

# Igor A. Shovkovy

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## Employment

- **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  
Kiev, Ukraine

## Education

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

## Research grants

- **2017 – 2020:** National Science Foundation grant “Research in Quantum Field Theory: Anomalous Properties of Chiral Matter” (PI: I. A. Shovkovy, 100%, award number PHY-1713950, award amount: \$240,000)
- **2014 – 2018:** National Science Foundation grant “Research in quantum field theory: Relativistic matter in a magnetic field” (PI: I. A. Shovkovy, 100%, award number PHY-1404232, award amount: \$301,286)
- **2010 – 2014:** National Science Foundation grant “Relativistic matter under extreme conditions” (PI: I. A. Shovkovy, 100%, award number PHY-0969844, award amount: \$255,000)
- **2005 – 2008:** Deutsche Forschungsgemeinschaft (DFG) grant “Instabilities in superconducting and superfluid matter” (PI: D. H. Rischke, Co-PI: I. A. Shovkovy)

## 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 (35<sup>th</sup> course), Erice, Italy
- **1995:** Graduate student Soros Grant No. PSU052143
- **1993:** Undergraduate student Soros Grant

## Current student(s)

- **Denys Rybalka** (Aug. 2015 – now)

## Former students

- **Lifang Xia** (Aug. 2013 – May 2016), **Ph. D.** thesis defended on April 13, 2016, ASU
- **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:* postdoc at the Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China
- **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

## Additional student mentoring at Arizona State University

- 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
- Zhaofeng Gan (Jun. 2010 – Aug. 2010), graduate research (PHY-792), ASU
- Zhaofeng Gan (Jan. 2010 – May 2010), research rotation (PHY-500), ASU

### Additional 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

### Additional student mentoring at J. W. Goethe-University

- M. Hanauske (2002 – 2003), J. W. Goethe-University, Frankfurt am Main, Germany
- S. Rüster (2003 – 2006), J. W. Goethe-University, Frankfurt am Main, Germany
- A. Schmitt (2004 – 2006), J. W. Goethe-University, Frankfurt am Main, Germany
- J. Noronha (2006 – 2007), J. W. Goethe-University, Frankfurt am Main, Germany
- B. Sad (2006 – 2007), J. W. Goethe-University, Frankfurt am Main, Germany
- J. Noronha-Hostler (2006 – 2010), 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 331 - *Principles of Modern Electromagnetism*
- PHY 361 - *Introductory Modern Physics*
- PHY 500 - *Research Methods*
- PHY 792 - *Research*
- PHY 799 - *Dissertation*

**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*

### University service at Arizona State University

- *University Promotion and Tenure Committee*, Member (2017 – 2020)
- *Faculty Head Search Committee*, College of Integrative Sciences and Arts, Member (2017-2018)
- *University Senate*, President of the Polytechnic Campus Assembly (2017 – 2018)
- *University Senate*, President-Elect of the Polytechnic Campus Assembly (2016 – 2017)
- *University Services and Facilities Senate Committee*, Member (2016 – 2018)
- *Review of University Committees Ad-Hoc Senate Committee*, Member (2016 – 2017)

- *Physics Lecturer Search Committee*, College of Integrative Sciences and Arts, Member (2017)
- *Faculty Head Search Committee*, College of Integrative Sciences and Arts, Member (2016-2017)
- *Interim Physics Program Leader*, Science and Mathematics Faculty, College of Letters and Sciences (Spring 2016)
- *University Undergraduate Standards Committee*, ASU, Member (2013 – 2015)
- *Personnel Committee*, 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)
- *Internal review 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)

#### **University service at Western Illinois University**

- *Member of three different faculty hiring committees*, Department of Physics (2006 – 2008)
- *Physics Colloquium Organizer*, Department of Physics (2006 – 2008)
- *Physics web page administrator*, Department of Physics (2007 – 2008)

## Professional service

- **Referee** for Physical Review Letters, Physical Review B/C/D, Physics Letters B, Nuclear Physics A/B, Reviews of Modern Physics, Reports on Progress in Physics, Progress in Particle and Nuclear Physics, Journal of Physics: Condensed Matter, Journal of Physics G, European Physical Journal A (Hadrons and Nuclei), European Physical Journal C (Particles and Fields), EPL (Europhysics Letters), Journal of High Energy Physics (JHEP), Nature Physics
- **Organizer** (together with Cicilia Lunardini) of a series of mini-workshops on Neutron Stars and Neutrinos held at Arizona State University, Tempe, AZ
  - <http://shovkovy.faculty.asu.edu/astro2012/> (March 26 – 27, 2012),
  - <http://shovkovy.faculty.asu.edu/astro2011/> (March 28 – 29, 2011),
  - <http://shovkovy.faculty.asu.edu/astro2010/> (April 12 – 13, 2010),
  - <http://shovkovy.faculty.asu.edu/astro2009/> (April 15 – 16, 2009).
- **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
  - <http://www.int.washington.edu/PROGRAMS/graphene.html>
- **Reviewer** of grant proposals for (i) *National Science Foundation* and (ii) *United States-Israel Binational Science Foundation*
- **Reviewer** of a book proposal for World Scientific (2014) and a Computational Physics manual proposal for Addison-Wesley (2009)
- **Examiner** at multiple written and oral graduate comprehensive examinations in physics, Department of Physics, ASU
- **Dissertation committee member**
  - (i) Sebastian Cole (chair Dr. B. Ritchie), Physics Department, ASU, 2020 (estimated)
  - (ii) Cody Petrie (chair Dr. K. Schmidt), Physics Department, ASU, 2019 (estimated)
  - (iii) Adam Blake (chair Dr. M. Sukharev), Physics Department, ASU, November 2, 2016
  - (iv) Lili Yang (chair Dr. C. Lunardini), Physics Department, ASU, November 14, 2013
  - (v) Joel Lynn (chair Dr. K. Schmidt), Physics Department, ASU, April 1, 2013
  - (vi) Brian Morrison (chair Dr. B. Ritchie), Physics Department, ASU, November 15, 2011
- **External examiner** of Ph.D. dissertation theses
  - (i) Pavlo Pyatkovskiy (advisor: V.A. Miransky), Western University, London, ON, 2015
  - (ii) Jorge Noronha (advisor: D.H. Rischke), Goethe-University, Frankfurt am Main, 2007
  - (iii) Sirous Homayouni (advisor: V.A. Miransky), University of Western Ontario, 2006
- **Science Fair Judge**
  - (i) Junior-High & High School Science Fair, Gilbert Classical Academy, Gilbert Public Schools, Gilbert, AZ (2012, 2013, 2014, 2015)
  - (ii) Arizona Science & Engineering Fair (AzSEF), Phoenix, AZ (2011, 2012, 2013)

## PUBLICATIONS

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

### Reviews & book chapters

1. *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 [hep-ph], Physics Reports **576**, 1-209 (2015).
2. *Magnetic catalysis: A review*, I. A. Shovkovy, arXiv: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.
3. *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)].
4. *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, nucl-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.
5. *Two lectures on color superconductivity*, I. A. Shovkovy, nucl-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.
6. *Surprises in nonperturbative dynamics in  $\sigma$ -model at finite density*, V. P. Gusynin, V. A. Miransky and I. A. Shovkovy, hep-ph/0406219, Mod. Phys. Lett. A **19**, 1341 (2004) (Brief Review).

### Refereed articles

1. *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).
2. *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).
3. *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.
4. *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).
5. *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).

6. *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).
7. *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).
8. *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).
9. *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).
10. *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).
11. *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).
12. *Electrified magnetic catalysis in 3D topological insulators*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and P. O. Sukhachov, [arXiv:1607.04649 \[cond-mat.mes-hall\]](#), Phys. Rev. B **94**, 115429 (2016).
13. *Origin of dissipative Fermi arc transport in Weyl semimetals*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy, and [P. O. Sukhachov](#), [arXiv:1603.06004 \[cond-mat.mes-hall\]](#), Phys. Rev. B **93**, 235127 (2016).
14. *Anomalous Maxwell equations for inhomogeneous chiral plasma*, E. V. Gorbar, I. A. Shovkovy, S. Vilchinskii, [I. Rudenok](#), A. Boyarsky, and O. Ruchayskiy, [arXiv:1603.03442 \[hep-th\]](#), Phys. Rev. D **93**, 105028 (2016).
15. *Generalized Landau-level representation: effect of static screening in quantum Hall effect in graphene*, I. A. Shovkovy and [Lifang Xia](#), [arXiv:1508.04471 \[cond-mat.mes-hall\]](#), Phys. Rev. B **93**, 035454 (2016).
16. *Chiral separation and chiral magnetic effects in a slab: the role of boundaries*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy and [P. O. Sukhachov](#), [arXiv:1509.06769 \[cond-mat.str-el\]](#), Phys. Rev. B **92**, 245440 (2015).
17. *Surface Fermi arcs in  $\mathbb{Z}_2$  Weyl semimetals  $A_3Bi$  ( $A = Na, K, Rb$ )*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy and [P. O. Sukhachov](#), [arXiv:1503.07913 \[cond-mat.str-el\]](#), Phys. Rev. B **91**, 235138 (2015).
18. *Dirac semimetals  $A_3Bi$  ( $A = Na, K, Rb$ ) as  $\mathbb{Z}_2$  Weyl semimetals*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy and [P. O. Sukhachov](#), [arXiv:1412.5194 \[cond-mat.str-el\]](#), Phys. Rev. B **91**, 121101(R) (2015).
19. *Chiral asymmetry in cold QED plasma in a strong magnetic field*, [Lifang Xia](#), E. V. Gorbar, V. A. Miransky and I. A. Shovkovy, [arXiv:1408.1976 \[hep-ph\]](#), Phys. Rev. D **90**, 085011 (2014).

20. *Quantum oscillations as a probe of interaction effects in Weyl semimetals in a magnetic field*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy and [P. O. Sukhachov](#), [arXiv:1407.1323](#) [cond-mat.str-el], Phys. Rev. B **90**, 115131 (2014).
21. *Chiral anomaly, dimensional reduction, and magnetoresistivity of Weyl and Dirac semimetals*, E. V. Gorbar, V. A. Miransky and I. A. Shovkovy, [arXiv:1312.0027](#) [cond-mat.mes-hall], Phys. Rev. B **89**, 085126 (2014).
22. *Analysis of Faraday rotation and magneto-optical transmission in monolayer graphene*, I. A. Shovkovy and [X. Wang](#), Int. J. Mod. Phys. B **28**, 1450061 (2014).
23. *Engineering Weyl nodes in Dirac semimetals by a magnetic field*, E. V. Gorbar, V. A. Miransky and I. A. Shovkovy, [arXiv:1307.6230](#) [cond-mat.mes-hall], Phys. Rev. B **88**, 165105 (2013).
24. *Chiral asymmetry in QED matter in a magnetic field*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy and [X. Wang](#), [arXiv:1306.3245](#) [hep-ph], Phys. Rev. D **88**, 025043 (2013).
25. *Radiative corrections to chiral separation effect in QED*, E. V. Gorbar, V. A. Miransky, I. A. Shovkovy and [X. Wang](#), [arXiv:1304.4606](#) [hep-ph], Phys. Rev. D **88**, 025025 (2013).
26. *Coexistence and competition of nematic and gapped states in bilayer graphene*, E. V. Gorbar, V. P. Gusynin, V. A. Miransky and I. A. Shovkovy, [arXiv:1204.2286](#) [cond-mat.str-el], Phys. Rev. B **86**, 125439 (2012).
27. *Broken-symmetry  $\nu = 0$  quantum Hall states in bilayer graphene: Landau level mixing and dynamical screening*, E. V. Gorbar, V. P. Gusynin, V. A. Miransky and I. A. Shovkovy, [arXiv:1201.4872](#) [cond-mat.mes-hall], Phys. Rev. B **85**, 235460 (2012).
28. *Directional dependence of color superconducting gap in two-flavor QCD in a magnetic field*, [Lang Yu](#) and I. A. Shovkovy, [arXiv:1202.0872](#) [hep-ph], Phys. Rev. D **85**, 085022 (2012).
29. *Bulk viscosity in nonlinear and anharmonic regime of strange quark matter*, I. A. Shovkovy and [X. Wang](#), [arXiv:1012.0354](#) [nucl-th], New J. Phys. **13**, 045018 (2011).
30. *Normal ground state of dense relativistic matter in a magnetic field*, E. V. Gorbar, V. A. Miransky and I. A. Shovkovy, [arXiv:1101.4954](#) [hep-ph], Phys. Rev. D **83**, 085003 (2011).
31. *Chiral asymmetry and axial anomaly in magnetized relativistic matter*, E. V. Gorbar, V. A. Miransky and I. A. Shovkovy, [arXiv:1009.1656](#) [hep-ph], Phys. Lett. B **695**, 354 (2011).
32. *Bulk viscosity of spin-one color superconducting strange quark matter*, [X. Wang](#) and I. A. Shovkovy, [arXiv:1006.1293](#) [hep-ph], Phys. Rev. D **82**, 085007 (2010).
33. *Non-leptonic weak processes in spin-one color superconducting quark matter*, [X. Wang](#), H. Malekzadeh and I. A. Shovkovy, [arXiv:0912.3851](#) [hep-ph], Phys. Rev. D **81**, 045021 (2010).
34. *Dynamics of chemical equilibrium of hadronic matter close to  $T_c$* , [J. Noronha-Hostler](#), [M. Beitel](#), C. Greiner and I. A. Shovkovy, [arXiv:0909.2908](#) [nucl-th], Phys. Rev. C **81**, 054909 (2010).
35. *Chiral asymmetry of the Fermi surface in dense relativistic matter in a magnetic field*, E. V. Gorbar, V. A. Miransky and I. A. Shovkovy, [arXiv:0904.2164](#) [hep-ph], Phys. Rev. C **80**, 032801(R) (2009).



36. *Edge states on graphene ribbon in magnetic field: interplay between Dirac and ferromagnetic-like gaps*, V. P. Gusynin, V. A. Miransky, S. G. Sharapov, I. A. Shovkovy and [C. M. Wyenberg](#), [arXiv:0801.0708](#) [cond-mat.mes-hall], Phys. Rev. B **79**, 115431 (2009).
37. *Dynamics in quantum Hall effect and phase diagram in graphene*, E. V. Gorbar, V. P. Gusynin, V. A. Miransky and I. A. Shovkovy, [arXiv:0806.0846](#) [cond-mat.mes-hall], Phys. Rev. B **78**, 085437 (2008).
38. *Edge states, mass and spin gaps and quantum Hall effect in graphene*, V. P. Gusynin, V. A. Miransky, S. G. Sharapov and I. A. Shovkovy, [arXiv:0806.2136](#) [cond-mat.mes-hall], Phys. Rev. B **77**, 205409 (2008).
39. *Fast equilibration of hadrons in an expanding fireball*, [J. Noronha-Hostler](#), C. Greiner and I. A. Shovkovy, [arXiv:0711.0930](#) [nucl-th], Phys. Rev. Lett. **100**, 252301 (2008).
40. *Bound diquarks and their Bose-Einstein condensation in strongly coupled quark matter*, M. Kitazawa, D. H. Rischke and I. A. Shovkovy, [arXiv:0709.2235](#) [hep-ph], Phys. Lett. B **663**, 228-233 (2008).
41. *Color-flavor locked superconductor in a magnetic field*, [J. L. Noronha](#) and I. A. Shovkovy, [arXiv:0708.0307](#) [hep-ph], Phys. Rev. D **76**, 105030 (2007).
42. *Bulk viscosity of strange quark matter: Urca versus non-leptonic processes*, [B. A. Sa'd](#), I. A. Shovkovy and D. H. Rischke, [astro-ph/0703016](#), Phys. Rev. D **75**, 125004 (2007).
43. *Bulk viscosity of spin-one color superconductors with two quark flavors*, [B. A. Sa'd](#), I. A. Shovkovy and D. H. Rischke, [astro-ph/0607643](#), Phys. Rev. D **75**, 065016 (2007).
44. *Gluonic phase versus LOFF phase in two-flavor quark matter*, O. Kiriyama, D. H. Rischke and I. A. Shovkovy, [hep-ph/0606030](#), Phys. Lett. B **643**, 331 (2006).
45. *Excitonic gap, phase transition, and quantum Hall effect in graphene*, V. P. Gusynin, V. A. Miransky, S. G. Sharapov, I. A. Shovkovy, [cond-mat/0605348](#), Phys. Rev. B **74**, 195429 (2006).
46. *Collective excitations, instabilities, and ground state in dense quark matter*, E. V. Gorbar, M. Hashimoto, V. A. Miransky, I. A. Shovkovy, [hep-ph/0602251](#), Phys. Rev. D **73**, 111502(R) (2006).
47. *Stable gapless superconductivity at strong coupling*, M. Kitazawa, I. A. Shovkovy and D. H. Rischke, [hep-ph/0602065](#), Phys. Lett. B **637**, 367 (2006).
48. *Neutrino emission and cooling rates of spin-one color superconductors*, A. Schmitt, I. A. Shovkovy and Q. Wang, [hep-ph/0510347](#), Phys. Rev. D **73**, 034012 (2006).
49. *The phase diagram of neutral quark matter: Effect of neutrino trapping*, [S.B. Rüster](#), [V. Werth](#), M. Buballa, I. A. Shovkovy, D. H. Rischke, [hep-ph/0509073](#), Phys. Rev. D **73**, 034025 (2006).
50. *Note on color neutrality in NJL-type models*, M. Buballa and I. A. Shovkovy, [hep-ph/0508197](#), Phys. Rev. D **72**, 097501 (2005).
51. *The phase diagram of neutral quark matter: Self-consistent treatment of quark masses*, [S.B. Rüster](#), [V. Werth](#), M. Buballa, I. A. Shovkovy, D. H. Rischke, [hep-ph/0503184](#), Phys. Rev. D **72**, 034004 (2005).
52. *Pulsar kicks via spin-1 color superconductivity*, A. Schmitt, I. A. Shovkovy and Q. Wang, [hep-ph/0502166](#), Phys. Rev. Lett. **94**, 211101 (2005); Erratum *ibid.* **95**, 159902(E) (2005).

53. *Chemical equilibration due to heavy Hagedorn states*, C. Greiner, P. Koch-Steinheimer, F.M. Liu, I. A. Shovkovy and H. Stöcker, [hep-ph/0412095](#), J. Phys. G: Nucl. Phys. **31**, S725 (2005).
54. *Screening masses in neutral two-flavor color superconductor*, M. Huang and I. A. Shovkovy, [hep-ph/0408268](#), Phys. Rev. D **70**, 094030 (2004).
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### Conference proceedings

1. *Pulsar kicks via chiral asymmetry of magnetized stellar matter*, I. A. Shovkovy, Acta Astronomica Sinica Suppl. **56**, 58-60 (2015).
2. *Surprises in relativistic matter in a magnetic field*, E. V. Gorbar, V. A. Miransky and I. A. Shovkovy, arXiv:1111.3401, Prog. Part. Nucl. Phys. **67**, 547 (2012).

3. *Axial anomaly and chiral asymmetry in magnetized relativistic matter*, I. A. Shovkovy, arXiv:1108.4656, AIP Conf. Proc. **1441**, 381-383 (2012).
4. *Coulomb interaction and magnetic catalysis in the quantum Hall effect in graphene*, E. V. Gorbar, V. P. Gusynin, V. A. Miransky and I. A. Shovkovy, arXiv:1105.1360, Phys. Scr. **T146**, 014018 (2012).
5. *Fast chemical equilibration of hadrons in an expanding fireball*, J. Noronha-Hostler, C. Greiner and I. A. Shovkovy, Indian J. Phys. **85**, 819-824 (2011).
6. *Response of dense relativistic matter to a magnetic field*, E. V. Gorbar, V. A. Miransky and I. A. Shovkovy, Prog. Theor. Phys. Suppl. **186**, 471-478 (2010).
7. *Thermalization through Hagedorn states: the importance of multiparticle collisions*, J. Noronha-Hostler, C. Greiner and I. A. Shovkovy, arXiv:1001.2948, J. Phys. G **37**, 094017 (2010).
8. *Chiral shift in dense relativistic matter in a strong magnetic field*, I. A. Shovkovy, AIP Conf. Proc. **1361**, 267-271 (2011).
9. *Chemical equilibration and transport properties of hadronic matter near  $T_c$* , J. Noronha-Hostler, J. Noronha, H. Ahmad, I. A. Shovkovy and C. Greiner, arXiv:0907.4963, Nucl. Phys. A **830**, 745c-748c (2009).
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12. *Magnetization of color-flavor locked matter*, J. Noronha and I. A. Shovkovy, arXiv:0710.2445, in Proceedings of the International Symposium EXOCT07: Exotic States of Nuclear Matter, edited by M. Baldo, F. Burgio, H.-J. Schulze and U. Lombardo, (World Scientific, 2008) pp. 427-428.
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15. *Current status in color superconductivity*, I. A. Shovkovy, Nucl. Phys. A **785**, 36 (2007).
16. *Cooling rates of anisotropic color superconductors*, A. Schmitt, I. A. Shovkovy and Q. Wang, Acta Phys. Hung. A **27**, 319 (2006).
17. *Neutrino emissivity from spin-one color superconductors*, A. Schmitt, I. A. Shovkovy and Q. Wang, PoS (JHW2005), 028 (2006).
18. *Color superconductivity in quark matter*, I. A. Shovkovy, nucl-th/0511014, in proceedings of the Workshop on *Extreme QCD*, University of Wales Swansea, Swansea, August 2-5, 2005, edited by G. Aarts and S. Hands, pp. 37-46.
19. *Asymmetric neutrino emission from spin-1 color superconductor*, A. Schmitt, I. A. Shovkovy and Q. Wang, AIP Conf. Proc. **806**, 310 (2006).

20. *Gapless phases of color superconducting matter*, I. A. Shovkovy, [S. B. Rüster](#) and D. H. Rischke, [nucl-th/0411040](#), J. Phys. G: Nucl. Phys. **31**, S849-S856 (2005).
21. *The gapless 2SC phase*, M. Huang and I. A. Shovkovy, [hep-ph/0408325](#), in *Strong and Electroweak Matter 2004*, proceedings of the SEWM2004 Meeting, edited by K.J. Eskola, K. Kainulainen, K. Kajantie and K. Rummukainen, (World Scientific, 2005) pp. 296-300.
22. *Gapless superconductivity in dense QCD*, I. A. Shovkovy, in *Continuous Advances in QCD 2004*, edited by T. Gherghetta, (World Scientific, River Edge, 2004) pp. 313-322.
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24. *Neutral dense quark matter*, M. Huang and I. A. Shovkovy, [hep-ph/0311155](#) in *Superdense QCD matter and compact stars*, (Erevan, 2003) pp. 225-239.
25. *Two flavor color superconductivity and compact stars*, I. A. Shovkovy, M. Hanauske and M. Huang, [hep-ph/0310286](#). Published in proceedings of the 2nd International Workshop on QCD – Theory and Experiment (QCD@Work 2003), Conversano, Italy, 14-18 June 2003, eConf **C030614** (2003) 039.
26. *New method for calculating thermal baryon-antibaryon production rates*, I. A. Shovkovy and J. Kapusta, in Proceedings of the Seventh Workshop “Quantum Chromodynamics”, edited by H.M. Fried, B. Müller and Y. Babellini, (Singapore, 2003) pp. 145-153.
27. *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.
28. *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.
29. *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).
30. *The spectrum of diquark composites in cold dense QCD*, I. A. Shovkovy, [nucl-th/0010021](#), Int. J. Mod. Phys. **A16**, 1271 (2001).
31. *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).
32. *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.
33. *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.

34. *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. Expert comments for “Superconductivity from nowhere” by Jon Cartwright, published at [physicsworld.com](http://physicsworld.com), a website from the Institute of Physics, March 29, 2011.
2. 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. *Quantum field theory in a magnetic field*, Conference on Non-perturbative QFT and Loewe’s 65 Fest, Santiago, Chile, December 5 - 7, 2017
2. *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
3. A series of six lectures on (i) magnetic catalysis, (ii) QCD in strong magnetic fields, (iii) graphene and (iv) Dirac and Weyl materials, The Summer School on Frontiers in Theoretical Physics and the sixth Huada School on QCD, Wuhan, China, May 29 - June 2, 2017
4. *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
5. *Chiral matter in magnetic field*, RIKEN workshop *Chiral matter: from quarks to Dirac semimetals*, RIKEN, Wako, Japan, December 5-8, 2016
6. *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
7. *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
8. *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
9. *Chirality in magnetized relativistic plasma*, workshop on *Magnetic Fields in Strongly Interacting Matter*, Utrecht University, Netherlands, November 20-23, 2015
10. *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

11. *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
12. *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
13. *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
14. *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
15. *Radiative corrections to chiral separation effect*, The 10th biannual workshop *Continuous Advances in QCD (CAQCD\_2013)*, Minneapolis, MN, May 16-19, 2013
16. *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
17. *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
18. *Magnetized vacuum and matter: from magnetic catalysis to chiral asymmetry*, workshop on *QCD in strong magnetic fields*, ECT\*, Trento, Italy, November 12-16, 2012
19. *Fast chemical equilibration via Hagedorn states in heavy ion collisions*, Symposium on contemporary nuclear physics (*JoeFest*), McGill University, Montreal, Canada, June 12-14, 2012
20. *Abnormal normal ground state of dense relativistic matter in a magnetic field*, International workshop *New Frontiers in QCD 2010 – Exotic Hadron Systems and Dense Matter*, Yukawa Institute for Theoretical Physics, Kyoto, Japan, March 10, 2010
21. *Relativistic dynamics in graphene: Magnetic Catalysis & Quantum Hall Effect*, XII Mexican workshop on *Particles and Fields*, Mazatlan, Mexico, November 9-14, 2009
22. *Transport Properties of Stellar Quark Matter*, International workshop *Quark-gluon plasma meets cold atoms*, GSI, Darmstadt, Germany, September 25-27, 2008
23. *Magnetization of color-flavor-locked matter*, International workshop *New Frontiers in QCD 2008 — Fundamental Problems in Hot and/or Dense Matter*, Yukawa Institute for Theoretical Physics, Kyoto, Japan, March 11, 2008
24. *What is the true ground state of dense QCD?* (Discussion session leader), International workshop *New Frontiers in QCD 2008 — Fundamental Problems in Hot and/or Dense Matter*, Yukawa Institute for Theoretical Physics, Kyoto, Japan, March 3, 2008
25. *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
26. *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



27. *Color superconductivity*, International Conference on *Strong & Electroweak Matter 2006*, Brookhaven National Laboratory, May 10-13, 2006
28. *Dense baryon matter: progress and difficulties*, International workshop on *QCD at Finite Density*, ECT\* Trento, Italy, March 21-25, 2006
29. *The many phases of color-superconducting quark matter*, *DESY Theory workshop*, Hamburg, Germany, September 28-30, 2005
30. *Neutrino trapping in a color superconductor*, workshop on *Pairing in Fermionic Systems: Beyond the BCS Theory*, INT, University of Washington, Seattle, September 19-23, 2005
31. *Color superconductivity in dense quark matter*, workshop on *Extreme QCD*, University of Wales Swansea, Swansea, August 2-5, 2005
32. *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
33. *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
34. *Phases of high baryon density QCD*, The 4th Biennial Meeting of the *International Association for Relativistic Dynamics*, Saas Fee, Switzerland, June 12 - 19, 2004
35. *Theory of gapless superconductivity in quark matter*, NATO Advanced Study Institute *Structure and Dynamics of Elementary Matter*, Kemer, Turkey, September 22 - October 2, 2003
36. *Gapless color superconductivity in quark matter*, miniworkshop *Aspects of nonperturbative QCD: hadrons and thermodynamics*, Rostock, Germany, July 14-15, 2003
37. *Speculations about cooling of compact stars*, International workshop *Strong Coupling Gauge Theories and Effective Field Theories*, Nagoya, Japan, December 10-13, 2002
38. *Quark color superconductivity and the cooling of compact stars*, *Continuous Advances in QCD 2002/Arkadyfest*, Minneapolis, MN 55455, May 17-23, 2002
39. *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
40. *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
41. *Chiral symmetry breaking in weakly coupled QED in a magnetic field*, International workshop on *Mathematical Physics: Today, Priority Technologies – for Tomorrow*, Kiev, Ukraine, May 12-17, 1997

### Contributed conference talks

1. *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
2. *Chiral shift in renormalizable theories in magnetic field*, RIKEN-BNL workshop on “P- and CP-odd Effects in Hot and Dense Matter - 2012”, Brookhaven National Laboratory, Upton, NY, USA, June 25-27, 2012

3. *Magnetized dense relativistic matter*, CIPANP 2012: Eleventh Conference on the Intersections of Particle and Nuclear Physics, St. Petersburg, FL, USA, May 29 - June 3, 2012
4. *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
5. *Dynamics in the normal ground state of dense relativistic matter in magnetic field*, April Meeting of the American Physical Society, Anaheim, CA, April 30 - May 3, 2011
6. *Magnetic catalysis and chiral shift in dense matter*, International Conference *Strong and Electroweak Matter 2010*, McGill University, Montreal, Canada, June 29 - July 2, 2010
7. *Chiral shift in dense relativistic matter in magnetic field*, XII Mexican workshop on Particles and Fields, Mazatlan, Mexico, November 9-14, 2009
8. *Chiral shift at Fermi surface of dense relativistic matter in magnetic field*, the Bogolyubov Kyiv Conference Modern Problems of Theoretical and Mathematical Physics, Kiev, Ukraine, September 15-18, 2009
9. *Chiral asymmetry in relativistic matter in a magnetic field*, CIPANP 2009: Tenth Conference on the Intersections of Particle and Nuclear Physics, San Diego, CA, USA, May 26-31, 2009
10. *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
11. *Bulk viscosity in dense quark matter*, Vic Elias Memorial Conference, University of Western Ontario, London, Ontario, Canada, May 28-30, 2007
12. *Bulk viscosity of strange quark matter*, Color Superconductivity mini-workshop, Washington University, St. Louis, USA, March 29, 2007
13. *Transport properties of color superconductors*, 19th Annual Midwest Nuclear Theory Get-Together, Argonne National Laboratory, October 13-14, 2006
14. *Phase diagram of dense QCD with and without neutrino trapping*, Neutron Stars at the Crossroads of Fundamental Physics, Vancouver, Canada, August 9-13, 2005
15. *New mechanism for pulsar kicks powered by color superconductivity*, QCD@Work 2005, International workshop on QCD Theory and Experiment, Conversano, Italy, June 16-20, 2005
16. *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
17. <sup>‡</sup>*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
18. *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
19. *Stable gapless color superconducting phases of dense quark matter*, Nuclear Physics Spring Meeting, Cologne, Germany, March 8-12, 2004

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<sup>‡</sup> Voted “Best Lecturer” of the school.

20. *Color superconductivity and compact stars*, QCD@Work 2003, International workshop on QCD Theory and Experiment, Conversano, Italy, June 14-18, 2003
21. *Thermal rates for baryon and anti-baryon production*, Seventh workshop on Quantum Chromodynamics, Villefranche-sur-Mer, France, January 6-10, 2003
22. *Quark stars and their cooling*, International workshop *Strong and Electroweak Matter 2002*, Heidelberg, Germany, October 2-5, 2002
23. *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
24. *Collective modes in color superconducting matter*, International Conference on STATISTICAL QCD, ZiF, Bielefeld University, Germany, August 26 - 30, 2001
25. *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
26. *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
27. <sup>†</sup> *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
28. *Mass generation in the supersymmetric Nambu-Jona-Lasinio model in an external magnetic field*, D. Volkov Memorial Seminar *Supersymmetry and Quantum Field Theory*, Kharkov, Ukraine, January 5-7, 1997
29. *Dynamical chiral symmetry breaking by a magnetic field in QED*, Second Ukrainian Conference of Young Scientists, T. Shevchenko Kiev State University, Kiev, Ukraine, May 16-18, 1995
30. *Dimensional reduction and dynamical chiral symmetry breaking by a magnetic field*, Scientific Session of the Bogolyubov Institute for Theoretical Physics, Kiev, Ukraine, February 22-23, 1995

## Seminars & colloquia

1. *Collective modes in chiral (pseudo)relativistic matter*, theoretical physics seminar, Institute of High Energy Physics, CAS, Beijing, June 8, 2017
2. *Transport properties of anomalous chiral plasmas*, nuclear theory seminar, J.W. Goethe University, Frankfurt am Main, Germany, June 10, 2016
3. *Many faces of chiral magnetic effects*, FIAS colloquium, Frankfurt Institute for Advanced Studies, Frankfurt am Main, Germany, June 9, 2016
4. *Generalized Landau-level representation for spin-1/2 fermions and its applications*, nuclear physics seminar, Brookhaven National Laboratory, Upton, NY, July 31, 2015
5. *Research at the tip of a pencil*, Science and Mathematics seminar, College of Letters and Sciences, Arizona State University, Mesa, AZ, April 8, 2015

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<sup>†</sup> Voted “Best Theoretical Presentation” by a graduate student

6. *Magnetized relativistic plasma as a Weyl metal*, nuclear physics seminar, Department of Physics, University of Maryland, College Park, MD, December 3, 2014
7. *Chiral asymmetry in condensed matter physics*, condensed matter physics seminar, Wuhan University, Wuhan, China, November 6, 2014
8. *Universal magnetic catalysis*, physics seminar, Huazhong University of Science and Technology, Wuhan, China, November 6, 2014
9. *Chiral effects in magnetized plasma*, high-energy physics seminar, Central China Normal University, Wuhan, China, November 5, 2014
10. *Magnetism and chirality in relativistic systems*, high-energy physics seminar, Department of Physics, Tsinghua University, Beijing, China, October 30, 2014
11. *Chiral separation effect: Theoretical challenges and applications*, theoretical physics seminar, Department of Physics, Pusan National University, Busan, South Korea, March 14, 2014
12. *Magnetic dance in a quantum world*, physics seminar, Nishina Center, RIKEN, Wako, Japan, March 5, 2014
13. *High-energy research at the tip of a pencil*, physics colloquium, Department of Physics, Kent State University, Kent, OH, January 30, 2014
14. *Chiral separation effect: recent developments*, physics seminar, Bogolyubov Institute for Theoretical Physics of the National Academy of Sciences of Ukraine, Kiev, Ukraine, June 10, 2013
15. *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
16. *Quantum magnetic world*, high-energy physics seminar, Institute of High Energy Physics, CAS, Beijing, China, April 26, 2013
17. *Relativistic matter in magnetic fields*, physics seminar, University of Texas at El Paso, USA, September 16, 2011
18. *Relativistic Dynamics and Spontaneous Symmetry Breaking in Graphene*, YITP physics colloquium, Yukawa Institute for Theoretical Physics, Kyoto, Japan, March 15, 2010
19. *Chiral asymmetry in relativistic matter in a magnetic field*,
  - Vienna University of Technology, Vienna, Austria, July 9, 2009
  - J.W. Goethe University, Frankfurt am Main, Germany, July 16, 2009
20. *Neutron vs. Quark Stars*, seminar of the Cosmology Journal Club, Arizona State University, Tempe, AZ, April 21, 2009
21. *Graphene: Symmetry breaking in the carbon Flatland*,
  - Arizona State University, Tempe, USA, October 13, 2008
  - Washington University, St. Louis, USA, July 30, 2008
22. *Color-flavor locked superconductor in a magnetic field*, theoretical physics seminar, Washington University, St. Louis, USA, August 13, 2007
23. *Condensed quark matter*, theoretical physics seminar, University of Wales Swansea, Swansea, United Kingdom, June 20, 2007
24. *Exotic States of Matter at the Heart of Neutron Stars*, physics seminar, Arizona State University, Tempe, AZ, May 3, 2007

25. *Transport properties of color superconductors*, theoretical physics seminar, Washington University, St. Louis, USA, September 21, 2006
26. *Unconventional Cooper pairing in dense quark matter*, high-energy physics seminar, University of Cincinnati, Cincinnati, OH, May 16, 2006
27. *Introduction into color superconductivity*, theoretical physics seminar, Norwegian University of Science and Technology, Trondheim, Norway, April 26, 2006
28. *Unconventional Cooper pairing in dense quark matter*, theoretical physics seminar, University of Minnesota, Minneapolis, USA, April 17, 2006
29. *Quest for new states of matter in stars*, physics colloquium, Western Illinois University, Macomb, IL, March 10, 2006
30. *Cooper pairing under stress*, theoretical physics seminar, Washington University, St. Louis, USA, March 7, 2006
31. *Superconducting phases of quark matter*, theoretical physics seminar, University of Leipzig, Germany, January 19, 2006
32. Invited review talk and two lectures *on color superconductivity*, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam, Germany, November 1-3, 2005
33. *Color superconductivity*, theoretical physics seminar, Bielefeld University, Germany, October 27, 2005
34. *Towards phase diagram of neutral dense matter*, theoretical physics seminar, Massachusetts Institute of Technology, USA, May 10, 2005
35. *The current crisis in the understanding of QCD phase diagram*, theoretical physics seminar, Rockefeller University, USA, November 18, 2004
36. *On recent progress in color superconductivity*, Institute for Physics, Humboldt-University, Berlin, Germany, October 26, 2004
37. *Chromomagnetic instability in cold dense quark matter*, theoretical physics seminar, Bielefeld University, Germany, July 8, 2004
38. *Gapless superconductivity in dense quark matter*, theoretical physics seminar, Institute of Theoretical Physics, L'Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, June 4, 2004
39. *Gapless superconductivity — from quark matter to atomic gases*,
  - Symposium of the Frankfurt Institute for Advanced Studies, Frankfurt am Main, Germany, February 25, 2004
  - Physics Colloquium, Pontificia Universidad Católica de Chile, Santiago, Chile, March 18, 2004
40. *Gapless color superconductivity*, Nordita, Copenhagen, Denmark, February 17, 2004
41. *Spontaneous rotational symmetry breaking in gauged sigma-model*, nuclear theory seminar, J.W. Goethe-University, Frankfurt am Main, Germany, November 21, 2003
42. *Color superconductivity and compact stars*,
  - Brookhaven National Laboratory, Upton, April 16, 2003;
  - University of Connecticut, Storrs, April 10, 2003;
  - Perimeter Institute, Waterloo, Canada, April 3, 2003;

- University of Western Ontario, London, Canada, April 1, 2003
43. *New method for calculating thermal baryon-antibaryon production rates*, SUNY, Stony Brook, April 15, 2003
  44. *Transport properties of color-flavor locked quark matter inside compact stars*, Instituto de Fisica Corpuscular, University of Valencia, Valencia, Spain, November 28, 2002
  45. *Optically opaque color-flavor locked phase inside compact stars*, nuclear theory seminar, J.W. Goethe-University, Frankfurt am Main, Germany, November 8, 2002
  46. *Cooling of quark stars*, as part of the discussion on color superconductivity, Institute for Theoretical Physics, UCSB, Santa Barbara, CA, May 5, 2002
  47. *Cold dense quark matter*, nuclear theory seminar, Jefferson Lab, February 11, 2002
  48. *Exotic excitations in dense quark matter and the Anderson-Higgs mechanism*, high-energy physics seminar, Nordita/NBI, Denmark, October 1, 2001
  49. *Microscopic approach to color superconductivity of dense quark matter*, nuclear physics seminar, Argonne National Laboratory, May 31, 2001
  50. *Diquark pseudo-Nambu-Goldstone bosons in color superconducting quark matter*, high-energy physics seminar, Nagoya University, Japan, February 2, 2001
  51. *Diquarks in the color superconducting phase of cold dense QCD*, high-energy physics seminar,
    - University of Minnesota, September 28, 2000
    - T-division, Los Alamos National Laboratory, July 21, 2000
  52. *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
    - TNT colloquium, University of North Carolina, Chapel Hill, February 8, 2000
  53. *The effective potential of the composite field in the color superconducting phase of QCD*, nuclear theory seminar,
    - Lawrence Berkeley National Laboratory, January 20, 2000
    - MIT, January 6, 2000
  54. *What is hot about cold dense quark matter?*, high-energy physics seminar,
    - Institute of Theoretical Science, University of Oregon, January 18, 2000
    - Physics Department, University of Cincinnati, November 8, 1999
  55. *Some issues on color superconductivity in cold dense QCD*,
    - high-energy physics seminar, Columbia University, November 15, 1999
    - nuclear theory seminar, State University of New York at Stony Brook, November 18, 1999
  56. *Some issues on color superconductivity in cold dense QCD*, Nuclear Theory / RIKEN Seminar, Brookhaven National Laboratory, November 19, 1999
  57. *Schwinger-Dyson approach to color superconductivity in dense QCD*, high-energy physics seminar, Physics Department, University of Cincinnati, May 25, 1999
  58. *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

59. *Theory of chiral symmetry breaking by magnetic field in QED*, high-energy physics seminar, Department of Physics, Virginia Tech, February 26, 1999
60. *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
  - Physics Department, Purdue University, April 14, 1998
  - HEP/Astro Seminar, Physics Department, Ohio State University, April 8, 1998
61. *Magnetic catalysis of chiral symmetry breaking*, high-energy physics seminar, Physics Department, University of Cincinnati, October 28, 1997
62. *Monopole condensation in N=1 supersymmetric model*, high-energy physics seminar, Department of Applied Mathematics, University of Western Ontario, October 17, 1996
63. *A dual description of supersymmetric models*, high-energy physics seminar, Department of Applied Mathematics, University of Western Ontario, June 19, 1996
64. *Instantons and SUSY*, high-energy physics seminar, Department of Applied Mathematics, University of Western Ontario, January 17 and January 31, 1996