Design Physics Division May 12, 2018
Weapons and Complex Integration (WCI) Directorate
Lawrence Livermore National Laboratory

Dear Design Physics Division, Weapons and Complex Integration (WCI) Directorate;

As a budding and ambitious physicist, I am extremely interested in the Computational Physicist position in the Design Physics Division within the Weapons and Complex Integration (WCI) Directorate, Job ID #103186. I would like to apply for the position.

Having spent much of my adolescent life between 1994 to 2005 in South Korea, I witnessed first hand what it is like to live next to a communist regime in times of both peace and stability as well as tension in the midst of potential war. I strongly believe it is imperative that the United States be at the top of its capability in understanding and exercising responsible stewardship of its nuclear weapons capabilities.

With regard to my qualifications for this job:

- **PhD in relevant field:** PhD in experimental particle physics, University of Hawaii, May, 2016.
- **Demonstrated technical mastery in relevant disciplines:** Led development of Geant4 detector simulation for miniTimeCube portable neutron/neutrino detector and conducted trade studies for neutron capture dopants in plastic scintillator for eventual deployment at nuclear reactor site at NIST (National Institute of Standards and Technology).
- **Experience developing, implementing and evaluating new methods and numerical algorithms:** Developed novel 3-D topological event reconstruction and particle discrimination algorithms in monolithic scintillator detectors. This work opens the doors to an unprecedented capability of scintillator detectors to conduct directional neutrino signal searches at energies $\gtrsim 1$ GeV. Algorithm was successfully evaluated using actual events from T2K neutrino beam line.
- **Experience in converting theory into models or algorithms appropriate for numerical simulation:** Successfully implemented inverse beta decay kinematics for particle trasport code in anti-electron neutrino detector simulation.
- **Advanced programming experience/fluency in Python, FORTRAN, C and/or C++:** Over 8 years of experience with C/C++/ROOT, 4 years of experience with python for data manipulation, experience writing and editing multiple pieces of FORTRAN code.
- **Experience working independently in team-research environment, demonstrating self-motivation and initiative in addressing challenging problems:** Experience working in 3 international collaborations on particle detector experiments based in Japan, US, and Europe. Took personal initiative to solve problem of directional neutrino detection in scintillator target medium and independently applied technique to final indirect dark matter search analysis.
- **Demonstrated verbal and written communication and presentation skills:** 17 publications and 14 talks (3 talks as invited speaker) given at international venues across 3 continents.

I would appreciate an opportunity to meet and discuss my application at an interview. I have also sent my resume and other relevant documents for your consideration. Please feel free to let me know if you have any questions.

Thank you for your consideration and time,

Michinari Sakai

Michinari Sakai
475 Portola Plaza #5-123B – Los Angeles, CA 90095-1547 – USA
+1 (808) 206 4357 • michsakai@ucla.edu