

Adaptive, Multi-mission Design of CanX Nanosatellites

Stuart Eagleson, MAsc. Candidate

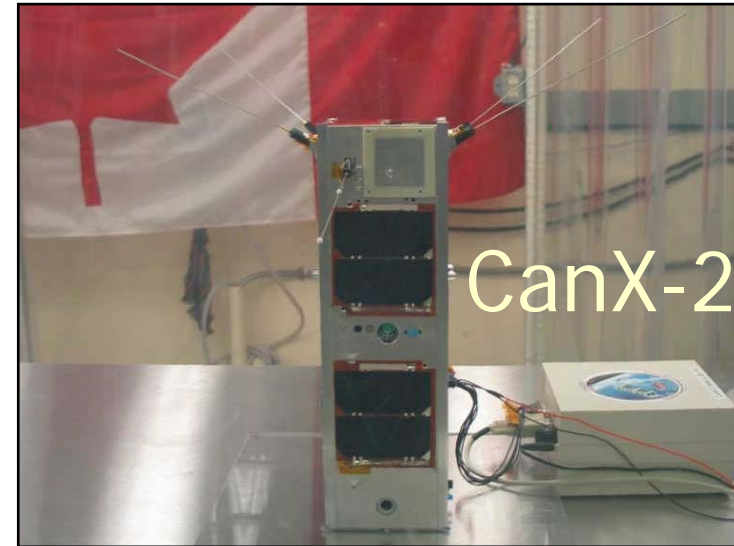
Karan Sarda, Stephen Mauthe, Tarun Tuli, and Dr. Robert E. Zee

University of Toronto Institute for Aerospace Studies

Space Flight Laboratory

16 August 2006

The CanX Program



Train students at the Master's level.

Advance scientific and engineering capability.

Provide quick, low-cost access to space.

Philosophy

Hybrid performance/cost-driven design.

Limited scope and simplicity of design.

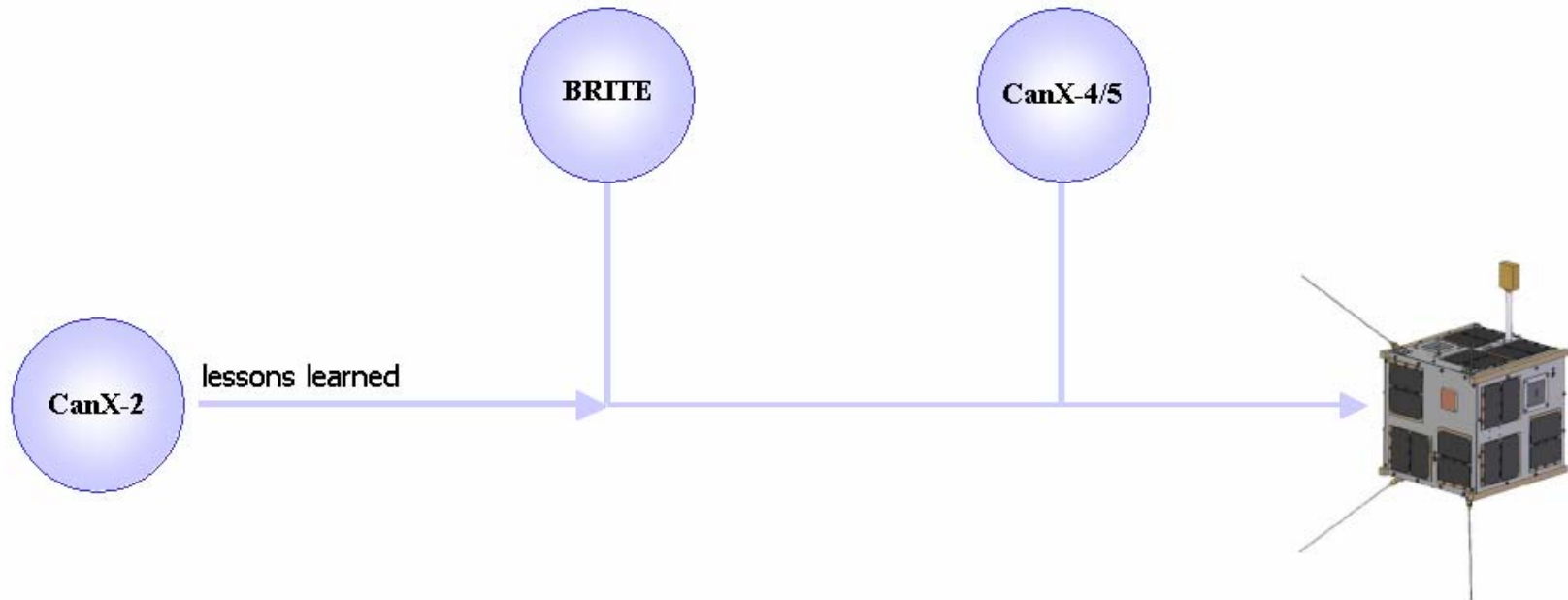
Knowledge of the service environment.

Emphasis on commercial components.

Small, tightly-knit team environment.

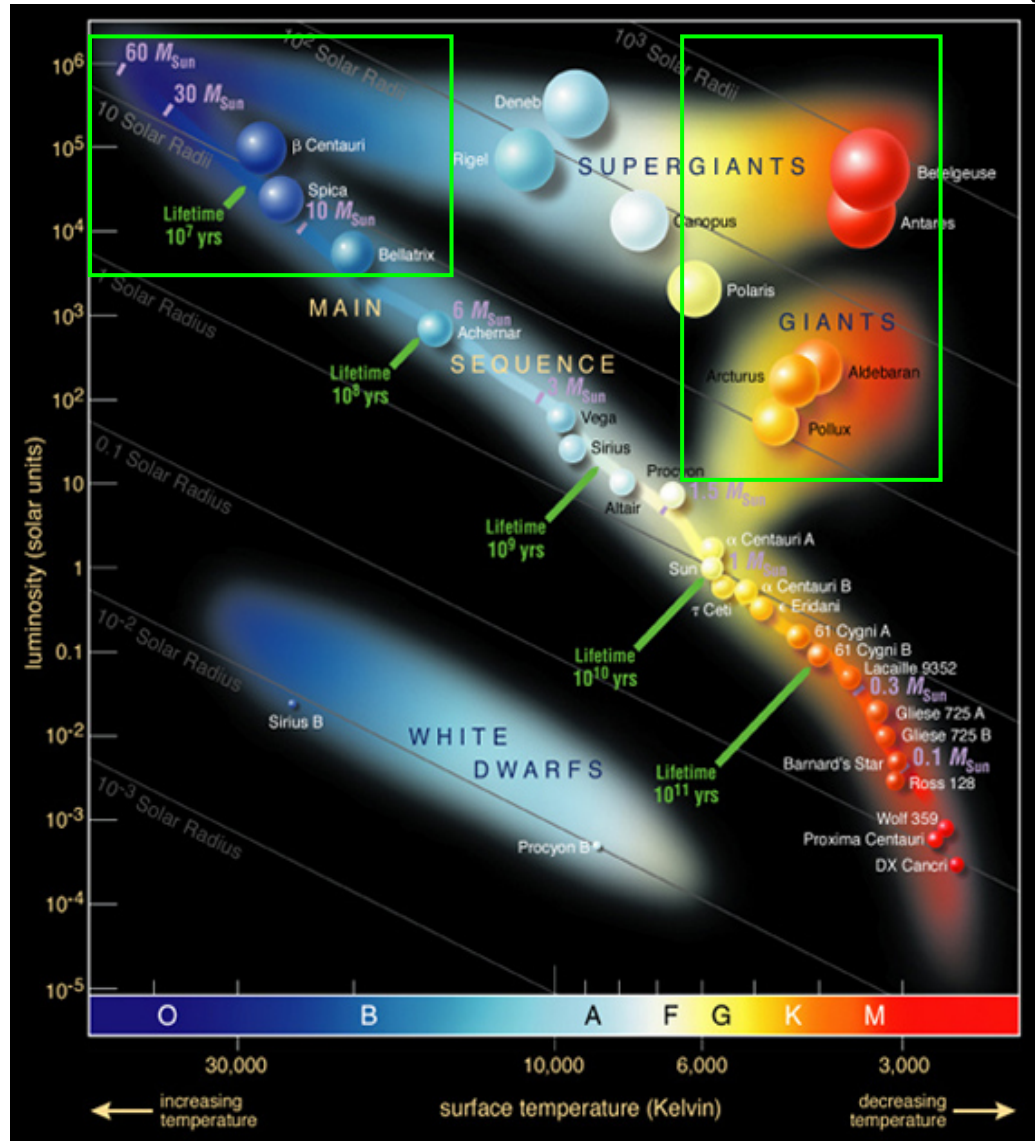
Cost Mitigation

Reduction of non-recurring engineering costs.
Solution is a multi-mission strategy.



Scope limited to missions at hand.

BRITE (CanX-3)



BRITE (CanX-3)

Observe stars of $M_v + 3.5$ and brighter.

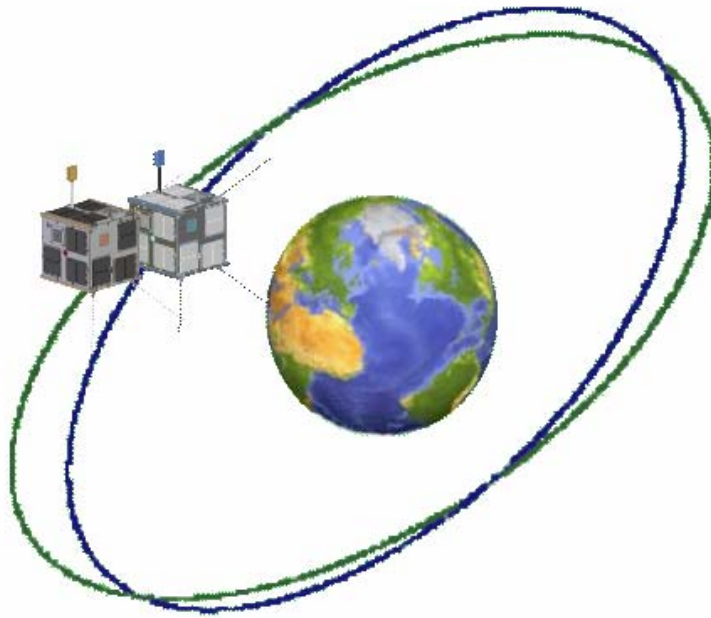
Single image error $< 0.1 \%$.

100 day imaging campaigns at 15% duty cycle.

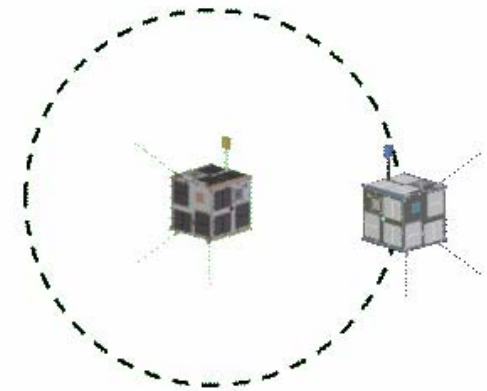
Long-term photometric error < 20 ppm.

Arcminute-level attitude accuracy and stability.

CanX-4 and CanX-5



Viewed from Space



Viewed from Earth

CanX-4 and CanX-5

Along-track, in and out of plane relative orbits.

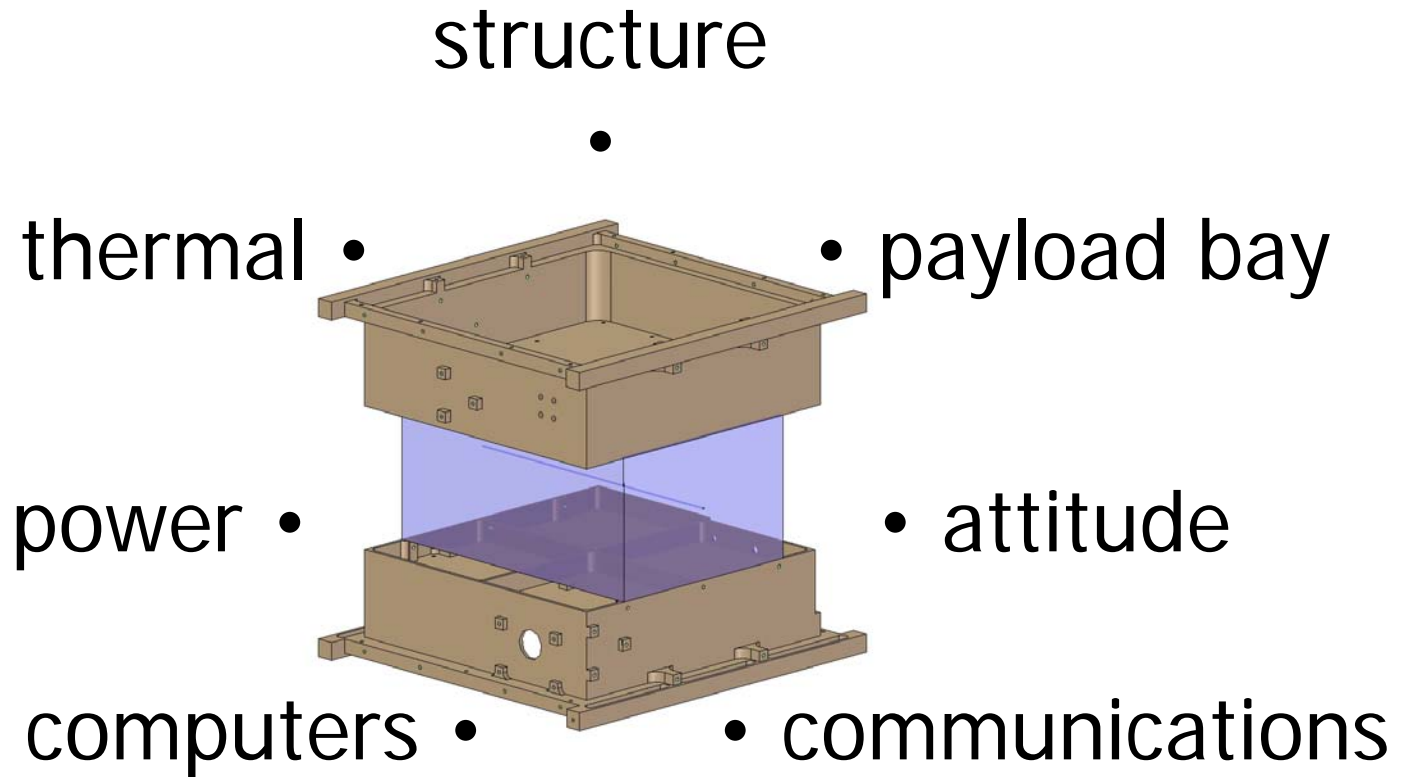
Show cm-level determination; m-level control.

5+ GPS satellites viewed by both satellites.

Inter-satellite communication.

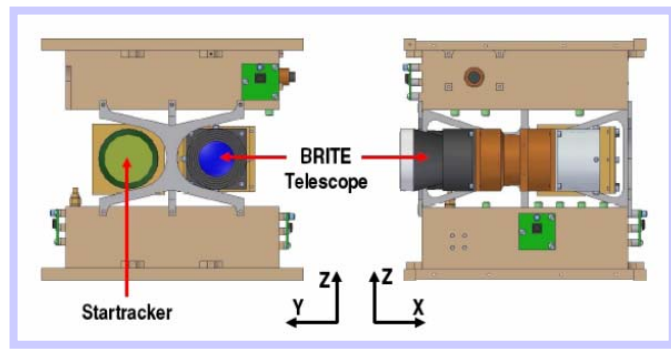
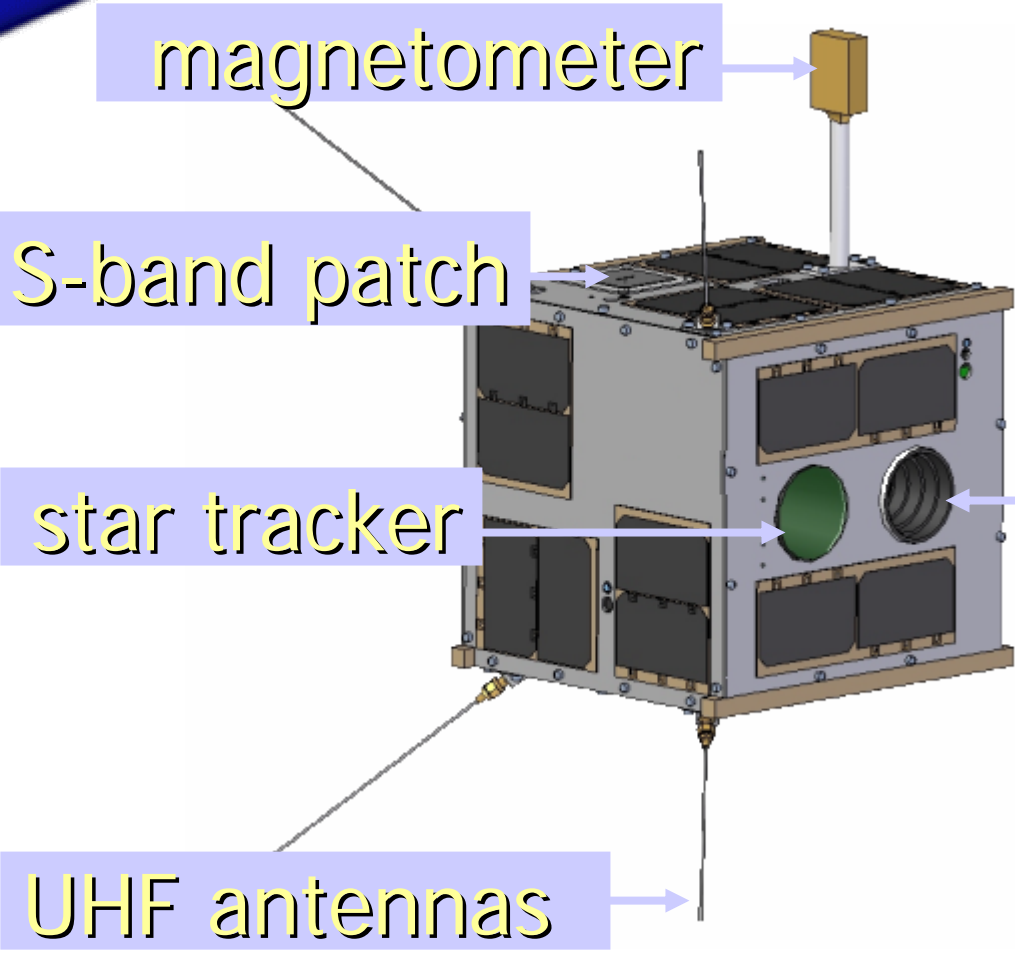
Role reversal capability.

Key Subsystems



GNB Adaptation

BRITE (CanX-3)



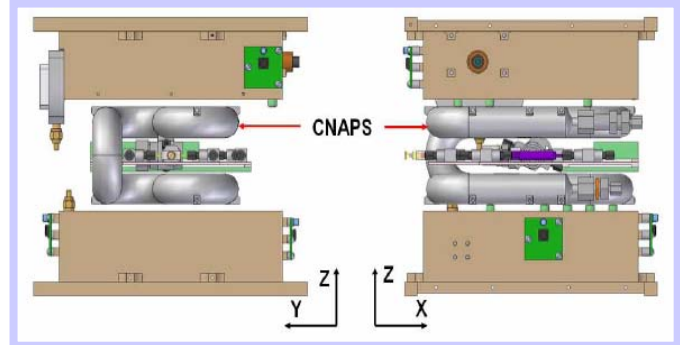
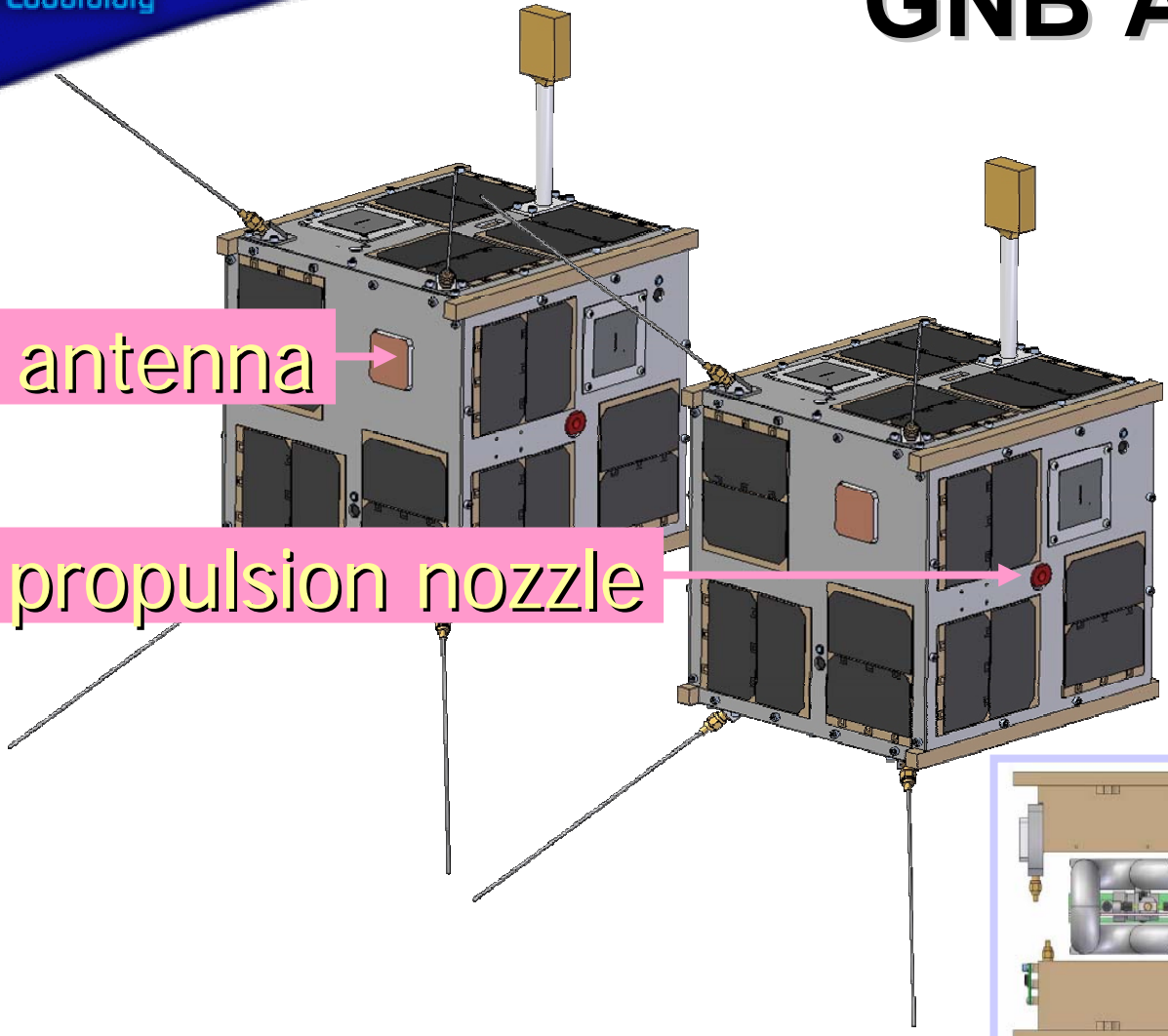
Payload Bay

GNB Adaptation

CanX-4 and CanX-5

GPS antenna

propulsion nozzle



Payload Bay

Questions?



Partners



Sponsors