Dr. Karolina Górnicka

Contact

Tel: +48 505 787 463; +1.865.441.3298
Email: gornickaka@ornl.gov

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

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"*

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 $IrPr_3$"*

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 $Gd_{1-x}La_xNiC_2$"*

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 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, 42 000 EUR (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, 5 960 EUR

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 ("Diamentowy Grant"), the Ministry of Science and Higher Education, Poland; 29/08/2017 – 28/08/2020

Peer-reviewed Publications

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. Blaszczak, 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. Juszynska-Galazka, M. Galazka, D. Majda, W. Piekarczyk, A. Zywczak, A. Cizman, M. Sitarz, P. Jelen, W. Salamon, P. Czaja, J. Jedryka, K. Koronski, A. Kalvane, **K. Gornicka**, 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. Prześniak-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. Niedzialkowski, A. Koterwa, A. Olejnik, A. Zielinski, **K. Gornicka**, 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. Prześniak-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. Gornicka**, 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. Gornicka**, 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. Mudiyanselage, 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).