

# W. A. Horowitz

## Curriculum Vitae

October 29, 2016

Department of Physics  
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### Education:

**Ph.D.** in Physics, Columbia University 2008  
Thesis Advisor: Miklos Gyulassy  
Thesis title: *Probing the Frontiers of QCD*  
**M.Phil.** in Physics, Columbia University 2007  
**M.A.** in Physics, Columbia University 2005  
**B.S.** in Physics, Summa Cum Laude, Georgia Institute of Technology 2003

### Research Positions:

**Postdoctoral Researcher**, The Ohio State University 2008-2010  
Advisor: Yuri V. Kovchegov

### Faculty Positions:

**Lecturer**, University of Cape Town 2010-2014  
**Senior Lecturer**, University of Cape Town 2015-  
**Associate Faculty**, African Institute for Math. Sciences (AIMS) 2016-

### Leadership Positions:

**Head**, Theory Division, SA-CERN Collaboration 2016-  
**Deputy Head**, Theory Division, SA-CERN Collaboration 2015-2016  
**Representative** for UCT on the Electron Ion Collider  
Users' Group (EICUG) Institutional Board 2016-  
**Member** of the EICUG Charter Writing Committee 2016  
**Deputy Director**, Centre for Theoretical and Mathematical  
Physics (CTMP), University of Cape Town 2015-

**Awards:**

UCT College of Fellows Young Researcher Award	2012
Finalist, NSTF BHP-Billiton Emerging Researcher Award	2012
Best Student Talk, <i>Strange Quark Matter 2007</i>	2007
E. Higgins Scholarship, Columbia University	2003-2005
Outstanding Graduating Senior in Physics, Georgia Institute of Technology	2003
Hope Scholarship, Georgia Institute of Technology	1999-2002

**Schools:**

Lecturer for the <i>Workshop on High Energy Particle Physics</i> Johannesburg, South Africa	February, 2016
Lecturer for The 58 <sup>th</sup> Annual Conference of the South African Institute of Physics <i>Winter School</i> : Richards Bay, South Africa	July, 2013
Lecturer for the 22 <sup>nd</sup> <i>Jyväskylä Summer School</i> : Jyväskylä, Finland	August, 2012

**Memberships and Collaborations:**

National Institute of Theoretical Physics (NITheP) Associate  
 Member of SA-CERN Collaboration  
 Senior Group Member of UCT-CERN  
 Member of the Electron Ion Collider (EIC) Users' Group  
 Associate Member of the Organization for Women in Science  
 for the Developing World, South Africa Chapter  
 Associate Member of the JET Collaboration  
 Member of the UCT Centre for Theoretical and Mathematical Physics (CTMP)

**Editorial Activities and Grant Reviews:**

Refereed for Acta Physica Hungarica, European Physical Journal A, European Physical Journal C, the Journal of High Energy Physics (JHEP), the Journal of Physics G, the New Journal of Physics, Nuclear Physics A, Physical Review C, Physical Review D, Physical Review Letters, Reports on Progress in Physics

External reviewer for the Claude Leon Foundation Postdoctoral Fellowship Programme, South Africa; National Research Foundation, South Africa; and CONICYT, Chile

**Professional Service:**

Local Organizer for the <i>4<sup>th</sup> Biennial International Workshop on Discovery Physics at the LHC (Kruger2016)</i> , Kruger National Park, South Africa	December, 2016
Convener for Open Heavy Flavour at the Lorentz Center <i>Tomography of the Quark-Gluon Plasma with Heavy Quarks</i> workshop	October, 2016
International Advisory Committee for the <i>8<sup>th</sup> International Conference on Hard and Electromagnetic Probes (Hard Probes 2016)</i> , Wuhan, China	September, 2016
Local Organizer for the <i>Workshop on High Energy Particle Physics</i> Johannesburg, South Africa	February, 2016
Co-organizer for the “Hadron structure, nuclear environment, and binding” session at the <i>EIC Users’ Group Meeting</i>	January, 2016
International Advisory Committee for the <i>7<sup>th</sup> International Conference on Hard and Electromagnetic Probes (Hard Probes 2015)</i> , Montreal, Canada	July, 2015
Local Organizer for the <i>Workshop on High Energy Particle Physics</i> Johannesburg, South Africa	January, 2015
Local Organizer for the <i>26<sup>th</sup> Chris Engelbrecht Summer School 2015 Physics of the LHC</i> , Cape Town, South Africa	January 2015
Local Organizer for the <i>3<sup>rd</sup> Biennial International Workshop on Discovery Physics at the LHC (Kruger2014)</i> , Kruger National Park, South Africa	December, 2014
Chair of the Local Organizing Committee for the <i>6<sup>th</sup> International Conference on Hard and Electromagnetic Probes (Hard Probes 2013)</i> , Cape Town, South Africa	November, 2013
Local Organizer for the <i>2<sup>nd</sup> Biennial International Workshop on Discovery Physics at the LHC (Kruger2012)</i> , Kruger National Park, South Africa	December, 2012
Judge for Student Awards, <i>5<sup>th</sup> Annual Conference of the South African Institute of Physics</i> , Pretoria, South Africa	July, 2012
Convener for the <i>11<sup>th</sup> Conference on the Intersections of Particle and Nuclear Physics (CIPANP2012)</i> , St. Petersburg, FL, USA	June 2012
Chair of the Organizing Committee for the <i>Exploring QCD Frontiers: from RHIC and LHC to EIC (CPTEIC) Workshop</i> , Stellenbosch, South Africa	January 2012
Organizer for Nuclear Physics seminars at Ohio State	2009-2010
Organizer for <i>AdS Strings Intersect with Nuclear Beams at Columbia</i>	October 2007
Organizer for <i>Yale-Columbia Fest 2007</i>	January 2007

**Grants and Rating:**

National Research Foundation (NRF) Rating of Y1	2012-
NRF Incentive Grant for R40,000 per year	2012-
NRF Competitive Programme for Rated Researchers for R324,000	2014-2016
DAAD-NRF In-Country Doctoral Scholarship for R300,000 for Isobel Kolbé	2016-2018
National Institute for Theoretical Physics (NITheP) PhD Bursary for R300,000 for Isobel Kolbé (declined)	2016
J. W. Jagger Centenary Gift Scholarship for R30,000 for Abdullah Khalil	2016
UCT University Research Committee (URC) Block Grant for R8959	2016
Science Faculty PhD Fellowship for R320,000 for Andrianiaina Rasoanaivo	2015-2017
DAAD-NRF In-Country Doctoral Scholarship for R300,000 for Andrianiaina Rasoanaivo (declined)	2015
NITheP Half MSc Bursary for R40,000 for Isobel Kolbé	2015
UCT URC Block Grant for R6276	2015
UCT URC Postdoctoral Fellowship for Razieh Morad	2014
Harry Crossley Fellowship for Benjamin Meiring	2014-2015
Grants for Hard Probes 2013 Conference (All 2013):	
NITheP Grant for R150,000	
SA-CERN Grant for R125,000	
NRF KIC Grant for R35,000	
Support from Lawrence Livermore National Laboratory for \$5,000	
Support from Los Alamos National Laboratory for \$2,000	
Support from CERN for CHF5,000	
ExtreMe Matter Institute Grant for €2500	
University Research Committee Block Grant for R5,655	2012
Fulbright Specialist at UCT won for Prof. Raju Venugopalan	2012
NITheP Visitor's Program Grant for R10,000	2012
Grants for the CPTEIC Workshop (All 2012):	
NITheP Grant for R110,000	
NRF KIC Grant for R40,000	
Support from Jefferson Laboratory for \$5,000	
Support from Brookhaven National Laboratory for \$3,000	
Carnegie Research Development Grant for R30,000	2011
Research Development Grant for R6,919	2011
URC Block Grant for R6,892	2011
University Research Committee Start-Up Grant for R20,000	2011

## Visiting Positions and Extended Workshops:

INT: Gluons and the Quark Sea at High Energies	2010
INT: Quantifying the Properties of Hot QCD Matter	2010
Aspen Center for Physics	2009
Frankfurt Institute for Advanced Studies (FIAS)	2006-2007

## Publications:

1. R. W. Moeman and W. A. Horowitz, *A semi-classical recipe for wobbly limp noodles in partonic soup*, arXiv:[1605.09285](#) [hep-th], submitted to JHEP
2. Isobel Kolbé and W. A. Horowitz, *Radiative Energy Loss in Small and Large Systems*, arXiv:[1511.09313](#) [hep-ph], submitted to Phys. Lett. B
3. A. Andronic *et al.*, *Heavy-flavour and quarkonium production in the LHC era: from proton-proton to heavy-ion collisions*, *Eur.Phys.J.* **C76** (2016) 107 [arXiv:[1506.03981](#) [nucl-ex]]
4. W. A. Horowitz, *Fluctuating Heavy Quark Energy Loss in Strongly-Coupled Quark-Gluon Plasma*, *Phys.Rev.* **D91** (2015) 8, 085019 [arXiv:[1501.04693](#) [hep-ph]]
5. R. Morad and W. A. Horowitz, *Strong-coupling Jet Energy Loss from AdS/CFT*, *JHEP1411*, 017 (2014) [arXiv:[1409.7545](#) [hep-th]]
6. Nestor Armesto *et al.*, *Comparison of Jet Quenching Formalisms for a Quark-Gluon Plasma ‘Brick’*, *Phys. Rev.* **C86** (2012) 064904 [arXiv:[1106.1106](#) [hep-ph]]
7. W. A. Horowitz and Miklos Gyulassy, *Quenching and Tomography from RHIC to LHC*, *J. Phys.* **G38**, 124114 (2011) [arXiv:[1107.2136](#) [hep-ph]]
8. W. A. Horowitz and Yuri V. Kovchegov, *Running coupling corrections to inclusive gluon production*, *J. Phys.* **G38**, 124064 (2011) [arXiv:[1106.5456](#) [hep-ph]]
9. W. A. Horowitz and Miklos Gyulassy, *The Surprising Transparency of the sQGP at LHC*, *Nucl. Phys.* **A872**, 265 (2011) [arXiv:[1104.4958](#) [hep-ph]]
10. Jiangyong Jia, W. A. Horowitz, and Jinfeng Liao, *A study of the correlations between jet quenching observables at RHIC*, *Phys. Rev.* **C84**:034904 (2011) [arXiv:[1101.0290](#) [nucl-th]]
11. W. A. Horowitz, *Qualitative and Quantitative Energy Loss?*, *Nucl. Phys.* **A855**:225-228 (2011) [arXiv:[1011.5965](#) [hep-ph]]

12. W. A. Horowitz and Yuri V. Kovchegov, *Running Coupling Corrections to High Energy Inclusive Gluon Production*, *Nucl. Phys.* **A849**:72-97 (2011) [arXiv:1009.0545 [hep-ph]]
13. W. A. Horowitz and B. A. Cole, *Systematic Uncertainties in Theoretical Predictions of Jet Quenching*, *Phys. Rev.* **C81**:024909 (2010) [arXiv:0910.1823 [hep-ph]]
14. W. A. Horowitz, *Shock Treatment: Heavy Quark Energy Loss in a Novel AdS/CFT Geometry*, *Nucl. Phys. A* **830**, 773C (2009) [arXiv:0907.4845 [nucl-th]]
15. W. A. Horowitz and Yuri V. Kovchegov, *Shock Treatment: Heavy Quark Drag in a Novel AdS Geometry*, *Phys. Lett.* **B680**:56-61 (2009) [arXiv:0904.2536 [hep-th]]
16. W. A. Horowitz and M. Gyulassy, *Testing AdS/CFT Drag and pQCD Heavy Quark Energy Loss*, *J. Phys. G* **35**, 104152 (2008) [arXiv:0804.4330 [hep-ph]]
17. N. Armesto *et al.*, *Heavy Ion Collisions at the LHC - Last Call for Predictions*, *J. Phys. G* **35**, 054001 (2008) [arXiv:0711.0974 [hep-ph]]. Contributed:
  - W. A. Horowitz, *Ratio of charm to bottom  $R_{AA}$  as a test of pQCD vs. AdS/CFT energy loss*, arXiv:0710.0595 [hep-ph]
18. W. A. Horowitz, *pQCD vs. AdS/CFT Tested by Heavy Quark Energy Loss*, *J. Phys. G* **35**, 044025 (2008) [arXiv:0710.0703 [nucl-th]]
19. W. A. Horowitz, M. Gyulassy, *Testing AdS/CFT deviations from pQCD heavy quark energy loss with Pb+Pb at LHC*, *Phys. Lett. B* **666**, 320 (2008) [arXiv:0706.2336 [nucl-th]]
20. William A. Horowitz, *LHC Predictions from an extended theory with Elastic, Inelastic, and Path Length Fluctuating Energy Loss*, *Int. J. Mod. Phys.* **E16**, 2193-2199 (2007) [arXiv:nucl-th/0702084]
21. Simon Wicks, William Horowitz, Magdalena Djordjevic, Miklos Gyulassy, *Heavy quark jet quenching with collisional plus radiative energy loss and path length fluctuations*, *Nucl. Phys.* **A783**:493-496 (2007) [arXiv:nucl-th/0701063]
22. A. Adil, M. Gyulassy, W. A. Horowitz, S. Wicks, *Collisional Energy Loss of Non Asymptotic Jets in a QGP*, *Phys. Rev.* **C75**:044906 (2007) [arXiv:nucl-th/0606010]
23. Simon Wicks, William Horowitz, Magdalena Djordjevic, Miklos Gyulassy, *Elastic, Inelastic, and Path Length Fluctuations in Jet Tomography*, *Nucl. Phys.* **A784**:426-442 (2007) [arXiv:nucl-th/0512076]
24. William Horowitz, *Overcoming Fragility*, *Nucl. Phys.* **A783**:543-546 (2007) [arXiv:nucl-th/0610024]

25. W. A. Horowitz, *Large Observed  $v_2$  as a Signature for Deconfinement*, [Acta Phys. Hung. \*\*A27\*\*:221-225, 2006](#) [arXiv:nucl-th/0511052]

## Books:

1. William Horowitz *et al.* eds., *Proceedings, 6th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions (Hard Probes 2013): Cape Town, South Africa, November 4-8, 2013*, [Nucl.Phys. \*\*A932\*\* \(2014\) pp.1-638](#)
2. Daniel Boer *et al.*, eds., *Gluons and the quark sea at high energies: distributions, polarization, tomography*, arXiv:[1108.1713](#) [nucl-th]
  - W. A. Horowitz, *Gluon Density in  $e+A$ : KLN, CGC, DGLAP Glauber, or Neither?*
  - W. A. Horowitz, *Gluon Tomography in Nuclei - The Heavy Ion Collision Initial State*

## Proceedings:

1. D. M. Adamiak and W. A. Horowitz, *Probing quark gluon plasma in  $pA$  collisions*, submitted to the 61st Annual Conference of the South African Institute of Physics (SAIP2016) conference proceedings
2. Robert Hambroek and W. A. Horowitz, *AdS/CFT predictions for momentum correlations of  $b\bar{b}$  pairs in heavy ion collisions*, submitted to the 61st Annual Conference of the South African Institute of Physics (SAIP2016) conference proceedings
3. Abdullah Khalil and W. A. Horowitz, *NLO Rutherford scattering and energy loss in a QGP*, submitted to the 61st Annual Conference of the South African Institute of Physics (SAIP2016) conference proceedings
4. Isobel Kolbé and W. A. Horowitz, *Short Path Length Energy Loss in the Quark Gluon Plasma*, submitted to the 61st Annual Conference of the South African Institute of Physics (SAIP2016) conference proceedings
5. W. A. Horowitz and Arnaud Andrianaivalomahefa, *Energy loss of open strings with massive endpoints in AdS/CFT*, submitted to the 61st Annual Conference of the South African Institute of Physics (SAIP2016) conference proceedings
6. Ben Meiring and W. A. Horowitz, *Late time behaviour for Hard Parton Evolution using the Schwinger-Keldysh Formalism*, [J.Phys.Conf.Ser. \*\*668\*\* \(2016\) 012116](#)
7. Isobel Kolbé and W. A. Horowitz, *Short path length pQCD corrections to energy loss in the quark gluon plasma*, [J.Phys.Conf.Ser. \*\*668\*\* \(2016\) 012107](#)

8. W. A. Horowitz, *Fluctuations in Strong-Coupling Heavy Quark Energy Loss*, [J.Phys. Conf.Ser. 668 \(2016\) 012060](#)
9. D. M. Adamiak and W. A. Horowitz, *High-momentum particle production at RHIC, Fermilab, and LHC*, submitted to the 60th Annual Conference of the South African Institute of Physics (SAIP2015) conference proceedings
10. R. W. Moerman and W. A. Horowitz, *Prescription for Constructing Modified Stringy Yo-yos in (1 + 1)-dimensional Minkowski Space*, submitted to the 60th Annual Conference of the South African Institute of Physics (SAIP2015) conference proceedings
11. R. Morad and W. A. Horowitz, *Jets of light hadrons via AdS/CFT correspondence*, [J. Phys. Conf. Ser. 645 \(2015\) 1, 012007](#)
12. Ben Meiring and W. A. Horowitz, *Finite time calculations for hard parton production relevant to the quark-gluon plasma*, [J. Phys. Conf. Ser. 645 \(2015\) 1, 012006](#)
13. Isobel Kolbe and W. A. Horowitz, *Short Path Length Energy Loss in the Quark-Gluon Plasma from pQCD*, [J. Phys. Conf. Ser. 645 \(2015\) 1, 012004](#)
14. R. Morad and W. A. Horowitz, *Jet Nuclear Modification Factor from the AdS/CFT Correspondence*, [J. Phys. Conf. Ser. 623 \(2015\) 1, 012021](#)
15. Ben Meiring and W. A. Horowitz, *The Energy Momentum Tensor associated with Hard Parton production in Finite Time*, [J. Phys. Conf. Ser. 623 \(2015\) 1, 012019](#)
16. W. A. Horowitz, *NLO Heavy Quark Energy Loss in Strongly-Coupled Quark-Gluon Plasmas*, [J. Phys. Conf. Ser. 623 \(2015\) 1, 012015](#)
17. W. A. Horowitz, *Properties of the Quark-Gluon Plasma Observed at RHIC and LHC*, [59th Annual Conference of the South African Institute of Physics \(SAIP2014\) conference proceedings \(2015\)](#)
18. R. Morad and W. A. Horowitz, *Quark-gluon plasma physics from string theory*, [59th Annual Conference of the South African Institute of Physics \(SAIP2014\) conference proceedings \(2015\)](#)
19. W. A. Horowitz, *Corrections and Uncertainties in Energy Loss Model Predictions*, [J. Phys. Conf. Ser. 589 \(2015\) 012011](#)
20. W. A. Horowitz, *AdS/CFT Heavy Quark Energy Loss Beyond the Leading Order*, [Nucl. Phys. A931 \(2014\) 541-545](#)
21. G. S. Jackson and W. A. Horowitz, *Predictions for the Spatial Distribution of Gluons in the Initial Nuclear State*, [Nucl. Phys. A932 \(2014\) 280-285 \[arXiv:1404.4743 \[nucl-th\]\]](#)



22. W. A. Horowitz, *Heavy Quark Energy Loss and Bulk Physics*, *J. Phys. Conf. Ser.* **509** (2014) 012046
23. W. A. Horowitz, *Weakness or Strength in the Golden Years of RHIC and LHC?*, *Nucl. Phys.* **A910** (2013) 239242 [arXiv:1207.7158 [nucl-th]]
24. W. A. Horowitz, *Heavy Quark Production and Energy Loss*, *Nucl. Phys.* **A904** (2013) 186c-193c [arXiv:1210.8330 [nucl-th]]
25. W. A. Horowitz, *Is It Hard Yet? The Qualitative Agreement of pQCD Energy Loss with RHIC and LHC Data*, *J. Phys. Conf. Ser.* **455** (2013) 012052
26. W. A. Horowitz, *The Study of Hot Many Body QCD*, to appear in the proceedings for the 57th Annual Conference of the SA Institute of Physics
27. W. A. Horowitz, *Testing pQCD and AdS/CFT Energy Loss at RHIC and LHC*, *AIP Conf. Proc.* **1441** (2012) 889-891 [arXiv:1108.5876 [hep-ph]]
28. W. A. Horowitz, *Qualitative and Quantitative Jet Physics in Pb + Pb at LHC*, *PoS KRUGER2010* (2011) 060, arXiv:1103.3018 [hep-ph]
29. W. A. Horowitz, *Testing AdS/CFT at LHC*, *PoS High-pT physics09:043,2009* [arXiv:0905.0504 [hep-ph]]
30. W. A. Horowitz, *0th Order Heavy Quark Photon Bremsstrahlung*, to appear in the proceedings for the 24<sup>th</sup> Winter Workshop on Nuclear Dynamics, arXiv:0806.3092 [nucl-th]

## Colloquia:

1. *Studying Hot Many Body QCD*, University of Pretoria: Pretoria, South Africa (June, 2012)
2. *High- $p_T$  Probes of Heavy Ion Collisions?*, Johann Wolfgang Goethe Universität: Frankfurt am Main, Germany (June, 2012)
3. *Phenomenology of the Quark-Gluon Plasma*, The University of Tennessee: Knoxville, TN (September, 2010)
4. *Successes, Failures, and Uncertainties in the Jet Physics of Heavy Ion Collisions*, The University of Cape Town: Cape Town, South Africa (February, 2010)
5. *RHIC High- $p_T$  Physics*, Johann Wolfgang Goethe Universität: Frankfurt am Main, Germany (October, 2006)

**Seminars:**

1. *Strongly Coupled Heavy Flavor Predictions at LHC*, Nuclear Physics Seminar, Istituto Nazionale di Fisica Nucleare: Torino, Italy (October, 2016)
2. *Time Dependent Momentum Transfer in a Strongly-Coupled Quark-Gluon Plasma from AdS/CFT*, Theoretical Physics Seminar, Institut de physique théorique, Université Paris Saclay: Gif-sur-Yvette, France (October, 2016)
3. *Advances in Strong Coupling Energy Loss*, High Energy Physics Seminar, University of the Witwatersrand: Johannesburg, South Africa (May, 2016)
4. *Weak and Strong Coupling Energy Loss at RHIC and LHC*, Nuclear Theory Seminar, Duke University: Durham, NC, USA (June, 2015)
5. *Weak and Strong Coupling Energy Loss at RHIC and LHC*, High Energy Physics Seminar, Georgia State University: Atlanta, GA, USA (June, 2015)
6. *Weak and Strong Coupling Energy Loss at RHIC and LHC*, Nuclear Theory Seminar, Columbia University: New York, NY, USA (June, 2015)
7. *Weak and Strong Coupling Energy Loss at RHIC and LHC*, Nuclear Theory Seminar, Wayne State University: Detroit, MI, USA (June, 2015)
8. *Weak and Strong Coupling Energy Loss at RHIC and LHC*, Nuclear Theory Seminar, Lawrence Berkeley National Laboratory: Berkeley, CA, USA (June, 2015)
9. *Weak and Strong Coupling Energy Loss at RHIC and LHC*, High Energy Theory Seminar, Purdue University: West Lafayette, IN, USA (June, 2015)
10. *Weak and Strong Coupling Energy Loss at RHIC and LHC*, Nuclear Theory Seminar, Ohio State University: Columbus, OH, USA (June, 2015)
11. *Heavy Quark Quenching in Quark-Gluon Plasma from the AdS/CFT Correspondence*, Quantum Gravity and Strings (QGaSLAB) Seminar, UCT: Cape Town, South Africa (February, 2015)
12. *Energy Loss in the Context of the  $p/d$ -A Non-Null Control*, Heavy Ion Forum, CERN: Geneva, Switzerland (June, 2014)
13. *The Qualitative Failure of Holographic Jet Quenching and Success of pQCD Energy Loss in Heavy Ion Collisions*, Heavy Ion Forum, CERN: Geneva, Switzerland (July, 2013)

14. *AdS/CFT: Is It Useful?*, The Laboratory for Quantum Gravity and Strings (QGa SLAB) Seminar, University of Cape Town: Cape Town, South Africa (February, 2013)
15. *Studying Hot Many Body QCD*, University of Johannesburg: Johannesburg, South Africa (June, 2012)
16. *Studying Hot Many Body QCD*, University of the Witwatersrand: Johannesburg, South Africa (June, 2012)
17. *High- $p_T$  Probes of Heavy Ion Collisions?*, CERN Heavy Ion Physics Seminar, CERN: Geneva, Switzerland (June, 2012)
18. *High- $p_T$  Probes of Heavy Ion Collisions?*, EMMI at GSI Seminar, Gesellschaft für Schwerionenforschung mbH (GSI): Darmstadt, Germany (June, 2012)
19. *Energy Loss Calculations, RHIC, and First Results from LHC*, Center for Theoretical Physics Seminar, Massachusetts Institute of Technology: Cambridge, MA, USA (July, 2011)
20. *Energy Loss Calculations, RHIC, and First Results from LHC*, Nuclear Theory Seminar, The Ohio State University: Columbus, OH, USA (July, 2011)
21. *Gluon Tomography with EVMP*, EIC Task Force Meeting: Upton, New York (June, 2011)
22. *Phenomenology of the Quark-Gluon Plasma*, The UCT Astrophysics, Cosmology and Gravity Centre (ACGC) Seminar: Cape Town, South Africa (April, 2011)
23. *Phenomenology of the Quark-Gluon Plasma*, Wits Theory Seminar, University of the Witwatersrand: Johannesburg, South Africa (March, 2011)
24. *RHIC in the Age of the LHC*, Nuclear Physics Seminar, Brookhaven National Laboratory: Upton, NY (August, 2010)
25. *Heavy Ion Physics at RHIC and LHC*, Nuclear Physics Seminar, The University of Tennessee: Knoxville, TN (July, 2010)
26. *Uncertainties and Consistency (?) in pQCD and AdS/CFT Jet Physics*, Special Seminar, Columbia University: New York, NY (March, 2010)
27. *Successes, Failures, and Uncertainties in Jet Physics in Heavy Ion Collisions*, WSU Nuclear Physics Seminar, Wayne State University: Detroit, MI (March, 2010)
28. *Successes, Failures, and Uncertainties in Jet Physics in Heavy Ion Collisions*, ISU Nuclear Physics Seminar, Iowa State University: Ames, IA (February, 2010)

29. *Jet Energy Loss with pQCD and AdS/CFT in Heavy Ion Collisions*, HIP Seminar, The Helsinki Institute of Physics: Helsinki, Finland (February, 2010)
30. *Successes, Failures, and Uncertainties in Jet Physics in Heavy Ion Collisions*, Theory Seminar, The University of Jyväskylä: Jyväskylä, Finland (February, 2010)
31. *Heavy Ion Collisions with pQCD and AdS/CFT*, Nuclear Theory Seminar, The Lawrence Berkeley National Laboratory: Berkeley, CA (January, 2010)
32. *The Success of AdS in Heavy Ion Collisions*, Special Seminar, Stony Brook University: Stony Brook, NY (December, 2009)
33. *Heavy Ion Collisions with pQCD and AdS/CFT*, UW Particle Theory Seminar, the University of Washington: Seattle, WA (November, 2009)
34. *String Theory Meets Field Theory in Heavy Ion Collisions*, OSU Nuclear Seminar, The Ohio State University: Columbus, OH (October, 2009)
35. *pQCD and AdS/CFT in Heavy Ion Collisions*, Institute of Nuclear & Particle Physics, Ohio University: Athens, OH (September, 2009)
36. *pQCD and AdS/CFT in Heavy Ion Collisions*, High Energy Physics Seminar, Purdue University: West Lafayette, IN (September, 2009)
37. *An Introduction to AdS/CFT and Heavy Ion Phenomenology*, The Aspen Center for Physics: Aspen, CO (May, 2009)
38. *Theoretical Thoughts on Energy Loss at RHIC and LHC*, The University of Colorado at Boulder: Boulder, CO (May, 2009)
39. *Testing String Theory with Jets*, Nuclear Theory Seminar, The Ohio State University: Columbus, OH (November, 2008)
40. *Testing AdS/CFT Drag and pQCD Heavy Quark Energy Loss*, Nuclear Theory Seminar, McGill University: Montréal, Canada (October, 2008)
41. *Falsifying AdS/CFT Drag or pQCD Heavy Quark Energy Loss with A+A at RHIC and LHC*, Nuclear Seminar, The Ohio State University: Columbus, OH (January, 2008)
42. *Falsifying AdS/CFT Drag or pQCD Heavy Quark Energy Loss with A+A at RHIC and LHC*, Nuclear Theory Group Seminar, Texas A&M University: College Station, TX (November, 2007)
43. *pQCD vs. AdS/CFT Tested by Heavy Quark Energy Loss*, Nuclear Physics & RIKEN Theory Seminar, Brookhaven National Laboratory: Upton, NY (August, 2007)

44. *Identified Charm and Bottom Jets to Test pQCD vs. AdS/CFT Energy Loss*, Los Alamos P-25 Seminar, Los Alamos National Laboratory: Los Alamos, NM (August, 2007)
45. *Possible String Theoretic Deviations from pQCD in Heavy Quark Energy Loss at LHC*, Seminar at the *CERN Heavy Ion Forum*, CERN: Geneva, Switzerland (May, 2007)
46. *Surface or Volume Emission at RHIC: Is Jet Tomography Possible?*, Sonderkolloquium [Special Seminar], Johann Wolfgang Goethe Universität: Frankfurt am Main, Germany (September, 2006)

### Plenaries/Overviews:

1. *Non-Specialist Talk: Theoretical Heavy Ion Physics*, at the *61st Annual Conference of the South African Institute of Physics*, University of Cape Town: Cape Town, South Africa (July, 2016)
2. *A theoretical overview on heavy quarks in a hot and dense medium*, at the *2nd Heavy Flavour Meet*, Saha Institute of Nuclear Physics: Kolkata, India (February, 2016)
3. *Heavy quark production and energy loss*, at *The XXIII International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (Quark Matter 2012)*, Omni Shoreham Hotel: Washington, D.C. (August, 2012)
4. *Systematic Theoretical Uncertainties in Jet Quenching Due to Gluon Kinematics*, at the *Joint TECHQM/CATHIE Workshop*, Brookhaven National Laboratory: Upton, NY (December, 2009)

### Invited Conference Talks:

1. *pQCD Energy Loss in Small Systems and Correlations in AdS Heavy Flavor Energy Loss*, at the *2nd Heavy Flavour Meet*, Saha Institute of Nuclear Physics: Kolkata, India (February, 2016)
2. *The Surprising Fluctuations in Tomo/Holo-graphy*, Looking Beyond  $10^{10}$  Mini-Bangs, CGCs, Perfect Fluids, and Jet Tomo/Holo-graphy Workshop: Wuhan, China (September, 2015)
3. *Prospects for Energy Loss in Highly Nonconformal Matter at NICA*, SA-NICA Roundtable: Dubna, Russia (July, 2015)

4. *Weak and Strong Coupling Heavy Quark Energy Loss*, Heavy Quark Physics in Heavy-Ion collisions: experiments, phenomenology and theory: Trento, Italy (March, 2015)
5. *Light and Heavy Quark Jet Quenching in Quark-Gluon Plasma using AdS/CFT*, CERN-CKC TH Institute on Numerical Holography: Geneva, Switzerland (December 2014)
6. *Energy Loss in pQCD and AdS/CFT*, the Sapore Gravis Heavy flavour and quarkonium production in high-energy heavy-ion collisions workshop: Padua, Italy (December 2014)
7. *NLO Heavy Quark Energy Loss in Strongly-Coupled Quark-Gluon Plasmas*, 3rd Biennial International Workshop on Discovery Physics at the LHC (Kruger2014) at the Protea Hotel Kruger Gate: Hazyview, South Africa (December, 2014)
8. *Corrections and Uncertainties in Energy Loss Model Predictions*, 9th International Workshop on High-pT Physics at LHC at LPSC Grenoble, France (September, 2013)
9. *Do We Understand Energy Loss? The Critical Mass Dependence Test*, International MUON Workshop 2012: iThemba LABS, South Africa (May, 2012)
10. *Calculation of Energy Loss in AA Collisions*, High- $p_T$  Probes of High Density QCD at LHC 2011 (HPHD2011) at École Polytechnique: Palaiseau, France (May, 2011)
11. *Phenomenology of the Quark-Gluon Plasma*, National Institute of Theoretical Physics (NITheP) Associates Meeting: Stellenbosch, South Africa (April, 2011)
12. *Testing Energy Loss and the Pion Puzzle (?) at LHC*, 6th International Workshop on High-pT Physics at LHC 2011: Utrecht, Netherlands (April, 2011)
13. *The EIC, Heavy Quarks, and QGP Phenomenology*, Gluons and the quark sea at high energies at the Institute for Nuclear Theory: Seattle, WA (October, 2010)
14. *Heavy Ion Physics and Electron Ion Colliders*, Electron-Ion Collider Collaboration Meeting at the Catholic University of America: Washington, DC (July, 2010)
15. *Energy Loss Mechanisms and Jet Physics*, PHENIX Collaboration Meeting at Iowa State University: Ames, IA (July, 2010)
16. *RHIC Challenges and LHC Outlook*, Quantifying the Properties of Hot QCD Matter at the Institute for Nuclear Theory: Seattle, WA (June, 2010)
17. *Theory Comparisons*, JET Collaboration Meeting, Lawrence Berkeley National Laboratory: Berkeley, CA (June, 2010)

18. *Theory Update on Energy Loss*, RHIC & AGS Annual Users' Meeting 2010, Brookhaven National Laboratory: Upton, NY (June, 2010)
19. *Energy Loss in the Hot QCD Brick I*, Talk at the *Joint TECHQM/CATHIE Workshop*, Brookhaven National Laboratory: Upton, NY (December, 2009)
20. *WHDG Brick and Comparing WHDG to ASW-SH*, Talk at the *Third TEC-HQM Collaboration Meeting*, CERN: Geneva, Switzerland (July, 2009)
21. *Understanding Energy Loss of Heavy Quarks*, Talk at the 2009 RHIC & AGS Annual Users' Meeting, Brookhaven National Laboratory: Upton, NY (June, 2009)
22. *Testing AdS/CFT at LHC*, Talk at the *4<sup>th</sup> International Workshop on High- $p_T$  Physics at LHC*, The Emauzy Abbey: Prague, Czech Republic (February, 2009)
23. *Shock Treatment: Heavy Quark Drag in Novel AdS Geometries*, Talk at the *Heavy Quark Physics in Nucleus-Nucleus Collisions* workshop, UCLA: Los Angeles, CA (January, 2009)
24. *WHDG @ TECHQM*, Talk at the *Second Workshop of the Theory-Experiment Collaboration for Hot QCD Matter*, Lawrence Berkeley National Laboratory: Berkeley, CA (December, 2008)
25. *Falsifying AdS/CFT Drag or pQCD Heavy Quark Energy Loss with A+A at RHIC and LHC*, Talk at the *Heavy Quark Workshop*, Lawrence Berkeley National Laboratory: Berkeley, CA (November, 2007)
26. *Probing AdS/CFT with Heavy Quarks*, Talk at *AdS Strings Intersect with Nuclear Beams at Columbia*, Columbia University: New York, NY (October, 2007)
27. *Jet Quenching at RHIC and the LHC*, Seminar for the *High- $p_T$  Arbeitsgruppe [Working Group]*, Johann Wolfgang Goethe Universität: Frankfurt am Main, Germany (November, 2006)
28. *Heavy Quark Energy Loss*, Talk at the *2006 RHIC & AGS Annual Users' Meeting*, Brookhaven National Laboratory: Upton, NY (June, 2006)

### Conference Oral Presentations:

1. *Time Dependent  $\hat{q}$  from AdS/CFT*, Talk at *Hard Probes 2016*, East Lake Conference Center: Wuhan, China (September, 2016)
2. *Fluctuations in Strong-Coupling Heavy Quark Energy Loss*, Talk at *Strange Quark Matter 2015*, Joint Institute for Nuclear Research (JINR): Dubna, Russia (July, 2015)

3. *AdS/CFT heavy-quark energy loss beyond the leading order*, Talk at the 24<sup>th</sup> *International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (Quark Matter 2014)*, Darmstadtium: Darmstadt, Germany (May, 2014)
4. *EVMP: Nucleons vs. Nuclei An Update*, Talk at the *4th International Workshop on the Physics Opportunities at an ElecTron-Ion Collider (POETIC IV)*, University of Jyväskylä: Jyväskylä, Finland (September, 2013)
5. *Heavy Quark Energy Loss and Bulk Physics*, Talk at the *14th International Conference on Strangeness in Quark Matter (Strange Quark Matter 2013)*, University of Birmingham: Birmingham, UK (July, 2013)
6. *Is it Hard Yet? The Qualitative Agreement of pQCD Energy Loss with RHIC and LHC Data*, Talk at the *International Workshop on Discovery Physics at the LHC (Kruger2012)*, Protea Kruger Gate: Hazyview, South Africa (December, 2012)
7. *Studying Hot Many Body QCD*, Talk at the *57<sup>th</sup> Annual Conference of the South African Institute of Physics*: Pretoria, South Africa (July, 2012)
8. *Weakness or Strength in the Golden Years of RHIC and LHC?*, Talk at the *5<sup>th</sup> International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions (Hard Probes 2012)*: Cagliari, Italy (May, 2012)
9. *EVMP: Nucleons vs. Nuclei, An Update*, Talk at the *Exploring QCD Frontiers: from RHIC and LHC to EIC Workshop*, Stellenbosch Institute for Advanced Studies (STIAS): Stellenbosch, Western Cape, South Africa (February, 2012)
10. *Testing pQCD and AdS/CFT Energy Loss at RHIC and LHC*, Talk at the *19th Particles & Nuclei International Conference (PANIC2011)*, Massachusetts Institute of Technology: Cambridge, MA, USA (July, 2011)
11. *Quenching and Tomography from RHIC to LHC*, Talk at the *22<sup>nd</sup> International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (Quark Matter 2011)* at L'imperial Palace: Annecy, France (May, 2011)
12. *Qualitative and quantitative jet physics?*, Talk at *Kruger2010 – Workshop on Discovery Physics at the LHC*, Protea Hotel Kruger Gate: Hazyview, South Africa (December, 2010)
13. *Qualitative and quantitative jet physics?*, Talk at the *4<sup>th</sup> International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions (Hard Probes 2010)* meeting, Dan Eilat Hotel: Eilat, Israel (October, 2010)
14. *Qualitative Successes of AdS/CFT at RHIC*, Talk at the *GLS/SPOCK* meeting, The University of Cincinnati: Cincinnati, OH (March, 2010)



15. *Quantitative pQCD and Qualitative AdS/CFT in Jet Physics*, Talk at the *XXII Midwest Theory Get-Together*, Argonne National Laboratory: Dupage, IL (October, 2009)
16. *Shock Treatment: Heavy Quark Energy Loss in a Novel Geometry*, Talk at the *21<sup>st</sup> International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (Quark Matter 2009)*, Knoxville Convention Center: Knoxville, TN (March, 2009)
17. *Zeroth Order Heavy Quark Photon/Gluon Bremsstrahlung*, Talk at *Yale-Columbia Fest*, Yale University: New Haven, CT (May, 2008)
18. *Heavy Quark Photon Bremsstrahlung*, Talk at the *24<sup>th</sup> Winter Workshop on Nuclear Dynamics*, South Padre Island Sheraton: South Padre Island, TX (April, 2008)
19. *Falsifying AdS/CFT Drag or pQCD Heavy Quark Energy Loss with A+A at RHIC and LHC*, Talk at the *20<sup>th</sup> International Conference on Ultra-Relativistic Nucleus-Nucleus Collisions (Quark Matter 2008)*, B. M. Birla Auditorium and Convention Center: Jaipur, India (February, 2008)
20. *pQCD vs. AdS/CFT Tested by Heavy Quark Energy Loss*, Talk at the *12<sup>th</sup> International Conference on Strangeness in Quark Matter (Strange Quark Matter 2007)*, Congress Hall: Levoča, Slovakia (June, 2007)
21. *Possible String Theoretic Deviations from pQCD in Heavy Quark Energy Loss at LHC*, Talk during the Focus Week of the *Heavy Ion Collisions at the LHC Last Call for Predictions* workshop, CERN: Geneva, Switzerland (June, 2007)
22. *The LHC to Test pQCD vs. AdS/CFT Heavy Quark Energy Loss*, Talk at the *44<sup>th</sup> RNM Workshop*, Gesellschaft für Schwerionenforschung mbH (GSI): Darmstadt, Germany (April, 2007)
23. *Heavy LHC Predictions: A Charming Disambiguation of Energy Loss*, Talk at the *Helmholtz Meeting*, Johann Wolfgang Goethe Universität: Frankfurt am Main, Germany (March, 2007)
24. *pQCD vs. String Theory: LHC Heavy Flavors to Decide*, Talk at *Yale-Columbia Fest 2007*, Yale University: New Haven, CT (January, 2007)
25. *Overcoming Fragility*, Talk at the *2<sup>nd</sup> International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions (Hard Probes 2006)*, Asilomar Conference Grounds: Pacific Grove, CA (June, 2006)
26. *The Role of Dynamic Geometry in Jet Tomography*, Talk at the *Heavy Flavor Productions Workshop*, Brookhaven National Laboratory: Upton, NY (December, 2005)

27. *The Importance of Both  $v_2$  and  $R_{AA}$* , Talk at *Yale-Columbia Fest 2005*, Yale University: New Haven, CT (June, 2005)

### Conference Posters:

1. *Heavy Quark Jet Quenching to Test pQCD vs. AdS/CFT*, at *Early Time Dynamics in Heavy Ion Collisions*, McGill University: Montréal, Canada (July, 2007)
2. *LHC Predictions from an extended theory with Elastic, Inelastic, and Path Length Fluctuating Jet Energy Loss*, at *Quark Matter 2006*, Shanghai Science Hall: Shanghai, China (December, 2006)
3. *A Promising Solution to the Elliptic Quench Puzzle at RHIC*, at *Quark Matter 2005*, Eötvös University: Budapest, Hungary (August, 2005)

### Outreach Talks:

1. *The Physics of a Microsecond After the Big Bang*, at *The Molecular and Cell Biology Research Day*, University of Cape Town: Cape Town, South Africa (September, 2016)
2. *High-Energy Nuclear Physics*, at the *Programme for the Enhancement of Research Capacity (PERC)*, University of Cape Town: Cape Town, South Africa (October, 2014)
3. *Non-Newtonian Fluids and the Viscosity of the Early Universe*, at *Phenomenal Physics*, University of Cape Town: Cape Town, South Africa (October, 2014)
4. *Non-Newtonian Fluids and the Viscosity of the Early Universe*, at *Phenomenal Physics*, University of Cape Town: Cape Town, South Africa (October, 2013)

**Teaching Experience:**

- University of Cape Town
  - Convenor
    - Physics A for Engineers (Knight) [PHY1012S] F2015-
    - Science Electromagnetism (Knight) [PHY1032F] F2013-F2014
  - Lecturer
    - Honours Quantum Mechanics (Sakurai) [PHY4000W] F2011-F2015
    - Honours Relativistic Quantum Mechanics (Peskin) [PHY4000W] S2013-
    - Honours Quantum Field Theory (Peskin) [PHY4000W] S2013-
    - Science Electromagnetism (Knight) [PHY1032F] F2013-
    - Science Mechanics (Knight) [PHY1031F] F2012
    - Physics A for Engineers (Knight) [PHY1012F] F2015-
    - Physics A for Engineers (Knight) [PHY1012S] S2011-
    - Lecturer in Charge [PHYLAB1] F2011-; S2012
    - Poisson Lab. Lecturer [PHYLAB3] F2011-
    - Convenor for PHYLAB3 Projects S2011-2012
  - External Examiner
    - M.Sc. Thesis, Nirina Tahiridimbisoa, University of the Witwatersrand 2014
    - Honours Introduction to the Standard Model University of the Witwatersrand S2013-
    - 3<sup>rd</sup> Year Quantum Mechanics and Special Relativity, University of Johannesburg F2013-
    - Honours Quantum Mechanics, University of Johannesburg S2011; F2012

**Student Supervision:**

- Postdoctoral Researchers
  - Razieh Morad 2014-2016
- Ph.D. Students
  - Isobel Kolbé 2016-
  - Andriniaina Rasoanaivo 2015-
  - Sebastian Bodenstein 2011-2014
  - Razieh Morad 2012

- M.Sc. Students

Tanjona Rabemananjara (AIMS)	2016
Abdullah Khalil	2015-
Isobel Kolbé*	2015
Abdullah Khalil (AIMS) <sup>†</sup>	2015
Arnaud Andrianavalomahefa (AIMS)*	2015
Emmanuel Artis (École Normale Supérieure Rennes)	2015
Benjamin Meiring*	2014-2015
Andriniaina Rasoanaivo (AIMS)*	2013
Mawande Lushozi	2012-2014

\*: Distinction; †: Essay distinction

- Honours Students

Robert Hambrock	2016
Lance Oom	2016
Daniel Adamiak	2015
Robert Moerman	2015
Mawande Lushozi	2011
Jason Myers	2011

- 3<sup>rd</sup> Year Projects

Nadiah Barnard, Lauren Denny, Victor Gueorguiev, Shaguftah Naimi	2016
Robert Hambrock, Nicole Moodley	2015
Daniel Adamiak, Jeremy Bingham, Ruach Slayen	2014
Greg Jackson	2013
Kerry Paterson, Emma Platts, Daniel Stanley	2012
Bongani (Amos) Baloyi, James Klatzow	2011

- National Institute for Theoretical Physics (NITheP) Interns

Lance Oom	2015
Isobel Kolbé	2014

**University Service:**

## • Faculty

Selection Committee for Two Positions in the Department of Physics	2016
Faculty of Science Research Committee	2016-

## • Department

Undergraduate Student Liaison	2012-
Founder and Faculty Mentor, UCT Society of Physics Students	2011-
Chair of the UCT Physics Curriculum Task Force	2011-2013
UCT Physics Schools Outreach Committee	2011-2012

## • Other

Judge, Denman Research Forum, Ohio State University	2009
Graduate Admissions Committee, Columbia University	2007-2008