

Kenneth S. Burch

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Education

2006-Jan	PhD Physics	University of California, San Diego
2004	MSc Physics	University of California, San Diego
2001	BSc Physics-Honors	University of California, Santa Cruz

Professional Experience

2024-current	Chair, Physics Department	Boston College
2020-current	Professor	Boston College
2015-2020	Associate Professor	Boston College
2013-2015	Assistant Professor	Boston College
2012-2013	Founder of CREATE-HEATER program	University of Toronto
2008-2013	Assistant Professor	University of Toronto
2006-2008	Director's Fellow	Los Alamos National Laboratory
2001-2006	Graduate Student Researcher	University of California, San Diego
2001-2002	Chair	University of California Student Association
2000-2001	Undergraduate Researcher	Stanford University
2000	Undergraduate Researcher	University of California, San Diego
1997-1998	Undergraduate Research Assistant	University of California, Santa Cruz

Professional Affiliations and Activities

Member	American Physical Society, Canadian Association of Physicists
Chair	LEES Conference 2021, Graduate Committee(18-19), Search Committee (17-18), Integrated Science for Society Curricula Committee (15-16), Colloquium Committee (14-16), Physical & Technical Services Committee (12-13)
Representative	User Advisory Committee of The Canadian Light Source, National High Magnetic Field Laboratory Users Committee
Referee	Science, Nature, Nanoletters, Nature Materials, Phys. Rev. Lett., DOE, NSERC, NSF, Phys. Rev. B, J. of The Opt. Soc. of America, Appl. Phys. Lett., J. of Raman Spec., New J. of Phys., NSC-Poland

Awards

American Physical Society Fellow	2022
Lee-Osheroff-Richardson Prize	2012
Ontario Early Researcher Award	2011-2016
Los Alamos National Lab Director's Fellowship	2006 - 2008
APS Outstanding Dissertation in Magnetism	2006
Malcolm R. Stacey Memorial Scholarship	2003 - 2005
GAANN Fellowship	2001 - 2002

Popular Media Coverage

Axial Higgs mode spotted in materials at room temperature Physics World, July 4th, 2022

Elusive particle discovered in a material through tabletop experiment Space Daily, July 4th, 2022

New Higgs-Related Particle Discovered In Tabletop Experiments IFLScience, June 10th, 2022
Quantum Computer Not Working? Grab Some Scotch Tape Wired, September 18th, 2012
Scotch tape may stick quantum computing to the masses NBC News, September 11th, 2012
Scotch Tape aids superconductivity breakthrough Toronto Star, September 13th, 2012
Scotch Tape Even Makes Semiconductors Better Gizmodo, September 16th, 2012

Invited Talks

Summary: Over 100 - APS March Meeting; GRC-Superconductivity, GRC - 2D Materials Beyond Graphene, MRS, AVS, Quantum Materials Symposium, E-MRS; Many N. American, European or Asian institutions including: MIT, Stanford, Princeton, Columbia, UC Boulder, Penn State, U. British Columbia, IOP-Beijing, Seoul National U., U. of Tokyo, Georgia Tech., Rice, U. of Rochester, l'Universite de Genève, EPF - Lausanne, Neel Institute - Grenoble, MPI-Stuttgart, NREL, LBNL, BNL

Active Funding

AFOSR <i>Exploring Correlated Topological States with Charge Density Waves</i>	\$1,018,329 (\$587,384-BC)	(2024-2027)
DOE-PBM <i>A Nonlinear Approach to Topological Semimetals</i>	\$551,774	(2024-2027)
NIH-SBIR Phase I <i>Population Monitoring of Stress Markers in Under-served Communities</i>	\$65,293	(2023-2025)
NSF-DMR <i>Unraveling the Topological Superconductivity of FeTeSe</i>	\$563,903	(2023-2026)
AFOSR <i>DURIP: Nonlinear Quantum Spectroscopy System for Quantum Materials</i>	\$395,224	(2022-2025)
NSF-ECCS <i>NSF-BSF: High-Temperature Superconducting Photon Detectors</i>	\$316,039	(2022-2025)
NIH-SBIR Phase II <i>Rapid Assessment of Illicit Drugs in Wastewater</i>	\$232,099	(2022-2024)
GRIP Molecular Inc <i>Developing Graphene Multiplexed Detectors</i>	\$375,000	(2021-2025)
Total Active Grants:	\$3,086,901	

Industry:

Patents: 2 Provisional, 2 full, 2 licensed

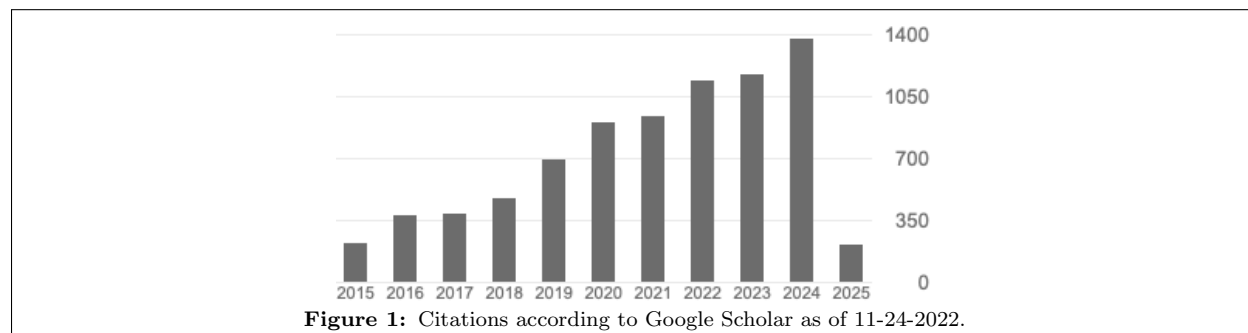
Partners: GRIP Molecular, Giner Inc., CDM Smith, BBN Raytheon

K.S. Burch Publications

Summary: (<http://goo.gl/04ZDsY>)

105 Publications

> 9000 citations; H# = 46



Peer-Reviewed Publications

- [1] H. Gao, *et al.*, *ACS Nano* **19**, 3362 (2025).
- [2] A. Kumar, *et al.*, *Optics Communications* **579**, 131548 (2025).
- [3] C.-C. Wei, *et al.*, *Physical Review Materials* **9**, 024402 (2025).
- [4] G. Villalpando, *et al.*, *Science Advances* **10**, ead11103 (2024).
- [5] J. Tang, *et al.*, *Nature* **628**, 515 (2024).
- [6] J. D. Thomsen, *et al.*, *ACS Nano* **18**, 13458 (2024).
- [7] V. M. Plisson, *et al.*, *Advanced Materials* **23**, e2310944 (2024).
- [8] M. Geiwitz, *et al.*, *ACS Applied Bio Materials* (2024).
- [9] D. Cao, *et al.*, *Nano Letters* **24**, 1544 (2024).
- [10] T. V. Ivanova, *et al.*, *APL Materials* **12**, 071114 (2024).
- [11] D. Cao, *et al.*, *Nano Letters* **23**, 9392 (2023).
- [12] R. Singha, *et al.*, *Advanced Functional Materials* p. 2308733 (2023).
- [13] C. Putzke, *et al.*, *Nature Communications* **14**, 3147 (2023).
- [14] R. J. Kirby, *et al.*, *The Journal of Physical Chemistry C* **127**, 577 (2023).
- [15] D. Cao, *et al.*, *Angewandte Chemie International Edition* **62**, e202302363 (2023).
- [16] T. Li, *et al.*, *ACS Applied Materials & Interfaces* (2022).
- [17] Y. Liu, K. Slagle, K. S. Burch, J. Alicea, *Phys. Rev. Lett.* **129**, 037201 (2022).
- [18] N. Kumar, *et al.*, *ACS Nano* **16**, 3704 (2022).
- [19] Y. Wang, *et al.*, *Nature* **606**, 896 (2022).
- [20] X. Chen, *et al.*, *Matter* (2022).
- [21] X. Wang, *et al.*, *Science Advances* **8**, eabl7707 (2022).
- [22] E. Choi, K. I. Sim, K. S. Burch, Y. H. Lee, *Advanced Science* p. 2200186 (2022).
- [23] Y. Yang, *et al.*, *Physical Review B* **105**, L241101 (2022).

- [24] T. H. Nguyen, *et al.*, *Phys. Rev. Lett.* **127**, 267203 (2021).
- [25] X.-Y. Zhang, *et al.*, *PRX Quantum* **2**, 030352 (2021).
- [26] Q. Ma, A. G. Grushin, K. S. Burch, *Nature Materials* (2021).
- [27] G. B. Osterhoudt, *et al.*, *Phys. Rev. X* **11**, 011017 (2021).
- [28] H.-Y. Yang, *et al.*, *Nature Communications* **12**, 5292 (2021).
- [29] A. Gao, *et al.*, *Nature* **595**, 521 (2021).
- [30] H. Gao, *et al.*, *Chemistry of Materials* (2021).
- [31] N. Kumar, *et al.*, *MEDICAL DEVICES & SENSORS* **3**, e10121 (2020).
- [32] Y. Wang, *et al.*, *Nano Letters* (2020).
- [33] M. J. Gray, *et al.*, *Review of Scientific Instruments* **91**, 073909 (2020).
- [34] T. A. Tartaglia, *et al.*, *Science Advances* **6** (2020).
- [35] N. Kumar, *et al.*, *Biosensors and Bioelectronics* p. 112123 (2020).
- [36] S. Lei, *et al.*, *Science Advances* **6**, eaay6407 (2020).
- [37] Y. Wang, *et al.*, *npj Quantum Materials* **5**, 14 (2020).
- [38] M. J. Gray, *et al.*, *Nano Letters* **19**, 4890 (2019).
- [39] G. B. Osterhoudt, *et al.*, *Nature Materials* **18**, 471 (2019).
- [40] M. Brotons-Gisbert, *et al.*, *Nature Nanotechnology* **14**, 442 (2019).
- [41] B. Zhou, *et al.*, *Journal of Physics and Chemistry of Solids* **128**, 291 (2019).
- [42] J. Coulter, *et al.*, *Phys. Rev. B* **100**, 220301 (2019).
- [43] S. Gao, *et al.*, *Proceedings of the National Academy of Sciences* **115**, 6986 (2018).
- [44] G. B. Osterhoudt, *et al.*, *Physical Review B* **98**, 014308 (2018).
- [45] M. Abramchuk, *et al.*, *Advanced Materials* p. 1801325 (2018).
- [46] K. S. Burch, D. Mandrus, J.-G. Park, *Nature* **563**, 47 (2018).
- [47] P. Zareapour, *et al.*, *New Journal of Physics* **19**, 043026 (2017).
- [48] Y. Tian, *et al.*, *Physical Review B* **95**, 094104 (2017).
- [49] Y. Tian, K. S. Burch, *Applied spectroscopy* **70**, 1861 (2016).
- [50] H. Luo, *et al.*, *Chemistry of Materials* **28**, 1927 (2016).
- [51] Y. Tian, G. B. Osterhoudt, S. Jia, R. Cava, K. S. Burch, *Applied Physics Letters* **108**, 041911 (2016).
- [52] Y. Tian, *et al.*, *Review of Scientific Instruments* **87**, 043105 (2016).
- [53] Y. Tian, M. J. Gray, H. Ji, R. Cava, K. S. Burch, *2D Materials* **3**, 025035 (2016).
- [54] P. Zareapour, *et al.*, *Superconductor Science and Technology* **29**, 125006 (2016).
- [55] S. Kushwaha, *et al.*, *Nature communications* **7**, 11456 (2016).
- [56] L. J. Sandilands, *et al.*, *Physical Review B* **93**, 075144 (2016).

- [57] C.-K. Chan, P. A. Lee, K. S. Burch, J. H. Han, Y. Ran, *Physical review letters* **116**, 026805 (2016).
- [58] J. Moir, *et al.*, *ChemSusChem* **8**, 1557 (2015).
- [59] J. Moir, *et al.*, *ChemSusChem* **8**, 1627 (2015).
- [60] L. J. Sandilands, Y. Tian, K. W. Plumb, Y.-J. Kim, K. S. Burch, *Physical review letters* **114**, 147201 (2015).
- [61] K. Post, *et al.*, *Physical review letters* **115**, 116804 (2015).
- [62] K. Plumb, *et al.*, *Physical Review B* **90**, 041112 (2014).
- [63] A. Hayat, H.-Y. Kee, K. S. Burch, A. M. Steinberg, *Physical Review B* **89**, 094508 (2014).
- [64] L. J. Sandilands, *et al.*, *Physical Review B* **90**, 094503 (2014).
- [65] P. Zareapour, *et al.*, *Physical Review B* **90**, 241106 (2014).
- [66] P. Mirtchev, *et al.*, *Journal of Materials Chemistry A* **2**, 8525 (2014).
- [67] X. G. Xu, *et al.*, *ACS nano* **8**, 11305 (2014).
- [68] A. A. Reijnders, *et al.*, *Physical Review B* **89**, 075138 (2014).
- [69] A. Reijnders, *et al.*, *Physical Review B* **90**, 235144 (2014).
- [70] L. Sandilands, *et al.*, *Physical Review B* **90**, 081402 (2014).
- [71] H. Ji, *et al.*, *Journal of Applied Physics* **114**, 114907 (2013).
- [72] H. Ji, *et al.*, *Materials Research Bulletin* **48**, 2517 (2013).
- [73] B. Chapler, *et al.*, *Physical Review B* **87**, 205314 (2013).
- [74] Y. Tian, C. Adamo, D. G. Schlom, K. S. Burch, *Applied Physics Letters* **102**, 041906 (2013).
- [75] A. Hayat, *et al.*, *Physical Review X* **2**, 041019 (2012).
- [76] P. Zareapour, *et al.*, *Nature communications* **3**, 1056 (2012).
- [77] C. Beekman, A. Reijnders, Y. S. Oh, S. Cheong, K. Burch, *Physical Review B* **86**, 020403 (2012).
- [78] A. Lupascu, *et al.*, *Applied Physics Letters* **101**, 223106 (2012).
- [79] S. Zhao, *et al.*, *Applied Physics Letters* **98**, 141911 (2011).
- [80] B. Chapler, *et al.*, *Physical Review B* **84**, 081203 (2011).
- [81] C. Lange, *et al.*, *Lasers and Electro-Optics (CLEO), 2011 Conference on* (IEEE, 2011), pp. 1–2.
- [82] D. Talbayev, *et al.*, *Physical review letters* **104**, 227002 (2010).
- [83] R. Bouskila, *et al.*, *Applied Physics Letters* **96**, 163103 (2010).
- [84] A. LaForge, *et al.*, *Physical Review B* **81**, 064510 (2010).
- [85] L. Sandilands, *et al.*, *Physical Review B* **82**, 064503 (2010).
- [86] A. Schafgans, *et al.*, *Physical review letters* **104**, 157002 (2010).
- [87] A. LaForge, *et al.*, *Physical Review B* **79**, 104516 (2009).
- [88] K. Burch, *et al.*, *Physical review letters* **100**, 026409 (2008).

- [89] M. M. Qazilbash, *et al.*, *Physical Review B* **77**, 115121 (2008).
- [90] K. Burch, D. Awschalom, D. Basov, *Journal of Magnetism and Magnetic Materials* **320**, 3207 (2008).
- [91] A. LaForge, *et al.*, *Physical review letters* **101**, 097008 (2008).
- [92] A. LaForge, *et al.*, *arXiv preprint arXiv:0705.0045* (2007).
- [93] A. LaForge, *et al.*, *Physical Review B* **76**, 054524 (2007).
- [94] K. Burch, *et al.*, *Physical Review B Condensed Matter And Materials Physics* **75**, 54523 (2007).
- [95] M. Qazilbash, *et al.*, *Physical Review B* **74**, 205118 (2006).
- [96] K. Burch, *et al.*, *Physical review letters* **97**, 087208 (2006).
- [97] Z. Li, *et al.*, *Physical Review B* **74**, 195404 (2006).
- [98] K. Burch, *et al.*, *arXiv preprint cond-mat/0604146* (2006).
- [99] K. S. Burch, *et al.*, *Physical Review B* **71**, 125340 (2005).
- [100] K. Burch, *et al.*, *Physical Review-Section B-Condensed Matter* **71**, 125340 (2005).
- [101] K. S. Burch, *et al.*, *Physical review letters* **95**, 046401 (2005).
- [102] W. Padilla, *et al.*, *Review of Scientific Instruments* **75**, 4710 (2004).
- [103] K. S. Burch, J. Stephens, R. Kawakami, D. Awschalom, D. Basov, *Physical Review B* **70**, 205208 (2004).
- [104] E. Singley, *et al.*, *Physical Review B* **68**, 165204 (2003).
- [105] D. Basov, *et al.*, *Review of scientific instruments* **74**, 4703 (2003).