

Name: Alexandre David-Uraz (he/him pronouns; please feel free to call me Alex)

Code: 662

Home institution: Howard University

Name of task: Advanced modeling of massive star X-ray spectra (662.003)

Role in task/What do you do for CRESST:

My work involves reducing and analyzing existing X-ray spectra of massive (O-type) stars to infer their wind properties. The goal of my project is to include additional atomic physics in the model of these spectra to yield more accurate estimates of the stars' mass-loss rates. This work is accomplished in collaboration with my GSFC sponsor, Dr. Maurice A. Leutenegger.



What is your background:

I'm originally from Montreal, Canada, and I obtained my B.Sc. and M.Sc. from Université de Montréal before moving to Kingston, Canada to pursue a PhD in Astrophysics at Queen's University. My postdoctoral work so far has all been done in the United States: I first spent a year in Florida (Florida Institute of Technology in Melbourne) before working for 3.5 years at the University of Delaware, after which I was hired as a CRESST II postdoctoral associate (in September 2020). I've enjoyed my time in the Mid-Atlantic region so far; Washington, DC and the area is a great place to live. When I'm not looking at the stars, my hobbies typically include singing in choirs and participating in pub quizzes.

Favorite part of being a CRESST Scientist:

I really like the idea of being affiliated to a university and also getting to work at a NASA Center; this way I get the best of both worlds. Howard University has a rich history of excellence and I'm excited to get to be a part of its present. GSFC is a huge institution that brings together some of the best minds in a variety of fields and represents a uniquely stimulating environment. Having started this position after the beginning of the pandemic, I have yet to fully experience these perks, but I really look forward to meeting everyone and fully soaking in this incredible opportunity.

Highlight of research as a CRESST Scientist:

While the results from my current project with CRESST are still rather preliminary, I've also had the chance to continue pursuing previous research endeavors during my time with CRESST. In particular, as one of the leads of the MOBSTER Collaboration (Magnetic OB[A] Stars with TESS: probing their Evolutionary and Rotational properties), I am particularly happy about some of our newest results, and the spike in interest that followed the successful online conference that we organized just prior to my arrival here. More broadly, another one of my highlights with CRESST has been to have the chance to help mentor a Goddard summer intern; I might even be learning more from this experience than her (although I hope not).

Selected list of recent publications:

- Erba C., **David-Uraz A.**, Petit V. et al., “Ultraviolet line profiles of slowly rotating massive star winds using the ‘Analytical Dynamical Magnetosphere’ formalism”, accepted by MNRAS (in press)
- **David-Uraz A.**, Shultz M.E., Petit V. et al., 2021, “MOBSTER – IV. Detection of a new magnetic B-type star from follow-up spectropolarimetric observations of photometrically selected candidates”, MNRAS, 504, 4841
- **David-Uraz A.**, Petit V., Shultz M.E. et al., 2021, “New observations of NGC 1624-2 reveal a complex magnetospheric structure and underlying magnetic geometry”, MNRAS, 501, 2677

Grants and fellowships:

- **Chandra theory grant**, *pending*
- **NICER GO grant**, cycle 3 (2021)
- **NSERC Postdoctoral Fellowship**, Natural Sciences and Engineering Research Council of Canada (2018-2020)
- **HST GO grant**, cycle 25 (2018)
- **FQRNT Postdoctoral Fellowship**, Fonds de recherche du Québec – Nature et technologie (2016-2020)

To contact Alex to learn more about his work or to collaborate, you can reach him at:

alexandre.daviduraz@howard.edu