CURRICULUM VITAE

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231 Maple Drive
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NM 87544

Nationality: USA

EDUCATION:

M.S. in Physics, University of Delhi, Delhi, India
Ph.D. in Theoretical Physics, 1982, California Institute of Technology

PROFESSIONAL DEVELOPMENT:

Scientist 5, T-8/T-2, Los Alamos National Laboratory, 1988–Present
Program Manager for High Energy Physics at LANL, 2000–Present
Research Professor, Electrical and Computer Engineering, Univ. of New Mexico, 2009-12
Group Leader, Elementary Particles and Field Theory (T-8), LANL, 2001–2008
P.I., High Energy Physics Grant KA140102, DOE HEP, 2001–2010
Visiting Lecturer, Caltech, April–June, 1991.
Guest Professor, University of Wuppertal, March–April 1987.
J. Robert Oppenheimer Fellow; Los Alamos National Laboratory: 1985-1988
Honorary Post-doctoral fellow at Harvard University: 1983–1986
Post-doctoral fellow at Northeastern University: 1982–1985

AWARDS:

PI, ALCC Computer Award on Titan at ORNL 2015
Elected Fellow of Los Alamos National Laboratory, 2006
PI, DoE Computer Allocation at NERSC, 2001–2005
Distinguished Performance Award, LANL, 1999
PI, DoE Grand Challenges Computer Allocation (ACL at LANL, NERSC), 1997–2000
PI, DoE Grand Challenges Computer Allocation (ACL at LANL), 1992–1996
Elected Fellow of American Physical Society, 1994
PI, DoE Grand Challenges Computer Allocation (NERSC), 1988–1991
National Science Talent Scholarship, India, 1970–1975

TEACHING EXPERIENCE:

Graduate Course in Physics 229c, CALTECH Spring 1991
Instructor for Undergraduate Physics: Northeastern University 1982–1985
Instructor for Undergraduate Physics: CALTECH 1977–1982
Instructor for Undergraduate Physics: Northwestern University 1975–1977

Funding and Grants Since 2000

[38] PI, INCITE DOE Computer Award at ORNL, "Precision calculations of matrix elements for Novel CP Violation Experiments"
PI: Rajan Gupta
Duration: 2022
Award: 440,000 Node hours on Summit

[37] PI, DOE ERCAP Computer Award at NERSC, "Lattice QCD search for physics beyond the standard model".
PI: Rajan Gupta
Duration: 2021
Award: 170,000,000 processor hours

[36] PI, INCITE DOE Computer Award at ORNL, "Precision calculations of matrix elements for Novel CP Violation Experiments"
PI: Rajan Gupta
Duration: 2021
Award: 500,000 Node hours on Summit

[35] LDRD 20210041DR "Beyond the Standard Model through Precision Neutron Decay"
PI: Steven Clayton, Co-PI Rajan Gupta
Duration: 2021-2023: $4.8 Million
Gupta Share: $120,000 per year.

[34] PI, ALCC Computer Award at ORNL and NERSC, "Nucleon Matrix Elements: Probes of New Physics"
PI: Rajan Gupta
Duration: 2020-2021
Award: 100K node hours on Summit and 56M Service units at NERSC

[33] DOE HEP KA2401032, "QuantISED" Award "Neutrino-nucleus Scattering and Quantum Computing"
PI: Rajan Gupta (LANL)
Duration: 2021-2023: $185,000 per year
Gupta Share: $100,000 per year.

[32] DOE HEP KA2401032, "QuantISED" Award "Quantum Field Theories on Quantum Computers"
PI: Tanmoy Bhattacharya (LANL)
Duration: 2021-2023: $300,000 per year
Gupta Share: $100,000 per year.

[31] PI, DOE ERCAP Computer Award at NERSC, "Lattice QCD search for physics beyond the standard model".
PI: Rajan Gupta
Duration: 2020
Award: 240,000,000 processor hours

[30] DOE HEP KA2401032, "QuantISED" Award "Neutrino-nucleus Scattering and Quantum Computing"
PI: Rajan Gupta (LANL)

Duration: 2019-2020: $185,000 per year
Gupta Share: $100,000 per year.

[29] DOE HEP KA2401032, "QuantISED" Award "Quantum Field Theories on Quantum Computers"
PI: Tanmoy Bhattacharya (LANL)
Duration: 2019-2020: $240,000 per year
Gupta Share: $100,000 per year.

[28] LDRD 20190098-DR "Convincing evidence for sterile neutrinos at Lujan".
PI: Richard van der Water
Duration: 2019-2021: $4.5 Million
Gupta Share: $100,000 per year.

[27] PI, DOE Computer Award at NERSC, "Lattice QCD search for physics beyond the standard model".
PI: Rajan Gupta
Duration: 2019
Award: 252,000,000 processor hours

[26] LDRD 20190041-DR "The Neutron Electric Dipole Moment as a Gateway to New Physics".
PI: Takesasu Ito
Duration: 2019-2021: $5 Million
Gupta Share: $180,000 per year.

[25] PI, DOE Computer Award at NERSC, "High Precision Calculations of the Nucleon Structure for Fundamental Symmetries".
PI: Rajan Gupta
Duration: 2019
Award: 252,000,000 processor hours

[24] LDRD 20180038-DR "Deepening LANLs Neutrino Legacy".
PI: Steve Elliott
Duration: 2018-2020: $4.5 Million
Gupta Share: $170,000 per year.

[23] PI, DOE Computer Award at NERSC, "High Precision Calculations of the Nucleon Structure for Fundamental Symmetries".
PI: Rajan Gupta
Duration: 2018
Award: 42,000,000 processor hours

[22] PI, DOE Computer Award at NERSC, "Probing BSM Physics using lattice QCD".
PI: Rajan Gupta
Duration: 2018
Award: 195,000,000 processor hours

[21] PI, DOE Computer Award at NERSC, "High Precision Calculations of the Nucleon Structure for Fundamental Symmetries".
PI: Rajan Gupta
Duration: 2017
Award: 20,000,000 processor hours

[20] PI, DOE Computer Award at NERSC, "Probing BSM Physics using lattice QCD".
PI: Rajan Gupta
Duration: 2017
Award: 70,000,000 processor hours

[19] ALCC Computer Award "Probing Novel Physics using Nucleon Matrix Elements".
PI: Rajan Gupta
Duration: 2015-2016
Award: 150,000,000 processor hours

[18] DOE KA1401020, "High Energy Physics".
PI: Michael Graesser (LANL)
Duration: 2015-2018: $400,000 per year
Gupta Share: $80,000 per year.

[17] LDRD 20140015-DR "Probing New Sources of Time-Reversal Violation with Neutron EDM".
PI: Vincenzo Ciriglino and Takesasu Ito
Duration: 2014-2016: $5 Million
Gupta Share: $180,000 per year.

[16] LDRD 20140015-DR "Discovery Science of Hydraulic Fracturing".
PI: Hari Vishvanath
Duration: 2014-2016: $5 Million
Gupta Share: $108,000 per year.

[15] LANL Computer Award "Probing Novel Physics using Nucleon Matrix Elements".
PI: Rajan Gupta
Duration: 2014-2016
Award: 20,000,000 processor hours

[14] LDRD 20130019-DR "Illuminating the Origin of the Nucleon Spin".
PI: Ivan Vitev and Andy Klein
Duration: 2013-2016: $5 Million
Gupta Share: $145,000 per year.

[13] DOE KA1401020, "High Energy Physics".
PI: Michael Graesser (LANL)
Duration: 2011-2014: $480,000 per year
Gupta Share: $80,000 per year.

[12] LDRD 20110043-DR "Probing New Interactions with Neutron Beta Decay".
PI: Vincenzo Ciriglino and Mark Makela
Duration: 2010-2013: $5 Million
Gupta Share: $130,000 per year.

[11] LDRD 20100030DR, "Optimization and Control Theory for Smart Grids".
PI: Misha Chertkov (LANL)
Duration: 2010-2013: $5 Million
Gupta Share: $100,000 per year.

[10] DOE Stimulus Funding, "Regional Climate Impacts".
PI: James Bossart (LANL)
Duration: 2010-2012: $5 Million

Gupta Share: \$100,000 per year.

[09] Berkeley Nuclear Research Center "UC Berkeley LANL Collaboration".
PI: Sara Scott (LANL) and Jasmina Vujic (UC Berkeley)
Duration: 2009-2011: \$2 Million
Gupta Share: \$40,000 per year.

[08] DOE KA1401020, "High Energy Physics".
PI: Rajan Gupta (LANL)
Duration: 2008-2011: \$300,000 per year
Gupta Share: \$60,000 per year.

[07] LDRD 20060340ER, "Multigene Correlations and Their Implications for Cardiovascular Disease".
PI: Rajan Gupta (LANL)
Duration: 2006-2009: \$280,000 per year
Gupta Share: \$140,000 per year.

[06] DOE KA1401020, "High Energy Physics".
PI: Rajan Gupta (LANL)
Duration: 2006-2008: \$250,000 per year
Gupta: \$62,500 per year.

[05] LDRD 20060049-DR, "Heavy quarks as a probe of a new state of matter".
PI: Patrick McGaughey
Duration: 2006-2008: \$1.5Million per year
Gupta Share: \$100,000 per year.

[04] DOE KA1401020, "High Energy Physics".
PI: Rajan Gupta (LANL)
Duration: 2000-2006: \$500,000 per year
Gupta Share: \$85,000 per year.

[03] LDRD 2000048ER, "CP Violation in Kaon Decays".
PI: Rajan Gupta (LANL)
Duration: 2000-2003: \$280,000 per year
Gupta Share: \$140,000 per year.

[02] LDRD , "Simulating the Decays of Bottom and Charm Mesons".
PI: Tanmoy Bhattacharya (LANL)
Duration: 1996-1999: per year
Gupta: \$65,000 per year.

[01] DOE KA1401020, "Research in Elementary Particles and Field Theory".
PI: Geoffrey West (LANL)
Duration: 1988-2000: \$425,000 per year
Gupta Share: \$65,000 per year.

Post−docs Mentored in Theoretical Physics at Los Alamos

[1] David Daniel (1990-1993)
Current Position: Staff Scientist, CCS-7, Los Alamos National Laboratory.
[2] Tanmoy Bhattacharya (1992-1995)
Current Position: Staff Scientist, Los Alamos National Laboratory.
[3] Jeffrey Grandy (1992-1994)
Current Position: Staff Scientist, Lawrence Livermore National Laboratory.
[4] Shailesh Chandrasekharan (1997-1998)
Current Position: Associate Professor, Duke University.
[5] Weonjong Lee (1997-2002)
Current Position: Associate Professor, Seoul National University, South Korea.
[6] Anosh Joseph (2011-2013)
Current Position: Scientist at IISER, Mohali, India
[7] Huey-Wen Lin (2010-2016) (She was an INT post-doc)
Current Position: Assistant Professor, Michigan State University.
[8] Saul Cohen (2010-2014) (He was an INT post-doc)
Current Position: NVIDIA.
[9] Boram Yoon (2013-2016)
Current Position: Staff Scientist CCS-7, LANL
[10] Yong-Chull Jang (2016–2017)
Current Position: Post-doctoral Fellow, Columbia University, NY
[11] Sungwoo Park (2018–2021)
Current Position: Post-doctoral Fellow, Jefferson Lab, New Port News, Virginia
[12] Shantanu Mondal (2019–2021)
Current Position: Post-doctoral Fellow, Michigan State University, Michigan

Post−docs Mentored in Computational Physics at Los Alamos

[1] Pablo Tamayo (1992-1994)
Current Position: Professor, School of Medicine, UC San Diego, CA,

Master′s Thesis Students Supervised at the University of New Mexico

[1] Harihar Shankar, ECE Department, UNM (2008-2009)
Current Position: Software Engineer, Los Alamos National Laboratory.
[2] Rathesh Prabhu Rajendran, Computer Science Department, UNM (2008-2009)
Current Position: Software Development Engineer, Microsoft Corporation.
[3] Parthiban Jayabal, ECE Department, UNM (2008-2009)
Current Position: Software Developer, Symplicity Corporation.
[4] Padampriya Palanisamy, ECE Department, UNM (2009-2010)
Current Position: Software Engineer, Google.

Staff Scientists Recruited and Hired at Los Alamos

[1] Tsutomu Shimomura (1985-1989)
Current Position: CEO and CTO of Neofocal Systems.
[2] Paul Ginsparg (1989-2000)
Current Position: Professor, Cornell University.
[3] David Daniel (1990-1993, 2001−Present)
Current Position: Staff Scientist, Computing Division, Los Alamos National Lab.
[4] Tanmoy Bhattacharya (1992−Present)
Current Position: Staff Scientist, T-2, Los Alamos National Laboratory.
[5] Jeffrey Grandy (1994-1996)
Current Position: Staff Scientist, Lawrence Livermore National Laboratory, USA.
[6] Weonjong Lee (1998-2002)
Current Position: Professor, Seoul National University, South Korea.
[7] John Terning (2000-2005)
Current Position: Professor, University of California, Davis.
[8] Yuri Shirman (2003−2009)
Current Position: Professor, University of California, Irving
[9] Alex Friedland (2002−2015)
Current Position: Senior Staff Scientist, SLAC.
[10] Michael Graesser (2007−Present)
Current Position: Staff Scientist, T-2, Los Alamos National Laboratory.
[11] Ryuchiro Kitano (2007-2009)
Current Position: Professor, Tohoku University and KEK, Japan
[12] Boram Yoon (2013-)
Current Position: Staff Scientist, CCS-7, LANL.
[13] Dru Renner (2015–)
Current Position: Staff Scientist, XTD-PRI, LANL.

SERVICE : Conferences/Workshops Organized In HEP

[21] Organizer, 2019 INT Workshop, "Fundamental Symmetries Research with Beta Decay", November 4–November 8, Seattle, 2019.
[20] Director, 2019 Santa Fe Workshop, "Lattice QCD", August 28–September 2, 2019.
[19] Member, International Advisory Committee, LATTICE 2018, Michigan State University, USA, 2018
[18] Director, 2017 Santa Fe Workshop, "Lattice QCD", August 28–September 2, 2017.
[17] Member, International Advisory Committee, LATTICE 2017, Granada, Spain, 2017.
[16] Co-organizer "Hadronic Matrix Elements for Probes of CP Violation", UMass Amherst, Jan. 2015
[15] Co-organizer "Modeling the QCD Equation of State at RHIC" LLNL, Livermore, CA, Feb. 2006.
[14] Local Organizing Committee, LATTICE 2000, Bangalore, India, August, 2000.
[13] Convener, Session on "Quark Masses" at DPF 2000, The Ohio State University, August 2000.
[12] Member, International Advisory Committee, LATTICE 1999, Pisa, Italy, 1999.
[11] Convener "Plenary session on Lattice QCD" at the APS Centennial Meeting, Atlanta, Georgia, March 20-26, 1999.
[10] Organized ROSENFEST, Oct 31-Nov 1, 1998, Santa Fe. Symposium to celebrate the 65th birthday of Peter Rosen.
[9] Director, 1998 Santa Fe Workshop, "Perturbative and Non-perturbative Aspects of the Standard Model", July 27 - August 14, 1998.
[8] Member, Local Organizing Committee, LATTICE 1998, Boulder, Colorado, 1998.
[7] Scientific Director, 1997 Les Houches Summer school on "PROBING THE STANDARD MODEL OF PARTICLE INTERACTIONS", Les Houches, France, 1997.
[6] International Advisory Committee, LATTICE 97, Edinburgh, Scotland, 1997.
[5] Director, 1994 Santa Fe Workshop, "Large Scale Numerical Studies of QCD" July 25 - August 12, 1994
[4] Member, International Advisory Committee, LATTICE 90, Tallahassee, Florida, 1990.
[3] Convener "Session on Lattice QCD and theoretical aspects of QCD:" QUARK MATTER 88, Lennox, Massachusetts (Sept. 1988).
[2] Convener "Session on Lattice Gauge Theory": 1988 DPF conference, Storrs, Connecticut (August 1988).
[1] Organizer, First Workshop on Monte Carlo Renormalization Group Methods, Cornell July 1985.
(with K. G. Wilson).

SERVICE : Conferences/Workshops Organized Outside HEP

[6] Co-organizer, "Energy for the 21^{st} Century", 29^{th} Annual CNLS Conference, Santa Fe, May 18-22, 2009 (http://cnls.lanl.gov/annual29/)

[5] Co-organizer, "Workshop on Volunteered Geographic Information", University of California Santa Barbara, 13-14 December, 2007, (http://ncgia.ucsb.edu/projects/vgi/)

[4] Organizer, "Socio-technical systems: Bridging the scales", 26th annual CNLS conference, 14-17 August 2006. (http://cnls.lanl.gov/External/annual_conference_2006.php)

[3] Director, "CONFRONTING TERRORISM −− CT2005", Los Alamos National Laboratory, January 2005.

[2] Principal organizer, "CONFRONTING TERRORISM −− CT2002", Los Alamos National Laboratory, March 2002. (http://library.lanl.gov/ccw/ct2002/)

[1] Organizer, "SCALING LAWS IN PHYSICS AND BIOLOGY", Symposium in honor of Geoffrey West, Santa Fe, Dec 2000

SERVICE TO LOS ALAMOS NATIONAL LABORATORY

[15] Created the "Harnessing Transformational Technologies Symposia Series" in partnership with the National Academy of Sciences, Engineering and Medicine. First symposia on "COVID-19: Harnessing a Transformational Pandemic", September 15, 2020. Second symposia on " How artificial intelligence and machine learning transform the human condition", July 20, 2021.
http://www.lanl.gov/htt

[14] Nominated and successfully obtained recognition for LANL as an APS "Historical Site", 2013

[13] Member, Leadership Team, Energy Security Center, LANL, 2008-2012

[12] Chair, LANL Energy Council 2006-2007

[11] Chair, LANL A-team (Science Advisory Committee to the Director), 2004-2006

[10] Member, Institutional Computing Steering Committee, LANL, 2002-2009

[9] Organizer, LANL Forum on International Security in the New Millenium, 2000-2006

[8] Member, LANL Research Environment Advisory Committee, 2000 – 2002

[7] Chair, LANL Director's Colloquium Committee, 2003-2013

[6] Program Manager for DOE/SC/HEP, 2000–

[5] Member, LANL Director's Colloquium Committee, 2000 – 2002

[4] Member, Search Committee for Theoretical Division Director, LANL, 1998-1999

[3] Member, Post-doctoral review committee

[2] Member, LDRD ER review committee

[1] Played a significant role in the development of parallel computing at LANL. Starting with the Floating Point T200 in 1986, and then the Thinking Machines CM2 and CM5 supercomputers (1989-1996), demonstrated that for large scale scientific simulations parallel computing will be the way of the future.

SERVICE : EDITORIAL APPOINTMENTS

[2] Divisional Associate Editor, *Physical Review Letters*, "Particles and Fields", 2000-2002.
[1] Editor, "High Speed Computing", World Scientific, 1990-

SERVICE TO HEP : RECENT WHITE PAPERS AND REVIEWS

[5] Member, Snowmass 2021 White Paper "Neutrino-nucleus scattering" in preparation
[4] Member, FLAG Report 2021 Report, 2021 (arXiv:2111.09849)
[3] Member, "Lattice QCD and Neutrino-Nucleus Scattering", (Eur.Phys.J. A55 (2019) no.11, 196)
[2] Member, FLAG Report 2019 Report, 2019 (arXiv:1902.08191), Eur.Phys.J. C80 (2020) 2, 113
[1] Member, "Parton distributions and lattice QCD calculations: a community white paper", (Prog.Part.Nucl.Phys. 100 (2018) 107-160)

PUBLICATIONS IN ELEMENTARY PARTICLE PHYSICS

Citations available at Google Scholar
http://scholar.google.com/citations?hl=en&user=0tEMY3kAAAAJ

[1] Beyond Leading Order QCD Perturbative Corrections to the Pion Form;
(with R.D. Field, S. Otto and L. Chang).
Nuclear Physics **B186** (1981) 429.

[2] Optimized Perturbation Theory: The Pion Form Factor.
Proceeding of the Conference on Perturbative QCD at Florida State University, Tallahassee; 1981, American Institute of Physics 1981.

[3] Hadron Spectrum, Spontaneous Breaking of Z(3) and Fake Loops in Lattice SU(3);
(with A. Patel).
Physics Letters **B124** (1983) 94.

[4] Calculation of the Hadron Masses in Lattice QCD
(with A. Patel).
Nuclear Physics **B226** (1983) 152.

[5] Exotic Mesons in Lattice QCD;
(with A. Patel and F. Fucito).
Physics Letters **B131** (1983) 169.

[6] Extended Operators for Mesons in Lattice QCD;
(with A. Patel).
Physics Letters **B131** (1983) 425.

[7] String Tension, Glueball Masses and Finite Size Effects in Lattice SU(3);
(with A. Patel).
Physics Letters **B138** (1984) 294.

[8] An Improved Renormalization Group Transformation in 4-Dimensions;
(with R. Cordery and M.A. Novotny).
Physics Letters **B128** (1983) 425.

[9] Calculation of Weak Transitions in Lattice QCD;
(with R.C. Brower, M.B. Gavela and G. Maturana).
Physical Review Letters **53** (1984) 1318.

[10] Monte Carlo Renormalization Group for SU(2) Lattice Gauge Theory;
(with R. Cordery, M. Novotny and A. Patel).
Physical Review Letters **53** (1984) 527.

[11] Monte Carlo Renormalization Group Improved Action for SU(2) Lattice Gauge Theory; (with A. Patel).
Physical Review Letters **53** (1984) 531.

[12] Monte Carlo Renormalizaton Group for SU(3) Lattice Gauge Theory;
(with A. Patel, G. Guralnik, T. Warnock and C. Zemach).
Physical Review Letters **53** (1984) 1721.

[13] The Nature of the Transition in $d = 4$ U(1) Lattice Gauge Theory;
(with R. Cordery and M. Novotny).
Physics Letters **B172** (1986) 86. Longer version NUB #2654; 1984.

[14] One Loop Lattice Vacuum Energy;
(with G. Kilcup and S. Sharpe).
Physics Letters **B147** (1984) 339.
[15] Monte Carlo Renormalization Group Investigations of SU(2) Lattice Gauge Theory;
(with A. Patel).
Nuclear Physics **B251** [FS13] (1985) 789.
[16] The Non-perturbative Beta-function for the SU(2) Lattice Gauge Theory;
(with S. Otto and A. Patel).
Physics Letters **B159** (1985) 143.
[17] The Non-perturbative Beta-function for the SU(3) Lattice Gauge Theory;
(with G. Guralnik, A. Patel, T. Warnock and C. Zemach).
Physics Letters **B161** (1985) 352.
[18] Solving QCD Using Monte Carlo Renormalization Group Method;
(with A.Patel),
Proceedings of APS Division of Particles and Fields Meeting; Santa Fe, New Mexico; 1984. World Scientific Publishing (1985).
[19] The SU(2) Deconfinement Temperature on a BCT Lattice;
(with W. Celmaster, E. Kovacs and F. Green).
Physical Review **D33** (1986) 3022.
[20] The Deconfinement Transition and MCRG;
(with G. Guralnik, A. Patel, C. Zemach and T. Warnock).
Proceedings of Conference on Quark Confinement and Liberation: University of California, Berkeley; World Scientific, 1985.
[21] Epsilon Beyond the Naive Mass Spectrum;
(with G. Kilcup, S. Sharpe, G. Guralnik, A. Patel and T. Warnock).
Physics Letters **B164** (1985) 347.
[22] Monte Carlo Renormalization Group: A Review.
Plenary talk at Lattice Gauge Theory 1985; Wuppertal, Germany;
Plenum Press 1986.
[23] An Improved Estimate of Scalar Glueball Mass;
(with G. Guralnik, G. Kilcup, A. Patel, S. Sharpe).
Physical Review Letters **57** (1986) 1288.
[24] Improved Actions, Redundant Operators and Scaling in Lattice SU(3);
(with A. Patel).
Physics Letters **B183** (1987) 193.
[25] Weak Interaction Matrix Elements with Staggered Fermions I:
Theory and a Trial Run;
(with G. Guralnik, G. Kilcup, A. Patel, and S. Sharpe).
Nuclear Physics **B286** (1987) 253.
[26] Clear Evidence for a First Order Chiral Transition in QCD;
(with G. Guralnik, G. Kilcup, A. Patel and S. Sharpe).
Physical Review Letters **57** (1986) 2621.

[27] The Hadron Spectrum on a $18^3 \times 42$ lattice ;
(with G. Guralnik, G. Kilcup, A. Patel, S. Sharpe and T. Warnock).
Physical Review **D36** (1987) 2813.

[28] $\frac{\epsilon'}{\epsilon}$ from the lattice;
(with G. Guralnik, G. Kilcup, A. Patel, S. Sharpe).
Physics Letters **B192** (1987) 149.

[29] Food for Thought: Five Lectures on Lattice Gauge Theory.
Lectures at China Center of Advanced Science and Technology Symposium/Workshop on Lattice Gauge Theory Using Parallel Processors, Gordon and Breach, 1987.

[30] Introduction to Lattice Gauge Theory.
TASI 87, Santa Fe. World Scientific 1988.

[31] Exploring Hadron Masses in Lattice QCD with Light Quarks and an Improved Fermion Action.
(with Ph. de Forcrand, S. Güsken, K.-H. Mutter, A. Patel, K. Schilling, R. Sommer)
Physics Letters **B200** (1988) 143.

[32] On The Finite Temperature Transition in QCD.
(with G. Guralnik, G. Kilcup, A. Patel, S. Sharpe).
Physics Letters **B201** (1988) 503.

[33] The β-function for pure gauge SU(3).
(with G. Kilcup, A. Patel and S. Sharpe)
Physics Letters **B211** (1988) 132.

[34] Tuning the Hybrid Monte Carlo Algorithm.
(with G. Kilcup and S. Sharpe)
Physical Review **D38** (1988) 1278.

[35] The finite temperature transition for QCD with heavy quarks.
(with G. Kilcup and S. Sharpe)
Physical Review **D38** (1988) 1288.

[36] Comparison of update algorithms for pure gauge SU(3).
(with G. Kilcup, A. Patel, S. Sharpe and P. de Forcrand)
Modern Physics Letters **A3** (1988) 1367.

[37] An improved fermion action from block diagnolaization.
(with S. Güsken, K-H. Mütter, A. Patel, R. Sommer, and K. Schilling)
Nuclear Physics **B314** (1989) 63.

[38] QCD with dynamical Wilson fermions.
(with C. Baillie, G. Guralnik, G. Kilcup, A. Patel and S. Sharpe)
Physical Review **D40** (1989) 2072.

[39] Sea quarks and the hadron spectrum.
(with Apoorva Patel, Gregory W. Kilcup, Stephen R. Sharpe)
Physics Letters **B225** (1989) 398.

[40] Lattice calculation of the Kaon B-parameter.
(with Gregory W. Kilcup, Apoorva Patel, Stephen R. Sharpe)
Physical Review Letters **64** (1990) 25.

[41] QCD spectrum from the lattice.
Plenary Talk at *HADRON 89*, Ajaccio, France.
Edited by F. Binon et.al., Editions Frontieres 1989, page 337.

[42] The Renormalization Group and lattice QCD.
Core Lectures at Sixth TASI in Elementary Particle Physics, Boulder, Colorado, June 1989.
From Actions to Answers, World Scientific 1990.

[43] Hadron spectrum from the lattice.
Plenary talk at LATTICE 89, Capri, Italy
Nuclear Physics **B** *(Proc. Suppl.)* **17** (1990) 70.

[44] Lattice Calculation of Electroweak Amplitudes;
(with C. Bernard, R. Gupta, G. Kilcup and A. Soni)
Int. Jour. of Supercomputer Applications, Vol. 4, Number 3, p. 61

[45] Exploring glueball wavefunctions on the lattice.
(with C. Baillie, G.W. Kilcup, Apoorva Patel, Stephen R. Sharpe)
Physical Review **D43** (1991) 2301.

[46] The quenched spectrum with Staggered fermions.
(with G. Guralnik, G.W. Kilcup, Stephen R. Sharpe)
Physical Review **D43** (1991) 2003.

[47] A calculation of the pion's quark distribution amplitude in lattice QCD with dynamical fermions.
(with D. Daniel and D. Richards)
Physical Review **D43** (1991) 3715.

[48] QCD with dynamical Wilson fermions II.
(with C. Baillie, R. Brickner, G. Kilcup, A. Patel and S. Sharpe)
Physical Review **D44** (1991) 3272.

[49] Lattice calculation of the $I = 2$ pion scattering length.
(with G. Kilcup and S. Sharpe)
Nuclear Physics **B383** (1992) 309.

[50] Phenomenology with Wilson fermions using smeared sources.
(with D. Daniel, G. Kilcup, A. Patel and S. Sharpe)
Physical Review **D46** (1992) 3130.

[51] The Kaon B parameter with Wilson fermions.
(with D. Daniel, G. Kilcup, A. Patel and S. Sharpe)
Physical Review **D47** (1993) 5113.

[52] Scaling, the Renormalization Group and Improved Lattice Actions.
One chapter in the book **"Quantum Fields on the Computer",** Ed. M. Creutz, World Scientific, 1992.

[53] $I = 2$ pion scattering amplitude with Wilson Fermions.
(with A. Patel and S. Sharpe)
Physical Review **D48** (1993) 388.

[54] Bethe-Salpeter amplitudes and density correlations for mesons with Wilson fermions.
(with D. Daniel and J. Grandy)
Physical Review **D48** (1993) 3330.

[55] Calculations of hadronic matrix elements using lattice QCD.
Proceedings of 1993 Mardi Gras Conference on "High Performance Computing and its applications in the Physical Sciences", World Scientific, 1994.

[56] Semi-leptonic form-factors of heavy-light mesons from lattice QCD.
(with T. Bhattacharya and D. Daniel)
hep-lat/9310007

[57] Matrix Elements of the Singlet Axial Current in the Proton.
(with J. Mandula)
Physical Review **D50** (1994) 6931.
e-print arXiv:hep-lat/9402018

[58] Semi-leptonic form-factors from lattice QCD
(with T. Bhattacharya)
Proceedings of The Albuquerque Meeting, 8^{th} *meeting of the Division of Particles and Fields of the American Physical Society.*
Ed. Sally Seidel, World Scientific, 1995.

[59] Chiral limit of QCD.
Plenary talk at *LATTICE 94*, Bielefeld, Germany.
Nuclear Physics **B** *(Proc. Suppl.)* **42** (1995) 85.

[60] Hadron Spectrum with Wilson Fermions
(with T. Bhattacharya, G. Kilcup, and S. Sharpe)
Physical Review **D53** (1996) 6486.
e-print arXiv:hep-lat/9512021

[61] Decay Constants with Wilson Fermions at $\beta = 6.0$
(with T. Bhattacharya)
Physical Review **D54** (1996) 1155.
e-print arXiv:hep-lat/9510044

[62] Matrix elements of 4-fermion operators and B-parameters with Wilson Fermions
(with T. Bhattacharya and S. Sharpe)
Physical Review **D55** (1997) 4036.
e-print arXiv:hep-lat/9611023

[63] Comparison of Inversion Algorithms for Wilson Fermions on the CM5.
(with T. Bhattacharya, and G. Kilcup)
e-print arXiv:hep-lat/9605029
Los Alamos Preprint Number LA-UR-96-1115.

[64] Light Quark Masses from Lattice QCD.
(with T. Bhattacharya)
Physical Review **D55** (1997) 7203.
e-print arXiv:hep-lat/9605039.

[65] The Extraction of Light Quark Masses From Sum Rule Analyses of Axial and Vector Current Ward Identities
(with T. Bhattacharya and K. Maltman)
Physical Review **D57** (1998) 5455.
e-print arXiv:hep-ph/9703455

[66] Staggered fermion matrix elements using smeared operators
(with G. Kilcup and S. Sharpe)
Physical Review **D57** (1997) 1654.
e-Print arXiv:hep-lat/9707006.

[67] Quark Masses, B-parameters, and CP violation parameters ϵ and ϵ'/ϵ
Proceedings of International Conference Orbis Scientiae 1997 II *Physics of Mass*, Pages 177-194, Miami Beach, Florida, December, 1997. Edited by B. Kursunoglu, S. Mintz, A. Perlmutter, Plenum Press, 1998.
e-print arXiv:hep-ph/9801412.

[68] B Meson Decay Constants From NRQCD.
(with A. Ali Khan, T. Bhattacharya, S. Collins, C. Davies, C. Morningstar, J. Shigemitsu, and J. Sloan)
Physics Letters **B427** (1998) 132
e-Print arXiv:hep-lat/9801038

[69] Introduction to Lattice QCD.
LXVIII Les Houches Summer School *Probing the Standard Model of Particle Interactions*, July 28 - Sept 5, 1997, Eds. R. Gupta, A. Morel, E. de Rafael and F. David, North-Holland, 1999.
e-Print arXiv:hep-lat/9807028

[70] Non-perturbative Renormalization Constants using Ward Identities
(with T. Bhattacharya, S. Chandrasekharan, W. Lee, S. Sharpe)
Physics Letters **B461** (1999) 79
e-Print arXiv:hep-lat/9904011

[71] Heavy-light Mesons and Baryons with b Quarks.
(with A. Ali Khan, T. Bhattacharya, S. Collins, C. Davies, C. Morningstar, J. Shigemitsu, and J. Sloan)
Physical Review **D62** (2000) 054505
e-Print arXiv:hep-lat/9912034

[72] General Physics Motivations for Numerical Simulations of Quantum Field Theory
Parallel Computing **25** (1999) 1199.
e-Print arXiv:hep-lat/9905027

[73] LATTICE QCD
Core lectures at the VIII Mexican School "Particles and Fields", Oaxaca de Juárez, November 20th – 28th 1998, Eds. J.C. DÓlivo, G.L. Castro, and M. Mondragon, AIP Conference Proceedings 490, 1999.

[74] Prospects of calculating ϵ_K and ϵ' from lattice QCD
Proceedings of *KAON 99*, Eds. J.L. Rosner and B. D. Winstein, University of Chicago Press, 2001.
e-Print arXiv:hep-lat/9908440

[75] Order a improved renormalization constants
(with Tanmoy Bhattacharya, Weonjong Lee, Stephen Sharpe)
Physical Review **D63** (2001) 074505
e-Print arXiv:hep-lat/0009038

[76] Light quark masses: A status report at DPF 2000
(with K. Maltman)
DPF 2000, The Ohio State University, Columbus.
Int.J.Mod.Phys. **A16S1B** (2001) 591
e-Print arXiv:hep-ph/0101132

[77] Status of B_K from Lattice QCD
The CKM matrix and the Unitarity Triangle, CERN 2002.
e-Print arXiv:hep-lat/0303010

[78] Simulating a fundamental Theory of Nature
Proceedings of "The Monte Carlo Method in Physical Sciences", Los Alamos, June 2003. Ed. J. Gubernatis, AIP Conference Proceedings, Volume 690, Pages 110-122.

[79] Estimates of Light Quark Masses from Lattice QCD and QCD Sum rules
Proceedings of the 2nd CKM Unitarity Triangle Workshop, 5-9 April 2003, IPPP Durham, UK (eConf C0304052).
e-Print arXiv:hep-ph/0311033

[80] Testing improved staggered fermions with m_s and B_K
(with Weonjong Lee, Tanmoy Bhattacharya, George T. Fleming, Gregory Kilcup, Stephen R. Sharpe)
Physical Review **D71** (2005) 094501.

[81] Scaling behavior of discretization errors in renormalization and improvement constants
(with Tanmoy Bhattacharya, Weonjong Lee, Stephen Sharpe)
Physical Review **D73** (2006) 114507
e-Print arXiv:hep-lat/0509160

[82] Improved bilinears in lattice QCD with non-degenerate quarks
(with Tanmoy Bhattacharya, Weonjong Lee, Stephen R. Sharpe, and Jackson Wu)
Physical Review **D73** (2006) 034504
e-Print arXiv:hep-lat/0511014

[83] Equation of State and QCD Transition at Finite Temperature
(with A. Bazavov et al., the HotQCD collaboration)
Physical Review **D80** (2009) 014504
e-Print arXiv:0903.4379

[84] Equation of State and the Finite Temperature Transition in QCD
Proceedings of the DPF-2009 Conference, Detroit, July 27-32, 2009.
e-Print arXiv:0912.1374

[85] Equation of State from Lattice QCD calculations, *Plenary talk, Proceedings of the Sixth International Conference ICPAQGO-2010*, Goa, India, 6-10 December, 2010.
ICPAQGP-2010, Eds. P. Ghosh, T. Nayak, R. Varma, Elsevier 2011.
e-Print arXiv:1104.0267

[86] The chiral and deconfinement aspects of the QCD transition
(with A. Bazavov et al., the HotQCD collaboration)
Physical Review **D85** (2012) 054503.
e-Print arXiv:1111.1710 DOI: 10.1103/PhysRevD.85.054503

[87] Probing Novel Scalar and Tensor Interactions from (Ultra)Cold Neutrons to the LHC
(with T. Bhattacharya, V. Cirigliano, S. Cohen, A. Filipuzzi, M. Gonzalez-Alonso, M. Graesser, H-W. Lin)
Physical Review **D85:5** (2012) 054512
e-Print arXiv:1110.6448

[88] Fluctuations and Correlations of net baryon number, electric charge, and strangeness: A comparison of lattice QCD results with the hadron resonance gas model
(with the HotQCD collaboration consisting of A. Bazavov, Tanmoy Bhattacharya, C. E. DeTar, H.-T. Ding, Steven Gottlieb, Rajan Gupta, P. Hegde, Urs Heller, F. Karsch, E. Laermann, L. Levkova, Swagato Mukherjee, P. Petreczky, Christian Schmidt, R. A. Soltz, W. Soeldner, R. Sugar, and Pavlos M. Vranas)
Physical Review **D86** (2012) 034509.
e-Print arXiv:1203.0784

[89] The chiral transition and $U(1)_A$ symmetry restoration from lattice QCD using Domain Wall Fermions
(HotQCD collaboration: A. Bazavov, Tanmoy Bhattacharya, Michael I. Buchoff, Michael Cheng, N. H. Christ, H.-T. Ding, Rajan Gupta, Prasad Hegde, Chulwoo Jung, F. Karsch, Zhongjie Lin, R. D. Mawhinney, Swagato Mukherjee, P. Petreczky, R. A. Soltz, P. M. Vranas, Hantao Yin)
Physical Review **D86** (2012) 094503
e-Print arXiv:1205.3535

[90] Nucleon Charges and Electromagnetic Form Factors from 2+1+1-Flavor Lattice QCD
(with T. Bhattacharya, A. Joseph, S. Cohen, H-W. Lin, B. Yoon)
Physical Review **D89:9** (2014) 094502
e-Print arXiv:1306.5435

[91] The QCD phase transition with chiral quarks and physical quark masses,
(HotQCD collaboration: Tanmoy Bhattacharya, Michael I. Buchoff, Norman H. Christ, H.-T. Ding, Rajan Gupta, Chulwoo Jung, F. Karsch, Zhongjie Lin, R. D. Mawhinney, Greg McGlynn, Swagato Mukherjee, David Murphy, P. Petreczky, Dwight Renfrew, Chris Schroeder, R. A. Soltz, P. M. Vranas, Hantao Yin)
Physical Review Letters **113**, 082001 (2014)
e-Print arXiv:1402.5175

[92] The equation of state in (2+ 1)-flavor QCD
(HotQCD collaboration: A Bazavov, Tanmoy Bhattacharya, C DeTar, H-T Ding, Steven Gottlieb, Rajan Gupta, P Hegde, UM Heller, F Karsch, E Laermann, L Levkova, Swagato Mukherjee, P Petreczky, C Schmidt, C Schroeder, RA Soltz, W Soeldner, R Sugar, M Wagner, P Vranas)
Physical Review **D90** (2014) 094503
e-Print arXiv:1407.6387 DOI: 10.1103/PhysRevD.90.094503

[93] Dimension-5 CP-odd operators: QCD mixing and renormalization.
(with T. Bhattacharya, V. Cirigliano, E. Mereghetti, B. Yoon)
Physical Review **D92** (2015) 114026
e-Print arXiv:1502.07325

[94] Neutron Electric Dipole Moment and Tensor Charges from Lattice QCD
(with T. Bhattacharya, V. Cirigliano, H-W Lin, B. Yoon)
Physical Review Letters **115** (2015) 212002.
e-Print arXiv:1506.04196

[95] Isovector and Isoscalar Tensor Charges of the Nucleon from Lattice QCD
(with T. Bhattacharya, V. Cirigliano, S. Cohen, A. Joseph, H-W Lin, B. Yoon)
Physical Review **D92** (2015) 094511
e-Print arXiv:1506.06411

[96] Controlling Excited-State Contamination in Nucleon Matrix Elements
Boram Yoon, Rajan Gupta, et al. (NME Collaboration)
Physical Review **D93** (2016) 114506
DOI: 10.1103/PhysRevD.93.114506
e-print arXiv:1602.07737

[97] Axial, Scalar and Tensor Charges of the Nucleon from 2+1+1-flavor Lattice QCD
T Bhattacharya, V Cirigliano, S. Cohen, R Gupta, H-W. Lin, B Yoon
e-print arXiv:1606.07049
Physical Review **D94** (2016) 054508
DOI: 10.1103/PhysRevD.95.074508

[98] The Contribution of Novel CP Violating Operators to the nEDM using Lattice QCD
Rajan Gupta, Tanmoy Bhattacharya, Vincenzo Cirigliano, Boram Yoon
Proceedings of the "XIIth Quark Confinement and the Hadron Spectrum," (CONF12), Thessiloniki, Greece, 2016. e-print arXiv:1701.04132
http://www.epj-conferences.org/articles/epjconf/abs/2017/06/contents/contents.html

[99] Isovector charges of the nucleon from 2+1-flavor QCD with clover fermions
B Yoon, Y-C Jang, R. Gupta, T. Bhattacharya, et al.
Physical Review **D95** (2017) no.7, 074508
DOI: 10.1103/PhysRevD.95.074508
e-print arXiv:1611.07452 [hep-lat] (2016).

[100] Nucleon Transverse Momentum-dependent Parton Distributions in Lattice QCD: Renormalization Patterns and Discretization Effects
Boram Yoon, Michael Engelhardt, Rajan Gupta, Tanmoy Bhattacharya, Jeremy R Green, Bernhard U Musch, John W Negele, Andrew V Pochinsky, Andreas Schaefer, Sergey N Syritsyn
Physical Review **D96** (2017) 094508. (https://doi.org/10.1103/PhysRevD.96.094508)
e-print arXiv:1706.03406 [hep-lat] (2017).

[101] Axial Vector Form Factors of the Nucleon from Lattice QCD
R. Gupta, Y-C Jang, B Yoon, Huey-Wen Lin, T. Bhattacharya
Physical Review **D96** (2017) 114503 (https://doi.org/10.1103/PhysRevD.96.114503)
e-print arXiv:1705.06834 [hep-lat] (2017).

[102] Isovector Charges of the Nucleon from 2+1+1-flavor Lattice QCD
R. Gupta, Y-C Jang, B Yoon, Huey-Wen Lin, V. Cirigliano, T. Bhattacharya
Physical Review **D98** (2018) 034503 (https://doi.org/10.1103/PhysRevD.98.034503)
e-print arXiv:1806.09006 [hep-lat] (2018).

[103] Parton distributions and lattice QCD calculations: a community white paper
HW Lin, ER Nocera, F Olness, K Orginos, J Rojo, A Accardi, C Alexandrou, et. al.,
Progress in Particle and Nuclear Physics, Volume 100, May 2018, Pages 107-160
https://doi.org/10.1016/j.ppnp.2018.01.007
arXiv preprint arXiv:1711.07916

[104] Flavor diagonal tensor charges of the nucleon from 2+1+1 flavor lattice QCD
R. Gupta, B Yoon, T. Bhattacharya, V. Cirigliano, Y-C Jang, Huey-Wen Lin,
Phys.Rev. D98 (2018) 091501 (https://doi.org/10.1103/PhysRevD.98.091501)
e-print arXiv:1808.07597 [hep-lat] (2018).

[105] Quark contribution to the proton spin from 2+1+1-flavor lattice QCD
Huey-Wen Lin, R. Gupta, B Yoon, Y-C Jang, T. Bhattacharya,
Phys.Rev. D98 (2018) 094512 (https://doi.org/10.1103/PhysRevD.98.094512)
e-print arXiv:1806.10604 [hep-lat] (2018).

[106] Machine Learning Estimators for Lattice QCD Observables
B Yoon, T. Bhattacharya, R. Gupta
Phys.Rev. D100 (2019) 014504 (https://doi.org/10.1103/PhysRevD.100.014504)
e-print arXiv:1807.05971 [hep-lat] (2018).

[107] Axial Vector Form Factors from Lattice QCD that Satisfy the PCAC Relation
Y-C Jang, R. Gupta, B Yoon, T. Bhattacharya
Phy. Rev. Lett. 124 (2020) 072002 https://doi.org/10.1103/PhysRevLett.124.072002
e-print arXiv:1905.06470 [hep-lat] (2019).

[108] Nucleon Electromagnetic Form Factors in the Continuum Limit from 2+1+1-flavor Lattice QCD
Y-C Jang, R. Gupta, H-W. Lin, B Yoon, T. Bhattacharya
Phys.Rev. D101 (2020) 014507 (https://doi.org/10.1103/PhysRevD.101.014507)
e-print arXiv:1906.07217 [hep-lat] (2019).

[109] Moments of nucleon isovector structure functions in 2+1+1-flavor QCD
S Mondal, R Gupta, S Park, B Yoon, T. Bhattacharya, H-W Lin
Phy. Rev. D102 (2020), 054512 (https://doi.org/10.1103/PhysRevD.102.054512)
e-print arXiv:2005.13779 [hep-lat] (2019).

[110] Nucleon Momentum Fraction, Helicity and Transversity from 2+1-flavor Lattice QCD
S Mondal, R Gupta, S Park, B Yoon, T Bhattacharya, B Joó, F Winter
JHEP 04 (2021) 044 (https://doi.org/10.1007/JHEP04(2021)044)
arXiv preprint arXiv:2011.12787

[111] Contribution of the QCD Θ-term to nucleon electric dipole moment
T Bhattacharya, V Cirigliano, R Gupta, E Mereghetti, B Yoon
Phy. Rev. D103 (2021), 114507 https://doi.org/10.1103/PhysRevD.103.114507
arXiv preprint arXiv:2101.07230

[112] Precision Nucleon Charges and Form Factors Using 2+1-flavor Lattice QCD
S Park, R Gupta, B Yoon, S Mondal, T Bhattacharya, YC Jang, B Joo, F. Winter
arXiv preprint arXiv:2103.05599

[113] The pion-nucleon sigma term from lattice QCD
R Gupta, S Park, M. Hofericter, E. Mereghetti, B Yoon, T Bhattacharya
Phy. Rev. Lett. 127 (2021) 242002.
https://link.aps.org/doi/10.1103/PhysRevLett.127.242002
arXiv preprint arXiv:2105.12095

PUBLICATIONS IN QUANTUM COMPUTING

[Q5] Space-time symmetric qubit regularization of the asymptotically free two-dimensional O(4) model
Junzhe Zhou, Hersh Singh, Tanmoy Bhattacharya, Shailesh Chandrasekharan, Rajan Gupta
e-print arXiv:2111.13780 [hep-lat]

[Q4] Nuclear two point correlation functions on a quantum-computer
Alessandro Baroni, Joseph Carlson, Rajan Gupta, Andy C. Y. Li, Gabriel N. Perdue, Alessandro Roggero
e-print arXiv:2111.02982 [hep-lat]

[Q3] Qubit regularization of asymptotic freedom
Tanmoy Bhattacharya, Alex Buser, Shailesh Chandrasekharan, Rajan Gupta, Hersh Singh
Phys.Rev. Lett 126 (2021) 172001
https://doi.org/10.1103/PhysRevLett.126.172001
e-print arXiv:2012.02153 [hep-lat] (2020).

[Q2] State preparation and measurement in a quantum simulation of the OO(3) sigma model
Alex Buser, Tanmoy Bhattacharya, Lukasz Cincio, Rajan Gupta
Phys.Rev. D102 (2020) 114514
https://doi.org/10.1103/PhysRevD.102.114514
e-print arXiv:2006.15746 [quant-ph] (2020).

[Q1] Quantum Computing for Neutrino-Nucleus Scattering
Alessandro Roggero, Andy C.Y. Li, Joseph Carlson, Rajan Gupta, Gabriel N. Perdue
Phys.Rev. D101 (2020) 7, 074038
https://doi.org/10.1103/PhysRevD.101.074038
e-print arXiv:1911.06368 [quant-ph] (2020).

PUBLICATIONS IN STATISTICAL MECHANICS

[S12] Behavior of the finite-sized, three-dimensional, Ising model near the critical point.
(with G. Baker, Jr.)
Computer Simulation Studies in Condensed Matter Physics IX, Eds. D.P.Landau, K.K. Mon, H.B. Schüttler, Springer Proceedings in Physics **82**, Pages 162-166.

[S11] Critical Exponents of the 3-D Ising Model.
(with P. Tamayo)
International Journal of Modern Physics **C7** (1996), 305-319.
e-print arXiv:cond-mat/9601048.

[S10] Two-temperature non-equilibrium Ising models: Critical behavior and universality.
(with P. Tamayo and F. J. Alexander)
Physical Review **E50** (1994) 3474.

[S9] Monte Carlo Renormalization Group studies of the 3-d Ising Model.
(with C. Baillie, K. A. Hawick and G. S. Pawley)
Physical Review **B45** (1992) 10438.

[S8] Critical behavior of the 2-d XY model.
(with C. Baillie)
Physical Review **B45** (1992) 2883.

[S7] The phase transition in the $2-d$ XY model.
(with J. DeLapp, G.C. Fox, C. Baillie, J. Apostolakis)
Physical Review Letters **61** (1988) 1996.

[S6] Open Problems in Monte Carlo Renormalization Group: Application to Critical Phenomena.
Proceedings of the 31^{st} *Annual Conference on Magnetism and Magnetic Materials*, Baltimore 1986, *J. of App. Phy.* **61, #8** (1987) 3605.

[S5] Dealing with Truncation in Monte Carlo Renormalization Group Calculations;
(with R. Shankar and G. Murthy).
Physical Review Letters **55** (1985) 1812.

[S4] Clear Evidence of Redundant Operators in Monte Carlo Studies of the Ising Model;
(with R. Shankar).
Physical Review **B32** (1985) 6084.

[S3] Monte Carlo Renormalized Hamiltonian;
(with R. Cordery)
Physics Letters **A105** (1984) 415.

[S2] Massgap and Scaling in the O(3) Sigma Model in 1+1 Dimension.
CALT-68-1010, and in Ph.D. Thesis (1982).

[S1] Monte Carlo Estimates of the Mass Gap of the O(2) and O(3) Spin Models in 1+1 Dimensions; (with G.C. Fox, O. Martin and S. Otto).
Nuclear Physics **205** [FS5] (1982) 188.

PUBLICATIONS IN COMPUTATIONAL SCIENCE

[C5] The Petaflops Router: harnessing FPGAs and Accelerators for High Performance Computing;
(with Z. Baker, T. Bhattacharya, P. Graham, J. Inman, A. Klein, G. Kunde, A. McPherson, M. Stettler, and J. Tripp),
"*2009 Symposium on Application Accelerators in High Performance Computing*", University of Illinois, Urbana Champaign, Jul 27, 2009 - Jul 31, 2009

[C4] Prospects of Solving Grand Challenge Problems.
Proceedings of the workshop on "*Debugging and Performance Tuning for Parallel Computing Systems: Toward a unified Environment*", Cape Cod, Oct 3-5, 1994. Ed. Ann Hayes and Margret Simmons.

[C3] QCD on the Connection Machine.
Proceedings of "Large Scale computing in the 21^{st} Century", Cape Cod, Oct. 1990. Ed. Jill P. Mesirov, SIAM 1991

[C2] QCD with dynamical fermions on the Connection Machine;
(with C.F. Baillie, R.G. Brickner, L. Johnsson).
Proceedings of "Supercomputing 89", Reno, Nevada (ACM Press, New York, 1989)

[C1] Nearest Neighbor Concurrent Processor;
(with E. Benedictis, E. Brooks, G. C. Fox, O. Martin, S. Otto).
CALT-68-867, (1981).

PUBLICATIONS IN COMPUTATIONAL BIOLOGY

[B2] Search for the origin of HIV and AIDS
(with T. Bhattacharya, F. Gao, B. Hahn, A. Lapedes, B. Korber, M. Mauldoon, J. Theiler, S. Wolensky)
Science, **289** (2000) 1140.

[B1] Timing the Ancestor of the HIV-1 Pandemic Strains
(with T. Bhattacharya, F. Gao, B. Hahn, A. Lapedes, B. Korber, M. Mauldoon, J. Theiler, S. Wolensky)
Science, **288** (2000) 1789.

Contributed Talks Published in Lattice QCD Conference Proceedings

[54] Updates on Nucleon Form Factors from Clover-on-HISQ Lattice Formulation
Yong-Chull Jang, Tanmoy Bhattacharya, Rajan Gupta, Huey-Wen Lin, Boram Yoon
Proceedings of the "36th annual International Symposium on Lattice Field Theory", 22-28 July 2018.
PoS LATTICE2018 (2018) 123
e-print arXiv:1901.00060 [hep-lat] (2019).

[53] Neutron Electric Dipole Moment from Beyond the Standard Model
Tanmoy Bhattacharya, Boram Yoon, Rajan Gupta, Vincenzo Cirigliano
Proceedings of the "36th annual International Symposium on Lattice Field Theory", 22-28 July 2018.
PoS LATTICE2018 (2018) 188
e-print arXiv:1812.03573 [hep-lat] (2018).

[52] Isovector and flavor-diagonal charges of the nucleon from 2+1+1 flavor QCD
Rajan Gupta, Tanmoy Bhattacharya, Vincenzo Cirigliano, Boram Yoon, Yong-Chull Jang, Huey-Wen Lin,
Proceedings of the "36th annual International Symposium on Lattice Field Theory", 22-28 July 2018.
PoS LATTICE2018 (2018) 131
e-print arXiv:1812.03573 [hep-lat] (2018).

[51] Isovector and flavor-diagonal charges of the nucleon from 2+1+1 flavor QCD
Rajan Gupta, Tanmoy Bhattacharya, Vincenzo Cirigliano, Boram Yoon, Yong-Chull Jang, Huey-Wen Lin,
Proceedings of the "36th annual International Symposium on Lattice Field Theory", 22-28 July 2018.
PoS LATTICE2018 (2018) 131
e-print arXiv:1812.03573 [hep-lat] (2018).

[50] Neutron Electric Dipole Moment on the Lattice
Boram Yoon, Tanmoy Bhattacharya, Rajan Gupta
Proceedings of the "35th annual International Symposium on Lattice Field Theory", 18-23 June 2017.
EPJ Web of Conferences 175, 01014
e-print arXiv:1712.08557 [hep-lat] (2018).

[49] Nucleon Axial and Electromagnetic Form Factors
Yong-Chull Jang, Tanmoy Bhattacharya, Rajan Gupta, Huey-Wen Lin, Boram Yoon
Proceedings of the "35th annual International Symposium on Lattice Field Theory", 18-23 June 2017, (LATTICE 2017)
EPJ Web of Conferences 175, 06033
e-print arXiv:1801.01635 [hep-lat] (2018).

[48] Isovector and flavor-diagonal charges of the nucleon
Rajan Gupta, Tanmoy Bhattacharya, Yong-Chull Jang, Huey-Wen Lin, Boram Yoon
Proceedings of the "35th annual International Symposium on Lattice Field Theory", 18-23 June 2017.

EPJ Web of Conferences 175, 06029
e-print arXiv:1801.03130 [hep-lat] (2018).

[47] Quark Chromoelectric Dipole Moment Contribution to the Neutron Electric Dipole Moment
T. Bhattacharya, V. Cirigliano, R. Gupta, B. Yoon
Proceedings of the "34th annual International Symposium on Lattice Field Theory", 24-30 July 2016.
PoS LATTICE2016 (2016) 225
e-print arXiv:1612.08438

[46] Lattice QCD calculations of nucleon transverse momentum-dependent parton distributions using clover and domain wall fermions
B. Yoon, T. Bhattacharya M. Engelhardt, J. Green, R. Gupta, P. Hgler, B. Musch, J. Negele, A. Pochinsky, S. Syritsyn.
PoS LATTICE 2015 (2016) 116
e-Print: arXiv:1601.05717

[45] Neutron Electric Dipole Moment from quark Chromoelectric Dipole Moment
T Bhattacharya, V Cirigliano, R Gupta, E Mereghetti, B Yoon
PoS (LATTICE 2015) 130
e-print arXiv:1601.02264

[44] Nucleon Charges, Form-factors and Neutron EDM
(with T. Bhattacharya, V. Cirigliano, H-W. Lin, B. Yoon)
PoS (LATTICE 2015) 130
e-Print arXiv:1601.01730

[43] Precision calculations of nucleon charges g_A, g_S, g_T
(with T. Bhattacharya, A. Joseph, H-W. Lin, B. Yoon)
PoS (Lattice2014) 152.
e-Print arXiv:1501.07639

[42] Neutron Electric Dipole Moments from Beyond the Standard Model Physics
T. Bhattacharya, R. Gupta, V. Cirigliano
PoS (LATTICE 2013) 299
e-Print arXiv:1403.2445

[41] Probing TeV scale physics in precision UCN decays
R. Gupta, T. Bhattacharya, A. Joseph, S. Cohen, H-W. Lin
PoS (LATTICE 2013) 409
e-Print arXiv:1403.2447

[40] Probing novel TeV physics through precision calculations of scalar and tensor charges of the nucleon
(with T. Bhattacharya, A. Joseph, S. Cohen, H-W. Lin)
PoS (LATTICE 2012), 114 (2012)
e-Print arXiv:1212.4889

[39] Neutron electric dipole moment from beyond the standard model
(with T. Bhattacharya, V. Cirigliano)
PoS (LATTICE 2012), 179 (2012)
e-Print arXiv:1212.4918

[38] Probing TeV scale physics via ultra cold neutron decays and calculating non-standard baryon matrix elements
(with T. Bhattacharya, A. Joseph, H-W. Lin, S. Cohen)
PoS LATTICE2011, 271 (2011)
e-Print arXiv:1202.1320

[37] Toward a precise determination of Tc with 2+1 Flavor of Quarks
(with Carleton Detar for the HotQCD collaboration)
PoS(LATTICE 2007)179
e-Print arXiv:hep-lat/0710.1655

[36] QCD EoS from Simulations on BlueGene L Supercomputers at LLNL and NYBlue
(with the HotQCD collaboration)
PoS (LATTICE 2008) 170
e-Print arXiv:0810.1764

[35] Calculating ϵ'/ϵ using HYP staggered fermions
(with Tanmoy Bhattacharya, George T. Fleming, Greg Kilcup, Weonjong Lee, Stephen Sharpe)
Lattice 2004. Nuclear Physics **B** *(Proc. Suppl.)* **140** (2005) 369.
e-Print arXiv:hep-lat/0409046

[34] Phenomenology using Lattice QCD
Proceedings of PASCOS 2004 (Nath Festschrift), Boston, September 2004. World Scientific 2005.
e-Print arXiv:hep-lat/0502005

[33] Towards a chiral gauge theory by deconstruction in AdS5
(with Tanmoy Bhattacharya, Matthew R. Martin, Yuri Shirman, Csaba Csaki, John Terning
Proceedings of Science LAT2005 (2005) 136
e-Print arXiv:hep-lat/0510073

[32] Calculating weak matrix elements using HYP staggered fermions
(with T.Bhattacharya, G.T.Fleming, G.Kilcup, W.Lee, S.Sharpe)
Lattice 2003. Nuclear Physics **B** *(Proc. Suppl.)* **129&130** (2004) 257
e-Print arXiv:hep-lat/0309105

[31] Improved bilinears in unquenched lattice QCD
(with Tanmoy Bhattacharya, Weonjong Lee, Stephen R. Sharpe, Jackson M. S. Wu)
Lattice 2003. Nuclear Physics **B** *(Proc. Suppl.)* **129&130** (2004) 441
e-Print arXiv:hep-lat/0309087

[30] Progress report on the staggered epsilon'/epsilon project
(with T. Bhattacharya, G.T. Fleming, G. Kilcup, W. Lee, S. Sharpe)
Proceedings of *LATTICE 2002*.
Nuclear Physics **B** *(Proc. Suppl.)* **119** (2003) 428
e-Print arXiv:hep-lat/0208050

[29] Weak matrix elements for CP violation
(with T. Bhattacharya, W. Lee, and S. Sharpe)
LATTICE 2001. Nuclear Physics **B** *(Proc. Suppl.)* **106** (2002) 311
e-Print arXiv:hep-lat/0111004

[28] Scaling behavior of improvement and renormalization constants
(with T. Bhattacharya, W. Lee, and S. Sharpe)
LATTICE 2001. Nuclear Physics **B** *(Proc. Suppl.)* **106** (2002) 789
e-Print arXiv:hep-lat/0111001

[27] Renormalization Constants using Quark States in Landau Gauge
(with T. Bhattacharya and W. Lee)
LATTICE 2001. Nuclear Physics **B** *(Proc. Suppl.)* **106** (2002) 786
e-Print arXiv:hep-lat/0111002

[26] Improvement and Renormalization Constants in $O(a)$ Improved Lattice QCD
(with T. Bhattacharya, W. Lee, and S. Sharpe)
LATTICE 2000
Nuclear Physics **B** *(Proc. Suppl.)* **94** (2001) 599
e-Print arXiv:hep-lat/0101007

[25] Renormalization Constants using Quark States in Fixed Gauge
(with T. Bhattacharya and W. Lee)
LATTICE 2000
Nuclear Physics **B** *(Proc. Suppl.)* **94** (2001) 595
e-Print arXiv:hep-lat/0106007

[24] Non-perturbative improvement of bilinears in unquenched QCD.
(with T. Bhattacharya, W. Lee, and S. Sharpe)
LATTICE 99, June 1999, Pisa, Italy
Nuclear Physics **B** *(Proc. Suppl.)* **83-84** (2000) 902
e-Print arXiv:hep-lat/9909092

[23] Order a improved renormalization constants
(with T. Bhattacharya, W. Lee, and S. Sharpe)
LATTICE 99, June 1999, Pisa, Italy
Nuclear Physics **B** *(Proc. Suppl.)* **83-84** (2000) 851
e-Print arXiv:hep-lat/9909115

[22] Fixed point pure gauge action with $b = \sqrt{3}$ RGT.
R. Gupta, T. Bhattacharya, and W. Lee
LATTICE 99, June 1999, Pisa, Italy
Nuclear Physics **B** *(Proc. Suppl.)* **83-84** (2000) 860
e-Print arXiv:hep-lat/9910046

[21] Spectrum of Mesons and Baryons with b Quarks
LATTICE 99, June 1999, Pisa, Italy
Nuclear Physics **B** *(Proc. Suppl.)* **83-84** (2000) 295
e-Print arXiv:hep-lat/9910035

[20] Wilson versus Clover fermions: A case for improvement
Lattice 98, *Nuclear Physics* **B** *(Proc. Suppl.)* **73** (1999) 321
e-Print arXiv:hep-lat/9810016.

[19] Non-perturbative Renormalization Constants using Ward Identities
(with T. Bhattacharya, S. Chandrasekharan, W. Lee, and S. Sharpe)
Lattice 98, *Nuclear Physics* **B** *(Proc. Suppl.)* **73** (1999) 276
e-Print arXiv:hep-lat/9810018.

[18] B-parameters of 4-fermion operators from lattice QCD
Nuclear Physics **B** *(Proc. Suppl.)* **63A-C** (1998) 278.
e-print arXiv:hep-lat/9710090.

[17] Advances in the determination of Quark Masses
(with T. Bhattacharya)
Plenary talk at *LATTICE 97*, Edinburgh, UK
Nuclear Physics **B** *(Proc. Suppl.)* **63A-C** (1998) 95.
e-print arXiv:hep-lat/9710095

[16] Light quark masses and the CP violation parameter ϵ'/ϵ
(with T. Bhattacharya)
Nuclear Physics **B** *(Proc. Suppl.)* **53** (1997) 292.
e-Print arXiv:hep-lat/9609046

[15] Testing the chiral behavior of the hadron spectrum.
(with T. Bhattacharya and S. Sharpe)
LATTICE 95, Melbourne, Australia.
Nuclear Physics **B** *(Proc. Suppl.)* **47** (1996) 549.
e-print arXiv:hep-lat/9512005

[14] Lattice analysis of semi-leptonic form factors.
(with T. Bhattacharya)
LATTICE 95, Melbourne, Australia.
Nuclear Physics **B** *(Proc. Suppl.)* **47** (1996) 481.
e-print arXiv:hep-lat/9512007

[13] Status report on weak matrix element calculations.
(with T. Bhattacharya)
LATTICE 95, Melbourne, Australia.
Nuclear Physics **B** *(Proc. Suppl.)* **47** (1996) 473.
e-print arXiv:hep-lat/9512006

[12] Phenomenology from 100 large lattices
(with T. Bhattacharya)
LATTICE 94, Bielefeld, Germany.
Nuclear Physics **B** *(Proc. Suppl.)* **42** (1995) 935.

[11] Topological density and Instantons on the lattice.
(with J. Grandy)
LATTICE 94, Bielefeld, Germany.
Nuclear Physics **B** *(Proc. Suppl.)* **42** (1995) 246.
e-print arXiv:hep-lat/9501009

[10] A pot-pourri of results in QCD from large lattice simulations on the CM5.
(with T. Bhattacharya)
LATTICE 93, Dallas, Texas.
Nuclear Physics **B** *(Proc. Suppl.)* **34** (1994) 341.

[9] Geometric measurement of topological susceptibility on large lattices.
(with J. Grandy)
LATTICE 93, Dallas, Texas
Nuclear Physics **B** *(Proc. Suppl.)* **34** (1994) 164.

[8] Meson form-factors and wave-functions with Wilson Fermions
(with D. Daniel and J. Grandy)
LATTICE 92, Amsterdam, The Netherlands.
Nuclear Physics **B** *(Proc. Suppl.)* **30** (1993) 419.

[7] Matrix Elements with Wilson fermions.
LATTICE 91, Tsukuba, Japan.
Nuclear Physics **B** *(Proc. Suppl.)* **26** (1992) 337.

[6] QCD with dynamical Wilson fermions.
LATTICE 90, Tallahassee, Florida.
Nuclear Physics **B** *(Proc. Suppl.)* **20** (1991) 385.

[5] Simulating QCD with dynamical Wilson and Staggered fermions.
1988 International Symposium LATTICE 88, Fermilab, Sept. 1988, *Nuclear Physics* **B** *(Proc. Suppl.)* **9** (1989) 473.

[4] The Hybrid Monte Carlo algorithm and the Chiral Transition.
Field Theory on the Lattice, Seillac, France, Sept. 1987, *Nuclear Physics (Proc. Supp.)* **4** (1988) 562.

[3] More on the first order chiral symmetry transition in QCD.
Proceedings of the International Conference, Brookhaven, USA
Lattice Gauge Theory 1986, Plenum Press 1987.

[2] Improved Monte Carlo Renormalization Group:
Proceedings of the Tallahassee Conference on Lattice Gauge Theory, World Scientific Publishing (1985).

[1] Monte Carlo Renormalization Group Analysis of SU(2) and SU(3) Gauge Theories;
(with A. Patel).
Proceedings of the Argonne National Laboratory Workshop on Gauge Theory on a Lattice; Argonne 1984.

Publications and Invited Talks on Energy and Energy Security

[ES15] The shale gas revolution: barriers, sustainability, and emerging opportunities
(Richard S. Middleton, Rajan Gupta, Jeffrey D. Hyman and Hari S. Viswanathan
Applied Energy 199C (2017) pp. 88-95. (doi: 10.1016/j.apenergy.2017.04.034).

[ES14] Supply Side Economics and the Need for Energy Diversification
(Rajan Gupta and Thomas Elmar Schuppe)
https://www.economic-policy-forum.org/wp-content/uploads/2014/05/EPF-Website_Gupta_supply

[ES13] The Future of Global Energy Systems
(Rajan Gupta and Thomas Elmar Schuppe)
https://www.economic-policy-forum.org/wp-content/uploads/2014/05/EPFwebsite_Gupta_FutureE

[ES12] Energy-water nexus and sustainability. Interview with the Dallas Committee on Foreign Relations, 29 August, 2012.
Available at http://www.dallascfr.org/sites/default/files/GuptaResourcesF_0.pdf

[ES11] Meeting Electric Power Demand in South Asia
(With Harihar Shankar)
Invited Contribution to Book "South Asia 2060" Editors Adil Najam and Moeed Yusuf, Antham Press, 2013. (Pardee Center Project, Boston University, http://www.bu.edu/pardee/asia-2060/)
Invited Contribution to Book "Energy and Society in the Longer Range Future" Editors Cutler Cleveland and Adil Najam, Pardee Center Project, Boston University, 2010.
LA-UR-10-04209

[ES10] Global Energy Observatory: a One-stop Site for Information on Energy Systems
Keynote address at the XXIV Rencontres de Physique de La Vallee d'Aoste
Il Nuovo Cimento C33 No 5 Pg. 353-361 Online First DOI 10.1393/ncc/i2011-10729-9
LA-UR-10-03589

[ES9] Development, Energy Security and Climate Security: Indias Converging Goals
(With Harihar Shankar and Sunjoy Joshi)
Invited contributed book chapter in "Sustainable Development and Climate Change", Eds S. Joshi and M. Linke, Rupa Publications India, 2010.
LA-UR-09-07450

[ES8] Development, Energy and Climate Security
(With Harihar Shankar and Sunjoy Joshi)
Seminar 606 (www.india-seminar.com), Feburary 2010, Pages 30-34. A special issue on "Climate Change Conundrum".
LA-UR-09-06014

[ES7] Promoting India's Development – energy security and climate security are convergent goals
International Conference on Sustainable Development and Climate Change organized by The Observer Research Foundation (ORF), New Delhi, and Rosa Luxumbourg Foundation, Berlin. New Delhi, India, Sept. 24-25, 2009.
LA-UR-09-06014

[ES6] GEO: An Open Database to Understand, Visualize, and Analyze Global Energy Sys-

tems
International School of Scientific Journalism and Communication, 6-9 July 2009, Ettore Majorana Foundation and Center for Scientific Culture Erice, Sicily, Italy.

[ES5] Global Energy Observatory: a One-stop Site for Information on Energy Systems
"Energy for the 21st Century", 29th Annual CNLS Conference, May 18-22, 2009, Santa Fe, New Mexico, USA

[ES4] The many faces of the energy challenge.
American Association for Petroleum Landmen, Annual Meeting, Chicago May 11-13, 2008

[ES3] The future of Energy Security in the 21st century.
American Physical Society, SESAPS Annual Meeting, Williamsburg, Nov 2006

[ES2] The future of Energy Security in the 21st century.
American Physical Society, DNP Annual Meeting, Nashville, Oct 2006

[ES1] Will there be enough energy for all in the 21st century?
Los Alamos National Laboratory Frontiers of Science Lectures, April-May 2006

PUBLICATIONS AND INVITED TALKS IN PUBLIC HEALTH
See my website http://cnls.lanl.gov/~rajan/AIDS-india/

[PH1] The HIV/AIDS Pandemic in India is Real
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/summary.3.99.html

[PH2] Dilemmas in the care of patients with AIDS in India
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/dilemma.3.99.html
A abridged version published in "Issues in Medical Ethics", vol VIII No. 2, April-June, 2000.

[PH3] HIV/AIDS Poses a Threat to India: A Global Perspective
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/issues.9.99.html

[PH4] Health care in India in light of HIV/AIDS and the role of the West
Published in e-forum AIDS-INDIA. http://groups.yahoo.com/group/AIDS-INDIA/
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/healthINDIA.1.00.html

[PH5] Thoughts on whether there should be isolated or common wards for HIV+ patients
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/HIVwards.1.00.html

[PH6] On the HIV Beat in Bombay
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/beatbombay.2.00.html

[PH7] Issues of Blood Safety in India
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/blood.6.00.html

[PH8] We need to talk about condoms: A plea to Christian Organizations in India to break their silence
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/christian.html

[PH9] Risk Factors and Societal Response to HIV/AIDS in India
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/hivindia2001.html

[PH10] The need for a holistic approach to social intervention
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/designing.html

[PH11] Contagion and Stability
Participent in a simulated Health Scenario organized by the U.S. Army War College, Carlisle, Pennsylvania, May 2001.

[PH12] Response to HIV/AIDS – A Universal Policy. My thoughts on what a national policy on controlling HIV/AIDS should be.
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/hivpolicy.html

[PH13] Being a Good Role Model: A talk to parents and teachers in India on the importance of setting a good example.
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/rolemodel.html

[PH14] Students as agents of change: tackling societal problems in India
Invited talk at "AIDS-in-India". Conference organized by IHO and the Harvard School of Public Health, Dec 7, 2001

[PH15] Developing partnerships for improving health in India
Invited talk at "Health and Security". A workshop organized by CBACI, 18 June 2002, Geneva

[PH16] Reaching kids by being a kid: HIV/AIDS intervention
Invited talk at "UNIDOS 2002" New Mexico Department of Health, Las Cruces, NM

[PH17] Why has the number 4 million HIV+ failed to elicit the required response in India?
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/documentation.html

[PH18] Five questions on HIV/AIDS in India following the National Parliamentarians Forum, July 2003
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/fivequestions.html

[PH19] Should commercial sex be designated sex work or prostitution in the era of HIV/AIDS?

http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/sex-work.html

[PH20] Thoughts on the workshop "Land, Community and Governance" organized in Udaipur by Seva-Mandir during 12-13 September, 2003.
Published in the Seva-Mandir Newsletter, Volume October 2003 - March 2004.
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/SM03conf.html

[PH21] Risky Sex, Addictions, and Communicable Diseases in India: Implications for Health, Development and Security.
Published as a special monograph (Number 9 in the series on Health and Security) by Chemical and Biological Arms Control Institute, Washington D.C., September 2004
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/Gupta_HIV_India.pdf

[PH22] "Teen Freedoms, Sexual Health, and Making the Right Choices"
Keynote address at "UNIDOS 2004" New Mexico Department of Health, Las Cruces, NM, October 2004.

[PH23] "HIV/AIDS and the Future of the Poor, Illiterate and Marginalized Populations"
Plenary talk at the International Symposium "The future of Life and the Future of Our Civilization", Frankfurt, May 2005. Proceedings Pages 379-400, Ed. Vladimir Burdyuzha, Springer, 2006. Also available at
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/HIV_poor_future.pdf

[PH24] "HIV/AIDS, a thermometer for the Future of the Poor: India a case study"
Colloquium at the Morrison Institute, Stanford University, January 2006.

[PH25] "Teen Freedoms, Sexual Health, and Making the Right Choices"
Keynote address at "UNIDOS 2006" New Mexico Department of Health, Las Cruces, NM, November 2006.

[PH26] "HIV, Empowerment, and how concerned people can contribute"
Invited talk at "The Feminine Epidemic: Global Intersections of Women and HIV/AIDS" A conference presented by the Student Global AIDS Campaign at University of Chicago, 26 May 2007. (LAUR-07-3557)
http://cnls.lanl.gov/~rajan/AIDS-india/MYWORK/Gupta_HIV_SW.pdf

[PH27] "Addressing Teen Pregnancy: Intervention & Support"
Keynote presentation at "New Mexico Teen Pregnancy Coalition Annual Conference," Albuquerque, 4 May 2012.

PUBLICATIONS AND INVITED TALKS IN EDUCATION

[E2] Education: A Key to Development: Lessons from India
Plenary talk at the International Conference *Models of Universities in the Arab World*, Beirut, Lebanon, 23-24 October 2003.
http://t8web.lanl.gov/people/rajan/AIDS-india/MYWORK/education_India_Arab.pdf

[E1] Strategic Research at Los Alamos
(with D. Watkins)
Los Alamos Science, Volume Number 28 "Celebrating 60 years", 2003.

PUBLICATIONS AND INVITED TALKS IN INFORMATION SCIENCE

[IS4] Gupta, R., "Global Energy Observatory: A one-stop site for information on energy systems, infrastructure and emissions", 18th Annual International Emission Inventory Conference "Comprehensive Inventories -Leveraging Technology and Resources"; Baltimore, Maryland - April 14 - 17, 2009
http://www.epa.gov/ttn/chief/conference/ei18/session4/gupta.pdf
Los Alamos Preprint Number LA-UR-09-01804

[IS3] Gupta, R., "Mapping, Monitoring and Modeling the Global Energy System"," Workshop on Volunteered Geographic Information, University of California Santa Barbara, 13-14 December, 2007, (http://ncgia.ucsb.edu/projects/vgi/)

[IS2] Gupta, R., "Volunteered Information: part of a toolkit to address complex global challenges"," Workshop on Volunteered Geographic Information, University of California Santa Barbara, 13-14 December, 2007, (http://ncgia.ucsb.edu/projects/vgi/)

[IS1] Gupta, R.,"Mapping the global energy system using Google Earth, Wikis, and Open Sources", Interlab 2007 Workshop, Los Alamos, October 1-3, 2007.
(http://www.lanl.gov/interlab/)

PLENARY/REVIEW TALKS AND SUMMER SCHOOL LECTURES IN HIGH ENERGY PHYSICS AND COMPUTATIONAL PHYSICS

[1] Monte Carlo Renormalization Group in Lattice Gauge Theories.
APS Spring Meeting, Baltimore, Maryland; 1985.

[2] Monte Carlo Renormalization Group: A Review.
Plenary talk at the *International Conference on Lattice Gauge Theories.* Wuppertal, West Germany; 1985.

[3] Open Problems in Monte Carlo Renormalization Group: Application to Critical Phenomena.
31^{st} *Annual Conference on Magnetism and Magnetic Materials*, Baltimore Maryland, 1986.

[4] Food for Thought: Five Lectures on Lattice Gauge Theories.
1^{st} *CCAST Symposium/Workshop on Lattice Gauge Theory Using Parallel Computers*, Beijing, Peoples Republic of China, 1987.

[5] Introduction to Lattice Gauge Theory.
Lectures at the Fourth TASI in Elementary Particle Physics, Santa Fe, New Mexico, July 1987.

[6] The Renormalization Group and lattice QCD.
Lectures at Sixth TASI in Elementary Particle Physics, Boulder, Colorado, June 1989.

[7] The finite temperature transition in QCD and the equation of state near T_c.
QUARK MATTER 88, Lennox, Massachusetts (Sept. 1988).

[8] Status of Lattice QCD (Core lectures).
1989 U.K. Summer Institute in Theoretical Physics, Durham, U.K., August 1989.

[9] Hadron spectrum from the lattice.
Plenary talk at International Symposium on Lattice Field Theory, LATTICE89, Capri, Italy, 1989
Nuclear Physics **B** *(Proc. Suppl.)* **17** (1990) 70.

[10] QCD spectrum from the lattice.
Plenary talk at HADRON 89, Ajaccio, France.
Edited by F. Binon et.al., Editions Frontieres 1989, page337

[11] Scaling, the Renormalization Group and Improved Lattice Actions.
One chapter in the book **Quantum Fields on the Computer,** Ed. M. Creutz, World Scientific, 1992.

[12] Calculations of matrix elements using lattice QCD.
Mardi Gras '93 Conference *High Performance Computing and its Applications in the Physical Sciences*, Ed Dana Browne, World Scientific 1994.

[13] Standard Model Phenomenology from the Lattice. Six core lectures at the *XXXIV Cracow Summer School*, Zakopane, Poland, June 1994.

[14] Chiral limit of QCD.
Plenary talk at the *International Symposium on Lattice Field Theory, LATTICE 88*, Bielefeld, Germany.
Nuclear Physics **B** *(Proc. Suppl.)* **42** (1995) 85.

[15] The chiral behavior of quenched and unquenched QCD.
International workshop *Lattice QCD and the Structure of matter, Present and Future*, Cartona, Italy, Feb 7- 11, 1995.

[16] Common trends in multigrid and renormalization group methods.
International conference *Multiscale Phenomena*, Eilat, Israel, Feb 20-24, 1995.

[17] Status report on weak matrix element calculations.
International Symposium on Lattice Field Theory, LATTICE95, Melbourne, Australia.
Nuclear Physics **B** *(Proc. Suppl.)* **47** (1996) 473.

[18] Critical Exponents of the 3-D Ising Model.
US-Japan Bilateral Seminar, Maui, August 1995.
International Journal of Modern Physics **C7** (1996), 305-319, cond-mat/9601048.

[19] Quark masses from lattice QCD.
International symposium on *Multiscale Phenomena and their simulation*, Bielefeld, Germany, 1996.

[20] Light quark masses.
1997 Joint April APS/AAPT meeting, Washington D.C., April, 1997.

[21] Advances in the determination of Quark Masses
Nuclear Physics **B** *(Proc. Suppl.)* **63A-C** (1998) 95.
Plenary talk at *International Symposium on Lattice Field Theory, LATTICE 97*, Edinburgh, U.K..
Los Alamos Preprint Number LA-UR-97-4355.

[22] Introduction to Lattice QCD.
Core lectures at the LXVIII Les Houches Summer School *Probing the Standard Model of Particle Interactions*, July 28 - Sept 5, 1997, Eds. R. Gupta, A. Morel, E. de Rafael and F. David, North-Holland, 1999.

[23] Quark Masses, B-parameters, and CP violation parameters ϵ and ϵ'/ϵ
Review talk given at CPMASS 1997, Portugal.

[24] Quark Masses, B-parameters, and CP violation parameters ϵ and ϵ'/ϵ
in *Physics of Mass* Proceedings of an International Conference on Orbis Scientiae 1997 II, Miami Beach, Florida, December 12–15, 1997. Edited by B. Kursunoglu, S. Mintz, A. Perlmutter, Plenum Press, 1998.

[25] General Physics Motivations for Numerical Simulations of Quantum Field Theory
Parallel Computing **25** (1999) 1199.

[26] Prospects of calculating ϵ_K and ϵ' from lattice QCD
KAON 99, Eds. J.L. Rosner and B. D. Winstein, University of Chicago Press, 2001.

[27] LATTICE QCD
Core lectures at the VIII Mexican School "Particles and Fields", Oaxaca de Juárez, November 20th – 28th 1998, Eds. J.C. DÓlivo, G.L. Castro, and M. Mondragon, AIP Conference Proceedings 490, 1999.

[28] "Light quark masses: A status report",
(with K. Maltman) Review at DPF 2000, The Ohio State University
Int.J.Mod.Phys. **A16S1B** (2001) 591

[29] Status of B_K from Lattice QCD
Review at the first CKM Unitarity Triangle Workshop, CERN Geneva, 2002
[30] When will High Performance Computing become a mature tool to think with?
International Workshop on "*Science on Cluster Computers*",
WE-Heraeus-Seminar, Bad Honnef, Germany, August 22 - 24, 2002.
http://www.theorie.physik.uni-wuppertal.de/Cluster2002/talks.phtml
Los Alamos Preprint Number LA-UR-02-6733
[31] Light Quark Masses from Lattice QCD and QCD Sumrules
Review at the second CKM Unitarity Triangle Workshop, Durham U.K, 2003
[32] Simulating a Fundamental Theory of Nature
Plenary Talk at "The Monte Carlo Method in Physical Sciences", Los Alamos, June 2003
AIP Conference Proceedings, Volume 690, Pages 110-122.
[33] Phenomenology using Lattice QCD
Proceedings of PASCOS 2004 (Nath Festschrift), Boston, September 2004. World Scientific 2005.
[34] The QCD transition temperature from simulations on BlueGene L Supercomputer at LLNL; *QCD in extreme conditions*, Laboratori Nazionali di Frascati dell' INFN, Roma, Italy, August 6-8, 2007.
[35] Equation of State and the finite temperature transition in QCD *Invited talk at the 2009 DPF Meeting*, Wayne State University, Detroit, USA, July 27-31, 2009.
[36] Equation of State and the finite temperature transition in QCD *Invited talk at the Third Joint Meeting of the Nuclear Physics Division of the American Physical Society and The Physical Society of Japan*, Waikoloa, HI, USA, Oct13-19, 2009.
[37] Equation of State from Lattice QCD *Invited talk at the Sixth International Conference ICPAQGO-2010*, Goa, India, Dec 6-10, 2010.
[38] Probing novel scalar and tensor interactions at the TeV scale *Invited talk at CIPANP 2012*, Saint Petersburg, Florida, 29 May 3 June, 2012.
[39] Probing novel interactions at the TeV scale using precision measurements of neutron beta decay. *Invited talk at STRONGNET-2012*, Madrid, Spain, Oct 15-19, 2012.
[40] Matrix elements of novel operators in the nucleon state to probe physics at the TeV scale Trento Workshop "Nucleon Matrix Elements for New-Physics Searches, Trento, July 24-27, 2013
[41] g_A, g_S and g_T. Solvay Workshop on "Beta-Decay: Weak Interaction Studies in the era of the LHC", Brussels, September 3-5, 2014
[42] Exploring Novel Physics at the TeV Scale through Lattice QCD Simulations of the Nucleon. Invited talk at Gerald S. Guralnik Symposium - The Value of Just Imagining, Brown University, April 10, 2015
[43] Exploring Novel CP Violation through Lattice QCD Simulations. Invited talk at Richard Arnowitt Symposium. Texas A&M University, May 18, 2015
[44] Probing novel CP violating interactions through neutron EDM. Invited talk at Benasque School "High Precision QCD at Low Energy", Benasque, Spain, August 2-22, 2015

[45] Introduction to probing the nuclear structure using Lattice QCD. Invited talk at "Electromagnetic Interactions with Nucleons and Nuclei", Paphos, Cyprus, November 1-7, 2015

[46] Nucleon Charges and Probing Novel CP violation via Neutron EDM Invited talk at "Probing Fundamental Symmetries and Interactions with UCN", Mainz, April 11, 2016

[47] "Baryogenesis, novel CP violation and the neutron electric dipole moment on the lattice" QCDNA, Edinburgh, August 1-3, 2016.

[48] The Contribution of Novel CP Violating Operators to the nEDM using Lattice QCD Invited talk at the "XIIth Quark Confinement and the Hadron Spectrum," (CONF12), Thessiloniki, Greece, 2016

[49] "Nucleon TMDs from Lattice QCD", Invited talk at the "Joint CTEQ and POETIC 7 Meeting", November 14-18, 2016, Philadelphia, PA, USA

[50] "Nucleon Matrix Elements", Invited talk at at PDFLattice2017 Workshop, Oxford March 22-25, 2017

[51] "Status of g_A calculations and future prospects" Invited talk at Lattice QCD Input for Neutrinoless Double β Decay, INT, July 6-7, 2017.

[52] "Nucleon TMDs from Lattice QCD", Invited talk at at POETIC 8 Conference, Regensburg, March 19-23, 2018.

[53] "Nucleon Matrix Elements", Santa Fe Workshop on Lattice QCD, Santa Fe, August 25–29, 2017.

[54] "Present and future lattice QCD predictions for nEDM arising from various CP-violating mechanisms" Invited talk at EDM theory workshop, CERN, March 26, 2018.

[55] "Lattice QCD calculations of the quark and gluon contributions to the proton spin" Plenary talk at at SPIN 2018, Ferrara, September 10-14, Italy, https://pos.sissa.it/346/018/

[56] "Present and future prospects for lattice QCD calculations of matrix elements for nEDM" Invited talk at at SPIN 2018, Ferrara, September 10-14, Italy, https://pos.sissa.it/346/095/

[57] "g_A from lattice QCDM" Invited talk at CKM2018 Conference, Heidelberg Germany, Sept 17-21, 2018

[58] "Electric, Magnetic and Axial VectorForm Factors from Lattice QCD", ECT*, Trento: 28 May 2019.

[59] "Electric, Magnetic and Axial Vector Form Factors from Lattice QCD", Lepton Interactions with Nucleans and Nuclei", Marciana Marina (Isolad'Elba), Elba, 2019

[61] "Nucleon Matrix Elements and Nucleon Structure", Lectures at Beijing Summer School, Peking University, June 2019.

[62] "Nucleon Matrix Elements from lattice QCD", Santa Fe Workshop on Lattice QCD, Santa Fe, August 25–29, 2019.

[63] "Axial Vector Form Factors: Solution to the PCAC puzzle", NuMu2019, PSI, Oct 25, 2019

[64] "Axial Vector form factors for neutrino-nucleus scattering", CNNP2020, South Africa: 28 Feb 2020

[65] "Axial Vector form factors for neutrino-nucleus scattering", Neutrino Frontier for Snowmass, 17 July 2020

[66] "Contributions of CP Violating Operators to the Neutron/Proton EDM from Lattice QCD: Status and Future Prospects", 744. WE-Heraeus-Seminar Towards Storage Ring EDM Measurements, University of Bonn, Germany, March 29-31, 2021