

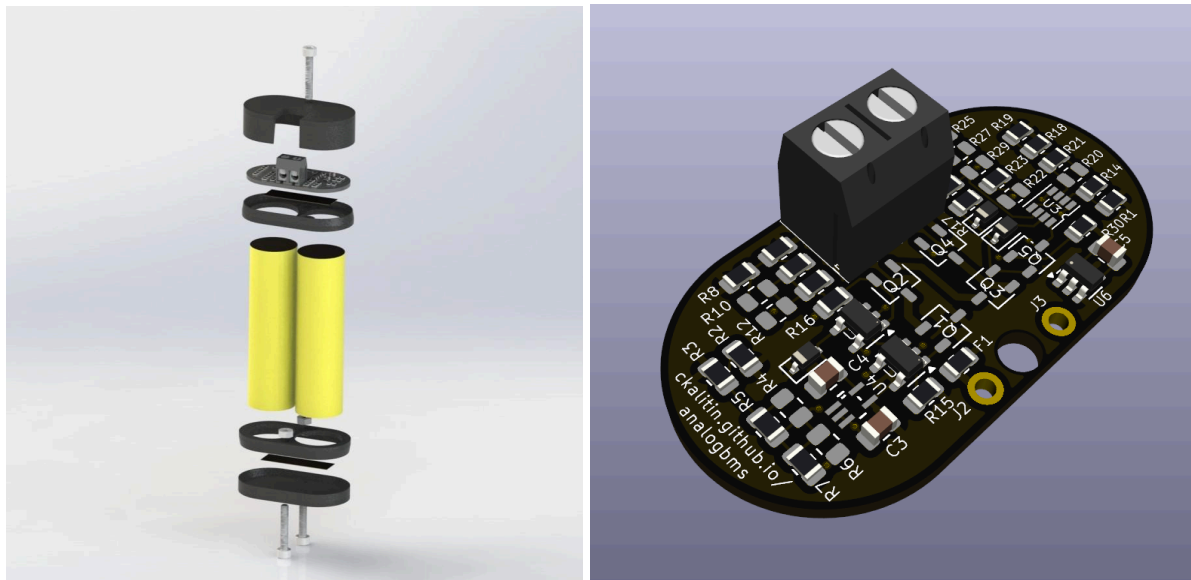
Analog BMS + 1s2p Li-ion Battery Module

Raw PCB & solidworks files available here: <https://github.com/CKalitin/analog-bms>

Over the summer I designed a 1s2p lithium-ion battery module enclosure in solidworks and an Analog Battery Management System for it in KiCAD.

The BMS is uses no microcontroller and leverages comparators, shunt voltage references, and P/N MOSFETs to achieve under/over voltage faults, under/over temperature faults, and over-current faults.

I designed the enclosure in Solidworks while taking into account cell dimension tolerances and the tolerance of my 3D printer. Most components are snap fits with a few M3 screws to keep everything in place.



Python Data Analysis & Simulation Projects

McDowell Dataset Analysis: <https://github.com/CKalitin/mcdowell-dataset-analysis>

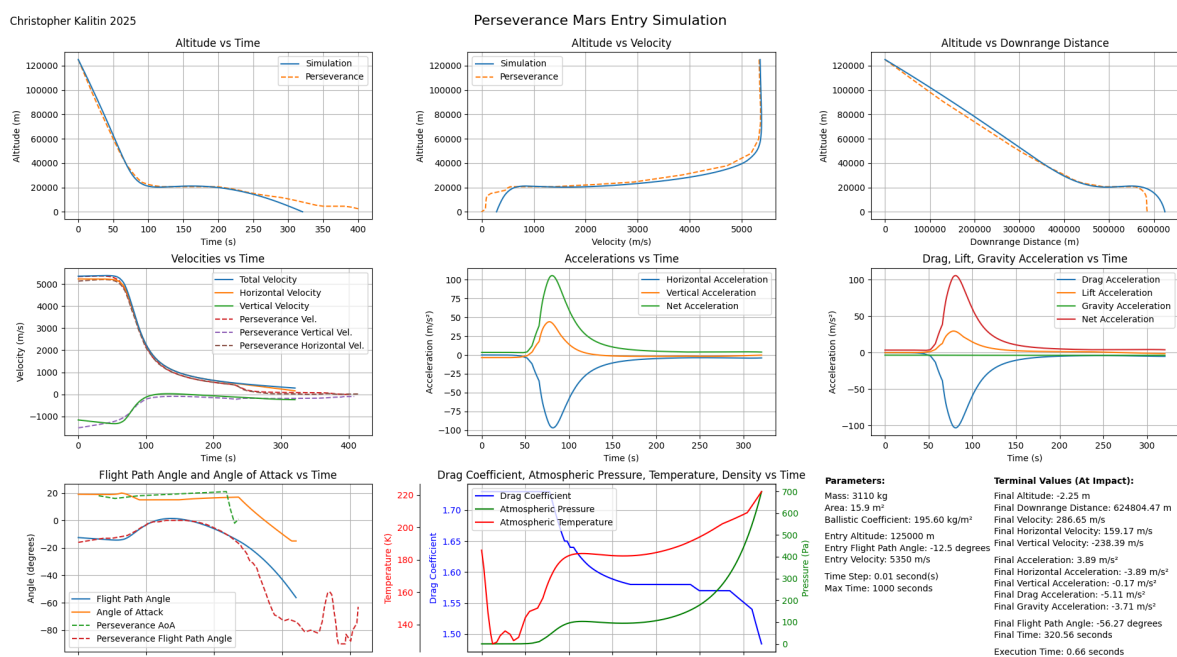
Martian Ballistic Modelling:

<https://ckalitin.github.io/space/2025/05/13/martian-atmosphere-model.html>

I wrote a python library (that's on [PIP!](#)) to analyze Jonathan McDowell's dataset of every launch that's ever occurred and every object to ever be intentionally put into space. He gives raw .tsv files and I wrote a more user friendly Python package.

I also wrote a Blunt Body Mars Entry Vehicle simulation in Python to derive a graph of impact velocity vs. ballistic coefficient, and back tested to NASA's published data of previous landers (eg. Phoenix & Perseverance).

Christopher Kalitin 2025



Analysis of the Commercial Satellite Launch Market

Rocket Lab & Firefly Aerospace Blog Post:

<https://ckalitin.github.io/space/2024/08/12/extrapolating-demand-firefly.html>

https://x.com/Peter_J_Beck/status/1823128548581994792

NordSpace Blog Post:

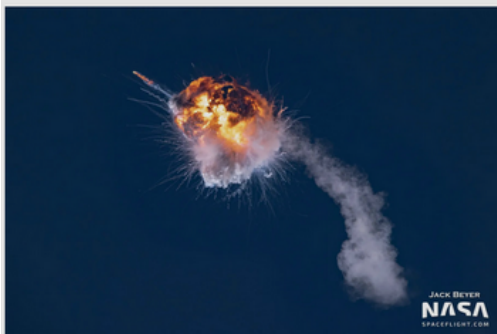
<https://ckalitin.github.io/space/2025/07/08/canada-space-industry.html>

As part of my demand analysis of the commercial small satellite launch market I wrote 10+ blog posts. The most successful of these was read by Peter Beck, the CEO of Rocket Lab!

More recently, I wrote a blog post on domestic Canadian demand for launch and had a call with Rahul Goel, CEO & Founder of NordSpace about the topic.

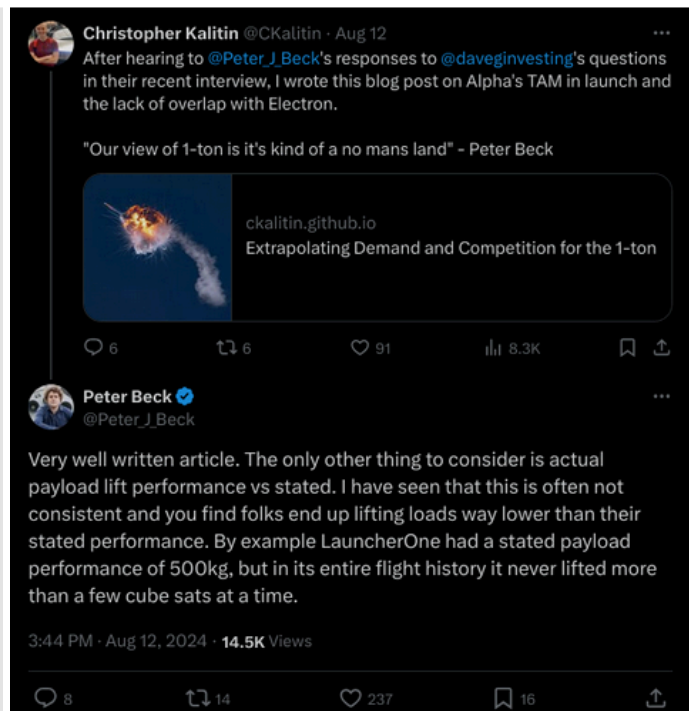
Extrapolating Demand and Competition for the 1-ton Rocket Class

Aug 12, 2024 • Christopher Kalitin



Tell me where I'm wrong or just give compliments [here](#).

Today four of the best space investing Youtubers posted their interview with Peter Beck and Adam Spice of Rocket Lab. Responding to one of Dave G's questions, Peter Beck said this about the 1-ton rocket class: "Our view of 1-ton is it's kind of a no man's land."



My call with Rahul Goel of NordSpace. Also met one of the original members of UBC Rocket, Hubert Fortier (bottom left) who happened to be working there.

STM32 Projects & Blog Posts

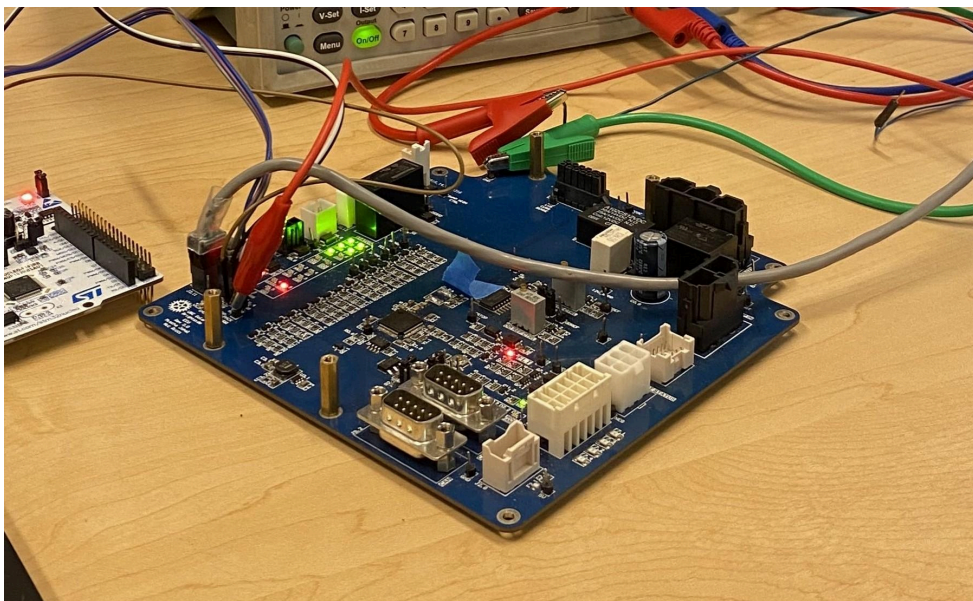
IWDG & RCC_CSR Blog post:

<https://ckalitin.github.io/technical/2025/03/26/stm32-rcc-register.html>

Automated ADC Characterization:

<https://ckalitin.github.io/projects/2024/12/29/scpi-auto-characterization.html>

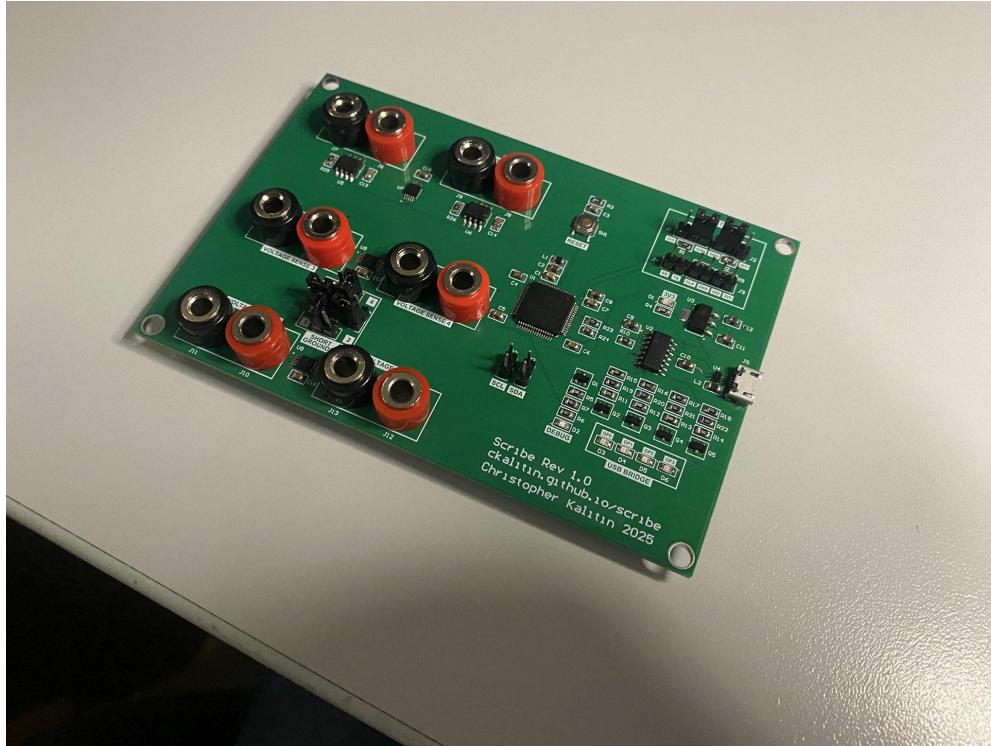
In 2024 I joined the UBC Solar student design team on the Battery Management System subteam. Most of my work involved programming, and characterizing STM32 microcontrollers. This involved debugging Independent Watchdog errors (which required diving deep into how STM32s really work), characterizing the ADCs, and more development/programming tasks.



PCB Design

For UBC Solar projects I taught myself PCB Design and designed a PCB based on the STM32 to record time series voltage and current data for easy characterization of various systems (eg. current sensor). Essentially an easily programmable & readable multimeter & oscilloscope.

Currently doing this project, see the current state of the PCB with firmware [here](#):



Unity Development

<https://github.com/CKalitin/Unity-Simple-Networking-Layer>

<https://github.com/CKalitin/Simple-Hex-Strategy-Game>

My final project in my Digipen Game Development class was an online multiplayer platformer called Stuck in the Simulation. After finishing this project I was familiar enough with C# Unity Networking programming that I decided to create a high-level Unity Package for networking. This abstracted away many of the intricacies of networking so that the user had an easier experience creating a game. At the end it was 8,000 lines of code and I implemented it in a game myself called Tiny Troops (second link).



I'm no artist, excuse the extreme adherence to low poly art in this early build of the game.