Daniela Breitman

Education

2020-2021 **MSc**, *University of Toronto*, Department of Physics, supervised by Keith Vanderlinde. Project summary here.

Master's Thesis **A Study of the Signal Morphology from Fast Radio Bursts**.
Processing large amounts of high resolution (2.56 μs) data in order to extract a width distribution from over a hundred Fast Radio Bursts (FRBs) and study their morphology in order to rule out some FRB models.

2017-2020 **BSc**, *McGill University*, Montreal, Honours Mathematics and Physics.

Undergraduate Thesis **Characterizing the Repetition Rate of CHIME Fast Radio Bursts**, *supervised by Prof. Victoria Kaspi*, Full report here.
Simulating FRB populations using various models and fitting to the Canadian Hydrogen Intensity Mapping Experiment (CHIME) FRB data to rule out possible models [paper in prep.].

Research Experience & Awards

Summer Internships

May-July 2020 **Characterizing the Repetition Rate of CHIME Fast Radio Bursts**, *Victoria Kaspi*, McGill University, Value: $6,000.00.
Continue the project on simulating FRB populations from my undergraduate thesis. Full report.

May-July 2020 **Solving the relativistic wave equation in FLRW cosmology using spectral theory on non-Euclidean spaces**, *Dmitry Jakobson, Linan Chen, Gantumur Tsogtgerel*, McGill University, Value: $2,000.00.
- On the torus $\mathcal{T}^3$: Solved the relativistic wave equation and show that only one initial condition is required for the IVP of the wave equation.
- On the sphere $\mathcal{S}^3$ and the hyperbola $\mathcal{H}^3$: solved the time ODE.

NSERC Summer Internships

Summer 2019 **SURP**, *Ue-Li Pen*, University of Toronto, Value: $9,500.00 + $2,000.00 frqnt bpca.
- FRB microstructure: Analyse FRBs with microstructure i.e burst components at the microsecond timescale.
- FRB descatteraing: Correlate and descatter wide FRB pulses using different pulse components based on the work of Main et al. 2017 on the descattering of giant pulses. Full report here.

Winter 2019 **Tomlinson Engagement Award for Mentoring (TEAM)**, McGill, Value: $300.00.
Conduct weekly tutorials for MATH 248 - Honours Advanced Calculus, awarded per the recommendation of the professor.

Summer 2018 **USRA**, *Victoria Kaspi*, McGill University, Value: $6,500.00 + $2,000.00 frqnt bpca.
- Develop a data visualisation web app using Bokeh to compare CHIME data with FRB and pulsar catalogues and view data statistics to monitor telescope sensitivity.
- Develop a CHIME/FRB CPU monitoring system using Node.js in Javascript and HTML/CSS.

Research Project Course

Winter 2019 **PHYS 396**, *Victoria Kaspi*, McGill University, Full report here.
Develop the data statistics section of the data visualisation web app I worked on in summer 2018 by tracking pulsars of interest to characterise the telescope sensitivity on a daily basis.

Publications

[1] CHIME Collaboration. *The First CHIME/FRB Fast Radio Burst Catalog*. under review.

[2] D. Michilli, K. W. Masui, R. Mckinven, D. Cubranic, M. Bruneault, C. Brar, C. Patel,

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P. J. Boyle, I. H. Stairs, A. Renard, K. Bandura, S. Berger, and **D. Breitman** et al. An analysis pipeline for CHIME/FRB full-array baseband data. *ApJ arXiv:2010.06748*, October 2020.

[3] **D. Breitman** et al. *Characterising the Repetition Rate of CHIME Fast Radio Bursts*. in prep.

Languages

- *Programming*: Python (Bokeh, Plotly, Astropy), C, Java, Javascript (Node.js), HTML, CSS.
- *Spoken and written*: Russian, Hebrew, English, French, and Spanish.

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