



Leibniz-Institut
für Festkörper- und
Werkstoffforschung
Dresden

Annual Report

2008

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Flashback to 2008

The Annual Report of the IFW presents a typical cross section of our scientific activities in the past year, highlighting main results in the first part and giving a somewhat more systematic overview of results obtained in our five Research Areas in its second part. It finally informs on the materialized and personalized output and activities, and on how the IFW is organized. The very first pages of the Annual Report we want to use for a flashback to the institutes life in 2008: highlights, events and important developments beyond scientific results.

In the very beginning of 2008 the cooperation agreement between the Martin Andersen Nexö High School and the IFW Dresden has been signed. The close cooperation results from the project "Teachers into Research" initiated by the IFW and supported by the Saxon Ministry of Cultural Affairs. Within this project physics teachers are released for one year from teaching to work scientifically in a research team at the IFW Dresden. After the first teacher who took part in this program in 2006/2007 returned to Martin Andersen Nexö High School the relation between the IFW and the high school continued and developed into a close partnership manifested now in a cooperation agreement. The IFW supports the high school students in their first steps to scientific work and organizes lab-tours for physics and chemistry school classes.

The IFW Winter School takes place every year in January to foster the scientific communication among IFW groups and to train young scientists in special topics of IFW's Research Program. In 2008 the topical focus was put on magnetism, the largest research area in the IFW's Research Program. The program of the four-day event included tutorial lectures of experts and short contributions of senior and junior scientists as well as some time for skiing and social gathering. All participants agreed that the IFW Winter School is a very useful event to strengthen the internal cooperation and to train the skills of senior and junior scientists.

On March 3, 2008, the IFW invited its partners, friends and sponsors to the Annual Reception. On this occasion Dr. Rudolf Schäfer was awarded the IFW Research Prize for his excellent and internationally renowned work on magnetic microstructures. The Deutsche Bank Junior Award was given to Dr. Karin Leistner for her outstanding PhD thesis on hard-magnetic Iron-Platinum films. A further highlight of this evening was the talk of Dorothee Dzwonnek, General Secretary of the German Research Foundation (DFG), on the excellence in research funding – a topic which refers to the current discussion in German research politics and which was discussed quite vividly.

Signing of the Cooperation Agreement between the IFW and the Nexö High School in presence of the State Minister Steffen Flath (right).

Lab-tour with the speakers of the Annual Reception: in the foreground State Secretary Neverman, in the middle Dorothee Dzwonnek.

Group picture of VIP during the official ceremony to mark the change of office of the Scientific Director.



An important event for the IFW in 2008 was the change of the Scientific Director. On April 1, 2008, Prof. Dr. Ludwig Schultz took over the directorship from Prof. Dr. Helmut Eschrig who has been in responsibility for the scientific work of the IFW Dresden during the last 10 years. On the occasion of the official ceremony on April 4 the Saxon Minister of Science and Arts, Dr. Eva-Maria Stange, the Leibniz President Prof. Ernst Th. Rietschel and the Rector of the Dresden University of Technology Prof. Hermann Kokenge appreciated the merits of Helmut Eschrig and congratulated Ludwig Schultz on taking office. The ceremony was accompanied by music of the IFW's chorus and of the IFW's brass band "nanonics". This was a nice opportunity to demonstrate the range of the institute's life in the IFW which reaches far beyond scientific communication.

The IFW as a Leibniz Institute is institutionally funded by the federal government and by the German Länder in equal shares. The justification of this funding has to be affirmed for each institute in intervals of about seven years by an Evaluation Group under a particular Senate Commission of the Leibniz Association. The prerequisite of confirmed funding is high-quality scientific work which meets the demands of the society of the whole country. IFW was visited by the Evaluation Group in April 2007. On 9 July 2008 the Leibniz Senate came to the final statement attesting the IFW a very good, often excellent scientific work, an effective combination of experiment and theory, a very convincing publication output, an excellent networking in the scientific community, a high training performance for young researchers and in the non-academic area and a very good fund raising. The statement of the Leibniz Senate includes eight suggestions and recommendations one of them being the strengthening of chemistry in the IFW.

The IFW participates as a starting member in the science network Sigma 5 (School of Solid State Sciences Saxony) which has a focus on chemistry, especially on materials synthesis and characterization techniques. This recent initiative coordinates and develops a number of matured bilateral cooperations so that the organization does not require supplementary legal constructions or additional administration. The academic school envelops academic teaching activities from undergraduate Bachelor studies up to final postdoctoral lecture qualifications. Thus, the regional cluster goes well beyond a typical graduate school. The aim of high quality and efficiency is tackled by integrating the widespread competences in research and education of all partner institutions. International Summer Schools on selected topics intensify the exchange of scientific expertise within Europe and combine the deepening of professional competence with the acquisition of desirable soft skills. To date, the cluster comprises a total of fourteen participants from the Technical Universities of Dresden and Freiberg as well as from the Leibniz, Fraunhofer and Max Planck Societies.

The present for the parting Scientific Director, Helmut Eschrig, was handed over by the artist Peter Makolies.

Prof. Dr. Ludwig Schultz (left) took over the directorship from Prof. Dr. Helmut Eschrig.

PhD seminar on project management and presentation

Women high school students try the work in a chemical lab during the Autumn School "Theoria cum praxi"



The number of PhD students working at the Institute is about 100 on average. Some of them spend guest stays or fellowships at the IFW and do their examinations at other places. Also the number of diploma and master students doing their theses at the IFW has been increased significantly during the last years resulting in the record number of 23 diploma theses in 2008. The training of students and young scientists is a very important concern of IFW's work. PhD and diploma students are involved in nearly all scientific projects and in the resulting publications. In regular internal PhD seminars and multi-day workshops they not only deepen the knowledge in their special fields but also acquire presentation and management skills. In the result five PhD students won best presentation awards at international conferences in 2008. However the promotion of young people starts not just as students but already in primary and secondary schools. The IFW is quite active in bringing science to school and in making kids excited of things like magnetism and superconductivity. As in the years before the IFW offered ambitious programs for the Girls' Day in April 2008 and for the Summer University in July and August 2008. 13 girls aged 12 to 18 used the excellent opportunity to gain insight into our electronic lab and the working life of a research institute. The experimental lectures of Prof. Schultz enriched events like the Kids' Academy in Görlitz and project days at high schools. In October 2008 the IFW launched a new project to encourage female high-school graduates to decide for a career in natural or engineering sciences – the Autumn Course "Theoria cum praxi" which is supported by the Saxon Ministry of Science and Arts for three years. 36 girls spent 4 days in the institute listening lectures, working in the laboratories and workshops and proving students' working day. Already traditionally, the IFW played also in 2008 an active role in some outstanding public events like Dresden Long Night of Sciences, Highlights of Physics in Halle, ThyssenKrupp Ideas' Park in Stuttgart and the Festival of Sciences in Genoa, Italy. The IFW regularly participates in public events of the TU Dresden like Students' Day and Physics at Saturday. Furthermore the IFW offers guided lab-tours for groups and school classes of which ample use is made.

The IFW is engaged in getting scientific conferences to Dresden and in organizing them. In 2008 IFW scientists were responsible for eight conferences, among them the International Conference on Rapidly Quenched and Metastable Materials (RQ13) and the International Workshops on Physics and Chemistry of FeAs-based Superconductors. 300 material scientists from all over the world came to Dresden in August 2008 for the RQ13 to present and discuss the latest results on metastable materials, quasicrystals, nanometer scale materials and bulk metallic glasses. The "International Workshops on Physics and Chemistry of FeAs-based Superconductors" was organized within a short term in October 2008 in reaction to the tremendous interest raised world-wide in the physics and chemistry of the new family of Fe-based compounds which exhibit superconducting transition temperatures above 50 K. A full list of conferences organized by the IFW in 2008 is given on page 111.

Participants of the Final European Workshop "Strengthening the role of women scientists in Nano-Science"

Autumn School "Theoria cum praxi" for women high school students

Full house and full courtyard in the IFW during the Dresden Long Night of Sciences 2008

Presentation of the superconducting train on the Science Festival in Genoa, Italy



All these conferences demonstrate that Dresden has developed to an attractive place for the scientific community. The IFW as one of the key players in this regional network of university and non-university research institutes takes much effort to improve further the collaboration between Dresden institutes to have a good starting position for the next call in the German excellence initiative.

Large efforts are being made by the IFW to acquire project funding. After some decrease in 2005 and 2006 caused by changes in positions of directors the level of third party funding has raised since 2007. For 2008 it achieves more than 10 Mio. Euro. A large amount of funding was acquired in competitive mode from the DFG and the EU. In particular the grant of a new Emmy Noether Research Group by the DFG for four years was a nice success. The IFW is very successful in initiating EU projects and participating in them. Four of the 26 EU-projects running in 2008 were coordinated by the IFW. Within the Saxon Excellence Initiative the IFW participates in 2 of the 5 programs granted from 2009 on, namely in the European Centre for Emerging Materials and Processes Dresden (ECEMP) and in the program "Functional structure design of new high performance materials".

2008 was again a yielding year with respect to prizes and honors awarded to members of the IFW. A complete list of prizes awarded to members of the IFW is included at the end of this Report. The most prestigious of the prizes won in 2008 by IFW members is the Gottfried-Wilhelm-Leibniz-Prize of the German Research Foundation, which has been awarded to Prof. Dr. Jürgen Eckert. Along with the great prestige of winning, Prof. Eckert is awarded a significant amount of prize money which can be used flexibly for the own research.

So we are looking back to a successful year 2008 in the Institute's development. We are quite aware that this is due to the sustainable network of colleagues and partners in universities, research institutes and industry, both on the regional and the international scale. We thank all of them for constructive cooperation and are looking forward to taking up future challenges together. Special tribute is paid to the members of the Scientific Advisory Board and of the Board of Trustees as well as the funding organizations that continuously support and foster the positive development of the IFW.

Dresden, January 2009

Prof. Ludwig Schultz
Scientific Director

Dipl.-Finw. Rolf Pfrengle
Administrative Director

Presentation of the Research Prizes of IFW Institutes during the first colloquium of the winter term

The Megalloys Team of the IFW was successful in the FutureSax contest and won the 1. Prize in the category technology.

IFW teams took part in various sports competitions, e.g. Dresden Marathon and Dresden Soccer Contest both benefiting from the team spirit and strengthening it.

IFW Summer Day – one example for improving the balance of work and family. In the afternoon all participants met in the courtyard to enjoy several games and a concert together with their families.