

## Bibliographical Sketch

### Prof. Dr.-Ing. Peter Haring Bolívar

<b>Date of Birth</b>	March, 20 <sup>th</sup> 1969
<b>Academic Education</b>	<b>1987 –92:</b> Studies in Electrical Engineering, RWTH Aachen <b>1993 –97:</b> PhD studies at the Inst. for Electronic Semiconductors, RWTH Aachen <b>2001 –04:</b> Habilitation at the Inst. for Electronic Semiconductors, RWTH Aachen
<b>Professional Career</b>	<b>1992 –93:</b> Head of the Rescue Equipment Division at <i>Náutica Diesel Europea S.A. de C.V.</i> in Mexico City, Mexico <b>1993 –97:</b> Researcher, Inst. for Electronic Semicond., RWTH Aachen <b>1997 –04:</b> Head (C1) of the High Frequency group and Oberingenieur (C2) , Inst. for Electronic Semiconductors, RWTH Aachen <b>Since 2004:</b> Professur (C4) for High Frequency Technology and Quantum Electronics, University of Siegen
<b>Teaching</b>	High Frequency Technology, Opto-Electronics, Optical Information Technology, Semiconductor Technology
<b>Research and Scientific Interests</b>	<ul style="list-style-type: none"> <li>• Terahertz Technology, Analytics and Imaging</li> <li>• Optical Mass Storage, Persistent Storage</li> <li>• Integrated Optics</li> <li>• Ultra fast Opto-Electronics</li> </ul>
<b>Memberships</b>	<ul style="list-style-type: none"> <li>• Europ. Optical Society; Speaker of the THz Technology group</li> <li>• NRW Center for Sensor Systems (ZESS)</li> <li>• OSA, IEEE, DPG, SPIE</li> </ul>
<b>Committees and Reviewing</b>	<ul style="list-style-type: none"> <li>• Conference Chair “Innovative Mass Storage Techniques” (IMST)</li> <li>• Reviewer for DFG and EU</li> <li>• Reviewer for Appl. Physics Letter (APL), Phys. Review Letter (PRL), Optics Letter (OL), IEEE MW Theory &amp; Techn. (T-MTT)</li> </ul>
<b>Awards</b>	<ul style="list-style-type: none"> <li>• 1993 –95 Heinrich Hertz Scholarship, Research Ministry NRW</li> <li>• 1997 Wilhelm Borchers Medal, RWTH Aachen</li> <li>• 2003 Innovation Award University contest „Patente Erfinder“, NRW</li> <li>• 2005 Friedrich Wilhelm Award, RWTH Aachen</li> </ul>
<b>PhD Students</b>	<ul style="list-style-type: none"> <li>• 3 doctorats as 2<sup>nd</sup> supervisor</li> <li>• 6 ongoing docotrates</li> </ul>
<b>Förderprojekte</b>	<b>2004 –08:</b> “Teranova”: Optical THz Technology (EU IP) <b>2004 –08:</b> “Metamorphose”: Meta materials(EU NoE) <b>2005 –07:</b> 3D THz Imaging (DFG, Ha3022/5-1, PAK 73) <b>2005 –08:</b> Non-apertur THz Near Field Microscopy (DFG, Ha3022/4-1) <b>2006 –09:</b> 3D THz Systems (BMBF cooperative project “Lynkeus”) <b>2007 –09:</b> Surface Plasmon Polariton THz Sensors (DFG, Ha3022/6-1) <b>2007 –10:</b> Bolometric und Heterodyn THz Detektors (BMBF cooperative project “Teracam”) <b>2007 –10:</b> “Dotfive”: THz Hetero Bipolar Transistors (EU IP) <b>2008 –10:</b> Development of integral hetero-sensor architectures for n-dimensional (bio)chemical analysis (Graduiertenkolleg, Uni. Siegen) <b>2008 –11:</b> „Ultra“: Broadband THz-Electronics (EU, STRP)
<b>Patents</b>	<ul style="list-style-type: none"> <li>• “Identification Method for Polynucleotid-Sequences”, patent for D, US, GB, LU, AU, CH, FR.</li> <li>• “Manufacturing Method for conducting Structures in organic electronic Devices with Embossing Procedures”, application in D.</li> <li>• „Lateral Phase Cambist Storage“, application in D, EU, PCT</li> <li>• „Integrated sensing probes, methods of fabrication thereof, and methods of use thereof“, application US</li> </ul>
<b>Internet</b>	<a href="http://www.hge.uni-siegen.de/">http://www.hge.uni-siegen.de/</a>

## Publications (since 2002)

1. Debus, C. ; Haring Bolívar, P.: Frequency selective surfaces for high sensitivity terahertz sensing. In: *Appl. Phys. Lett.* 91, 2007, Nr. 18. - DOI: 10.1063/1.2805016.
2. Merget, F. ; Kim, D.-H. ; Haring Bolívar, P. ; Kurz, H.: Lateral phase change random access memory cell design for low power operation. In: *Microsystem Technologies- micro-and nanosystems-information storage and processing systems 13*. Berlin : Springer, 2007, Nr. 2. - DOI: 10.1007/s00542-006-0141-z, S. 169-172.
3. Kuttge, M. ; Kurz, H. ; Gómez Rivas, J. ; Sanchez-Gil, J.A. ; Haring Bolívar, P.: Analysis of the propagation of terahertz surface plasmon polaritons on semiconductor groove gratings. In: *Journal of Applied Physics* 101. 2007, Nr. 2. - Art. No. 023707.
4. Debus, C. ; Voltolina, F. ; Haring Bolívar, P.: New concepts for THz biomolecular sensing systems. In: *4ième Journée THz*. Bombannes, Frankreich, 2007. - URL: <http://www.cpmoh.cnrs.fr/html/UserFiles/File/Bombannes/haringBordeaux2006.pdf>.
5. Debus, C. ; Voltolina, F. ; Haring Bolívar, P.: Towards Cost-Efficient THz Biochip Technologies. In: *2007 IEEE Antennas and Propagation Society Meeting*. Honolulu, Hawaii, 2007.
6. Haring Bolívar, P.: Perspectives for high sensitivity THz biosensing. In: *Academy Colloquium, Royal Dutch Society of Science and Arts*. Amsterdam, Niederlande, 2007.
7. Debus, C. ; Voltolina, F. ; Surawicz, D. ; Haring Bolívar, P.: New approaches for high-sensitivity THz biosensing systems. In: *International Symposium Topical Problems of Biophotonics*. Moscow, Russia, 2007.
8. Haring Bolívar, P.: Biological applications of THz sensing. In: *Infrared and Millimeter Wave Conference*. Cardiff, United Kingdom, 2007.
9. Surawicz, D. ; Haring Bolívar, P. ; Shin, H.-J. ; Mizaikoff, B.: Surface Plasmon Polariton-based Coaxial Probe for Terahertz Near-field Microscopy. In: *Conference on Lasers and Electrooptics / Quantum Electronics and Laser Science Conference*. Baltimore, Maryland, USA, 2007.
10. Debus, C. ; Haring Bolívar, P.: Frequency Selective Surfaces for High-Sensitivity Terahertz Sensors. In: *Conference on Lasers and Electrooptics / Quantum Electronics and Laser Science Conference*. Baltimore, Maryland, USA, 2007.
11. Gómez Rivas, J. ; Kuttge, M. ; Kurz, H. ; Haring Bolívar, P. ; Sanchez-Gil, J.A.: Low-frequency active surface plasmon optics on semiconductors. In: *Appl. Phys. Lett.* 88, 2006, Nr. 8. - DOI: 10.1063/1.2177348. ISSN: 00036951.
12. Gómez Rivas, J. ; Sanchez-Gil, J.A. ; Kuttge, M ; Haring Bolívar, P. ; Kurz, H.: Optically switchable mirrors for surface plasmon polaritons propagating on semiconductor surfaces. In: *Phys. Rev. B* 74. 2006, Nr. 24. - DOI: 10.1103/PhysRevB.74.245324.
13. Surawicz, D. ; Haring Bolívar, P. ; Shin, H. ; Mizaikoff, B.: New concepts for near-field sensors operating in the THz frequency range. In: *Proceedings of the 2006 International Symposium on Spectral Sensing Research (ISSSR-2006)*. Bar Harbor, Maine, USA, 2006, S. 164.

14. Gómez Rivas, J. ; Janke, C. ; Haring Bolívar, P. ; Kurz, H.: Transmission of THz radiation through InSb gratings of subwavelength apertures. In: *Optics Express* 13, 2005, Nr. 3, S. 847-859.
15. Nagel, M. ; Haring Bolívar, P. ; Kurz, H.: Modular parallel-plate THz components for cost-efficient biosensing systems. In: *Semiconductor Science and Technology* 20, 2005, Nr. 7. - DOI: 10.1088/0268-1242/20/7/019, S. 281-285.
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17. Berdel, K. ; Gómez Rivas, J. ; Haring Bolívar, P. ; de Maagt, P. ; Kurz, H.: Temperature dependence of the permittivity and loss tangent of high-permittivity materials at terahertz frequencies. In: *IEEE transactions on microwave theory and techniques* 53, 2005, Nr. 4, S. 1266-1271.
18. Gómez Rivas, J. ; Farré Benet, A. ; Niehusmann, J. ; Haring Bolívar, P. ; Kurz, H.: Timeresolved broadband analysis of slow-light propagation and superluminal transmission of electromagnetic waves in three-dimensional photonic crystals. In: *Phys. Rev. B* 71, 2005, Nr. 15. - DOI: 10.1103/PhysRevB.71.155110.
19. Kim, D.H. ; Merget, F. ; Laurenzis, M. ; Haring Bolívar, P. ; Kurz, H.: Electrical percolation characteristics of Ge<sub>2</sub>Sb<sub>2</sub>Te<sub>5</sub> and Sn doped Ge<sub>2</sub>Sb<sub>2</sub>Te<sub>5</sub> thin films during the amorphous to crystalline phase transition. In: *Journal of Applied Physics* 97, 2005, Nr. 8. - DOI: 10.1063/1.1875742.
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21. de Maagt, P. ; Haring Bolívar, P. ; Mann, C.: Terahertz science, engineering and systems - from space to earth applications. In: Chang ; K. (Hrsg.): *Encyclopedia of RF and Microwave Engineering*. Hoboken, N.J. : John Wiley, 2005. - ISBN 0-471-27053-9, S. 5175-5194.
22. Nüsse, S. ; Wolter, F. ; Haring Bolívar, P. ; Köhler, K. ; Hey, R. ; Grahn, H.T. ; Kurz, H.: Intraband coherence of Bloch oscillations after momentum scattering. In: *Appl. Phys. A* 78, 2004, Nr. 4. - DOI: 10.1007/s00339-003-2409-9, S. 491-495.
23. Janke, C. ; Gómez Rivas, J. ; Schotsch, C. ; Beckmann, L. ; Haring Bolívar, P. ; Kurz, H.: Optimization of enhanced terahertz transmission through arrays of subwavelength apertures. In: *Physical Review B* 69, 205314, 2004. - DOI: 10.1103/PhysRevB.69.205314.
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25. Gómez Rivas, J ; Haring Bolívar, P. ; Kurz, H.: Thermal switching of the enhanced transmission of terahertz radiation through subwavelength apertures. In: *Opt. Lett.* 29, 1680, 2004, Nr. 14. - URL: <http://www.opticsinfobase.org/abstract.cfm?id=80572>.
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29. Haring Bolívar, P. ; Brucherseifer, M. ; Gómez Rivas, J. ; Gonzalo, R. ; Ederra, I. Reynolds, A. ; Holker, M. ; de Maagt, P.: Measurement of the Dielectric Constant and Loss Tangent of High Dielectric Constant Materials at Terahertz Frequencies. In: *IEEE Transactions on Microwave Theory and Techniques* 51, 2003, Nr. 4. - DOI: 10.1109/TMTT.2003.809693, S. 1062-1066.
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37. Laurenzis, M. ; Först, M. ; Haring Bolívar, P. ; Kurz, H.: Influence of hot carrier diffusion on the density limitation of optical data storage. In: *Japanese Journal of Applied Physics* 43, 2004, Nr. 7B. - DOI: 10.1143/JJAP.43.4700, S. 4700-4703.
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44. Gonzalo, R. ; Martinez, B. ; Mann, C.M. ; Pellemans, H.P.M. ; Haring Bolívar, P. ; de Maagt, P.: A Low-Cost Fabrication Technique for Symmetrical and Asymmetrical Layer-by-Layer Photonic Crystals at Submillimeter-Wave Frequencies. In: *IEEE Transactions on Microwave Theory and Techniques* 50, 2002, Nr. 10. - DOI: 10.1109/TMTT.2002.803446, S. 2384-2392.