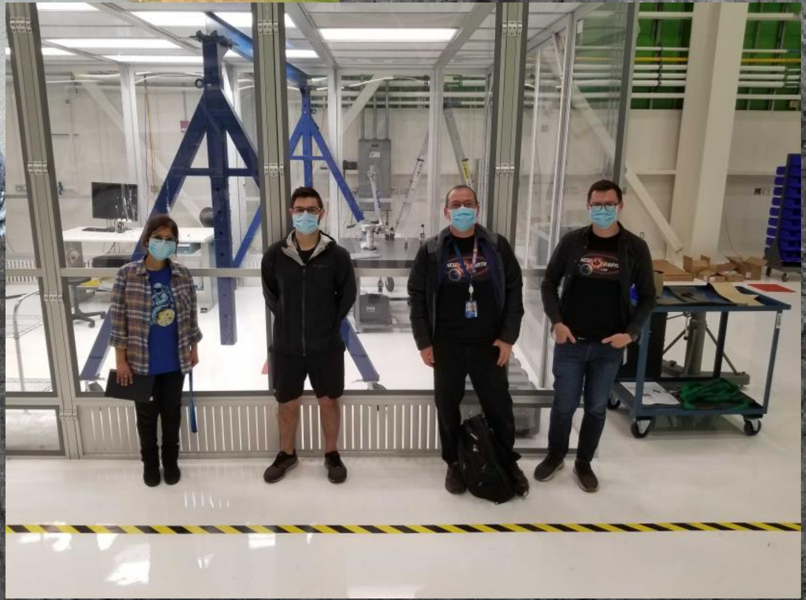
A journey through grad school

Adam B. Johnson (he/him)

Ph.D Candidate

Dept. of Mech. Engineering

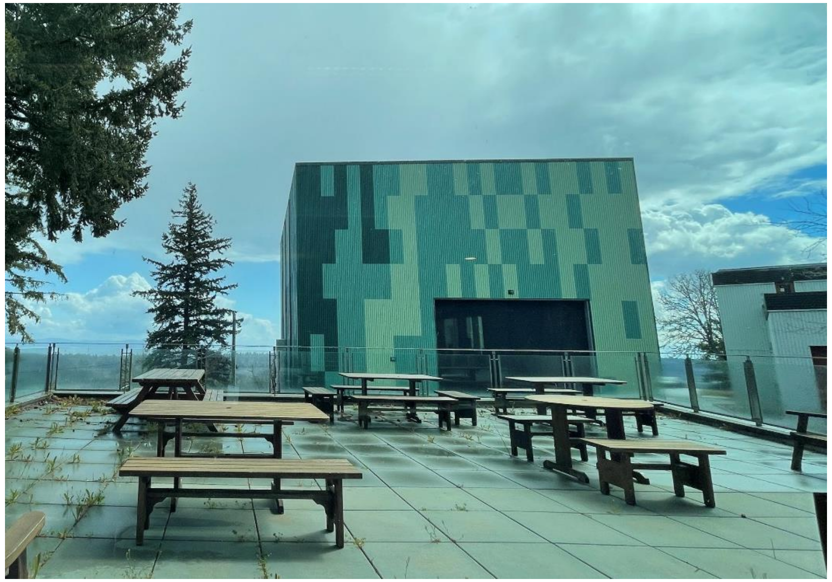
University of Victoria



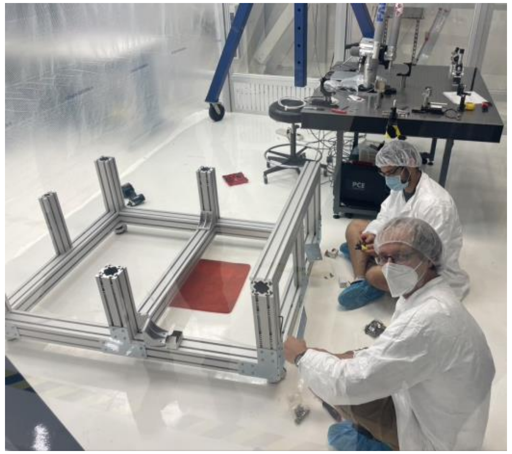
Where it began

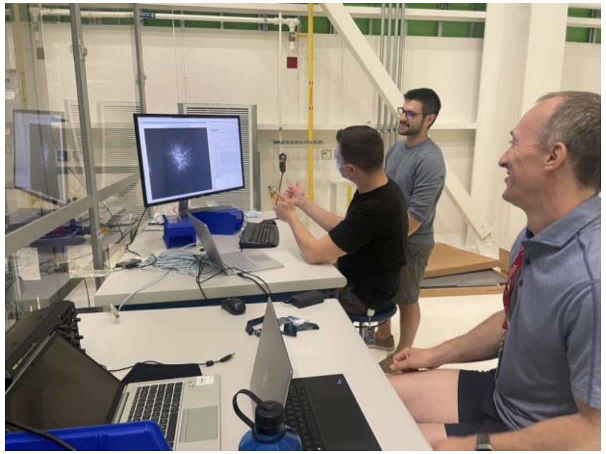
- Born 1995, Brentwood Bay, BC, Canada
- Stelly's Secondary High School 2013
- Camosun College
    - Mech. Engineering Technology 2015
    - Bridge Mech. Engineering Technology 2018
- University of Victoria
    - BEng - Mech. Engineering 2021
    - PhD - Mech. Engineering 2021~2025
- NRC HAA – 2021 and beyond
    - NEW EARTH Lab team
    - GPI2 CAL2 team

Joining the NEW EARTH Lab team



- NRC's Extreme Wavefront control for Exoplanet & Adaptive optics Research Topics at Herzberg (NEW EARTH)
  - A lab where we try new and crazy ideas
- Subaru Pathfinder Instrument for Detecting Exoplanets and Retrieving Spectra (SPIDERS)
  - Student built exoplanet imager with new technologies
  - Lead on mech. structure, FTS, and chopper.



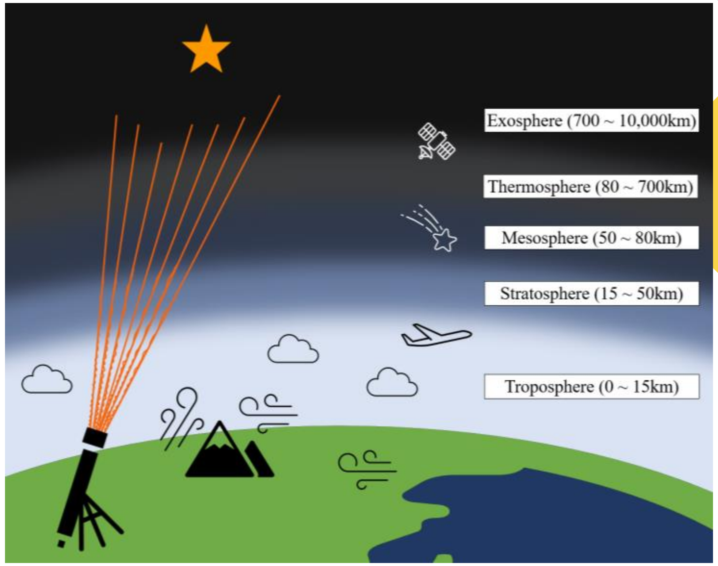


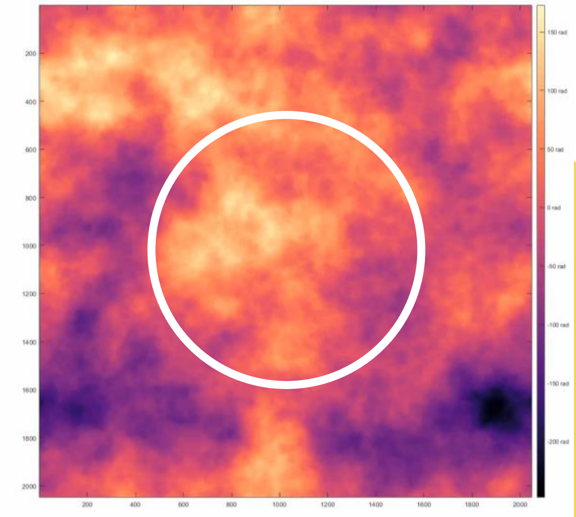
What our research focuses on

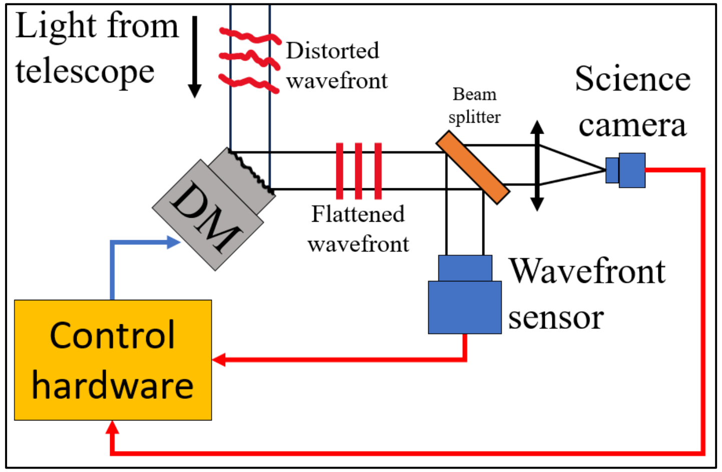
- Atmospheric turbulence distorts the image we are trying to capture

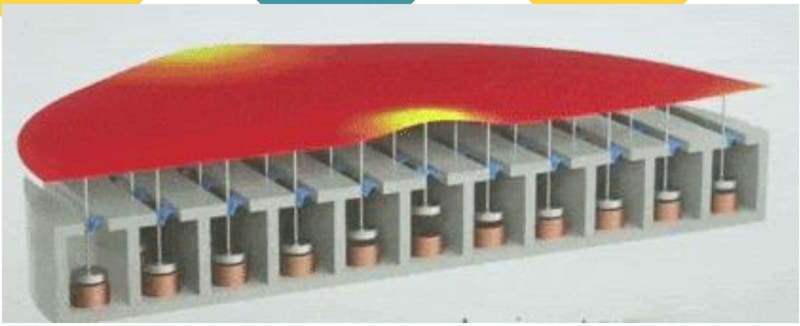
- Adaptive Optics (AO) uses wavefront sensing (WFS) to measure and reshape the wavefront

- The deformable reflective surface can change shape at kHz speed

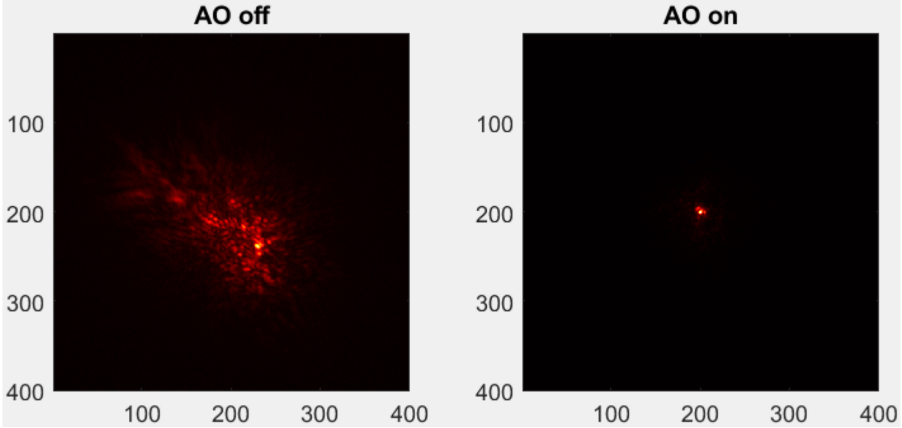








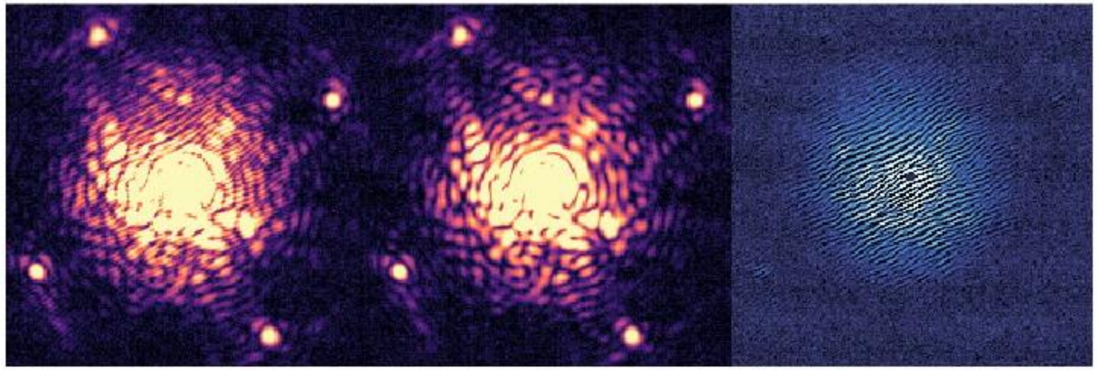
https://www.alpao.com/products-and-services/deformable-mirrors/

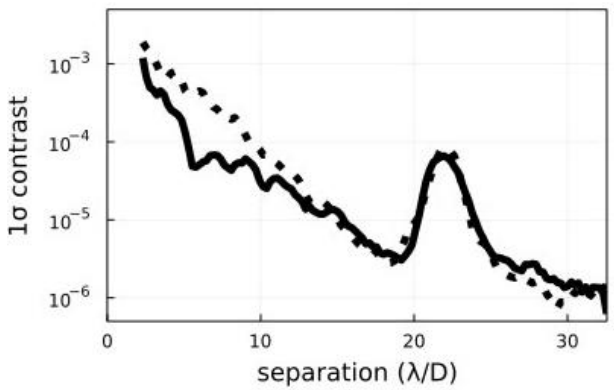


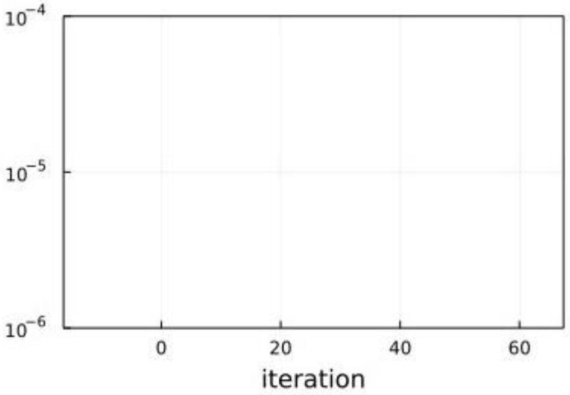
https://www.lam.fr/en/new-results-for-papyrus-at-ohp/

First lab results with SPIDERS

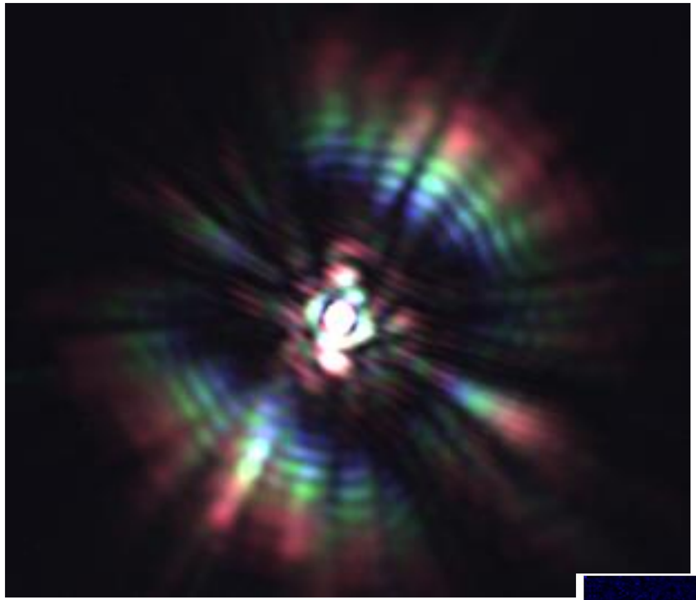
- Initial AO and characterization results 2023
- Development still underway for delivery and commissioning at Subaru telescope ~2025

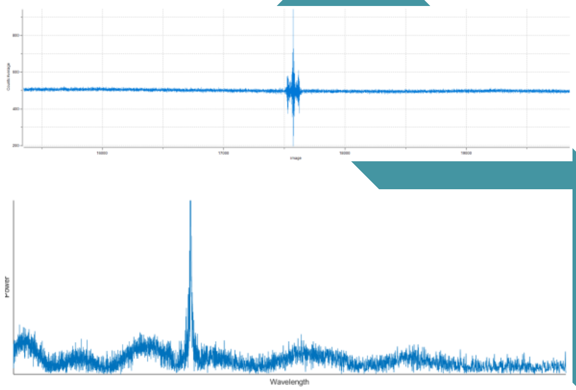


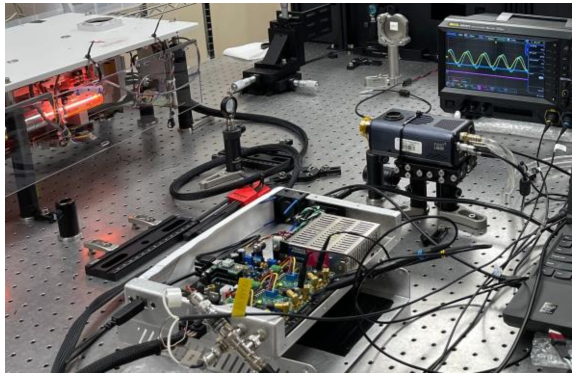


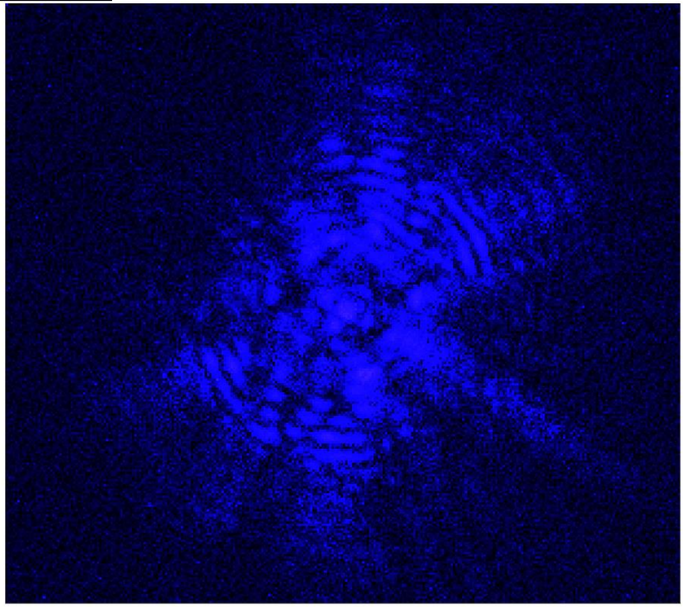


William Thompson

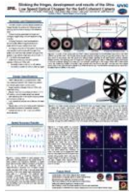


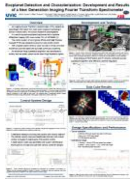




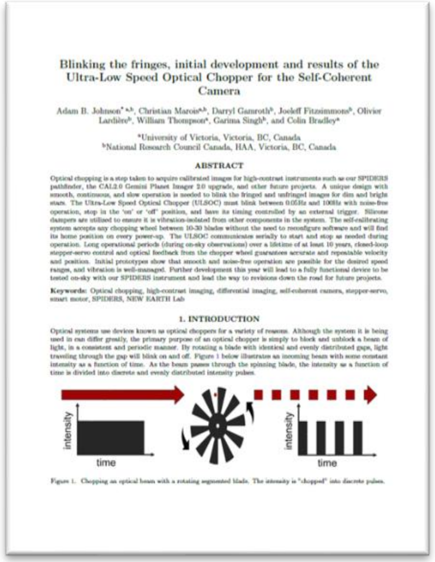


Sharing knowledge through publications





- Conference proceedings and posters help build reputation
- Poster presentations/talks provide great practice for public speaking
- Traveling to network with and learn from experts in the field



Blinking the fringes, initial development and results of the Ultra-Low Speed Optical Chopper for the Self-Coherent Camera

Adam B. Johnson[a,b], Christian Marois[a,b], Darryl Gamroth[b], Joeleff Fitzsimmons[b], Olivier Lardière[b], William Thompson[a], Garima Singh[b], and Colin Bradley[a]

[a]University of Victoria, Victoria, BC, Canada
[b]National Research Council Canada, HAA, Victoria, BC, Canada

ABSTRACT

1. INTRODUCTION

AO4ELT7 - June 2023 - Avignon

Exoplanet Detection and Characterization: Development and Results of a New Generation Imaging Fourier Transform Spectrometer

Adam B. Johnson[a,b], William Thompson[b], Kris Caputa[b], Frédéric Grandmont[c], Christian Marois[a,b], Tim Hardy[b], Joeleff Fitzsimmons[b], Olivier Lardière[b], and Colin Bradley[a]

[a]University of Victoria, Victoria, BC, Canada
[b]National Research Council Canada, HAA, Victoria, BC, Canada
[c]ABB Inc., Montréal, QC, Canada

ABSTRACT

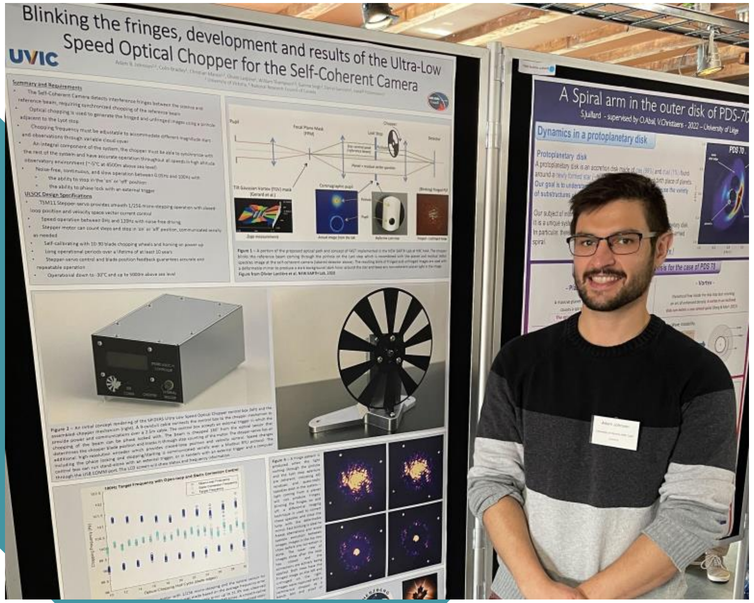
A SmallSat mission study for STARLITE: Superluminous Tomographic Atmospheric Reconstruction with Laser-beacons for Imaging Terrestrial Exoplanets

ABSTRACT

1. INTRODUCTION (0.5 PAGE)

SPIE.

Traveling to share and learn 2022

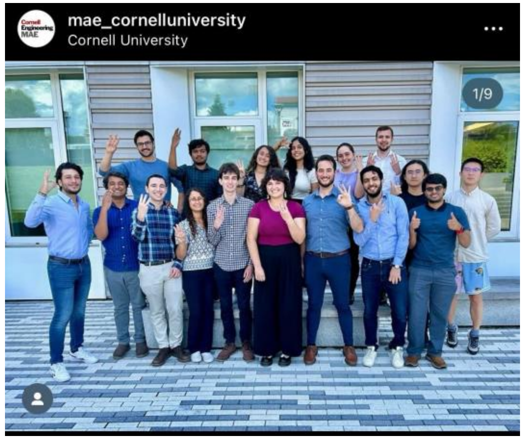


Spirit of Lyot Conference
Poster presentation
Leiden, Netherlands

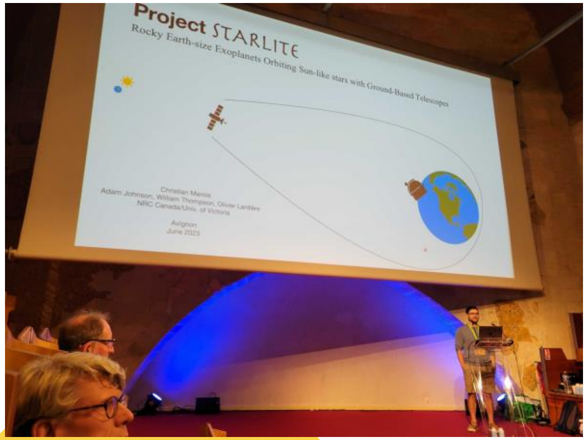
NTCO AGM
Poster presentation
Montréal, Canada

SPIE Conference
Poster presentation
Montréal, Canada

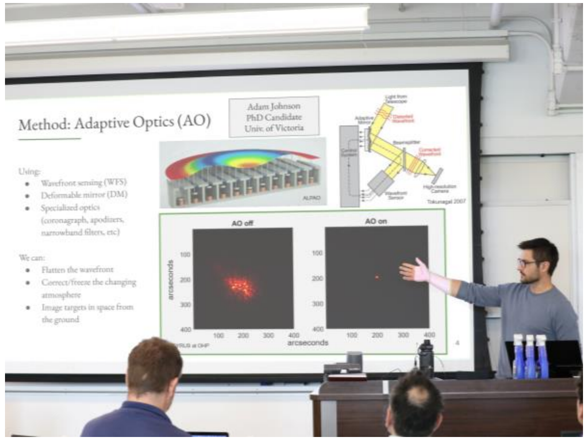
Traveling to share and learn 2023



CDI Workshop
Paris, France



AO4ELT7 Conference
Talk
Poster presentation
Avignon, France



SmallSat Design Course
PI for STARLITE Mission
Cornell University, USA

Dunlap Institute
Instrumentation Workshop
Toronto, Canada

Making sure to enjoy the city

Leiden, Netherlands

Montréal, Canada

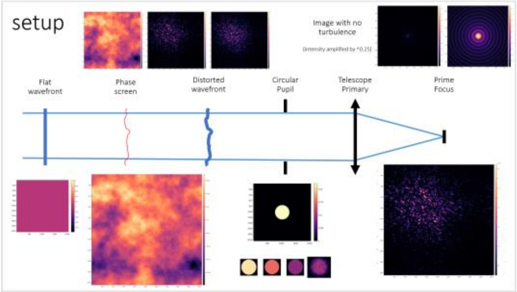
Montréal, Canada

Avignon, France

Cornell University, USA

Toronto, Canada

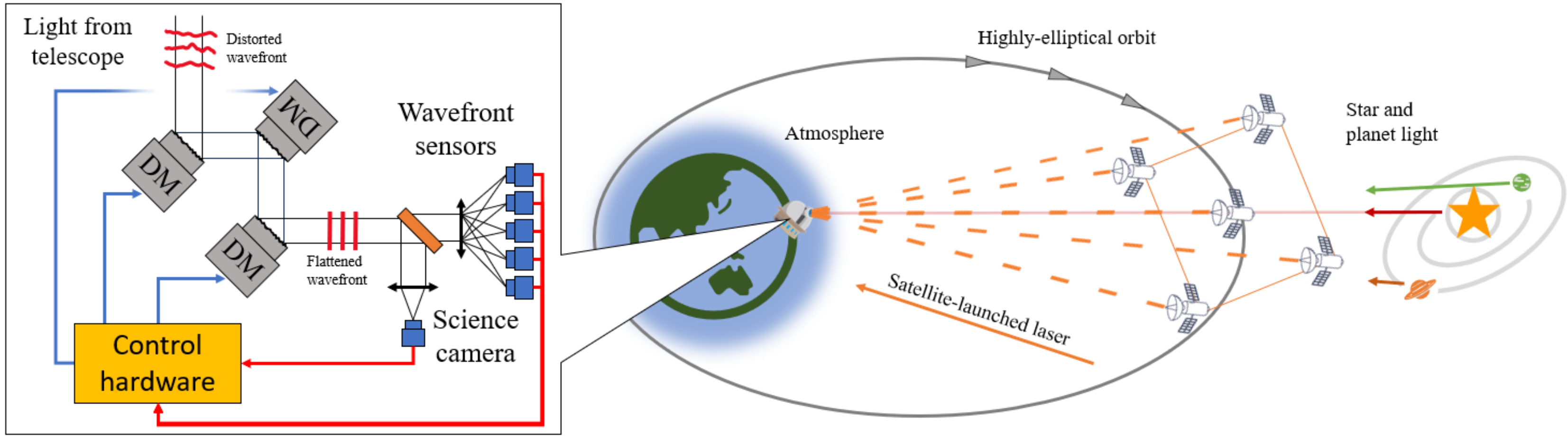
Where my research is now



~1.5 years of PhD remaining

STARLITE PhD thesis – optical simulations and system desgin

GPI2 CAL2 mech. Eng.
- FPM Wheel Engineering Lead
- PM Engineering Lead
- Chopper Lead



SPIDERS Mechanical Eng. Lead
- IFTS Engineering Lead
- Chopper Engineering Lead

Small engineering jobs with REVOLT and NFIRAOS

https://commons.wikimedia.org/wiki/File:Panoroma_of_Mauna_Kea_Observatories.jpg

Lessons learned and final takeaways

- Seek feedback and ask questions
- Build an effective network
- Set personal goals, schedules, and be organized
    - Grad school is a marathon, not a sprint
- Be yourself, have fun

Thank you