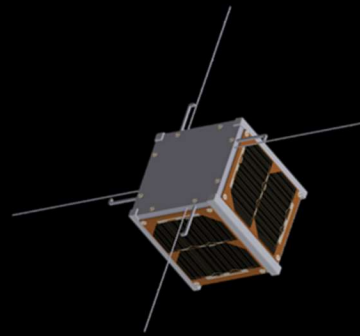
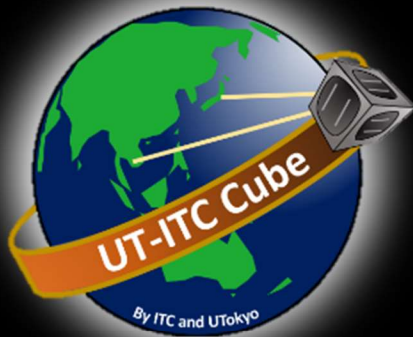


International Collaboration Towards Cambodia's First Small Satellite Education Program: Lessons Learnt

35th Small Satellite Conference
Logan, United States - August 2021



M. Berthet, M. Sakal, P. Srean, S. Oum, P. Im, S. Srey,
R. Takahashi, J. Garcia, N. Funabiki, Y. Suenaga, R. Chhin

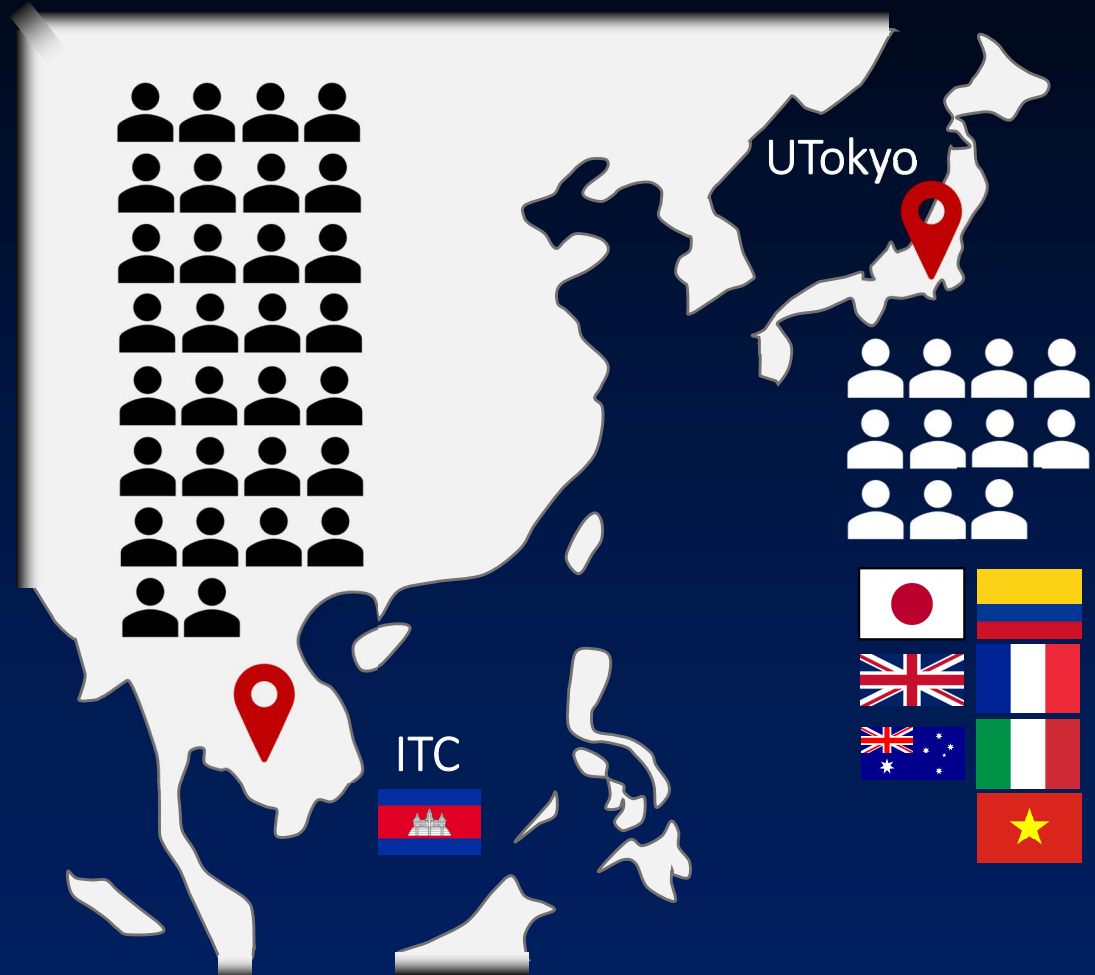
Meet our members

Program history

- 2-year collaboration
- 3 laboratories
- 11 Cambodian provinces, 7 countries
- Led by students

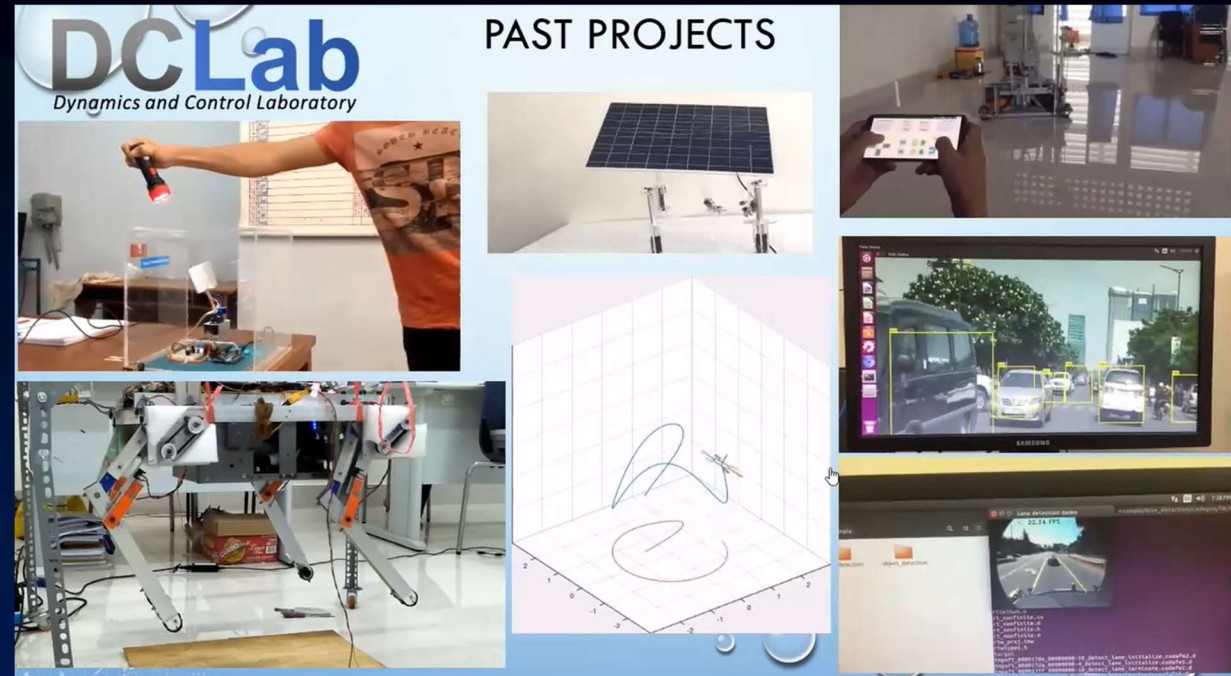
Aim

- Develop Cambodia's first small satellite education program



Why begin?

- Students motivated on both sides
- Existing expertise in dynamics and control at ITC



*images courtesy of DCLab, all rights reserved

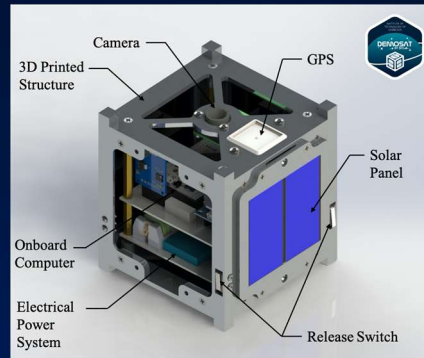
“Hills before mountains” curriculum

1. Hands-on open day



1-week intensive course:
Intro to space eng.,
recruitment (space eng. team)

2. CubeSat design workshop



DemoSat satellite training kit by ITC

2-month competition:
CubeSat mission design and
prototype fabrication

3. Leadership in real smallsat project

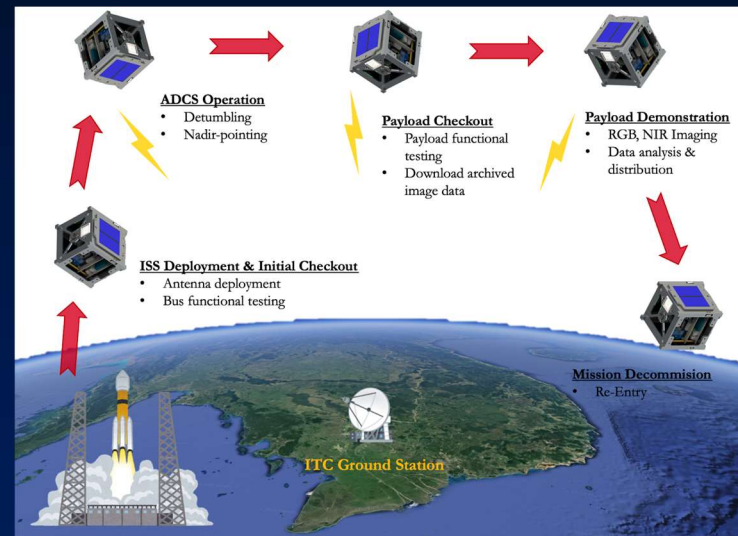


6-month design challenge:
BBM, EM, and FM of real
small satellite, UG thesis

Output of first learning cycle: Apsara-1

Project title

- “Technology demonstration CubeSat with multi-spectral camera for land and water resource monitoring in Cambodia”



Application to KiboCUBE*

- 174-page document, 97 requirements, 81 scheduled tasks, 12 SDG targets

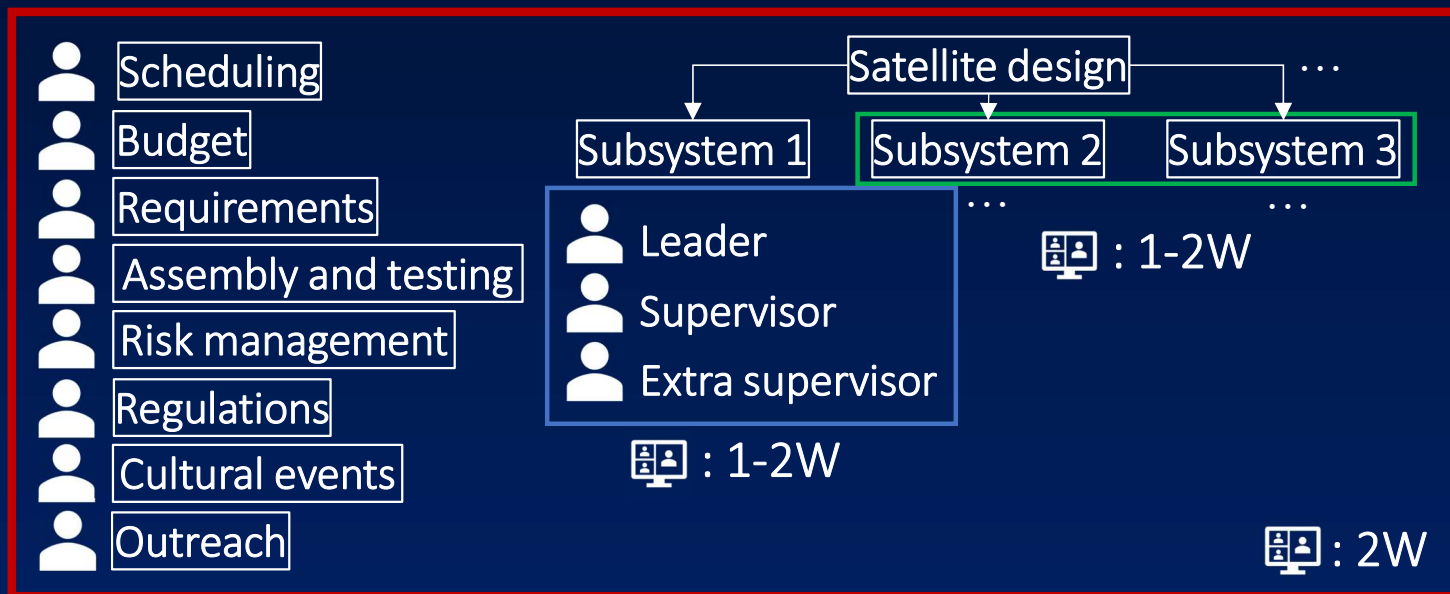
*UNOOSA / JAXA cooperation program for CubeSat deployment from the ISS: <https://www.unoosa.org/oosa/en/ourwork/psa/hsti/kibocube.html>



Output of first learning cycle: Apsara-1

International collaboration method

- Three-layer horizontal mentor/participant structure
- Clear and reasonable responsibilities for all members
- Regular and focused meetings
- Periodic review and allocation of tasks



-> Student leadership, information sharing

Output of first learning cycle: Apsara-1

Global team-building



Colombia:
Culture
and music

Colombia culture evening (culture & music)



Japan culture evening (origami)



UK culture evening (language and accents)



Cambodia culture evening (Khmer New year)

-> Understanding of different cultures (+ fun!)

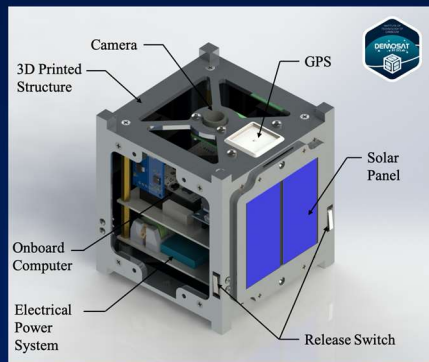
Lessons learnt



Start with physical before online



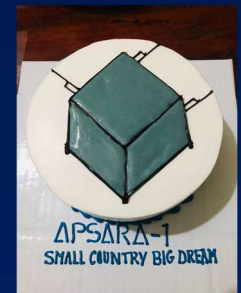
Let students lead



Mobilize local resources



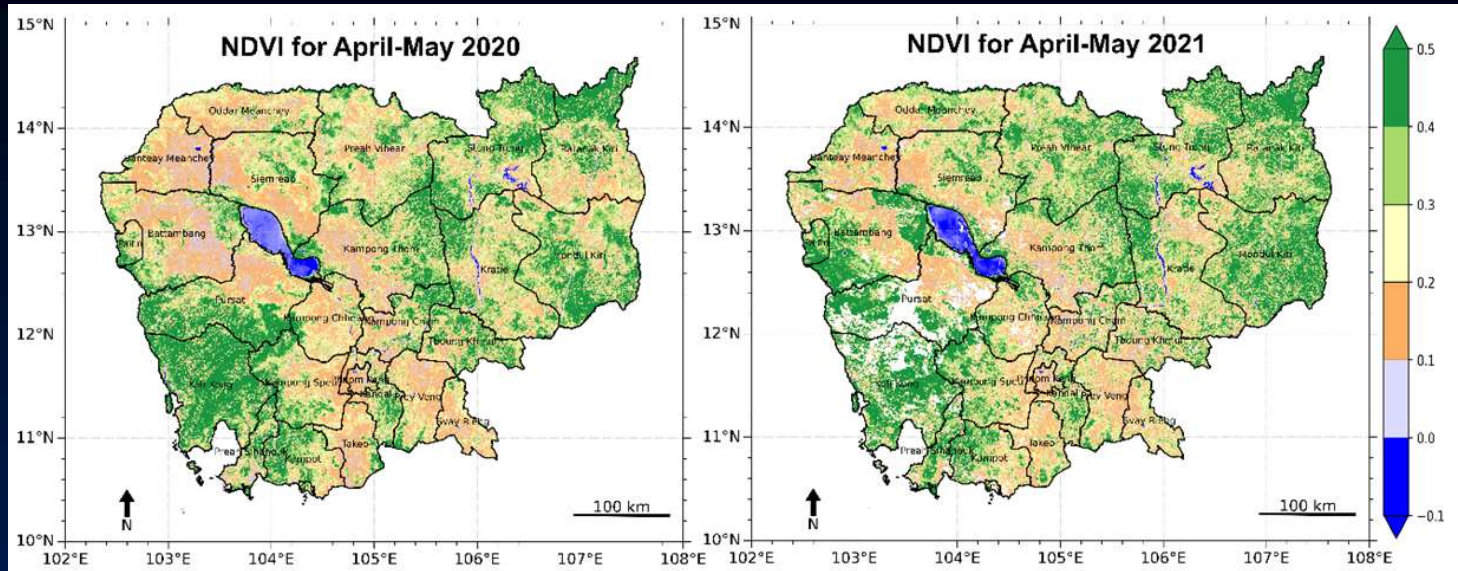
Accordion approach for collaboration



Foster creativity

Towards an educational ecosystem

NDVI in Cambodia based on Sentinel 2 data



Linkage with research at ITC

Graphic design by
Kampuchea Aerospace
Exploration Aspiration
(KAXA)*

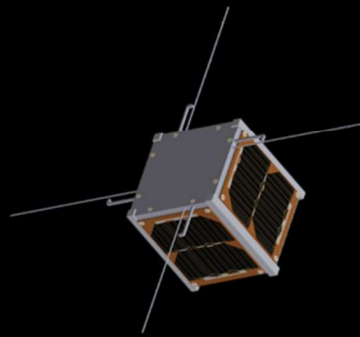


Outreach



Entrepreneurship

*<https://www.facebook.com/kaxa.itc>



Thank you
អរគុណច្រើន
Stay tuned!



Apsara-1 project website: <http://dclab.itc.edu.kh/ut-itc-cube-satellite-project>