

# Chun SHEN

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## EDUCATION

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| 2009~2014 | <b>Doctor of Philosophy</b><br>The Ohio State University<br>Graduation date: Aug. 10, 2014<br>Thesis Title: The standard model for relativistic heavy-ion collisions and electromagnetic tomography | GPA: 3.99/4.0<br>Major: Theoretical Physics<br>Advisor: Prof. Ulrich Heinz |
| 2005~2009 | <b>Bachelor of Science</b><br>Shanghai Jiao Tong University<br>Graduation date: June 30, 2009<br>Thesis Title: Nuclear Surface Property and Its Isospin Dependence                                  | GPA: 3.86/4.0<br>Major: Applied Physics<br>Advisor: Prof. Lie-wen Chen     |

## PROFESSIONAL EXPERIENCE

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|---------------------------------|---------------------------------------|-----------------|
| • Assistant Professor           | <i>Wayne State University</i>         | 2018.08~present |
| • Goldhaber Fellow              | <i>Brookhaven National Laboratory</i> | 2016~2018       |
| • Postdoctoral Fellow           | <i>McGill University</i>              | 2014~2016       |
| • Research Assistant            | <i>The Ohio State University</i>      | 2011~2014       |
| • Teaching & Research Assistant | <i>The Ohio State University</i>      | 2010~2011       |
| • Research Assistant            | <i>The Ohio State University</i>      | 2009~2010       |

## ACADEMIC AWARDS

- Goldhaber Fellow *Brookhaven National Laboratory* 2016.04  
— The most prestigious postdoc fellowship offered by Brookhaven National Laboratory, which is awarded to candidates with exceptional talent and credentials who have a strong desire for independent research at the frontiers of their fields.
- J. Robert Oppenheimer Fellow (declined) *Los Alamos National Laboratory* 2016.01  
— The most prestigious postdoc fellowship offered by Los Alamos National Laboratory, which recognizes individuals whose research aligns with the Laboratory's mission and who have demonstrated outstanding ability in research.
- APS Dissertation Award in Nuclear Physics *American Physics Society* 2015.10  
— Citation: "For his successful prediction of anisotropic flow in Pb+Pb collisions at the LHC, his elucidation of the 'direct photon flow puzzle', and his contributions to the development of a computational tool of viscous fluid dynamics enabling precision studies of relativistic heavy-ion collisions."
- Honorable mention in the 2015 RHIC and AGS Thesis Award competition 2015.06  
— The only recipient with a thesis in theory in the 2015 competition
- Chinese National Award for Outstanding Ph.D. Students Abroad 2014.01  
— This prestigious award recognizes top Chinese Ph.D. students *across all fields of study* around the world who study abroad without receiving financial support from the Chinese government

- Elizabeth Clay Howald Presidential Fellowship *The Ohio State University* 2013~2014  
— This prestigious award recognizes outstanding scholarship and research ability at The Ohio State University *across all fields of study*, and provides recipients the opportunity to devote full time to the dissertation research  
— One of the only two recipients awarded such a named Presidential Fellowship in 2012 Fall
- Outstanding Academic papers by students (OAPS) *Shanghai Jiao Tong University* 2009  
— This program recognizes outstanding academic researches by undergraduate students *across all fields* in Shanghai Jiao Tong University and provides a platform for international communication  
— The only recipient in physics in 2009 competition
- Excellent Academic Scholarship 3rd-class *Shanghai Jiao Tong University* 2007-2008
- Excellent Academic Scholarship special *Shanghai Jiao Tong University* 2006-2007
- Excellent Tri-A Student Scholarship *Shanghai Jiao Tong University* 2006-2007
- Excellent Academic Scholarship 3rd-class *Shanghai Jiao Tong University* 2005-2006

## PUBLICATIONS AND PRESENTATIONS

**73** scientific papers with **2803** citations  $h_{HEP}$  index: **25**<sup>1</sup>; **3271** citations  $h$ -index: **27**<sup>2</sup>  
Citation Statistics highlight<sup>1</sup>: 250+: **1** paper; 100-249: **9** papers; 50-99: **7** papers;  
**77** talks/seminars in total; **58** invited/competitive selected talks including invited plenary overview talks at Quark Matter 2015 and Hard Probes 2015

## COMMUNITY SERVICE

- Peer review referee
  - ▶ Physical Review Letters
  - ▶ Physics Letter B
  - ▶ Physical Review C
  - ▶ Physical Review D
  - ▶ Journal of Physics G
  - ▶ European Physical Journal A
  - ▶ Nuclear Physics A
  - ▶ Physica Scripta
  - ▶ Chinese Physics C
  - ▶ Universe
- Conference/summer school organized
  - ▶ Co-organizer of symposium on Jet and Electromagnetic Tomography of Dense Matter, McGill University, Canada, June 26-27, 2015 <http://www.physics.mcgill.ca/jet15/>
  - ▶ Co-organizer of Hard Probes 2015 Summer School, McGill University, Canada, June 27-28, 2015 <http://www.physics.mcgill.ca/hp2015-ss/>

## ASSOCIATION MEMBERSHIPS

- Young scientist Member, American Physical Society

## RESEARCH INTERESTS

- Precision fluid dynamical modelling of quark-gluon plasma at finite baryon density
- Jet and electromagnetic tomography in strongly-coupled systems
- Rapid thermalization and out-of-equilibrium physics of many-body QCD
- Gluon saturation and 3D imaging of nucleus at high energy

<sup>1</sup> from INSPIRE, <http://inspirehep.net/author/profile/Chun.Shen.1> (08/29/2018)

<sup>2</sup> from Google Scholar, <https://scholar.google.ca/citations?user=HEtBL2UAAAAJ&hl=en> (08/29/2018)

## RESEARCH AND TEACHING EXPERIENCE

- *Postdoctoral Research:*
  - ▶ Develop the first full (3+1)-d relativistic hydrodynamic model which includes net baryon current and its dissipative diffusion which is a key component for the RHIC Beam Energy Scan program
  - ▶ Propose to use electromagnetic and QCD jet probes to understand the property and dynamics of the possible smallest QGP droplet created in high energy proton-lead collisions
  - ▶ State-of-the-art precision prediction of hadronic flow observables in Pb+Pb collisions at the highest 5.02 TeV at LHC to understand the property of the hottest QGP ever created in experiments
  - ▶ Develop and maintain the open-source full (3+1)-d relativistic hydrodynamic model, MUSIC, <http://www.physics.mcgill.ca/music/>
- *Postdoctoral Teaching and Mentoring:*
  - ▶ Co-mentor 4 graduate students to conduct scientific research on relativistic heavy-ion collisions in various aspects, namely collective dynamics (*Scott McDonald*), QCD jets energy loss (*Chanwook Park*), hydrodynamic fluctuations (*Mayank Singh*), and electromagnetic radiation near thermal equilibrium (*Sigtryggur Hauksson*)
  - ▶ Organizing weekly based journal club, group meeting, and nuclear seminar
  - ▶ Give a 3-lecture course on introduction to relativistic hydrodynamics
- *Doctoral Research:*
  - ▶ Develop the first complete integrated and open-source theoretical framework to model the dynamical evolution of relativistic heavy-ion collisions, <http://u.osu.edu/vishnu/>
  - ▶ Pioneered in studying thermal photon emissions from a nearly equilibrated quark gluon plasma and propose electromagnetic probes as a good viscometer for the QGP
- *Graduate Teaching and Mentoring:*
  - ▶ Co-mentor 4 undergraduate students together with my phd supervisor to conduct phenomenological research for U+U (*Andy Goldschmidt*) and p+A collisions (*Kevin Welsh, Jordan Singer, and Brian Baker*) at the RHIC and the LHC and in results of 2 scientific papers
  - ▶ Teaching assistant for graduate level electromagnetism course
- *Undergraduate Research:*
  - ▶ Study the isospin dependence of the bulk and surface properties of nuclei based on nuclear droplet model and in results of my first co-authored scientific paper (cited 75 times up to now).

## REFERENCES

- Ulrich Heinz  
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- Charles Gale  
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- Raju Venugopalan  
*Group Leader, Nuclear Theory Group*  
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## PUBLICATION LIST<sup>3</sup>

### *Letters*

1. H. Mantysaari, B. Schenke, **C. Shen**, and P. Tribedy, “Imprints of fluctuating proton shapes on flow in proton-lead collisions at the LHC”, Phys. Lett. B **772** (2017) 681-686. *[32 citations]*
2. **C. Shen**, J.-F. Paquet, G. S. Denicol, S. Jeon and C. Gale, “Thermal photon radiation in high multiplicity p+Pb collisions at the Large Hadron Collider”, Phys. Rev. Lett. **116**, 072301 (2016). *[24 citations]*
3. S. Ryu, J.F. Paquet, **C. Shen**, G.S. Denicol, B. Schenke, S. Jeon and C. Gale, “The importance of the bulk viscosity of QCD in ultrarelativistic heavy-ion collisions”, Phys. Rev. Lett, **115**, 132301 (2015). *[152 citations]*
4. A. Majumder and **C. Shen**, “Suppression of the high  $p_T$  charged hadron  $R_{AA}$  at the LHC”, Phys. Rev. Lett. **109** 202301 (2012) *[60 citations]*
5. Z. Qiu, **C. Shen** and U. Heinz, “Hydrodynamic elliptic and triangular flow in Pb-Pb collisions at  $\sqrt{s} = 2.76A$  TeV”, Phys. Lett. B **707**, 151 (2012). *[193 citations]*
6. H. Song, S. A. Bass, U. Heinz, T. Hirano and **C. Shen**, “200 A GeV Au+Au collisions serve a nearly perfect quark-gluon liquid”, Phys. Rev. Lett. **106**, 192301 (2011). *[323 citations]*

### *Invited Featured Articles*

7. **C. Shen** and U. Heinz, “The road to precision: Extraction of the specific shear viscosity of the quark-gluon plasma”, invited feature article in Nuclear Physics News Vol. 25, issue 2, 2015, arXiv:1507.01558 [nucl-th]. *[16 citations]*

### *Regular Articles*

8. A. Czajka, S. Hauksson, C. Shen, S. Jeon, and C. Gale, “Bulk viscosity of strongly interacting matter in the relaxation time approximation”, Phys. Rev. C **97** (2018) 044914, arXiv: 1712.05905 [nucl-th]. *[3 citations]*
9. **C. Shen** and B. Schenke, “Dynamical initial state model for relativistic heavy-ion collisions”, Phys. Rev. C **97** (2018) 024907, arXiv: 1710.00881 [nucl-th]. *[20 citations]*
10. S. Ryu, J.-F. Paquet, **C. Shen**, G. Denicol, B. Schenke, S. Jeon, C. Gale, “Effects of bulk viscosity and hadronic rescattering in heavy ion collisions at RHIC and LHC”, Phys. Rev. C **97** (2018) 034910, arXiv: 1704.04216 [nucl-th] *[21 citations]*

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<sup>3</sup> Citation data is based on INSPIRE (08/23/2018)

11. S. Cao *et al.* [JETSCAPE Collaboration], “Multistage Monte-Carlo simulation of jet modification in a static medium”, Phys. Rev. C **96** (2017) 024909, arXiv: 1705.00050 [nucl-th] **[12 citations]**
12. I. Iatrakis, E. Kiritsis, **C. Shen**, and D. L. Yang, “Holographic Photon Production in Heavy-Ion Collisions”, JHEP **1704** (2017) 035, arXiv: 1609.07208 [hep-ph] **[10 citations]**
13. S. McDonald, **C. Shen**, F. Fillion-Gourdeau, S. Jeon, and C. Gale, “Hydrodynamic Predictions for Pb+Pb collisions at 5.02 A TeV”, Phys. Rev. C **95** (2017) 064913, arXiv: 1609.02958 [hep-ph]. **[38 citations]**
14. **C. Shen**, J.F. Paquet, G.S. Denicol, S. Jeon, and C. Gale, “Collectivity and electromagnetic radiation in small systems”, Phys. Rev. C **95** (2017) 014906, arXiv: 1609.02590 [nucl-th]. **[32 citation]**
15. N. b. Chang *et al.*, “Physics perspectives of heavy-ion collisions at very high energy”, *Science China: Physics, Mechanics & Astronomy*, arXiv:1510.05754 [nucl-th]. **[16 citations]**
16. J. F. Paquet, **C. Shen**, G. S. Denicol, M. Luzum, B. Schenke, S. Jeon and C. Gale, “The production of photons in relativistic heavy-ion collisions”, Phys. Rev. C **93** (2016) 044906, arXiv:1509.06738 [hep-ph]. **[90 citations]**
17. A. Goldschmidt, Z. Qiu, **C. Shen** and U. Heinz, “Collision Geometry and Flow in Uranium+Uranium Collisions”, Phys. Rev. C **92**, 044903 (2015), arXiv:1507.03910 [nucl-th]. **[11 citations]**
18. **C. Shen**, Z. Qiu, H. Song, J. Bernhard, S. Bass, and U. Heinz, “The iEBE-VISHNU code package for relativistic heavy-ion collisions”, Comp. Phys. Commun. **199** (2016) 61-85, arXiv:1409.8164 [nucl-th]. **[141 citations]**
19. **C. Shen**, Z. Qiu and U. Heinz, “Shape and flow fluctuations in ultra-central Pb+Pb collisions at the LHC”, Phys. Rev. C **92**, 014901 (2015), arXiv:1502.04636 [nucl-th] **[21 citations]**
20. J. Liu, **C. Shen**, and U. Heinz, “Pre-equilibrium evolution effects on heavy-ion collision observables”, Phys. Rev. C **91**, 064906 (2015), arXiv:1504.02160 [nucl-th] **[30 citations]**
21. **C. Shen**, U. Heinz, J.-F. Paquet, I. Kozlov, and C. Gale, “Anisotropic flow of thermal photons as a quark-gluon plasma viscometer”, Phys. Rev. C **91**, 024908 (2015), arXiv: 1308.2111 **[82 citations]**
22. **C. Shen**, J.F. Paquet, U. Heinz, and C. Gale, “Photon Emission from a Momentum Anisotropic Quark-Gluon Plasma”, Phys. Rev. C **91**, 014908 (2015) **[29 citations]**

23. K. M. Burke *et al.* [JET Collaboration], “Extracting the jet transport coefficient from jet quenching in high-energy heavy-ion collisions,” Phys. Rev. C **90**, 014909 (2014), arXiv: 1312.5003 [nucl-th]. **[190 citations]**
24. C. Shen, U. Heinz, J.-F. Paquet, and C. Gale, “Thermal photons as a quark-gluon plasma thermometer revisited”, Phys. Rev. C **89**, 044910 (2014), arXiv: 1308.2440 **[96 citations]**
25. C. Plumberg, C. Shen, U. Heinz, “HBT interferometry relative to the triangular flow plane in heavy-ion collisions”, Phys. Rev. C **88**, 044914 (2013), arXiv: 1306.1485 **[17 citations]**
26. U. Heinz, Z. Qiu, C. Shen, “Fluctuating flow angles and anisotropic flow measurements”, Phys. Rev. C **87**, 034913 (2013) **[85 citations]**
27. Z. Qiu, C. Shen, U. Heinz, “Resonance decay contributions to higher-order anisotropic flow coefficients”, Phys. Rev. C **86**, 064906 (2012) **[10 citations]**
28. C. Shen and U. Heinz, “Collision Energy Dependence of Viscous Hydrodynamic Flow in Relativistic Heavy-Ion Collisions”, Phys. Rev. C **85**, 054902 (2012). **[65 citations]**
29. C. Shen, U. Heinz, P. Huovinen and H. Song, “Radial and elliptic flow in Pb+Pb collisions at the Large Hadron Collider from viscous hydrodynamic”, Phys. Rev. C **84**, 044903 (2011). **[239 citations]**
30. H. Song, S. A. Bass, U. Heinz, T. Hirano and C. Shen, “Hadron spectra and elliptic flow for 200 A GeV Au+Au collisions from viscous hydrodynamics coupled to a Boltzmann cascade”, Phys. Rev. C **83**, 054910 (2011). **[130 citations]**
31. C. Shen and U. Heinz, “Hydrodynamic flow in heavy-ion collisions with large hadronic viscosity”, Phys. Rev. C **83**, 044909 (2011). **[30 citations]**
32. C. Shen, U. Heinz, P. Huovinen and H. Song, “Systematic parameter study of hadron spectra and elliptic flow from viscous hydrodynamic simulations of Au+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV”, Phys. Rev. C **82**, 054904 (2010). **[125 citations]**
33. T. Renk, H. Holopainen, U. Heinz and C. Shen, “A systematic comparison of jet quenching in different fluid-dynamical models”, Phys. Rev. C. **83** 014910 (2011). **[42 citations]**
34. L. W. Chen, B. J. Cai, C. M. Ko, B. A. Li, C. Shen and J. Xu, “High-order effects on the incompressibility of isospin asymmetric nuclear matter”, Phys. Rev. C **80**, 014322 (2009). **[109 citations]**

### ***Conference Proceedings***

35. C. Shen, B. Schenke, “Initial state and hydrodynamic modelling of heavy-ion collisions at RHIC BES energies”, PoS CPOD2017 (2018) 006, arXiv: 1711.10544. **[2 citations]**

36. H. Mantysaari, B. Schenke, **C. Shen**, and P. Tribedy, “Proton structure fluctuations: from HERA to the LHC”, PoS DIS2017 (2018) 060, arXiv: 1706.05937 [nucl-th] [*1 citations*]
37. J. F. Paquet, **C. Shen**, G. Denicol, S. Jeon, and C. Gale, “Phenomenological constraints on the bulk viscosity of QCD”, Nucl. Phys. A **967** (2017) 429-432 [*2 citations*]
38. A. Kumar, E. Bianchi, J. Elledge, A. Majumder, G. Y. Qin, and **C. Shen**, “Solving the  $\hat{q}$  puzzle and  $x$  and scale dependence”, Nucl. Phys. A **967** (2017) 536-539, arXiv: 1706.07547 [nucl-th] [*1 citations*]
39. H. Mantysaari, B. Schenke, **C. Shen**, and P. Tribedy, “Proton structure fluctuations: constraints from HERA and applications to p+A collisions”, Nucl. Phys. A **967** (2017) 317-320, arXiv: 1705.03735 [nucl-th] [*0 citations*]
40. S. McDonald, **C. Shen**, F. Fillion-Gourdeau, S. Jeon, C. Gale, “Pre-equilibrium Longitudinal Flow in the IP-Glasma Framework for Pb+Pb Collisions at the LHC”, Nucl.Part.Phys.Proc. **289-290** (2017) 461-464, arXiv: 1704.07680 [nucl-th] [*0 citations*]
41. S. McDonald, **C. Shen**, F. Fillion-Gourdeau, S. Jeon, C. Gale, “A Detailed Study and Synthesis of Flow Observables in the IP-Glasma+MUSIC+UrQMD Framework”, Nucl. Phys. A **967** (2017) 393-396, arXiv: 1704.05362 [nucl-th] [*1 citations*]
42. **C. Shen**, G. Denicol, C. Gale, S. Jeon, A. Monnai, B. Schenke, “A hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”, Nucl. Phys. A **967** (2017) 796-799, arXiv: 1704.04109 [nucl-th] [*7 citations*]
43. G. Vujanovic, J. F. Paquet, **C. Shen**, G. Denicol, S. Jeon, C. Gale, U. Heinz, “Dilepton radiation and bulk viscosity in heavy-ion collisions”, Nucl.Part.Phys.Proc. **289-290** (2017) 165-168, arXiv: 1703.06164 [*3 citations*]
44. G. Vujanovic, J. F. Paquet, **C. Shen**, G. Denicol, S. Jeon, C. Gale, U. Heinz, “Bulk viscous effects on flow and dilepton radiation in a hybrid approach”, Nucl. Phys. A **967** (2017) 692-695, arXiv: 1704.04687 [nucl-th]. [*3 citations*]
45. I. Iatrakis, E. Kiritsis, **C. Shen**, and D. L. Yang, “Direct photon spectra and anisotropic flow in heavy-ion collisions from holography”, EPJ Web Conf. **137**, 07029 (2017) [*1 citations*]
46. C. Park, **C. Shen**, S. Jeon, C. Gale, “Rapidity-dependent jet energy loss in small systems with finite-size effects and running coupling”, Nucl.Part.Phys.Proc. **289-290** (2017) 289-292, arXiv: 1612.06754 [*4 citations*]
47. S. Hauksson, **C. Shen**, S. Jeon, C. Gale, “Bulk viscous corrections to photon production in the quark-gluon plasma”, Nucl.Part.Phys.Proc. **289-290** (2017) 169-172, arXiv: 1612.05517 [*3 citations*]



48. **C. Shen**, J. F. Paquet, G. Denicol, S. Jeon, C. Gale, “Electromagnetic radiation and collectivity in small quark-gluon droplets”, Nucl.Part.Phys.Proc. **289-290** (2017) 161-164, arXiv: 1612.05464 [*1 citations*]
49. I. Iatrakis, E. Kiritsis, **C. Shen**, and D. L. Yang, “Holography photon production and anisotropic flow”, Nucl.Part.Phys.Proc. **289-290** (2017) 177-180, arXiv: 1612.05114 [*1 citations*]
50. J. F. Paquet, **C. Shen**, G. Denicol, M. Luzum, B. Schenke, S. Jeon, and C. Gale, “Thermal and prompt photons at RHIC and the LHC”, Nucl. Phys. A, **956**, 409-412 (2016) [*2 citations*]
51. **C. Shen**, C. Park, J. F. Paquet, G. S. Denicol, S. Jeon and C. Gale, “Direct photon production and jet energy-loss in small systems”, Nucl. Phys. A, **956**, 741-744 (2016), arXiv:1601.03070 [hep-ph]. [*6 citations*]
52. **C. Shen**, “Electromagnetic Radiation from QCD Matter: Theory Overview”, Nucl. Phys. A, **956**, 184-191 (2016), arXiv:1601.02563 [nucl-th]. [*18 citations*]
53. **C. Shen**, “Recent developments in the theory of electromagnetic probes in relativistic heavy-ion collisions”, Nuclear and Particle Physics Proceedings, **276-278**, 72-77 (2016), arXiv:1511.07708 [nucl-th]. [*6 citations*]
54. G. Vujanovic, **C. Shen**, G. S. Denicol, B. Schenke, S. Jeon and C. Gale, “Probing the dissipative properties of a strongly interacting medium with dileptons”, Nuclear and Particle Physics Proceedings, **276-278**, 113-114 (2016), arXiv:1511.04625 [nucl-th]. [*3 citations*]
55. G. Vujanovic, G. S. Denicol, **C. Shen**, M. Luzum, B. Schenke, S. Jeon and C. Gale, “Dilepton emission in high-energy heavy-ion collisions with dissipative hydrodynamics”, arXiv:1510.00441 [nucl-th]. [*2 citations*]
56. A. Goldschmidt, Z. Qiu, **C. Shen** and U. Heinz, “Collision Geometry and Flow in Uranium+Uranium Collisions”, arXiv:1502.00603 [nucl-th]. [*7 citations*]
57. **C. Shen**, J.-F. Paquet, J. Liu, G. Denicol, U. Heinz and C. Gale, “Event-by-event direct photon anisotropic flow in relativistic heavy-ion collisions”, Nucl. Phys. A **931** 675-580, arXiv:1407.8533 [nucl-th]. [*15 citations*]
58. U. Heinz, J. Liu and **C. Shen**, “Electromagnetic fingerprints of the Little Bang”, Nucl. Phys. A **932**, 310, arXiv:1403.8101 [nucl-th]. [*10 citations*]
59. **C. Shen**, U. Heinz, J.-F. Paquet and C. Gale, “Thermal photon anisotropic flow serves as a quark-gluon plasma viscometer”, Nucl. Phys. A **932**, 184, arXiv:1403.7558 [nucl-th]. [*25 citations*]

60. **C. Shen** and U. Heinz, “Viscous Flow in Heavy-Ion Collisions from RHIC to LHC”, *Nucl. Phys. A* **904-905** 361c-364c (2013). [**5 citations**]
61. U. Heinz, **C. Shen** and H. Song, “The viscosity of quark-gluon plasma at RHIC and the LHC”, *AIP Conf. Proc.* **1441** (2012) 766-770. [**100 citations**]
62. **C. Shen**, S. A. Bass, T. Hirano, P. Huovinen, Z. Qiu, H. Song and U. Heinz, “The QGP shear viscosity: Elusive goal or just around the corner?”, *J. Phys. G* **38**, 124045 (2011). [**50 citations**]
63. T. Renk, J. Auvinen, K. J. Eskola, U. Heinz, H. Holopainen, R. Paatelainen and **C. Shen**, “Systematics of parton-medium interaction from RHIC to LHC”, *J. Phys. G* **38**, 124089 (2011). [**3 citations**]
64. L. W. Chen, B. J. Cai, **C. Shen**, C. M. Ko, J. Xu and B. A. Li, “Incompressibility of asymmetric nuclear matter”, *Int. J. Mod. Phys. E* **19**, 1675 (2010). [**0 citations**]

### *Under peer-review*

65. C. Gale, S. Jeon, S. McDonald, J-F. Paquet, **C. Shen**, “Photon radiation from heavy-ion collisions in the  $\sqrt{s_{NN}} = 19-200$  GeV regime”, *submitted to Nucl. Phys. A*, arXiv: 1807.09326 [nucl-th] [**0 citations**]
66. M. Singh, **C. Shen**, S. McDonald, S. Jeon, C. Gale, “Hydrodynamic Fluctuations in Relativistic Heavy-Ion Collisions”, *submitted to Nucl. Phys. A*, arXiv: 1807.054551 [nucl-th] [**0 citations**]
67. **C. Shen**, B. Schenke, “Dynamical initialization and hydrodynamic modelling of relativistic heavy-ion collisions”, *accepted by Nucl. Phys. A*, arXiv: 1807.05141 [nucl-th] [**2 citations**]
68. B. Schenke, **C. Shen**, P. Tribedy, “Features of the IP-Glasma”, *submitted to Nucl. Phys. A*, arXiv: 1807.05205 [nucl-th] [**2 citations**]
69. U. Gursoy, D. Kharzeev, E. Marcus, K. Rajagopal, **C. Shen**, “Charge-dependent Flow Induced by Magnetic and Electric Fields in Heavy Ion Collisions”, *submitted to Phys. Rev. C*, arXiv: 1806.05288 [nucl-th] [**2 citations**]
70. A. Dubla, S. Masciocchi, J. M. Pawlowski, B. Schenke, **C. Shen**, J. Stachel, “Towards QCD-assisted hydrodynamics for heavy-ion collisions phenomenology”, *submitted to Nucl. Phys. A*, arXiv: 1805.02985 [nucl-th] [**2 citations**]
71. G. Denicol, C. Gale, S. Jeon, A. Monnai, B. Schenke, **C. Shen**, “Net baryon diffusion in fluid dynamic simulations of relativistic heavy-ion collisions”, *accepted by Phys. Rev. C*, arXiv: 1804.10557 [nucl-th] [**6 citations**]

72. S. Cao, A. Majumder, G.-Y. Qin, **C. Shen**, “Drag Induced Radiation and Multi-Stage Effects in Heavy-Flavor Energy Loss”, *submitted to Phys. Lett. B*, arXiv: 1711.09053 [nucl-th] **[1 citations]**
73. E. Bianchi, J. Elledge, A. Kumar, A. Majumder, G. Y. Qin, and **C. Shen**, “The  $x$  and  $Q^2$  dependence of  $q_{\text{had}}$ , quasi-particles and the JET puzzle”, *submitted to Phys. Rev. Lett.*, arXiv: 1702.00481. **[7 citations]**

## TALKS AND SEMINARS

### *Invited*

1. “Initial State and hydro group status report”  
**BEST Collaboration Meeting**, LBNL Berkeley, Aug. 20, 2017
2. “JETSCAPE 1.0 — an event generator for heavy-ion collisions”  
**Invited talk in Workshop on Probing Quark-Gluon Matter with Jets**, BNL, July 23, 2018
3. “Theory for the Beam Energy Scan Program”  
**Invited talk in the STAR Collaboration Meeting**, Lehigh University, July 16, 2018
4. “Collectivity and electromagnetic radiation in small collision systems”  
**Invited talk in the Second International Workshop on Collectivity in Small Collision Systems**, CCNU Wuhan China, June 14, 2018
5. “Dynamical initialization and hydrodynamic modelling of relativistic heavy-ion collisions”  
**Selected parallel talk at the 27th international conference on ultrarelativistic nucleus-nucleus collisions Quark Matter 2018**, Venice Italy, May 16, 2018
6. “Dynamical initialization and hydrodynamic modelling of relativistic heavy-ion collisions”  
**Invited talk at the APS April Meeting**, Columbus, OH, Apr. 15, 2018
7. “Going with the flow — the nuclear phase diagram at the highest temperature and densities”  
**Invited HENPIC-EVO talk**, online, Mar. 22, 2018
8. “Going with the flow — the nuclear phase diagram at the highest temperature and densities”  
**Invited Physics Colloquium at East Carolina University**, Greenville NC, Mar. 22, 2018
9. “Going with the flow — the nuclear phase diagram at the highest temperature and densities”  
**Invited Physics Colloquium at Wayne State University**, Feb. 8, 2018

10. “Going with the flow — the nuclear phase diagram at the highest temperature and densities”  
**Invited Physics Colloquium at University of Minnesota**, Jan. 23, 2018
11. “Hydrodynamics: state of the art”  
**Invited talk at the JETSCAPE winter workshop**, LBNL, Jan. 6, 2018
12. “Dynamical modelling of relativistic heavy-ion collisions at the RHIC BES energies”  
**Invited nuclear seminar at LBNL**, Berkeley, Nov. 15, 2017
13. “Dynamical initial state model for relativistic heavy-ion collisions”  
**Invited talk at the NA61-theory meeting**, Nov. 9, 2017
14. “Hydrodynamic modelling of RHIC BES”  
**Invited talk at the Critical Point and Onset of Deconfinement 2017**, Stony Brook University, Aug 8, 2017
15. “Hydrodynamic Simulations for the RHIC-BES, Progress, and Challenges ”  
**Invited talk at the BEST Collaboration Meeting**, Stony Brook University, Aug 5, 2017
16. “Hydrodynamics in small collision systems from LHC to RHIC”  
**Invited talk at RHIC & AGS Users’ Meeting**, Brookhaven National Lab, June 20, 2017
17. “Dancing with MUSIC — recent progress and future”  
**Invited talk at Symposium on Light, Color and Dense Matter**, University of Minnesota, June 14, 2017
18. “Hydrodynamics with sources”  
**Invited talk at INT workshop**, University of Washington, May. 22, 2017
19. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”  
**Invited talk at STAR Collaboration meeting**, Brookhaven National Lab, May. 18, 2017
20. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”  
**Invited nuclear seminar talk**, McGill University, Mar. 30, 2017
21. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”  
**Invited nuclear seminar talk**, The Ohio State University, Mar. 20, 2017
22. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”

- Invited nuclear seminar talk**, Stony Brook University, Feb. 23, 2017
23. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”  
**Selected parallel talk at the 26th international conference on ultrarelativistic nucleus-nucleus collisions Quark Matter 2017**, Chicago, Feb. 7, 2017
  24. “Photon Puzzle at RHIC: a theory perspective”  
**Invited talk given at APS GHP meeting 2017**, Washington DC, Feb. 2, 2017
  25. “Hydrodynamics Module in The JETSCAPE Framework”  
**Invited talk given at JETSCAPE Collaboration meeting**, Wayne State University, Nov. 27, 2016
  26. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”  
**Invited talk given at the RIKEN/Nuclear BNL lunch seminar**, Brookhaven National Lab, Oct. 2016
  27. “Electromagnetic radiation and collectivity in small quark-gluon droplets”  
**Selected parallel talk at the 8th international conference on hard and electromagnetic probes of high-energy nuclear collisions Hard Probes 2016**, Wuhan, China, Sept. 2016
  28. “Building the Standard Model for Relativistic Heavy-ion Collisions”  
**Invited talk given at ULtra-RelativistiCH Heavy IoNZ 2016**, CERN, Geneva, Switzerland, July 2016
  29. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”  
**Invited talk given at the 2016 RHIC & AGS Annual Users’ Meeting**, Brookhaven National Lab, June 2016
  30. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”  
**Invited talk given at the BEST collaboration meeting**, Indiana University, Bloomington, USA, May 2016
  31. “The standard model for relativistic heavy-ion collisions and electromagnetic tomography”  
**Invited talk given at the INT for postdoc interview**, Jan. 2015
  32. “The standard model for relativistic heavy-ion collisions and electromagnetic tomography”

- Invited talk given at the award section in APS DNP Meeting 2015**, Santa Fe, USA, Oct. 2015
33. “The standard model for relativistic heavy-ion collisions and electromagnetic tomography”  
**Invited Nuclear Physics Seminar**, Shanghai Jiao Tong University, China, Oct. 2015
34. “Theory Overview of Electromagnetic Radiation from QCD Matter”  
**Invited plenary talk at the 25th international conference on ultrarelativistic nucleus-nucleus collisions Quark Matter 2015**, Kobe, Japan, Oct 2015
35. “Recent developments in the theory of electromagnetic probes in relativistic heavy-ion collisions”  
**Invited plenary talk at Second conference on heavy ion collisions in the LHC era and beyond**, Quy Nhon, Vietnam, July 2015
36. “MUSIC with diffusion”  
**Invited plenary talk at Second conference on heavy ion collisions in the LHC era and beyond**, Quy Nhon, Vietnam, July 2015
37. “Recent developments in the theory of electromagnetic probes in relativistic heavy-ion collisions”  
**Invited plenary talk at the 7th international conference on hard and electromagnetic probes of high-energy nuclear collisions Hard Probes 2015**, McGill University, Canada, June 2015
38. “iEBE hydro for JET”  
**JET Symposium**, McGill University, Canada, June 2015
39. “MUSIC with diffusion”  
**Invited Nuclear Physics Seminar**, The Ohio State University, USA, Mar 2015
40. “The iEBE package”  
**JET EVO Meeting**, Oct 2014
41. “The standard model for relativistic heavy-ion collisions and electromagnetic tomography”  
**McGill Welcome Seminar**, McGill University, Canada, Oct 2014
42. “Photon tomography of relativistic heavy-ion collisions”

**Riken BNL Research Center Workshop — Thermal photon and Dilepton in Heavy-Ion Collisions**, Brookhaven National Lab USA, Aug 2014

43. “The iEBE package”  
**Workshop on Toward Quantitative Conclusions for Heavy-Ion Collisions**, Michigan State University, USA, July 2014
44. “Viscous corrections to photon emission in heavy-ion collisions”  
**Selected parallel talk at the 24th international conference on ultrarelativistic nucleus-nucleus collisions Quark Matter 2014**, Darmstadt, Germany, May 2014
45. “Photon emission from viscous hydrodynamics in relativistic heavy-ion collisions”,  
**EMMI Rapid Reaction Task Force**, GSI Darmstadt, Germany, Feb. 2014
46. “Viscous hydrodynamics in heavy-ion collisions from RHIC to LHC”  
**Invited Nuclear Physics Seminar**, LBNL, Berkeley, USA, Jan. 2014
47. “Anisotropic flow of thermal photons as a quark-gluon plasma viscometer”  
**Selected parallel talk at the 6th international conference on hard and electromagnetic probes of high-energy nuclear collisions Hard Probes 2013**, Stellenbosch, South Africa, Nov. 2013
48. “Improved Sampling Procedure in iEBE-VISHNU”  
**Sampling Workshop 2013**, Frankfurt, Germany, July 2013
49. “Event-by-event viscous photon emission in relativistic heavy-ion collisions”  
**Invited Nuclear Physics Seminar**, McGill University, Canada, June 2013
50. “Viscous Hydrodynamic flows in Heavy-Ion Collisions from RHIC to LHC”  
**Invited Nuclear Physics Seminar**, McGill University, Canada, Nov. 2012
51. “Hydrodynamic flows from RHIC to LHC”  
**Invited Nuclear Physics Seminar**, University of Illinois at Chicago, Oct. 2012
52. “Collision energy dependence of hydrodynamic flow in relativistic heavy-ion collisions”  
**Invited Nuclear Physics Seminar**, High-Energy Nuclear Physics in China EVO, Sept. 2012
53. “Collision energy dependence of hydrodynamic flow in relativistic heavy-ion collisions”



**Selected parallel talk at the 23th international conference on ultrarelativistic nucleus-nucleus collisions Quark Matter 2012**, Washington DC, USA, Aug. 2012

54. “Hydrodynamic flow from RHIC to LHC”  
**Invited Nuclear Physics Seminar**, McGill University, Canada, Feb. 2012
55. “Viscous hydrodynamic radial and elliptic flow from RHIC to LHC”  
**Invited Nuclear Physics Seminar**, McGill University, Canada, Jun. 2011
56. “The QGP shear viscosity - elusive goal or just around the corner?”  
**Selected parallel talk at the 22th international conference on ultrarelativistic nucleus-nucleus collisions Quark Matter 2011**, Annecy France, May 2011
57. “Viscous hydrodynamic radial and elliptic flow from RHIC to LHC”  
**Invited Nuclear Physics Seminar**, Brookhaven National Laboratory, USA, Mar. 2011
58. “Viscous hydrodynamic radial and elliptic flow from RHIC to LHC”  
**Invited Nuclear Physics Seminar**, The Ohio State University, USA, Jan. 2011

### ***Contributed talks***

59. “Hybrid approach to relativistic heavy-ion collisions at the RHIC BES energies”  
**The BEST collaboration hydro group meeting**, online talk through Blue Jeans, Sept 2016
60. “Study the collectivity and electromagnetic emissivity in a small quark-gluon droplet”  
**Selected talk in CAP Congress Meeting**, University of Ottawa, Ottawa, Canada, June, 2016
61. “MUSIC with diffusion”  
**Riken BNL Research Center Workshop — Theory and Modeling for the Beam Energy Scan: from Exploration to Discovery**, Brookhaven National Lab, USA, Feb 2015
62. “Thermal photon emission in relativistic heavy-ion collisions”  
**JET Summer School**, UC Davis, USA, June 2014
63. “The iEBE package”  
**JET Collaboration Meeting**, UC Davis, USA, June 2014

64. “Thermal photons as a quark-gluon plasma thermo-meter revisited”  
**Critical Mass Meeting**, University of Toledo, USA, Mar. 2014
65. “Photon emission from a nearly equilibrated medium in relativistic heavy-ion collisions”  
**JET Bulk Meeting**, JET EVO meeting, Oct. 2013
66. “Thermal photons as a quark-gluon plasma thermometer?”  
**Midwest Theory Get Together**, Argonne National Laboratory, USA, Sept. 2013
67. “Hydro-EM radiation interface”  
**JET Collaboration Meeting**, The Ohio State University, USA, June 2013
68. “Photon emission from a nearly equilibrated medium in relativistic heavy-ion collisions”  
**Selected talk given at APS meeting Ohio Section**, Ohio University, USA, Mar. 2013
69. “Photon emission from a nearly equilibrated medium in relativistic heavy-ion collisions”  
**JET Bulk Meeting**, JET EVO meeting, Mar. 2013
70. “Thermal photon emission with partial chemical equilibrium equation of state”  
**Midwest Theory Get Together**, Argonne National Laboratory, USA Sept. 2012
71. “Hydrodynamic flow from RHIC to LHC”  
**National Nuclear Physics Summer School**, Santa Fe, USA, July 2012
72. “Hydrodynamic flow from RHIC to LHC”  
**Selected talk given at Hayes Research Form**, The Ohio State University, USA, Feb. 2012
73. “(2+1)-d vs. (3+1)-d viscous hydrodynamics from RHIC to LHC”  
**APS DNP Fall Meeting 2011**, Michigan State University, USA, Oct. 2011
74. “Viscous elliptic and triangular flow at LHC”  
**Midwest Theory Get Together**, Argonne National Laboratory, USA, Sept. 2011
75. “Viscous hydrodynamic radial and elliptic flow from RHIC to LHC”  
**APS April Meeting 2011**, Anaheim, USA, Apr. 2011
76. “Systematic parameter study in viscous hydrodynamics”  
**Midwest Critical Mass 2010**, University of Toledo, USA, Oct. 2010

77. “Hydrodynamic flow in heavy-ion collisions with large hadronic viscosity”  
**Midwest Theory Get Together**, Argonne National Laboratory, USA, Sept. 2010

### *Poster presentations*

78. “The shining quark-gluon plasma”  
**Graduate Research Poster competition**, The Ohio State University, USA, Feb. 2013
79. “Thermal photon emission with PCE equation of state”  
**Quark Matter 2012**, Washington DC, USA, Aug. 2012
80. “Viscous hydrodynamic elliptic flow from RHIC to LHC”  
**Quark Matter 2011**, Annecy, France, May 2011
81. “Viscous hydrodynamic elliptic flow from RHIC to LHC”  
**Graduate Research Poster competition**, The Ohio State University, USA, May 2011

## SCIENTIFIC PUBLIC BROADCAST

### *Movie posted on Youtube*

- Charged hadrons vs thermal photons production in relativistic heavy-ion collisions  
<http://youtu.be/oMFboC7O1DU>
- Hydrodynamic simulations of relativistic heavy ion collisions at RHIC and LHC  
[http://www.youtube.com/watch?feature=player\\_detailpage&v=G18pyVomSRw](http://www.youtube.com/watch?feature=player_detailpage&v=G18pyVomSRw)
- Viscous hydrodynamics from RHIC to LHC energies  
[http://www.youtube.com/watch?feature=player\\_detailpage&v=DU2KTiPOEA4](http://www.youtube.com/watch?feature=player_detailpage&v=DU2KTiPOEA4)