Adith **Ramamurti**

Ph.D. Candidate, Nuclear Theory Group
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Education

Stony Brook University — Stony Brook, NY

Ph.D. Candidate in Theoretical Nuclear Physics (GPA: 3.86/4) — Aug. 2013 - PRESENT

Dissertation topic: Non-perturbative aspects of quantum chromodynamics
Advisor: Edward Shuryak

Brown University — Providence, RI

A.B. in Mathematical Physics and Music (History/Theory), *magna cum laude* (GPA: 3.82/4) — Sep. 2009 - May 2013

Senior/Honors thesis: Quantization of symmetric spaces
Advisor: Antal Jevicki

Research Experience

Graduate Research Assistant — Stony Brook, NY

Nuclear Theory Group, Stony Brook University — Mar. 2014 - PRESENT

Dissertation research on non-perturbative aspects of quantum chromodynamics (QCD), with particular focus on understanding quark confinement and chiral symmetry breaking

- Investigated the relation between the Bose-Einstein condensation (BEC) transition of chromo-magnetic monopoles and the chiral transition of QCD-like gauge theories (arXiv:1801.06922)
- Studied the influence of chromo-magnetic monopoles on the phenomenon of jet quenching in heavy-ion collisions (Published: Phys. Rev. D97 016010)
- Developed an effective quantum model for the magnetic monopole component of quark-gluon plasma using the path-integral Monte Carlo (PIMC) method; studied the BEC, thermodynamics, permutation cycles, and spatial distributions of large systems of Coulomb-interacting bosons (Published: Phys. Rev. D95 076019, Nucl. Phys. A967 868)
  - Developed a fully-parallelized C++ PIMC code for one- and two-component Coulomb Bose gases, based on Markov Chain Monte Carlo and the Metropolis Algorithm, run on the clusters at the National Energy Research Science Computing Center (NERSC) and at the Institute for Advanced Computational Science (IACS) at Stony Brook University (http://www.ramamurti.com/adith/PIMC/, https://github.com/aramamurti/PIMC)
- Used the Improved Holographic QCD model to study - analytically and numerically - hadron spectroscopy; the fields, dynamics, and collectivization of QCD strings; and derive an effective theory for Pomeron and tensor glueball production (Published: Phys. Rev. D92 014011, Phys. Rev. D94 045005)

Reference:
Edward Shuryak, Distinguished Professor, Dept. of Physics and Astronomy, Stony Brook University, Stony Brook, NY 11794-3800
(631) 632-8127, edward.shuryak@stonybrook.edu

Undergraduate Research Assistant — Providence, RI

High Energy Theory Group, Brown University — May 2011 - May 2013

Senior thesis research on higher-spin gravity

- Studied the process for quantizing symmetric spaces, developed from the theory of coherent states; studied examples of this coherent state construction and the properties of the consequent pseudoclassical algebras

Reference:
Antal Jevicki, Professor, Department of Physics, Brown University, 182 Hope Street, Providence, RI 02912
(401) 863-2624, antal_jevicki@brown.edu

Physical Science Aid — Washington, DC

Acoustics Division, U.S. Naval Research Laboratory — Jun. 2007 - Dec. 2009

- Supervised by Dr. David Calvo (2008-2009); Dr. Jason Summers and Dr. Raymond J. Soukup (2007-2008)
- Created and compared various computational algorithms for predicting the near- and far-field scattering off of smooth objects, focusing on the study of the on-surface-radiation-condition
- Created a small-scale rough surface model of the ocean floor using stochastic fractals, and performed various underwater back-scattering experiments to verify theoretical predictions

Reference:
David C. Calvo, Research Scientist, Acoustics Division, Code 7165, Naval Research Laboratory, Washington, DC 20375
(202) 404-4800, david.calvo@nrl.navy.mil

Publications and Preprints

Chiral symmetry breaking and monopoles in gauge theories
Adith Ramamurti, Edward Shuryak — arXiv:1801.06922 [hep-ph] 22 Jan. 2018

Role of QCD monopoles in jet quenching — Physical Review D **97**, 016010
Adith Ramamurti, Edward Shuryak — arXiv:1708.04254 [hep-ph] 19 Jan. 2018

An effective model of QCD monopoles — Nuclear Physics A **967**, 868-871
Adith Ramamurti, Edward Shuryak — arXiv:1704.04467 [hep-ph] 25 Sep. 2017

Effective model of QCD magnetic monopoles from numerical study of one- and two-component Coulomb quantum Bose gases — Physical Review D **95**, 076019
Adith Ramamurti, Edward Shuryak — arXiv:1702.07723 [hep-ph] 24 Apr. 2017

Pomeron interactions from the Einstein-Hilbert action — Physical Review D **94**, 045005
Ioannis Iatrakis, **Adith Ramamurti**, Edward Shuryak — arXiv:1602.05014 [hep-ph] 5 Aug. 2016

Collective string interactions in AdS/QCD and high-multiplicity pA collisions — Physical Review D **92**, 014011
Ioannis Iatrakis, **Adith Ramamurti**, Edward Shuryak — arXiv:1503.04759 [hep-ph] 8 Jul. 2015

Talks, Conferences, and Workshops

JETSCAPE Winter School and Workshop 2018 — Berkeley, CA
The Role of QCD Monopoles in Jet Quenching — 7 Jan. 2018

Stony Brook Nuclear Theory Seminar — Stony Brook, NY
The Role of QCD Monopoles in Jet Quenching — 7 Nov. 2017

XXVIth International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (Quark Matter 2017) — Chicago, IL
An Effective Model of QCD Monopoles — 8 Feb. 2017

Gauge Field Topology Workshop at the Simons Center for Geometry and Physics — Stony Brook, NY
QCD strings and their interactions from the holographic perspective — 21 Aug. 2015

Software Skills

Programming Languages

- Expert: C++, Python, Unix shell (bash, tcsh), Mathematica, parallelization (MPI, openMP), LaTeX
- Intermediate: Fortran, Java, MATLAB

Other Work Experience

Teaching Assistant — Stony Brook, NY
Stony Brook University — Aug. 2014 - Dec. 2015
Courses taught: F2014, F2015: PHY113/115 (Physics of Sports); S2015: PHY112 (Physics of Light, Color, and Vision)

- Taught the laboratory portion and gave recitation/review lectures for classes given by Prof. Chang Kee Jung

Physics in Perspective — Stony Brook, NY
Assistant to the Editor — Sep. 2013 - May 2014

- Assisted Prof. Robert Crease in editing physics content of submitted articles

Honors & Awards

Mildred G. Widgoff Prize for Excellence in Thesis Preparation — May 2013
Brown University Physics Deptartment

Phi Beta Kappa Honor Society — Mar. 2013
Brown University