

From MOST to BRITE: With a Stopover at CanX-2

C. Grant¹, R. Zee¹

¹ Space Flight Laboratory, University of Toronto, Institute for Aerospace Studies,
4925 Dufferin Street, Toronto, Ontario, Canada, M3H 5T6

Abstract

This proceeding paper was generated using a Power-Point presentation from the workshop.

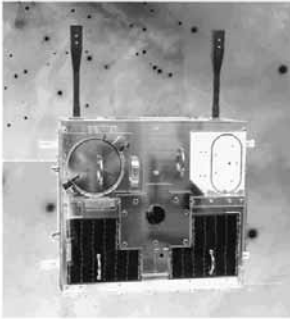
Presentation Slides

Who Are We?

- Unique university lab in Canada focusing on **microspace** systems.
- "Microspace" = disciplined small team approach to using commercial technologies in space.
- Developed key subsystems for the **MOST** microsatellite and supported integration, test and operations.
- Canadian Advanced Nanospace eXperiment (**CanX**) nanosatellite program provides low cost access to space.



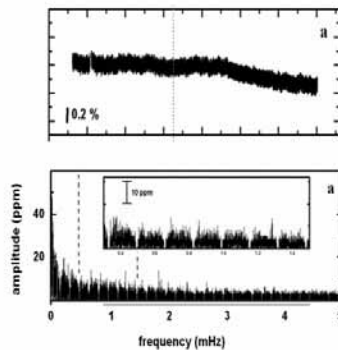
MOST



- Microvariability & Oscillations of STars
- Mission goals: Use photometry to characterize stellar behavior, determine age of universe, discover planets
- Canada's First Space Telescope, first microsat for CSA, first Canadian-built satellite in 35 years, and the world's first precision-pointed microsat
- Launched June 30, 2003 and currently operating in space and exceeding performance expectations

MOST Impressive

- Setting the new standard for microsatellites by far exceeding its required performance
- Currently completing its 4th year in operation
- Achieving performance some believed impossible for such a small spacecraft
- Numerous scientific discoveries that added to, refined and even rewrote existing theories



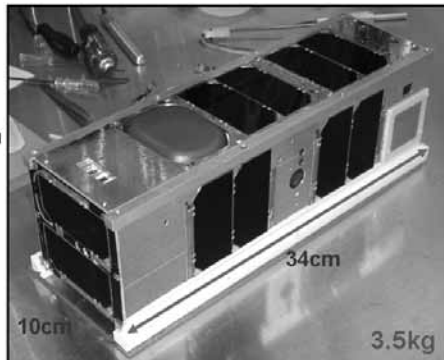
CanX Program



- **C**anadian **A**dvanced **N**anospace **e**xperiment
- Established at SFL in 2001 to:
 - Provide inexpensive and rapid access to space
 - Train students to build real satellites
 - Exploit staff knowledge and lab resources gained through MOST
- CanX-1 launched in 2003
- CanX-2 to be launched this year

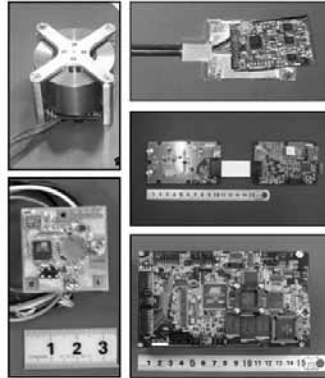
CanX-2

- First CanX nanosatellite to follow the development approach used for MOST
- CanX-2 will be:
 - Launched from India on a PSLV in September
 - Three-axis stabilized
 - Carry three science payloads (one optical)
 - Carry numerous technologies demos



CanX-2

- CanX-2 will qualify technologies needed for upcoming missions including BRITE
- Key technologies include:
 - Reaction wheel
 - Sun sensors
 - Magnetometer
 - UHF receiver
 - S-band transmitter
 - On-board computer
- CanX-2 reduces risk on the BRITE mission



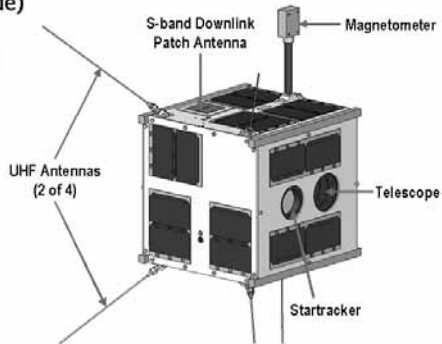
BRITE



- Mission is similar to MOST but also complementary
- Focus is on the most luminous and massive stars
- Observe fields for 15 minutes each orbit for up to 100 days
- Uses a nanosat bus ($\approx 6\text{kg}$) instead of a microsat bus
- Reuse technologies tested and proven on CanX-2
- Use knowledge and lessons learned from MOST (science & engineering)

BRITE

- Cubic form factor (20cm/side) with mass < 7kg
- Pre-deployed antennas and booms
- Telescope (Blue and Red):
 - 11 Megapixel CCD
 - Aperture = 3cm
 - FOV = 24°
- Three-axis attitude control (≈ 1.5 arcminute stability)



Conclusion

- MOST was a groundbreaking mission for microsatellites
- BRITE has the potential to be just as revolutionary for nanosatellites

