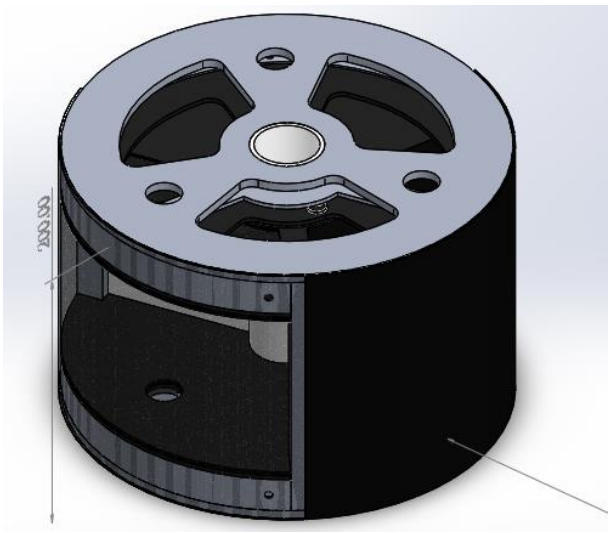
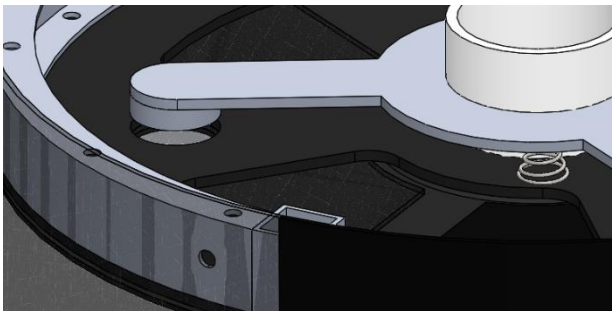
T: 604.822.9677 | F: 604.822.9676 | science.coop@ubc.ca | www.sciencecoop.ubc.ca

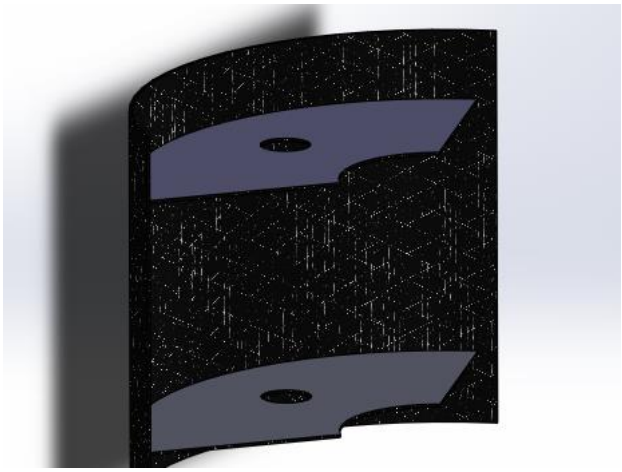
THOMAS BICHEL

403-970-5310
Thomas.bichel@live.com

Project Portfolio





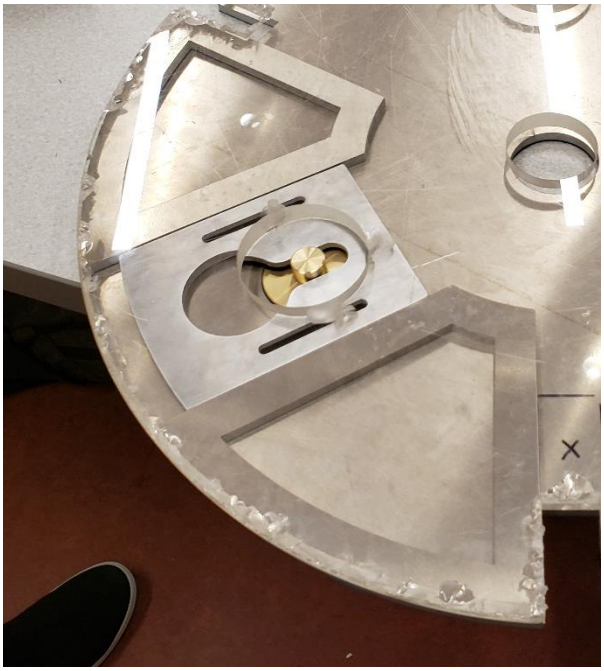


UBC Rocket's Whistler Blackcomb Recovery Bay Cad (2020 - 21)

if all goes according to design, this bay should be able to bring our 130 kg rocket back from space

- *The model follows parametric equations, any overhead design adjustment from the simulation team (such as a diameter change) can be easily inputted and a new model will be generated automatically*

- *Spring and electronically actuated panel locks, these keep our bay doors (pictured below) connected to the rocket despite large skin friction and pressure gradients across the rocket body*



- *An old prototype of the door lock,*
  - *Waterjet aluminum, acrylic*
  - *Machined brass*

More prototype and design pictures and videos available upon request.

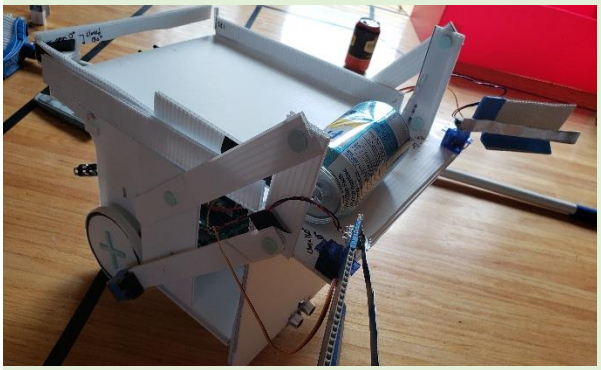
UBC Rocket's SkyPilot (2019):

- *Peak altitude: 26,400 ft*
- *Max speed: Mach 1.2 (1482 Km/h)*

- *The entire exterior of that rocket is comprised of my sub team's hard work.*
- *Designing, and in-house manufacturing of carbon, and fiberglass composites.*

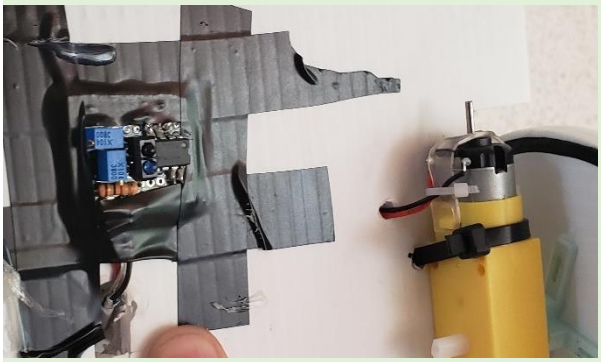
Videos available upon request.

T: 604.822.9677 | F: 604.822.9676 | science.coop@ubc.ca | www.sciencecoop.ubc.ca

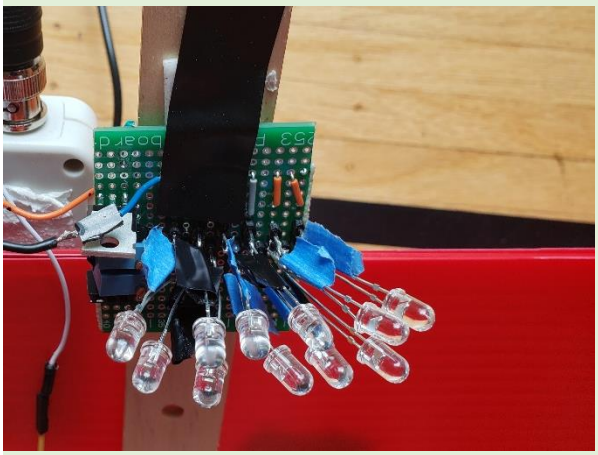


Engineering Physics Robot Summer (2020)
Built an autonomous robot to collect and recycle cans during a time limit

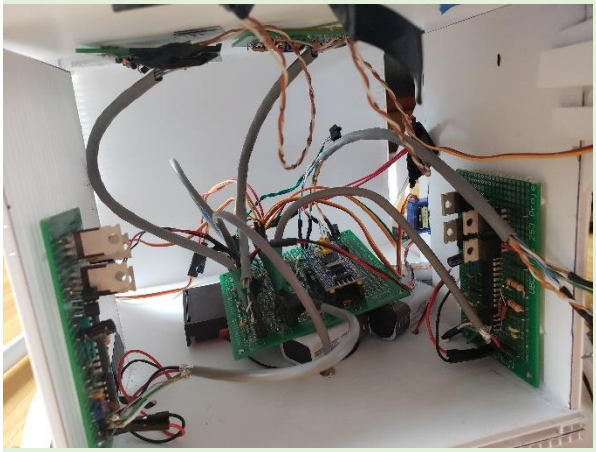
- *Servo-actuated 4 bar linkage to lift cans into carrying tray*



- *Tape IR limit sensor to keep the robot within the competition surface*
- *Also seen: Motor and wheel*



- *All construction was done at home during quarantine. This led to circuits that would be normally provided, such as the IR beacon here, needing to be designed and constructed using only what we had in our home-labs*
- *This uses a portable oscilloscope to flash IR LED's at a 1kHz frequency*



- *Internal electronics. Pictured are: two H-bridges, main computation and integration chip, IR receiver and filter circuits, power and servo wire routing*
- *All circuits are built from discrete components and soldered onto protoboards by hand*

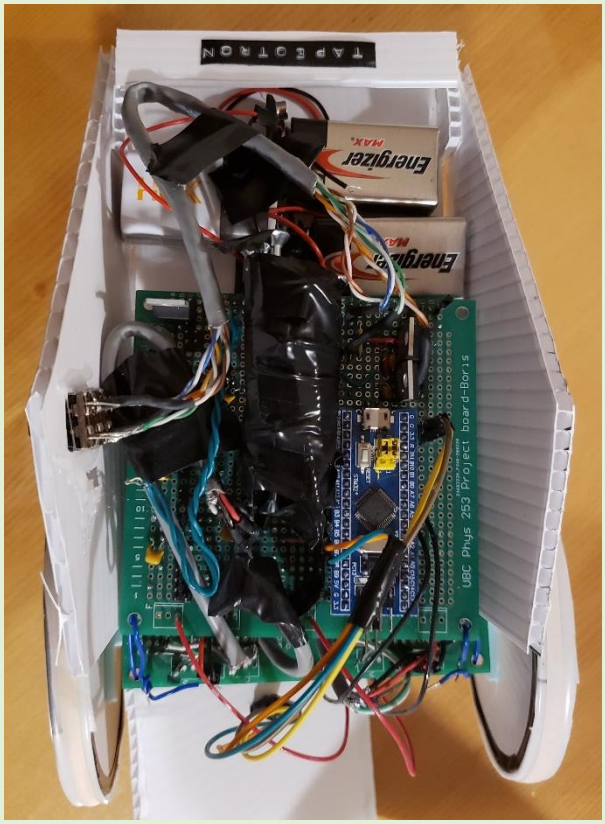
T: 604.822.9677 | F: 604.822.9676 | science.coop@ubc.ca | www.sciencecoop.ubc.ca

Guy-Manuel helmet from the band Daft-Punk. (2019)

- *Runs on a Bluno BLE Beetle and a portable phone charger.*

- *3D printed shell with Bondo and paint to cover layer lines. (thermo form buck is currently shown)*
- *Thermoformed PETG visor, spray tinted.*
- *Individually addressable LED'S capable of displaying various patterns and colours.*

I can't take credit for the 3D model; however, all the electronics work was researched and implemented by me

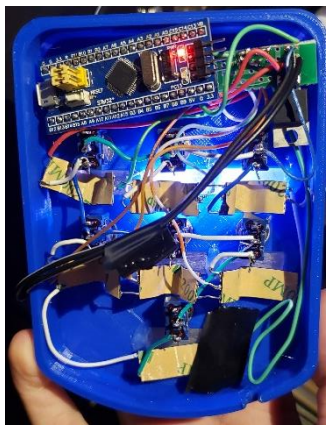


Tape-Tron

- *A self-driven exercise to reinforce what I learned while constructing my previous robot*

- *Used scrounged parts from the previous robot to follow a tape trail on the ground*

T: 604.822.9677 | F: 604.822.9676 | science.coop@ubc.ca | www.sciencecoop.ubc.ca



Weekly Goal Calendar (2020)

- *Simple weekend project, satisfying toggle-flipping reward for completing weekly tasks*
- *3D printed enclosure, 5V power supply, powered by STM32 blue-pill and addressable LED's (what I had on hand)*

Modular Can Rockets (2019)

- *Fully modular can rocket system, capable of making your drinks soar to over 500 ft!*
- *Summer design project to practice cad and get a firmer grasp on my 3D printer*

Videos available upon request