous measuring flights in **Italy**, to investigate the emissions from the volcanos Etna and Stromboli. He performed similar investigations for the volcano Grimsvötn in **Island**.

Prof. Weber was in Oslo, **Norway** for further flights and investigations with the AVOID system. Additionally, Prof. Weber

undersigned an agreement with **Airbus** for performing measuring flights. Furthermore, ISAVIA, the national airport and air navigation service provider of Island visited Prof. Weber in Düsseldorf. A further visit to the laboratories of Prof. Weber was performed by Dr. Tsanev from the University of Cambridge, **UK** for discussing the details of the measurement techniques applied.

Together with the Univ. of Geneva and Berlin, Prof. Weber investigated water droplet generation in humid air via laser filaments. The flights for the investigation were performed in Geneva, **Switzerland**. The results of the investigation were published twice in "**Nature**", which is a very renown international journal on natural sciences with very high ratings.



Prof. Weber with his plane

Prof. Benim continued his research cooperation with Prof. Chattopadhyay of Jadavpur University, **India** on convective heat transfer. Within this framework, a student of Prof. Chattopadhyay, Ms. Chaterjee visited CFD Lab of Prof. Benim for two months (funded by DAAD).

Prof. Shatha Ammourah from the Philadelphia University, **Jordan**, visited Prof. Benim for three months (funded by DFG) for collaborative research on biofluid dynamics.

Also Prof. Ayman Maqableh from the Al-Huson University College, **Jordan** visited Prof. Benim for three months in Summer 2011 (funded by DFG) for collaborative research on micro fluid dynamics.



E. Aslan, M.Sc.

Prof. Benim continued to host Erman Aslan. M.Sc. in his CFD Lab and supervise his research work within the framework of a cooperative promotion (Ph.D.) with the Sakarya University, **Turkey** (Turkish supervisor: Prof. Dr. I. Taymaz). These studies are being funded by the Sakarya University, Turkey.

Results if the research performed at the CFD Lab of Prof. Benim have been published in numerous **international journals** and **conferences**.



Prof. S. Amourah



Prof. A. Maqableh

Publications in International Journals

Y. Petit, S. Henin, J. Kasparian, J.P. Wolf, P. Rohwetter, K. Stelmaszczyk, Z.Q. Hao, W.M. Nakaema, L. Wöste, A. Vogel, T. Pohl, K. Weber, „Influence of pulse duration, energy, and focusing on laser-assisted water condensation”, Applied Physics Letters 98, 041105 (2011), doi: 10.1063/1.3546172

M. Petrarca, S. Henin, K. Stelmaszczyk, S. Bock, S. Kraft, U. Schramm, C. Vaneph, A. Vogel, J. Kasparian, R. Sauerbrey, K. Weber, L. Wöste, J.-P. Wolf, Wöste, L.; Wolf, "Multijoule scaling of laser-induced condensation in air", Applied Physics Letters 98, 041103 (2011), doi:10.1063/1.3646397

J. Eliasson, A. Palsson, K. Weber, "Monitoring ash clouds for aviation", Nature 475, 455 28 Jul 2011, doi: 10.1038/475455b

S. Henin, Y. Petit, P. Rohwetter, K. Stelmaszczyk, Z. Q. Hao, W. M. Nakaema, A. Vogel, T. Pohl, F. Schneider, J. Kasparian, K. Weber, L. Wöste, J.-P. Wolf, "Influence of pulse duration, energy, and focusing on laser-assisted water condensation", Nature Communications (2011) DOI: 10.1038/ncomms1462

M. L. Carapezza, F. Barberi, M. Ranaldi, T. Ricci, L. Tarchini, J. Barrancos, C. Fischer, N. Perez, K. Weber, A. Di Piazza, A. Gattuso, "Diffuse CO₂ soil degassing and CO₂ and H₂S concentrations in air and related hazards at Vulcano Island (Aeolian arc, Italy)" Journal of Volcanology and Geothermal Research, , 15 October 2011, Pages 130-144 doi:10.1016/j.jvolgeores.2011.06.010

K. Weber, J. Eliasson, A. Vogel, C. Fischer, T. Pohl, G. van Haren, M. Meier, N. Grobéty, D. Dahmann, „Airborne in-situ investigations of the Eyjafjallajökull volcanic ash plume on Iceland and over North-Western Germany with light aircrafts and optical particle counters Atmospheric Environment (2011), doi:10.1016/j.atmosens.2011.10.030.

A. C. Benim, M. Escudier, A. Nahavandi, K. Nickson, and K. J. Syed, "Computational Analysis of Incompressible Turbulent Flow in an Idealized Swirl Combustor", Progress in Computational Fluid Dynamics 11 (2011) 42-53.

A.M. Maqableh, A. F. Khadrawi, M. A. A-Nimr, S. A. Ammourah and A. C. Benim, "Heat Transfer Characteristics of Parallel and Counter Flow Heat Exchangers with Varying Wall Resistance", Progress in Computational Fluid Dynamics 11 (2011) 318-328.

A.C. Benim, A. Nahavandi, A. Assmann, D. Schubert, P. Feindt and S. H. Suh, "Simulation of Flow in Human Aorta with Emphasis on Outlet Boundary Conditions", Applied Mathematical Modelling 35 (2011) 3175-3188.

A.C. Benim, E. Aslan and I. Taymaz, "Lattice Boltzmann Method for Laminar Forced Convection in a Channel with a Triangular Prism", Heat Transfer Research 42 (2011) 359-377.

A.C. Benim, H. Chattopadhyay and A. Nahavandi, "Computational Analysis of Turbulent Forced Convection in a Channel with a Triangular Prism", International Journal of Thermal Sciences 50 (2011) 1973-1983.

A.C. Benim, F. Gul, A. Nahavandi, A. Assmann, P. Feindt and F. Joos, "Computational Analysis of Blood Flow in Human Aorta", International Journal of Emerging Multidisciplinary Fluid Sciences 2 (2011) 233-242.

H. Chattopadhyay and A. C. Benim, "Turbulent Heat Transfer on a Moving Surface due to Impinging Slot Jets", ASME Journal of Heat Transfer, 133 (2011) pp. 104502-1, 104502-5.

Publications in International Conferences

A. Vogel, K. Weber, C. Fischer, G. van Haren, G. C. Kollesch, S. Fuchs, S. Sadowski, "Measurements of hotel ship emissions of fine particles PM₁₀, PM_{2.5} and PM₁ at the river Rhine in Duesseldorf (Germany) Proceedings of the "MicroCAD 2011 - International Scientific Conference", 30-31 March 2011, Miskolc, Hungary.

A.C. Benim, K. Kuppa, P. Wollny, B. Pfeiffelmann, A. Al-Halbouni and A. Giese, "A Validation Study for Modelling Supersonic Combustion", Proc. "7th International Conf. on Computational Heat and Mass Transfer, July 18-22, 2011, Istanbul, Turkey", (2011) Paper No. 127.

A.C. Benim, F. Gul, A. Nahavandi, A. Assmann, P. Feindt and F. Joos, "CFD Analysis of Blood Flow in Human Aorta with Experimental Validation", Proc. "7th International Conf. on Computational Heat and Mass Transfer July 18-22, 2011, Istanbul, Turkey", Paper No. 128.

A.C. Benim, E. Aslan, I. Taymaz, "LBM Investigation of Laminar Forced Convection in a Channel with a Built-In Triangular Prism", Proceedings of the "7th International Conf. on Computational Heat and Mass Transfer, July 18-22, 2011, Istanbul, Turkey", Paper No. 129.

A.C. Benim, K. Kuppa, P. Wollny, B. Pfeiffelmann, A. Al-Halbouni and A. Giese, "CFD Analysis of Supersonic Combustion", Proc. "1st International Conf. on Naval Architecture and Maritime, 24-25 Oct., 2011, Yildiz Technical University, Istanbul, Turkey" pp. 393-404.

A.C. Benim, E. Aslan, I. Taymaz, "LBM Analysis of Heat and Fluid Flow", Proc. "1st International Conference on Naval Architecture and Maritime, 24-25 October, 2011, Yildiz Technical University, Istanbul, Turkey", pp. 725-734.

EDITORIAL STAFF

**This is an overview, which is not claimed to be exhaustive.
Some activities have been omitted due to space limitations.
We apologize, in advance, for any activity that might have
unintentionally be omitted due to an oversight.**

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