Michinari Sakai

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Experience

KamLAND (Kamioka Liquid Scintillator Antineutrino Detector) - *University of Hawaii* 2009 - 2016

- Spearheaded development of novel directional neutrino detection technique in scintillator and demonstrated with data for the first time that this can be applied to conduct indirect dark matter searches in scintillator; first ever physics application of neutrino directionality in scintillator
- Led unprecedented particle ID capability studies in scintillator using track profile reconstruction techniques and never before observed T2K events spilling into KamLAND

Mini-TimeCube (World's Smallest Portable Neutrino Detector) - *University of Hawaii* 2009 - 2016

- Led development of Geant4 detector simulation to conduct case studies of neutron capture doping agents in solid scintillator. Simulation results were later used to guide overall detector design during construction
- Was responsible for background studies associated with long lived cosmogenic isotopes ^{8}He/^{9}Li to quantitatively determine effect on detector live time

Hanohano (Deep Sea-based monolithic Scintillator Neutrino Detector) - *University of Hawaii* 2009 - 2010

- Used CAD to design from scratch and assemble apparatus to measure light output of various LAB based scintillators from ionizing radiation as well as test light yield changes in extreme electric potential gradients ($\sim$1 kV/cm)
- Operated machine, took data, and analyzed light transmissivity of LAB based scintillator when put in near freezing temperatures and high pressure environments (for potential deep sea deployment scenarios) in custom made pressurizer chamber

CUORE (Cryogenic Underground Observatory for Rare Events) - *UCLA* 2016 - *Current*

- Spearheading development of precision α background modeling 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/β backgrounds for next generation $0\nu\beta\beta$ decay searches requiring ultra-low background levels

Skills

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

Leadership

Mentor - *UCLA* 2016 - *Current*

- Taught weekly Geant4 tutorials to 3 PhD-level students and an undergraduate student for 1 semester; students are now able to take on simulation projects of their own and make original contribution

Teaching Assistant - *University of Hawaii* 2007 - 2009

- Planned classwork and taught 2 weekly undergraduate Physics Laboratory classes of over 20 students each for 3 semesters, received very positive reviews
- Mentored undergraduate students in undergraduate Physics classwork for 2 hours each week for 3 semesters

Education

PhD, Experimental Neutrino Physics May 2016

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

Double BS, Physics and Mathematics 2005

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

Talks and Presentations

- Invited Talk: Monte Carlo Tools in CUORE — Apr 2018
  Durham University, UK - Monte Carlo Tools for Beyond the Standard Model Physics
- Seminar: CUORE: A Bolometric Search for Lepton Number Violation — Feb 2018
  Argonne National Laboratory
- Talk: CUORE and Background Reduction Case Studies for CUPID — Oct 2017
  Pittsburgh/Carnegie Mellon University - Division of Nuclear Physics 2017
- Invited talk: Status of the CUORE $0\nu\beta\beta$ Decay Search — May 2017
  Sanford Underground Research Facility (SURF), South Dakota - Conference on Science at SURF 2017
- Invited talk: Particle ID and event reconstruction algorithms in scintillator — Mar 2016
  Fermilab - Frontiers of Liquid Scintillator Technology
- Seminar: High Energy Analysis at KamLAND and Application to Dark Matter Search — Nov 2015
  Los Alamos National Laboratory
- Seminar: High Energy Analysis at KamLAND and Application to Dark Matter Search — Nov 2015
  California Institute of Technology
- Seminar: High Energy Analysis at KamLAND and Application to Dark Matter Search — Oct 2015
  University of California, Los Angeles
- Talk: High Energy Analysis and Application to Dark Matter Search in KamLAND — Jul 2015
  University of Hawaii at Manoa - DOE project review
- Poster: Indirect Dark-Matter Detection Through KamLAND — Jun 2012
  Neutrino 2012, Kyoto, Japan
- Talks: What is a Neutrino?, mini-TimeCube: The World's Smallest Neutrino Detector — Nov 2010/2011
  University of Hawaii at Manoa - Campus Open-house
- Talk: mini-TimeCube: A Portable Directional Neutrino Detector — Aug 2010
  Applied Antineutrino Physics 2010, Sendai, Japan
- Talk: KamLAND Summary — Sep 2009
  University of Hawaii at Manoa - DOE project review
- Talk (Student Presentation): How to solve θ_{23} degeneracy — Jul 2009
  Fermilab - International Neutrino Summer School 2009

References

Supplied upon request or please contact in person.

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