



# Developing Sensitivity Threshold Algorithms for CHIME/FRB

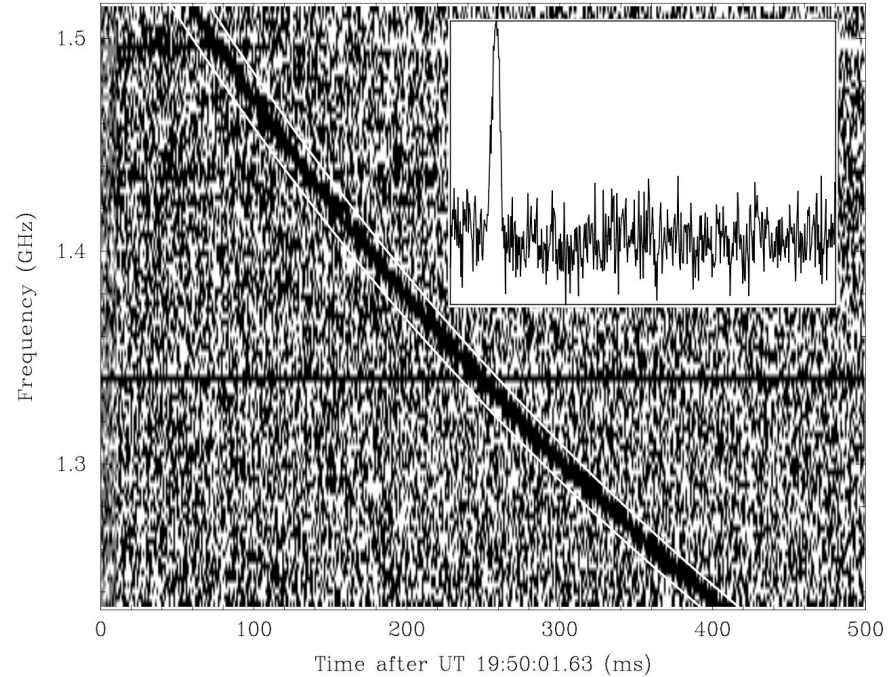
NSERC NTCO-CREATE Annual General Meeting

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# Fast Radio Bursts (FRBs)

- Transient phenomena discovered in 2007 by Duncan Lormier
- Radio pulses of micro to milli-second durations
- Interaction with cold, ionized plasma disperses the signal
- Known to have extragalactic origins
- **Significant astrophysical mystery!**

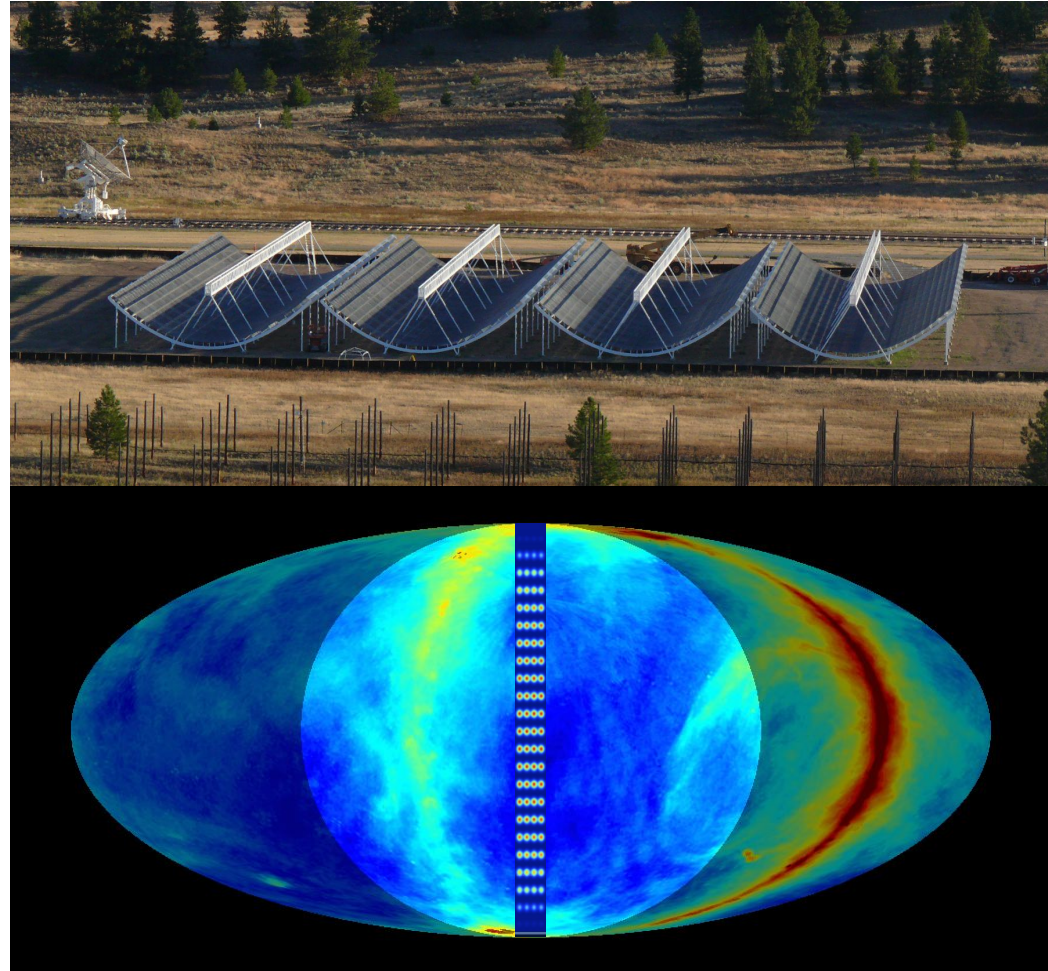


Lormier Burst

# CHIME Telescope

- Transit telescope
- Four 20m by 80m cylinders
- Observes 400-800 MHz
- Simultaneously forms 1024 beams
- Field of view >200 sq degree
- Maps the entire sky every day
- Detects ~3 FRBs per day (~5000 to date)

CHIME Telescope and Field of View



# Fluence Thresholds

Open science questions,

- Do all FRBs repeat?
- What is the all sky rate of FRBs?
- Multi-wavelength counterparts of FRBs

Careful consideration of the exposure and sensitivity of the telescope to the source needed

Fluence threshold accounts for,

1. the daily instrument gain variations,
2. **telescope exposure to the source position**, and,
3. different emission bandwidths and frequency centers within the instrument bandpass

Determines the limit of fluence cut-off above which we are sensitive to bursts from that region of sky

