Michinari Sakai

michsakai@ucla.edu • 808-206-4357

Education

PhD, Experimental Neutrino Physics 2016
GPA: 4.0/4.0, University of Hawaii at Manoa
Dissertation: High Energy Neutrino Analysis at KamLAND and Application to Dark Matter Search

Graduate Program in Mathematics 2006
GPA: 4.5/4.5, Sun Moon University, S. Korea

Double BS, Physics and Mathematics 2005
GPA: 4.3/4.5, Sun Moon University, S. Korea
President's Award 2005, Award for Outstanding Academic Achievement – Samsung Corp.

Leadership and Research

KamLAND (Kamioka Liquid Scintillator Antineutrino Detector) 2009 - 2016
Research Assistant, University of Hawaii at Manoa

- Spearheaded development of novel directional neutrino detection technique in scintillator and demonstrated with data that this can be used to conduct dark matter searches in scintillator, first ever physics application of neutrino directionaly in scintillator
- Led unprecedented particle ID capability studies in scintillator using track profile reconstruction techniques using never before observed T2K events spilling into KamLAND
- Was solely responsible for high energy ($\gtrsim$1 GeV) energy calibration using cosmic ray muons and applying this to neutrino analysis for the first time

Mini-TimeCube (World's Smallest Portable Neutrino Detector) 2009 - 2016
Research Assistant, University of Hawaii at Manoa

- Led development of Geant4 detector simulation with team of 3 undergraduate students to conducted case studies for various neutron capture doping agents. Simulation results were used to guide overall detector design
- Was responsible for background studies associated with long lived cosmogenic isotopes 8He/9Li, to quantitatively determine effect on detector live time

CUORE (Cryogenic Underground Observatory for Rare Events) Apr. 2016 - *Current*
Post-doctoral Scholar, University of California, Los Angeles (UCLA)

- Spearheading development of precision alpha background modeling in collaboration with a graduate student with goal for further background reduction to cover inverted neutrino mass hierarchy of $0\nu\beta\beta$ decay in ^{130}Te
- Mentored and worked with 2 undergraduate students for investigation of shielding structures to mitigate γ and beta backgrounds for next generation $0\nu\beta\beta$ decay searches requiring ultra-low background levels

Teaching Experience

Mentor, *UCLA* 2016 - *Current*

- Taught weekly Geant4 simulation tutorials to 3 PhD students and 3 undergraduate students for 1 semester, students are now able to take on simulation tasks and collaborate in the group
- Led weekly Physics paper discussion groups for 3 PhD students, and promoted team work to increase dialogue and productivity within team

Teaching Assistant, *University of Hawaii at Manoa* 2007 - 2009

- Planned classwork and taught 2 weekly undergraduate Physics Laboratory classes of over 20 students each for 3 semesters, received "excellent" reviews
- Mentored undergraduate students in undergraduate Physics classwork for 2 hours each week for 3 semesters, got students repeatedly seeking my particular tutoring

Skills

Human Languages:	English (native), Japanese/Korean (trilingual proficiency)
Programming Languages:	Proficient in C, C++, Python, Fortran, Mathematica, Bash
Software/Tools:	ROOT, Geant4, Pads, AutoCAD

Talks and Presentations

- Division of Nuclear Physics, Pittsburgh/Carnegie Mellon University — Oct 2017
  Talk: CUORE and Background Reduction Case Studies for CUPID
- Conference on Science at SURF, South Dakota — May 2017
  Invited talk: Status of the CUORE $0\nu\beta\beta$ Decay Search
- Fermilab - Frontiers of Liquid Scintillator Technology — Mar 2016
  Invited talk: Particle ID and event reconstruction algorithms in scintillator
- Los Alamos National Laboratory — Nov 2015
  Seminar: High Energy Analysis at KamLAND and Application to Dark Matter Search
- California Institute of Technology — Nov 2015
  Seminar: High Energy Analysis at KamLAND and Application to Dark Matter Search
- University of California, Los Angeles — Oct 2015
  Seminar: High Energy Analysis at KamLAND and Application to Dark Matter Search
- DOE project review, Honolulu, Hawaii — Jul 2015
  Talk: High Energy Analysis and Application to Dark Matter Search in KamLAND
- Neutrino, Kyoto, Japan — Jun 2012
  Poster: Indirect Dark-Matter Detection Through KamLAND
- University of Hawaii Campus Open-house — Nov 2010, 2011
  Talks: What is a Neutrino?, mini-TimeCube: The World's Smallest Neutrino Detector
- Applied Antineutrino Physics, Sendai, Japan — Aug 2010
  Talk: mini-TimeCube: A Portable Directional Neutrino Detector
- DOE project review, Honolulu, Hawaii — Sep 2009
  Talk: KamLAND Summary
- Fermilab - International Neutrino Summer School — Jul 2009
  Talk: Student presentation: How to solve θ_{23} degeneracy

References

Supplied upon request or please contact in person.

Huan Z. Huang	Professor, University of California, Los Angeles, +1-310-825-9297 huang@physics.ucla.edu
John G. Learned	Professor, University of Hawaii at Manoa, +1-808-956-2964 jgl@phys.hawaii.edu
Yury Kolomensky	Professor, University of California, Berkeley, +1-510-642-9619 ygkolomensky@lbl.gov
Brian K. Fujikawa	Staff Scientist, Lawrence Berkeley National Laboratory, +1-510-486-4398 bkfujikawa@lbl.gov
Lindley Winslow	Jerrold R. Zacharias Assistant Professor, MIT, +1-617-253-2332 lwinslow@mit.edu
Thomas O'Donnell	Assistant Professor, Virginia Tech, +1-540-231-3308 tdonnell@vt.edu