

PROF. DR. MARKUS R. WAGNER

PERSONAL DATA

Work address: Technische Universität Berlin / Berlin Institute of Technology
Institut für Festkörperphysik / Institute of solid state physics
Hardenbergstr. 36, 10623 Berlin, Germany

Date / Place of birth: 23 Feb. 1979 / Berlin, Germany

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ACADEMIC DEGREES

- 2020 **Habilitation (Dr. habil.):** TU Berlin, Germany
Venia Legendi for experimental physics
Thesis: "*Phononic and photonic semiconductor nanostructures: Transport, coherence, confinement, and dynamics of phonons and excitons in single and periodic nanostructures*"
- 2011 **Doctorate (Dr. rer. nat.):** TU Berlin, Germany (summa cum laude)
Specialization: Optical properties of semiconductor nanostructures,
Thesis: "*Fundamental properties of excitons and phonons in ZnO: A spectroscopic study of the dynamics, polarity, and effects of external fields*"
- 2005 **Diplom (Dipl. Phys.):** TU Berlin, Germany (1.0)
Major subjects: Solid-state physics / applied physics / particle physics
Thesis: "*Optical spectroscopy of defects and impurities in ZnO*"

WORK EXPERIENCE

- 2020 – date **Visiting Professor / Group Leader** – Semiconductor Nanophononics and Nanophotonics Group (AG Wagner), Institute of solid state physics, TU Berlin, Germany
- 2016 – 2019 **Principal Investigator / Senior Scientist** – DFG Collaborative Research Center CRC787 "*Semiconductor Nanophotonics*", TU Berlin, Germany
- 2014 – 2016 **Marie Curie Research Fellow** – Catalan Institute of Nanoscience and Nanotechnology (ICN2), Barcelona, Spain
- 2012 – 2014 **Postdoctoral Researcher** – Catalan Institute of Nanoscience and Nanotechnology (ICN2), Barcelona, Spain
- 2012 **Postdoctoral Researcher** – Institute of solid state physics, TU Berlin, Germany
- 2011 **Postdoctoral Researcher** – Microstructure Analysis Unit, University of Technology Sydney, Australia
- 2008 – 2011 **Research Associate** – DFG Cluster of Excellence "*Unifying concepts in catalysis*", TU Berlin, Germany
- 2005 – 2008 **Ernst-von-Siemens PhD Fellow** – Institute of solid state physics, TU Berlin, Germany
- 2004 **Exchange Student** – Microstructure Analysis Unit, University of Technology Sydney, Australia
- 1999 – 2004 **Student** – Physics (Diplom), TU Berlin, Germany

TEACHING

2018 - date	Student supervisor within the “advanced laboratory course” (“Fortgeschrittenen Praktikum) for experiments on Raman spectroscopy
2017 - date	Lecturer of the M.Sc. Seminar "Selected topics of solid-state physics - Nanophotonics and semiconductor nanostructures
2016 - date	Lecturer of the undergraduate course “ <i>Physics for Engineers</i> ” with >300 students, Student supervisor within the graduate laboratory courses “ <i>Applied Physics</i> ” and “ <i>Solid State Physics</i> ” on time resolved and Raman spectroscopy
2014 – 2015	Lecturer and co-initiator of the “ <i>Open Knowledge Lecture Series</i> ”, Course title: “ <i>Using photons to study the properties of condensed matter</i> ”, Catalan Institute of Nanoscience and Nanotechnology (ICN2), Spain
2012	Student supervisor for the graduate laboratory courses “ <i>Applied Physics</i> ” and “ <i>Solid State Physics</i> ” on time resolved and Raman spectroscopy, TU Berlin, Germany
2011	Lecturer of graduate course “ <i>Optical spectroscopy and electronic structure of wide band gap semiconductors and nanostructures</i> ”, UTS Sydney, Australia
2008 – 2010	Teaching Assistant for the solid-state physics and applied physics laboratory courses for graduate students at TU Berlin, Germany

FELLOWSHIPS / AWARDS

2017	Ramon y Cajal fellowship (RyC) – 96.4%
2014	Marie Curie fellowship award
2013	Marie Curie postgraduate fellowship (IEF) – 93.9%
2006	Academic scholarship of e-fellows.net
2005	Ernst-von-Siemens scholarship for PhD studies
2004	Exchange scholarship of the TU Berlin for studies at UTS
2003	Scholarship of DESY for the International Summer Student Program

COMMISSIONS OF TRUST

Program Committee:	SPIE Photonics West - Oxide-based Materials and Devices, 2018 - date
Board of Trustees:	Magnus Haus Berlin (DFG), 2019 - date
Editorial Board:	Advances in Condensed Matter Physics, 2012 - date Functional Nanomaterials Journal, 2016-2019
Project Reviewer:	Romanian National Plan for Research, Development, and Innovation, 2015-2020 Polish National Science Center, 2016
Journal Reviewer:	Physical Review X, Physical Review Letters, Nature Communications, ACS Nano Letters, ACS Applied Materials, Laser & Photonics Reviews, Scientific Reports

LANGUAGES

Languages:	German (native) English: C2 (proficiency) Spanish: A2 (basics)
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FUNDED PROJECTS

Project title (acronym)	Funding source Call for proposal	Funding € own (total)	Period	Role within project
Point defects control in Ga ₂ O ₃ thin films grown via molecular beam epitaxy	DFG Research Grant, Germany	249,750 (614,850)	01/2016 to 12/2019	Principal investigator
Semiconductor nanophotonics: Materials, Models, Devices, 3rd funding period, project A5	DFG, Collaborative Research Center 787, Germany	635,800 (11,332,500)	01/2016 to 12/2019	Principal investigator
Nanophotonics meets nanophonics – Materials for novel light sources	UTS-TUB key technology partnership program	10,000	09/2017 to 08/2018	Principal investigator
Heat Propagation and Thermal Conductivity in Nanomaterials for Nanoscale Energy Management (HeatProNano)	EU FP7-PEOPLE-2013-MC-IEF, grant no.: 628197	166,336 (166,366)	03/2014 to 02/2016	Principal investigator
Membrane-based phonon engineering for energy harvesting (MERGING)	EU FP7-ENERGY-2012-1-2STAGE, grant no.: 309150	655,218 (3,698,667)	01/2013 to 12/2015	Researcher
Nanostructured Efficient White LEDs based on short-period superlattices and quantum dots (NEWLED)	EU FP7-ICT-2011-8, grant no.: 318388	1,171,296 (11,760,277)	11/2012 to 10/2016	Researcher
Innovative nano and micro technologies for advanced thermo and mechanical interfaces (NANOTHERM)	EU FP7-ICT-2011-8 grant no.: 318117	226,764 (9,514,464)	09/2012 to 08/2016	Scientific responsible
Carbon-based smart systems for wireless applications (NANORF)	EU FP7-ICT-2011-8, grant no.: 318352	255,761 (6,249,195)	09/2012 to 05/2016	Scientific responsible
Semiconductor nanophotonics: Materials, Models, Devices, 2nd funding period, project A6	DFG, Collaborative Research Center 787, Germany	494,377 (10,559,500)	01/2012 to 12/2015	Researcher
Materials World Network: Science of Polar Homo- and Heterointerfaces	NSF / DFG grant no.: 1108071	600,000 US\$	08/2011 to 05/2016	Researcher
Tailoring electronic and phononic properties of nanomaterials: Towards ideal Thermoelectricity (nanoTHERM)	MICINN CONSOLIDER grant no.: CSD2010-00044	950,494 (3,900,000)	01/2011 to 12/2015	Researcher
Total acquired funding as PI		1,061,886		

PUBLICATIONS

Publications: 87 journal articles (2 under review), 4 book chapter
Citations: 3274 (Google Scholar), 2203 (Web of Science)
h-index: 34 (Google Scholar), 29 (Web of Science)
Researcher ID: A-3582-2009
ORCID ID: 0000-0002-7367-5629

OVERVIEW OF SELECTED PUBLICATIONS:

- 1 Applied Physics Reviews (IF2019 = 17.1)
- 2 Advanced Functional Materials (IF2019 = 16.8)
- 1 ACS Nano (IF2019 = 14.6)
- 1 Nature Communications (IF2019 = 12.1)
- 2 Nano Letters (IF2019 = 11.3)
- 4 Chemistry of Materials (IF2019 = 9.6)
- 1 Chemical Science (IF2019 = 9.3)
- 2 ACS Photonics (IF2019 = 6.9)
- 2 Nanoscale (IF2019 = 6.9)
- 1 Journal of Physical Chemistry Letters (IF2019 = 6.7)
- 1 Journal of Physical Chemistry C (IF2019 = 4.2)
- 2 APL Materials (IF2019 = 3.8)
- 14 Physical Review B (IF2019 = 3.6)
- 8 Applied Physics Letters (IF2018 = 3.6)
- 8 Journal of Applied Physics (IF2018 = 2.3)

Under review:

- 1 Journal of Materials Chemistry C, 1 Applied Physics Letters

BOOK CHAPTERS

- **Semiconductor Nanophotonics – Materials, Models, and Devices**
Ed. M. Kneissl, A. Knorr, S. Reitzenstein, and A. Hoffmann
Chapter: **Optical and Structural Properties of Nitride Based Nanostructures**
F. Bertram, C. Berger, J. Christen, H. Eisele, L. A. Th. Greif, A. Hoffmann, J. Maultzsch, M. Müller, E. Poliani, G. Schmidt, P. Veit, and M. R. Wagner
[Springer Series in Solid-State Science, Vol. 194, ISBN: 978-3-030-35655-2 \(2020\).](#)
- **Semiconductor Nanophotonics – Materials, Models, and Devices**
Ed. M. Kneissl, A. Knorr, S. Reitzenstein, and A. Hoffmann
Chapter: **Nitride Microcavities and Single Quantum Dots for Classical and Non-classical Light Emitters**
G. Schmidt, C. Berger, A. Dadgar, F. Bertram, P. Veit, S. Metzner, A. Strittmatter, J. Christen, S. T. Jagsch, M. R. Wagner, and A. Hoffmann
[Springer Series in Solid-State Science, Vol. 194, ISBN: 978-3-030-35655-2 \(2020\).](#)
- **21st Century Nanoscience – A Handbook: Nanophysics Sourcebook**
Ed. K. Sattler
Chapter: **Thermal transport and phonon coherence in phononic nanostructures**
J. S. Reparaz and M. R. Wagner
[Taylor & Francis \(CRC Press\) in 10 volumes, Vol. 1, ISBN: 978-0-367-33300-3 \(2019\).](#)
- **Zinc oxide: From fundamental properties towards novel applications**
Ed. C. F. Klingshirn, B. K. Meyer, A. Waag, A. Hoffmann, and J. Geurts
Chapter: **Influence of External Fields**
M. R. Wagner and A. Hoffmann
[Springer Series in Materials Science, Vol. 120, ISBN: 978-3-642-10576-0 \(2010\).](#)

JOURNAL ARTICLES

89. **Observation of nanoscale InN clusters and compositional inhomogeneities in InGaN epitaxial layers by tip enhanced Raman scattering**
D. Seidlitz, E. Poliani, M. Ries, A. Hoffmann, and [M. R. Wagner](#)
[Applied Physics Letters](#) (under review) (2020).
88. **Isotopic study of Raman active phonon modes in β -Ga₂O₃**
B. M. Janzen, P. Mazzolini, R. Gillen, A. Falkenstein, M. Martin, H. Tornatzky, O. Bierwagen, and [M. R. Wagner](#)
[Journal of Materials Chemistry C](#) (under review) (2020).
87. **A 310 nm optically pumped AlGaN vertical-cavity surface-emitting laser**
F. Hjort, J. Enslin, M. Cobet, M. A. Bergmann, J. Gustavsson, T. Kolbe, A. Knauer, F. Nippert, I. Häusler, [M. R. Wagner](#), T. Wernicke, M. Kneissl, and Å. Haglund
[ACS Photonics](#) (accepted) (2020).
86. **Strong near-field light-matter interaction in plasmon-resonant tip-enhanced Raman scattering in indium nitride**
E. Poliani, D. Seidlitz, M. Ries, S. J. Choi, J. S. Speck, A. Hoffmann, and [M. R. Wagner](#)
[Journal of Physical Chemistry C](#) (accepted) (2020).
85. **Influence of Polymorphism on the Electronic Structure of Ga₂O₃**
J. E. N. Swallow, C. Vorwerk, P. Mazzolini, P. Vogt, O. Bierwagen, A. Karg, M. Eickhoff, J. Schörmann, [M. R. Wagner](#), J. W. Roberts, P. R. Chalker, M. J. Smiles, P. A. E. Murgatroyd, S. A. Razek, Z. W. Lebens-Higgins, L. F. J. Piper, L. A. H. Jones, P. K. Thakur, T.-L. Lee, J. B. Varley, J. Furthmüller, C. Draxl, T. D. Veal, and A. Regoutz
[Chemistry of Materials](#) **32**, 8460 (2020)
84. **Vibrational dynamics in lead halide hybrid perovskites investigated by Raman spectroscopy**
J. Ibaceta-Jaña, R. Muydinov, P. Rosado, H. Mirhosseini, M. Chugh, O. Nazarenko, D. Dirin, D. Heinrich, [M. R. Wagner](#), T. D. Kühne, B. Szyszka, M. Kovalenko, and A. Hoffmann.
[Physical Chemistry Chemical Physics](#) **20**, 5604 (2020).
83. **Triple group V donors in ZnO**
M. Hegde, F. Mohammadbeigi, T. Kure, E. Senthil Kumar, [M. R. Wagner](#), A. Hoffmann, and S. P. Watkins
[Journal of Applied Physics](#) **127**, 075705 (2020).
82. **Localized thinning for strain concentration in suspended germanium membranes and optical method for precise thickness measurement**
P. O. Vaccaro, M. I. Alonso, M. Garriga, J. Gutiérrez, D. Peró, [M. R. Wagner](#), J. S. Reparaz, C. M. Sotomayor Torres, X. Vidal, E. A. Carter, P. A. Lay, M. Yoshimoto, and A. R. Goñi
[AIP Advances](#) **8**, 115131 (2018).
81. **Tuning the emission directionality of stacked quantum dots**
L. A. Th. Greif, S. T. Jagsch, [M. R. Wagner](#), and A. Schliwa
[ACS Photonics](#) **5**, 4838 (2018).
80. **Comparative study of the pressure dependence of optical-phonon transverse-effective charges and linewidths in wurtzite InN**
J. S. Reparaz, K. Pereira, A. H. Romero, J. Serrano, [M. R. Wagner](#), G. Callsen, S. Choi, J. S. Speck, and A. R. Goñi
[Physical Review B](#) **98**, 165204 (2018).

79. **Suppression of the quantum-confined Stark effect in polar nitride heterostructures**
S. Schlichting, G. M. O. Hönig, J. Müßener, P. Hille, T. Grieb, S. Westerkamp, J. Teubert, J. Schörmann, M. R. Wagner, A. Rosenauer, M. Eickhoff, A. Hoffmann, and G. Callsen
Communications Physics **1**, 48 (2018).
78. **Auger recombination in AlGaIn quantum wells for UV light-emitting diodes**
F. Nippert, M. T. Mazraehno, M. J. Davies, M. P. Hoffmann, H.-J. Lugauer, T. Kure, A. Hoffmann, and M. R. Wagner
Applied Physics Letters **113**, 071107 (2018).
77. **Electronic excitations stabilized by a degenerate electron gas in semiconductors**
C. Nenstiel, G. Callsen, F. Nippert, T. Kure, S. Schlichting, N. Jankowski, M. P. Hoffmann, A. Dadgar, S. Fritze, A. Krost, M. R. Wagner, A. Hoffmann, and F. Bechstedt
Communications Physics **1**, 38 (2018).
76. **Excited states of neutral donor bound excitons in GaN**
G. Callsen, T. Kure, M. R. Wagner, R. Butté, and N. Grandjean
Journal of Applied Physics **123**, 215702 (2018).
75. **Crystallisation behaviour of CH₃NH₃PbI₃ films: The benefits of sub-second flash lamp annealing**
R. Muydinov, S. Seeger, S. H. B. V. Kumar, C. Klimm, R. Kraehnert, M. R. Wagner, B. Szyszka
Thin Solid Films **653**, 204 (2018).
74. **Optical Emission of GaN/AlN Quantum-Wires - The Role of Charge Transfer from the Nanowire Template**
J. Müßener, L. A. Th. Greif, S. Kalinowski, G. Callsen, P. Hille, J. Schörmann, M. R. Wagner, A. Schliwa, S. Marti-Sanchez, J. Arbiol, A. Hoffmann, and M. Eickhoff
Nanoscale **10**, 5991 (2018).
73. **Breakdown of far-field Raman selection rules by light-plasmon coupling demonstrated by tip-enhanced Raman scattering**
E. Poliani, M. R. Wagner, A. Vierck, F. Herziger, C. Nenstiel, F. Gannott, M. Schweiger, S. Fritze, A. Dadgar, J. Zaumseil, A. Krost, A. Hoffmann, and J. Maultzsch
Journal of Physical Chemistry Letters **8**, 5462 (2017).
72. **Thermal transport in epitaxial Si_{1-x}Ge_x alloy nanowires with varying composition and morphology**
A. El Sachat, J. S. Reparaz, J. Spiece, M. I. Alonso, A. R. Goñi, M. Garriga, P. O. Vaccaro, M. R. Wagner, O. V. Kolosov, C. M. Sotomayor Torres, and F. Alzina
Nanotechnology **28**, 505704 (2017).
71. **Modification of thermal conductivity and phonon dispersion relation by means of phononic crystals**
M. Sledzinska, A. El Sachat, J. S. Reparaz, M. R. Wagner, F. Alzina, and C. M. Sotomayor Torres
IEEE Thermic **23**, 01 (2017).
70. **Thermal conductivity and air-mediated losses in periodic porous silicon membranes at high temperatures**
B. Graczykowski, A. El Sachat, J. S. Reparaz, M. Sledzinska, M. R. Wagner, E. Chavez-Angel, S. Volz, Y. Wu, F. Alzina, and C. M. Sotomayor Torres
Nature Communications **8**, 415 (2017).
69. **Influence of carbon doping and hydrogen co-doping on acceptor related optical transitions in ZnO nanowires**
F. Mohammadbeigi, T. Kure, G. Callsen, E. S. Kumar, M. R. Wagner, A. Hoffmann, and S. P. Watkins
Semiconductor Science and Technology **32**, 045017 (2017).

- 68. Polarity in GaN and ZnO: Theory, measurements, growth, and devices (invited review)**
J. Zúñiga-Pérez, V. Consonni, L. Lympirakis, X. Kong, A. Trampert, S. Fernández-Garrido, O. Brandt, H. Renevier, S. Keller, K. Hestroffer, [M. R. Wagner](#), J. S. Reparaz, F. Akyol, S. Rajan, S. Rennesson, T. Palacios, and G. Feuillet
[Applied Physics Review](#) **3**, 041303 (2016).
- 67. Temperature-dependent recombination coefficients in InGaN light-emitting diodes: Hole localization, Auger processes, and the green gap**
F. Nippert, S. Yu. Karpov, G. Callsen, B. Galler, T. Kure, C. Nenstiel, [M. R. Wagner](#), M. Straßburg, H.-J. Lugauer, and A. Hoffmann
[Applied Physics Letters](#) **109**, 161103 (2016).
- 66. Two-dimensional phononic crystals: Disorder matters**
[M. R. Wagner](#), B. Graczykowski, J. S. Reparaz, A. El Sachat, M. Sledzinska, F. Alzina, and C. M. Sotomayor Torres
[Nano Letters](#) **16**, 5661 (2016).
- 65. Measurement and modeling of the effective thermal conductivity of sintered silver pastes**
J. Ordonez-Miranda, M. Hermens, I. Nikitin, V. G. Kouznetsova, O. van der Sluis, M. Abo Ras, J. S. Reparaz, [M. R. Wagner](#), M. Sledzinska, J. Gomis-Bresco, C. M. Sotomayor Torres, B. Wunderle, and S. Volz
[International Journal of Thermal Sciences](#) **108**, 185 (2016).
- 64. Catalytically doped semiconductors for chemical gas-sensing: Aerogel-like aluminium containing zinc oxide materials prepared in the gas-phase**
K. Hagedorn, W. Li, Q. Liang, S. Dilger, M. Noebels, [M. R. Wagner](#), J. S. Reparaz, A. Dollinger, J. Schmedt auf der Günne, T. Dekorsy, L. Schmidt-Mende, and S. Polarz
[Advanced Functional Materials](#) **26**, 3424 (2016).
- 63. Spatially controlled growth of highly crystalline ZnO nanowires by an inkjet-printing catalyst-free method**
F. Güell, P. R. Martínez-Alanis, S. Khachadorian, R. R. Zamani, A. Franke, A. Hoffmann, [M. R. Wagner](#), and G. Santana
[Materials Research Express](#) **3**, 025010 (2016).
- 62. Nanophononics: State of the art and perspectives (invited review)**
S. Volz, J. Ordonez-Miranda, A. Shchepetov, M. Prunnila, J. Ahopelto, T. Pezeril, G. Vaudel, V. Gusev, P. Ruello, E. M. Weig, M. Schubert, M. Hettich, M. Grossman, T. Dekorsy, F. Alzina, B. Graczykowski, E. Chavez-Angel, J. S. Reparaz, [M. R. Wagner](#), C. M. Sotomayor-Torres, S. Xiong, S. Neogi, and D. Donadio
[European Physics Journal B](#) **89**, 15 (2016).
- 61. A single-source precursor route to anisotropic halogen doped zinc oxide as a promising candidate for new transparent conducting oxide materials**
D. Lehr, [M. R. Wagner](#), J. S. Reparaz, C. M. Sotomayor Torres, J. Flock, A. Klaiber, T. Dekorsy, and S. Polarz
[Beilstein Journal of Nanotechnology](#) **6**, 2161 (2015).
- 60. Nanoparticle shape anisotropy and photoluminescence properties: Europium containing ZnO as a Model Case**
M. Gerigk, P. Ehrenreich, [M. R. Wagner](#), I. Wimmer, J. S. Reparaz, C. M. Sotomayor-Torres, L. Schmidt-Mende, and S. Polarz
[Nanoscale](#) **7**, 16969 (2015).
- 59. Tuning thermal transport in ultrathin silicon membranes by surface nanoscale engineering**
S. Neogi, J. S. Reparaz, L. F. C. Pereira, B. Graczykowski, [M. R. Wagner](#), A. Shchepetov, M. Prunnila, J. Ahopelto, C. M. Sotomayor-Torres, and D. Donadio
[ACS Nano](#) **9**, 3820 (2015).

58. **Optical and mechanical properties of nanofibrillated cellulose: towards a robust platform for next-generation green technologies**
C. D. Simão, J. S. Reparaz, M. R. Wagner, B. Graczykowski, M. Kreuzer, Y. B. Ruiz-Blanco, Y. García, J.-M. Malho, A. R. Goñi, J. Ahopelto, and Clivia M. Sotomayor-Torres
Carbohydrate Polymers **126**, 40 (2015).
57. **Phonon dispersion in hypersonic two-dimensional phononic crystal membranes**
B. Graczykowski, M. Sledzinska, F. Alzina, J. Gomis-Bresco, J. S. Reparaz, M. R. Wagner, and C. M. Sotomayor-Torres
Physical Review B **91**, 075414 (2015).
56. **Phonon pressure coefficients and deformation potentials of wurtzite AlN determined by uniaxial pressure-dependent Raman measurements**
G. Callsen, M. R. Wagner, J. S. Reparaz, F. Nippert, T. Kure, S. Kalinowski, A. Hoffmann, M. J. Ford, M. R. Phillips, R. F. Dalmau, R. Schlessler, R. Collazo, and Z. Sitar
Physical Review B **90**, 205206 (2014).
55. **A novel contactless technique for thermal conductivity determination: Two-laser Raman thermometry**
J. S. Reparaz, E. Chavez-Angel, M. R. Wagner, B. Graczykowski, J. Gomis-Bresco, F. Alzina, C. M. Sotomayor Torres
IEEE Thermic **20**, 01 (2014).
54. **Nanoarchitecture effects on persistent room temperature photoconductivity and thermal conductivity in ceramic semiconductors: mesoporous, yolk-shell, and hollow ZnO spheres**
S. Dilger, M. Wessig, M. R. Wagner, J. S. Reparaz, C. M. Sotomayor Torres, L. Qijun, T. Dekorsy, and S. Polarz
Crystal Growth & Design **14**, 4593 (2014).
53. **Dependence on pressure of the refractive indices of wurtzite ZnO, GaN and AlN**
A. R. Goni, F. Käß, J. S. Reparaz, M. I. Alonso, M. Garriga, G. Callsen, M. R. Wagner, A. Hoffmann, and Z. Sitar
Physical Review B **90**, 045208 (2014).
52. **High quality single crystal Ge nano-membranes for opto-electronic integrated circuitry**
V. A. Shah, S. D. Rhead, J. E. Halpin, O. Trushkevych, E. Chávez-Ángel, A. Shchepetov, V. Kachkanov, N. R. Wilson, M. Myronov, J. S. Reparaz, R. S. Edwards, M. R. Wagner, F. Alzina, I. P. Dolbnya, D. H. Patchett, P. S. Allred, M. J. Prest, P. M. Gammon, M. Prunnila, T. E. Whall, E. H. C. Parker, C. M. Sotomayor Torres and D. R. Leadley
Journal of Applied Physics **115**, 144307 (2014).
51. **A novel contactless technique for thermal field mapping and thermal conductivity determination: Two-Laser Raman Thermometry**
J. S. Reparaz, E. Chavez-Angel, M. R. Wagner, B. Graczykowski, J. Gomis-Bresco, F. Alzina and C. M. Sotomayor Torres
Review of Scientific Instruments **85**, 034901 (2014).
50. **Reduction of the thermal conductivity in free-standing ultrathin Si membranes investigated using Raman thermometry**
E. Chávez-Ángel, J. S. Reparaz, J. Gomis-Bresco, M. R. Wagner, J. Cuffe, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, and C. M. Sotomayor Torres
APL Materials **2**, 012113 (2014).
49. **Li-doped ZnO nanorods with single-crystal quality – non-classical crystallization and self-assembly into mesoporous sensors.**
C. Lizandara-Pueyo, S. Dilger, M. R. Wagner, S. Wolf, M. Gerigk, A. Hoffmann and S. Polarz
Crystal Engineering Communications **16**, 1525 (2014).

- 48. Effects of strain on the band structure and exciton-polariton energies in wurtzite ZnO**
M. R. Wagner, G. Callsen, J. S. Reparaz, R. Kirste, A. Hoffmann, A. V. Rodina, A. Schleife, F. Bechstedt, and M. R. Phillips
[Physical Review B **88**, 235210 \(2013\).](#)
- 47. SrTiO₃ thin films as high efficient thermoelectric materials**
S. Bhansali, W. Khunsin, J. S. Reparaz, M. R. Wagner, J. Roqueta, J. Santiso, B. Abad Mayor, P. Diaz-Chao, M. Martin-Gonzalez, C. M. Sotomayor Torres
[IEEE Thermic **19**, 359 \(2013\).](#)
- 46. Thermal conductivity reduction in Si free-standing membranes investigated using Raman thermometry**
J. S. Reparaz, E. Chavez-Angel, J. Gomis-Bresco, M.R. Wagner, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, C. M. Sotomayor Torres
[IEEE Thermic **19**, 95 \(2013\).](#)
- 45. Nanoscale thermal transport and phonon dynamics in ultra-thin Si based nanostructures**
M. R. Wagner, E. Chavez-Angel, J. Gomis-Bresco, J. S. Reparaz, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, C. M. Sotomayor-Torres
[IEEE Thermic **19**, 10 \(2013\).](#)
- 44. Nitrogen and vacancy clusters in ZnO (Invited Feature Paper)**
F. Tuomisto, C. Rauch, M. R. Wagner, A. Hoffmann, S. Eisermann, B. K. Meyer, L. Kilanski, M. C. Tarun, and M. D. McCluskey
[Journal of Materials Research **28**, 1977 \(2013\).](#)
- 43. Steering photon statistics in single quantum dots: From one- to two-photon emission (Editor's choice)**
G. Callsen, A. Carmele, G. Hönig, J. Brunmeier, C. Kindel, M. R. Wagner, E. Stock, J. S. Reparaz, A. Schliwa, S. Reitzenstein, A. Knorr, A. Hoffmann, S. Kako, and Y. Arakawa
[Physical Review B **87**, 245314 \(2013\).](#)
- 42. Nanoscale imaging of InN segregation and polymorphism in single vertically aligned InGaN/GaN multi quantum well nanorods by tip-enhanced Raman scattering**
E. Poliani, M. R. Wagner, J. S. Reparaz, M. Mandl, M. Strassburg, X. Kong, A. Trampert, C. M. Sotomayor Torres, A. Hoffmann, J. Maultzsch
[Nano Letters **13**, 3205 \(2013\).](#)
- 41. Spatial mapping of exciton dynamics in single ZnO nanowires**
J. S. Reparaz, G. Callsen, M. R. Wagner, F. Güell, J. R. Morante, C. M. Sotomayor Torres, and A. Hoffmann
[APL Materials **1**, 012103 \(2013\).](#)
- 40. Structural and optical investigation of non-polar (1-100) GaN grown by the ammonothermal method**
D. Gogova, P. P. Petrov, M. Buegler, M. R. Wagner, C. Nenstiel, G. Callsen, M. Schmidbauer, R. Kucharski, M. Zajac, R. Dwilinski, M. R. Phillips, A. Hoffmann and R. Fornari
[Journal of Applied Physics **113**, 203513 \(2013\)](#)
- 39. Probing local strain and composition in Ge nanowires by means of tip-enhanced Raman scattering**
J. S. Reparaz, N. Peica, R. Kirste A. R. Goni, M. R. Wagner, G. Callsen, M. I. Alonso, M. Garriga, I. C. Marcus, A. Ronda, I. Berbezier, J. Maultzsch, C. Thomsen, and A. Hoffmann
[Nanotechnology **24**, 185704 \(2013\)](#)

- 38. Compensation effects in GaN:Mg probed by Raman spectroscopy and photoluminescence measurements**
R. Kirste, M. P. Hoffmann, J. Tweedie, Z. Bryan, G. Callsen, T. Kure, C. Nenstiel, M. R. Wagner, R. Collazo, A. Hoffmann, and Zlatko Sitar
[Journal of Applied Physics](#) **113**, 103504 (2013)
- 37. Effect of TMGa preflow on the properties of high temperature AlN layers grown on sapphire**
R. Kirste, M. R. Wagner, C. Nenstiel, F. Brunner, M. Weyers, A. Hoffmann
[Physica Status Solidi A](#) **210**, 285 (2012)
- 36. Optical signature of Mg-doped GaN: Transfer processes**
G. Callsen, M. R. Wagner, T. Kure, J. S. Reparaz, M. Bügler, J. Brunmeier, C. Nenstiel, A. Hoffmann, M. Hoffmann, J. Tweedie, Z. Bryan, S. Aygun, R. Kirste, R. Collazo, and Z. Sitar
[Physical Review B](#) **86**, 075207 (2012).
- 35. Phonon plasmon interaction in ternary group-III-nitrides**
R. Kirste, S. Mohn, M. R. Wagner, J. S. Reparaz, and A. Hoffmann
[Applied Physics Letters](#) **101**, 041909 (2012).
- 34. Optical signatures of nitrogen acceptors in ZnO**
S. Lautenschlaeger, S. Eisermann, G. Haas, E. A. Zolnowski, M. N. Hofmann, A. Laufer, M. Pinnisch, B. K. Meyer, M. R. Wagner, J. S. Reparaz, G. Callsen, A. Hoffmann, A. Chernikov, S. Chatterjee, V. Bornwasser, and M. Koch
[Physical Review B](#) **85**, 235204 (2012).
- 33. Band-gap engineering of zinc oxide colloids via lattice substitution with sulfur leading to materials with advanced properties for optical applications like full inorganic UV protection**
D. Lehr, M. Luka, M. R. Wagner, M. Bügler, A. Hoffmann, and S. Polarz
[Chemistry of Materials](#) **24**, 1771 (2012)
- 32. Temperature dependent photoluminescence of lateral polarity junctions of metal organic chemical vapor deposition grown GaN**
R. Kirste, R. Collazo, G. Callsen, M. R. Wagner, T. Kure, J. S. Reparaz, S. Mita, J. Xie, A. Rice, J. Tweedie, Z. Sitar, A. Hoffmann
[Journal of Applied Physics](#) **110**, 093 503 (2011).
- 31. Decay dynamics of excitonic polarons in InAs/GaAs quantum dots**
S. Werner, J. S. Reparaz, M. R. Wagner, P. Zimmer, N. N. Ledentsov, J. Kabuss, M. R. Dachner, M. Richter, A. Knorr, C. Thomsen, and A. Hoffmann
[Journal of Applied Physics](#) **110**, 074303 (2011).
- 30. Titanium assisted growth of silica nanowires: From lattice-matched to free-standing morphologies**
G. Callsen, J. S. Reparaz, M. R. Wagner, A. Vierck, M. R. Phillips, and A. Hoffmann
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- 29. Assembly of carbon nanotubes and alkylated-fullerenes: Nanocarbon-hybrid towards photovoltaic applications**
Y. Shen, J. S. Reparaz, M. R. Wagner, A. Hoffmann, C. Thomsen, J.-O Lee, S. Heeg, B. Hatting, S. Reich, A. Saeki, S. Seki, K. Yoshida, S. S. Babu, H. Möhwald, and T. Nakanishi
[Chemical Science](#) **2**, 2243 (2011).
- 28. Bound excitons in ZnO - structural defect complexes versus shallow impurity centers**
M. R. Wagner, G. Callsen, J. S. Reparaz, J.-H. Schulze, R. Kirste, M. Cobet, I. A. Ostapenko, S. Rodt, C. Nenstiel, M. Kaiser, A. Hoffmann, A. V. Rodina, M. R. Phillips, S. Lautenschläger, S. Eisermann, and B. K. Meyer
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- 27. Raman and photoluminescence spectroscopic detection of surface-bound Li⁺O₂⁻ defect sites in Li-doped ZnO nanocrystals derived from molecular precursors**
R. Kirste, Y. Aksu, [M. R. Wagner](#), S. Khachadorian, S. Jana, M. Driess, C. Thomsen, and A. Hoffmann
[ChemPhysChem](#) **12**, 1189 (2011)
- 26. Phonon deformation potentials in wurtzite GaN and ZnO determined by uniaxial pressure dependent Raman measurements**
G. Callsen, J. S. Reparaz, [M. R. Wagner](#), R. Kirste, C. Nenstiel, A. Hoffmann, and M. R. Phillips
[Applied Physics Letters](#) **98**, 061906 (2011)
- 25. Shape anisotropy influencing functional properties: Trigonal prismatic ZnO nanoparticles as an example**
C. Lizandara-Pueyo, S. Siroky, [M. R. Wagner](#), A. Hoffmann, J. S. Reparaz, M. Lehmann, and S. Polarz
[Advanced Functional Materials](#) **21**, 295 (2011).
- 24. Recombination dynamics in ZnO nanowires: surfaces states vs. mode quality factor**
J. S. Reparaz, F. Güell, [M. R. Wagner](#), G. Callsen, R. Kirste, S. Claramunt, J. R. Morante, and A. Hoffmann
[Applied Physics Letters](#) **97**, 133116 (2010).
- 23. Excited state properties of donor bound excitons in ZnO**
B. K. Meyer, J. Sann, S. Eisermann, S. Lautenschläger, [M. R. Wagner](#), M. Kaiser, G. Callsen, and A. Hoffmann
[Physical Review B](#) **82**, 115207 (2010).
- 22. Optical properties of InN grown on templates with controlled surface polarities**
R. Kirste, A. Strittmatter, [M. R. Wagner](#), J.-H. Schulze, R. Collazo, S. Sitar, M. Alevli, N. Dietz, and A. Hoffmann
[Physica Status Solidi A](#) **207**, 2351 (2010).
- 21. A molecular precursor route to a metastable form of zinc oxide**
C. L. Pueyo, S. Siroky, S. Landsmann, M. W. E. van den Berg, [M. R. Wagner](#), J. S. Reparaz, A. Hoffmann, and S. Polarz
[Chemistry of Materials](#) **22**, 4263 (2010).
- 20. Reduction of the transverse effective charge of optical phonons in ZnO under pressure**
J. S. Reparaz, L. R. Muniz, [M. R. Wagner](#), A. R. Goni, M. I. Alonso, A. Hoffmann, and B. K. Meyer
[Applied Physics Letters](#) **96**, 231906 (2010).
- 19. Clebsch-Gordon coefficients for scattering tensors in ZnO and other wurtzite semiconductors**
H. W. Kunert, [M. R. Wagner](#), A. G. J. Machatine, P. Niyongabo, J. B. Malherbe, A. Hoffmann, J. Barnas, and W. Florek
[Physica Status Solidi B](#) **247**, 1802 (2010).
- 18. Identification of a donor-related recombination channel in ZnO thin films**
M. Brandt, H. v. Wenckstern, G. Benndorf, M. Lange, C. P. Dietrich, C. Kranert, C. Sturm, R. Schmidt-Grund, H. Hochmuth, M. Lorenz, M. Grundmann, [M. R. Wagner](#), M. Alic, C. Nenstiel, and A. Hoffmann
[Physical Review B](#) **81**, 073306 (2010).
- 17. Size-dependent recombination dynamics in ZnO nanowires**
J. S. Reparaz, F. Güell, [M. R. Wagner](#), A. Hoffmann, A. Cornet, and J. R. Morante
[Applied Physics Letters](#) **96**, 053105 (2010).
- 16. Lithium related deep and shallow acceptors in Li-doped ZnO nanocrystals**
C. Rauch, W. Gehlhoff, [M. R. Wagner](#), E. Malguth, G. Callsen, R. Kirste, B. Salameh, A. Hoffmann, S. Polarz, Y. Aksu, and M. Driess
[Journal of Applied Physics](#) **107**, 024311 (2010).

15. **Polariton effects in the dielectric function of ZnO excitons obtained by ellipsometry**
M. Cobet, C. Cobet, [M. R. Wagner](#), N. Esser, C. Thomsen, and A. Hoffmann
[Applied Physics Letters](#) **96**, 031905 (2010).
14. **Γ_7 valence band symmetry related hole fine splitting of bound excitons in ZnO observed in magneto-optical studies (Editors choice)**
[M. R. Wagner](#), J.-H. Schulze, R. Kirste, M. Cobet, A. Hoffmann, C. Rauch, A. V. Rodina, B. K. Meyer, U. Röder, and K. Thonke
[Physical Review B](#) **80**, 205203 (2009)
13. **A systematic study on zinc oxide materials containing group I metals (Li, Na, K) – Synthesis from organometallic precursors, characterization, and properties**
S. Polarz, A. Orlov, A. Hoffmann, [M. R. Wagner](#), C. Rauch, R. Kirste, W. Gehlhoff, Y. Aksu, M. Driess, M. W. E. van den Berg, and M. Lehmann
[Chemistry of Materials](#) **21**, 3889 (2009).
12. **Influence of substrate surface polarity on homoepitaxial growth of ZnO layers by chemical vapor deposition**
[M. R. Wagner](#), T. P. Bartel, R. Kirste, A. Hoffmann, J. Sann, S. Lautenschläger, B. K. Meyer, and C. Kisielowski
[Physical Review B](#) **79**, 035 307 (2009).
11. **Nitrogen incorporation in homoepitaxial ZnO CVD epilayers**
S. Lautenschläger, S. Eisermann, B. K. Meyer, G. Callsen, [M. R. Wagner](#), and A. Hoffmann
[Physica Status Solidi RRL](#) **3**, 16 (2009).
10. **Bound and free excitons in ZnO. Optical selection rules in the absence and presence of time reversal symmetry**
[M. R. Wagner](#), H.W. Kunert, A. G. J. Machatine, A. Hoffmann, P. Niyongabo, J. Malherbe, and J. Barnas
[Microelectronics Journal](#) **40**, 289 (2009).
09. **Elementary excitations in Si, Ge, and diamond time reversal affected**
H. W. Kunert, A. G. J. Machatine, J. B. Malherbe, J. Barnas, A. Hoffmann, and [M. R. Wagner](#)
[Thin Solid Films](#) **517**, 372 (2008).
08. **Infrared absorption, multiphonon processes and time reversal effect on Si and Ge band structure**
H. W. Kunert, A. G. J. Machatine, J. B. Malherbe, J. Barnas, A. Hoffmann, and [M. R. Wagner](#)
[Thin Solid Films](#) **517**, 134 (2008).
07. **Asymmetry in the excitonic recombinations and impurity incorporation of the two polar faces of homoepitaxially grown ZnO films**
S. Lautenschläger, J. Sann, N. Volvers, B. K. Meyer, A. Hoffmann, U. Haboek, and [M. R. Wagner](#)
[Physical Review B](#) **77**, 144 108 (2008).
06. **Optical and structural properties of homoepitaxial ZnO**
T. P. Bartel, [M. R. Wagner](#), U. Haboek, A. Hoffmann, S. Lautenschläger, J. Sann, and B. K. Meyer
[Proceedings of SPIE](#) **6895**, 689 502 (2008).
05. **Phonons and electronic states of ZnO, Al₂O₃ and Ge in the presence of time reversal symmetry**
A. G. J. Machatine, H. W. Kunert, A. Hoffmann, J. B. Malherbe, J. Barnas, R. Seguin, [M. R. Wagner](#), P. Niyongabo, and N. Nephale
[Journal of Physics – Conference Series](#) **92**, 012 071 (2007).
04. **Ionized and neutral donor-bound excitons in ZnO**
B. K. Meyer, J. Sann, S. Lautenschläger, [M. R. Wagner](#), and A. Hoffmann
[Physical Review B](#) **76**, 184 120 (2007).

- 03. Resonant Raman scattering at exciton intermediate states in ZnO**
M. R. Wagner, P. Zimmer, A. Hoffmann, and C. Thomsen
[Physica Status Solidi – Rapid Research Letters](#) **1**, 169 (2007).

- 02. Photonic properties of ZnO epilayers**
M. R. Wagner, U. Haboeck, P. Zimmer, A. Hoffmann, S. Lautenschläger, C. Neumann, J. Sann,
and B. K. Meyer
[Proceedings of SPIE](#) **6474**, 64 740X (2007).

- 01. Phonons in sapphire Al₂O₃ substrate for ZnO and GaN**
H.W. Kunert, A. G. J. Machatine, A. Hoffmann, G. Kaczmarczyk, U. Haboeck, J. Malherbe, J. Barnas,
M. R. Wagner, and J. D. Brink
[Materials Science and Engineering C](#) **27**, 1222 (2007).

CONFERENCES & WORKSHOPS

INVITED TALKS

- 30. Phonons and excitons in semiconductor nanostructures**
M. R. Wagner
International Symposium Semiconductor Nanophotonics 2019
04.11.2019 – Berlin, Germany
- 29. Optical and thermal characteristics of Ga₂O₃ polymorphs**
M. R. Wagner
TCO2019, Conference on Transparent Conductive Oxides – Fundamentals and Applications
25.09.2019 – Leipzig, Germany
- 28. Thermal conductivity, elasticity, phonon modes, and optical band gap of gallium oxide polymorphs**
M. R. Wagner, H. Tornatzky, S. Kalinowski, S. T. Jagsch, N. Jankowski, L. Grote, T. Kure, F. Nippert, A. Hoffmann, R. Gillen, B. Graczykowski, J. S. Reparaz
IWUMD IV, 4th International Workshop on Ultraviolet Materials and Devices
10.09.2019 – St. Petersburg, Russia
- 27. Excitons, phonons, and thermal transport in gallium oxide polymorphs**
M. R. Wagner
Institute of Crystal Growth (IKZ), Dr. Martin Albrecht, Prof. Thomas Schröder
18.02.2019 – Berlin, Germany
- 26. Strain engineering as a tool to tune the acoustic phonon dynamics of suspended nanostructures**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, M. I. Alonso, M. Garriga, D. Pero, C. M. Sotomayor-Torres, A. R. Goni, P. O. Vaccaro
HPSP18, 18th International Conference on High Pressure in Semiconductor Physics
26.07.2018 – Barcelona, Spain
- 25. Photonic and phononic properties of oxide and nitride semiconductor nanostructures**
M. R. Wagner
University Bremen, Prof. M. Eickhoff
29.05.2018 – Bremen, Germany
- 24. Thermal properties of semiconductor nanostructures**
M. R. Wagner
Block Seminar on Semiconductor Nanophotonics
08.05.2018 – Graal-Müritz, Germany
- 23. Phonons and excitons in Ga₂O₃ polytypes**
M. R. Wagner
DPG Spring Meeting 2018,
13.03.2018 – Berlin, Germany
- 22. Optical and vibrational properties of various Ga₂O₃ polymorphs**
M. R. Wagner, N. Jankowski, R. Gillen, A. Hoffmann
SPIE Photonics West 2018,
29.01.2018 – San Francisco, California, USA
- 21. Thermal properties and characterization of semiconductor nanostructures**
M. R. Wagner
University Konstanz, CRC1214 “Anisotropic Particles as Building Blocks: Tailoring Shape, Interactions and Structures”, Prof. S. Polarz
06.07.2017 – Konstanz, Germany

- 20. Limitation of hypersonic and thermal phonon coherence by disorder and roughness in 2D phononic crystals**
M. R. Wagner, B. Graczykowski, J. S. Reparaz, A. El Sachat, M. Sledzinska, F. Alzina, C. M. Sotomayor-Torres
Phononics 2017, 4th International Conference on Phononic Crystals/Metamaterials, Phonon Transport/Coupling and Topological Phononics
06.06.2017 – Changsha, China
- 19. Thermal properties and phonon dynamics of suspended and patterned semiconductor nanostructures**
M. R. Wagner, J. S. Reparaz, B. Graczykowski
University Hamburg, Prof. H. Lange
07.02.2017 – Hamburg, Germany
- 18. Phononic properties of oxide superlattices and multi quantum well heterostructures**
M. R. Wagner, J. S. Reparaz, G. Callsen, F. Nippert, T. Kure, A. Hoffmann, M. Hugues, M. Teyssiere, B. Damilano, J. M. Chauveau
SPIE Photonics West 2017,
30.01.2017 – San Francisco, California, USA
- 17. Phonon dynamics in suspended nanostructures**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, M. Sledzinska, F. Alzina, and C. M. Sotomayor-Torres
International Workshop: "What is bright with light",
05.12.2016 – Bariloche, Argentina
- 16. Optical and thermal performance of ZnMgO/ZnO quantum well heterostructures**
M. R. Wagner, J. S. Reparaz, G. Callsen, G. M. O. Pahn, A. Franke, C. Nenstiel, A. Hoffmann, M. Hugues, M. Teyssiere, J. M. Chauveau
IS-TCM 2016 - International Symposium on Transparent Conductive Materials,
13.09.2016 – Platanias - Chania, Greece
- 15. Phonon dynamics and thermal properties in suspended and patterned Si based nanostructures**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, A. El Sachat, M. Sledzinska, F. Alzina, C. M. Sotomayor-Torres
Institute Silicon Photovoltaics – HZB, Prof. C. Pettenkofer, Prof. N. Nickel
07.07.2016 – Berlin, Germany
- 14. From fundamental properties of ZnO to group IV nanophononics**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, M. Sledzinska, F. Alzina, C. M. Sotomayor-Torres
CRHEA-CNRS - Centre de Recherche sur l'Hétéro-Epitaxie et ses Applications, Prof. J.-M. Chauveau,
10.06.2016 – Valbonne, France
- 13. Phonon dynamics in suspended, strained, and patterned nanostructures**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, A. El Sachat, F. Alzina, P. O. Vaccaro, A. R. Goni, D. Pero, M. I. Alonso, M. Garriga, C. M. Sotomayor-Torres
University of Illinois Urbana Champaign, Prof. A. Schleife, Prof. D. G. Cahill,
23.02.2016 – Urbana-Champaign, Illinois, USA
- 12. Controlled tailoring of thermal conductivity and optical properties of nonpolar ZnMgO/ZnO multi quantum well heterostructures**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, F. Alzina, C. M. Sotomayor-Torres, M. Hugues, M. Teyssiere, A. Franke, G. Callsen, C. Nenstiel, F. Nippert, A. Hoffmann, J. M. Chauveau
SPIE Photonics West 2016,
16.02.2016 – San Francisco, California, USA

11. **Phonon dynamics and thermal properties of Si 2D phononic crystals and stressed Ge nanobridges**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, A. El Sachat, M. Sledzinska, F. Alzina, C. M. Sotomayor-Torres, P. O. Vaccaro, D. Pero, A. R. Goni, M. Garriga, M. I. Alonso
GDRe Workshop on Thermal Nanosciences and Nanoengineering 2015,
13.11.2015 – Paris, France
10. **Optical and thermal properties of doped ZnO thin films and nanostructures**
M. R. Wagner, J. S. Reparaz, C. M. Sotomayor-Torres, S. Dilger, D. Lehr, M. Gerigk, C. Lizandara-Pueyo, S. Polarz, S. Schlichting, T. Kure, A. Hoffmann, M. R. Phillips, J. M. Chauveau, B. K. Meyer
SPIE Photonics West 2015,
08.02.2015 – San Francisco, California, USA
09. **From ZnO to group IV nano-membranes**
M. R. Wagner
Justus Liebig University Gießen, Prof. B. K. Meyer,
08.05.2014 – Gießen, Germany
08. **Time resolved spectroscopy**
M. R. Wagner
Institut de Ciència de Materials de Barcelona (ICMAB), Prof. M. I. Alonso,
05.11.2012 – Barcelona, Spain
07. **Excitons, defects, and phonon dynamics in ZnO**
M. R. Wagner
Catalan Institute of Nanotechnology (ICN2), Prof. C. M. Sotomayor-Torres,
27.04.2012 - Barcelona, Spain
06. **Dynamical processes in wide gap semiconductors: From bulk material to 1D nanostructures**
M. R. Wagner, J. S. Reparaz, G. Callsen, A. Hoffmann, M. R. Phillips
University of Technology Sydney (UTS), Prof. G. Skilbeck
21.09.2011 - Sydney, Australia
05. **ZnO: From fundamentals towards novel results**
M. R. Wagner, A. Hoffmann
Institute of Materials Research and Engineering (IMRE)
08.07.2011 - Singapore, Singapore
04. **Optical and electronic properties of ZnO: From fundamentals towards novel applications**
M. R. Wagner
Institut de Ciència de Materials de Barcelona (ICMAB), Prof. A. R. Goñi,
19.05.2011 - Barcelona, Spain
03. **Optical properties of undoped and doped ZnO**
M. R. Wagner, A. Hoffmann
75th DPG Spring Meeting 2011,
15.03.2011 – Dresden, Germany
02. **Valence band symmetry and exciton fine splitting of ZnO and related materials**
M. R. Wagner
University of Pretoria, Prof. J. B. Malherbe,
06.10.2009 - Pretoria, South Africa
01. **Spectroscopy of transition metal ion doped GaN and ZnO**
M. R. Wagner, A. Hoffmann, O. Hitzemann, E. Malguth, W. Gehlhoff, M. Kaiser, M. H. Kane,
I. T. Ferguson
E-MRS Fall Meeting 2009 - European Material Research Society Conference,
16.09.2009 – Warsaw, Poland

CONTRIBUTED TALKS

- 32. Acoustic phonon dynamics in uniaxially strained Ge nanomembranes**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, D. Pero, M. I. Alonso, M. Garriga, A. R. Goni, C. M. Sotomayor Torres, P. O. Vaccaro
E-MRS Spring Meeting 2018 - European Material Research Society Conference
June 18 – 22, 2018 – Strasbourg, France
- 31. Bandgap, excitons, phonons, and thermal conductivity of alpha-, beta-, gamma- and epsilon-Ga₂O₃**
N. Jankowski, R. Gillen, G. Callsen, C. Nenstiel, F. Nippert, A. Hoffmann, J. S. Reparaz, P. O. Vaccaro, A. R. Goñi, M. Campoy-Quiles, M. Bosi, R. Fornari, J. Schörmann, M. Kracht, A. Karg, M. Eickhoff, T. Oshima, F. H. Teherani, P. Bove, V.E. Sandana, D. Rogers, C. Ton-That, Z. Galazka, J. Furthmüller, F. Bechstedt, and M. R. Wagner
IWGO 2017 – 2nd International Workshop on Ga₂O₃ and Related Materials
September 12 – 15, 2017 – Parma, Italy
- 30. Suppression of the quantum confined Stark effect in polar III-nitride heterostructures for efficient UV emitters**
M. R. Wagner, S. Schlichting, J. Müßener, P. Hille, J. Teubert, J. Schörmann, M. Eickhoff, A. Hoffmann, G. Callsen, G. M. O. Hönig
ICNS 12 – 12th International Conference on Nitride Semiconductors
July 24 – 28, 2017 – Strasbourg, France
- 29. Optical band edge and lattice modes of alpha-, beta-, and epsilon-Ga₂O₃**
M. R. Wagner, A. Hoffmann, N. Jankowski, C. Nenstiel, G. Callsen, Z. Galazka, K. Irmscher, M. Albrecht, and M. Eickhoff
IWZNO 2016 – 9th International Workshop on Zinc Oxide and Related Materials
October 30 - November 02, 2016 – Taipei, Taiwan
- 28. Longitudinal excitons and the polar surface states of ZnO**
M. R. Wagner, M. Cobet, and A. Hoffmann
IWZNO 2016 – 9th International Workshop on Zinc Oxide and Related Materials
October 30 - November 02, 2016 – Taipei, Taiwan
- 27. Tuning coherent acoustic phonon dynamics by strain engineering of ultrathin suspended nanostructures**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, A. El Sachat, P. O. Vaccaro, A. R. Goni, D. Pero, M. I. Alonso, M. Garriga, F. Alzina, C. M. Sotomayor-Torres
SPIE Photonics West 2016
February 13 – 18, 2016 – San Francisco, California, USA
- 26. Thermal and mechanical features of Si-based 2D phononic crystal membranes**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, A. El Sachat, M. Sledzinska, E. Chávez-Ángel, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, C. M. Sotomayor-Torres
SPIE Photonics West 2016
February 13 – 18, 2016 – San Francisco, California, USA
- 25. Modification of acoustic phonon dynamics and thermal conductivity in ultra-thin stressed Si membranes and phononic crystals**
M. R. Wagner, J. S. Reparaz, B. Graczykowski, A. El Sachat, M. Sledzinska, E. Chávez-Ángel, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, C. M. Sotomayor-Torres
MRS Spring Meeting 2015 - Material Research Society Conference
April 06 – 10, 2015 - San Francisco, California, USA

- 24. Enhanced photoconductivity and reduced thermal conductivity in mesoporous and hollow TCO nanostructures with potential applications as thermoelectric material**
M. R. Wagner, J. S. Reparaz, S. Dilger, C. Lizandara-Pueyo, M. Wessig, S. Polarz, C. M. Sotomayor Torres, A. Hoffmann
[IS-TCM 2014 - International Symposium on Transparent Conductive Materials](#)
October 12 – 17, 2014 – Platanias - Chania, Crete, Greece
- 23. Two laser Raman thermometry: A novel contactless technique to measure thermal properties in oxide thin films, membranes and nanostructure**
M. R. Wagner, J. S. Reparaz, C. M. Sotomayor Torres, S. Dilger, M. Wessig, S. Polarz, F. Kuhl, F. Gather, P. J. Klar, T. Kure, S. Schlichting, A. Hoffmann
[IWZNO 2014 – 8th International Workshop on Zinc Oxide and Related Materials](#)
September 07 – 11, 2014 – Niagara Falls, Ontario, Canada
- 22. Pressure dependence of the refractive indices and Born's transverse effective charge of wurtzite ZnO, GaN, and AlN**
M. R. Wagner, J. S. Reparaz, A. R. Goni, L. R. Muniz, I. Alonso, M. Garriga, F. Kaess, G. Callsen, A. Hoffmann, C. M. Sotomayor Torres, Z. Sitar, B. K. Meyer
[IWZNO 2014 – 8th International Workshop on Zinc Oxide and Related Materials](#)
September 07 – 11, 2014 – Niagara Falls, Ontario, Canada
- 21. Impact of boundary scattering on nanoscale thermal transport properties in ultra-thin Si based nanostructures**
M. R. Wagner, E. Chávez, J. Gomis-Bresco, J. S. Reparaz, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, C. M. Sotomayor-Torres
[ASME 2013 – International Mechanical Engineering Congress and Exposition](#)
November 15 – 21, 2013 – San Diego, California, USA
- 20. Thermal conductivity reduction in Si free-standing membranes investigated using Raman thermometry**
M. R. Wagner, J. S. Reparaz, E. Chávez, J. Gomis-Bresco, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, C. M. Sotomayor-Torres
[Therminic 2013 – 19th international workshop on Thermal Investigations of ICs and Systems](#)
September 25 – 27, 2013, Berlin, Germany
- 19. Nanoscale thermal transport and phonon dynamics in ultra-thin Si based nanostructures**
M. R. Wagner, E. Chávez, J. Gomis-Bresco, J. S. Reparaz, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, C. M. Sotomayor-Torres
[Therminic 2013 – 19th international workshop on Thermal Investigations of ICs and Systems](#)
September 25 – 27, 2013, Berlin, Germany
- 18. Acoustic phonon dynamics in free-standing silicon and germanium membranes**
M. R. Wagner, E. Chávez, J. Gomis-Bresco, J. S. Reparaz, V. A. Shah, M. Myronov, D. R. Leadley, A. Shchepetov, M. Prunnila, J. Ahopelto, F. Alzina, C. M. Sotomayor-Torres
[E-MRS Spring Meeting 2013 - European Material Research Society Conference](#)
May 27 – 31, 2013 – Strasbourg, France
- 17. Nanoscale imaging of indium segregation and polymorphism in single vertically aligned InGaN/GaN quantum well nanorods by tip enhanced Raman spectroscopy**
M. R. Wagner, E. Poliani, J. S. Reparaz, M. Mandl, M. Strassburg, A. Trampert, C. M. Sotomayor-Torres, A. Hoffmann, J. Maultzsch
[E-MRS Spring Meeting 2013 - European Material Research Society Conference](#)
May 27 – 31, 2013 – Strasbourg, France

- 16. Alteration of functional properties in low dimensional ZnO nanostructures by shape anisotropy, size effects and metastable polymorphs**
[M. R. Wagner](#), J. S. Reparaz, A. Hoffmann, C. Lizandara-Pueyo, S. Siroky, S. Landsmann, S. Polarz
IWZNO 2012 - 7th International Workshop on ZnO and Related Materials
September 11 – 14, 2012 – Nice, France
- 15. Alteration of functional properties in low dimensional ZnO nanostructures by shape anisotropy, size effects and metastable polymorphs**
[M. R. Wagner](#), J. S. Reparaz, A. Hoffmann, C. Lizandara-Pueyo, S. Siroky, S. Landsmann, S. Polarz
E-MRS Spring Meeting 2012 - European Material Research Society Conference
May 14 – 18, 2012 – Strasbourg, France
- 14. Resonant phonon and exciton dynamics in ZnO**
[M. R. Wagner](#), J. S. Reparaz, R. Kirste, G. Callsen, C. Thomsen, A. Hoffmann, M. R. Phillips
76th DPG Spring Meeting 2012
March 25 – 30, 2012 – Berlin, Germany
- 13. Structural defect complexes versus impurity centers: Shallow and deep binding centers for excitons in ZnO and related materials**
[M. R. Wagner](#), G. Callsen, J. S. Reparaz, A. Hoffmann, A. V. Rodina, M. R. Phillips, B. K. Meyer
ICDS-26 – 26th International Conference on Defects in Semiconductors
July 17 – 22, 2011 – Nelson, New Zealand
- 12. ZnO: From single crystals to 1D nanostructures – excitons, strain fields, and recombination dynamics**
[M. R. Wagner](#), J. S. Reparaz, G. Callsen, R. Kirste, A. Hoffmann, A. V. Rodina, A. Schleife, S. Lautenschläger, B. K. Meyer
SPIE Photonics West 2011
January 22 – 27, 2011 – San Francisco, California, USA
- 11. Invitation and presentation of the PLMCN11 in Berlin, Germany, April 04 – 08, 2011**
[M. R. Wagner](#), B. Bastek, A. Hoffmann, J. Christen
PLMCN10 – 10th International Conference on Physics of Light-Matter Coupling in Nanostructures
April 12 – 16, 2010 – Cuernavaca, Mexico
- 10. Structural defect bound excitons in ZnO**
[M. R. Wagner](#), G. Callsen, J.-H. Schulze, M. Kaiser, R. Kirste, A. Hoffmann, M. Noltemeyer, A. V. Rodina, S. Lautenschläger, S. Eisermann, B. K. Meyer
74th DPG Spring Meeting 2010
March 21 – 26, 2010 – Regensburg, Germany
- 09. Optical and vibrational properties of nonpolar a-plane versus polar c-plane ZnO**
[M. R. Wagner](#), M. Cobet, G. Callsen, R. Kirste, M. Kaiser, A. Hoffmann, S. Eisermann, S. Lautenschläger, J. Sann, B. K. Meyer
SPIE Photonics West 2010
January 23 – 28, 2010 – San Francisco, California, USA
- 08. Time resolved and magneto-optical studies of bound exciton complexes in homoepitaxial ZnO**
[M. R. Wagner](#), J.-H. Schulze, C. Rauch, G. Callsen, A. Hoffmann, S. Lautenschläger, J. Sann, B. K. Meyer, A. V. Rodina
14th International Conference on II-VI Compounds 2009
August 23 – 28, 2009 – Sankt Petersburg, Russia
- 07. Magneto-optic and recombination dynamic of complex bound excitons in homoepitaxially grown ZnO epilayers**
[M. R. Wagner](#), C. Rauch, J.-H. Schulze, A. Hoffmann, J. Sann, S. Lautenschläger, B. K. Meyer, A. V. Rodina
SPIE Photonics West 2009
January 24 – 29, 2009 – San Jose, California, USA

- 06. Structural and optical properties of high quality ZnO substrates for homoepitaxial growth**
M. R. Wagner, R. Kirste, J.-H. Schulze, E. Malguth, A. Strittmatter, T. P. Bartel, S. Werner, G. Callsen, M. Kaiser, A. Hoffmann, S. Lautenschläger, J. Sann, B. K. Meyer
IWZNO 2008 – 5th International Workshop on ZnO and Related Materials
September 22 – 24, 2008 – Ann Arbor, Michigan, USA
- 05. Coherent and non-coherent dynamics of phonons and excitons in homoepitaxial ZnO**
M. R. Wagner, R. Kirste, J.-H. Schulze, U. Haboeck, A. Hoffmann, S. Lautenschläger, B. K. Meyer
29th ICPS 2008 – Int. Conference on the Physics of Semiconductors
July 27 – August 01, 2008 – Rio de Janeiro, Brazil
- 04. Optical and structural properties of homoepitaxial grown ZnO epilayers by chemical vapor deposition**
M. R. Wagner, R. Kirste, T. Bartel, J.-H. Schulze, U. Haboeck, A. Hoffmann, J. Sann, S. Lautenschläger, B. K. Meyer
28th ISSLED 2008 – Int. Symp. On Semiconductor Light Emitting Devices
April 27 – May 02, 2008 – Phoenix, Arizona, USA
- 03. Dynamics of charge carrier relaxation and recombination in high quality homoepitaxial-grown and single crystal ZnO**
M. R. Wagner, U. Haboeck, A. Hoffmann, S. Lautenschläger, J. Sann, B. K. Meyer
72th DPG Spring Meeting 2008
February 25 – 29, 2008 – Berlin, Germany
- 02. Resonant Raman scattering and recombination dynamics in homoepitaxial-grown and single crystal ZnO**
M. R. Wagner, P. Zimmer, A. Hoffmann, S. Lautenschläger, J. Sann, B. K. Meyer
71th DPG Spring Meeting 2007
March 26 – 30, 2007 – Regensburg, Germany
- 01. Evidence for non-zero hole effective g-values by magneto-optical studies of bound exciton complexes in ZnO**
M. R. Wagner, R. McKenna, U. Haboeck, A. Hoffmann, S. Lautenschläger, J. Sann, B. K. Meyer
E-MRS Spring Meeting 2006 - European Material Research Society Conference
May 29 - June 02, 2006 - Nice, France

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