

## Prof. Krishna S. Kumar

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### Personal Information

Address: Department of Physics  
University of Massachusetts, Amherst  
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### Scientific Career and Professional Experience

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

### 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, Weak Structure of Hadrons, Proton Spin Structure, Precision Tests of Low Energy QCD.

### Professional Collaborations and Leadership

- **PRINCIPAL SPOKESPERSON:** SLAC E158 Collaboration, JLab MOLLER Collaboration
- **CO-SPOKESPERSON:** Jefferson Laboratory HAPPEX-H and PREX Collaborations
- **COLLABORATION MEMBER:** EXO, Mu2e, SLAC E154, 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

### Professional Service during the past Five Years

2006: Chair, US National Nuclear Physics Summer School Committee  
2006: Co-convenor, EW & BSM Physics session at CIPANP2006  
2006-7: Member, Program Committee of Division of Nuclear Physics, APS  
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, International Advisory Committee of PAVI09  
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 Precision Tests of the Standard Model, ECT\*, Trento, Italy  
2010-11: Member, Fellowship Committee of the Division of Nuclear Physics, APS

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- 2011: Member, Organizing Committee of PAVI11
- 2011: Co-convenor, Session on Tests of Symmetries and Conservation Laws, PANIC 11, Boston, USA
- 2011: Chair, NSAC Subcommittee on Fundamental Physics with Neutrons
- 2012: Member, NSAC Subcommittee on the Implementation of the 2007 Long Range Plan of Nuclear Science.

### Selected Publications

Major results in the recent past in **Physical Review Letters**:

- *Search for Neutrinoless Double-Beta Decay in  $^{136}\text{Xe}$  with EXO-200*, EXO-200 Collaboration, M. Auger et al, *Phys. Rev. Lett.* **109**:032505 (2012)
- *Measurement of the Neutron Radius of  $^{208}\text{Pb}$  with Parity-Violating Electron Scattering*, PREX Collaboration, S. Abrahamyan et al, *Phys. Rev. Lett.* **108**:112502 (2012)
- *New Precision Limit on the Strange Form Factors of the Proton*, HAPPEX Collaboration, Z. Ahmed et al, *Phys. Rev. Lett.* **108**:102001 (2012)
- *Observation of Two-Neutrino Double-Beta Decay in  $^{136}\text{Xe}$  with EXO-200*, EXO-200 Collaboration, N. Ackerman et al, *Phys. Rev. Lett.* **107**:212501 (2011)

Principal spokesman of major experimental results with **100+ citations**:

- *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)

### Selected Recent Invited Conference Talks

- *Low Energy Standard Model Tests with Parity-Violating Electron Scattering*, invited talk at the "Electron-Nucleus XII", Elba, Italy, June 2012
- *Parity-Violating Electron Scattering: MeV to TeV Physics*, Invited talk at the 50<sup>th</sup> International Meeting on Nuclear Physics, Bormio, Italy, January 2012
- *High Precision Electroweak Measurements with Electrons and Muons*, plenary talk at the 10<sup>th</sup> Seminar of the International Committee on Future Accelerators, CERN, Geneva, Switzerland, October 2011
- *Searches for BSM Physics at Low Energy*, plenary talk at the Fall Meeting of the Division of Particles and Fields (DPF2011), Providence, RI, August 2011
- *What is the Proton Made of?* Invited pedagogical plenary lecture at the 19<sup>th</sup> Particles and Nuclei International Conference (PANIC11), MIT, Cambridge, MA, July 2011
- *Introduction to Parity-Violating Electron Scattering*, Opening talk at the Minisymposium on Parity-Violation, APS April Meeting, Anaheim, CA, April 2011
- *Beyond the Standard Model with Electron and Muon Beams*, plenary talk at the International Nuclear Physics Conference (INPC2010), Vancouver, Canada, July 2010

### Mentoring

- **PhD Students**: G.W. Miller (Virginia), David Relyea (Caltech), Lisa Kaufman (Indiana), Luis Mercado, Sereres Johnston, Jon Wexler, Tyler Kutz
- **Research Associates**: Carlos Arroyo, Kent Paschke (Virginia), Dustin McNulty (Idaho State), Juliette Mammei (University of Manitoba), Seamus Riordan