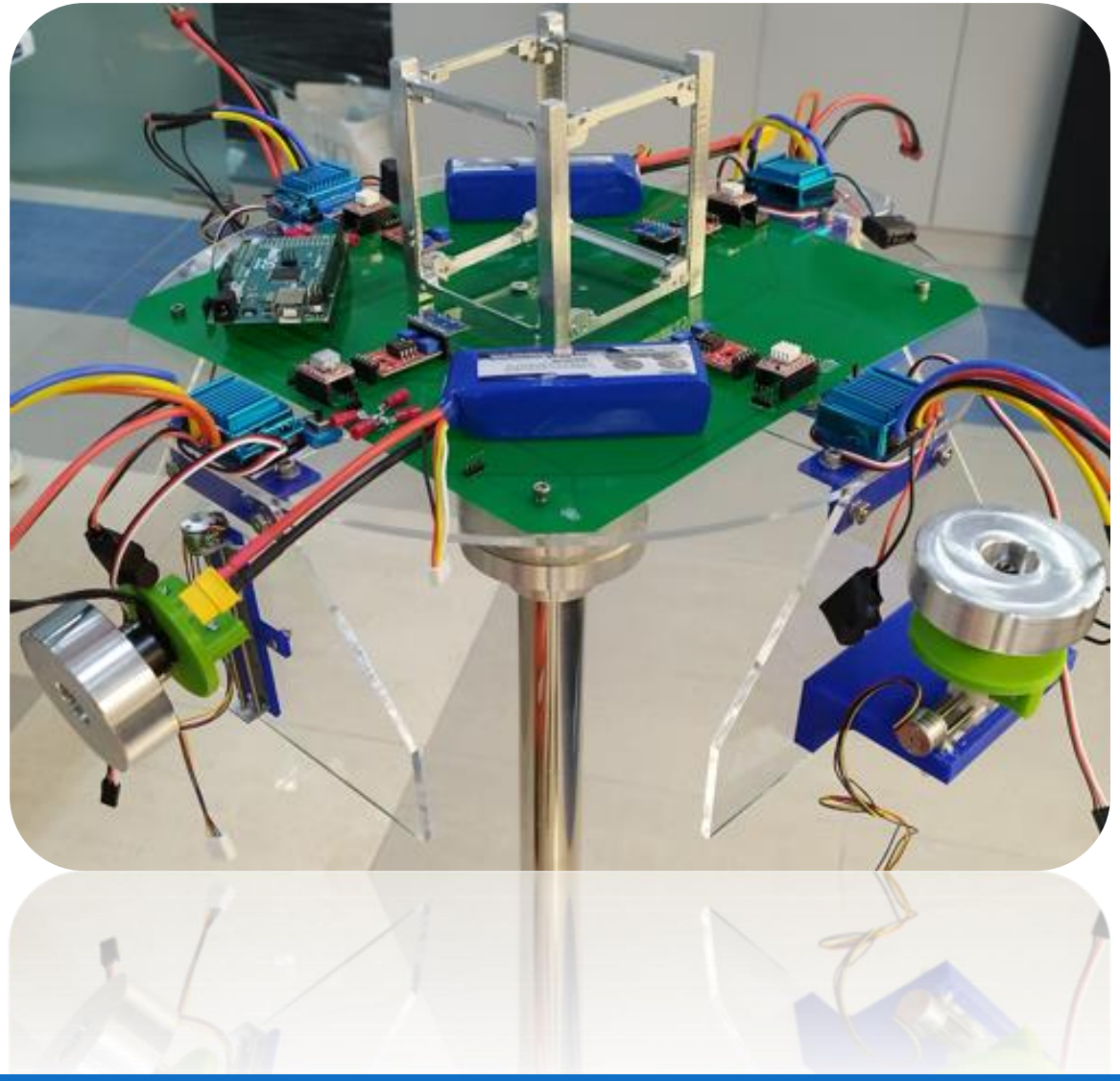


CubeTumble

ABDULLAH ALI (CO-FOUNDER)

JUNE 2022

Founding Team

Abdullah Ali
Co-Founder
(Technical + Marketing)

Aerospace Engineer
KU Master degree in Space concentration
ADCS system engineer in YahSat Space Lab

Abdullah Al-Ansari
Co- Founder
(Technical + Business)

Electrical Engineer
KU Master degree
PhD Student working on ADCS
Worked on ADCS in 2 CubeSat projects

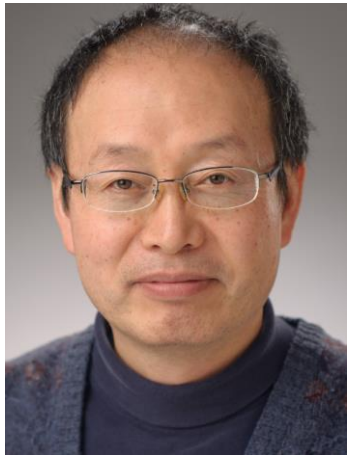
Advisory Board

Dr. Bashar El-Khasawneh

Associate Professor at KU

Dr. Firas Jarrar

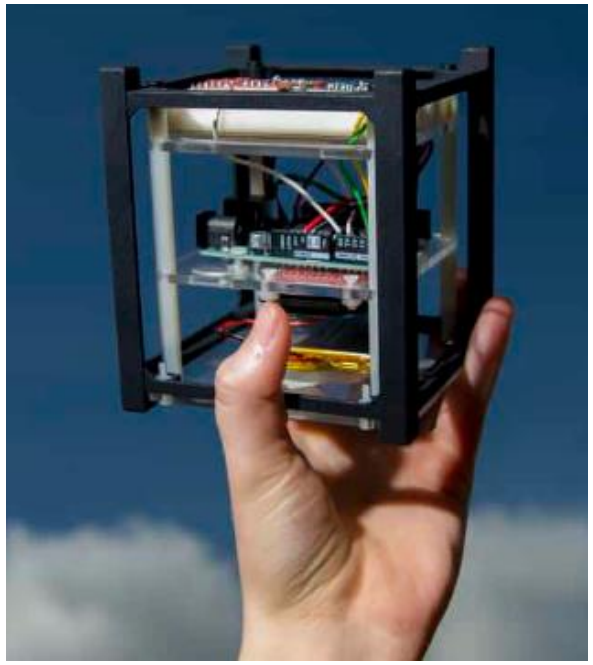
Assistant Professor at KU



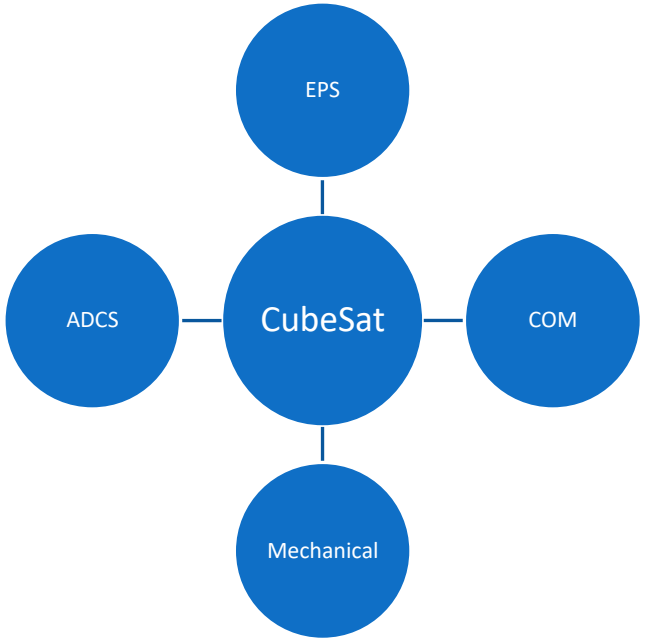
Dr. Sean Shan Min Swei

Director of KUSTIC & KU Aerospace chair

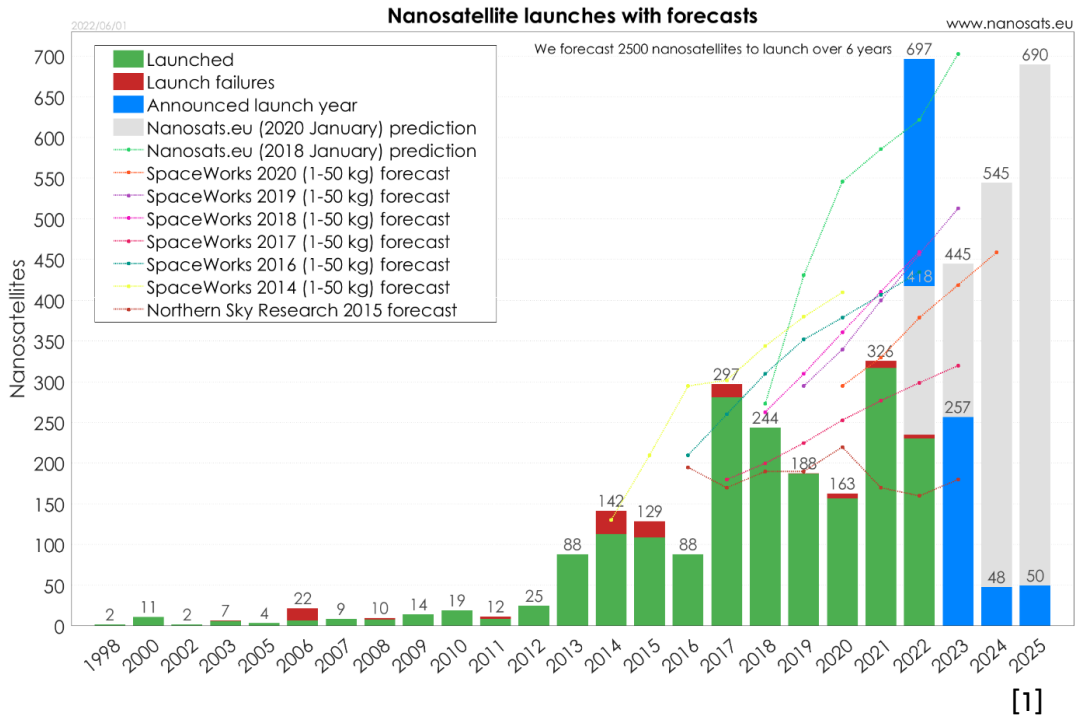
Introduction about CubeSats



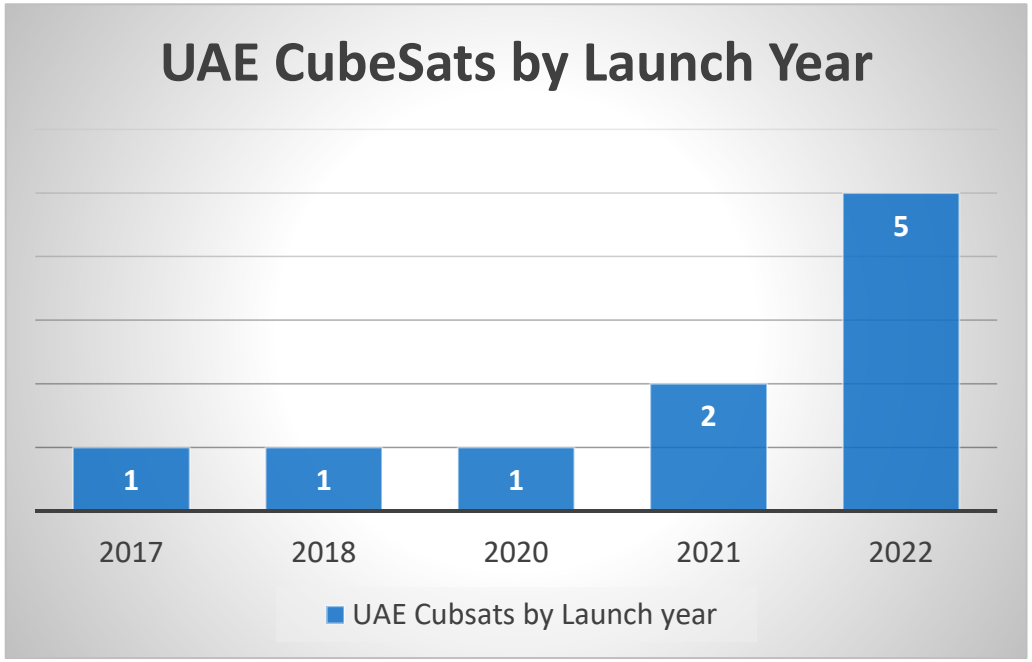
- Small Satellites with standard sizes (1U,2U,…etc)
- 1U = 10cm x 10cm x 10cm & 1.33 Kg
- Cheaper (thousands) than large satellites (millions)
- Cheap access to space for Universities
- Attitude determination and control system
  - Directing antennas
  - Directing solar panels
  - Directing the camera



CubeSat Spread Trend



[1]



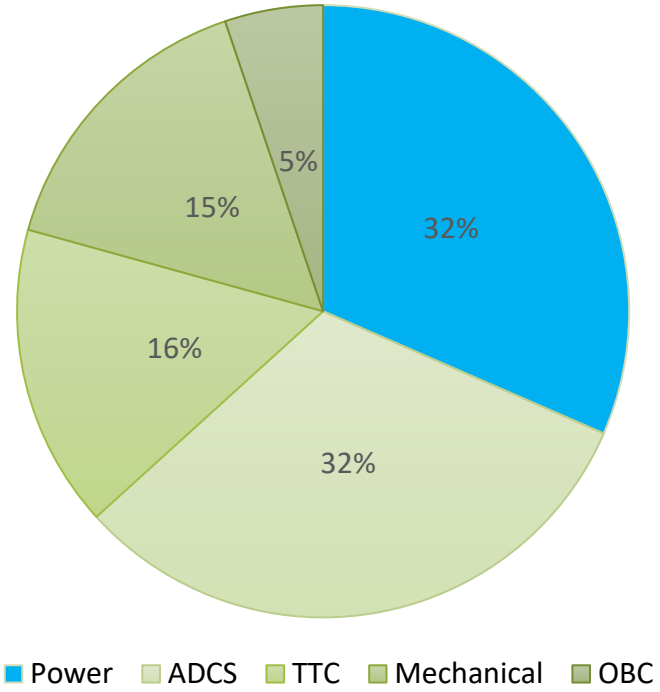
[1]

- UAE vision 2030 for the space sector [2]

[1]https://www.nanosats.eu
[2] https://space.gov.ae/Documents/PublicationPDFFiles/2030-National-Strategy-Summary-EN.pdf

Problem

Failures in the first 30 days in Orbit [3]

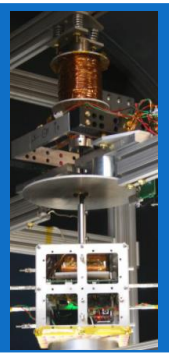


- Almost 50% of CubeSats fail due to insufficient testing [4]
- $6000 to put 1Kg in Orbit [5]
- At least $50000 to construct a CubeSat [6]

[3]https://www.mdpi.com/2226-4310/9/2/46/pdf?version=1642578177
[4]https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=3397&context=smallsat
[5]https://ttu-ir.tdl.org/bitstream/handle/2346/74082/ICES_2018_81.pdf
[6]https://www.researchgate.net/publication/305888045_A_Pathway_to_Small_Satellite_Market_Growth

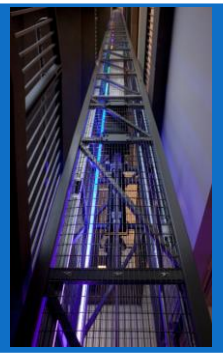
Existing Solutions Shortcomings

Magnetic Levitation



- 1 DOF only at a time
- Can induce currents
- Needs a closed-loop system
- Stability issues

Drop Towers



- Short periods of simulation
- Damage risk

Rod Hanging

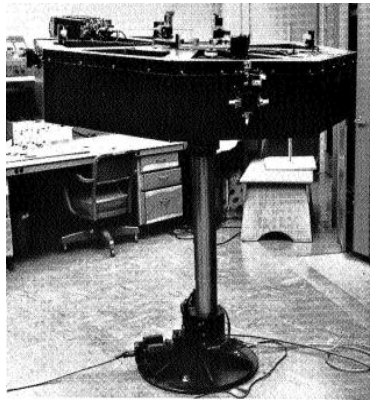
- 1 DOF only at a time
- Sensible to disturbances

Parabolic Flights

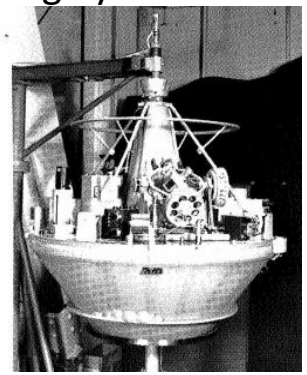
- Short periods of simulation

Air Bearing Solution

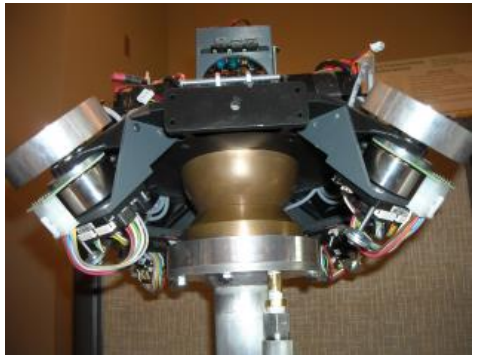
JPL



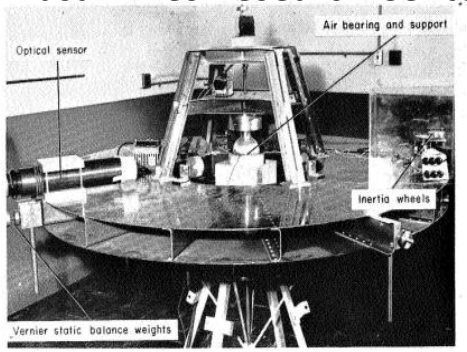
Langley Research center



Utah State University

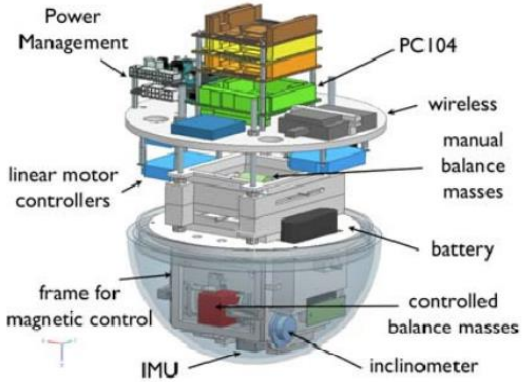


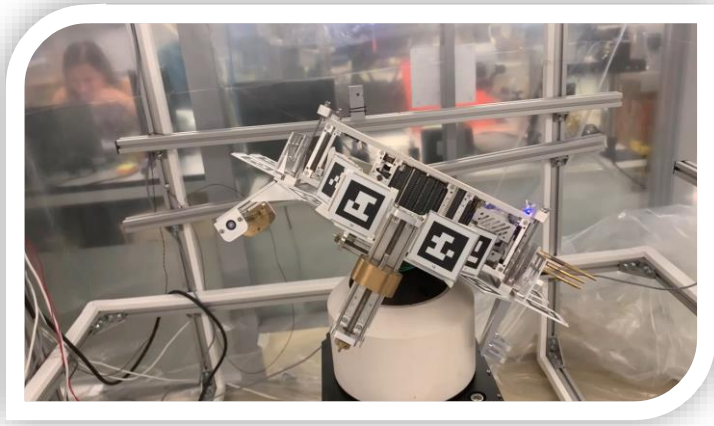
Nasa Ames Research Center

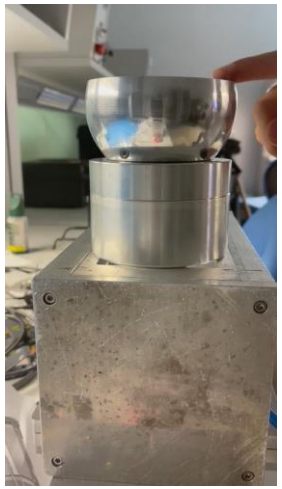


Georgia Institute

Naval School





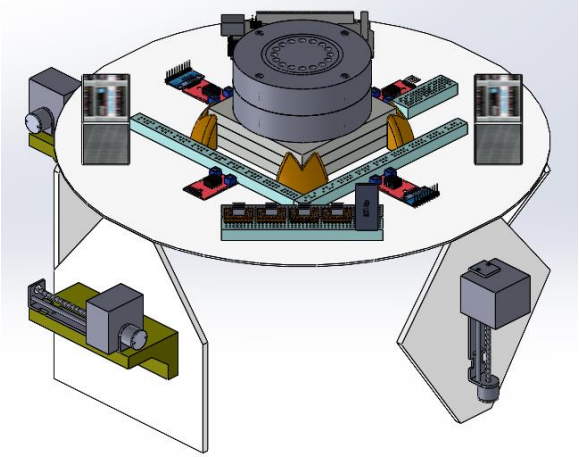


Our Solution

- Replicate space environment for CubeSats
- Utilizing Air bearing (Smooth performance)
- Center of gravity balance & Actuation mechanisms
- Possible Patent (process)
- TRL (5)

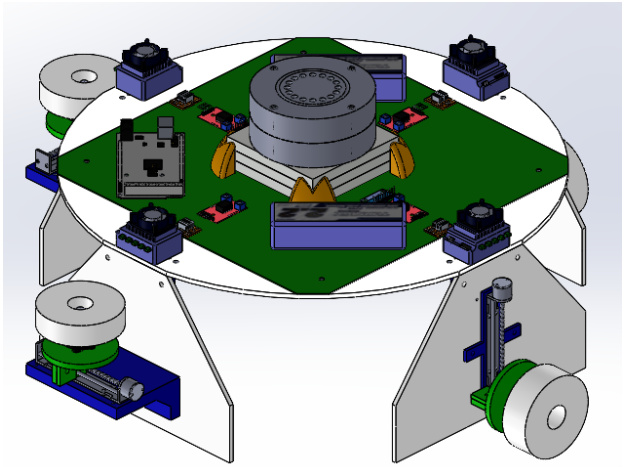
Products

BASIC



- No Reaction Wheels
- ADCS Educational Purposes

COMPREHENSIVE



- Has Reaction Wheels
- Commercial Version

Value proposition

UNIQUE

Specifically dedicated to CubeSat ADCS testing

TESTED

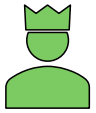
Conducted testing for the needed features

FILLS THE GAP

Our product makes ADCS testing possible in the lab

COST SAVINGS

> 75% less than other competitors



EASY TO USE & MAINTAIN

Friendly LabView interface

Business Models

CUBESAT TESTING

Targeted Segment

Space centers & Agencies (1 Potential Customer Already)

CubeSat Developers

Offer

CubeSat testing setup

Revenue streams

Selling testbed + Codes

Maintenance contracts

Delivering Workshops

EDUCATIONAL

Targeted Segment

Space Labs in universities

Offer

An educational simulator for space environment

Revenue streams

Selling testbed + Codes

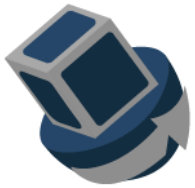
Maintenance contracts

Delivering Workshops

Our Solution Reliability

	CubeTumble	ASTROFEIN	Sputnix
Cost	Much Affordable (< €35 000)	Very Expensive (€600 000)	Expensive (€152 000)
Convenience for CubeSats	Specifically, for CubeSats	For Large and medium satellites	For Large and medium satellites
Ease of Maintenance	Very easy (Commercial components)	Not easy (Specially designed components)	Not easy (Specially designed components)
Maturity	New startup	Since 2011	Since 2011

thank you!



CubeTumble

Abdullah Ali

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https://cubetumble.com/