

Adith Ramamurti

PH.D. CANDIDATE, NUCLEAR THEORY GROUP

DEPT. OF PHYSICS AND ASTRONOMY

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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
 - * 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 (<http://www.ramamurti.com/adith/PIMC/>, <https://github.com/aramamurti/PIMC>)
 - Code 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
- Used the Improved Holographic QCD model to study hadron spectroscopy; the fields, dynamics, and collectivization of QCD strings; and derive an effective theory for tensor particle 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 Hilbert 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 C. Calvo (2008-2009); Dr. Jason E. Summers and 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, for use in 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

Are there monopoles in the quark-gluon plasma?

Adith Ramamurti, Edward Shuryak, Ismail Zahed

arXiv:1802.10509 [hep-ph]

28 Feb. 2018

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

Adith Ramamurti, Edward Shuryak

Physical Review D **97**, 016010

arXiv:1708.04254 [hep-ph]

19 Jan. 2018

An effective model of QCD monopoles

Adith Ramamurti, Edward Shuryak

Nuclear Physics A **967**, 868-871

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

Adith Ramamurti, Edward Shuryak

Physical Review D **95**, 076019

arXiv:1702.07723 [hep-ph]

24 Apr. 2017

Pomeron interactions from the Einstein-Hilbert action

Ioannis Iatrakis, **Adith Ramamurti**, Edward Shuryak

Physical Review D **94**, 045005

arXiv:1602.05014 [hep-ph]

5 Aug. 2016

Collective string interactions in AdS/QCD and high-multiplicity pA collisions

Ioannis Iatrakis, **Adith Ramamurti**, Edward Shuryak

Physical Review D **92**, 014011

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

SKILLS

Programming Languages

- Expert: C++, Python, Unix shell (bash, tcsh), Mathematica, L^AT_EX
- Intermediate: Fortran, Java, MATLAB

Programming Techniques

- Expert: Parallelization (MPI, openMP), Monte Carlo methods
- Intermediate: Machine learning, neural networks

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 Department

Phi Beta Kappa Honor Society

Mar. 2013

Brown University