

Prof. Krishna S. Kumar

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Education and Professional Experience

1979-84: M.Sc. (Physics), Indian Institute of Technology, Mumbai, India
1984-1990: Ph.D. (Physics), Syracuse University, NY
1990-93: Research Associate, Harvard University, MA. (L3 Experiment at CERN)
1993-99: Assistant Professor, Princeton University, NJ
1999-2004: Associate Professor, University of Massachusetts, Amherst, MA
2004-2014: Professor, University of Massachusetts, Amherst, MA
2014-2019: Professor, Stony Brook University, SUNY, Stony Brook, NY
2019-: Research Professor, Stony Brook University, SUNY, Stony Brook, NY
2019-: Gluckstern Professor, University of Massachusetts, Amherst

Main Research Field

Experimental Particle and Nuclear Physics: Beyond the Standard Model Searches at Low Energy, Tests of Fundamental Symmetries & Conservation Laws, Neutral Weak Interactions, Structure of the Nucleon and Tests of Low Energy QCD, Neutrinoless Double-beta Decay.

Professional Collaborations and Leadership

- **PRINCIPAL SPOKESPERSON:** SLAC E158 Collaboration, JLab MOLLER Collaboration
- **CO-SPOKESPERSON:** JLab HAPPEX-II and PREX-II Collaborations
- **EXECUTIVE BOARD MEMBER:** nEXO
- **COLLABORATION MEMBER:** EXO-200, SLAC E154 (1993-1999), L3 (1990-1995)

Awards and Honours

1990: Doctoral Prize, Graduate School, Syracuse University
1990: Peter Demos Award, MIT-Bates Linac Users Group
1995: Outstanding Junior Investigator Award, US DOE High Energy Physics
2005: Fellow, Division of Nuclear Physics, American Physical Society

Selected Professional Service

2007-8: Member, Executive Committee of Division of Nuclear Physics, APS
2008: Co-organizer, 10 week program on Low Energy Precision Tests of the Standard Model in the LHC Era, INT, Seattle, USA
2009: Member, Scientific Program Committee of CIPANP2009
2010: Lecturer, Joint US-Canadian National Nuclear Physics Summer School
2010: Lecturer, Joliot-Curie French Nuclear Physics Summer School
2010: Co-organizer, Workshop on Standard Model Precision Tests, ECT*, Italy
2010-11: Member, Fellowship Committee of the Division of Nuclear Physics, APS
2011: Member, Organizing Committee of PAVI11
2011: Chair, NSAC Subcommittee on Fundamental Physics with Neutrons
2012: Member, NSAC Subcommittee on the Implementation of the 2007 LRP
2012-14: Member, Nominating Committee, Division of Nuclear Physics, APS
2015: Member, 2015 NSAC Long Range Plan Writing Group
2016-18: Member, Editorial Board, Physical Review C
2017: Chair, Jefferson Laboratory User Group Board of Directors
2020-21: Chair, Division of Nuclear Physics, American Physical Society

Selected Publications

Major results in **Nature** and **Physical Review Letters**:

- *New Measurements of the Beam-Normal Single Spin Asymmetry in Elastic Electron Scattering Over a Range of Spin-0 Nuclei*, PREX and CREX Collaborations, D. Adhikari et al, *Phys. Rev. Lett.*, to be published, arXiv: 2111.04250 [nucl-ex]
- *Accurate Determination of the Neutron Skin Thickness of ^{208}Pb through Parity-Violation in Electron Scattering*, PREX Collaboration, D. Adhikari et al, *Phys. Rev. Lett.* **126**:172502 (2021)
- *Search for Neutrinoless Double-Beta Decay with the Upgraded EXO-200 Detector*, EXO-200 Collaboration, J.B. Albert et al, *Phys. Rev. Lett.* **120**:072701 (2018)
- *Search for Majorana Neutrinos with the First Two Years of EXO-200 Data*, EXO-200 Collaboration, J.B. Albert et al, *Nature* **510**, 229-234 (2014)
- *Measurement of the Parity Violation in Electron-Quark Scattering*, PVDIS Collaboration, D. Wang et al, *Nature*. **506**:7486, 67-70 (2014)

Spokesperson of experiments that produced major results (**250+ citations**):

- *Measurement of the Neutron Radius of ^{208}Pb with Parity-Violating Electron Scattering*, PREX Collaboration, S. Abrahamyan et al, *Phys. Rev. Lett.* **108**:112502 (2012)
- *Precision Measurements of the Nucleon Strange Form Factors at $Q^2 \sim 0.1 \text{ GeV}^2$* , HAPPEX Collaboration, A. Acha et al, *Phys. Rev. Lett.* **98**:032301 (2007)
- *Precision Measurement of the Weak Mixing Angle in Møller Scattering*, SLAC E158 Collaboration, P.L. Anthony et al, *Phys. Rev. Lett.* **95**:081601 (2005)

Review Articles

- *Low Energy Measurements of the Weak Mixing Angle*, K.S. Kumar, S. Mantry, W.J. Marciano and P.A. Souder, et al, *Ann. Rev. Nucl. Part. Sci.* **63** (2013)
- *Physics Opportunities with the 12 GeV Upgrade of Jefferson Lab*, J. Dudek et al, *Eur. Phys. J.* **A48**:187 (2012)

Selected Recent Invited Talks at International Meetings

- *Low Energy Measurements of the Weak Mixing Angle*, Invited talk at COFI Workshop on BSM Physics with Charged Leptons, San Juan, Puerto Rico, May 2018
- *Neutron Skins in Nuclei*, Invited talk at “Nuclear Astrophysics in the Era of Multi-Messenger Astronomy”, Annals of Physics Workshop, Columbia University, June 2018
- *Low Energy Probes of the Standard Model*, Invited talk at “Standard Model at 50”, SLAC Summer School, Menlo Park, CA, July 2018
- *The PREX, CREX and MOLLER Experiments at Jefferson Lab*, Invited talk at the MITP Workshop, Mainz, Germany, April 2018
- *Beyond the Standard Model with Electron Scattering*, Invited talk at the Photonuclear Reactions Gordon Research Conference, Holderness, NH, August 2016

Mentoring

- **PhD Students**: G.W. Miller (UVA), David Relyea (Blackberry), Lisa Kaufman (SLAC), Luis Mercado (Sleep Number Corp), Jon Wexler (NC State), Tyler Kutz (MIT), Oumarou Njoya (Intel), Ryan Richards (UVA), Cameron Clarke (Canon Medical), Tao Ye (ByteDance), Jon Mott
- **Research Associates**: Carlos Arroyo, Kent Paschke (UVA), Dustin McNulty (Idaho State), Juliette Mammei (Manitoba), Seamus Riordan (Accenture), Yuxiang Zhao (USTC), Nickie Saylor (Arete Associates), Michal Tarka (UC Santa Cruz), Chandan Ghosh, Hanjie Liu, Jason Bane