

physica **p** status **s** solida **S**

[www.pss-c.com](http://www.pss-c.com)

**Proceedings**

International Conference on  
Extended Defects in Semiconductors  
Halle, Germany, 17–22 September 2006

**Guest Editor**  
Hartmut S. Leipner



 **WILEY-VCH**

phys. stat. sol.  
(a) **204**, No. 7, 2185–2260 (2007), (c) **4**, No. 8, 2871–3122 (2007)

Discover papers in this journal online, ahead of the print issue, through EarlyView® at  
 **WILEY InterScience®**  
DISCOVER SOMETHING GREAT  
[www.interscience.wiley.com](http://www.interscience.wiley.com)

## Preface

This issue of *physica status solidi – Proceedings* contains papers presented as oral and poster contributions at the International Conference on Extended Defects in Semiconductors (EDS 2006) held in Halle, Germany, on 17–22 September 2006. The event was organized by the Martin-Luther-Universität Halle–Wittenberg, the Max-Planck-Institut für Mikrostrukturphysik Halle, and the Fraunhofer-Institut für Werkstoffmechanik Halle. The EDS conference series was inaugurated in Hünfeld (Germany) and followed by conferences in Poland, France, Great Britain, Germany, and Russia. The EDS 2006 is the direct follower of the conferences of 2002 held in Bologna (Italy) and 2004 in Chernogolovka (Russia). Although there were some difficulties in numbering the EDS conferences, we followed the scheme introduced at the conference in Brighton 2000 and define our meeting as EDS13. In order to appreciate the 1200th anniversary of the city of Halle in 2006, we selected the famous five towers of the market square as the conference logo. The dislocation expert, however, will recognize a dislocation line, pinned by glide obstacles.

The aim of the conference was to provide a forum on the current state of art of investigation and modeling of extended defects in semiconductors in order to achieve a deeper understanding of lattice imperfections, their interaction, and their role in the development of semiconductor technology. The following main topics were covered: Structure of defects, defect imaging, structure modelling, electronic structure of extended defects, mechanical properties and dislocation dynamics, interaction between different kinds of defects, structure of strained layers, compliant substrates, wafer bonding, defects in thin films and interfaces, interface structures, role of extended defects in devices, utilizing of defects for devices, wide band gap materials (SiC, diamond, ZnO, III–V nitrides), defects in solar cell materials and photovoltaic devices, embedded semiconductor nanoparticles, and quantum-dot-like “extended defects”.

As a new topic, we introduced a crossover between extended defects and nanostructures in semiconductors. We think that the comparison of experiments and the theoretical description of extended defects and nanostructures in semiconductors may give exciting new insights into the understanding of dimensionally confined systems in general. This approach will certainly be extended in the next EDS conference to be held in Poitiers, France, in 2008.

We dedicate this proceedings volume to our friend and colleague Jürgen Schreiber, who suddenly passed away during the preparation of this conference. His cathodoluminescence studies on dislocations in semiconductors will be a lasting contribution to the defect community.

Hartmut S. Leipner, Martin Kittler  
Conference Chairmen

Halle, January 2007

## **Conference Committees**

### **Conference Chairmen**

Hartmut S. Leipner, Interdisziplinäres Zentrum für Materialwissenschaften,  
Martin-Luther-Universität Halle-Wittenberg  
Martin Kittler, IHP Frankfurt (Oder) and IHP/BTU Joint Lab Cottbus

### **Organizing Committee**

Otwin Breitenstein, Max-Planck-Institut für Mikrostrukturphysik Halle  
Silke Christiansen, Martin-Luther-Universität Halle-Wittenberg  
Frank Heyroth, Martin-Luther-Universität Halle-Wittenberg  
Reinhard Krause-Rehberg, Martin-Luther-Universität Halle-Wittenberg  
Matthias Petzold, Fraunhoferinstitut für Werkstoffmechanik Halle  
Jürgen Schreiber<sup>†</sup>, Martin-Luther-Universität Halle-Wittenberg  
Peter Werner, Max-Planck-Institut für Mikrostrukturphysik Halle

### **Scientific Committee**

Anna Cavallini, University of Bologna, Italy  
Cor Claeys, IMEC, Leuven, Belgium  
Malcolm Heggie, University of Sussex, Brighton, United Kingdom  
Robert Hull, University of Virginia, Charlottesville, USA  
Robert Jones, University of Exeter, United Kingdom  
Martin Kittler, IHP Frankfurt (Oder) and IHP/BTU Joint Lab Cottbus, Germany  
Vitaly V. Kveder, Institute of Solid State Physics RAS, Chernogolovka, Russia  
Hartmut S. Leipner, University of Halle-Wittenberg, Germany  
Bernard Pichaud, Université Aix-Marseille III, France  
Pirouz Pirouz, Case Western Reserve University, Cleveland, USA  
Sergio Pizzini, University of Milano-Bicocca, Italy  
Jacques Rabier, University of Poitiers, France  
Horst P. Strunk, University of Erlangen-Nürnberg, Germany  
Guy Vanderschaeve, CEMES-CNRS, Toulouse, France  
Eicke R. Weber, Fraunhofer Institute for Solar Energy Systems, Freiburg, Germany  
Tadeusz Wosiński, Institute of Physics PAS, Warsaw, Poland  
Ichiro Yonenaga, Tohoku University, Sendai, Japan

### **Conference Sponsors**

Deutsche Forschungsgemeinschaft  
Stadt Halle (Saale)  
Martin-Luther-Universität Halle-Wittenberg  
Max-Planck-Institut für Mikrostrukturphysik  
point electronic GmbH Halle  
JEOL (Deutschland) GmbH  
Freiberger Compound Materials GmbH  
Carl Zeiss SMT AG  
Air Liquide Deutschland GmbH  
Q-Cells AG