

United Nations/Austria

World Space Forum

13 - 15 December 2022



ORGANIZED JOINTLY BY:

 Federal Ministry
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology



UNITED NATIONS
Office for Outer Space Affairs

 Federal Ministry
Republic of Austria
European and International
Affairs

United Nations Activities for Enhancing Access to Space

Access to Space for All initiative

World Space Forum 2022



UNOOSA and Space for Sustainable Development



Space for Women



Space Law for New Space Actors



UN-SPIDER



Access to Space for All



Space for Persons with Disabilities



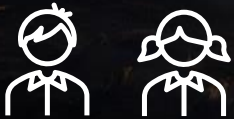
Space Economy



Space for Climate Action



International Committee on GNSS



Space for Youth



Space Sustainability



Space for Water



UNITED NATIONS
Office for Outer Space Affairs



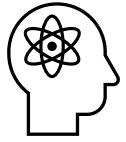


Access to Space for All

Space Technology Capacity Building



The goal of the Access to Space 4 All initiative is to provide research and orbital opportunities for UN Member States **to access space and to ensure that the benefits of space, in particular for sustainable development, are truly accessible to all**



Acquire cutting-edge skills for jobs and other opportunities and **develop hands-on capabilities** from A-Z



Access to unique ground and space infrastructure, technology, and information



Gain international cooperation experience through working with the UN and space-faring partners



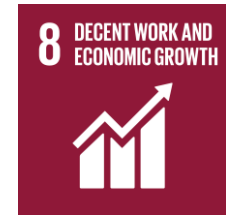
Visibility to of the R&D and space activities already done in the country/region



Motivate the young generation and **boost interest in STEM**

Access to Space for All in Numbers

- **9** Hands on Opportunities
- **1** Annual Fellowship
- **27** Awardees involving **42** Entities from **30** countries
- **4** CubeSats launched
- **7** Microgravity Experiments performed
- **16** projects in development
- **62** Scholarships granted
- **70+** Hours of educational content on YouTube



SPACE AGENCIES



RESEARCH INSTITUTIONS AND UNIVERSITIES



PRIVATE SECTOR





Access to Space for All

Impact of the initiative



Ellas construyen el satélite guatemalteco

Conozca a las siete estudiantes que participan en el proyecto del CubeSat.

“Estamos haciendo historia”
Estudiante Ingeniera Industrial y es parte del equipo de Mujeres y Ciudadanos Científicos. “Este proyecto me permite poner un granito de arena en la historia de Guatemala, para dar a conocer en qué consiste el CubeSat”, dice. “Es importante que las personas estén enteradas de los retos tecnológicos que se están creando aquí... ¡OIC!... y que puedan entender la importancia y complejidad que involucra construir el satélite. Estoy segura que los futuros científicos lo apreciarán”.

LUCILA CARIL, de 22 años, es asistente de la divulgación del proyecto.

“No debemos arrodillarnos nada a los hombres”
“Este proyecto muestra que Guatemala, pese a ser un país en vías de desarrollo, está dando todo de sí”, dice Nancy, que está en el área de Computación e Inteligencia Artificial. “Como ingeniera, me gusta el desafío tecnológico, porque debemos demostrar que somos capaces de realizar estas ingenierías. Me a sea un trabajo largo, con muchas dificultades, pero, al mismo tiempo, involucramos a otras mujeres para que sigan nuestras pisadas”, agrega.

NANCY MAZARECOS, de 19 años, cursa Ingeniería Mecatrónica.

“Aprendemos a trabajar en equipo y a cumplir metas”
“Me usé al proyecto porque me encanta saber que Guatemala puede hacer su primer satélite. Me encanta involucrarme y me ayuda a crecer profesionalmente. Me gusta el reto de trabajar en un equipo y cumplir metas, que está en el núcleo de la Ingeniería. Me encanta saber que estas mujeres se han integrado, para demostrar que somos capaces de hacer que una ingeniería y cumplir grandes proyectos. Creo que este satélite es el primer paso para que Guatemala y la latinoamérica, avance”.

“Somos capaces de hacer un excelente trabajo”
“Me usé al proyecto hace varias semanas. Hay muchas cosas que he aprendido de este proyecto, como trabajar en un equipo y cumplir metas. Me gusta el reto de trabajar en un equipo y cumplir metas, que está en el núcleo de la Ingeniería. Me encanta saber que estas mujeres se han integrado, para demostrar que somos capaces de hacer que una ingeniería y cumplir grandes proyectos. Creo que este satélite es el primer paso para que Guatemala y la latinoamérica, avance”.

“Confiamos en mí”
“Estoy en el núcleo de Ingeniería, todo lo que he hecho que voy con la ingeniería electrónica del satélite”, dice Lucila. “Es uno de los mejores momentos que estoy viviendo 100% por estudiantes. He sido un gran líder”, añade. “Quiero ser una de las ingenieras que en 2025, está haciendo otra”.

ASU News

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Guatemalan team launches nation's 1st CubeSat, wins Interplanetary Initiative prize

International student team recognized for its success through adversity

June 6, 2022

When members of the team that built the Quetzal-1 CubeSat watched their satellite take off on a SpaceX Falcon 9 rocket in 2020, it was the culmination of six years of hard work, overcoming financial and personnel hurdles, and challenging cultural barriers.

That hard work and ingenuity has garnered the team the CubeSat Delivery Prize award through Arizona State University's Interplanetary Initiative. The award is just the latest step in the team's remarkable journey.

FIRST MAURITIAN SATELLITE – OPENING NEW OPPORTUNITIES

JOURNEY TO SPACE ALTHOUGH NOT EASY BUT EXTREMELY REWARDING AND OFFERS HIGHLY PROMISING FUTURE

- MAURITIUS EMBARKS IN NEW SPACE ERA**
 - Geolocation interesting for future space related activities
 - More advanced space nations interested to collaborate
- ENTHUSIASTIC YOUNGSTERS**
 - The training program on antenna building gave us an insight of the high level of enthusiasm for this new field. There is hope to enhance this interest further to build new capacity.
- BOOST TECHNICAL CAPACITY**
 - Building highly technical capacity
 - Sophisticated ground station for future missions set up
 - Training of younger generation
- A POTENTIALLY NEW SOCIO-ECONOMIC PILLAR**
 - Space offers numerous possibilities for Mauritius. Data analytics, opportunities for R&D, business opportunities, intergovernmental collaborations.
- GOVERNMENT FULLY SUPPORTIVE**
 - This historical initiative for the Republic of Mauritius promises to unlock new opportunities for research, innovation and socio-economic development.

3. How has participating in DropTES changed the environment around you?

CIDIMEC recruits new interns to support research activities

State-of-the-Art Research

MECHATRONICS DEPARTMENT

Aerospace, AI and Digital Centre

ESPITA was able to grow, to expand by inauguration AEROSPACE, AI AND DIGITAL CENTER on July 2022

Aerospace AI Digital Center



Access to Space for All

Hypergravity/Microgravity Track

- **Achievable entry point** to acquire knowledge and skills through conducting various experiments in many different scientific fields
- **Beneficial first step to start capacity-building** for space activities

HYPERGRAVITY AND MICROGRAVITY

- Building capacity for conducting experiments in orbit



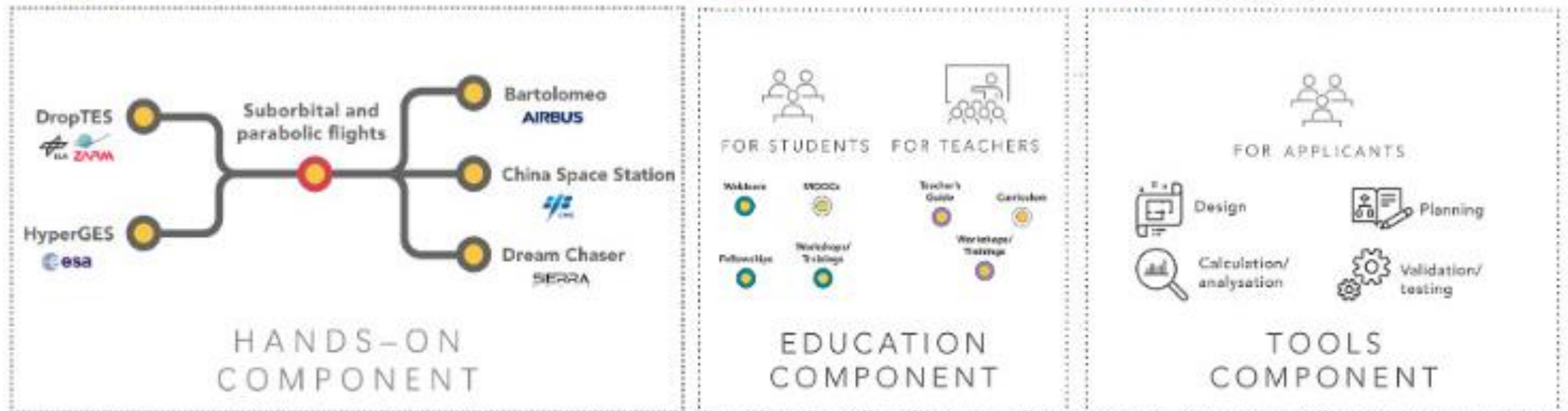
Hands-on opportunities in hypergravity and microgravity from ground to orbit



Education material for building up experiments



Open-source tools bridging hands-on and education components





Access to Space for All

Hypergravity/Microgravity Track



DropTES



- Partners: ZARM (Center of Applied Space Technology and Microgravity) and DLR (German Aerospace Center)
- Established: 2014
- Aims to provide educational or research institutions with opportunities to conduct a series of **microgravity experiments** at the Bremen Drop Tower in Germany.
- The drop tower experiment series consists of **5 drops or catapult launches** to be conducted within one week. Each experiment series is accompanied by an on-site experiment integration taking place one week prior to the campaign.
- 7 experiments have successfully been conducted with the programme.
- Currently open for applications until 22 January 2023.**



2014 German Jordanian University



2015 & 2020 Universidad Católica Boliviana "San Pablo"



2016 Universidad de Costa Rica



2017 Warsaw University of Technology



2018 University of Bucharest Politehnica



2019 Politecnico de Milano "Polimi"

Photo credit: ZARM





Access to Space for All

Hypergravity/Microgravity Track: DropTES

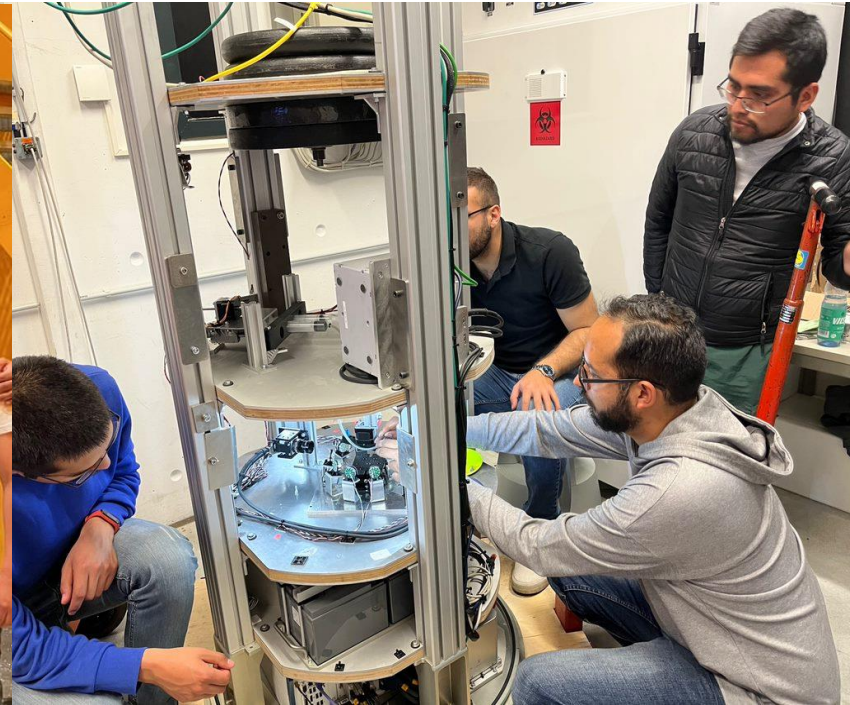
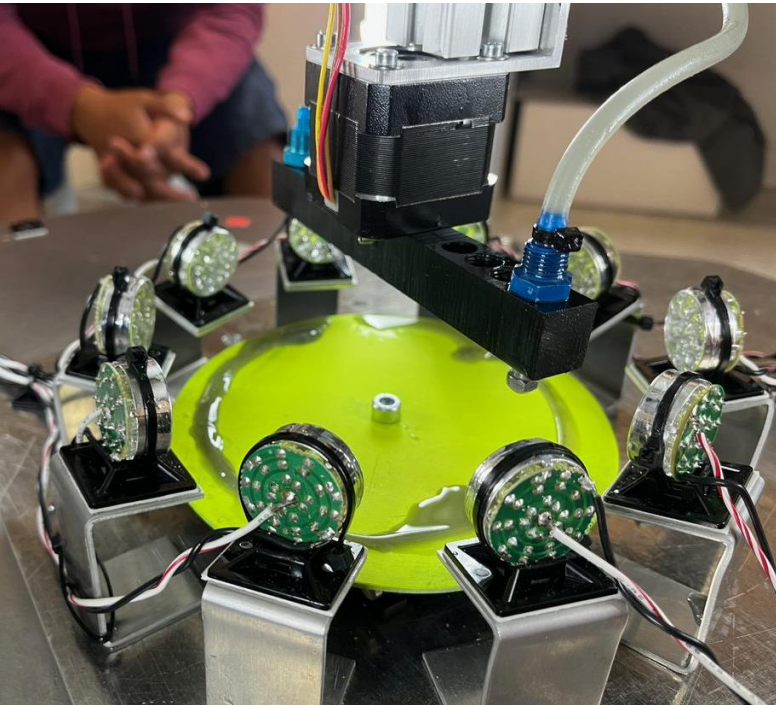


Universidad Católica Boliviana "San Pablo" awardee of DropTES 2nd & 7th round

- In 2015, the team **examined and evaluated the property of Nitinol**, which is a metal alloy often used in medical devices.
- In 2022, the team tested **3D printing techniques using liquid resin**, which could lead to new applications in various fields.



The **technical expertise and skills acquired through the experiments** helped develop ventilators during the COVID19 pandemic.





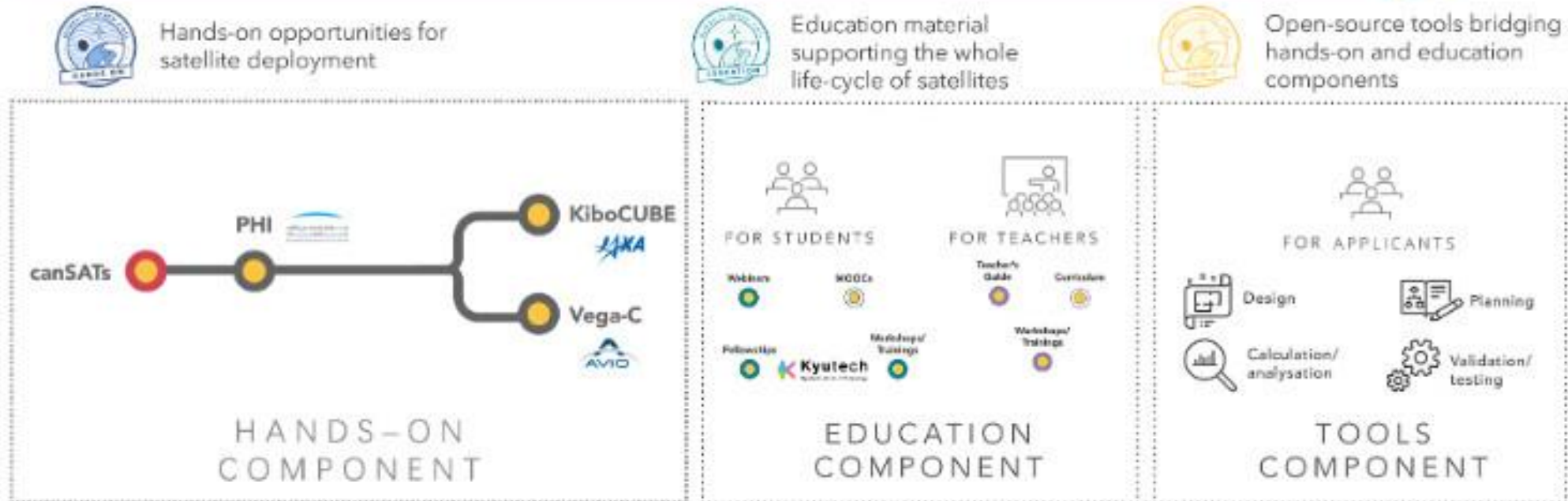
Access to Space for All

Satellite Development Track

- CubeSats offer a **large variety of applications**
- CubeSat development can be the **first step for a country in the acquisition of the skills and know-how needed to develop a space programme**
- CubeSats are **affordable to develop** and represent an **achievable entry point to space activities.**

SATELLITE DEVELOPMENT

- Building capacity that enables the development, deployment, and operation of satellites





Access to Space for All

Satellite Development Track



KiboCUBE 1st Round Awardee: Kenya

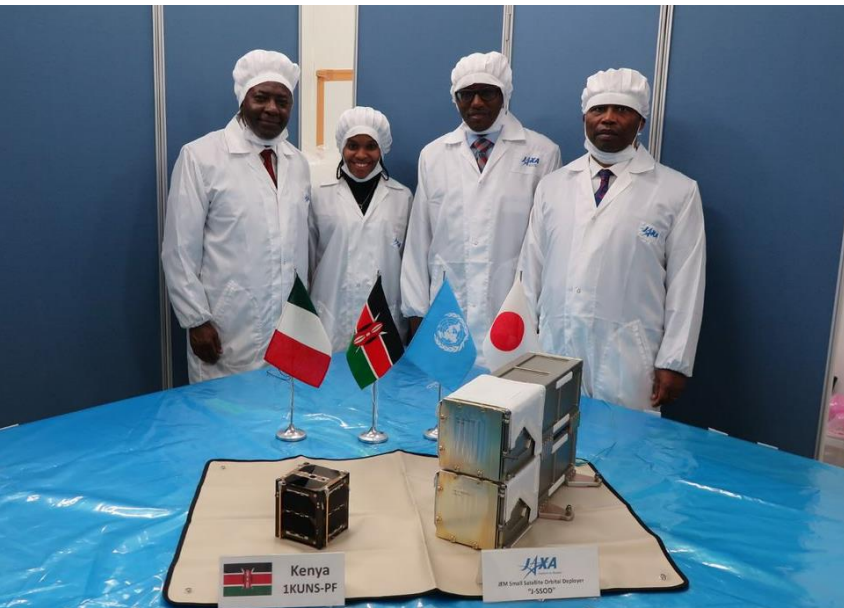
- Institute: University of Nairobi
- Satellite: 1KUNS-PF
- Objective: To monitor agriculture and coastal areas
- Partnership: University of Rome (Italy)
- Deployed from ISS: 11 May 2018
- Re-entered atmosphere: June 2020

Achievements

- More than 300 images downloaded, surpassing initial expectations
- **Accelerated the creation of the Kenya Space Agency,** which led to more KSA participation in other Access to Space for All opportunities such as the Bartolomeo and ISONscope programme

Photo credit: JAXA

Photo credit: JAXA/NASA





Access to Space for All

Satellite Development Track

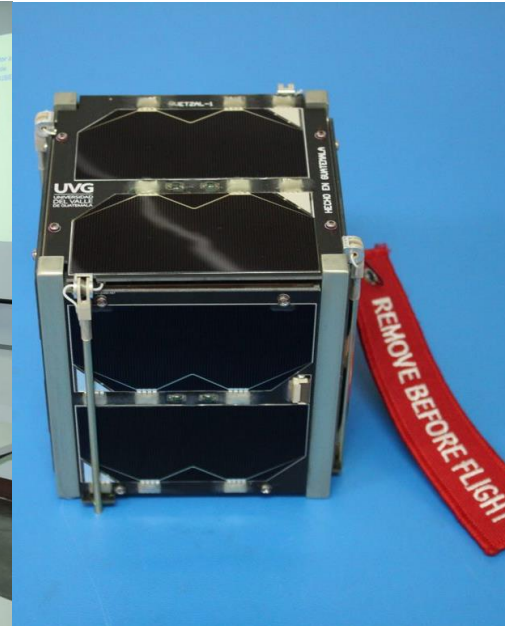
KiboCUBE 2nd Round Awardee: Guatemala

- Institute: Universidad del Valle de Guatemala
- Satellite: Quetzal-1
- Objective: To test the acquisition of EO data
- Partnership: Universitat Wurzburg, University of Alabama, University of Colorado Boulder, LASP, NASA, ESAC, UKSA, ASTROSAT, and more
- Deployed from ISS: 29 April 2020
- Re-entered atmosphere: August 2021

Achievements

- In operation for 211 days with 84,976 data packages received globally, **involved more than 100 students in the project, developed 70% of the CubeSat in-house.**
- **Conducted successful outreach activities** involving the media, workshops for young students (especially girls) & publishing books/documentaries

Photo credit: Ivan Castro





Access to Space for All

Satellite Development Track

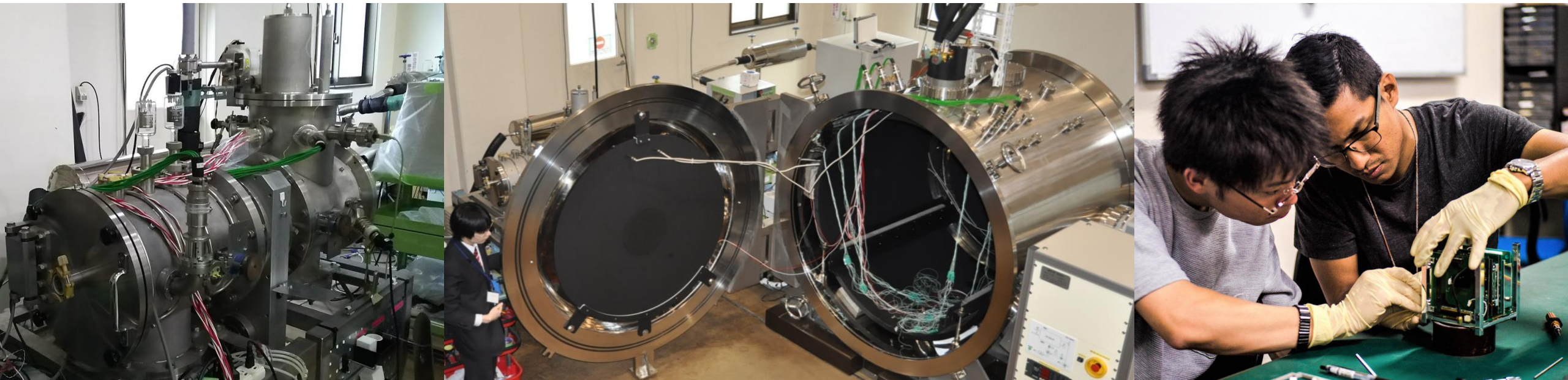


Post-graduate Study on Nano-Satellite Technology (PNST)



- Partner: Kyutech (Kyushu Institute of Technology) with the support of the Gov. of Japan (MEXT)
- Established: 2013
- Provides **3 students in the Master's Programme (2 years duration) and 3 students in the Doctoral Programme (3 years duration)** to enroll in Kyutech's **Space Engineering International Course (SEIC)** for a **hands-on, extensive research opportunity in nano-satellite systems through the use of the nano-satellite development and testing facilities** available at Kyutech.
- The selected fellows are expected to return to their home counties upon completion of their studies and contribute to their countries using the experience and knowledge gained from the programme.
- **Currently open for applications until 9 January 2023.**

Photo credit: Kyutech





Access to Space for All Satellite Development Track



Post-graduate Study on Nano-Satellite Technology (PNST)



Year	Selected Student's Countries of Origin
2022	Egypt, Mexico, Mongolia, South Africa, Turkey, Thailand
2021	Bhutan, Cambodia, Ethiopia, Laos, Trinidad and Tobago, Zimbabwe
2020	Brazil, El Salvador, Indonesia, Nepal, Paraguay, Vietnam
2019	Bhutan, Ethiopia, Laos, Malaysia, Sri Lanka, Trinidad and Tobago
2018	Algeria, Egypt, Nepal, Sudan, Turkey

United Nations Office for Outer Space Affairs
 How satellite technology has opened new opportunities:
 From El Salvador to the world
 Interview conducted on 25 August 2021
 Institution: **Kyutech**
 Interviewee: Fatima Duran, Master's Student at Kyushu Institute of Technology from the Republic of El Salvador

Background:
 The United Nations Office for Outer Space Affairs (UNOOSA), in partnership with the Government of Japan and the Kyushu Institute of Technology (Kyutech) through the UN/Japan Long-term Fellowship Programme Post-graduate study on Satellite Technologies (PNST).

The programme provides 3 masters and doctoral students from developing countries the opportunity to enrol in the Kyutech Space Engineering International Course (SEIC) to study nano-satellite systems. The chosen candidates receive a grant from the Ministry of Education, Culture, Sports, Science and Technology of Japan for the duration of their fellowship, covering housing, food, local transportation, and other expenses. In addition, each candidate is provided an economy class air ticket between an international airport in the country of his/her nationality and Narita or Fukuoka International Airport. Fees for matriculation, tuition and entrance examination are covered by Kyutech.

Fatima is a first-year master student in the programme since fall of the PNST fellowship, she obtained her bachelor's degree in aeronautics from the Pusan National University of South Korea and an associate degree in aerodynamics from the Universidad Don Bosco, El Salvador. She is also a technician in Universidad Don Bosco (SGAC) of El Salvador of the Space Generation Advisory Council (SGAC) of El Salvador Aerospace Institute.

In this interview, we spoke with her about her experience at Kyutech.

United Nations Office for Outer Space Affairs
 Access to Space for All Initiative for Sustainability- Interview Series Article #2 July 2022
 How Education Through PNST Contributes to the SDGs

Background:
 The United Nations/Japan Long-term Study on Nano-Satellite Technologies (PNST) is offered by the United Nations Office for Outer Space Affairs (UNOOSA) and the Government of Japan, through the support of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), in cooperation with the Kyushu Institute of Technology (Kyutech). The Fellowship programme provides extensive hands-on opportunities in nano-satellite development and the use of the nano-satellite systems through PNST facilities available at Kyutech and Master's Program (2 years duration) and up to three students in the Doctoral Program (3 years duration). The selected students will enroll in the Space Engineering International Course (SEIC) and Kyutech have selected more than 50 students from various developing countries. Many have returned to their countries to promote and develop space activities locally within their countries/regions.

The PNST fellowship has been awarded the Japan Ministry of Foreign Affairs Award in 2017 for its contribution to human resource development in the global space sector.

Kyutech
 Kyushu Institute of Technology

Interviewee: Prof. Meegu Cho, Director of the Space Engineering International Course, Kyushu Institute of Technology (Kyutech)
Interviewee: Abhas Maskey, 2020 graduate of the PNST fellowship, Founder of Antarcticya Pratisthan Nepal
 Date: Interview conducted with Kyutech on 28 June 2022 and with Abhas Maskey on 13 July 2022

Background:
 The thermal vacuum chamber at Kyutech

PNST Past 5 Year Beneficiaries Data UNOOSA

Year	Selected Student's Countries of Origin
2022	Egypt, Mexico, Mongolia, South Africa, Turkey, Thailand
2021	Bhutan, Cambodia, Ethiopia, Laos, Trinidad and Tobago, Zimbabwe
2020	Brazil, El Salvador, Indonesia, Nepal, Paraguay, Vietnam
2019	Bhutan, Ethiopia, Laos, Malaysia, Sri Lanka, Trinidad and Tobago
2018	Algeria, Egypt, Nepal, Sudan, Turkey

Students from different countries working together at Kyutech.

www.unoosa.org

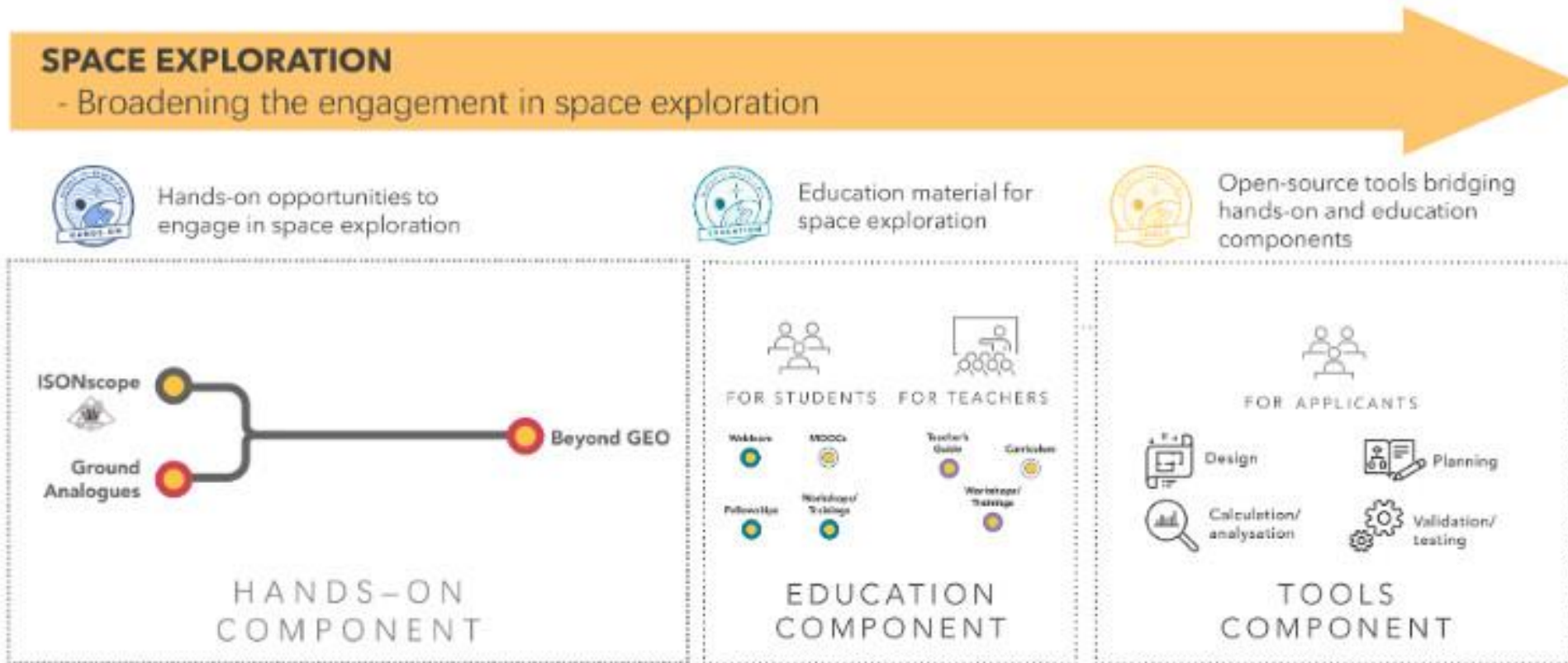




Access to Space for All

Space Exploration Track

- Increasing capability in astronomy/observation and space data analysis can **deepen scientific knowledge and support necessary technology** for monitoring space debris, managing space traffic, and future exploration beyond GEO
- Space exploration can **motivate the young generation** who are the leaders of tomorrow
- Space exploration is an international effort and it can **foster international cooperation**





Access to Space for All

Partnerships



Value Propositions for Partners

- Visibility of infrastructure, facilities, and technology
- More impact through being part of an organized initiative
- Bridge the space divide and support the development of cross-cutting skills with a partnership with the United Nations
- Promote the safe and sustainable use of outer space as a responsible space actor

**17 PARTNERSHIPS
FOR THE GOALS**



SPACE AGENCIES



RESEARCH INSTITUTIONS AND UNIVERSITIES



PRIVATE SECTOR



**Any questions?
Interested in cooperation  ?
Contact us**

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**Help us help
#AccSpace4All**



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