

Karolina Górnicka

Contact

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Research Interests

My area of research is interdisciplinary at the frontier of solid-state chemistry and condensed-matter physics. I have experience in synthesizing inorganic materials, including high-purity single crystals, identifying their crystal structures, and carrying out the detailed characterization of known and novel compounds. Through my investigations, I aim to present a comprehensive understanding of the properties and behavior of superconductors and magnetic materials.

Education

07/2017-10/2021 **Ph.D. degree in Materials Science**, Gdansk University of Technology, Institute of Nanotechnology and Materials Engineering, Poland.

Thesis title: *"Superconductivity in the selected intermetallic systems"*

02/2016-07/2017 **Master of Science in Nanotechnology**, Gdansk University of Technology, Institute of Nanotechnology and Materials Engineering, Poland.

Thesis title: *"Synthesis and selected properties of IrPr_3 "*

10/2012-02/2016 **Bachelor of Science in Nanotechnology**, Gdansk University of Technology, Institute of Nanotechnology and Materials Engineering, Poland.

Thesis title: *"Synthesis and selected properties of $\text{Gd}_{1-x}\text{La}_x\text{NiC}_2$ "*

Research Experience

22/01/2024 to present: **Postdoctoral Researcher**, ORNL, Materials Science & Technology Division, Oak Ridge, TN

30/11/2021 to present: **Research Adjunct**, Faculty of Applied Physics and Mathematics, Gdansk University of Technology, Poland

01/10/2022 - 30/09/2023: **Postdoctoral researcher**, Department for Quantum Matter Physics, University of Geneva, Switzerland

28/12/2020 - 29/11/2021: **Research Assistant**, Faculty of Applied Physics and Mathematics, Gdansk University of Technology, Poland

Scientific Research Collaboration/Trainee

1) Novel Quantum Materials Group, XieLab, Department of Chemistry and Chemical Biology, Rutgers University, USA, 28/07-08/08/2022

2) Emergent Functional Material Science Group, IshiwataLab, Division of Materials Physics, Osaka University, Japan, 15/02-20/02/2020

3) Solid State Chemistry Research Group, CavaLab, Department of Chemistry, Princeton University, USA, several short (10-13 days) visits in 2018-present

Conferences

- APS Global Physics Summit 2025; Anaheim, USA (2025); oral presentation
- Fundamentals of Quantum Materials – Winter School; Washington DC, USA (2025)
- APS March Meeting 2023; Las Vegas, USA; oral presentation (2023)
- Polish Conference on Crystal Growth 2022, Gdańsk, Poland; poster presentation (2022)
- XX National Conference on Superconductivity; Lublin; Poland; oral presentation (2022)
- International Conference on Solid Compounds of Transition Elements (SCTE 2021); Poland; poster presentation (2021)
- International Conference of Strongly Correlated Electron Systems 2019, SCES 2019, Okayama, Japan, poster presentation (2019)
- XIX National Conference on Superconductivity; Bronisławów; Poland; oral presentation (2019)
- 12th International Conference on Materials and Mechanisms of Superconductivity and High Temperature Superconductors, Beijing, China, poster presentation (2018)
- 12th Prague Colloquium on f-electron systems, Prague, Czech Republic, poster presentation (2018)
- XVIII National Conference on Superconductivity; Krynica Morska; Poland, oral presentation (2017)
- XV Ogólnopolska Sesja Kół Naukowych Fizyków; Poland; poster presentation (2016)
- Fizyczno-Astronomiczna Konferencja 2016; Poland; oral presentation (2016)

Awards/Scholarships

- 1) **Scholarship for Young Scientist** (Minister of Education and Science), Poland, 2021-2024 (<https://pg.edu.pl/en/news/2021-07/young-scientists-scholarships-minister-education-and-science>)
- 2) **Stipend for Young Researcher START 2021** (Foundation for Polish Science), Poland, 2021-2022
- 3) **Gdansk University of Technology Rector's Award (2nd degree) for individual scientific achievements** (2021)
- 4) **Gdansk University of Technology Rector's Award (1st degree) for individual scientific achievements** (2020)
- 5) **Gdansk University of Technology Rector's Scholarship for the best PhD students** in years 2017-2021
- 6) **Gdansk University of Technology Pro-quality Scholarship for the best PhD students** in years 2017-2021

Funding/Grants received so far

- 1) *"Superconductivity in the alkaline earth metal-based Laves phase compounds"* Project No: 2019/33/N/ST5/01496, National Science Center, Poland; 29/01/2020 – 28/01/2024
- 2) *"Superconductivity and magnetism in a new R-Rh and R-Ir binary compounds (R-rare earth)"* Project No: DI2016020546 ("Diamantowy Grant"), the Ministry of Science and Higher Education, Poland; 29/08/2017 – 28/08/2020

Peer-reviewed Publications

57. J. Ignaczak, M. Bik, J. Jamroz, **K. Górnicka**, A. Drewniak, J. Karczewski, P. Jasiński, S. Molin; *Journal of the European Ceramic Society* 45, 117259 (2025)
56. S. Gutowska, **K. Górnicka**, P. Wojcik, T. Klimczuk, B. Wiendlocha; *Physical Review B* 110, 214510 (2024)
55. **K. Górnicka**, B.R. Ortiz, A.D. Christianson, A.F. May; *Physical Review Materials* 8, 114412 (2024)
54. **K. Górnicka**, M. J. Winiarski, R. J. Cava, M.A. McGuire, T. Klimczuk; *Physical Review B* 110, 064431 (2024)
53. B. R. Ortiz, H. Zhang, **K. Górnicka**, D. S. Parker, G. D. Samolyuk, F. Yang, H. Miao, Q. Lu, R. G. Moore, A. F. May, M. McGuire; *Chemistry of Materials* 36, 8002–8014 (2024)
52. **K. Górnicka**, X. Gui, J. R. Chamorro, T. M. McQueen, R. J. Cava, T. Klimczuk, M. J. Winiarski; *Chemistry of Materials* 36, 1870–1879 (2024)
51. K. Lankauf, B. Lemieszek, **K. Górnicka**, P. Blaszcak, M. Zajac, P. Jasinski, S. Molin; *Energy Fuels* 38, 2, 1330–1336 (2024)
50. **K. Górnicka**, Michał J. Winiarski, Dorota I. Walicka, Tomasz Klimczuk; *Scientific Reports* 13, 16704 (2023)

49. J. Ignaczak, L. Zeng, D. Ferreira Sanchez, M. Makowska, **K. Górnicka**, K. Lankauf, J. Karczewski, P. Jasiński, S. Molin; *International Journal of Hydrogen Energy* 48, 36076-36093 (2023)
48. A. Mroziński, S. Molin, P. Błaszczak, T. Miruszewski, **K. Górnicka**, J. Karczewski, P. Jasiński; *International Journal of Hydrogen Energy* 48, 35250-35266 (2023)
47. S. Pawłowska, K. Lankauf, P. Błaszczak, J. Karczewski, **K. Górnicka**, G. Cempura, P. Jasiński, S. Molin; *Applied Surface Science* 619, 156720 (2023)
46. R. Bujakiewicz-Koronska, Ł. Gondek, L. Vasylechko, M. Balanda, E. Juszyńska-Gałazka, M. Gałazka, D. Majda, W. Piekarczyk, A. Zywczak, A. Cizman, M. Sitarz, P. Jelen, W. Salamon, P. Czaja, J. Jedryka, K. Koronski, A. Kalvane, **K. Górnicka**, E. Markiewicz, S. Yamashita, Y. Nakazawa; *Journal of Alloys and Compounds* 946, 169344 (2023)
45. K. Lankauf, **K. Górnicka**, P. Błaszczak, J. Karczewski, J. Ryl, G. Cempura, M. Zając, M. Bik, M. Sitarz, P. Jasiński, S. Molin; *International Journal of Hydrogen Energy* 48, 8854-8866 (2023)
44. S. Pawłowska, K. Lankauf, P. Błaszczak, J. Karczewski, **K. Górnicka**, G. Cempura, P. Jasiński, S. Molin; *Applied Surface Science* 619, 156720 (2023)
43. A.H. Mayo, H. Takahashi, S. Ishiwata, **K. Górnicka**, M.J. Winiarski, J. Jaroszynski, R.J. Cava, W. Xie, T. Klimczuk; *Adv. Electron. Mater.*, 2201120 (2022)
42. S. Królak, H. Świątek, **K. Górnicka**, M.J. Winiarski, W. Xie, R.J. Cava, T. Klimczuk; *Journal of Alloys and Compounds* 929, 167279 (2022)
41. A. Kulpa-Koterwa, J. Ryl, **K. Górnicka**, P. Niedziałkowski; *Journal of Molecular Liquids*, 120710 (2022)
40. M. Przeźniak-Welenc, M. Nadolska, K. Jurak, J. Li, **K. Górnicka**, A. Mielewczyk-Gryń, M. Rutkowska, A.P. Nowak; *Scientific Reports* 12 (1), 1-10 (2022)
39. D. Das, **K. Górnicka**, Z. Guguchia, J. Jaroszynski, R.J. Cava, W. Xie, H. Luetkens, T. Klimczuk; *Physical Review B* 106 (9), 094507 (2022)
38. N.A. Wójcik, K. Polcyn, J. Karczewski, **K. Górnicka**, R.J. Barczyński; *Journal of the European Ceramic Society* 42 (12), 5015-5022 (2022)
37. P. Niedziałkowski, A. Koterwa, A. Olejnik, A. Zielinski, **K. Górnicka**, M. Brodowski, R. Bogdanowicz, J. Ryl; *Langmuir* 38, 31, 9597-9610 (2022)
36. M. Nadolska, M. Szkoda, K. Trzciński, P. Niedziałkowski, J. Ryl, A. Mielewczyk-Gryń, **K. Górnicka**, M. Przeźniak-Welenc; *Inorganic Chemistry* 61, 25, 9433-9444 (2022)
35. M.J. Winiarski, K. Stolecka, L.S. Litzbarski, T.T. Tran, **K. Górnicka**, T. Klimczuk; *The Journal of Physical Chemistry C* 126 (33), 14229-14235 (2022)
34. K. Lankauf, K. Ostrowska, **K. Górnicka**, J. Karczewski, P. Jasiński, S. Molin; *Materials Letters* 323, 132574 (2022)
33. A. Drewniak, D. Koszelow, P. Błaszczak, **K. Górnicka**, K. Jurak, H. Javed, A.G. Sabato, P. Jasiński, S. Molin, F. Smeacetto; *Materials & Design* 212, 110259 (2021)
32. KY. Ma, R. Lefèvre, **K. Górnicka**, H.O. Jeschke, X. Zhang, Z. Guguchia, T. Klimczuk, F. von Rohr; *Chemistry of Materials* 33 (22), 8722-8732 (2021)
31. **K. Górnicka**, G. Kuderowicz, M.J. Winiarski, B. Wiendlocha, T. Klimczuk; *Scientific Reports* 11 (1), 1-16 (2021)
30. K. Lankauf, A. Mroziński, P. Błaszczak, **K. Górnicka**, J. Ignaczak, M. Łapiński, J. Karczewski, G. Cempura, P. Jasiński, S. Molin; *International Journal of Hydrogen Energy* 46 (28575), e28590 (2021)
29. S. Gutowska, **K. Górnicka**, P. Wójcik, T. Klimczuk, B. Wiendlocha; *Physical Review B* 104 (5), 054505 (2021)
28. N. A. Wójcik, N.S. Tagiara, S. Ali, **K. Górnicka**, H. Segawa, T. Klimczuk, B. Jonson, D. Möncke, E.I. Kamitsos; *Journal of the European Ceramic Society* 41 (10), 5214-5222 (2021)
27. KY. Ma, **K. Górnicka**, R. Lefèvre, Y. Yang, H.M. Rønnow, H.O. Jeschke, T. Klimczuk, F. von Rohr; *ACS Materials Au* 1 (1), 55-61 (2021)
26. M.J. Winiarski, G. Kuderowicz, **K. Górnicka**, L.S. Litzbarski, K. Stolecka, B. Wiendlocha, R.J. Cava, T. Klimczuk; *Physical Review B* 103, 214501 (2021)
25. C. Witteveen, **K. Górnicka**, J. Chang, M. Månsson, T. Klimczuk, F. von Rohr; *Dalton Transactions* 50 (9), 3216-3223 (2021)
24. **K. Górnicka**, X. Gui, B. Wiendlocha, L.T. Nguyen, W. Xie, R.J. Cava, T. Klimczuk; *Advanced Functional Materials* 31 (3), 2007960 (2021)
23. S. Guo, R. Zhong, **K. Górnicka**, T. Klimczuk, R.J. Cava; *Chemistry of Materials* 32 (24), 10670-10677 (2020)
22. J. Ignaczak, Y. Naumovich, **K. Górnicka**, J. Jamroz, W. Wróbel, J. Karczewski, M. Chen, P. Jasiński, S. Molin; *Journal of the European Ceramic Society* 40 (15), 5920-5929 (2020)
21. I. Makarova, J. Ryl, Z. Sun, I. Kurilo, **K. Górnicka**, M. Laatikainen, E. Repo; *Separation and Purification Technology* 251, 117362 (2020)
20. N.Y. Mostafa, M.M. Qhtani, S.H. Alotaibi, Z.I. Zaki, S. Alharthi, M. Cieslik, **K. Górnicka**, J. Ryl, R. Boukherroub, M.M. Amin; *International Journal of Energy Research* 44 (13), 10695-10709 (2020)

19. K. Górnicka, G. Kuderowicz, E. Carnicom, K. Kutorasiński, B. Wiendlocha, R.J. Cava, T. Klimczuk; *Physical Review B* 102 (2), 024507 (2020)
18. K. Lankauf, K. Cysewska, J. Karczewski, A. Mielewczyk-Gryń, K. Górnicka, G. Cempura, M. Chen, P. Jasiński, S. Molin; *International Journal of Hydrogen Energy* 45 (29), 14867-14879 (2020)
17. X. Gui, K. Górnicka, Q. Chen, H. Zhou, T. Klimczuk, W. Xie; *Inorganic chemistry* 59 (9), 5798-5802 (2020)
16. K. Górnicka, S. Gutowska, M.J. Winiarski, B. Wiendlocha, W. Xie, R.J. Cava, T. Klimczuk; *Chemistry of Materials* 32 (7), 3150-3159 (2020)
15. I. Szpunar, S. Wachowski, T. Miruszewski, K. Dzierzgowski, K. Górnicka, T. Klimczuk, M. H. Sørby, M. Balaguer, J.M. Serra, R. Strandbakke, M. Gazda, A. Mielewczyk-Gryń; *Journal of the American Ceramic Society* 103 (3), 1809-1818 (2020)
14. K. Górnicka, D. Das, S. Gutowska, B. Wiendlocha, M.J. Winiarski, T. Klimczuk, D. Kaczorowski; *Physical Review B* 100 (21), 214514 (2019)
13. K. Jasiewicz, B. Wiendlocha, K. Górnicka, K. Gofryk, M. Gazda, T. Klimczuk, J. Tobola; *Physical Review B* 100 (18), 184503 (2019)
12. M. Marshall, K. Górnicka, R. Mudiyansele, T. Klimczuk, W. Xie; *Crystals* 9 (10), 527 (2019)
11. M. A. Mezni, M. Alsawat, T. Kumeria, M. R. Das, S. Alzahly, A. Aldalbahi, K. Górnicka, J. Ryl, M. A. Amin, T. Altalhi; *International Journal of Energy Research* 43 (10), 5367-5383 (2019)
10. K. Górnicka, R. J. Cava, T. Klimczuk; *Journal of Alloys and Compounds* 793, 393-399 (2019)
9. B. Kamecki, T. Miruszewski, K. Górnicka, T. Klimczuk, J. Karczewski; *SN Applied Sciences* 1 (4), 1-9 (2019)
8. E. M. Carnicom, W. Xie, Z. Yang, K. Górnicka, T. Kong, T. Klimczuk, R. J. Cava; *Chemistry of Materials* 31 (6), 2164-2173 (2019)
7. K. Górnicka, W. Xie, E.M. Carnicom, R. J. Cava, T. Klimczuk; *Physical Review B* 99, 104430 (2019)
6. K. Górnicka, E. M. Carnicom, S. Gołąb, M. Łapiński, B. Wiendlocha, W. Xie, D. Kaczorowski, R. J. Cava, T. Klimczuk; *Superconductor Science and Technology* 32 (2), 025008 (13pp) (2019)
5. K. Górnicka, K.K. Kolincio, T. Klimczuk; *Intermetallics* 100, 63-69 (2018)
4. E.M. Carnicom, K. Górnicka, T. Klimczuk, R.J. Cava; *Journal of Solid State Chemistry* 265, 319-325 (2018)
3. T. Kong, K. Górnicka, S. Gołąb, B. Wiendlocha, T. Klimczuk, R.J. Cava; *Journal of the Physical Society of Japan* 87 (7), 074711 (2018)
2. E. M. Carnicom, W. Xie, T. Klimczuk, J. Lin, K. Górnicka, Z. Sobczak, N. Phuan Ong, R. J. Cava; *Science advances* 4 (5), eaar7969 (2018)
1. K.K. Kolincio, K. Górnicka, M.J. Winiarski, J. Strychalska-Nowak, T. Klimczuk; *Physical Review B* 94 (19), 195149 (2016)

References

- Prof. Tomasz Klimczuk (Gdańsk University of Technology; tomasz.klimczuk@pg.edu.pl).
- Prof. Robert J. Cava (Princeton University; rcava@princeton.edu).
- Prof. Weiwei Xie (Michigan State University; xieweiwe@msu.edu).
- Prof. Shintaro Ishiwata (Osaka University; ishiwata@mp.es.osaka-u.ac.jp).
- Prof. Bartłomiej Wiendlocha (AGH University of Science and Technology; wiendlocha@fis.agh.edu.pl).