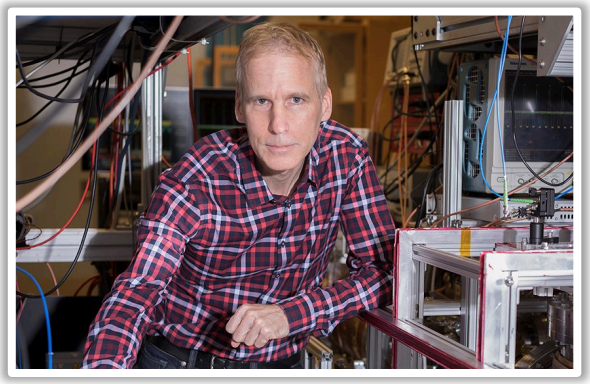
PHAS@York Newsletter

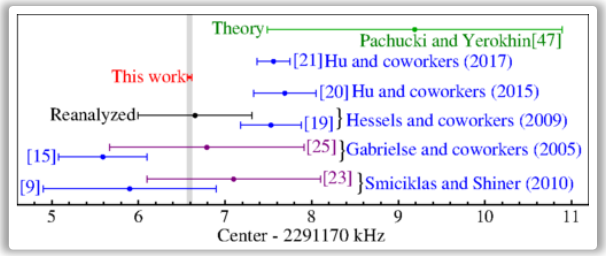
January 2021

Awards, awards!

Congratulations to Eric Hessels, who has received the Canadian Association of Physicists 2020 CAP Medal for Lifetime Achievement in Physics**.** Recent success in Eric's lab came on two fronts: Kosuke Kato (PhD) with the help of Taylor Skinner (PhD in progress) published the highest-precision result on n=2 triplet helium P-state fine structure (https://doi.org/10.1103/PhysRevLett.121.143002) with the ultimate goal of determining the fine-structure constant, α, to high precision. That goal currently requires better calculations in quantum electrodynamics. The other work concerns a new measurement of the hydrogen 2S-2P Lamb shift in atomic hydrogen in order to help resolve the proton charge radius puzzle. Nikita Bezginov (PhD) worked hard on this with Travis Valdez (MSc) (https://science.sciencemag.org/content/365/6457/1007.editor-summary). Both works were based on a new version of separated oscillatory fields method co-developed by Eric and then-postdoc Amar Vutha (now Canada Research Chair at University of Toronto). The lab has engaged in a highly funded long-term project to measure the electron electric dipole moment using diatomic molecules (e.g., barium monofluoride) embedded in an argon matrix (at about 10 Kelvin). This joint experimental effort is based on contributions from a new generation of graduate students as well as colleagues Cody Storry and Matt George.



Eric Hessels



Two recent BSc graduates also deserve congratulations! Nadav Gasner was awarded the Faculty of Science Gold Medal and is currently studying medicine at McMaster University. Karin Saltoun is the recipient of the Faculty of Science Silver Medal, and moved on to graduate studies at McGill University.

New Faculty Profile: Joel Zylberberg

Joel Zylberberg

Joel Zylberberg joined PHAS in 2019 as Canada Research Chair in Computational Neuroscience. He substantially strengthens our biophysics complement with links to the Centre for Vision Research, the Brain, Behaviour, and Cognitive Science (BBCS) Graduate Program; the Electrical Engineering and Computer Science (EECS) Graduate Program; and the Mathematics and Statistics Graduate Program. Joel was previously Assistant Professor at the University of Colorado School of Medicine in the Department of Physiology and Biophysics, and prior to that in the Department of Applied Mathematics at the University of Washington in Seattle. Joel obtained his B.Sc. in physics from Simon Fraser University, and did his graduate work at University of California at Berkeley in vision research (PhD in 2012). His recent work is in several areas, such as understanding the adaptation response of retinal ganglion cells (https://www.nature.com/articles/s41467-020-18436-2), object recognition algorithms using neural networks (https://www.sciencedirect.com/science/article/pii/S0893608020302549), as well as deep learning approach to image processing in the primary visual cortex (https://jov.arvojournals.org/article.aspx?articleid=2732380).

Where are they now?

Laura Sagunski

Laura Sagunski, who was a York Research Fellow with Sean Tulin (2016-2018), has been appointed Professor at the Institute for Theoretical Physics at Goethe University in Frankfurt/Main, Germany in October of 2020 (https://www.goethe-university-frankfurt.de/66536206/Teachers_at_ITP). In her research, she uses gravitational waves (https://arxiv.org/abs/2010.11224), cosmological probes (https://arxiv.org/abs/2011.03050) and astrophysical observations (https://arxiv.org/abs/2006.12515, https://arxiv.org/abs/2011.04679) to explore the very fundamental unsolved mysteries in our understanding of the Universe, such as the mysterious nature of dark matter. Together with four faculty members from York University and Goethe University, Nassim Bozorgnia, Saeed Rastgoo, Jürgen Schaffner-Bielich and Sean Tulin, Laura will launch the first German-Canadian undergraduate research collaboration in theoretical astro-particle physics this coming summer. In this initiative, York students can join in an international research team together with undergraduate students from Goethe University and explore one of the most fascinating mysteries of modern physics: dark matter! Stay tuned for more information coming soon!

YORK
UNIVERSITÉ
UNIVERSITY