

# Curriculum Vitae

**Hovhannes R. Grigoryan**

Theory Group, Physics Division  
Argonne National Laboratory  
9700 South Cass Avenue, Argonne, IL 60439  
Phone: (630) 252-6223  
E-mail: grigoryan@anl.gov

---

## RESEARCH INTERESTS

My research interests mainly lie in Particle and Nuclear Physics. My immediate interests include applying Quantum Field Theory and String Theory methods to study Hadronic Physics and some nonperturbative aspects of QCD at zero and finite temperatures. Also, I am interested in Physics Beyond the Standard Model emerging from the setups involving Extra Dimensions. Finally, I am interested in applications of gauge/gravity duality to study theoretical aspects of Condensed Matter Physics.

---

## EDUCATION

**Department of Physics, Louisiana State University, Baton Rouge, LA  
& Thomas Jefferson National Accelerator Facility, Newport News, VA**

- **PhD in Physics, August, 2008**

Advisors: Anthony Thomas (Jefferson Lab) and Jerry Draayer (LSU),

Thesis: *Nonperturbative dynamics of strong interactions from gauge/gravity duality.*

**Department of Physics, Yerevan State University, Yerevan, Armenia**

- **M.Sc. in Theoretical Physics, 2003**

Advisor: Aram Saharian,

Thesis: *Analysis and Review of Neutrino Oscillations.*

- **B.Sc. in Physics and Mathematics, with honors, 2001**

Advisor: Rouben Manvelyan,

Thesis: *Domain Walls of Calibrating Supergravity, M-branes.*

---

## PROFESSIONAL EXPERIENCE

2008–                      Director's Postdoctoral Fellow  
                                 Argonne National Laboratory  
                                 9700 Cass Ave., Argonne, IL 60439

- 2008– Long term visitor at Enrico Fermi Institute, University of Chicago  
5640 S. Ellis Ave., Chicago, IL 60637  
*Collaborating with Professors Jeffrey Harvey and David Kutasov.*
- 2008– Long term visitor at Department of Physics, University of Illinois  
845 West Taylor Street, Chicago, IL 60607  
*Collaborating with Professor Mikhail Stephanov.*
- 2008 Short term visitor at Institute for Nuclear Theory  
University of Washington, Seattle, WA  
*Working on AdS/QCD description of baryons.*
- 2006–2008 Graduate Research Assistant at Jefferson Laboratory  
*Working in collaboration with Anatoly Radyushkin.*  
*Topic: Holographic dual model of QCD and its applications to non-perturbative QCD problems.*
- 2003–2005 SURA Graduate Research Fellow at Jefferson Laboratory  
*Working in collaboration with Anthony Thomas.*  
*Topic: Chiral extrapolations of hadronic observables from lattice QCD.*
- 2003–2006 Research Assistant (aspirant) at Joint Institute of Nuclear Research  
Laboratory of Theoretical Physics, Dubna, Russia  
*Affiliated with Prof. Sergey I. Vinitzky.*  
*Topic: Berry's phase and its relation with neutrino oscillations.*
- 2000–2001 Junior Scientist at Yerevan Physics Institute, Yerevan, Armenia.  
*Mentors: Professors Rouben Manvelyan and Ruben Mkrtchyan.*  
*Topic: String theory, Domain Walls, Supergravity and M-branes.*
- 1999–2000 Junior Scientist at Institute of Physical Research, Armenia.  
*Mentor: Professor Michael Ter-Michaelyan.*  
*Topic: Two level atom in external electromagnetic field.*

---

#### AWARDS AND ACHIEVEMENTS

- 2008 Director's Postdoctoral Fellowship at Argonne National Laboratory.
- 2004 Scholarship from Armenian Professional Society (APS)  
for high academic achievements.
- 2003–2005 Fellowship Award from Southeastern Universities Research Association  
(SURA) to conduct an independent research at Jefferson Laboratory.
- 2002–2004 Graduate School Scholarship Award, for academic excellence.

---

**ORGANIZED CONFERENCES**

- *Dynamics of Symmetry Breaking*, April 13–17,  
Argonne National Laboratory, IL, 2009.  
A Workshop sponsored by the ANL/UChicago Joint Theory Institute.
- 

**PUBLICATIONS**

1. S.K. Domokos, H.R. Grigoryan and J.A. Harvey,  
*Photoproduction through Chern-Simons Term Induced Interactions  
in Holographic QCD*,  
submitted to Phys. Rev. D, [arXiv:0905.1949[hep-ph]]
2. H.R. Grigoryan, T.-S.H. Lee and Ho-Ung Yee,  
*Electromagnetic Nucleon-to-Delta Transition in Holographic QCD*,  
Phys. Rev. D **80**, 055006 (2009) , [arXiv:0904.3710[hep-ph]]
3. H.R. Grigoryan and A.V. Radyushkin,  
*Pion in the Holographic Model with 5D Yang-Mills Fields*,  
Phys. Rev. D **78**, 115008 (2008), [arXiv:0808.1243[hep-ph]].
4. H.R. Grigoryan and A.V. Radyushkin,  
*Anomalous Form Factor of the Neutral Pion in Extended AdS/QCD Model  
with Chern-Simons Term*,  
Phys. Rev. D **77**, 115024 (2008), [arXiv:0803.1143 [hep-ph]].
5. H.R. Grigoryan,  
*Dimension Six Corrections to the Vector Sector of AdS/QCD Model*,  
Phys. Lett. B **662**, 158 (2008), [arXiv:0709.0939 [hep-ph]].
6. H.R. Grigoryan, A.V. Radyushkin,  
*Pion Form Factor in Chiral Limit of Hard-Wall AdS/QCD Model*,  
Phys. Rev. D **76**, 115007 (2007), [arXiv:0709.0500 [hep-ph]].
7. H.R. Grigoryan, A.V. Radyushkin,  
*Structure of Vector Mesons in Holographic Model with Linear Confinement*,  
Phys. Rev. D **76**, 095007 (2007), [arXiv:0706.1543 [hep-ph]].
8. H.R. Grigoryan, A.V. Radyushkin,  
*Form Factors and Wave Functions of Vector Mesons in Holographic QCD*,  
Phys. Lett. B **650**, 421 (2007), hep-ph/0703069.

9. H.R. Grigoryan, A.W. Thomas,  
*Vector Meson Mass Corrections at  $O(a^2)$  in PQChPT with Wilson and Ginsparg-Wilson quarks,*  
 Phys. Lett. B **632**, 657 (2006), hep-lat/0507028.
10. H.R. Grigoryan, A.W. Thomas,  
*PQChPT with Staggered Sea and Valence Ginsparg-Wilson Quarks: Vector Meson Masses,*  
 J. Phys. G **31**, 1527 (2005), hep-lat/0511022.

---

## PATENTS

1. H.R. Grigoryan, R. Sargsyan, S. Ter-Grigoryan, J. Draayer,  
*US Patent Systems and Methods for Investigations of Living Systems.*  
 US Patent Application 2006-0044564, filed September 1, 2005.  
 Published as US 2007/0149866 on March 2, 2006.
2. H.R. Grigoryan, R. Sargsyan, S. Ter-Grigoryan, J. Draayer,  
*Extension on US Patent Systems and Methods for Investigations of Living Systems.*  
 US Patent Application 2007-0149866, filed January 22, 2007.  
 Published as US 2007/0149866 on June 28, 2007.

---

## CONFERENCE TALKS AND PRESENTATIONS

### Invited Talks

- Plenary talk on *Hadron Form Factors in AdS/QCD*,  
 APS Topical Group in Hadron Physics (GHP), Denver, CO, April 29, 2009

### Contributed Talks

1. *Nucleon-to-Delta Transition in Holographic QCD*,  
 Joint Theory Institute, Argonne, IL, Apr 16, 2009
2. *Light Meson Form Factors From AdS/QCD*,  
 Midwest Theory Get-Together, ANL, Argonne, IL, Oct. 17, 2008
3. *Baryon as Skyrmion-like Soliton from the Holographic Dual Model of QCD*,  
 Institute for Nuclear Theory program, Seattle, WA, May 6, 2008
4. *Anomalous Form Factor of Pion in AdS/QCD model with Chern-Simons term*,  
 Ecole de Physique des Houches, Les Houches, France, Mar. 28, 2008
5. *Vector Meson Form Factors and Wave Functions from Holographic QCD*,  
 2007 Annual Meeting of the Division of Nuclear Physics,  
 Newport News, VA, Oct. 10-13, 2007

6. *Chiral Extrapolation of Lattice Observables*,  
Lawrence Berkeley National Laboratory, Berkeley, CA, 2005

### Poster Presentations

1. *Holographic Nuclear Form Factors*, Gordon Research Conference,  
Bryant University, Smithfield, RI, July 12-17, 2009
  2. *Vector Meson Mass Corrections at  $O(a^2)$  in PQChPT with Wilson  
and Ginsparg-Wilson quarks*,  
Particles and Nuclei International Conference Santa Fe, NM, 2005
- 

### SEMINARS PRESENTED

1. *Weak Interaction Physics from Holographic Approach*,  
Los Alamos National Laboratory, Los Alamos, NM, Nov. 18, 2009
2. *Studying Strong Interactions Using Five Dimensions*,  
University of Notre Dame, Notre Dame, IN, Sep.28, 2009
3. *Light Hadrons From AdS/QCD*,  
HEP 362, Argonne National Laboratory, Argonne, IL, Nov. 4, 2008
4. *Nonperturbative dynamics of strong interactions from gauge/gravity duality*,  
Louisiana State University, Baton Rouge, LA, Aug. 2, 2008
5. *AdS/QCD model as a tool for solving non-perturbative QCD problems*,  
Los Alamos National Laboratory, Los Alamos, NM, Feb. 12, 2008
6. *Holographic dual model of QCD as an alternative tool for studying  
the strong interactions at low energies*,  
Argonne National Laboratory, Argonne, IL, Feb. 7, 2008
7. *Various Applications of the AdS/QCD Model* (video presentation),  
University of Washington, Seattle, WA, Feb. 4, 2008
8. *Various applications of the AdS/QCD model*,  
The Ohio State University, Columbus, OH, Jan. 31, 2008
9. *Pion Structure from the AdS/QCD Model*,  
College of William and Mary, Williamsburg, VA, Oct.25, 2007
10. *Meson Form Factors and Wave Functions in Holographic QCD*,  
Thomas Jefferson National Laboratory, Newport News, VA, 2006
11. *Review of Kaluza-Klein and Domain Wall Scenarios in Five Dimensions*,  
Thomas Jefferson National Laboratory, Newport News, VA, 2005

---

## CONFERENCES AND WORKSHOPS ATTENDED

1. “From Particles and Partons to Nuclei and Fields,”  
Columbia University, NY, Oct. 23-25, 2009
2. “String Duals of Finite Temperature and Low-Dimensional Systems,”  
Aspen Center for Physics, Aspen, CO, May 24-June 14, 2009
3. “Gordon Research Conference on Nuclear Physics,”  
Bryant University, Smithfield, RI, July 12–17, 2009
4. “QCD Bound States Bound States: Methods & Properties,”  
Argonne National Laboratory, Argonne, IL, June 15–19, 2009
5. “APS Topical Group in Hadron Physics (GHP),”  
Denver, CO, April 29–May 1, 2009
6. “From Strings to Things: String Theory Methods in QCD and Hadron Physics,”  
Institute for Nuclear Theory program, Seattle, WA, May 5–19, 2008
7. Users Group Workshop and Annual Meeting 2008,  
Jefferson Lab, Newport News, VA
8. “(APS) Division of Nuclear Physics Annual Meeting,”  
Newport News, VA, Oct 10–13, 2007
9. Users Group Workshop and Annual Meeting 2007,  
Jefferson Lab, Newport News, VA
10. Topical Workshop on Short-Range Correlations in Nuclei 2006,  
Jefferson Lab, Newport News, VA
11. 3rd International Lattice Field Theory Network Workshop 2005,  
Jefferson Lab, Newport News, VA
12. Particles and Nuclei International Conference 2005,  
Santa Fe, NM

---

## ATTENDED SCHOOLS (SCHOLARSHIPS AWARDED)

1. “Strings and Phenomenology,”  
Prospects in Theoretical Physics (PiTP 2008),  
Institute for Advanced Study, Princeton, NJ, July 14–25, 2008.
2. “Hadronic collisions at the LHC and QCD at high density,”  
Ecole de Physique des Houches, Les Houches, France, Mar. 25–Apr.5, 2008.

3. “Summer School on Particle Physics, Cosmology and Strings 2007,”  
Perimeter Institute, Ontario, Canada.
  4. “The Standard Model and Beyond,”  
Prospects in Theoretical Physics (PiTP 2007),  
Institute for Advanced Study, Princeton, NJ.
  5. “Exploring New Frontiers Using Colliders and Neutrinos,”  
Theoretical Advanced Study Institute (TASI 2006),  
University of Colorado at Boulder, CO.
  6. 18th National Nuclear Physics Summer School 2006,  
Indiana University, Bloomington, IN.
  7. 17th National Nuclear Physics Summer School 2005,  
Lawrence Berkeley National Laboratory, Berkeley, CA.
- 

#### OTHER ACTIVITIES

- Referee for Physical Review D, International Journal of Modern Physics A
- Current organizer of Theory Group Seminar, PHY, Argonne, IL
- Member of American Physical Society (since 2004)