May, 2023

SHORT VITA

Ubirajara L. van Kolck

Employment

1. Directeur de Recherche, Centre National de la Recherche Scientifique, since Jan. 2012.
2. Professor, Department of Physics, University of Arizona, since Aug. 2009.
3. Associate Professor, Department of Physics, University of Arizona, Aug. 2003–July 2009.
4. RHIC Physics Fellow, RIKEN BNL Research Center, Brookhaven National Laboratory, Aug. 2000–July 2004.
5. Assistant Professor, Department of Physics, University of Arizona, Aug. 2000–July 2003.
6. Senior Research Fellow; Kellogg Radiation Laboratory, California Institute of Technology, Jan. 1998–Aug. 2000.
7. Research Assistant Professor, Department of Physics, University of Washington, Mar. 1996–Dec. 1997.
8. Research Associate, Department of Physics, University of Washington, Sep. 1993–Feb. 1996.

Degrees

Ph.D. (Physics)	University of Texas, Austin, USA, 1993	Adviser: S. Weinberg
M.Sc. (Physics)	Instituto de Física Teórica, São Paulo, Brazil, 1987	Adviser: B. Pimentel
B.Sc. (Physics)	Universidade de São Paulo, Brazil, 1984.	

Affiliate and Visiting (≥ 1 mo.) Positions

1. EMMI Associated Partner, ExtreMe Matter Institute, GSI Helmholtzzentrum für Schwerionenforschung GmbH, Feb. 2013–present.
2. Affiliate Professor, Instituto de Física Teórica, Universidade Estadual Paulista, São Paulo, Nov. 2010–present.
3. Affiliate Professor, Department of Physics, University of Washington, Aug. 2009–present.
4. Visiting Scholar, Institute for Nuclear Theory, Seattle, July–Aug. 2000, Sep.–Dec. 2003, Sep.–Nov. 2004, Mar.–June 2009, Apr.–May 2010, and Apr.–May 2016
5. Affiliate Member, Program in Applied Mathematics, University of Arizona, Aug. 2004–July 2013.
6. Affiliate Associate Professor, Department of Physics, University of Washington, Aug. 2003–Aug. 2009.
7. FAPESP Visiting Professor (MS-6), Instituto de Física Teórica, Universidade Estadual Paulista, São Paulo, Jan.–Aug. 2007.
8. FOM Visiting Scientist, Kernfysisch Versneller Instituut, Groningen, Oct. 2006–Jan. 2007.
9. Affiliate Assistant Professor, Department of Physics, University of Washington, Feb. 2002–July 2003.

Selected Honors

- Member, Academia Europaea, 2020.
- 2020 Herman Feshbach Prize in Theoretical Nuclear Physics, American Physical Society.
- 2019 Henry and Phyllis Koffler Prize in Research, Scholarship and Creative Activity, University of Arizona.
- 2019 Outstanding Referee, American Physical Society.
- Prix Paul Langevin 2015, Société Française de Physique.
- Prime d'excellence scientifique, Centre National de la Recherche Scientifique, Nov. 2012–Oct. 2016.
- Outstanding Reviewer, *Annals of Physics* (Elsevier), Aug. 2014.
- Chair of the Department of Applied Mathematics and Sciences, Khalifa University of Science, Technology and Research (KUSTAR), Abu Dhabi, Fall 2012. Offer declined.
- Excellence in Graduate Physics Teaching Award, University of Arizona, 2009.
- Sloan Research Fellow, Alfred P. Sloan Foundation, Sep. 2002–Sep. 2006.
- Fellow, American Physical Society, 2004.
- Outstanding Junior Investigator, U.S. Department of Energy, August 2001–July 2004.
- Professor of Theoretical Physics and Theory Group Leader at the Kernfysisch Versneller Instituut, Rijksuniversiteit Groningen, Fall 2003. Offer declined.

Selected Funding Awards

- Principal Investigator, Projet IN2P3 "AIQI", CNRS, since Jan. 2023.
- Principal/Co-Principal Investigator, US DOE grant DE-FG02-04ER41338, since Aug. 2004.
- Principal Investigator, Programme CAPES-COFECUB, Campus France, Jan. 2020–Dec. 2023.
- Principal/Co-Principal Investigator, Laboratoire International Associé France-Brésil, CNRS, Jan. 2018–Dec. 2022.
- Principal Investigator, Projet International de Coopération Scientifique avec la Chine, CNRS, Jan. 2014–Dec. 2016.
- Principal Investigator, Programme Xu Guangqi, Campus France, Jan.–Dec. 2014.
- Principal Investigator, Projets de Physique Théorique, CNRS/IN2P3, Jan. 2012–Dec. 2016.
- Principal Investigator, Université Paris-Sud Attractivité 2013 grant, Jan.–Dec. 2013.
- Outstanding Junior Investigator, Department of Energy grant DE-FG03-01ER41196, Aug. 2001–July 2004.

Teaching Experience, Mentoring, and Related Activities

- Instructor/co-instructor of 11 graduate, 16 undergraduate, and over 35 independent study or honors thesis courses; Université Paris-Saclay and University of Arizona, since Spring 2001.
- Supervisor/co-supervisor of 9 postdoctoral (1 current), 13 Ph.D. (1 current), and 1 M.Sc. students; California Institute of Technology, University of Arizona, Institut de Physique Nucléaire d'Orsay, and Laboratoire Irène Joliot-Curie, since Spring 1998.
- Member of 4 Habilitation, 31 Ph.D., and 2 M.Sc. defense committees; California Institute of Technology, University of Arizona, Rijksuniversiteit Groningen, Université Paris-Sud, and Université Paris-Saclay, since Spring 2002.

Selected Service

- Organizer of 40 meetings and advanced schools; Brazil, Chile, China, Ecuador, France, Italy, Netherlands, USA, and Vietnam, since Sep. 1996.
- Member of 29 advisory, organizing, or program committees of international conferences; Brazil, Chile, China, Ecuador, France, Germany, Italy, Japan, Netherlands, South Africa, Switzerland, and USA, since July 2000.
- Member of editorial boards: *Physical Review C* (American Physical Society), 2015–2017; *Progress in Particle and Nuclear Physics* (Elsevier), 2009–2013.
- Internal reviewer, Flavor Lattice Averaging Group (FLAG) Review: FLAG 2021, July 2021; FLAG 2019, November 2018.
- Referee for over 185 articles for journals such as *Physical Review A, C, D & Letters*, and *Nature Physics*, and 5 book outlines/drafts for Oxford and Cambridge University presses, since 1993.
- Vice–Chair, Chair–Elect, Chair, and Past–Chair of the Topical Group on Few–Body Systems and Multiparticle Dynamics; American Physical Society, 2008–2012.
- Member/chair of 12 committees or subcommittees; American Physical Society, since Spring 2001.
- Member of the Nuclear Science Advisory Committee (NSAC) and the NSAC Subcommittee on Nuclear Physics Performance Measures and Milestones; US DOE and NSF, Jan. 2006–Dec. 2008.
- Member of funding panels: Ramón y Cajal and Juan de la Cierva Contracts, Agencia Nacional de Evaluación y Prospectiva, Spain, 2005; Nuclear Theory Review Panel, US NSF, 2003.
- Reviewer of over 60 grant proposals/fellowship applications for agencies such as US DOE, NSF, and ERC, since 1998.
- Member of evaluation committees: Institut de Physique de Nice, Haut conseil de l'evaluation de la recherche et de l'enseignement supérieur (HCERES), France, 2016/7; High Intensity Gamma Source (HIGS) Review Panel, US DOE, 2005.
- Member of institutional advisory boards: European Centre for Theoretical Studies in Nuclear Physics and Related Areas (ECT*), Trento, 2014–2017; Institute for Nuclear Theory (INT), Seattle, 2014–2017.
- Referee for 26 external faculty promotions/transfers and 4 faculty hirings; Brazil, France, Germany, India, Italy, Netherlands, Switzerland, UAE and USA, since 2003.
- Co-coordinator of the Working Group GT3, *Groupement de Recherche Réactions, Structure et Astrophysique Nucléaire*, CNRS, Jan. 2018–Dec. 2022.
- Chargé de mission Relations internationales et communication, Institut de Physique Nucléaire, Orsay, 2012–2016.
- Member/chair of over 50 departmental committees; University of Arizona, since 2000.

Scholarly Presentations

- 140 invited talks at conferences, and 173 seminars/colloquia at universities/laboratories and contributed conference talks; Argentina, Australia, Belgium, Brazil, Canada, China, Czech Republic, England, Finland, France, Germany, India, Italy, Japan, Korea, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Turkey, and USA, since July 1987.
- 22 courses in advanced/summer schools; Brazil, China, France, Germany, India, Italy, Korea, Portugal, South Africa, Tunisia, and USA, since June 1992.

Main Publication Output

- 108 research and review papers in refereed journals; *Ann. Phys.* (5), *Ann. Rev. Nucl. Part. Sci.* (2), *Can. J. Phys.* (1), *Eur. Phys. J. A* (4), *Few–Body Syst.* (6), *Front. Phys.* (1), *J. Phys. G* (3), *Nucl. Phys. A* (13), *Phys. Lett. B* (21), *Phys. Rev. A* (4), *C* (29), *D* (1), *& Lett.* (12), *Phys. Scr.* (1), *Prog. Part. Nucl. Phys.* (2), *Prog. Theor. Phys.* (1), *Rev. Mod. Phys.* (1), and *Symmetry* (1), since 1988.
- 42 papers in conference proceedings (most refereed), since 1995.
- 6 book chapters, since 1995.
- 3 books and 1 journal special issue edited, since 1998.
- 3 popular papers in outreach media, since 2001.
- 5 committee reports/white papers, since 1998.

Citation Metrics [Google Scholar, 21 May 2023]

- citations: 14,634
- $h = 58$
- $i10 = 111$

Top Cited Papers [Google Scholar, 21 May 2023]

1. "Effective Field Theory for Few–Nucleon Systems", P.F. Bedaque and U. van Kolck, *Ann. Rev. Nucl. Part. Sci.* **52** (2002) 339. [930 citations]
2. "The Two–Nucleon Potential from Chiral Lagrangians", C. Ordóñez, L. Ray, and U. van Kolck, *Phys. Rev. C* **53** (1996) 2086. [797 citations]
3. "Few–Nucleon Forces from Chiral Lagrangians", U. van Kolck, *Phys. Rev. C* **49** (1994) 2932. [707 citations]
4. "Renormalization of the Three–Body System with Short–Range Interactions", P.F. Bedaque, H.-W. Hammer, and U. van Kolck, *Phys. Rev. Lett.* **82** (1999) 463. [683 citations]
5. "Nucleon–Nucleon Potential from an Effective Chiral Lagrangian", C. Ordóñez, L. Ray, and U. van Kolck, *Phys. Rev. Lett.* **72** (1994) 1982. [553 citations]
6. "Electric Dipole Moments of Nucleons, Nuclei, and Atoms: The Standard Model and Beyond", J. Engel, M.J. Ramsey-Musolf, and U. van Kolck, *Prog. Part. Nucl. Phys.* **71** (2013) 21. [538 citations]
7. "Effective Field Theory of Short–Range Forces", U. van Kolck, *Nucl. Phys. A* **645** (1999) 273. [517 citations]
8. "The Three–Boson System with Short–Range Interactions", P.F. Bedaque, H.-W. Hammer, and U. van Kolck, *Nucl. Phys. A* **646** (1999) 444. [469 citations]
9. "Renormalization of One–Pion Exchange and Power Counting", A. Nogga, R.G.E. Timmermans, and U. van Kolck, *Phys. Rev. C* **72** (2005) 054006. [423 citations]
10. "Chiral Lagrangians and Nuclear Forces," C. Ordóñez and U. van Kolck, *Phys. Lett. B* **291** (1992) 459. [423 citations]

Representative Achievements

- First derivation of nuclear forces from Chiral Effective Field Theory and quantitative fit to nucleon–nucleon phase shifts
- Renormalization–group formulation of singular potentials, including those from Chiral EFT
- Formulation of Pionless (Contact) EFT for atomic and nuclear systems with large scattering lengths

- Renormalization–group analysis of the three– and four–body systems with short–range interactions and discovery of the limit–cycle behavior of the three–body force
- Demonstration that light nuclei are perturbatively close to the unitarity limit, while alpha-particle nuclei clusterize
- First calculation of the universal quantum–liquid properties of unitary bosons
- First predictions from lattice QCD for binding energies of nuclei heavier than the alpha particle and for light–nuclear reactions
- Formulation of the No-Core Shell Model as an EFT in a harmonic–oscillator basis and an infrared extrapolation method
- Proof–of–principle calculation of nuclear–matter properties using EFT in a finite spatial lattice
- Formulation of Halo/Cluster EFT and first applications to halo and cluster nuclei
- First systematic description of pion-nucleon scattering around the Delta peak in Chiral EFT, including explicit Delta and Roper fields
- Model–independent determination of nucleon polarizabilities from proton and deuteron Compton scattering
- Successful prediction of neutral–pion photoproduction on the deuteron at threshold
- Comprehensive analysis of isospin-breaking nuclear forces and successful prediction of the sign of charge–symmetry breaking in $pn \to d\pi^0$
- Extension of Chiral EFT to pion production in nuclear collisions and participation in the first experiment to measure the charge–symmetry–forbidden reaction $dd \to \alpha\pi^0$
- Formulation of X-EFT, an EFT with perturbative pions for exotic hadrons such as the $X(3872)$
- Development of a broad framework for the analysis of parity and time–reversal violation in nuclear systems, including first calculations of nucleon and light–nuclear electric–dipole form factors from all Standard–Model operators of dimension up to six
- First analyses of one– and two–unit baryon–number violation in nuclear EFT
- Discovery of a new leading mechanism in neutrinoless double–beta decay from Majorana neutrino exchange