

Anton Burkov

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PERSONAL:

Place of birth: Saint Petersburg, Russia.
Citizenship: Canada, Russia.

EDUCATION:

1999 - 2002: Indiana University, Bloomington, Indiana.
PhD (Physics): May 2002.
Advisor: Allan MacDonald.
1996 - 1999: Michigan State University, East Lansing, Michigan.
M.S.(Physics): December 1998.
1990 - 1996: Saint Petersburg State Technical University,
Saint Petersburg, Russia.
Diploma (Solid State Physics): June 1996.

EMPLOYMENT:

2018-present: Professor, Department of Physics and Astronomy,
University of Waterloo.
2012-2018: Associate Professor, Department of Physics and Astronomy,
University of Waterloo.
2007-2012: Assistant Professor, Department of Physics and Astronomy,
University of Waterloo.
2005 - 2007: Postdoctoral Researcher, Department of Physics,
Harvard University (supervisor: Eugene Demler).
2002 - 2005: Postdoctoral Researcher, Department of Physics,
University of California, Santa Barbara (supervisor: Leon Balents).

VISITING AND ADJUNCT APPOINTMENTS:

May 2015-May 2017: Department of Electrical Engineering, ITMO University,
Saint Petersburg, Russia.
May-June 2011: Kavli Institute for Theoretical Physics, Santa Barbara.
February-April 2011: Department of Physics, California Institute of Technology.

FELLOWSHIPS, AWARDS, HONORS:

- APS Outstanding Referee, 2019.

- Outstanding Performance Award, University of Waterloo, 2017.
- Caltech Postdoctoral Prize Fellowship in Theoretical Physics, 2005.

PROFESSIONAL SERVICE:

- Associate Editor, NPJ Quantum Materials, 2018-2019.
- Referee for Annals of Physics, Applied Physics Letters, Journal of Applied Physics, Journal of High Energy Physics, Journal of Magnetism and Magnetic Materials, Nature, Nature Communications, Nature Materials, Nature Nanotechnology, Nature Physics, NPJ Quantum Materials, Physical Review Letters, Physical Review A, Physical Review B, Physica Status Solidi, Physics Letters, Proceedings of the National Academy of Sciences, Reviews of Modern Physics, Science, Scientific Reports, Solid State Communications.
- US National Science Foundation, grant proposal reviewer.
- NSERC, grant proposal reviewer.
- US DOE, grant proposal reviewer.
- Swiss Supercomputing Centre, grant proposal reviewer.
- Netherlands Foundation for Fundamental Research, grant proposal reviewer.
- Czech Science Foundation, grant proposal reviewer.
- NSF National High Magnetic Field Laboratory Renewal 2013-2017, member of the review panel.
- European Research Council, grant proposal reviewer.
- The Israel Science Foundation, grant proposal reviewer.
- Direct Submission Editor, Proceedings of the National Academy of Sciences.

SIGNIFICANT UNIVERSITY SERVICE:

- Associate Graduate Officer, Department of Physics and Astronomy, University of Waterloo, 2016-present. I am responsible for the departmental TA assignments and generally deal with all TA-related matters.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

American Physical Society, Canadian Association of Physicists.

PUBLICATIONS:

1. Chong Wang, L. Gioia, and A.A. Burkov, *Fractional Quantum Hall Effect in Weyl Semimetals*, arXiv:1907.02068.
2. M. Goyal, H. Kim, T. Schumann, L. Galletti, A.A. Burkov, and S. Stemmer, *Surface states of strained thin films of the Dirac semimetal Cd_3As_2* , Phys. Rev. Materials, **3**, 064204 (2019).
3. S.-L. Zhang, A.A. Burkov, I. Martin, and O.G. Heinonen, *Spin-to-charge conversion in magnetic Weyl semimetals*, arXiv:1904.07181.
4. A.A. Burkov, *Dirac fermion duality and the parity anomaly*, Phys. Rev. B **99**, 035124 (2019).
5. A.A. Burkov, *Dynamical density response and optical conductivity in topological metals*, Phys. Rev. B **98**, 165123 (2018).
6. A.A. Burkov, *Quantum anomalies in nodal line semimetals*, Phys. Rev. B **97**, 165104 (2018).
7. D.A. Pshenay-Severin, Yu.V. Ivanov, A.A. Burkov, and A.T. Burkov, *Band structure and unconventional electronic topology of $CoSi$* , J. Phys.: Condens. Matter **30**, 135501 (2018).
8. A.A. Burkov, *Mirror Anomaly in Dirac Semimetals*, Phys. Rev. Lett. **120**, 016603 (2018).
9. A.A. Burkov, *Weyl Metals*, Annu. Rev. Condens. Matter Phys. **9**, 359 (2018).
10. A.A. Burkov, *Giant Planar Hall Effect in Topological Metals*, Phys. Rev. B **96**, 041110(R) (2017).
11. A.A. Burkov, *Topological Semimetals*, Nature Materials **15**, 1145 (2016).
12. A.A. Burkov and Yong Baek Kim, *Z_2 and Chiral Anomalies in Topological Dirac Semimetals*, Phys. Rev. Lett. **117**, 136602 (2016).
13. G. Bednik, A.A. Zyuzin, and A.A. Burkov, *Anomalous Hall effect in Weyl superconductors*, New J. Phys. **18**, 085002 (2016). Invited article for the Focus Issue on Topological Semimetals.
14. I. Panfilov, A. Patri, Kun Yang, and A.A. Burkov, *Chiral spin liquid from magnetic Wannier states*, Phys. Rev. B **93**, 125126 (2016).
15. S.A. Owerre, A.A. Burkov, and R.G. Melko, *Linear spin wave study of a quantum kagome ice*, Phys. Rev. B **93**, 144402 (2016).
16. A.A. Burkov, *Chiral anomaly without relativity*, Science **350**, 378 (2015).
17. G. Bednik, A.A. Zyuzin, and A.A. Burkov, *Superconductivity in Weyl metals*, Phys. Rev. B **92**, 035153 (2015).
18. A.A. Burkov, *Negative longitudinal magnetoresistance in Dirac and Weyl metals*, Phys. Rev. B **91**, 245157 (2015).
19. A.A. Burkov, *Chiral anomaly and transport in Weyl metals*, J. Phys.: Condens. Matter, **27** (2015) 113201.

20. A.A. Burkov, *Chiral Anomaly and Diffusive Magnetotransport in Weyl Metals*, Phys. Rev. Lett. **113**, 247203 (2014).
21. A.A. Burkov, *Anomalous Hall Effect in Weyl Metals*, Phys. Rev. Lett. **113**, 187202 (2014).
22. I. Panfilov, A.A. Burkov, and D.A. Pesin, *Density response in Weyl metals*, Phys. Rev. B **89**, 245103 (2014).
23. A.A. Burkov, *Topological response in ferromagnets*, Phys. Rev. B **89**, 155104 (2014).
24. Y. Chen, D.L. Bergman, and A.A. Burkov, *Reply to Comment by Vanderbilt, Souza and Haldane*, arXiv:1312.5751.
25. Y. Chen, Si Wu, and A.A. Burkov, *Axion response in Weyl semimetals*, Phys. Rev. B **88**, 125105 (2013).
26. Y. Chen, D.L. Bergman, and A.A. Burkov, *Weyl fermions and the anomalous Hall effect in metallic ferromagnets*, Phys. Rev. B **88**, 125110 (2013).
27. A.A. Zyuzin and A.A. Burkov, *Topological response in Weyl semimetals and the chiral anomaly*, Phys. Rev. B **86**, 115133 (2012).
28. A.A. Zyuzin, Si Wu, and A.A. Burkov, *Weyl semimetal with broken time reversal and inversion symmetries*, Phys. Rev. B **85**, 165110 (2012).
29. A.A. Burkov, M.D. Hook and Leon Balents, *Topological nodal semimetals*, Phys. Rev. B **84**, 235126 (2011).
30. A.A. Burkov and Leon Balents, *Weyl Semimetal in a Topological Insulator Multilayer*, Phys. Rev. Lett. **107**, 127205 (2011).
31. A.A. Zyuzin and A.A. Burkov, *Thin topological insulator film in a perpendicular magnetic field*, Phys. Rev. B **83**, 195413 (2011).
32. A.A. Zyuzin, M.D. Hook, and A.A. Burkov, *Parallel magnetic field driven quantum phase transition in a thin topological insulator film*, Phys. Rev. B **83**, 245428 (2011).
33. J. Iaconis, R.G. Melko, and A.A. Burkov, *Continuous thermal melting of a two-dimensional Abrikosov vortex solid*, Phys. Rev. B **82**, 180504(R) (2010).
34. P. Nikolić, A.A. Burkov, and A. Paramekanti, *Pair density wave instability and Cooper pair insulators in gapped fermion systems*, Journal of Physics: Conference Series **273**, 012012 (2011).
35. A.A. Burkov and D.G. Hawthorn, *Spin and Charge Transport on the Surface of a Topological Insulator*, Phys. Rev. Lett. **105**, 066802 (2010).
36. A.A. Burkov, *Fractional quantum Hall effect and featureless Mott insulators*, Phys. Rev. B **81**, 125111 (2010).
37. Predrag Nikolić, A.A. Burkov, and Arun Paramekanti, *Finite momentum pairing instability of band insulators with multiple bands*, Phys. Rev. B **81**, 012504 (2010).
38. R. Ganesh, A. Paramekanti, and A.A. Burkov, *Collective modes and superflow instabilities of strongly correlated Fermi superfluids*, Phys. Rev. A **80**, 043612 (2009).
39. L.J. LeBlanc, J.H. Thywissen, A.A. Burkov, and A. Paramekanti, *Repulsive Fermi Gas in a harmonic trap: Ferromagnetism and spin textures*, Phys. Rev. A **80**, 013607 (2009).

40. A.A. Burkov and Arun Paramekanti, *Multiband superfluidity and superfluid to band-insulator transition of strongly interacting fermions in an optical lattice*, Phys. Rev. A **79**, 043626 (2009).
41. R. Schaffer, A.A. Burkov, and R.G. Melko, *Superfluid phases of lattice bosons with ring-exchange interaction*, Phys. Rev. B **80**, 014503 (2009).
42. A.A. Burkov and Arun Paramekanti, *Stability of Superflow for Ultracold Fermions in Optical Lattices*, Phys. Rev. Lett. **100**, 255301 (2008).
43. W.-C. Lee, J. Sinova, A.A. Burkov, Y. Joglekar, and A.H. MacDonald, *Theory of reduced superfluid density in underdoped cuprate superconductors*, Phys. Rev. B **77**, 214518 (2008).
44. A.A. Burkov, M.D. Lukin and Eugene Demler, *Decoherence Dynamics in Low-Dimensional Cold Atom Interferometers*, Phys. Rev. Lett. **98**, 200404 (2007).
45. R.G. Melko, A. Del Maestro and A.A. Burkov, *A striped supersolid phase and the search for deconfined quantum criticality in hard-core bosons on the triangular lattice*, Phys. Rev. B **74**, 214517 (2006).
46. A.A. Burkov and Eugene Demler, *Vortex-Peierls States in Optical Lattices*, Phys. Rev. Lett. **96**, 180406 (2006).
47. V.M. Galitski, A.A. Burkov and S. Das Sarma, *Boundary conditions for spin diffusion in disordered systems*, Phys. Rev. B **74**, 115331 (2006).
48. A.A. Burkov and Leon Balents, *Superfluid-Insulator transitions on the triangular lattice*, Phys. Rev. B **72**, 134502 (2005).
49. R.G. Melko, A. Paramekanti, A.A. Burkov, A. Vishwanath, D.N. Sheng and Leon Balents, *Supersolid Order from Disorder: Hard-Core Bosons on the Triangular Lattice*, Phys. Rev. Lett. **95**, 127207 (2005).
50. M. Polini, A. Burkov, and A.H. MacDonald, *Spin-flip excitations in bilayer quantum Hall ferromagnets*, Solid State Commun. **135**, 654 (2005).
51. Leon Balents, Lorentz Bartosch, Anton Burkov, Subir Sachdev and Krishnendu Sengupta, *Competing Orders and non-Landau-Ginzburg-Wilson Criticality in (Bose) Mott transitions*, Prog. Theor. Phys. Supp. **160**, 314 (2005).
52. Leon Balents, Lorentz Bartosch, Anton Burkov, Subir Sachdev and Krishnendu Sengupta, *Competing orders II: A spin on the dimer model*, Phys. Rev. B **71**, 144509 (2005).
53. Leon Balents, Lorentz Bartosch, Anton Burkov, Subir Sachdev and Krishnendu Sengupta, *Putting competing orders in their place near the Mott transition*, Phys. Rev. B **71**, 144508 (2005).
54. A.A. Burkov and Leon Balents, *Spin relaxation in a two-dimensional electron gas in a perpendicular magnetic field*, Phys. Rev. B **69**, 245312 (2004).
55. A.A. Burkov, A.S. Núñez and A.H. MacDonald, *Theory of spin-charge coupled transport in a two-dimensional electron gas with Rashba spin-orbit interactions*, Phys. Rev. B **70**, 155308 (2004).
56. A.A. Burkov, Y.N. Joglekar, E. Rossi and A.H. MacDonald, *Collective transport in bilayer quantum Hall systems*, Physica E **22**, 19 (2004).

57. A.H. MacDonald, A.A. Burkov, Y.N. Joglekar and E.Rossi, *Collective transport properties of bilayer-quantum-Hall excitonic condensates*, Physics of Semiconductors **171**, 29 (2003).
58. A.A. Burkov and Leon Balents, *Anomalous Hall Effect in Ferromagnetic Semiconductors in the Hopping Transport Regime*, Phys. Rev. Lett. **91**, 057202 (2003).
59. A.A. Burkov and A.H. MacDonald, *Lattice pseudospin model for $\nu = 1$ quantum Hall bilayers*, Phys. Rev. B **66**, 115320 (2002).
60. A.A. Burkov and A.H. MacDonald, *$\nu = 2$ Bilayer quantum Hall system in tilted magnetic field*, Phys. Rev. B **66**, 115323 (2002).
61. E. Bascones, A.A. Burkov and A.H. MacDonald, *Theory of Ferromagnetism in Doped Excitonic Condensates*, Phys. Rev. Lett. **89**, 086401 (2002).
62. Anton Burkov, John Schliemann, A.H. MacDonald and S.M. Girvin, *Phase transition and spin-wave dispersion in quantum Hall bilayers at filling factor $\nu = 1$* , Physica E **12**, 28 (2002).
63. S. Bastea, A. Burkov, C. Moukarzel and P.M. Duxbury, *Combinatorial optimization methods in disordered systems*, Comput. Phys. Commun. **122**, 199 (1999).
64. A.A. Burkov and A.Yu. Zyuzin, *Correlations in transmission of light through a disordered amplifying medium*, Phys. Rev. B **55**, 5736 (1997).
65. A.A. Burkov and A.Yu. Zyuzin, *Correlation function of speckle in reflection from photonic paint*, JETP Lett. **63**, 878 (1996).

INVITED TALKS:

1. *Fractional quantum Hall effect in Weyl semimetals*, Quantum Transport and Universality, Rome, Italy, September 24, 2019.
2. *Weyl Semimetals*, Quantum Materials at UW Workshop, July 26, 2019.
3. *Magnetotransport in topological metals*, CAP Congress, Simon Fraser University, June 4, 2019.
4. *Magnetotransport in topological metals*, Condensed Matter Physics Seminar, University of British Columbia, April 16, 2019.
5. *Magnetotransport in topological metals*, Condensed Matter Physics Seminar, University of Texas at Austin, February 14, 2019.
6. *Topological Metals*, Physics Department Colloquium, University of Toronto, January 17, 2019.
7. *Topological Metals*, Physics Department Colloquium, University of California at Santa Cruz, October 25, 2018.
8. *Magnetotransport in topological metals*, Condensed Matter Physics Seminar, University of Massachusetts at Amherst, September 25, 2018.
9. *Magnetotransport in topological metals*, Condensed Matter Physics Seminar, Texas A&M University, September 14, 2018.
10. *Quantum anomalies and transport in topological semimetals*, Topological matter beyond the ten-fold way, NORDITA, July 24, 2018.

11. *Topological Metals*, Physics Department Colloquium, College of William and Mary, April 27, 2018.
12. *Quantum anomalies and transport in topological semimetals*, Condensed Matter Physics Seminar, Harvard University, March 1, 2018.
13. *Quantum anomalies in nodal line and Dirac semimetals*, Relativistic fermions and nodal semimetals from topology, Banff, February 12, 2018.
14. *Transport in Topological Metals*, Advances in Dirac and Weyl Materials, Jacksonville, Florida, December 15, 2017.
15. *Topological Metals*, Physics Department Colloquium, University of South Florida, October 27, 2017.
16. *Transport in Topological Metals*, Topological Semimetals and Beyond, Weizmann Institute of Science, Rehovot, Israel, September 12, 2017.
17. *Topological Metals*, Condensed Matter Physics Seminar, Universite de Sherbrooke, May 10, 2017.
18. *Transport in Weyl Metals*, APS March meeting Weyl and Dirac semimetals tutorial session, New Orleans, March 12, 2017.
19. *Topological Metals*, Physics Department Colloquium, University at Buffalo, February 23, 2017.
20. *Topological Metals*, Physics Department Colloquium, Brock University, January 31, 2017.
21. *Transport in Topological Metals*, Chiral Matter 2016, RIKEN, Wako, Japan, December 5, 2016.
22. *Transport in Topological Metals*, Low Energy Neutron Source/Condensed Matter Physics Seminar, Department of Physics, Indiana University, November 11, 2016.
23. *Topological Metals*, Physics Department Colloquium, University of Waterloo, October 20, 2016.
24. *Z_2 and Chiral Anomalies in Topological Dirac Semimetals*, Interactions and Topology in Dirac Systems, ICTP, Trieste, August 3, 2016.
25. *Topological Insulator Route to Weyl Fermions*, APS March meeting invited talk, Baltimore, March 16, 2016.
26. *Chiral symmetry, chiral anomaly and transport in Dirac and Weyl metals*, Dirac and Weyl Fermions in Topological Semimetals, Princeton University, March 9, 2016.
27. *Chiral symmetry, chiral anomaly and transport in Dirac and Weyl metals*, Topological Quantum Matter: Progress and Applications, Aspen, Colorado, February 19, 2016.
28. *Weyl Semimetals*, Physics Department Colloquium, College of William and Mary, December 4, 2015.
29. *Weyl Semimetals*, Physics Department Colloquium, Emory University, September 15, 2015.
30. *Topological response in Weyl metals*, New Trends in Topological Insulators, Berlin, Germany, July 7-11, 2014.
31. *Topological response in Weyl metals*, Fundamentals of Electronic Nanosystems, Saint-Petersburg, Russia, June 21-27, 2014.

32. *Topological response in Weyl semimetals and metallic ferromagnets*, APS March meeting invited talk, Denver, March 3, 2014.
33. *Dirac Materials*, University of Montreal, Physics Department Colloquium, November 22, 2013.
34. *Topological response in gapless systems: from Weyl semimetals to metallic ferromagnets*, Ohio State University, Condensed Matter Physics seminar, September 30, 2013.
35. *Weyl Fermions and the Anomalous Hall Effect*, CAP Congress, Montreal, May 29, 2013.
36. *Topological Semimetals*, Symposium: Frontiers of Quantum Matter, George Mason University, June 22, 2012.
37. *Topological Semimetals*, McGill University, Condensed Matter Seminar, January 26, 2012.
38. *Topological Semimetals*, Perimeter Institute, Condensed Matter Seminar, November 25, 2011.
39. *Topological Semimetals*, University of Toronto, Condensed Matter Seminar, October 25, 2011.
40. *Topological Semimetals*, CIFAR Quantum Materials meeting, Montreal, October 15, 2011.
41. *Topological Semimetals*, Brock University, Physics Department Colloquium, October 11, 2011.
42. *Spin-dependent transport and magnetic response in topological insulators*, Boston College, Condensed Matter Physics Seminar, May 3, 2011.
43. *Spin-dependent transport and magnetic response in topological insulators*, California Institute of Technology, Condensed Matter Physics Seminar, April 1, 2011.
44. *Spin-dependent transport and magnetic response in topological insulators*, Kavli Institute for Theoretical Physics, Condensed Matter Physics Seminar, March 4, 2011.
45. *Topological Phases in Condensed Matter*, Physics Department Colloquium, University of Guelph, September 28, 2010.
46. *Incompressible vortex liquids and Mott insulators in two dimensions*, Nordita workshop “Quantum solids, liquids and gases”, August 1-6, 2010, Stockholm, Sweden.
47. *Fractional Quantum Hall Effects and Featureless Mott Insulators*, Southwestern Ontario 4-Corners Condensed Matter Symposium, Perimeter Institute for Theoretical Physics, April 22, 2010.
48. *Fractional Quantum Hall Effect and Featureless Mott Insulators*, Workshop on Exotic Insulating States of Matter, The Johns Hopkins University, January 14-16, 2010.
49. *Nonequilibrium dynamics in cold atom condensates*, Institute for Quantum Computing, University of Waterloo, Seminar, June 19, 2008.
50. *Stability of superflow for ultracold fermions in optical lattices*, Southwestern Ontario 4-Corners Condensed Matter Symposium, Perimeter Institute for Theoretical Physics, April 24, 2008.
51. *Stability of superflow for ultracold fermions in optical lattices*, CIFAR Cold Atoms meeting, April 17-20, 2008.

52. *Nonequilibrium dynamics in low-dimensional cold atom condensates*, McMaster University, Physics Department Colloquium, November 28, 2007.
53. *Nonequilibrium dynamics in low-dimensional cold atom condensates*, University of Waterloo, Condensed Matter Physics seminar, October 31, 2007.
54. *Nonequilibrium dynamics in low-dimensional cold atom condensates*, University of Toronto, Condensed Matter Physics seminar, September 24, 2007.
55. *Phase fluctuations and charge ordering in low-dimensional superfluids*, University of New Hampshire, Physics Department Colloquium, February 19, 2007.
56. *Phase fluctuations and charge ordering in low-dimensional superfluids*, University of Waterloo, Physics Department Colloquium, February 15, 2007.
57. *Vortex-Peierls states in optical lattices*, Boston University, Condensed Matter Physics seminar, May 4, 2006.
58. *Vortex-Peierls states in optical lattices*, Massachusetts Institute of Technology, Condensed Matter Physics seminar, March 22, 2006.
59. *Supersolids and Mott insulators on the triangular lattice*, University of Wisconsin, Condensed Matter Physics seminar, January 10, 2006.
60. *Bosons on the triangular lattice: Mott transition in the presence of geometrical frustration*, Oak Ridge National Laboratory, Condensed Matter Physics seminar, December 13, 2005.
61. *Bosons on the triangular lattice: Mott transition in the presence of geometrical frustration*, University of Virginia, Condensed Matter Physics seminar, December 1, 2005.
62. *Bosons on the triangular lattice: Mott transition in the presence of geometrical frustration*, Harvard University, Condensed Matter Physics seminar, October 18, 2005.
63. *Anomalous Hall effect in ferromagnetic semiconductors in the hopping transport regime*, Harvard University, Condensed Matter Physics seminar, March 11, 2005.
64. *Superfluid-insulator transition in two-dimensional superfluids*, University of California-Berkeley, Condensed Matter Physics seminar, March 3, 2005.
65. *Superfluid-insulator transition in two-dimensional superfluids*, McMaster University, Physics Department Colloquium, February 14, 2005.
66. *Superfluid-insulator transition in two-dimensional superfluids*, University of California-Riverside, Physics Department Colloquium, January 13, 2005.
67. *Theory of spin-charge coupled transport in a two-dimensional electron gas with Rashba spin-orbit interactions*, California Institute of Technology, Condensed Matter Physics seminar, December 3, 2004.
68. *Anomalous Hall effect in ferromagnetic semiconductors in the hopping transport regime*, University of California at Santa Barbara, Condensed Matter Physics seminar, November 2004.
69. *Theory of ferromagnetism in doped excitonic condensates*, University of California at Santa Barbara, Condensed Matter Physics seminar, October 2002.
70. *Lattice pseudospin model for $\nu = 1$ quantum Hall bilayers*, University of Kentucky, Condensed Matter Physics seminar, June 2002.

CONFERENCE/WORKSHOP ORGANIZING:

1. 4-Corners Condensed Matter Symposium, Perimeter Institute for Theoretical Physics, April 30, 2015.
2. APS March meeting 2017, tutorial session on Weyl semimetals.

GRADUATE STUDENT/POSTDOC SUPERVISION:

1. William Sim, M.Sc., 2011. Now analyst at PureHM.
2. Jason Iaconis, M.Sc., 2011. Now graduate student in Physics at University of California, Santa Barbara.
3. Michael Hook, M.Sc., 2012. Now graduate student in Mechanical Engineering at University of Waterloo.
4. Yige Chen, M.Sc., 2013. Now graduate student in Physics at University of Toronto.
5. Ivan Panfilov, PhD, 2017. Now manager/instructor at Grand River Rocks, applying for positions in quantitative finance.
6. Grigory Bednik, PhD, 2018. Now postdoc at University of California, Santa Cruz.
7. Lei Yang, PhD in progress.
8. Si Wu, postdoc, 2012-2013. Now quantitative analyst at FINCAD.
9. Alexander Zyuzin, postdoc, 2011-2012. Now group leader at Aalto University, Finland.

FUNDING HISTORY:

1. University of Waterloo Startup Grant: \$80,000.
2. NSERC Discovery Grant, 2008-2013: \$130,840.
3. NSERC Discovery Grant, 2013-2018: \$125,000.
4. NSERC Discovery Grant, 2018-2023: \$305,000.
5. NSERC Discovery Accelerator Supplement, 2018-2022: \$120,000.
6. DOE Energy Frontier Research Center: Center for the Advancement of Topological Semimetals, 2018-2022: \$10,750,000 (co-PI).

RESEARCH INTERESTS AND GOALS:

I am interested in the physics of materials with nontrivial electronic structure topology and in the observable effects of electron-electron interactions in condensed matter systems. Both electronic structure topology and electron-electron interactions may lead to macroscopic quantum phenomena, in which quantum mechanics manifests on macroscopic scales due to topology- or interaction-induced quantum coherence. Sometimes the two work in unison, as in Fractional

Quantum Hall systems, in which case particularly interesting and unexpected phenomena result. My most significant research contribution so far has been to the rapidly growing field of Topological (Weyl and Dirac) metals. I have made some of the pioneering contributions to this field, and continue to be one of its leaders. The current goal is to develop a complete theoretical description of the response, including transport, in topological metals, to be able to describe the existing transport experiments in these materials, and predict new unexpected phenomena.