



The PNST Experience

Sa ley Sora
ས་ལས་ཤིག་ཀྱི་ (From land to sky)

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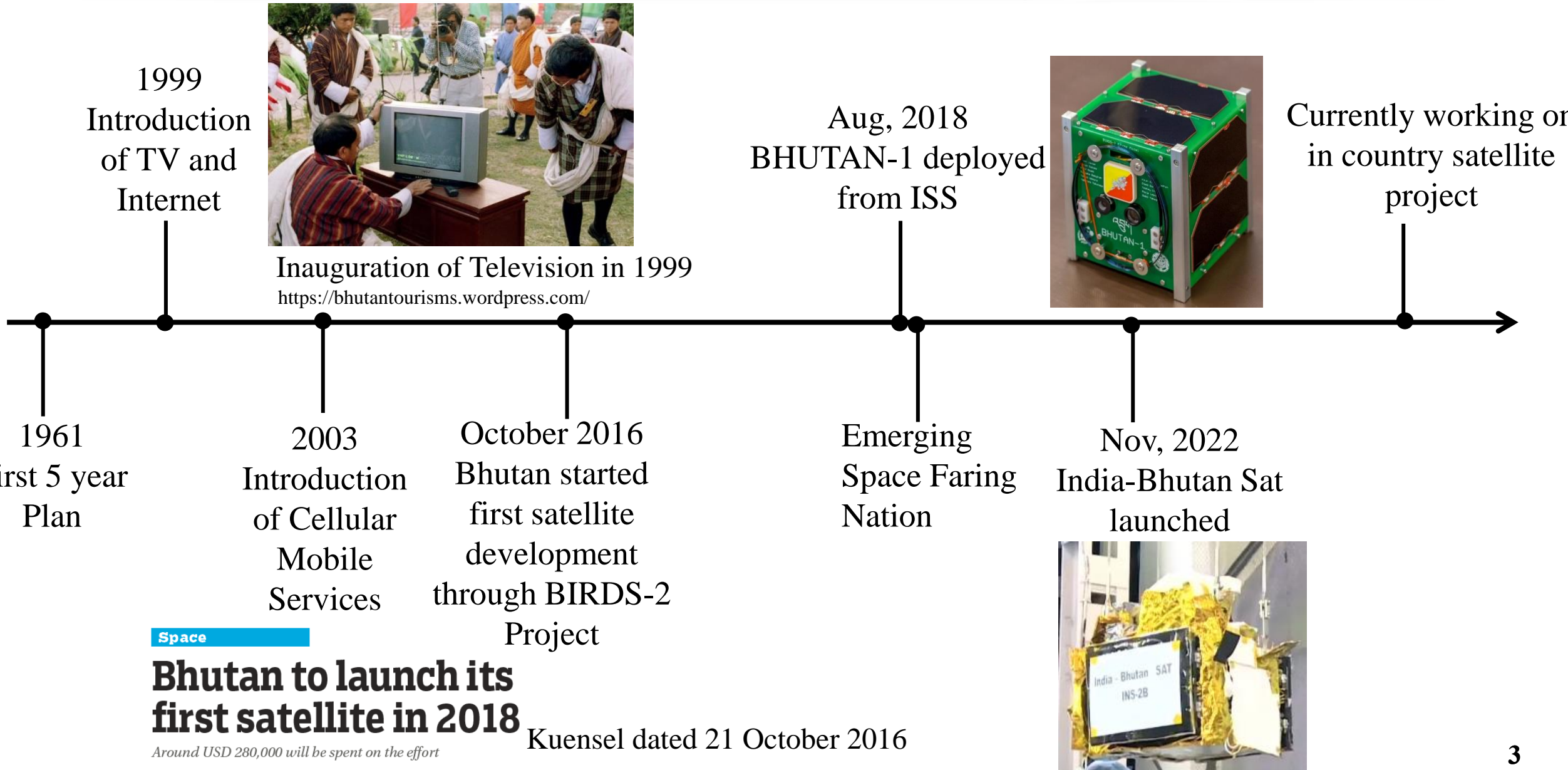
Where I come from?



- Area : 38,394 Sq. km
- Population : 791,121 (October 2022)
- Landlocked between India and China

- Bhutan
- Small developing country in South Asia
- Famous for Gross National Happiness and worlds first **carbon negative country**
- Major economy – Hydroelectric power and tourism

Bhutan's Development Timeline



Before PNST



Image from: <http://www.bhutanvisit.com/map-of-bhutan/>

Design electrical drawings



Prepare tender documents



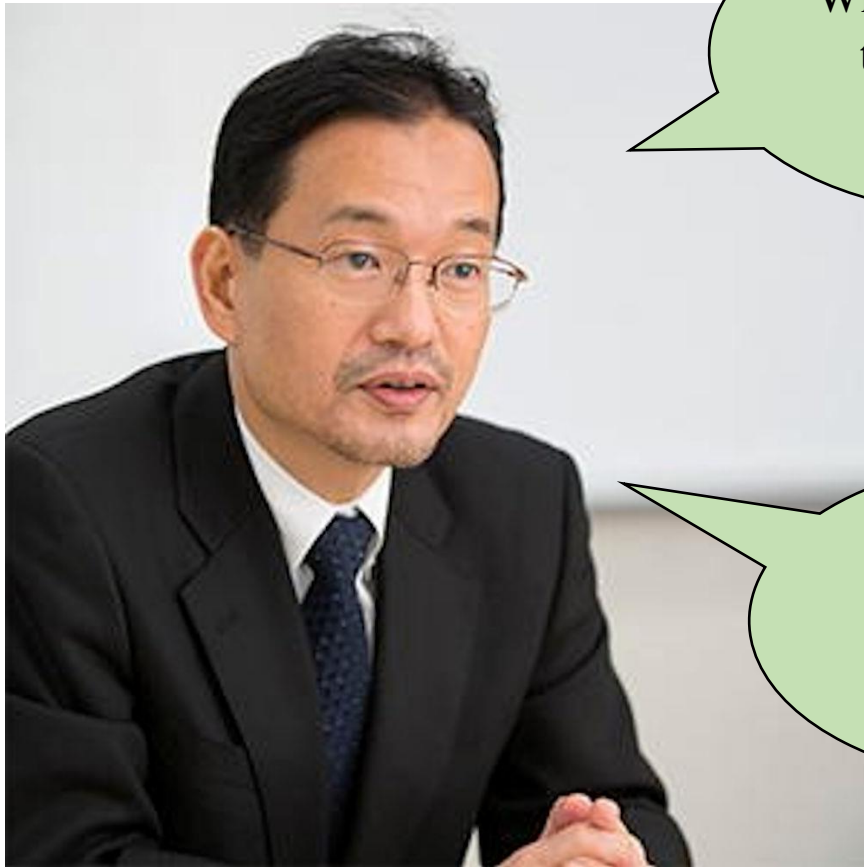
Troubleshoot tipoffs



Too far from Space

Before PNST

During PNST interview



Cho sensei

What do you want to do for your research?

I want to build a CubeSat
(no idea how complex it is to build a CubeSat)

What part of CubeSat do you want to build?

I want to build the whole CubeSat alone

1U CubeSat is just 10cm³ and 1kg, how difficult can it be?



After PNST



Entrance Ceremony, 2017



Lab Members



The world in our lab ft. Student room, LaSEINE

Students studying about:

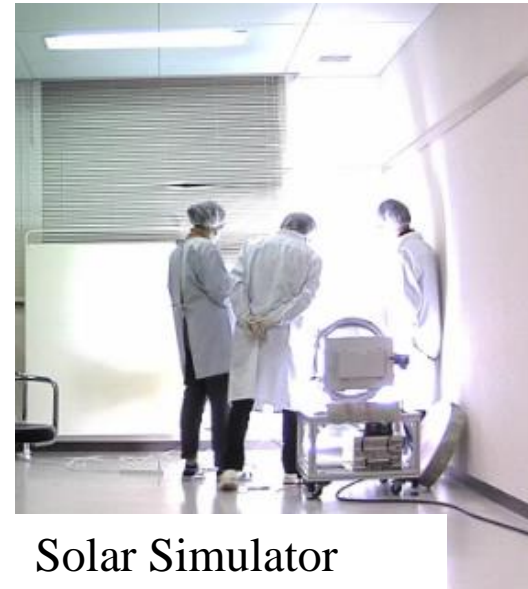
- **Ground station network and operations**
- **Structure and Thermal designs**
- **PCB designs, Circuit Design, Programming**
- **Material Science**
- **Project Management**
- **Propulsion systems**
- **In-orbit qualifications**

Hands-on Experience

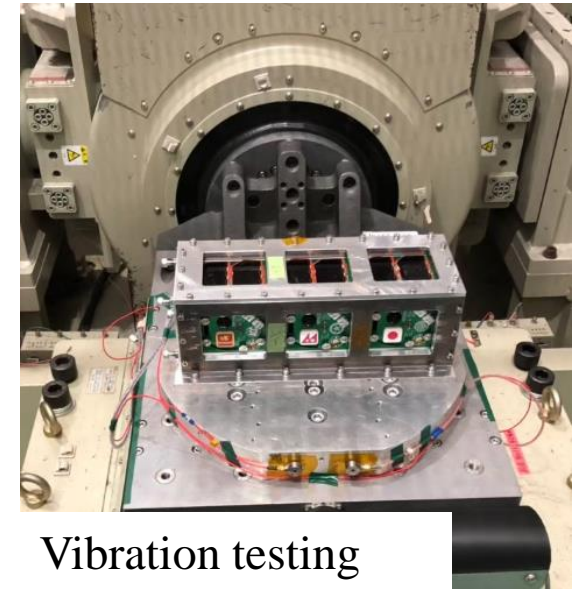
- Could get involved in 7 different satellite projects from (1U to 6U)
- Experience the entire process of satellite development from mission design to operation
- Initiate and perform satellite tests alone and also teach fellow mates
- Specifically focus on 2 subsystems in 5 years



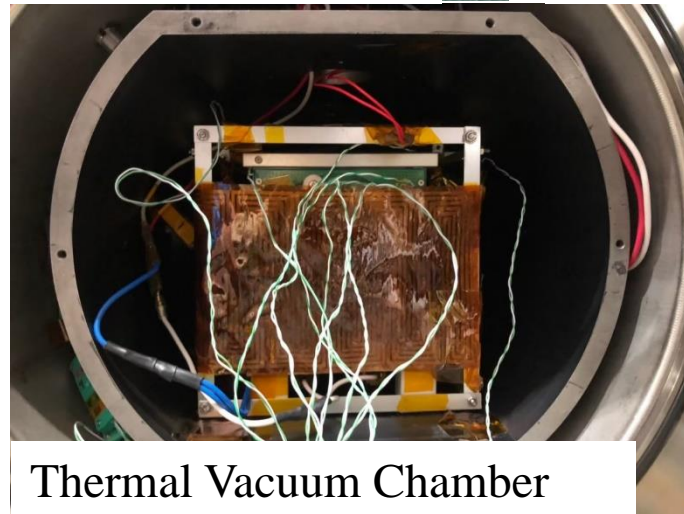
Anechoic Chamber



Solar Simulator



Vibration testing



Thermal Vacuum Chamber



Satellite functionality tests

Availability of any kind of test equipment within the lab

Special Guest Lectures from around the world

If you cannot send all students around the world, bring the world to the students



Prof. Jordi, CalPoly (then)



Dr. Doi, pr. JAXA Astronaut



Dr. Wood, MIT



Dr. Wakata, JAXA astronaut



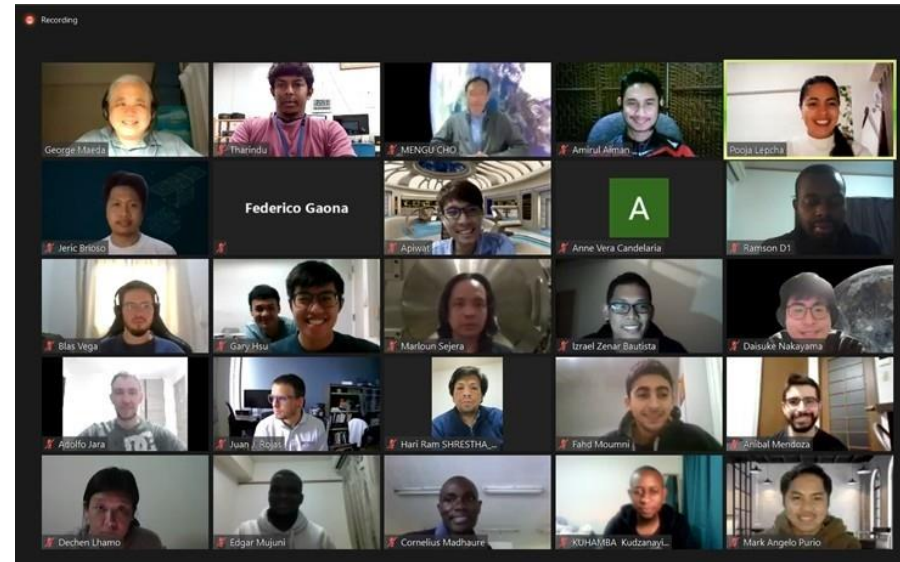
Dr. Werner, ESA



Dr. Joel, PHILSA

Research, Outreach, Conference and Workshops

- I could design and support development of ground sensor terminals for remote data collection using satellites in 11 countries and promote capacity building in space utilization



- A chance to attend international workshops and conferences held in and outside of Japan such as International Workshop on Lean Satellites, International Symposium on Space Technology, International Astronautical Congress.
- A chance to be at par with what the rest of the world is doing in space technology
- *Space is not too far from Kyutech*

Life outside studies and projects in Japan

Cycling Trips



Celebrating Hanami



Autumn Leaves



Skiing in Hiroshima



See sun rise from Mt. Fuji



Visit Kawachi for Wisteria



Current Job Responsibilities

- Engineer at Division of Telecom and Space (DoTS) established under Department of IT and Telecom, Government Technology Agency, Bhutan
 - DoTS is spearheading space related activities and outreach programs in the country
 - Using my experience and skills gained at Kyutech, I am able to contribute towards satellite development in Bhutan.
 - I am involved in review of space technology inclusion for school curriculum in junior and high schools
- (No more Bhutanese that thinks building a 1U satellite is a piece of cake and that space is too far)*



THANK YOU

https://twitter.com/Astro_Alex