

Igor A. Shovkovy

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Employment

- **Jul. 2023 – present**
*Faculty Head of Polytechnic
Science & Mathematics*
Arizona State University, Polytechnic campus
School of Applied Sciences & Arts
Mesa, Arizona, USA
- **Aug. 2017 – present**
Professor
Arizona State University, Polytechnic campus
Mesa, Arizona, USA
- **Aug. 2012 – Aug. 2017**
Associate Professor
Arizona State University, Polytechnic campus
Mesa, Arizona, USA
- **Aug. 2008 – Aug. 2012**
Assistant Professor
Arizona State University, Polytechnic campus
Mesa, Arizona, USA
- **Aug. 2006 – Aug. 2008**
Assistant Professor
Western Illinois University
Macomb, Illinois, USA
- **Oct. 2004 – Aug. 2006**
Junior Fellow
Frankfurt Institute for Advanced Studies
Frankfurt am Main, Germany
- **Oct. 2002 – Sep. 2004**
Research Associate
Johann Wolfgang Goethe-University
Frankfurt am Main, Germany
- **Oct. 2000 – Sep. 2002**
Research Associate
University of Minnesota
Minneapolis, Minnesota, USA
- **Oct. 1997 – Sep. 2000**
Research Associate
University of Cincinnati
Cincinnati, Ohio, USA
- **Feb. 1997 – Sep. 1997**
Junior Research Fellow
Bogolyubov Institute for Theoretical Physics
Kyiv, Ukraine

Education

- **Oct. 1993 – Feb. 1997**
Bogolyubov Institute for Theoretical Physics, Kyiv, Ukraine
Ph. D. in Physics (1997)
Thesis advisors: *V. A. Miransky & V. P. Gusynin*
Dissertation: *Effective Lagrangians and dynamical symmetry breaking
in external magnetic fields*
- **Sep. 1995 – Aug. 1996**
University of Western Ontario, London, ON, Canada
Exchange graduate student
Advisor: *V. A. Miransky*
- **Sep. 1988 – Jun. 1993**
T. Shevchen Kyiv State University, Kyiv, Ukraine
M. Sc. in Physics (1993)
Thesis advisor: *V. P. Gusynin*
Thesis: *Low energy effective Lagrangian in quantum electrodynamics
(derivative expansion)*

Research grants

- **2022 – 2025:** National Science Foundation grant “Research in relativistic plasma under extreme conditions” (PI: I. A. Shovkovy, Grant No. PHY-2209470)
- **2017 – 2022:** National Science Foundation grant “Research in quantum field theory: Anomalous properties of chiral matter” (PI: I. A. Shovkovy, Grant No. PHY-1713950)
- **2014 – 2018:** National Science Foundation grant “Research in quantum field theory: Relativistic matter in a magnetic field” (PI: I. A. Shovkovy, Grant No. PHY-1404232)
- **2010 – 2014:** National Science Foundation grant “Relativistic matter under extreme conditions” (PI: I. A. Shovkovy, Grant No. PHY-0969844)
- **2005 – 2008:** Deutsche Forschungsgemeinschaft (DFG) grant “Instabilities in superconducting and superfluid matter” (PI: D. H. Rischke, Co-PI: I. A. Shovkovy, Grant No. 18448644)

Honors and Awards

- **2014:** Visiting Professorship for Senior International Scientists of the Chinese Academy of Sciences, Institute of High Energy Physics, Beijing, China
- **2011:** Outstanding Referee for the journals of the American Physical Society
- **1997:** Prize of the National Academy of Sciences of Ukraine for young scientists
- **1997:** V. N. Gribov Scholarship at the International School of Subnuclear Physics (35th course), Erice, Italy
- **1995:** Graduate student Soros Grant No. PSU052143
- **1993:** Undergraduate student Soros Grant

Postdoctoral mentoring

- **Dr. Ritesh Ghosh** (Nov. 2023 – present)

Former Ph.D. students

- **Denys Rybalka** (Aug. 2015 – May 2019), **Ph.D.** thesis defended on March 25, 2019, ASU
Current position: Software Consultant, TNG Technology Consulting, Germany
- **Dr. Lifang Xia** (Aug. 2013 – May 2016), **Ph.D.** thesis defended on April 13, 2016, ASU
Current position: private sector
- **Dr. Xinyang Wang** (Aug. 2009 – Aug. 2013), **Ph.D.** thesis defended on July 2, 2013, ASU (Aug. 2006 – May 2008), **M.Sc.** thesis defended on May 6, 2008, WIU
Current position: Professor & Executive Director of the Center for Fundamental Physics, Anhui University of Science & Technology, Huainan, China
- **Dr. Lang Yu** (Jun. 2010 – May 2012), **Ph.D.** thesis defended on April 6, 2012, ASU
Current position: faculty member at Jilin University, Changchun 130012, China

Dissertation committee member

- Bonfilio (Lio) Nainggolan (chair Dr. K. Schmidt), Physics Department, ASU, 2026 (expected)
- Sebastian Cole (chair Dr. M. Dugger), Physics Department, ASU, July 2, 2021
- Rong Chen (chair Dr. K. Schmidt), Physics Department, ASU, July 9, 2020
- Cody Petrie (chair Dr. K. Schmidt), Physics Department, ASU, May 23, 2019
- Adam Blake (chair Dr. M. Sukharev), Physics Department, ASU, November 2, 2016
- Lili Yang (chair Dr. C. Lunardini), Physics Department, ASU, November 14, 2013
- Joel Lynn (chair Dr. K. Schmidt), Physics Department, ASU, April 1, 2013
- Brian Morrison (chair Dr. B. Ritchie), Physics Department, ASU, November 15, 2011

External examiner of Ph.D. dissertation theses

- Debarshi Dey (advisor: Dr. Binoy Krishna Patra), Indian Institute of Technology Roorkee, Roorkee 247667, India, 2024
- Pavlo Pyatkovskiy (advisor: Dr. V.A. Miransky), Western University, London, ON, 2015
- Jorge Noronha (advisor: Dr. D.H. Rischke), Goethe-University, Frankfurt am Main, 2007
- Sirous Homayouni (advisor: Dr. V.A. Miransky), University of Western Ontario, 2006

External examiner of M.Sc. dissertation theses

- Thiago H. Moreira (advisor: Dr. Fábio L. Braghin), The Federal University of Goiás, Brazil, January 28, 2022

Additional graduate student mentoring at ASU

- Jorge Jaber-Urquiza (Aug. 2023 – Sep. 2023), exchange graduate (Ph.D.) student from the National Autonomous University of Mexico, Mexico
- Danis Yangaliev (Jan. 2020 – Dec. 2020), graduate research (PHY-500 & PHY-792), ASU
- Zhaofeng Gan (Jun. 2010 – Aug. 2010), graduate research (PHY-792), ASU
- Zhaofeng Gan (Jan. 2010 – May 2010), research rotation (PHY-500), ASU

Additional undergraduate student mentoring at ASU

- Natalie Figueroa (Sep. 2022 – May 2024), two undergraduate honors projects and honors thesis, ASU
- Jack Hibner (May. 2023 – Dec. 2023), undergraduate project research, ASU
- Hung Nguyen (Jan. 2023 – May 2023), undergraduate project research, ASU
- Maximus Smith (Sep. 2022 – May 2023), two undergraduate honors projects, ASU
- Srinidhi Budhiraju (Sep. 2022 – Dec. 2022), undergraduate honors project, ASU
- Austin Crisenbery, (Sep. 2020 – May 2022), NSF LEAP Scholar, undergraduate research project, ASU
- Kristian Dolgier (May 2020 – May 2021), undergraduate honors thesis project, ASU
- Reid Baker (Aug. 2018 – May 2019), undergraduate research, ASU

- Haoyu Hu (Jul. 2015 – Aug. 2015), exchange student from the University of Science and Technology of China, undergraduate summer research experience, ASU
- Yingchao Lu (Jul. 2014 – Aug. 2014), exchange student from the University of Science and Technology of China, undergraduate summer research experience, ASU

Undergraduate student mentoring at Western Illinois University

- J. E. Brown (Aug. 2007 – May 2008), undergraduate research, Western Illinois University
- N. M. Buckner (Aug. 2006 – May 2007), undergraduate research, Western Illinois University

Student mentoring at J. W. Goethe-University

- J. Noronha-Hostler (2006 – 2010), J. W. Goethe-University, Frankfurt am Main, Germany
- B. Sad (2006 – 2007), J. W. Goethe-University, Frankfurt am Main, Germany
- J. Noronha (2006 – 2007), J. W. Goethe-University, Frankfurt am Main, Germany
- A. Schmitt (2004 – 2006), J. W. Goethe-University, Frankfurt am Main, Germany
- S. Ruster (2003 – 2006), J. W. Goethe-University, Frankfurt am Main, Germany
- M. Hanauske (2002 – 2003), J. W. Goethe-University, Frankfurt am Main, Germany

Teaching experience

2008-present: Arizona State University, Polytechnic Campus, Mesa, AZ

- PHY 112 - *General Physics (Electricity and Magnetism)*
- PHY 113 - *General Physics Laboratory (Mechanics)*
- PHY 121 - *University Physics I: Mechanics*
- PHY 201 - *Mathematical Methods in Physics I* (in-person, online, and Sync)
- PHY 302 - *Mathematical Methods in Physics II* (in-person, online, and Sync)
- PHY 331 - *Principles of Modern Electromagnetism* (in-person, online, and Sync)
- PHY 361 - *Introductory Modern Physics* (in-person, online, and Sync)

2006-2008: Western Illinois University, Macomb, IL

- PHYS 101Y - *Introduction to Astronomy* (a first-year experience course)
- PHYS 560 - *Topics in Solid State Physics*
- PHYS 540 - *Introduction to Particle and Nuclear Physics*
- PHYS 410G - *MATHEMATICA for Physics*
- PHYS 510 - *Classical Mechanics II*
- PHYS 421G/520 - *Electricity & Magnetism II*

Administrative experience

- *Faculty Head of Polytechnic Science & Mathematics*, School of Applied Sciences and Arts, College of Integrative Sciences and Arts (Jul. 2023–now)

University service at ASU

- *College Personnel Committee for Tenured and Tenure-Track Faculty*, College of Integrative Science and Arts, Co-Chair (2022–2023)
- *Search Committee for the inaugural Director of the School of Applied Sciences and Arts*, College of Integrative Science and Arts, Chair (Spring 2023)
- *ad-hoc Unit Personnel Committee* (one P&T case), Science and Mathematics Faculty, College of Integrative Sciences and Arts, Chair (Fall 2022)
- *Panelist at “University Promotion & Tenure” Panel Discussion*, organized by the ASU Faculty Women’s Association, February 16, 2022
- *University hearing board*, Office of the University Provost, Member (Spring 2021)
- *Search Committee for the dean of the College of Integrative Science and Arts*, Member (Fall 2020 – Spring 2021)
- *Applied Physics Lecturer Search Committee*, College of Integrative Sciences and Arts, Member (Spring 2021)
- *Panelist at “University Promotion & Tenure Panel Discussion,”* organized by the ASU Faculty Women’s Association, January 27, 2021
- *University Promotion and Tenure Committee*, Member (2017–2020)
- *ad-hoc Unit Personnel Committee* (one P&T case), Science and Mathematics Faculty, College of Integrative Sciences and Arts, Chair (2020)
- *ad-hoc Unit Personnel Committee* (two P&T cases), Science and Mathematics Faculty, College of Integrative Sciences and Arts, Chair & co-Chair (2019)
- *University Senate*, President-Elect (2016–2017), President (2017–2018), and Past-President (2018–2019) of the Polytechnic Campus Assembly
- *ad-hoc Unit Personnel Committee* (one P&T case), Science and Mathematics Faculty, College of Integrative Sciences and Arts, Chair (2018)
- *Faculty Head Search Committee*, College of Integrative Sciences and Arts, Member (2017–2018)
- *University Services and Facilities Senate Committee*, Member (2016–2018)
- *Physics Lecturer Search Committee*, College of Integrative Sciences and Arts, Member (2017)
- *Review of University Committees Ad-Hoc Senate Committee*, Member (2016–2017)
- *Faculty Head Search Committee*, College of Integrative Sciences and Arts, Member (2016–2017)
- *Interim Physics Program Lead*, Science and Mathematics Faculty, College of Letters and Sciences (Spring 2016)
- *University Undergraduate Standards Committee*, ASU, Member (2013–2015)

- *Unit Personnel Committee* (annual evaluations of contract faculty), Science and Mathematics Faculty, College of Letters and Sciences, Member (2012) and Chair (2013–2015)
- *Major in Applied Physics Committee*, Science and Mathematics Faculty, College of Letters and Sciences, Member (2015)
- *Physics Instructor Search Committee*, Science and Mathematics Faculty, College of Letters and Sciences, Chair (2014), Member (2015)
- *ad-hoc Unit Personnel Committee* (three P&T cases), Science and Mathematics Faculty, School of Letters and Sciences, Co-chair (2013)
- *Faculty review committee* (1 faculty promotion case), Science and Mathematics Faculty, School of Letters and Sciences, Member (2013)
- *Assistant Professor Search Committee* (tenure-track faculty position in microbiology), Science and Mathematics Faculty, School of Letters and Sciences, Member (2013)
- *Science and Mathematics Seminar organizer*, Science and Mathematics Faculty, School of Letters and Sciences, Chair (2013–2014)
- *Minor in Physics Committee*, Science and Mathematics Faculty, School of Letters and Sciences, Member (2013)
- *Committee on Research*, College of Technology & Innovation, Member (2011–2012)
- *Alternative Energy Task Force*, College of Technology & Innovation, Member (2011–2012)
- *Evaluator of physics instructional specialists*, Department of Applied Science & Mathematics (2009–2012)
- *Applied Science Seminar Committee*, Department of Applied Science & Mathematics, Member (2008–2012)
- *Minor in Physics Committee*, Department of Applied Science & Mathematics, Member (2010–2012)
- *Bylaws Committee*, Department of Applied Science & Mathematics, Member (2010–2012)
- *Awards Committee*, Department of Applied Science & Mathematics, Member (2009–2011)

Professional service

- Spring 2023, **Grant Review Panelist**, National Science Foundation
- 2022 – present, **Editorial Board Member** of *Particles*, an international, open access, peer-reviewed journal covering nuclear physics, particle physics and astrophysics
- 2020 – 2023: **Creator, organizer, and host** of the *Theoretical Physics Colloquium* series with the dedicated *YouTube channel*. The series is featured by ECT*
- **Co-organizer** (together with A. Cherman, L. Fidkowski, and S. Sen) of the (in-person) workshop “Topological Phases of Matter: from low to high energy” (INT-21-1a) at the Institute for Nuclear Theory, Seattle, WA, March 6-10, 2023.
- **Proposer and co-organizer** (together with A. Cherman, L. Fidkowski, and S. Sen) of the (online) program “*Topological Phases of Matter: from low to high energy*” (INT-21-1a) at the Institute for Nuclear Theory, Seattle, WA, March 1-19, 2021.

- **Convener** of the *Workshop on Lattice Field Theory and Condensed Matter Physics*, which was part of the International Conference on New Frontiers in Physics (ICNFP 2020 & ICNFP 2021), Crete, August 23 – September 2, 2021
- Member of the **advisory committee** and a session **discussion leader**, the XXXII International (online) Workshop on High Energy Physics “*Hot problems of Strong Interactions*”, Protvino, Russia, November 9-13, 2020
- **Referee** for Physical Review Letters, Physical Review B/C/D, Physics Letters B, Nuclear Physics A/B, and others.
- Member of the **Expert Committee** for evaluating applications for two tenured Associate Professor positions at the University of Stavanger, Norway (2017)
- **Organizer** (together with Cicilia Lunardini) of a series of mini-workshops on Neutron Stars and Neutrinos held at Arizona State University, Tempe, AZ (2009-2012)
- **Proposer** (together with D. Kharzeev, G. Semenoff, and A. Tsvelik) and **Lead Organizer** of an inter-disciplinary workshop “Relativistic dynamics of graphene” at the National Institute for Nuclear Theory, Seattle, WA, January 8–11, 2008
- **Reviewer** of grant proposals for (i) *Department of Energy*, (ii) *National Science Foundation*, (iii) *United States-Israel Binational Science Foundation*, (iv) *Israel Science Foundation*, (v) *Megagrants Program* of the Ministry of Education and Science of the Russian Federation, and (vi) *National Fund for Scientific and Technological Development (FONDECYT)*, Chile

PUBLICATIONS

(Links to publication lists on the web: INSPIRE, arXiv, ADS, Web of Science, Google Scholar)

Book

1. *Electronic Properties of Dirac and Weyl Semimetals*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, ISBN: 978-981-120-734-1, DOI: 10.1142/11475 (World Scientific, Singapore, 2021)

Reviews & book chapters

2. *Anomalous plasma: chiral magnetic effect and all that*, Igor A. Shovkovy, [arXiv:2111.11416](https://arxiv.org/abs/2111.11416), published in *Peter Suranyi 87th Birthday Festschrift: A Life in Quantum Field Theory*, edited by P. Argyres, G. Dunne, G. Semenoff, and R. Wijewardhana, (World Scientific, Singapore, 2022) pp. 291-316.
3. *Anomalous transport properties of Dirac and Weyl semimetals (Review Article)*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1712.08947](https://arxiv.org/abs/1712.08947) [`cond-mat.str-el`], published in a Special Issue “*To the 90th birthday of A. A. Abrikosov*”, edited by A. A. Varlamov, Yu. A. Kolesnichenko, V. M. Loktev, *Low Temp. Phys.* **44**, 487-505 (2018) [*Fizika Nizkikh Temperatur* **44**, 635-657 (2018)].
4. *Quantum field theory in a magnetic field: From quantum chromodynamics to graphene and Dirac semimetals*, V. A. Miransky and I. A. Shovkovy, [arXiv:1503.00732](https://arxiv.org/abs/1503.00732) [`hep-ph`], *Physics Reports* **576**, 1-209 (2015).

5. *Magnetic catalysis: A review*, I. A. Shovkovy, [arXiv:1207.5081](https://arxiv.org/abs/1207.5081) [hep-ph], published in “*Strongly interacting matter in magnetic fields*”, edited by D. Kharzeev, K. Landsteiner, A. Schmitt, H.-U. Yee. Lect. Notes Phys. **871** (Springer, Berlin, 2013) pp. 13-49.
6. *Edge states in quantum Hall effect in graphene (Review Article)*, V. P. Gusynin, V. A. Miransky, S. G. Sharapov and I. A. Shovkovy, *Low Temp. Phys.* **34**, 778-789 (2008) [*Fizika Nizkikh Temperatur* **34**, 993-1006 (2008)].
7. *Phase diagram of neutral quark matter at moderate densities (Chapter 3)*, [S. B. Ruster, V. Werth, M. Buballa, I. A. Shovkovy and D. H. Rischke, nuc1-th/0602018](https://arxiv.org/abs/nuc1-th/0602018), in *Pairing in fermionic systems: basic concepts and modern applications*, Series on Advances in Quantum Many-Body Theory – Vol. 8 (World Scientific, Singapore 2006), pp. 63-89.
8. *Two lectures on color superconductivity*, I. A. Shovkovy, [nuc1-th/0410091](https://arxiv.org/abs/nuc1-th/0410091), *Found. Phys.* **35**, 1309 (2005); abridged version published in *Hot points in astrophysics and cosmology*, (Joint Institute for Nuclear Research, Dubna, 2005), pp. 260-314.
9. *Surprises in nonperturbative dynamics in σ -model at finite density*, V. P. Gusynin, V. A. Miransky and I. A. Shovkovy, [hep-ph/0406219](https://arxiv.org/abs/hep-ph/0406219), *Mod. Phys. Lett. A* **19**, 1341 (2004) (Brief Review).

Preprint(s)

10. *Anisotropic charge transport in strongly magnetized relativistic matter*, R. Ghosh and I. A. Shovkovy, [arXiv:2407.13828](https://arxiv.org/abs/2407.13828).
11. *Distilling circularly polarized photon emission from magnetized chiral plasmas*, X. Wang and I. A. Shovkovy, [arXiv:2407.06271](https://arxiv.org/abs/2407.06271).
12. *Electrical conductivity of hot relativistic plasma in a strong magnetic field*, R. Ghosh and I. A. Shovkovy, [arXiv:2404.01388](https://arxiv.org/abs/2404.01388).

Refereed articles

13. *Fermion self-energy and damping rate in a hot magnetized plasma*, R. Ghosh and I. A. Shovkovy, [arXiv:2402.04307](https://arxiv.org/abs/2402.04307), *Phys. Rev. D* **109**, 096018 (2024).
14. *Photon and dilepton emission anisotropy for a magnetized quark-gluon plasma*, X. Wang and I. A. Shovkovy, [arXiv:2307.07557](https://arxiv.org/abs/2307.07557), *Phys. Rev. D* **109**, 056008 (2024).
15. *Scalar boson emission from a magnetized relativistic plasma*, J. Jaber-Urquiza and I. A. Shovkovy, [arXiv:2310.00050](https://arxiv.org/abs/2310.00050), *Phys. Rev. D* **108**, 096009 (2023).
16. *Electromagnetic response in an expanding quark-gluon plasma*, I. A. Shovkovy, [arXiv:2210.00691](https://arxiv.org/abs/2210.00691), *Particles* **5**, 442-450 (2022).
17. *Rate and ellipticity of dilepton production in magnetized quark-gluon plasma*, X. Wang and I. A. Shovkovy, [arXiv:2205.00276](https://arxiv.org/abs/2205.00276), *Phys. Rev. D* **106**, 036014 (2022).
18. *Chiral anomalous processes in magnetospheres of pulsars and black holes*, E. V. Gorbar and I. A. Shovkovy, [arXiv:2110.11380](https://arxiv.org/abs/2110.11380), *Eur. Phys. J. C* **82**, 625 (2022).
19. *Entropy wave instability in Dirac and Weyl semimetals*, P. O. Sukhachov, E. V. Gorbar, and I. A. Shovkovy, [arXiv:2106.11992](https://arxiv.org/abs/2106.11992), *Phys. Rev. Lett.* **127**, 176602 (2021).
20. *Polarization tensor of magnetized quark-gluon plasma at nonzero baryon density*, X. Wang and I. A. Shovkovy, [arXiv:2106.09029](https://arxiv.org/abs/2106.09029), *Eur. Phys. J. C* **81**, 901 (2021).

21. *Strong suppression of electron convection in Dirac and Weyl semimetals*, P. O. Sukhachov, E. V. Gorbar, and I. A. Shovkovy, [arXiv:2103.15836](#), Phys. Rev. B **104**, L121113 (2021).
22. *Photon polarization tensor in a magnetized plasma: absorptive part*, X. Wang and I. Shovkovy, [arXiv:2103.01967](#), Phys. Rev. D **104**, 056017 (2021).
23. *Ellipticity of photon emission from strongly magnetized hot QCD plasma*, X. Wang, I. A. Shovkovy, L. Yu, and M. Huang, [arXiv:2006.16254](#), Phys. Rev. D **102**, 076010 (2020).
24. *Hydrodynamics of Fermi arcs: Bulk flow and surface collective modes*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1901.00006](#), Phys. Rev. B **99**, 155120 (2019).
25. *Hydrodynamic modes in magnetized chiral plasma with vorticity*, D. O. Rybalka, E. V. Gorbar, and I. A. Shovkovy, [arXiv:1807.07608](#), Phys. Rev. D **99**, 016017 (2019).
26. *Inter-node superconductivity in strained Weyl semimetals*, P. O. Sukhachov, E. V. Gorbar, I. A. Shovkovy, and V. A. Miransky, [arXiv:1809.00019](#), J. Phys.: Cond. Mat. **31**, 055602 (2019).
27. *Electronic properties of strained double-Weyl systems*, P. O. Sukhachov, E. V. Gorbar, I. A. Shovkovy, and V. A. Miransky, [arXiv:1806.03302](#), Annalen der Physik (Berlin) **530**, 1800219 (2018).
28. *Non-Abelian properties of electron wavepackets in Dirac semimetals $A_3\text{Bi}$ ($A = \text{Na, K, Rb}$)*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1805.03222](#), Phys. Rev. B **98**, 045203 (2018).
29. *Nonlocal transport in Weyl semimetals in hydrodynamic regime*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1804.01550](#), Phys. Rev. B **98**, 035121 (2018).
30. *Collective excitations in Weyl semimetals in the hydrodynamic regime*, P. O. Sukhachov, E. V. Gorbar, I. A. Shovkovy, and V. A. Miransky, [arXiv:1802.10110](#), J. Phys.: Cond. Mat. **30**, 275601 (2018).
31. *Hydrodynamic electron flow in a Weyl semimetal slab: Role of Chern–Simons terms*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1802.07265](#), Phys. Rev. B **97**, 205119 (2018).
32. *Consistent hydrodynamic theory of chiral electrons in Weyl semimetals*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1712.01289](#) [cond-mat.str-el], Phys. Rev. B **97**, 121105(R) (2018).
33. *Anomalous thermoelectric phenomena in lattice models of multi-Weyl semimetals*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1708.04248](#) [cond-mat.mes-hall], Phys. Rev. B **96**, 155138 (2017).
34. *Chiral response in lattice models of Weyl materials*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1706.09419](#) [cond-mat.mes-hall], Phys. Rev. B **96**, 125123 (2017).
35. *Wigner function and kinetic phenomena for chiral plasma in a strong magnetic field*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1707.01105](#) [hep-ph], J. High Energy Phys. **08** (2017) 103.

36. *Origin of the Bardeen-Zumino current in lattice models of Weyl semimetals*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1706.02705](#) [`cond-mat.mes-hall`], Phys. Rev. B **96**, 085130 (2017).
37. *Pseudomagnetic lens as a valley and chirality splitter in Dirac and Weyl materials*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1703.03415](#) [`cond-mat.mes-hall`], Phys. Rev. B **95**, 241114(R) (2017).
38. *Second-order dissipative hydrodynamics for plasma with chiral asymmetry*, E. V. Gorbar, [D. O. Rybalka](#), and I. A. Shovkovy, [arXiv:1702.07791](#) [`hep-th`], Phys. Rev. D **95**, 096010 (2017).
39. *Second-order chiral kinetic theory: chiral magnetic and pseudomagnetic waves*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1702.02950](#) [`cond-mat.mes-hall`], Phys. Rev. B **95**, 205141 (2017).
40. *Consistent chiral kinetic theory in Weyl materials: chiral magnetic plasmons*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1610.07625](#) [`cond-mat.str-el`], Phys. Rev. Lett. **118**, 127601 (2017).
41. *Pseudomagnetic helicons*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1612.06397](#) [`cond-mat.mes-hall`], Phys. Rev. B **95**, 115422 (2017).
42. *Chiral magnetic plasmons in anomalous relativistic matter*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1611.05470](#) [`cond-mat.mes-hall`], Phys. Rev. B **95**, 115202 (2017).
43. *Anomaly-driven inverse cascade and inhomogeneities in a magnetized chiral plasma in the early Universe*, E. V. Gorbar, [I. Rudenok](#), I. A. Shovkovy, and S. Vilchinskii, [arXiv:1610.01214](#) [`hep-ph`], Phys. Rev. D **94**, 103528 (2016).
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28. *Impact of CFL quark matter on the cooling of compact stars*, I. A. Shovkovy and P. J. Ellis, [hep-ph/0303073](#), in "Strong Coupling Gauge Theories and Effective Field Theories", edited by M. Harada, Y. Kikukawa and K. Yamawaki, (World Scientific, Singapore, 2003) pp. 192-198.
29. *Quark color superconductivity and the cooling of compact stars*, I. A. Shovkovy and P. J. Ellis, [hep-ph/0207346](#), in "Continuous Advances in QCD 2002/Arkadyfest", edited by K.A. Olive, M.A. Shifman and M.B. Voloshin, (World Scientific, River Edge, 2002) pp. 291-302.
30. *Collective modes in color superconducting matter*, I. Shovkovy, [hep-ph/0110352](#), Int. J. Mod. Phys. **A17**, 904 (2002); J. Phys. G: Nucl. Phys. **28**, 1877 (2002); Nucl. Phys. **A702**, 191 (2002).
31. *The spectrum of diquark composites in cold dense QCD*, I. A. Shovkovy, [nucl-th/0010021](#), Int. J. Mod. Phys. **A16**, 1271 (2001).
32. *Diquark composites in the color superconducting phase of two flavor dense QCD*, V. Miransky, I. A. Shovkovy and R. Wijewardhana, [hep-ph/0003327](#), Nucl. Phys. Proc. Suppl. **102**, 385 (2001).

33. *Derivative expansion of the one loop effective action in QED*, I. A. Shovkovy, [hep-th/9902019](#). Published in “*Trends in Mathematical Physics*”, edited by V. Alexiades and G. Siopsis (AMS/International Press, Cambridge MA, 1999) pp. 467-474.
34. *Chiral symmetry breaking in the weakly coupled QED in a magnetic field*, I. A. Shovkovy, [hep-ph/9709340](#). Published in “*Highlights of subnuclear physics: 50 years later*”, edited by A. Zichichi (World Scientific, Singapore, 1999) pp. 602-609.
35. *Mass generation in the supersymmetric Nambu–Jona-Lasinio Model in an external magnetic field*, I. A. Shovkovy, [hep-th/9703116](#), published in “*Supersymmetry and quantum field theory: proceedings of the D. Volkov Memorial Seminar*”, edited by J. Wess and V.P. Akulov (Springer, 1998) pp. 182-186.

PRESENTATIONS

Mass media

1. Episode of Scientific Sense Podcast with Gill Eapen, Feb. 26, 2021
2. Expert comments for “Superconductivity from nowhere” by Jon Cartwright, published at [physicsworld.com](#), a website from the Institute of Physics, March 29, 2011
3. Invited introduction to the Public Broadcasting Service (PBS) NOVA feature program “Monster of the Milky Way”, aired on WMEC-TV and other stations of Network Knowledge by public television for Central and Western Illinois (7 p.m. CST, October 31, 2006)

Invited conference talks

1. *Charge transport in strongly magnetized relativistic matter*, invited talk at the 8th International Conference on Chirality, Vorticity and Magnetic Field in Quantum Matter, West University of Timisoara, Timisoara, Romania, July 25, 2024
2. *Anomalous chiral transport in nuclear physics and beyond*, invited talk at the Workshop on *Chirality and Vorticity Effects from Nuclear Systems to Condensed Matter*, as part of the 2023 Joint APS/JPS Meeting, Maui, Hawaii, November 26, 2023
3. *Anomalous effects in chiral plasmas*, invited talk at *Gravity, Fields, and Strings in Honour of the 70th birthday of Professor Gordon Semenoff*, University of Montreal, Canada, July 28, 2023
4. *Anomalous effects in the magnetar magnetospheres* (video), invited blackboard talk at the program *The Many Faces of Relativistic Fluid Dynamics*, KITP, University of California, Santa Barbara, June 15, 2023
5. *Chiral plasma instability in the magnetosphere of magnetars* (video), invited talk at the International Workshop on *Electromagnetic Effects in Strongly Interacting Matter*, ICTP South American Institute for Fundamental Research, Sao Paulo, Brazil, October 27, 2022
6. *Relativistic-like electron hydrodynamics in Dirac semimetals*, invited HYDRO22 colloquium at the International Workshop on *Emergent Hydrodynamics in Condensed Matter and High-Energy Physics*, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, May 2, 2022
7. *Anomalous phenomena in Dirac and Weyl semimetals*, invited (remote) talk at the 6th International Conference on *Chirality, Vorticity and Magnetic Field in Heavy Ion Collisions* (hybrid meeting), Stony Brook University, Stony Brook, NY, November 3, 2021

8. *Riding the wave of relativistic-like hydrodynamics*, invited talk at the online workshop on “Topological Aspects of Strong Correlations and Gauge Theories”, International Centre for Theoretical Sciences (ICTS) of the Tata Institute of Fundamental Research, Bangalore, India, September 9, 2021
9. *Relativistic-like hydrodynamics: Catching the flow*, invited talk at the 2021 Summer program “From Chaos to Hydrodynamics in Quantum Matter”, Aspen Center for Physics, Aspen, CO, September 1, 2021
10. *Chiral anomalous effects in QGP*, invited mini-course (two online lectures) at the XX Jorge André Swieca Summer School in Theoretical Nuclear Physics, Brazilian Physical Society, February 8-10, 2021
11. *Photon emission from strongly magnetized QGP*, invited online talk at the XX Jorge André Swieca Summer School in Theoretical Nuclear Physics, Brazilian Physical Society, February 12, 2021
12. *Chiral kinetic theory: applications to semimetals*, virtual INT program “Chirality and Criticality: Novel Phenomena in Heavy-Ion Collisions”, Institute for Nuclear Theory, University of Washington, Seattle, May 19, 2020
13. *Applications of chiral kinetic theory in Dirac and Weyl semimetals*, workshop on Quantum kinetic theories in magnetic and vortical fields, Yukawa Institute for Theoretical Physics, Kyoto University, Japan, December 9, 2019
14. *Dimensional reduction and catalysis of dynamical symmetry breaking by a magnetic field*, workshop on Physics Opportunities at a Lepton Collider in the Fully Nonperturbative QED Regime, SLAC National Accelerator Laboratory, Menlo Park, CA, August 7, 2019
15. *Downfall of chiral magnetic wave*, Nordita scientific program “Effective Theories of Quantum Phases of Matter”, Nordita, Stockholm, Sweden, May 6, 2019
16. *Chiral plasmas: from cosmology to technology*, workshop on “Recent Developments in Chiral Matter and Topology”, Center for Theoretical Physics, National Taiwan University, Taipei, Taiwan, December 6-9, 2018
17. *Hydrodynamic modes in magnetized chiral plasma with vorticity*, Nordita scientific program “Quantum Anomalies and Chiral Magnetic Phenomena”, Nordita, Stockholm, Sweden, October 8, 2018
18. *Anomalous chiral matter: from QCD to condensed matter*, the XIIIth Quark Confinement and the Hadron Spectrum conference, Maynooth University, Ireland, August 1-6, 2018
19. *Hydrodynamic modes in charged chiral plasmas with vorticity*, workshop on “Open Problems and Opportunities in Chiral Fluids”, Santa Fe, NM, July 17-19, 2018
20. A series of three lectures on *Magnetic catalysis in QCD in a superstrong magnetic field*, the XIV International Workshop on Hadron Physics, Florianópolis, Brazil, March 18-23, 2018
21. *Quasi-relativistic systems in a strong magnetic field*, conference on Nonperturbative QFT and Loewe’s 65 Fest, Santiago, Chile, December 5-7, 2017
22. *Chiral effects in strong magnetic backgrounds: from QCD to condensed matter physics*, the 15th International Conference on QCD in Extreme Conditions (XQCD 2017), Pisa, Italy, June 26-28, 2017

23. A series of six lectures on *magnetic catalysis, QCD in strong magnetic fields, graphene, and Dirac & Weyl materials*, Summer School on *Frontiers in Theoretical Physics and the sixth Huada School on QCD*, Wuhan, China, May 29-June 2, 2017
24. *Physics of strong magnetic field*, KEK theory center workshop on *Hadron and Nuclear Physics in 2017* (KEK-HN-2017), KEK, Tsukuba, Japan, January 7-10, 2017
25. *Chiral matter in magnetic field*, RIKEN workshop *Chiral matter: from quarks to Dirac semimetals*, RIKEN, Wako, Japan, December 5-8, 2016
26. *Anomalous chiral plasmas: from Dirac semimetals to cosmology*, mini-workshop *Condensed matter physics meets relativistic quantum field theory*, Laboratory of Mathematical and Theoretical Physics, University of Tours, Tours, France, June 13-15, 2016
27. *Anomalous chiral plasma: finite size and inhomogeneity effects*, workshop on *Magnetic Fields in Hadron Physics*, ICTP South American Institute for Fundamental Research, Sao Paulo, Brazil, May 9-13, 2016
28. *Anomaly-driven chiral magnetic effects*, the 1st CORE-U International Conference: *Intense Fields and Extreme Universe*, Hiroshima University, Higashi-Hiroshima, Japan, March 7-8, 2016
29. *Chirality in magnetized relativistic plasma*, workshop on *Magnetic Fields in Strongly Interacting Matter*, Utrecht University, Netherlands, November 20-23, 2015
30. *Magnetism and chirality in QCD*, KITPC program “sQGP and Extreme QCD,” Kavli Institute for Theoretical Physics China at the Chinese Academy of Sciences, Beijing, China, May 12, 2015
31. *Chiral asymmetry in magnetized stellar matter*, workshop on *Quarks and Compact Stars*, Kavli Institute for Astronomy and Astrophysics at Peking University, Beijing, China, October 20-22, 2014
32. *Chiral asymmetry: A remarkable form of magnetization in relativistic matter*, the 2nd workshop on *QCD vacuum and matter under strong magnetic field*, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China, October 15-17, 2014
33. *Universal magnetic catalysis: from Quantum Chromodynamics to Dirac semimetals*, *Low Energy Challenges for High Energy Physicists* conference, Perimeter Institute for Theoretical Physics, ON, Canada, May 26-30, 2014
34. *Chiral separation effect: from high energy to Dirac and Weyl semimetals*, workshop on *Effective Field Theories for Quantum Many-Body Systems*, Instituto de Fisica Teorica, Universidad Autonoma de Madrid, Madrid, Spain, January 15-17, 2014
35. *Radiative corrections to chiral separation effect*, the 10th biannual workshop *Continuous Advances in QCD (CAQCD_2013)*, Minneapolis, MN, May 16-19, 2013
36. *Many facets of magnetic catalysis*, mini-workshop on *QCD vacuum and matter under strong magnetic field*, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China, April 29-30, 2013
37. *Radiative corrections to chiral separation effect in QED*, mini-workshop on *QCD vacuum and matter under strong magnetic field*, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China, April 29-30, 2013
38. *Magnetized vacuum and matter: from magnetic catalysis to chiral asymmetry*, workshop on *QCD in strong magnetic fields*, ECT*, Trento, Italy, November 12-16, 2012

39. *Fast chemical equilibration via Hagedorn states in heavy ion collisions*, symposium on contemporary nuclear physics (*JoeFest*), McGill University, Montreal, Canada, June 12-14, 2012
40. *Abnormal normal ground state of dense relativistic matter in a magnetic field*, workshop *New Frontiers in QCD 2010 – Exotic Hadron Systems and Dense Matter*, Yukawa Institute for Theoretical Physics, Kyoto, Japan, March 10, 2010
41. *Relativistic dynamics in graphene: Magnetic Catalysis & Quantum Hall Effect*, the XII Mexican workshop on *Particles and Fields*, Mazatlan, Mexico, November 9-14, 2009
42. *Transport Properties of Stellar Quark Matter*, workshop *Quark-gluon plasma meets cold atoms*, GSI, Darmstadt, Germany, September 25-27, 2008
43. *Magnetization of color-flavor-locked matter*, workshop *New Frontiers in QCD 2008 – Fundamental Problems in Hot and/or Dense Matter*, Yukawa Institute for Theoretical Physics, Kyoto, Japan, March 11, 2008
44. *What is the true ground state of dense QCD?* (Discussion session leader), workshop *New Frontiers in QCD 2008 – Fundamental Problems in Hot and/or Dense Matter*, Yukawa Institute for Theoretical Physics, Kyoto, Japan, March 3, 2008
45. *The quest for the ground state of cold dense quark matter*, International Conference on *Exotic States of Hot and Dense Matter and their Dual Description*, Perimeter Institute for Theoretical Physics, Waterloo, Ontario, Canada, May 22-25, 2007
46. *On recent advances and upsets in color superconductivity*, APCTP Focus Program *Search for Exotic State of Dense Matter*, POSTECH, Pohang, Korea, June 19-30, 2006
47. *Color superconductivity*, International Conference on *Strong & Electroweak Matter 2006*, Brookhaven National Laboratory, May 10-13, 2006
48. *Dense baryon matter: progress and difficulties*, workshop on *QCD at Finite Density*, ECT* Trento, Italy, March 21-25, 2006
49. *The many phases of color-superconducting quark matter*, *DESY Theory workshop*, Hamburg, Germany, September 28-30, 2005
50. *Neutrino trapping in a color superconductor*, workshop on *Pairing in Fermionic Systems: Beyond the BCS Theory*, Institute for Nuclear Theory, University of Washington, Seattle, September 19-23, 2005
51. *Color superconductivity in dense quark matter*, workshop on *Extreme QCD*, University of Wales Swansea, Swansea, August 2-5, 2005
52. *QCD phase diagram*, workshop on *Exploring the Phase Diagram of Strongly Interacting Matter*, State University of New York at Stony Brook, November 16-17, 2004
53. *Gapless phases of color superconducting matter*, The 8th International Conference on *Strangeness in Quark Matter (SQM 2004)*, Cape Town, South Africa, September 15-20, 2004
54. *Phases of high baryon density QCD*, The 4th Biennial Meeting of the *International Association for Relativistic Dynamics*, Saas Fee, Switzerland, June 12-19, 2004
55. *Theory of gapless superconductivity in quark matter*, NATO Advanced Study Institute *Structure and Dynamics of Elementary Matter*, Kemer, Turkey, September 22-October 2, 2003
56. *Gapless color superconductivity in quark matter*, miniworkshop *Aspects of nonperturbative QCD: hadrons and thermodynamics*, Rostock, Germany, July 14-15, 2003

57. *Speculations about cooling of compact stars*, workshop *Strong Coupling Gauge Theories and Effective Field Theories*, Nagoya, Japan, December 10-13, 2002
58. *Quark color superconductivity and the cooling of compact stars*, *Continuous Advances in QCD 2002/Arkadyfest*, Minneapolis, MN 55455, May 17-23, 2002
59. *Collective modes in color superconducting matter*, The 6th International Conference on *Strangeness Quarks in Matter (SQM 2001)*, Frankfurt am Main, Germany, September 24-29, 2001
60. *Collective modes in color superconducting matter*, The 5th workshop on *Quantum Field Theory under the Influence of External Conditions*, University of Leipzig, Germany, September 10-14, 2001
61. *Chiral symmetry breaking in weakly coupled QED in a magnetic field*, workshop on *Mathematical Physics: Today, Priority Technologies – for Tomorrow*, Kyiv, Ukraine, May 12-17, 1997

Contributed conference talks

1. *Anisotropic emission from magnetized quark-gluon plasma* (in person), the XVth international conference on *Strong and Electro-Weak Matter 2022 (SEWM 2022)*, Saclay & Paris, France, June 21, 2022
2. *Dilepton emission from magnetized quark-gluon plasma* (online talk), international workshop *FunQCD22: from first principles to effective theories*, Valencia, Spain, June 13, 2022
3. *Chiral anomaly effects in pulsar magnetospheres* (online talk), *APS April Meeting*, New York, NY, April 9, 2022
4. *Electromagnetic probes of strongly magnetized quark-gluon plasma*, virtual *2021 Fall Meeting of the Division of Nuclear Physics of the American Physical Society*, October 13, 2021
5. *Photon emission from strongly magnetized QCD plasma*, virtual *APS April Meeting*, April 20, 2021
6. *Anisotropic photon emission from magnetized QGP*, virtual workshop *FunQCD: from first principles to effective theories*, April 1, 2021
7. *Collective modes in chiral relativistic plasmas*, the *16th International Conference on QCD in Extreme Conditions (XQCD 2018)*, Frankfurt, Germany, May 21-23, 2018
8. *Anomalous inhomogeneous chiral plasma*, the 2nd QCD workshop on *Chirality, Vorticity and Magnetic Field in Heavy Ion Collisions*, University of California, Los Angeles, CA, February 23-26, 2016
9. *Chiral shift in renormalizable theories in magnetic field*, RIKEN-BNL workshop on “*P- and CP-odd Effects in Hot and Dense Matter*”, Brookhaven National Laboratory, Upton, NY, USA, June 25-27, 2012
10. *Magnetized dense relativistic matter*, the *11th Conference on the Intersections of Particle and Nuclear Physics (CIPANP 2012)*, St. Petersburg, FL, USA, May 29-June 3, 2012
11. *Chiral asymmetry and axial anomaly in magnetized relativistic matter*, the *19th Particles and Nuclei International Conference (PANIC11)*, Massachusetts Institute of Technology, Cambridge, MA, July 24-29, 2011
12. *Dynamics in the normal ground state of dense relativistic matter in magnetic field*, *APS April Meeting*, Anaheim, CA, April 30-May 3, 2011

13. *Magnetic catalysis and chiral shift in dense matter*, the IXth international conference on *Strong and Electro-Weak Matter 2010* (SEWM 2010), McGill University, Montreal, Canada, June 29-July 2, 2010
14. *Chiral shift in dense relativistic matter in magnetic field*, the XII Mexican workshop on *Particles and Fields*, Mazatlan, Mexico, November 9-14, 2009
15. *Chiral shift at Fermi surface of dense relativistic matter in magnetic field*, *Bogolyubov Kyiv Conference Modern Problems of Theoretical and Mathematical Physics*, Kyiv, Ukraine, September 15-18, 2009
16. *Chiral asymmetry in relativistic matter in a magnetic field*, the 10th *Conference on the Intersections of Particle and Nuclear Physics* (CIPANP 2009), San Diego, CA, USA, May 26-31, 2009
17. *Surprises in dense relativistic matter in a magnetic field*, *Mini-workshop on Neutron Stars and Neutrinos*, Arizona State University, Tempe, USA, April 15-16, 2009
18. *Bulk viscosity in dense quark matter*, *Vic Elias Memorial Conference*, University of Western Ontario, London, Ontario, Canada, May 28-30, 2007
19. *Bulk viscosity of strange quark matter*, mini-workshop on *Color Superconductivity*, Washington University, St. Louis, USA, March 29, 2007
20. *Transport properties of color superconductors*, the 19th *Annual Midwest Nuclear Theory Get-Together*, Argonne National Laboratory, October 13-14, 2006
21. *Phase diagram of dense QCD with and without neutrino trapping*, *Neutron Stars at the Crossroads of Fundamental Physics*, Vancouver, Canada, August 9-13, 2005
22. *New mechanism for pulsar kicks powered by color superconductivity*, *QCD@Work 2005*, workshop on QCD Theory and Experiment, Conversano, Italy, June 16-20, 2005
23. *Compact stars as a laboratory of gapless superconductivity*, presentation at the collaboration meeting of Virtual Institute and Research Training Network Initiative, Darmstadt, Germany, October 22-23, 2004
24. [‡]*Color superconductivity and compact stars*, (Lecture 1: *Introduction into color superconductivity* & Lecture 2: *Color superconductivity in neutral matter*), International Summer School and Workshop on *Hot points in astrophysics and cosmology*, Bogoliubov Laboratory of Theoretical Physics, Joint Institute for Nuclear Research, Dubna, Russia, August 2-13, 2004
25. *Gluon puzzle of gapless superconductivity*, INT-04-1 program “QCD and Dense Matter: From Lattices to Stars”, Institute for Nuclear Theory, University of Washington, Seattle, WA, USA, May 28, 2004
26. *Stable gapless color superconducting phases of dense quark matter*, Nuclear Physics Spring Meeting, Cologne, Germany, March 8-12, 2004
27. *Gapless superconductivity – from quark matter to atomic gases*, Symposium of the Frankfurt Institute for Advanced Studies, Frankfurt am Main, Germany, February 25, 2004
28. *Color superconductivity and compact stars*, QCD@Work 2003, workshop on QCD Theory and Experiment, Conversano, Italy, June 14-18, 2003

[‡] Voted “Best Lecturer” of the school.

29. *Thermal rates for baryon and anti-baryon production*, Seventh workshop on Quantum Chromodynamics, Villefranche-sur-Mer, France, January 6-10, 2003
30. *Quark stars and their cooling*, workshop *Strong and Electroweak Matter 2002*, Heidelberg, Germany, October 2-5, 2002
31. *The effect of color superconductivity on the cooling rate of quark stars*, DPF2002: Meeting of the Division of Particles and Fields, College of William & Mary, Williamsburg, May 24-28, 2002
32. *Collective modes in color superconducting matter*, International Conference on STATISTICAL QCD, ZiF, Bielefeld University, Germany, August 26-30, 2001
33. *The diquark pseudo-Nambu-Goldstone bosons in the color superconducting phase*, Mini-workshop on *Heavy Ion Reaction Dynamics*, University of Minnesota, Minneapolis, November 6-7, 2000
34. *The spectrum of diquark composites in cold dense QCD*, DPF2000: Meeting of The Division of Particles and Fields, Ohio State University, Columbus, OH, August 9-12, 2000
35. † *Chiral symmetry breaking in weakly coupled QED in a magnetic field*, International School of Subnuclear Physics, 35th Course: *Highlights: 50 Years Later*, Erice, Italy, August 26-September 4, 1997
36. *Mass generation in the supersymmetric Nambu-Jona-Lasinio model in an external magnetic field*, D. Volkov Memorial Seminar *Supersymmetry and Quantum Field Theory*, Kharkiv, Ukraine, January 5-7, 1997
37. *Dynamical chiral symmetry breaking by a magnetic field in QED*, Second Ukrainian Conference of Young Scientists, T. Shevchenko Kyiv State University, Kyiv, Ukraine, May 16-18, 1995
38. *Dimensional reduction and dynamical chiral symmetry breaking by a magnetic field*, Scientific Session of the Bogolyubov Institute for Theoretical Physics, Kyiv, Ukraine, February 22-23, 1995

Seminars & colloquia

1. *Chiral anomalous effects in magnetars*, seminar at Interdisciplinary Center for Theoretical Study, University of Science and Technology of China, Hefei, June 21, 2024
2. *Radiant strongly magnetized relativistic plasmas*, seminar at Center for Theoretical Physics, Anhui University of Science and Technology, Huainan, June 20, 2024
3. *Scalar boson emission from a magnetized relativistic plasma*, seminar (remote), Latin American network on electromagnetic effects in strongly interacting matter, October 11, 2023
4. *Electromagnetic probes of magnetized quark-gluon plasma* (video), IFT Colloquium (in person), Instituto de Física Teórica - UNESP, Sao Paulo, Brazil, October 26, 2022
5. *Chiral anomalous bursts in pulsar magnetospheres*, nuclear physics seminar (in person), Department of Physics and Astronomy, Iowa State University, Ames, IA, September 22, 2022
6. *Chiral matter: From quark gluon plasma to topological semimetals*, physics colloquium (in person), Department of Physics, Indiana University Bloomington, IN, March 9, 2022

† Voted “Best Theoretical Presentation” by a graduate student

7. *Chiral anomalous magnetospheres of magnetars*, S@INT hybrid seminar (remote), Institute for Nuclear Theory, University of Washington, Seattle, WA, January 11, 2022
8. *Chiral anomalous plasma in magnetospheres of pulsars*, online QCD theory seminar hosted by KEK Japan, December 14, 2021
9. *Anomalous chiral matter and all that*, physics colloquium (remote), Universidade Estadual de Campinas (UNICAMP), Brazil, September 28, 2021
10. *Anomalous quark-gluon plasma*, physics colloquium (dual mode), Arizona State University, Tempe, AZ, September 23, 2021
11. *Anomalous physics of magnetized quark-gluon plasma*, physics colloquium (remote), Physics Department, University of Arizona, Tucson, AZ, March 19, 2021
12. *Direct photons from magnetized quark-gluon plasma*, theoretical physics seminar (remote), Sharif University of Technology, Tehran, Iran, August 18, 2020
13. *Dissipation of chiral magnetic wave*, theoretical physics seminar, J.W. Goethe University, Frankfurt am Main, Germany, May 14, 2019
14. *Collective modes in chiral plasmas with dynamical electromagnetism*, theoretical high-energy physics seminar, Institute of Physics, Academia Sinica, Taipei, Taiwan, December 13, 2018
15. *Anomalous chiral matter: from quark-gluon plasma to novel materials*, physics seminar, University of Stavanger, Norway, October 11, 2018
16. *Collective modes in chiral (pseudo)relativistic matter*, theoretical physics seminar, Institute of High Energy Physics, CAS, Beijing, June 8, 2017
17. *Transport properties of anomalous chiral plasmas*, nuclear theory seminar, J.W. Goethe University, Frankfurt am Main, Germany, June 10, 2016
18. *Many faces of chiral magnetic effects*, FIAS colloquium, Frankfurt Institute for Advanced Studies, Frankfurt am Main, Germany, June 9, 2016
19. *Generalized Landau-level representation for spin-1/2 fermions and its applications*, nuclear physics seminar, Brookhaven National Laboratory, Upton, NY, July 31, 2015
20. *Research at the tip of a pencil*, Science and Mathematics seminar, College of Letters and Sciences, Arizona State University, Mesa, AZ, April 8, 2015
21. *Magnetized relativistic plasma as a Weyl metal*, nuclear physics seminar, Department of Physics, University of Maryland, College Park, MD, December 3, 2014
22. *Chiral asymmetry in condensed matter physics*, condensed matter physics seminar, Wuhan University, Wuhan, China, November 6, 2014
23. *Universal magnetic catalysis*, physics seminar, Huazhong University of Science and Technology, Wuhan, China, November 6, 2014
24. *Chiral effects in magnetized plasma*, high-energy physics seminar, Central China Normal University, Wuhan, China, November 5, 2014
25. *Magnetism and chirality in relativistic systems*, high-energy physics seminar, Department of Physics, Tsinghua University, Beijing, China, October 30, 2014
26. *Chiral separation effect: Theoretical challenges and applications*, theoretical physics seminar, Department of Physics, Pusan National University, Busan, South Korea, March 14, 2014

27. *Magnetic dance in a quantum world*, physics seminar, Nishina Center, RIKEN, Wako, Japan, March 5, 2014
28. *High-energy research at the tip of a pencil*, physics colloquium, Department of Physics, Kent State University, Kent, OH, January 30, 2014
29. *Chiral separation effect: recent developments*, physics seminar, Bogolyubov Institute for Theoretical Physics of the National Academy of Sciences of Ukraine, Kyiv, Ukraine, June 10, 2013
30. *Radiative corrections to chiral separation effect in QED*, physics seminar, Department of Modern Physics, University of Science and Technology of China, Hefei, China, May 3, 2013
31. *Quantum magnetic world*, high-energy physics seminar, Institute of High Energy Physics, CAS, Beijing, China, April 26, 2013
32. *Relativistic matter in magnetic fields*, physics seminar, University of Texas at El Paso, USA, September 16, 2011
33. *Relativistic Dynamics and Spontaneous Symmetry Breaking in Graphene*, YITP physics colloquium, Yukawa Institute for Theoretical Physics, Kyoto, Japan, March 15, 2010
34. *Chiral asymmetry in relativistic matter in a magnetic field*, theoretical physics seminar, Vienna University of Technology, Vienna, Austria, July 9, 2009
35. *Chiral asymmetry in relativistic matter in a magnetic field*, nuclear theory seminar, J.W. Goethe University, Frankfurt am Main, Germany, July 16, 2009
36. *Neutron vs. Quark Stars*, seminar of the Cosmology Journal Club, Arizona State University, Tempe, AZ, April 21, 2009
37. *Graphene: Symmetry breaking in the carbon Flatland*, theoretical physics seminar, Arizona State University, Tempe, USA, October 13, 2008
38. *Graphene: Symmetry breaking in the carbon Flatland*, theoretical physics seminar, Washington University, St. Louis, USA, July 30, 2008
39. *Neutron stars, quark-gluon plasma, and graphene*, research seminar, Arizona State University, Mesa, USA, March 17, 2008
40. *Color-flavor locked superconductor in a magnetic field*, theoretical physics seminar, Washington University, St. Louis, USA, August 13, 2007
41. *Condensed quark matter*, theoretical physics seminar, University of Wales Swansea, Swansea, United Kingdom, June 20, 2007
42. *Exotic states of matter at the heart of neutron stars*, physics seminar, Arizona State University, Tempe, AZ, May 3, 2007
43. *Transport properties of color superconductors*, theoretical physics seminar, Washington University, St. Louis, USA, September 21, 2006
44. *Unconventional Cooper pairing in dense quark matter*, high-energy physics seminar, University of Cincinnati, Cincinnati, OH, May 16, 2006
45. *Introduction into color superconductivity*, theoretical physics seminar, Norwegian University of Science and Technology, Trondheim, Norway, April 26, 2006
46. *Unconventional Cooper pairing in dense quark matter*, theoretical physics seminar, University of Minnesota, Minneapolis, USA, April 17, 2006

47. *Quest for new states of matter in stars*, physics colloquium, Western Illinois University, Macomb, IL, March 10, 2006
48. *Cooper pairing under stress*, theoretical physics seminar, Washington University, St. Louis, USA, March 7, 2006
49. *Superconducting phases of quark matter*, theoretical physics seminar, University of Leipzig, Germany, January 19, 2006
50. Invited review talk and two lectures *on color superconductivity*, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam, Germany, November 1-3, 2005
51. *Color superconductivity*, theoretical physics seminar, Bielefeld University, Germany, October 27, 2005
52. *Towards phase diagram of neutral dense matter*, theoretical physics seminar, Massachusetts Institute of Technology, USA, May 10, 2005
53. *The current crisis in the understanding of QCD phase diagram*, theoretical physics seminar, Rockefeller University, USA, November 18, 2004
54. *On recent progress in color superconductivity*, theoretical physics seminar, Institute for Physics, Humboldt-University, Berlin, Germany, October 26, 2004
55. *Chromomagnetic instability in cold dense quark matter*, theoretical physics seminar, Bielefeld University, Germany, July 8, 2004
56. *Gapless superconductivity in dense quark matter*, theoretical physics seminar, Institute of Theoretical Physics, L'Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, June 4, 2004
57. *Gapless superconductivity – from quark matter to atomic gases*, Physics Colloquium, Pontificia Universidad Católica de Chile, Santiago, Chile, March 18, 2004
58. *Gapless color superconductivity*, Nordita, Copenhagen, Denmark, February 17, 2004
59. *Spontaneous rotational symmetry breaking in gauged sigma-model*, nuclear theory seminar, J.W. Goethe-University, Frankfurt am Main, Germany, November 21, 2003
60. *Color superconductivity and compact stars*, nuclear theory seminar, Brookhaven National Laboratory, Upton, April 16, 2003;
61. *Color superconductivity and compact stars*, high-energy theory seminar, University of Connecticut, Storrs, April 10, 2003;
62. *Color superconductivity and compact stars*, high-energy theory seminar, Perimeter Institute, Waterloo, Canada, April 3, 2003;
63. *Color superconductivity and compact stars*, high-energy theory seminar, University of Western Ontario, London, Canada, April 1, 2003
64. *New method for calculating thermal baryon-antibaryon production rates*, nuclear theory seminar, SUNY, Stony Brook, April 15, 2003
65. *Transport properties of color-flavor locked quark matter inside compact stars*, high-energy theory seminar, Instituto de Fisica Corpuscular, University of Valencia, Valencia, Spain, November 28, 2002
66. *Optically opaque color-flavor locked phase inside compact stars*, nuclear theory seminar, J.W. Goethe-University, Frankfurt am Main, Germany, November 8, 2002

67. *Cooling of quark stars*, presentation during the discussion on color superconductivity, Institute for Theoretical Physics, UCSB, Santa Barbara, CA, May 5, 2002
68. *Cold dense quark matter*, nuclear theory seminar, Jefferson Lab, February 11, 2002
69. *Exotic excitations in dense quark matter and the Anderson-Higgs mechanism*, high-energy physics seminar, Nordita/NBI, Denmark, October 1, 2001
70. *Microscopic approach to color superconductivity of dense quark matter*, nuclear physics seminar, Argonne National Laboratory, May 31, 2001
71. *Diquark pseudo-Nambu-Goldstone bosons in color superconducting quark matter*, high-energy physics seminar, Nagoya University, Japan, February 2, 2001
72. *Diquarks in the color superconducting phase of cold dense QCD*, high-energy physics seminar, University of Minnesota, September 28, 2000
73. *Diquarks in the color superconducting phase of cold dense QCD*, high-energy physics seminar, T-division, Los Alamos National Laboratory, July 21, 2000
74. *Gorkov type effective action in the color superconducting phase of cold dense QCD*, high-energy physics seminar, Department of Physics, University of Illinois at Chicago, March 6, 2000
75. *Gorkov type effective action in the color superconducting phase of cold dense QCD*, TNT colloquium, University of North Carolina, Chapel Hill, February 8, 2000
76. *The effective potential of the composite field in the color superconducting phase of QCD*, nuclear theory seminar, Lawrence Berkeley National Laboratory, January 20, 2000
77. *The effective potential of the composite field in the color superconducting phase of QCD*, nuclear theory seminar, Massachusetts Institute of Technology, January 6, 2000
78. *What is hot about cold dense quark matter?*, high-energy physics seminar, Institute of Theoretical Science, University of Oregon, January 18, 2000
79. *What is hot about cold dense quark matter?*, high-energy physics seminar, Physics Department, University of Cincinnati, November 8, 1999
80. *Some issues on color superconductivity in cold dense QCD*, high-energy physics seminar, Columbia University, November 15, 1999
81. *Some issues on color superconductivity in cold dense QCD*, nuclear theory seminar, State University of New York at Stony Brook, November 18, 1999
82. *Some issues on color superconductivity in cold dense QCD*, Nuclear Theory / RIKEN Seminar, Brookhaven National Laboratory, November 19, 1999
83. *Schwinger-Dyson approach to color superconductivity in dense QCD*, high-energy physics seminar, Physics Department, University of Cincinnati, May 25, 1999
84. *Magnetic catalysis and its potential role during electroweak phase transition*, high-energy physics seminar, Department of Physics, University of Illinois at Chicago, May 4, 1999
85. *Theory of chiral symmetry breaking by magnetic field in QED*, high-energy physics seminar, Department of Physics, Virginia Tech, February 26, 1999
86. *One-loop low-energy effective action in QED in 2+1 and 3+1 dimensions*, high-energy physics seminar, Department of Physics and Astronomy, University of British Columbia, July 6, 1998

87. *One-loop low-energy effective action in QED in 2+1 and 3+1 dimensions*, high-energy physics seminar, Physics Department, Purdue University, April 14, 1998
88. *One-loop low-energy effective action in QED in 2+1 and 3+1 dimensions*, high-energy physics seminar, HEP/Astro Seminar, Physics Department, Ohio State University, April 8, 1998
89. *Magnetic catalysis of chiral symmetry breaking*, high-energy physics seminar, Physics Department, University of Cincinnati, October 28, 1997
90. *Monopole condensation in N=1 supersymmetric model*, high-energy physics seminar, Department of Applied Mathematics, University of Western Ontario, October 17, 1996
91. *A dual description of supersymmetric models*, high-energy physics seminar, Department of Applied Mathematics, University of Western Ontario, June 19, 1996
92. *Instantons and SUSY*, high-energy physics seminar, Department of Applied Mathematics, University of Western Ontario, January 17 and January 31, 1996