

PHAS@York Newsletter

September 2020



Changing of the Guard

On July 1, 2020, a major change occurred in the leadership of our department. Patrick Hall, who served as Undergraduate Program Director (UPD), has taken over as Department Chair, relieving Marshall McCall, who valiantly served for over 10 years. The UPD position has been assumed by Michael De Robertis for one year. Tom Kirchner, who served for four years as Graduate Program Director, handed over the reins to Matthew Johnson. Learn more about PHAS@York at <https://physics.yorku.ca/>



Department Chair Patrick Hall

Flavour-Changing Neutrinos

PHAS@York has had a long-term involvement in neutrino physics on the T2K Experiment in Japan through Sampa Bhadra and now Deborah Harris has joined the T2K team. The big problem in this branch of particle physics is to establish what the neutrino masses are and how neutrinos mutate (or oscillate) between their flavour eigenstates. T2K stands for Tokai to Kamioka. A powerful accelerator (called J-PARC) produces neutrinos, and 295 km away they are detected at the Super-Kamiokande detector. The purpose of the measurement is to establish accurately the mixing of neutrino flavours, and the recent discovery of a matter-antimatter asymmetry in the neutrino oscillations, published in Nature earlier this year, has the potential to explain why our Universe is matter dominated.



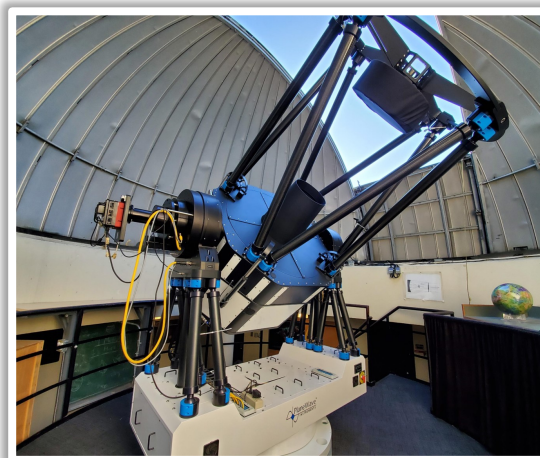
Sampa Bhadra and the Nature cover

One-Meter Telescope

In 2019, the new one-meter telescope was installed in the PHAS@York Observatory Dome. It was funded by a gift from the Carswell Family Foundation and is the largest telescope on any Canadian university campus. Students can now study fainter objects within and beyond the Milky Way Galaxy. In-person observing nights have been suspended for now but check out the online observing from 7:30 – 9:30 pm

Wednesday nights at

<http://youtube.com/user/YorkUObservatory/live>



Going Full Circle

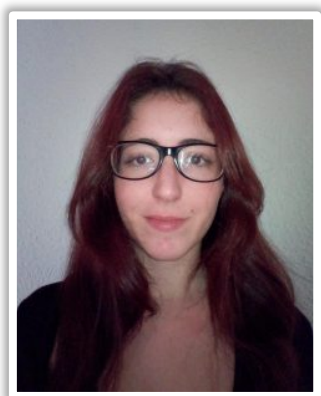


Gloria Orchard

Did you know that one of our Lab Technologists, Gloria Orchard, was our own undergraduate? Known then as Gloria Spirou, she was not only an engaged physics major, but also an athlete on the Track & Field Varsity team. After obtaining her Honours BSc (2002), she went for an MSc (2005) in Medical Physics at the University of Toronto, and then for a PhD (2010) from McMaster University in Medical Physics and Radiation Science. Prior to returning to York University, she was a postdoctoral fellow with a research interest in the field of microdosimetry and an instructor in radiation science at Ontario Tech University. Gloria enjoys playing the oboe and has been part of several community concert bands in the GTA through the years.

<https://www.physics.yorku.ca/faculty-profiles/orchard-gloria/>

Where are they now?



Alba Jorge

Alba Jorge was a York Science Fellow hosted by Tom Kirchner 2018-2020. She returned to Madrid (Universidad Autonoma) during the difficult time when Covid19 had hit her home country really badly. She recently published an important paper in the field of ionization of biologically relevant molecules (water in this case), which includes an interesting extension of previous modeling (<https://doi.org/10.1103/PhysRevA.102.012808>). The new model includes time-dependent screening effects which are important for multiply-charged ion impact (such as C^{6+}) since many of the water molecule's outer six electrons participate in multiple electron capture and ionization.