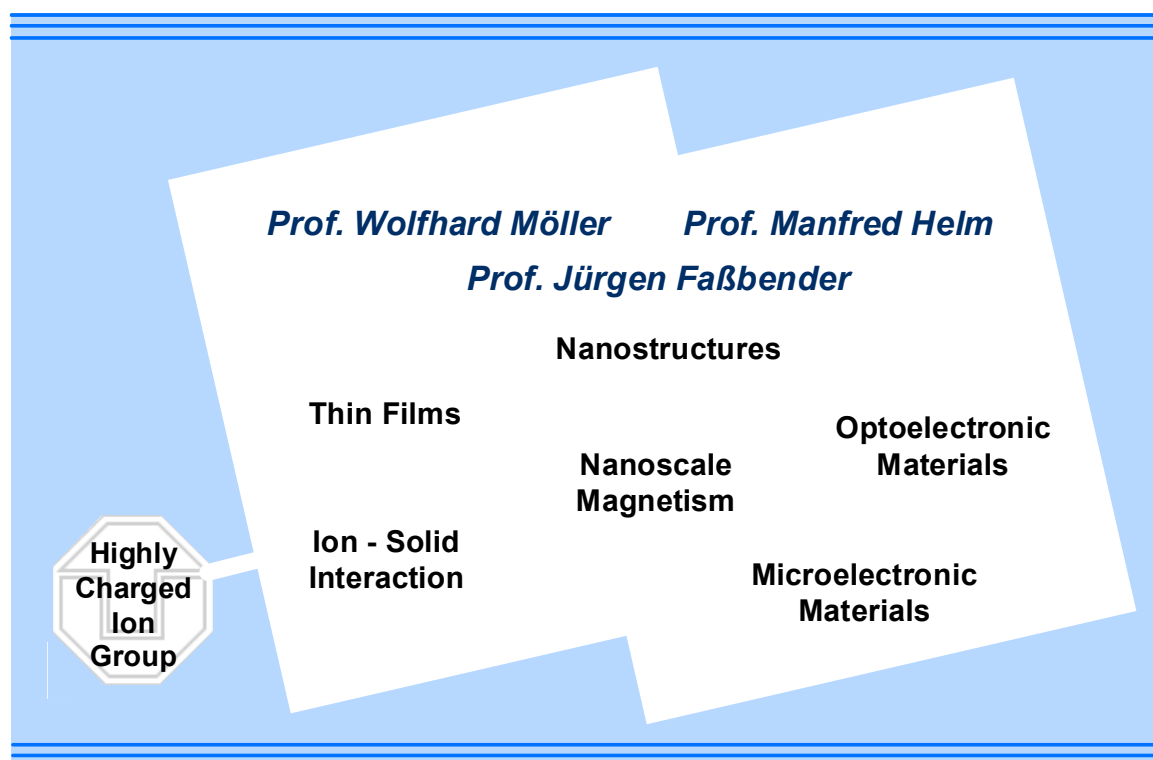


Preface by the Directors

The Institute of Ion Beam Physics and Materials Research (IIM) is one of the six institutes of the Forschungszentrum Dresden-Rossendorf (FZD), and contributes the largest part to its Research Program "Advanced Materials", mainly in the fields of semiconductor physics and materials research using ion beams. The institute operates a national and international Ion Beam Center, which, in addition to its own scientific activities, makes available fast ion technologies to universities, other research institutes, and industry. Parts of its activities are also dedicated to exploit the infrared/THz free-electron laser at the 40 MeV superconducting electron accelerator ELBE for condensed matter research. For both facilities the institute holds EU grants for funding access of external users.



The diagram displays the presently six R&D topics of the institute, together with the associated Highly Charged Ion (HCI) Group of the TU Dresden. The research activities span a wide range of topics relevant for future information processing and energy technology, be it in the realm of nanoelectronics, optoelectronics, magnetoelectronics, spintronics, and future photovoltaics. Readers familiar with our institute will notice the appearance of a third director in the diagram, Prof. Jürgen Faßbender. He is the designated successor of Prof. Wolfhard Möller, who will retire in the course of the year 2010. In order to enable a smooth transition, Prof. Faßbender was instated, after a competitive selection process, as of Oct. 1, 2009, both as a director at the institute and as Professor for Applied Solid State Physics at the Technical University Dresden. He is a world-renowned expert for magnetic materials and structures and their modification by ion beams. Already since 2004 he was a group leader at the institute.

Highlights of last year's research are presented in this Annual Report through reprints of short papers that were published in leading international journals. In 2009, IIM staff published more than 190 papers in peer-reviewed journals, the highest number ever in its history. But since not only quantity counts, institute members were also co-authors of two publications in the prestigious journal

"Nature Materials" and of five papers in Physical Review Letters, apart from about 60 more papers published at journals with impact factor >3.

2009 has again been an excellent year with respect to third party funding. Besides the continuation of the large project "Concepts of multifunctional memories" funded by the German Federal Government, the institute was successful in acquiring the large collaborative EU grant SPIRIT ("Support of Public and Industrial Research using Ion beam Technology") as a coordinator. This project constitutes a collaboration between the main ion beam laboratories in Europe and is granting transnational access to European users. Another essential part of funding arises from direct contracts with industry, including also local microelectronics and other high-tech industry. Thus also our funding spectrum reflects our span from successful basic science to relevant applied research.

An important milestone for the institute was the inauguration of a new 6 MV tandem accelerator on December 4, 2009, which was installed in a new, dedicated building. The machine will replace the outdated 5 MV Tandem for ion beam modification and analysis of materials, but additionally enable accelerator mass spectrometry (AMS). In relation to this, Dr. Silke Merchel, an AMS expert, joined the institute as a division head for ion beam analysis.

On the organizational side, FZD as a whole is preparing for its transition from being a member of the Leibniz Association of Research Institutes (WGL) to the Helmholtz Association of German Research Centers (HGF), which will formally take place in the beginning of 2011. This will require considerable changes in the way our research is funded, organized and administered. It will also open the way for new alliances and cooperations based on our scientific profile, and thus add to the stimulating atmosphere at the institute.

Finally we would like to cordially thank all partners, friends, and organizations who supported our progress in 2009. Special thanks are due to the Executive Board of the Forschungszentrum Dresden-Rossendorf, the Minister of Science and Arts of the Free State of Saxony, and the Minister of Education and Research of the Federal Government of Germany. Numerous partners from universities, industry and research institutes all around the world contributed essentially, and play a crucial role for the further development of the institute. Last but not least, the directors would like to thank all IIM staff for their efforts and excellent contributions in 2009.



Prof. Wolfhard Möller



Prof. Manfred Helm



Prof. Jürgen Faßbender