



U of T AstroDoings Newsletter

The official newsletter connecting past and present faculty, staff, students, colleagues and friends of the University of Toronto Astronomy community (DADDAA, CITA, Dunlap, CPS & UTM).

Dear All,

Welcome to the spring 2020 issue of the AstroDoings newsletter. I hope everyone has thoroughly enjoyed winter and is looking forward to spring and all the excitement that comes with it. Our department had a great and eventful last six months and this newsletter, as always, will attempt to cover our most important milestones.

Our biggest news is that our department, approaching its centenary year, is embracing its new name: **the David A. Dunlap Department of Astronomy and Astrophysics**.



The new name was announced officially on December 19, 2019 at a reception to honour the Dunlap family.

The reception was hosted by University of Toronto President Meric Gertler and Professor Melanie Woodin, Dean of the Faculty of Arts & Science, just a few days before our holiday break. [Follow this link to read more.](#)

This winter, we welcomed our new faculty, Professor Abigail Crites, past Fellow at the California Institute of Technology. Abby started her position in January, and she can be found in office AB123. Welcome Abby!

As always in the beginning of each new year, we are busy recruiting our next intake of graduate students. Potential students' visits are scheduled for March 12 to 13, 2020. This year we once again have a very strong cohort of domestic (31) and international (117) applicants.

The architects of our new building have been selected. [Morphosis](#) will be working with local firm [Teepie Architects](#). We are very excited about the approach they will bring to the design process. A current timeline estimate is seven years to occupancy, if all goes well.

Our next departmental party is scheduled for March 27, 2020 at the Faculty Club. We are looking forward to seeing you there!

Best wishes,

Raymond Carlberg

Professor and Chair, David A. Department of Astronomy and Astrophysics

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Featured New Faculty: Abby Crites

Abigail Crites was attracted to U of T by the vibrant science being done here, from theory to observation to instrumentation. She looks forward to working among an amazing community of faculty, staff, postdocs and students — all thinking about different questions in astronomy and solving them in different ways with new tools being created here.



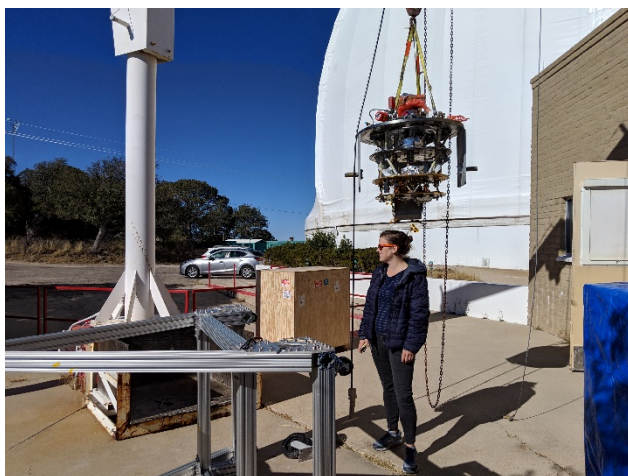
Why did you choose U of T?

I chose U of T because of the vibrant science being done here, from theory to observation to instrumentation in particular in my field. I love that this is an amazing community of

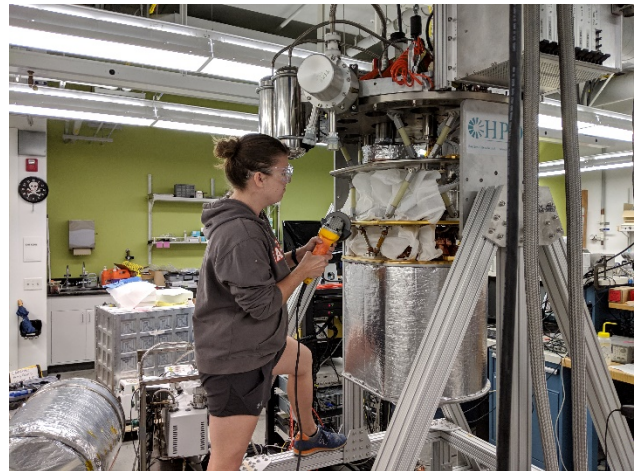
faculty, staff, postdocs and students thinking about different questions in astronomy and solving them in different ways with new tools that we are creating. So far, this has been a wonderful intellectual environment where people are excited about the new ways we can make measurements and understand our universe.

Can you tell us about yourself and your past, current and future research?

I got my undergraduate degree in physics from Caltech, my PhD from the University of Chicago, and did my postdoc at Caltech. So, I've bounced back and forth from warm and cold weather!



During my PhD, my research was focused on building an instrument called SPTpol with a team of researchers to measure the polarization of the cosmic microwave background. During my postdoc, I began working on my current project, TIME, which is an mm-wavelength spectrometer designed to measure ionized carbon in the early universe and help us better understand the epoch of reionization. I'm passionate about developing



technology and new instruments to help us better understand the early universe and the fainter these signals are, the more fun it is to figure out how we can measure them.

What made you choose your current research focus?

I chose my current research because I like to try to measure things that are hard to measure and that we haven't measured before. I want to expand our knowledge of the universe, develop technology to do this, and then see where that technology leads us. The epoch of reionization is when the photons from objects in the early universe began ionizing the neutral hydrogen in the universe and turned it into the universe we know today. For a few reasons, we don't know a lot about this period. One of the reasons is that

this happened about 13 billion years ago, so light from galaxies and other objects from that period have traveled quite far to get to us and is faint and shifted in wavelength. We are trying to measure the faint emission from these galaxies by looking at ionized carbon emission with a technique called line intensity mapping.

What are the big issues in your research area?

One of the very important issues in my research is the understanding of systematic errors in our measurements. When you are measuring such faint signals, any noise from your instruments or other astrophysical objects can cause effects that mimic the signal we are trying to measure. We have to carefully remove and account for these effects. This is one of the reasons that working with other groups and collaborating as a field is so important. We are all trying to measure similar signals with different techniques and probes. Validating each other's results and cross-correlating data will be very important for being certain of our results. One of the other big issues is interpreting what our result means about astrophysics and cosmology when we finally

make a measurement. One of the reasons I am excited to be at U of T is that I have colleagues here in CITA that are making models to predict and understand what these intensity mapping measurements mean.

What is the overall importance of this project?

TIME is a pathfinder instrument that will open up a new area of observational astrophysics, specifically ionized carbon line intensity mapping. This will allow us to probe the epoch of reionization in a new way that is complementary to direct detections of galaxies with things like ALMA, Hubble and JWST. It is also a great probe to be used in conjunction with 21 cm experiments that are also probing this same epoch. I was a co-author on a paper for the Canadian Long-Range Plan where we discuss these two probes, so if you are interested in learning more you can follow this [link](#).

What do you like to do in your spare time?

I like running, hiking, watching Murdoch Mysteries, reading and hanging out with my cats.

Could tell us one fun fact about your self?

I have five cats.

Congratulations to our students on successfully defending their theses

- Alexander Kostenko (supervisor Prof Chris Thompson) – March 5, 2020. Alexander is interested in government policy work and is considering pursuing a career in this field.
- Steven Janssens (supervisor Prof Bob Abraham) – December 4, 2019. Thesis title: Ultra-Diffuse Galaxies and Ultra-Compact Dwarfs in the Hubble. Steven is interested in a postdoctoral fellowship at the Swinburne University of Technology, Australia.

Featured Astronomy Alumni: Kaitlin Kratter

Kaitlin, who was one of our most gifted and enthusiastic graduate students, is currently an associate professor at the Department of Astronomy and Steward Observatory, University of Arizona. As our grad student at U of T, she held the prestigious Connaught Fellowship and later, as a postdoctoral fellow at University of Colorado Boulder, the Hubble Fellowship. Kaitlin kindly

agreed to answer a few questions for our newsletter.

Could you briefly tell us about yourself? What would be the first thing you would like people to know about you?

I'm a professor of astronomy. When I'm not at work, I love being outside (running, hiking, skiing). I share my home with my husband, our daughter,

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a dog and a Torontonion cat who is thoroughly enjoying his retirement in sunny Tucson, along with many like-minded Canadian snowbirds.

When were you part of the DADDAA graduate program? Why did you go U of T instead of other schools?

I was a graduate student from 2005 to 2010. I chose U of T because of the dynamic young faculty, the ability to start research immediately upon matriculation and the flexibility to work with multiple advisors before deciding on a thesis. I was also very enthusiastic about moving to Toronto — I wanted to live in a big city and get out of the US for a while.

Where are you now? What is your area of focus? Could you briefly tell us about your new research projects?

I'm an associate professor in the astronomy department at University of Arizona. I work on a variety of theoretical problems related to star formation, planet formation, binary stars and accretion discs. I'm currently working on a few projects that use the properties of circumbinary planets to constrain binary formation models and tidal evolution models.

What did you value the most about your years with DADDAA?

I loved my time in grad school in Toronto. I feel like I was provided with the necessary opportunities and resources to develop and grow as a scientist. I was lucky to not only have a great working relationship with my thesis advisor, but I also relied heavily on my graduate student peers and CITA postdocs — both for research and moral support. I fondly remember studying for the oral

prelim with my office mates. I definitely worked hard as a grad student, and it wasn't always easy, but I really loved it.

photo credit: Mamta Popat / Arizona Daily Star

Do you have any memorable moments you can share about your experience at DADDAA?

It's hard to pick a single moment. One of my favourite regular work activities was the fluids journal club at CITA on Thursdays. Many of the papers I read for those group meetings have proved useful to me throughout my career. On the more social side of things, early in grad school I organized a lot of Friday night outings that ended at Amnesia (not with amnesia). I also recall my immense joy when the Coffee Time at College and Spadina became a Tim Hortons.

What advice would you give to our students who are hoping to build a career in Astronomy?

Take advantage of the vast resources available to you at U of T. Push yourself out of your comfort zone, both intellectually and socially. Take advantage of the many visiting scientists and go out to dinner with them when you can (I'm hoping colloquium dinner is still hosted by the students). And don't forget to ask questions at colloquium!



Our Awards

Alumni

One of our past undergraduate students, **Katharine Hayhoe**, received a 2019 Champions of the Earth award, the UN's highest environmental honour, for her stalwart commitment to quantifying the effects of climate change and her

tireless efforts to transform public attitudes. Katharine is a climate scientist, a professor in the Department of Political Science at Texas Tech University and director of the Climate Center. Her research has informed climate resilience and

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enriched climate policy at a federal and local level across the US and beyond. She has a unique and effective approach to speaking about climate

science, engaging everyone from the Texas oil industry to the US Congress.

Graduate Students

Natalie Price-Jones has won this year's Fieldus award. She has demonstrated a commitment to research excellence and went above and beyond in her TA work. She helped organize Astro Tours and was the master of the 3D printer. She served as co-president of GASA for two years with many significant achievements. We appreciate her forceful and thoughtful approach to helping the department move forward with changes to our graduate program.

This year's Yen award winners are **Nilhoufar Afsariardchi** and **Sasha Kostenko**.

The awards committee was presented with a number of outstanding nominations and stated that it was a tough year to judge. The winners are based on the novelty and the breadth of the science in these papers.

Congratulations Natalie, Nilhoufar and Sasha.

Faculty Awards



Professor Maria Drout won a prestigious John Charles Polanyi Prize. This prize, funded by the Ontario government and awarded by the Council of

Ontario Universities, is given to outstanding researchers in the early stages of their career who are pursuing post-doctoral studies or who have recently been appointed faculty at an Ontario university. The Polanyi Prize is wonderful recognition of Maria's highly innovative research, which has seen her rise to international prominence within a few years of receiving her PhD.



Professor Diana Valencia was successful in obtaining an Early Research Award (2019).

Professor Renée Hložek was named as a 2020 Alfred P. Sloan Research Fellow. The Sloan Fellowship is one of the most prestigious awards in North American academia. Since 1955, this program has sought to stimulate fundamental research by recognising early career scientists and scholars of outstanding promise.

Renée is the sixth U of T astronomer to be named as a Sloan Fellow, starting with Dick Bond (1985) through to Jo Bovy (2016).





Congratulations to **Professor Howard Yee** for receiving the **Carlyle S. Beals Award**!

Howard has played many important roles in Canadian astronomy. When Howard started there was almost no extragalactic astronomy, let alone observational cosmology in Canada. He brought the experience and rigor of Caltech observing to CFHT which led to efficient and powerful uses of that telescope for many projects.

Featured Research Achievements

Below is a list of major research achievements from our department as highlighted by U of T News since the last issue of our newsletter.

- Astronomers in Europe – working with members of Canada’s CHIME Fast Radio Burst collaboration, which includes researchers from the University of Toronto and other universities – have pinpointed the location of a repeating fast radio burst first detected by the CHIME telescope in British Columbia in 2018.
You can read more [here](#).
- U of T expert on Canada’s grand plan to explore the mysteries of the cosmos.
You can read more [here](#).
- Can life exist on a “snowball” planet?
New U of T research says yes
You can read more [here](#).
- International researchers track repeating fast radio burst to nearby galaxy
You can read more [here](#)

On passing of Professor Bill Clarke

As some of you know, Professor Bill Clarke passed away suddenly in October last year. Bill served as Interim Chair from 2001 to 2002 and 2005 to 2006. When he passed away, the family requested privacy but agreed we could have a comment about Bill’s career in our spring newsletter. Some notes are forthcoming about Bill’s long career with the department. He was also involved in the publishing trade in the major Canadian firm Clarke, Irwin and Company.

A few remarks have already come in, but others are warmly welcome.



Professor Bill Clarke is in the middle

From Wendy Freedman

Bill Clarke was the first professor I had in astronomy and astrophysics during my first year at U of T. At that time, I had planned to major in biophysics. However, I enjoyed the course Bill taught so much that I switched my major. It is quite possible I would never have ended up in astronomy if it were not for Bill.

From Cristine Clement

I remember Bill Clarke as an articulate person who was very interested in teaching students to communicate effectively. I think he ran workshops from time to time for graduate students. With the undergraduates, he particularly enjoyed teaching the first-year seminar courses.

From Ernie Seaquist

Bill and I had been friends since we began graduate studies at Toronto in 1961 under the supervision of Don MacRae. We were involved with the development of the radio astronomy program in the back field of the David Dunlap Observatory.

Bill struck me as an ambitious and no-nonsense guy who was on a mission of achievement. When several of us took a course in stellar atmospheres from Lawrence Aller, who was visiting Toronto, Bill came to the rescue of the class with his knowledge of main frame computing to save the entire class from the drudgery of building a model stellar atmosphere on electric calculating machines. Bill went on to UCLA after his master's degree to do a PhD with Aller.

Bill subsequently returned to Toronto and accepted a faculty position here. However, ties to his family publishing business Clarke, Irwin and Company prevented him from taking on a full-time position here, and he focused his attention on teaching and administration. He was effective in both capacities, and a good listener, both to students and to fellow faculty before making decisions.

Bill and I became even greater friends after our retirement and we often rode together in his car

to visit Don Fernie for coffee at his retirement home, together with other associates.

Bill did not seek high visibility during his career, but he was a valuable contributor and a dear friend. Many others and I will miss him dearly.

From Raymond Carlberg

Bill embodied "wise counsel." He also had a wonderful sense of humour which served both of us well in a couple of issues during his two terms as Interim Chair. Bill attended the Inaugural Martin Lecture and commented that he liked Professor Martin John Rees's emphasis that we were capable of solving the challenges that face us on earth.

From Bob Abraham

I remember Bill with such fondness. I had been wondering from time to time how he was enjoying his retirement and learning of his passing was such a shock. I remember that when Peter Martin was on sabbatical and he was Acting Chair, I came to him with outrageously late requests for things that were important to me, and not only did he not turf me out of his office in disgust, he dropped everything to intercede up the administrative food chain to get me out of holes I had dug for myself. ('Bill – Aaaaaa! I just found out I need a signature from the Dean in the next two hours or I'm going to miss this application deadline! Help!). And he always sent such beautifully touching notes after the births of my kids. I always meant to ask him about his involvement in the publishing trade but somehow never managed that, and now it's too late.

From Hugh Zhao

Bill was my supervisor during his tenures early as the Chair of the Computing Committee and later as Interim Chair of the Department. I have fond memories of Bill being a no-nonsense and quick thinker. He was very supportive and even did some work for me. Aside from daily IT works, I have to do the tedious computing support charge-back calculations. At the beginning, I did the calculation by hand. Bill suggested that a spreadsheet would help. I told him at the moment that I was too busy to work on it. A

couple of days later, Bill handed me a well designed spreadsheet.

After retirement, Bill and I still kept in touch. The last conversation I had with him was regarding UofT's decommission of Exchange server. He was concerned if it would affect his email account, and happy to learn that it would not.

To submit content for DADDAA News, please contact alena.wasney@utoronto.ca