



Post-Doctoral Position in Experimental Neutrino Physics

The neutrino physics group of the Department of Physics at the University of Regina invites highly motivated individuals to work with us on the Hyper-Kamiokande and EMPHATIC experiments. The position is a joint appointment between the University of Regina and TRIUMF. It is a two-year position, with the possibility of extension as a research associate depending on mutual agreement of both parties.

Hyper-Kamiokande will be one of the world's largest neutrino detectors, recently began construction, and is due to start data taking in 2027. The successful candidate will work within the T2K/Hyper-K Canada group to carry out experiments in preparation for Hyper-K. The Canadian group is leading efforts to reduce systematic uncertainties in the Hyper-K era of experiments. The measurements of the neutrino flux and interaction cross section with the Intermediate Water Cherenkov Detector (IWCD) for Hyper-K will be an important factor in reducing the corresponding uncertainties. Calibration of water Cherenkov detectors using photogrammetry, initially in Super-Kamiokande, and eventually in IWCD and Hyper-K is being developed to reduce fiducial volume systematic uncertainties. The hadron production experiment EMPHATIC at Fermilab will measure pion and kaon production in different target materials, which will be used to reduce neutrino flux uncertainties. New analysis methods are being developed using machine learning techniques on water Cherenkov detectors, and could lead to improved selections of events in Super-K, IWCD, and Hyper-K.

EMPHATIC will be taking data in the next couple of years and a Water Cherenkov Text Experiment (WCTE) at CERN will start taking data in 2023, providing opportunity for the successful candidate to participate in the construction, commissioning and initial analysis of these projects.

A PhD in particle physics and experience of programming with C++ and python are required. Experience in data analysis, neutrino physics, hardware development and Geant 4 simulations are highly desirable. The successful candidate must be capable of independent research as well as working effectively in a team. Duties may require taking frequent trips and/or spending extended periods of time in Vancouver (at TRIUMF), Japan, the USA (at Fermilab) and Switzerland (at CERN).

Salary will be commensurate with qualifications and experience. This appointment will commence as soon as a candidate is accepted. Interested candidates should send a cover letter, curriculum vitae, research statement, and arrange to have two letters of reference sent, by Dec. 11, 2020, to:

Dr. Mauricio Barbi
barbi@uregina.ca

The University of Regina is an urban, medium size university. Its strategic plan 2020-2025 "All Our Relations" emphasizes the power of community and relationships and promotes the notion how

we are stronger together. The University of Regina is committed to employment equity, welcomes diversity in the workplace, and encourages applications from all qualified individuals, including women, members of visible minorities, aboriginal people, and persons with disabilities. Additional information on the University of Regina is available at <http://www.uregina.ca>.

TRIUMF is Canada's particle accelerator centre, and one of the world's leading laboratories for particle and nuclear physics and accelerator-based science. We are an international centre for discovery and innovation, advancing fundamental, applied, and interdisciplinary research for science, medicine, and business. At TRIUMF, we are passionate about accelerating discovery and innovation to improve lives and build a better world. Equity, diversity, and inclusion are integral to excellence and enhance our ability to create knowledge and opportunity for all. Together, we are committed to building an inclusive culture that encourages, supports, and celebrates the voices of our employees, students, partners, and the people and communities we serve.

For additional information please contact:

Dr. M. Barbi	barbi@uregina.ca
Dr. N. Kolev	kolev20n@uregina.ca
Dr. M. Hartz	mhartz@triumf.ca
Dr. A. Konaka	konaka@triumf.ca

