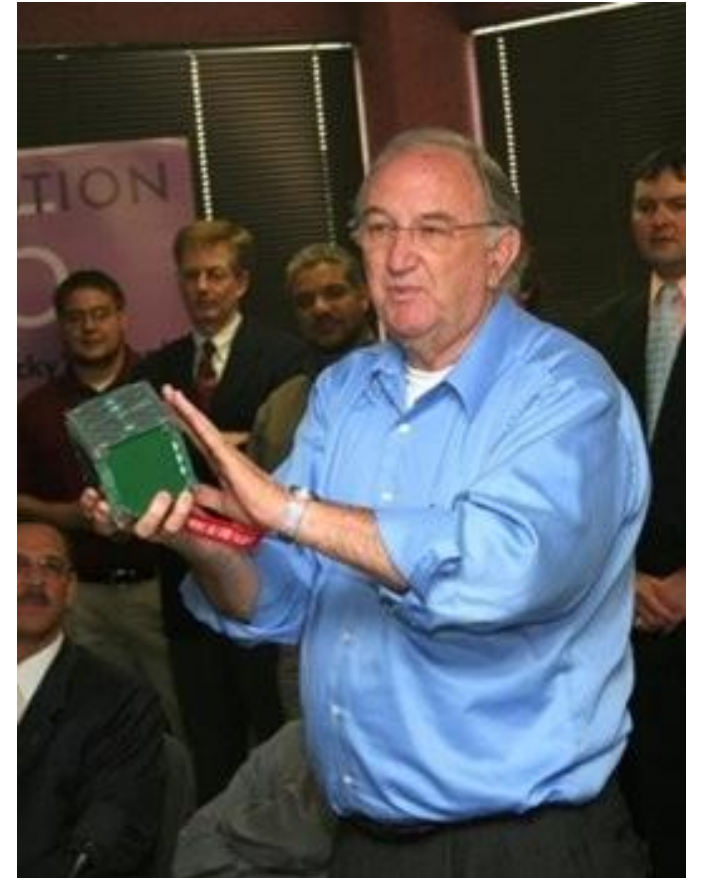


Prof. Bob Twiggs

- Introduced the CanSat, CubeSat and the PocketQube for educational applications in space.
- Academic Career
 - 1982-1994: Weber State University, Utah,
 - Started the Center for Aerospace Technology
 - Launched the first USA Educational Spacecraft
 - 1994-2008: Stanford University, California
 - Started Space Systems Development Laboratory
 - Introduced the CanSat
 - Co-Invented CubeSat
 - 2009-2019: Morehead State University
 - Launched First PocketQube



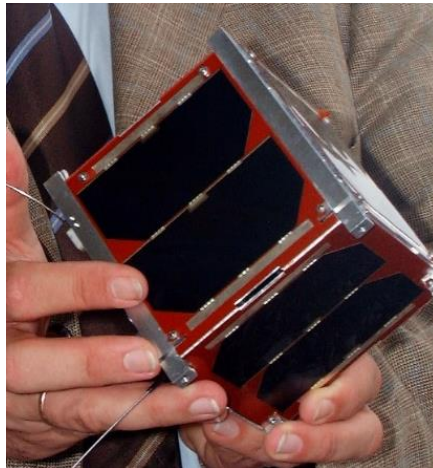
Prof. Klaus Schilling: Evolution of Space Technology during my Professional Life

traditional satellites



Cassini/Huygens Mission
by NASA / ESA to
explore Saturn and Titan
(initiated 1986) 6.7 m height /
Ø 4 m / launch mass: 5.82t
launch: 15.10.1997
work at Airbus

miniaturization



UWE-1
first German pico-
satellite; 10 cm cube;
mass < 0,9 kg; for
Internet from space;
launch: 27.10.2005
*work at University
Würzburg inspired by Bob*

cooperating multi- satellite systems



NetSat
distributed, networked multi-
satellite system; Four nano-
satellites to demonstrate 3D
self-organization in orbit
launch: 28.9.2020
*work at Zentrum für Telematik
(ZfT)*

production of small series



space factory
robotics and automation for
fast realization of multi-
satellite systems using
Industry 4.0, networked
production / test; initiated: 2022
*work at ZfT and S⁴ – Smart
Small Satellite Systems GmbH*

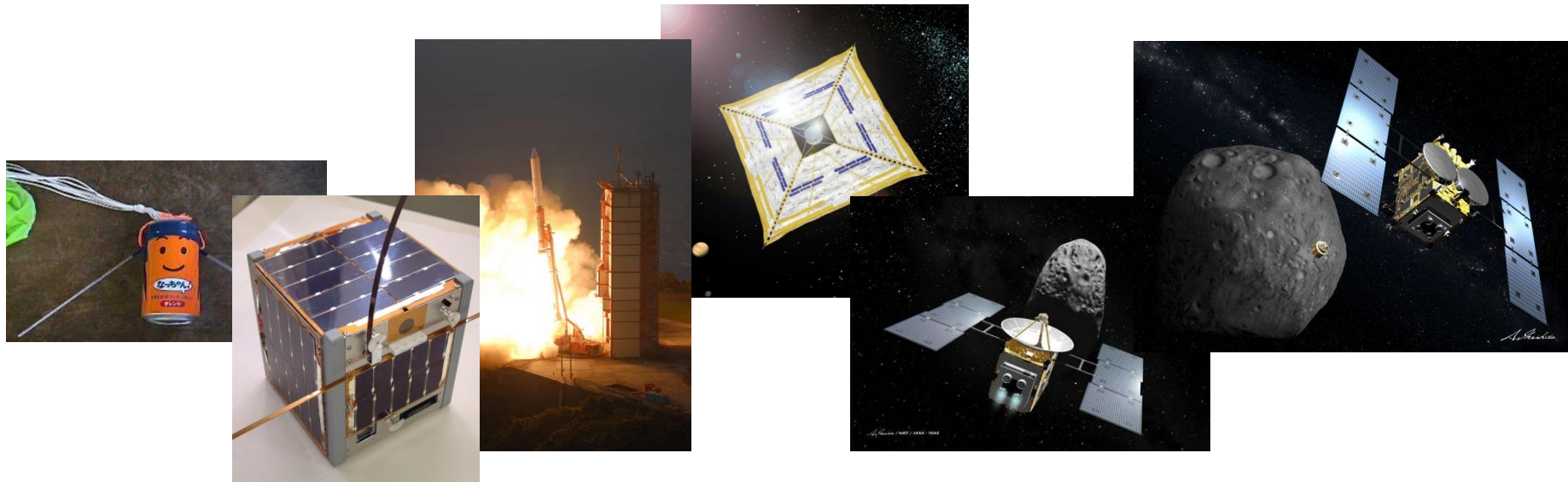
Prof. Yuichi Tsuda

Professor, Institute of Space and Astronautical Science
Japan Aerospace Exploration Agency

My background: Innovative spacecraft system, Solar system exploration, Astrodynamics

My career:

- CanSat (1st generation!)
- CubeSat (1st generation!) *Student project manager, U of Tokyo "XI-IV"*
- IKAROS (World first deep space solar sail) *Deputy project manager*
- Hayabusa2 (Asteroid sample return mission) *Project Manager*

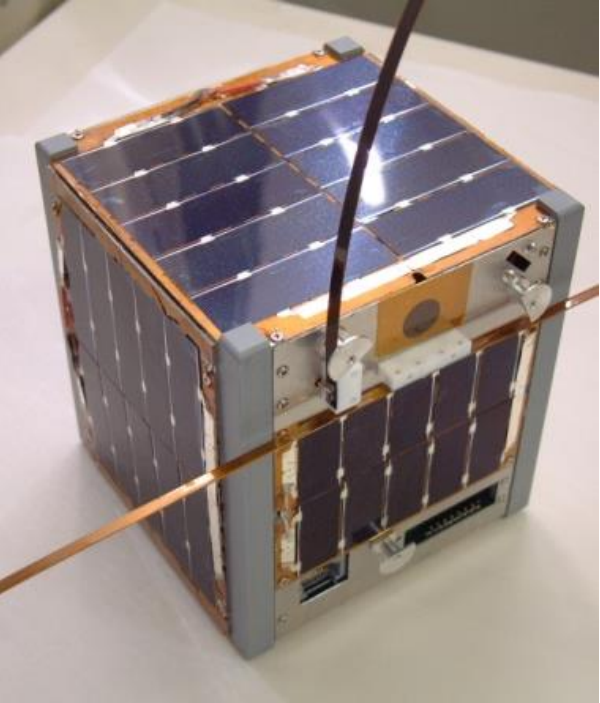
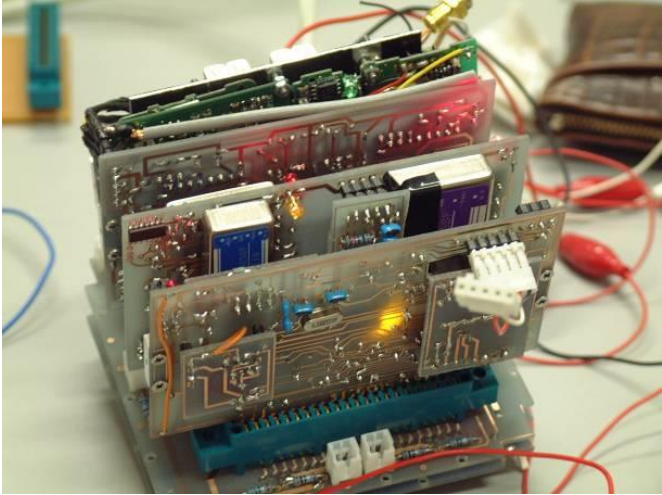


First Generation CanSat

Let's make a satellite out of this Coke-can !!



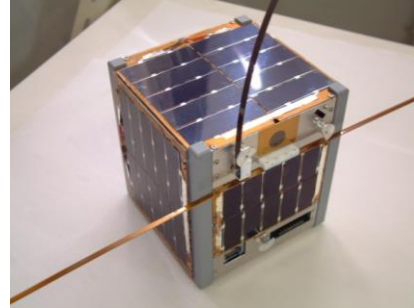
A World First CubeSat (U of Tokyo "XI-IV")



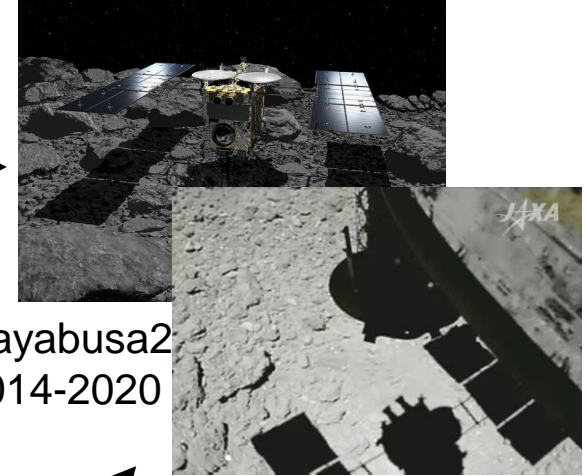
My carrier: Cyclic compromise & realization...



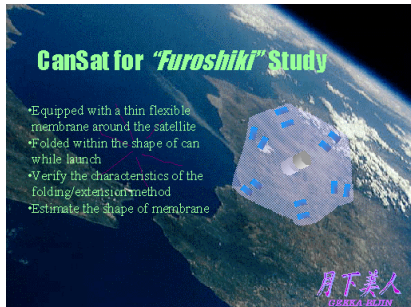
First flown CanSat
1999



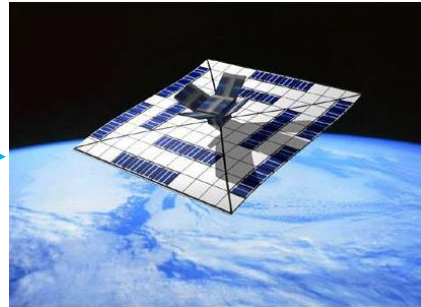
First flown CubeSat
2003



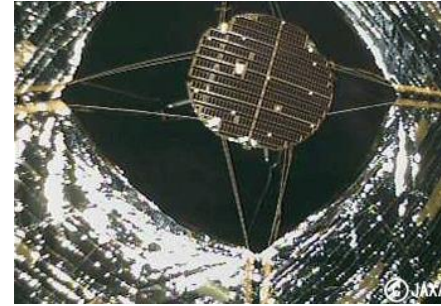
Hayabusa2
2014-2020



First CanSat concept



First CubeSat concept



IKAROS (solar sail mission)
2010

