SIMON GUICHANDUT

Physicist ~ Researcher

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SUMMARY

Recent astrophysics PhD, with a bachelor in engineering physics. With a strong background in mathematical modeling and computational physics, I am looking to transition into a industry or government R&D role. I am highly curious, willing to learn, and eager to take on challenging projects.

SKILLS

Languages: Python, Matlab, Fortran, Bash, C++, LaTeX

Technologies: Git, Scipy, Pandas, scikit-learn, Excel

Interpersonal: Technical writing & presenting, Public speaking, Leadership

- Fully fluent in english and french (native) -

EDUCATION

2018 - present	**M.Sc. & Ph.D. - Physics**	**McGill University**

Fully funded with competitive national scholarships. 4.0 GPA.
3 first-author publications in top-tier astrophysics journal (google scholar)
Teaching assistant for 5 undergrad level, 2 grad level courses. Lead >10 tutorials and gave 3 guest lectures.
2024 McGill physics graduate teaching award winner.

2014-2018	**B.Eng. - Engineering physics**	**Polytechnique Montréal**

Internships in neuroscience & biomedical physics. 3.85 GPA.
Final year project designing interferometer for fiber optics company.

RECENT PROJECTS

Data Science & ML	**Will My Flight Be Late?**	**Erdös Data Science Bootcamp (Online) - 2023**

Collected data from 20 million US domestic flights over 10 years. Trained classification models (Logistic Regression, Random Forest) to predict whether a given flight will be late depending on several factors. Built a web app where users can input their flight info and get a prediction. github link. certificate link.
— `scikit-learn` ● `pandas` ● `selenium` ● `seaborn` ● `streamlit`

Physics simulation	**Explosions on neutron stars in 2D & 3D**	**Stony Brook University - 2023**

Moved to Long Island for 4 months as a visiting researcher to work on hydrodynamic simulations of stellar explosions using open-source C++ code. Used 20k node-hours on Perlmutter supercomputer. Wrote several scripts in C++/Python that were merged into the main codebase. github link. arxiv link.
— HPC ● C++ ● `yt`

Physics simulation	**Explosions on neutron stars in 1D**	**McGill - 2022**

Utilized open-source Fortran code to model the ignition, growth and radiation from explosions on exotic stars. Explained peculiar X-ray telescope observation from 2019. Ran code in parallel on canadian supercomputer, with custom bash scripts for automation. github link. arxiv link.
— HPC ● Fortran ● Bash

Physics model	**Outflows from neutron stars**	**McGill - 2021**

Developed a model for the interaction of radiation and fluid dynamics in a star's atmosphere in general relativity. Wrote a $\sim$4000 line python solver with a command line interface. github link. arxiv link.
— `scipy` ● `numpy`

Hackathon project	**Disease-spreading and contact tracing simulator**	**McGill Physics Hackathon 2020**

Code written in 24 hours. Models the spread of a disease in a population within a particles-in-box simulation. Implements a contact-tracing network via breadth-first-search. github link.
— `numpy` ● `matplotlib`

Hackathon project	**Ocean tides from multiple moons**	**McGill Physics Hackathon 2019**

Code written in 24 hours. Solves the time-dependent motion of tides on a water planet with an arbitrary number of moons. Visualizations using cartographic projections. Winner of the "astro prize". github link.

LEADERSHIP

2021	**Outreach Coordinator**	**McGill**

Main organizer of all outreach events for *AstroMcGill* (public talks, festivals, trivia events).
Social media & mailing list advertising, volunteer recruitment.

2019-2021	**Graduate mentor**	**McGill**

Guiding undergraduate student through the graduate admissions process.

2018-2020	**Astronomy public talks organizer**	**McGill**

Booking speakers and auditoriums, coordinating student volunteers.