Juan Cruz Estrada Vigil
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Employment History

- 2014-now Dark Matter and New Initiatives group leader, Astrophysics Dept., Fermilab
- 2011-now Senior Scientist at Fermilab, Particle Physics Division, Astrophysics Dept., Fermilab
- 2011-2014 Deputy Head for Detector Development and Operations Department , Fermilab
- 2008-2011 Scientist-I at Fermilab
- 2004-2008 Wilson Fellow at Fermilab (Associate Scientist) - Dark Energy Survey experiment
- 2002-2004 Postdoctoral Researcher at Fermilab - Dzero experiment

Education

- 2002 Ph.D., University of Rochester, Rochester, NY.
- 1998 Licenciado en Física, Instituto Balseiro, Argentina.
- 1991-1994 Undergraduate Student, Universidad Nacional de Buenos Aires, Buenos Aires, Argentina.

Recent Research Activities

- 2018 Skipper-CCD for quantum imaging, Principal Investigator
- 2018 - now Development of 10kg Skipper-CCD experiment, Principal Investigator
- 2018 - now Dark Matter as Sterile Neutrino Search Satellite, co-Principal Investigator
- 2017-2018 Short Baseline Neutrino program, L2 manager for Near Detector installation
- 2017- now MKIDs LDRD, Principal Investigator
- 2014-now CONNIE LDRD, Principal Investigator
- 2012-2018 DAMIC (spokesperson), search for DM with CCDs
- 2015-now Dark Energy Spectroscopic Instrument responsible for CCD detector packaging and characterization
- 2004-2017 Dark Energy Survey and Sloan Digital Sky Survey data analysis for galaxy clusters. (L2 co-manager for the focal plane of the Dark Energy Camera)

Teaching Experience

- “Charge-Coupled Devices for Dark Matter and Neutrinos” Mini-Course, School and Workshop on Dark Matter and Neutrino Detection, São Paulo, Brazil, July 23 – August 3, 2018.

- “Experimental searches for dark matter” Mini-Course, CINVESTAV, Mexico, June 17-19 2016,
- Instructor at ICFA School on Instrumentation in Elementary Particle Physics, Bogota, Colombia, 2013.
- “Tópicos de Cosmología Experimental” , Visiting Professor, Universidad de Buenos Aires, Argentina. 8/2012.
- Instructor at EDIT School on Instrumentation in Elementary Particle Physics, Batavia, Illinois, USA, 2013.
- “Instrumentación en Física de Altas Energías”, Visiting Professor, Universidad de Buenos Aires, Argentina, 8/2011 - 12/2011.
- Instructor at ICFA School on Instrumentation in Elementary Particle Physics, Bariloche, Argentina, 2010.
- Teaching Assistant for Physics Labs at University of Rochester, USA, 1998.

Successful Proposals and Awards

- 2018 PI for Quantum Information Science Grant: “Skipper-CCD: new single photon sensor for quantum imaging” (Grant amount $500k)
- 2018 PI for FNAL-LDRD: “Development of 10kg skipper-CCD experiments”. (Grant amount $523k)
- 2018 co-PI for FNAL-LDRD: “Dark Matter as Sterile Neutrino Search Satellite”. (Grant amount $634k)
- 2017 PI for FNAL-LDRD “Development of optical and near-IR Microwave Kinetic Inductance Detectors (MKIDs)”. (Grant amount $350K)
- 2017 co-PI for Fermilab-U.Chicago Fermilab Seed Grant for the development of MKIDs for CMB. (Grant amount $75K)
- 2014 PI for FNAL-LDRD for development of CONNIE experiment (Coherent Neutrino-Nucleus Interaction Experiment). (Grant amount $200K)
- 2013 Fermilab Inventors Award presented by the director for the development of a “High Resolution Neutron Imager by Means of a Boron coated CCD”.
- 2012-2013 co-PI Fermilab-U.Chicago Fermilab Seed Grant for the development of DAMIC readout electronics.
- 2013 Exceptional Performance Recognition Award at Fermilab “for outstanding contributions in bringing his deep knowledge of advanced principles of detection physics to the design, production, assembly and testing of the Dark Energy Camera imager, one of the most sophisticated light detectors ever made.”
- 2010 Presidential Early Career Award for Scientists and Engineers (PECASE). The PECASE Award is the highest honor bestowed by the U.S. government on outstanding scientists and engineers beginning their independent careers. The awards was conferred at the White House for “... widely-recognized

contributions to high energy physics and particle astrophysics experiments, and his invention of a new detector concept that can extend searches for dark matter particles into a range not covered by existing experiments; and for actively involving high school science students and teachers in this research."

- 2004 Radiation and Instrumentation Early Career Recognition given by the Institute of Electrical and Electronics Engineers (IEEE) for "significant and innovative technical contributions to the science of measuring ionizing radiation". The recognition was based on the work done with the VLPC detectors at Fermilab.
- 2004 Wilson Fellowship given by Fermi National Accelerator Laboratory to work on any research area of the Fermilab program "... the Fellowships are awarded to those who have demonstrated unusual scientific abilities at and early stage of their careers and who are expected to have significant impact in particle physics."
- 2004 Humboldt Research Fellowship given by the Alexander von Humboldt Foundation to work on research and development of frictional muon cooling at Max Plank Institute in Munich, Germany. This fellowship was not accepted in favor of the Wilson Fellowship at FNAL.
- 2003 Alvin Tollestrup Award for postdoctoral research at Fermi National Accelerator laboratory "... the measurement of the top mass was outstanding and clearly deserving of this honor...".
- 2002 Frederick Lobkowicz Prize at University of Rochester "...in recognition of a Ph.D. degree based on exceptional experimental research in high-energy nuclear and particle physics...".
- 1998 Marshak Fellowship at University of Rochester, to complete the Ph.D. in Physics at University of Rochester, Rochester, NY.
- 1994 Scholarship of Comisión Nacional de Energía Atómica, to complete the Physics degree at Instituto Balseiro, Bariloche, Argentina.

Supervised students at FNAL

- Ms.Sci Brenda Cervantez, Universidad Nacional Autónoma de Mexico. Graduated in 2018.
- Ms.Sci Israel Hernandez, Universidad de Guanajuato, Mexico. Expecting graduation in 2018.
- Ms.Sci Melissa Butner, Northern Illinois University. Graduates in 2017.
- PhD advisor Federico Izraelevitch, Universidad de Buenos Aires, Argentina. Graduated in 2017.
- PhD advisor Guillermo Fernandez-Moroni, Universidad Nacional del Sur, Bahia Blanca. Argentina. Graduated in 2016.
- PhD advisor for Julia Campa, Universidad Autónoma de Barcelona, Spain. Graduated in 2015.
- From 2004-2018 supervised more than 30 undergraduate students from Argentina, Mexico, Paraguay, Colombia, Brazil, Spain and several institutions in USA.

Service to the Community

- 2017 - Invited Lecturer for Catedra Augusto Garcia Minicourse, Cinvestav, Mexico, “Experimental searches for dark matter”. (1 week course)
- 2017 Member of Review panel for DoE intensity frontier program.
- 2014-now Member of the Coordinating Panel for Advanced Detectors (CPAD)
- 2016-now Member of the International Advisory Committee of the “COFI Advanced Instrumentation and Analysis Techniques Summer School”.
- 2013-now Reviewer for DoE SBIR program.
- 2012 Invited Lecturer for Universidad de Buenos Aires, “Experimental Astroparticle” (1 week course).
- 2011 Invited Lecturer for Universidad de Buenos Aires, “Particle Detectors” (2 months course).

Selected Publications

- “Exploring low-energy neutrino physics with the Coherent Neutrino Nucleus Interaction Experiment (CONNIE)”, The CONNIE Collaboration, arXiv:1906.02200 (Submitted to PRD), 2019.
- “SENSEI: Direct-Detection Constraints on Sub-GeV Dark Matter from a Shallow Underground Run Using a Prototype Skipper-CCD”, The Sensei Collaboration, Phys. Rev. Lett. 122, 161801 (2019) arXiv:1901.10478 2019.
- “First Cosmological Results using Type Ia Supernovae from the Dark Energy Survey: Measurement of the Hubble Constant”, The DES Collaboration, arXiv:1811.02376 (submitted to MNRAS) 2018
- “SENSEI: First Direct-Detection Constraints on sub-GeV Dark Matter from a Surface Run”, Michael Crisler, Rouven Essig, Juan Estrada, Guillermo Fernandez, Javier Tiffenberg, Miguel Sofo Haro, Tomer Volansky, Tien-Tien Yu, (arXiv:1804.00088) 2018. Accepted for publication PRL.
- “Dark Energy Survey Year 1 Results: Measurement of the Galaxy Angular Power Spectrum”, The Dark Energy Survey Collaboration, (arXiv:1807.10163) 2018.
- “Antonella: A nuclear-recoil ionization-efficiency measurement in silicon at low energies”, Izraelevitch et al (2017).
- “Measuring the Scatter of the Mass–Richness Relation in Galaxy Clusters in Photometric Imaging Surveys by Means of Their Correlation Function”, Campa, Julia; Estrada, Juan; Flaugher, Brenna, The Astrophysical Journal, Volume 836, Issue 1, article id. 9, 11 pp. (2017)
- “Measurement of low energy ionization signals from Compton scattering in a CCD dark matter detector”, K. Ramanathan, A. Kavner, A.E. Chavarria, P. Privitera, D. Amidei, T.-L. Chou, A. Matalon, R. Thomas, J. Estrada, J. Tiffenberg, J. Molina, Phys. Rev. D 96, 042002 (2017).

- “First direct detection constraints on eV-scale hidden-photon dark matter with DAMIC at SNOLAB”, The DAMIC Collaboration, eprint arXiv:1611.03066 (2016).

- “Measurement of the ionization produced by sub-keV silicon nuclear recoils in a CCD dark matter detector”, Chavarria, A.E. et al, Physical Review D, Volume 94, Issue 8 (2017).

- “The Dark Energy Survey: more than dark energy - an overview”, Dark Energy Survey Collaboration, Monthly Notices of the Royal Astronomical Society, Volume 460, Issue 2, p.1270-1299 (2016)

- “Results of the engineering run of the Coherent Neutrino Nucleus Interaction Experiment (CONNIE)” , Journal of Instrumentation, Volume 11, Issue 07, pp. P07024 (2016).

- “The Correlation Function of Optically Selected Galaxy Clusters in the Sloan Digital Sky Survey”, Estrada, Juan; Sefusatti, Emiliano; Frieman, Joshua A., The Astrophysical Journal, Volume 692, Issue 1, pp. 265-282 (2009).

- “An improved measurement of the top quark mass”, The DØ Collaboration, Nature (429) 2004, 638, hep-ex/0406031, Fermilab-Pub-04/083-E. (PhD Thesis result)

- “Dynamical Cosmological Constant and Relations Among Pseudo-goldstone Bosons”, Juan Cruz Estrada Vigil and Luis Masperi. Mod. Phys. Lett A14 (1998) 423-428. (Ms.Sc. Thesis result)