

The NSF Cubesat program : A brief update

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National Science Foundation

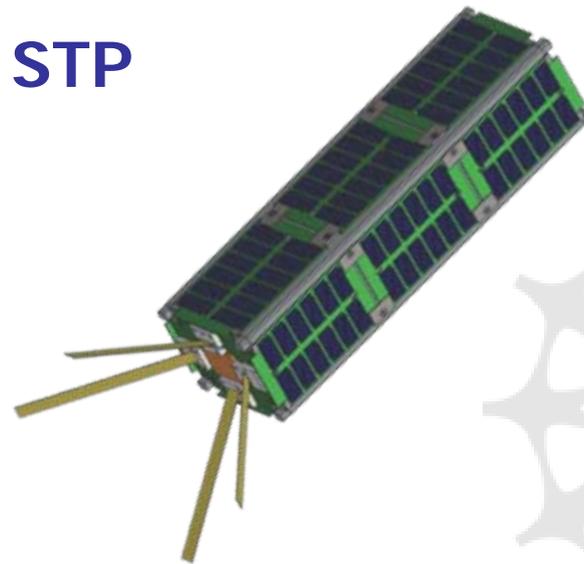


CubeSat-based science missions

- Recognize the scientific and educational value of low-cost (small) satellite mission
- Space weather and atmospheric research
- Launching 2-3 P-PODs/ year
- ~ 3 new science missions/ year
- First Competition May 2008
 - 2 Projects started Sep 2008
 - Well under way and doing great

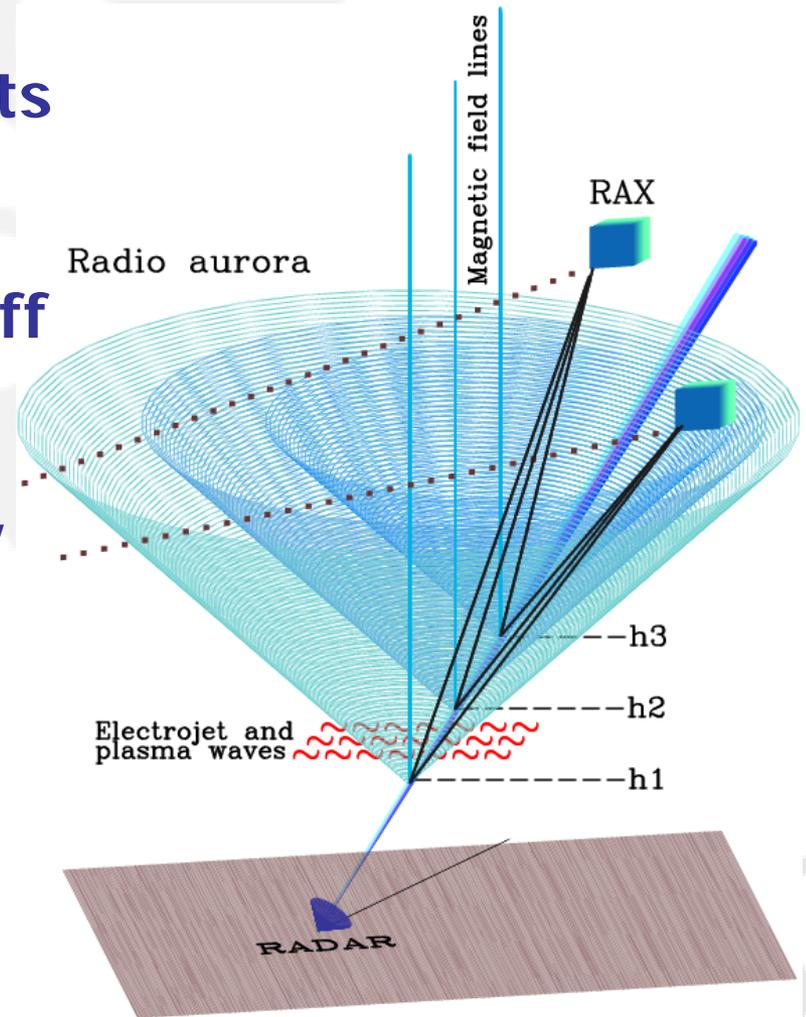
First Mission:

- Interdiscipl collab
 - Science: SRI Int.
 - Spacecraft: U. Michigan
- 3U CubeSat mission
- UHF Radar Receiver payload
- Kick-off Sep 2008
- Delivery Aug 2009
- Launch Feb 2010 DOD STP S-26
- 3-year grant totaling ~\$900k

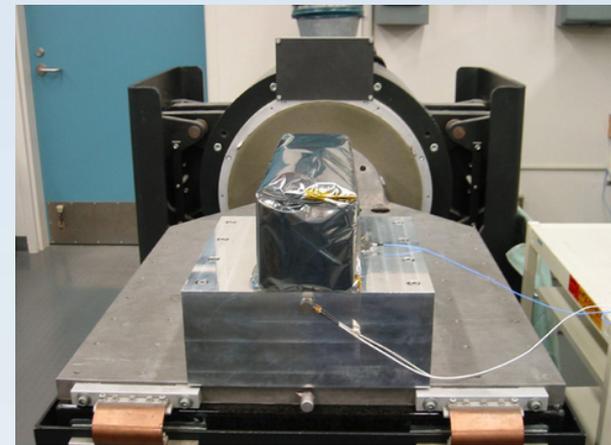


RAX Science

- Bi-static radar measurements together with ground based ISR, e.g. AMISR
- Radar pulse Bragg-scatter off the irregularity and is received by RAX
- Characterize plasma density structures in the lower ionosphere at high latitudes



Inter-Agency Agreements for Launch and Mission Support Established



➤ Launch arranged and paid by NSF

- Dod Space Test Program; 1st manifested launch, Dec 2009, Minotaur IV, Kodiak
- Future potential opportunities: DoD, NASA, Universities, Commercial

➤ Commissioning program at NASA WFF

- P-POD, integration, testing, documentation
- Technical POC for satellite developer and launch provider
- Frequency licensing and ground station support
- Other technical and management support



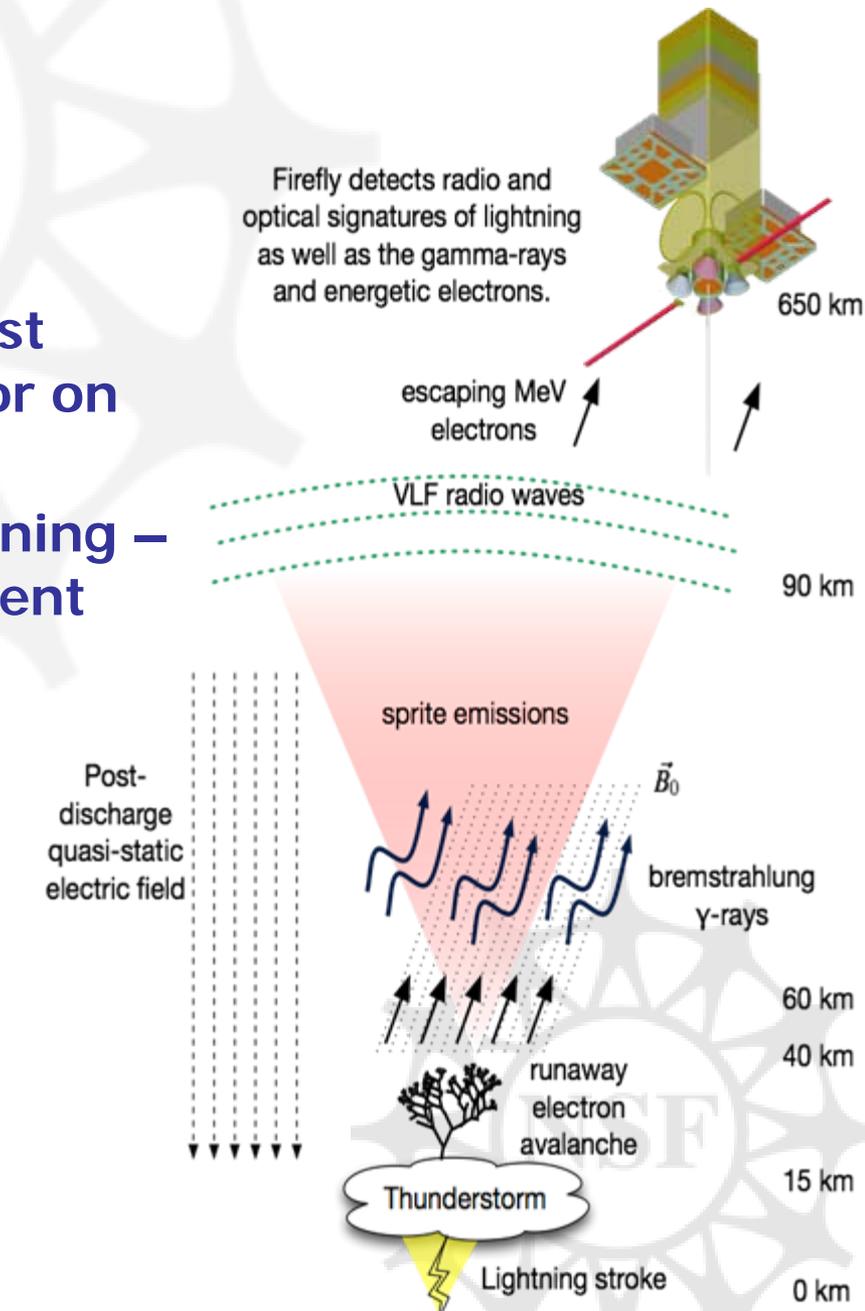
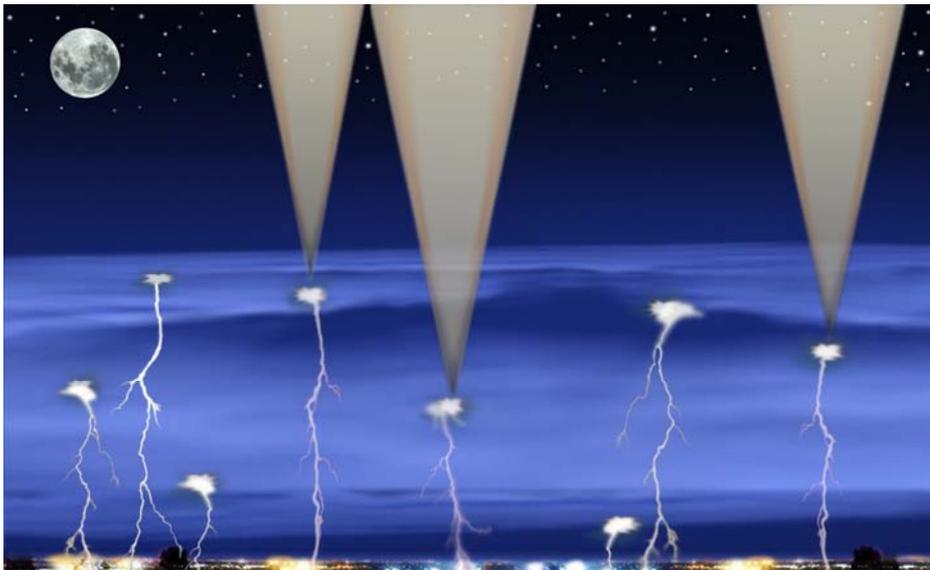
Second Mission:

- **Broad Collab:**
 - **NASA GSFC; Siena College; HISS; U. of Maryland Eastern Shore**
- **3U CubeSat mission**
- **Eksperiments:**
 - **Gamma-ray detector (10 keV to 10 MeV)**
 - **VLF receivers (100 Hz to 20 kHz)**
 - **4 optical photodiodes (2 pairs: white light for lightening, red for sprites)**
- **Kick-off Oct 2008**
- **Delivery Mar 2010**
- **No launch manifest yet**
- **3-year grant totaling ~\$900k**



FIREFLY Science

- Investigate Terrestrial Gamma-ray Flashes (TGFs) produced by the most powerful natural particle accelerator on Earth.
- Unambiguously determine the lightning – TGF relationship and detect the parent MeV electrons



Second competition

- Proposal deadline May 11, 2009
- Review panel Mid-July 2009
- Expect to start 2 new projects

