

## CURRICULUM VITAE

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|---------------------------------|---|
| Title                           | <b>Prof. Dr.</b>  |
| First name                      | <b>Kornelius</b>  |
| Name                            | <b>NIELSCH</b>  |
| Current position                | Director<br>Chaired Full Professor  |
| Current institution(s), country | Institute for Metallic Materials (IMW) at the Leibniz Institute for Solid State and Materials Research Dresden (IFW), Germany<br>Chair of "Metallic Materials and Metal Physics" at Technische Universität Dresden (TUD), Germany |
| Identifiers/ORCID               | 0000-0003-2271-7726   |



### Scientific Career

|             |   |
|-------------|---|
| Since 2015  | Director, IFW and Full Professor, TUD   |
| 2007 – 2015 | Professor for Experimental Physics, University of Hamburg   |
| 2007        | Habilitation: " <i>Multifunctional (Magnetic) Nanowires and -tubes based on Nanoscale Honeycombe Structures</i> ", University of Bielefeld  |
| 2003 – 2007 | Project Leader of the BMBF Nanotechnology Research Group: " <i>Multifunctional Nanowires and Nanotubes</i> ", Max Planck Institute for Microstructure Physics, Halle, Germany   |
| 2002 – 2003 | Postdoctoral Research Associate, topic " <i>Control of self-ordering material systems by lithographic methods</i> ", Massachusetts Institute of Technology, Cambridge, USA  |
| 1997 – 2002 | PhD thesis: " <i>Highly ordered ferromagnetic nanowire arrays: Electrochemical synthesis and magnetic characterization</i> " (with highest honors), with Prof. Ulrich Gösele, Max Planck Institute for Microstructure Physics, Halle, Germany |
| 1997        | Diploma thesis: " <i>Fabrication of semiconductor nanoparticles in the gas phase and their physical characterisation</i> ", Lund University, Sweden   |
| 1993 – 1997 | Study of Physics at the Gerhard-Mercator-University, Duisburg, Germany  |

### Scientific Results

#### Publications (\* open access):

Refereed publications  $\geq 500$ ; invited talks  $\geq 150$

As of June 2024: h-index  $\geq 79$ , i10-index  $\geq 369$ , citations  $\geq 32000$ , m-index = 3.29

1. J. Yang, S. Mukherjee, S. Lehmann, F. Krahl, X. Wang, P. Popov, A. Lubk, T. Ritschel, J. Geck, **K. Nielsch**, *Low-Temperature ALD of SbO(x)/Sb(2)Te(3) Multilayers with Boosted Thermoelectric Performance*, Small 20 (10), 2306350 (2024), DOI: [10.1002/smll.202306350](https://doi.org/10.1002/smll.202306350)\*
2. Q. Zhang, K. Deng, L. Wilkens, H. Reith, **K. Nielsch**, *Micro-thermoelectric devices*, Nature Electronics 5, 333-347 (2022). DOI: [10.1038/s41928-022-00776-0](https://doi.org/10.1038/s41928-022-00776-0).
3. P. Ying, R. He, J. Mao, Q. Zhang, H. Reith, J. Sui, Z. Ren, **K. Nielsch**, G. Schierning. *Towards tellurium-free thermoelectric modules for power generation from low-grade heat*, Nature Communications 12, 1121 (2021). DOI: [10.1038/s41467-021-21391-1](https://doi.org/10.1038/s41467-021-21391-1)\*

4. G. Li, J. G. Fernandez, D. A. Lara Ramos, V. Barati, N. Pérez, I. Soldatov, H. Reith, G. Schierning, **K. Nielsch**, *Integrated microthermoelectric coolers with rapid response time and high device reliability*, Nature Electronics 1, 555 (2018). DOI: [10.1038/s41928-018-0148-3](https://doi.org/10.1038/s41928-018-0148-3).
5. J. Gooth, A. C. Niemann, T. Meng, A. G. Grushin, K. Landsteiner, B. Gotsmann, F. Menges, M. Schmidt, C. Shekhar, V. Suesß, R. Huehne, B. Rellinghaus, C. Felser, B. Yan, **K. Nielsch**, *Experimental signatures of the mixed axial-gravitational anomaly in the Weyl semimetal NbP*, Nature 54, 24–327 (2017). DOI: [10.1038/nature23005](https://doi.org/10.1038/nature23005).

### Involvement in the Thermoelectric Community

The Nielsch Group's research focuses currently on **sustainable thermoelectric materials, microstructured thermoelectric cooling devices and improving the long-term stability of materials and modules using atomic layer deposition**. It shows a strong commitment to the TE community including raising research funds, organising workshops and symposia, supporting young researchers and participating in European project initiatives. The following activities demonstrate this commitment:

- Acquisition and coordination of the German Priority Programme SPP-1386 on “Nanostructured Thermoelectric Materials: Theory, Model Systems and Controlled Synthesis” (2009 - 2015) with partly 41 PIs and a funding of ca. 6 M€.
- Organisation of joint German-Korean workshops (x7, Fulda 2013, Changwon/Jeju 2014, Dresden 2015, Daejeon 2016, Knappenberg/Austria 2017, Daegu 2019 and Dresden 2023) for more than 10 years, e.g.
  - *German-Korean Thermoelectrics Workshop with Industry* (Dresden, 25-26 September 2023)
- Organisation of several Wilhelm and Else Heraeus Workshops (x 3) on thermoelectric topics over more than 15 years, e.g.
  - “*Transverse Effects in Thermoelectric Systems*” (14-16 October 2024) through the WE Heraeus Foundation, Bonn, Germany
- MRS meeting chair at the MRS conference in 2012 in San Francisco, USA, and organisation of two thermoelectric symposia at the 2011 and 2019 MRS Fall Meeting in Boston, USA.
- Supporting and promoting the career of raising young and established researchers in the field of thermoelectrics, e.g.
  - Prof. G. Jeffrey Snyder for the Humboldt Research Award from the Alexander von Humboldt Foundation (2024)
  - Dr. Ran He for the ERC Starting Grant (2023),
  - Prof. Dr. Gabi Schierning for the ERC Consolidator Grant (2019),
  - Prof. Dr. Zhifeng Ren for the Humboldt Research Award from the Alexander von Humboldt Foundation (2018),
- Organisation of European project initiatives in the field of thermoelectrics and participation in three European thermoelectrics projects, i.e.
  - PI at the Horizon Europe project on “Recycling Industrial Waste Heat Through the Application of Thermophotovoltaic and Thermoelectric: A Novel Hybrid Technology for Electricity Generation” (INFERN0), 2024-2027
  - Coordination of the EuProNet M-ERA.NET project on “Tellurium-Free Thermoelectric Modules by Interface Engineering” (THERMOS), 2022-2025
  - PI at the EU H2020 RIA project on “Thermally Integrated Smart Photonic System” TIPS, 20215-20218

Overall, these activities indicate Prof. Nielsch’s extensive involvement and significant contributions to the development of thermoelectrics materials and applications.