

Nanosatellites: VKI's Activities and Vision

Speaker: Jan Thoemel

6th European Conference for Aerospace and Space Science

Krakow, Poland

30 July 2015

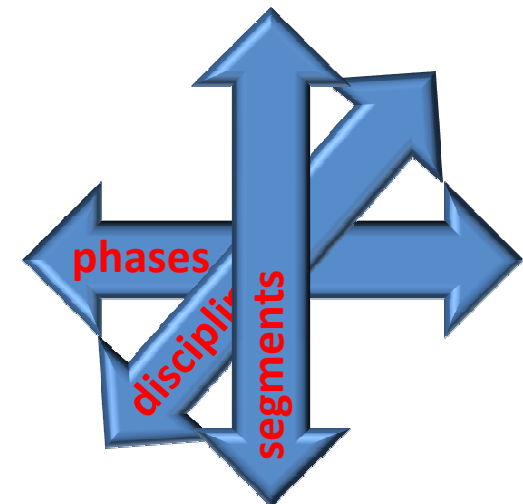


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QB50 – what is it?

- invited 50+ international universities to join and to carry-out an unprecedented science campaign to probe the thermosphere with fragmented sensors on ~43 satellites and to demonstrate new technologies
- is managed by a consortium of 15 partners
- supports cubesat teams with:
 - provision of sensor units
 - guidance on satellite development and operations
- carries out a test flight since June 2014

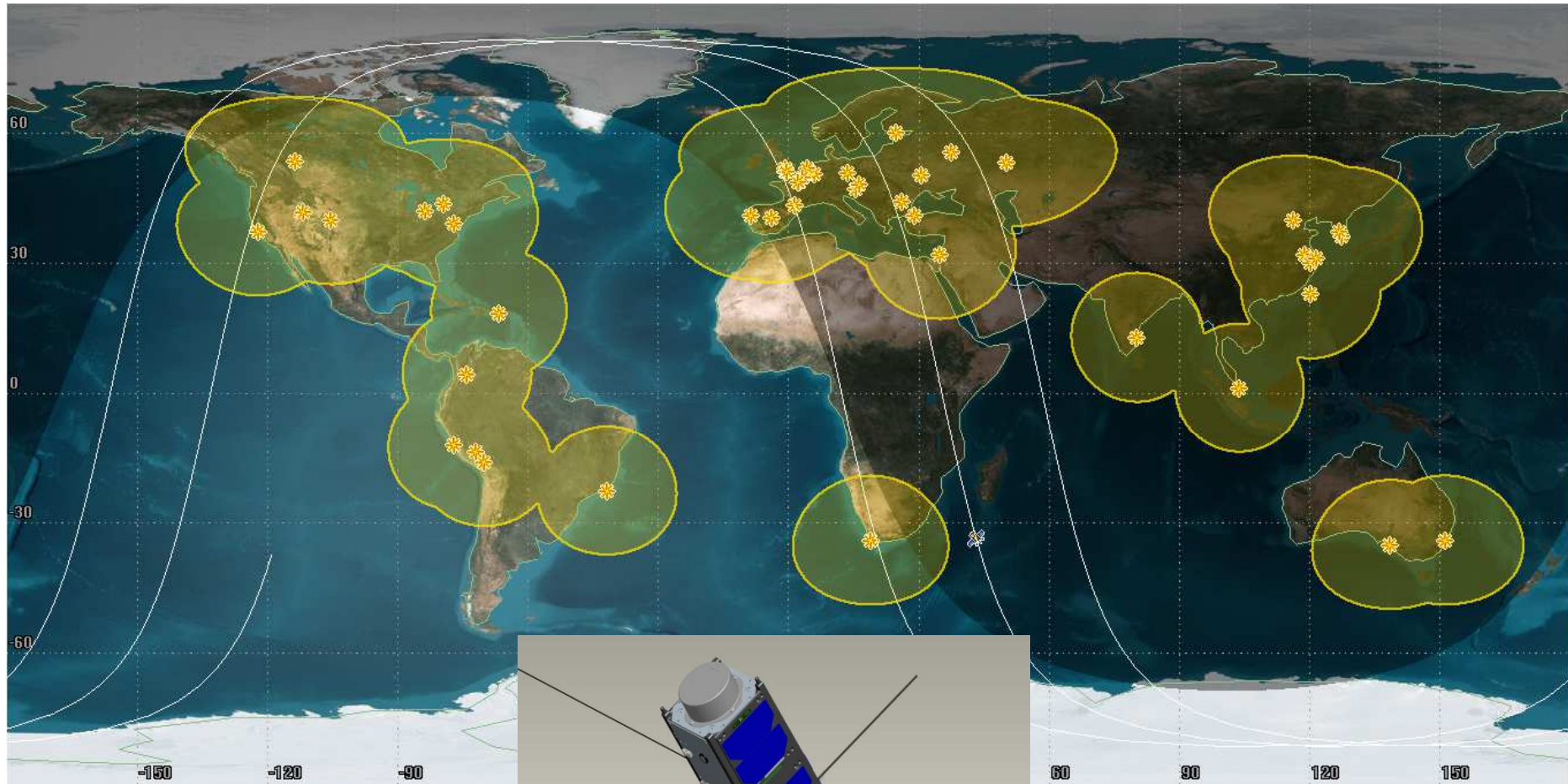
-> a space mission from end-to-end



QB50 Objectives

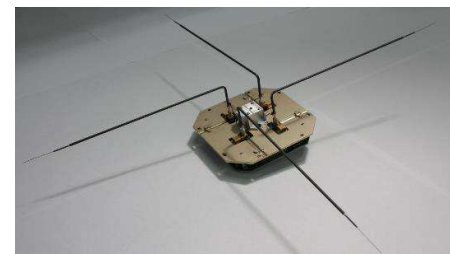
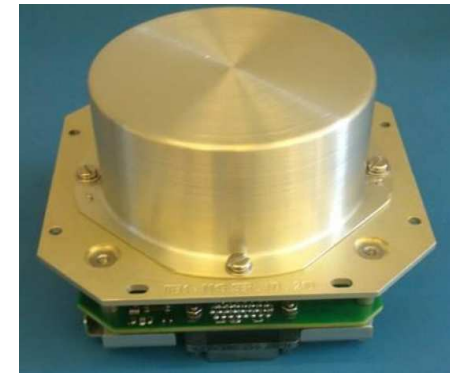
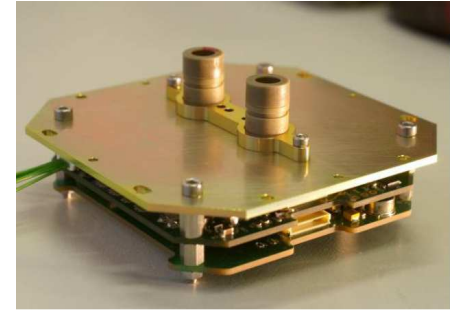
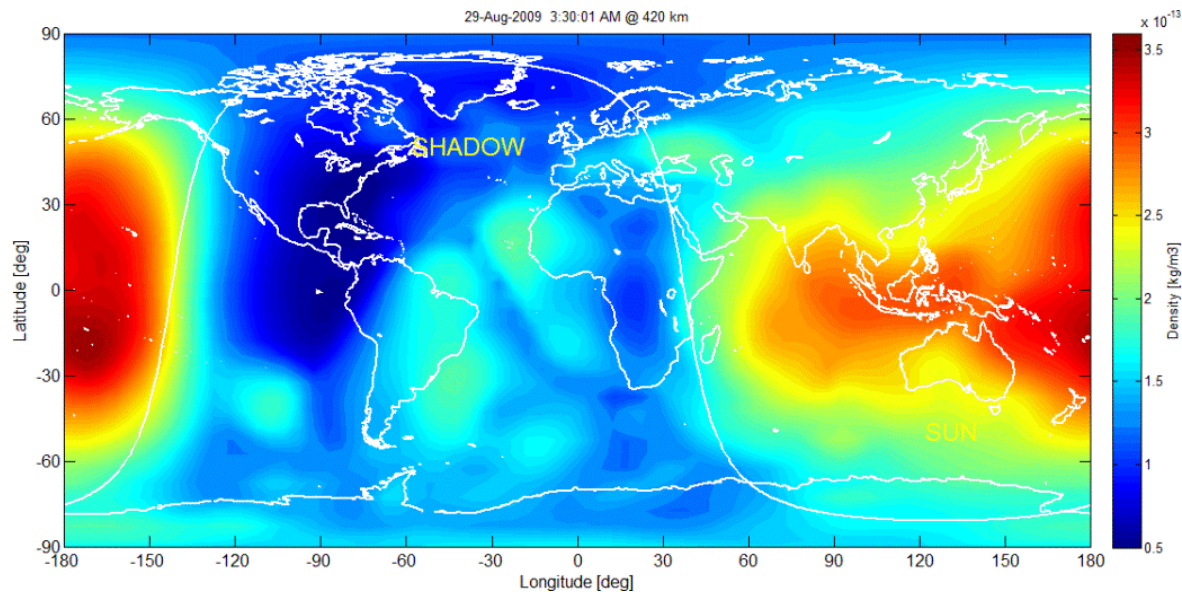


QB50 – Cubesat Community



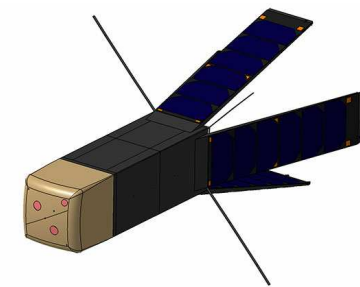
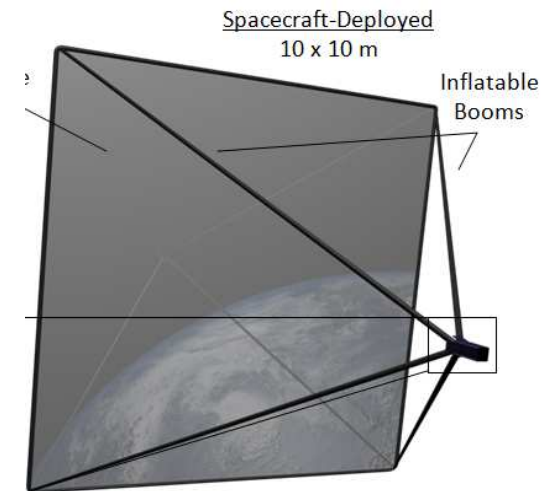
Thermosphere Science

- measurements:
 - ~ 43 fragmented sensors (3 types)
- modeling:
 - predict & validate
- explore



IOD Satellites

- **~10 In-Orbit-Demonstration satellites**
 - drag sail for rapid deorbiting
 - formation flying using green propellant
 - small objects/space debris reentry
 - further



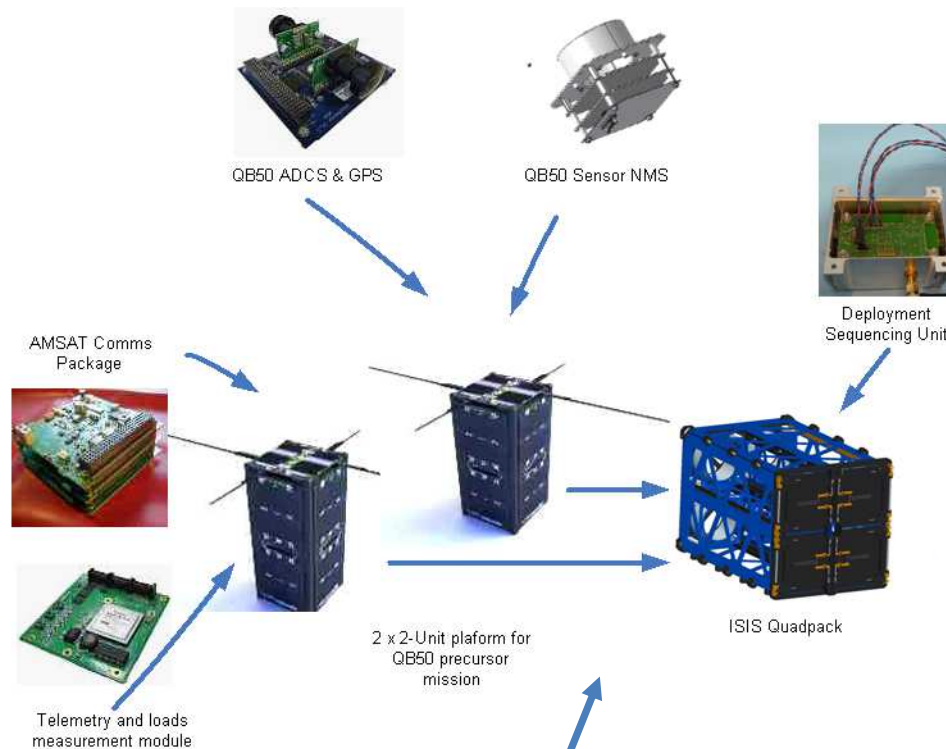
Status Satellites

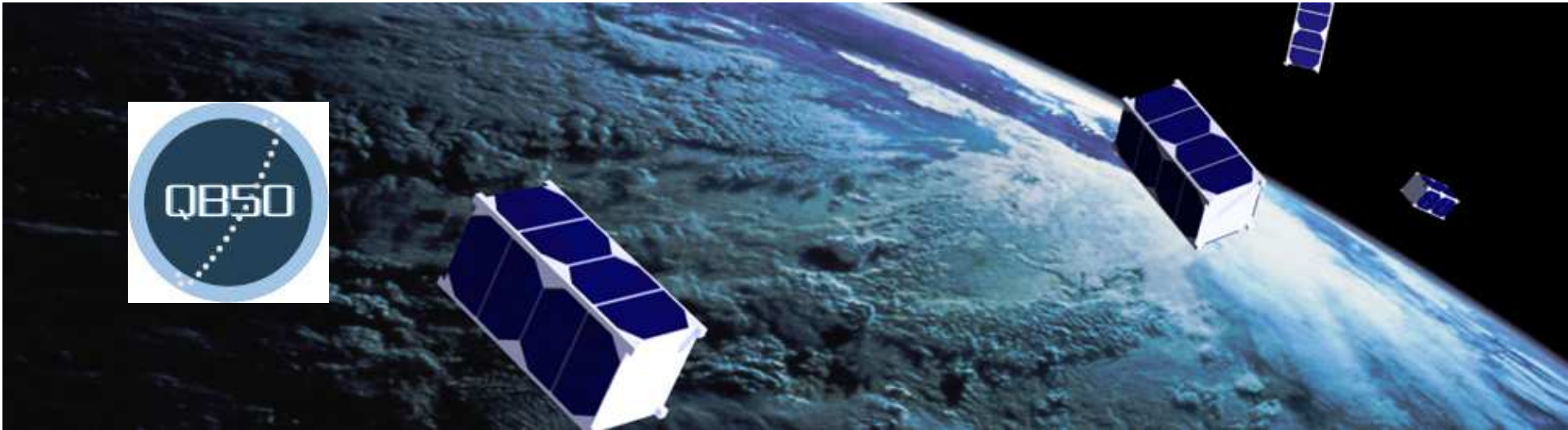
- assembly phase:
 - EM, QM and FMs
 - end-to-end test performed with a selected satellite
- FRR in end summer 2016
- launch 2016/2017



Precursor De-risking Campaign

- CubeSat missions are inherently more risky
- Is this acceptable for constellations like QB50?





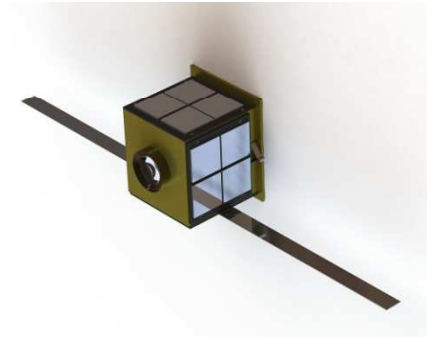
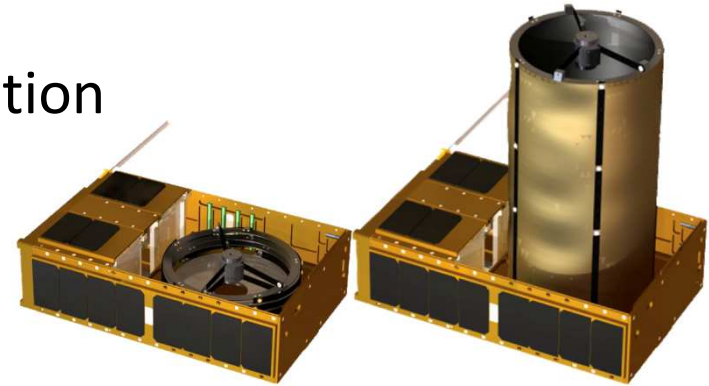
Observations Vision Challenges



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Observation – General Trends

- applications
 - educational & in-orbit demonstration
 - scientific & business
- reliability low
- size: advent of
 - 6U cubesats
 - pocketqubes
- launch
 - launch brokers appeared
 - change in attitude of traditional launcher providers
 - dedicated launchers



Observation: Customer's/User's Interest

- funding agencies:
 - science precursor
 - IOD
 - Earth observation
- private:
 - not so much



Vision

- educational
 - > success story
 - > pocketqubes

- IOD
- business
- scientific
 - > consolidation to come
 - > 3U+ sized satellites



Challenges

applications

launch opportunities <-> dedicated orbits

reliability <-> risk acceptance

sustained program <-> opportunity driven



7th European CubeSat Symposium

9th QB50 Workshop

Liège, Belgium

8 - 11 September 2015

Thank you for your interest!

Questions?

Comments?

Objections?