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44 Innovation Boulevard  
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Dear Recruiting Manager,

Hello!

In response to SXRMB Support Scientist position number 2021-2, kindly find my resume attached.

I have about 5 years of experience founding and managing an electronics company and performing associated research, along with a B.Sc. in Science.

Skills particularly suited to the CLS include some experience in the design and fabrication of high vacuum systems, and with beam simulation codes such as IBSimu and Warp.


I also have a small amount of recent experience in physical virology and applied microbiological technique that may be of some use.

I am willing to relocate for this position, and am available for a remote interview at any time.

Thanks for your time!

# Hi, I'm Daniel.

*Science rules!*

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**Education:**

B.Sc. in Science from York University, Physics stream. Graduated winter 2020 with B+ GPA.

## SafeSump Inc.

CEO/CTO of four-year project to design and produce a failure-resistant water pump system. Funded by a \$37,500 Ontario Centres of Excellence grant (2017-2020) followed by a \$75,000 government contract (2018-2020).

Broad overview of skills gained:

- **Electronics:** Production electronics design and design-for-manufacturing; rapid prototyping of ultrasonic and capacitive sensors, among others
- **Software and firmware:** Version control. Frontend and backend server programming; Linux administration, programming of production utilities and scripts. Writing and maintaining a 30k SLOC codebase of C, Python and C++.
- **Soft skills:** Pair programming, time management, writing.

## Viral electroporation

A 10-month attempt to follow up experimentally on previous research regarding the dielectric properties of viruses, in the hopes of harnessing a phenomenon known as irreversible membrane electroporation, via optimized Brillouin precursors.

This required some literature review and a degree of care

in experimental design, but also required several specialized pieces of equipment:

A custom, inexpensive synchronous photon-counting fluorescence system, allowing amplification-free quantification of dsDNA at sub-nanogram resolution.

Development of an inexpensive 12 GHz microwave absorption spectrometer (albeit unused in the final experiment)

Electromagnetic modelling of tissue and experimental system parameters via FDTD; sub-nanosecond kilovolt pulse generation; numerical optimization of dispersive pulses.

Broad overview of skills gained:

- **Documentation:** LaTeX, Jupyter notebooks, Mathematica, Reference management
- **Software:** Data analysis and automation; Python, C++, and a smattering of many others
- **Simulation:** Several dozen toolchains were in use, ranging from modified open-source electromagnetic simulation systems to molecular dynamics with GROMACS.
- **Electronics:** Microwave electronics design, PCB design with KiCAD
- **Fabrication:** Electronics prototyping, CNC mill and lathe operation, micromachining, microfluidics

## Vacuum systems

A 2-year attempt to develop a high-current ion beam lithography system, involving the ion-beam simulation tools noted in the cover letter and several custom solvers.