PAULO BEDAQUE

Physics Department
University of Maryland
College Park, MD 20742-4111
bedaque@umd.edu

Personal Information

Home address: 7225 Central Avenue, Takoma Park, MD 20912

Employment

Assistant Professor, University of Maryland, 2006-present
Senior Scientist: Lawrence-Berkeley Laboratory, 2006
Divisional Fellow: Lawrence-Berkeley Laboratory, 2001-present
Research Assistant Professor: Institute for Nuclear Theory, University of Washington, 1999-2001
Research Associate: Institute for Nuclear Theory, University of Washington, 1996-1999
Post-Doctoral Associate: Massachusetts Institute of Technology, 1994-1996

Education

Ph.D.: University of Rochester, Rochester, 1994, Physics
M.S.: Universidade de Sao Paulo, Brazil, 1989, Physics
B.S.: Universidade de Sao Paulo, Brazil, 1985, Physics

Grants and Fellowships

DoE Research Grant: "", Co-PI
NCSA Teragrid: 500.000 processor hours, 2006
SciDAC: 1.500.000 processor hours at the Fermilab cluster, 2005
LOFAR, University of Groningen: about 60 teraflop weeks of computer time, 2005
SciDAC: 700.000 processor hours at the JLab cluster, 2005
Laboratory Directed Research and Development program (LDRD): "Effective Field Theory for Few-Nucleon Systems", 2003
Laboratory Directed Research and Development program (LDRD): "Effective Field Theory for Few-Nucleon Systems", 2002
Research and Teaching Assistantship, University of Rochester (1989-1994)
Scholarship for Studies Abroad, CAPES, Brazil, 1989-1993
Scholarship for Studies Abroad, CNPq, Brazil, 1989

Conference and Workshop Organization

Co-Organizer of the "2005 National Nuclear Physics Summer School"
Organizer of "Berkeley Summer of Lattice", Berkeley, CA, 2004
Organizer of "Berkeley Effective Summer", Berkeley, CA, 2003
Co-convenor of Few-Body Systems Workgroup of "Chiral Dynamics 2003", Bonn, Germany, 2003
Co-organizer of INT Workshop on Effective Field Theory and Nuclear Physics, Seattle, 1999

Teaching and Mentoring

Advisor: graduate student Michael Buchoff
Instructor: (undergraduate) Quantum Mechanics and Physics of Music.
Co-advisor: undergraduate students Danielle Allor (UMD) and Charler Stebbens (MIT) (summer 2006)
Supervisor: Postdoctoral Fellow Andre Walker-Loud (2006), Postdoctoral Fellow Gautam Rupak (2001-2003) and Visiting Researcher Heron Caldas (2003), Lawrence-Berkeley Laboratory
Advisor: Research Experience for Undergraduates (REU) summer students Michael Kesden (1999) and James McGuire (2000), University of Washington
Instructor: Quantum Field Theory, University of Washington, 2000
Teaching Assistant: lower division courses, University of Rochester, 1990-1994

Invited Talks

After 2000
Invited talk at the "2007 Nuclear Physics Gordon Conference", "New strategies for the study of nuclear forces", July 2007
Seminar at George Washington University, Washington D.C., "Hadron Interactions from Lattice QCD, February 2007
Invited talk at the "APS Topical Group on Hadronic Physics Meeting", Nashville, "Nuclear Physics with Lattice QCD", November 2006
Invited talk at "Chiral Dynamics: Theory and Experiment", "$\pi\pi$ Scattering from Mixed Action Lattice QCD", Durham, September 2006
Invited talk at the "Few-Body Conference", Brazil, "Nuclear Forces and Lattice QCD", July 2006
Invited talk at the "Workshop on New Developments in Quantum Gases", August 2005
Lecturer: RIA Summer School on Exotic Beam Physics (2005)
Invited talk at the APS Spring Meeting 2005, "Nuclear Lattice QCD", Tampa April 2005
Invited talk at the University of Maryland, "Nuclear Forces and QCD", February 2005

Invited talk at the “Physics of Nuclei with the 12 GeV upgrade Worshop”, JLab, November 2004
Invited talk at the MIT, “Nuclear Forces from Lattice QCD”, October 2004
Invited talk at the University of Maryland, “Bohm-Aharonov Effect and Nuclear Forces on the Lattice”, October 2004
Invited talk at the Institute for Nuclear Theory, “Angulon Cooling of Neutron Stars”, Seattle, April 2004
Plenary talk at “Chiral Dynamics 2003”, Bonn, Germany, September 2003
Invited talk at Caltech, “Effective Theory and Three-body Systems”, March 2003
Invited talk at the Institute for Nuclear Theory, “Model Independency in Three-Nucleon Systems, December 2003
Invited talk at “The 17th International IUPAP Conference on Few-Body Problems in Physics”, “Three-Body Scattering”, Durham, June 2003
Invited talk at Ohio State University, “What is the Ground State of Quark Matter ?”, December 2002
Invited talk at Ohio State University, “Effective Field Theory and the Running of the Three Body Force”, November 2002
Invited talk at the Los Alamos National Laboratory, “Color Superconductivity”, November 2002
Invited talk at the APS Spring Meeting 2003, Philadelphia, “Nuclear Effective Field Theory”,
Invited Talk at the ETSIM Workshop, “Kaon Condensation in Quark Matter”, Manchester, UK 2003
Invited talk at the Institute for Nuclear Theory, Seattle, “3-Body Physics in Effective Field Theory”, August 2000
Colloquium at McGill University, Montreal, Canada, “Effective Theories for Dense QCD”, June 2000
Invited talk at the APS Spring Meeting 2000, “Three-Body Physics and Effective Field Theory”, Long Beach, April 2000

Selected talks before 2000
Nuclear Interactions: Modern Developments, ECT*, Trento, Italy, 1999
Caltech-INT Workshop on Nuclear Physics with Effective Theories, Caltech, 1999
Worshop on Disoriented Chiral Condensates, ECT*, Trento, Italy, 1996
Worshop on New Physics and New Facilities, Case Western Reserve, University, 1994
Over 40 invited seminars on US and abroad

Book

“Nuclear Physics with Effective Theories”, P. Bedaque, M. Savage, U. van Kolck and R. Seki (editors), World Scientific, 2000

Professional Associations

Member of the American Physical Society

Publication List

Effective Field Theory for the Anisotropic Wilson Lattice Action, Paulo F. Bedaque, Michael I. Buchoff and Andre Walker-Loud, *arXiv:0708.2254*[hep-lat]

Restless pions: orbifold boundary conditions and noise suppression in lattice QCD, Paulo F. Bedaque and Andre Walker-Loud, *arXiv:0708.0207* [hep-lat]

Fitting two nucleons inside a box: Exponentially suppressed corrections to the Luscher's form, I. Sato and Paulo F. Bedaque, *hep-lat/0702021.*

Hyperon-Nucleon Scattering from Fully-Dynamical Lattice QCD, by Silas R. Beane, Paulo F. Bedaque, Thomas C. Luu, Kostas Orginos, Elisabetta Pallante, Assumpta Parreno, Martin J. Savage, *hep-lat/0612026*

A New class of quantum bound states: Diprotons in extreme magnetic fields, by Danielle Allor, Paulo Bedaque, Thomas D. Cohen, Charles T. Sebens, *Phys. Rev. C75:034001, 2007.*

π K scattering in full QCD with domain-wall valence quarks, by Silas R. Beane, Paulo F. Bedaque, Thomas C. Luu, Kostas Orginos, Elisabetta Pallante , Assumpta Parreno, Martin J. Savage, *Phys.Rev.D74:114503,2006.*

f(K)/f(π) in Full QCD with Domain Wall Valence Quarks., by S.R. Beane, P.F. Bedaque , K. Orginos , M.J. Savage, *hep-lat/0606023, Phys.Rev.D75:094501,2007.*

Superfluid phases of the three-species fermion gas, by Paulo F. Bedaque, Jose P. D'Incao, *cond-mat/0602525*

Nucleon-nucleon scattering from fully-dynamical lattice QCD, by S.R. Beane, P.F. Bedaque , K. Orginos, M.J. Savage, *hep-lat/0602010, Phys.Rev.Lett.97:012001,2006.*

Finite volume corrections to pi-pi scattering, by Paulo F. Bedaque, Ikuro Sato, Andre Walker-Loud, *hep-lat/0601033, Phys.Rev.D73:074501,2006.*

I = 2 pi-pi scattering from fully-dynamical mixed-action lattice QCD, by NPLQCD Collaboration (Silas R. Beane *et al.), hep-lat/0506013, Phys.Rev.D73:054503,2006.*

Twisted valence quarks and hadron interactions on the lattice, by Paulo F. Bedaque , Jiunn-Wei Chen**,** *hep-lat/0412023, Phys.Lett.B616:208-214,2005.*

A Nucleon in a tiny box, by Paulo F. Bedaque , Harald W. Griesshammer , Gautam Rupak, *hep-lat/0407009, Phys.Rev.D71:054015,2005.*

Aharonov-Bohm effect and nucleon nucleon phase shifts on the lattice, by Paulo F. Bedaque, *nucl-th/0402051, Phys.Lett.B593:82-88,2004.*

Two Nucleons on a Lattice, by S. Beane, P. F. Bedaque, M. Savage and A. Parreno, *hep-lat/0312004, Phys.Lett.B585:106-114,2004.*

Exploring Hyperons and Hyper Nuclei with Lattice QCD, by S. Beane, P. F. Bedaque, M. Savage and A. Parreno, *nucl-th/0311027, Nucl.Phys.A747:55-74,2005.*

Phase Separation In Asymmetrical Fermion Superfluids, by Paulo F. Bedaque, Heron Caldas and Gautam Rupak, *cond-mat/0306694, Phys.Rev.Lett.91:247002,2003.*

Goldstone Bosons In The $^3P_2$ Superfluid Phase Of Neutron Matter And Neutrino Emission, by Paulo F. Bedaque, Gautam Rupak and Martin J. Savage, *nucl-th/0305032, Phys.Rev.C68:065802,2003.*

Narrow Resonances In Effective Field Theory, by P.F. Bedaque, H.W. Hammer and U. van Kolck, *nucl-th/0304007, Phys.Lett.B569:159-167,2003.*

Atomic Molecular Condensates With Large Positive Scattering Length, by Aurel Bulgac and Paulo F. Bedaque , *cond-mat/0210217*

Quantum Corrections To Dilute Bose Liquids, by Paulo F. Bedaque, Aurel Bulgac and Gautam Rupak, *Phys.Rev.A68:033606,2003.*

Low-Energy Expansion In The Three-Body System To All Orders And The Triton Channel, by Paulo F. Bedaque, Gautam Rupak, Harald W. Griesshammer and Hans-Werner Hammer, *nucl-th/0207034, Nucl.Phys.A714:589-610, 2003*

Dilute Resonating Gases And The Third Virial Coefficient, by Paulo F. Bedaque and Gautam Rupak , ***cond-mat/0206527,*** *Phys.Rev.B67:174513,2003.*

Effective Field Theory For Few Nucleon Systems, by Paulo F. Bedaque and Ubirajara van Kolck, *nucl-th/0203055, Ann.Rev.Nucl.Part.Sci.52:339-396, 2002*

Charged Kaon Condensation In High Density Quark Matter, by Paulo F. Bedaque, *Phys.Lett.B524:137-143, 2002*

High Density Quark Matter Under Stress, by Paulo F. Bedaque and Thomas Schafer, *Nucl.Phys.A697:802-822, 2002*

Towards A Perturbative Theory Of Nuclear Forces, by S.R. Beane, Paulo F. Bedaque, M.J. Savage and U. van Kolck, *Nucl.Phys.A700:377-402, 2002*

Singular Potentials And Limit Cycles, by S.R. Beane, Paulo F. Bedaque, L. Childress, A. Kryjevski, J. McGuire and U.van Kolck, *Phys.Rev.A64:042103, 2001*

From Hadrons To Nuclei: Crossing The Border, by Silas R. Beane, Paulo F. Bedaque, Wick C., Daniel R. Phillips and Martin J. Savage in the Boris Ioffe Festschrift, ed. by M. Shifman, World Scientific

How To Renormalize The Gap Equation In High Density QCD, by Silas R. Beane and Paulo F. Bedaque, **Phys***.Rev.D62:117502, 2000*

Renormalization Group Improved Gap Equation For Color Superconductors, by Silas R. Beane, Paulo F. Bedaque and Martin J. Savage, *Nucl.Phys.A688:931-938, 2001*

Three Body Recombination In Bose Gases With Large Scattering Length, by Paulo F. Bedaque, E. Braaten and H.W. Hammer, *Phys.Rev.Lett.85:908-911, 2000*

Meson Masses In High Density QCD, by Silas R. Beane, Paulo F. Bedaque and Martin J. Savage, *Phys.Lett.B483:131-138, 2000*

Higher Partial Waves In An Effective Field Theory Approach To Nd Scattering, by Fabrizio Gabbiani, Paulo F. Bedaque and Harald W. Griesshammer, *Nucl.Phys.A675:601-620, 2000*

Color Superconductivity In Asymmetric Matter, by Paulo F. Bedaque, *Nucl.Phys.A697:569-577, 2002*

Parity Violation In Gamma Polarized Compton Scattering, by Paulo F. Bedaque and Martin J. Savage, **Phys***.Rev.C62:018501, 2000*

Quartet S Wave Neutron Deuteron Scattering In Effective Field Theory, by Paulo F. Bedaque and Harald W. Griesshammer, *Nucl.Phys.A671:357-379, 2000*

Effective Theory Of The Triton, by Paulo F. Bedaque, H.W. Hammer and U. van Kolck, *Nucl.Phys.A676:357-370, 2000*

The Three Boson System With Short Range Interactions, by Paulo F. Bedaque, H.W. Hammer and U. van Kolck, *Nucl.Phys.A646:444-466, 1999*

Renormalization Of The Three-Body System With Short Range Interactions, by Paulo F. Bedaque, H.W. Hammer and U. van Kolck, *Phys.Rev.Lett.82:463-467, 1999*

Effective Theory For Neutron Deuteron Scattering: Energy Dependence, by Paulo F. Bedaque, H.W. Hammer and U. van Kolck, *Phys.Rev.C58:641-644, 1998*

Nucleon Deuteron Scattering From An Effective Field Theory, by Paulo F. Bedaque and U. van Kolck, *Phys.Lett.B428:221-226, 1998*

Cutting Rules At Finite Temperature, by Paulo F. Bedaque, Ashok K. Das and Satchidananda Naiak, *Mod.Phys.Lett.A12:2481-2496, 1997*

Chiral Perturbation Theory Analysis Of Baryon Temperature Mass Shifts, by Paulo F. Bedaque, *Phys.Lett.B387:1-8, 1996*

Baryon Masses At Second Order In Large N Chiral Perturbation Theory, by Paulo F. Bedaque and Markus A. Luty, *Phys.Rev.D54:2317-2327, 1996*

Thermalization And Pinch Singularities In Nonequilibrium Quantum Field Theory, by Paulo F. Bedaque, *Phys.Lett.B344:23-28, 1995*

Annihilation Diagrams In Two-Body Nonleptonic Decays Of Charmed Mesons, by Paulo F. Bedaque, A.K. Das and V.S. Mathur, *Phys.Rev.D49:1339-1341, 1994*

Two-Body Nonleptonic Decays Of Charmed Mesons, by Paulo F. Bedaque, A.K. Das and V.S. Mathur, *Phys.Rev.D49:269-274, 1994*

Out-Of-Equilibrium Phase Transitions And A Toy Model For Disoriented Chiral Condensates, by Paulo F. Bedaque and Ashok K. Das, *Mod.Phys.Lett.A8:3151-3164, 1993*

On The Analytic Structure Of The Selfenergy For Massive Gauge Bosons At Finite Temperature, by Peter Arnold, Stamatis, Paulo F. Bedaque and Ashok K. Das, *Phys.Rev.D47:4698-4704, 1993*

Delta Expansion And Selfconsistent Calculation, by Paulo F. Bedaque and Ashok K. Das, *hep-th/9211101*

Two-Dimensional Baryons In The Large N Limit, by Paulo F. Bedaque, I. Horvath and S.G. Rajeev, *Mod.Phys.Lett.A7:3347-3356, 1992*

Feynman Parametrization And The Degenerate Electron Gas, by Paulo F. Bedaque and Ashok K. Das, *Phys.Rev.D47:601-607, 1993*

On The Zero Momentum Limit Of Feynman Amplitudes At Finite Temperature, by Paulo F. Bedaque and Ashok K. Das, *Phys.Rev.D45:2906-2910, 1992*

Generalized Schwinger Model And A Theory Of Interacting Photons And Majorana Fermions, by Paulo F. Bedaque, Ashok K. Das and Wen-Jui Huang,
Phys.Rev.D44:1818-1824, 1991