

30th Workshop on Space Technology for Socio-Economic Benefits: "Challenges and Capacity-
building Opportunities for Emerging Space Nations"

30/09/2023

Baku, Azerbaijan

Emerging Capacity-Building of a Young Peruvian University: Universidad de Ciencias y Humanidades Study Case

M.Sc. Ing. Natalia Indira Vargas Cuentas



Context

- ❖ According to the National Superintendency of Higher Education (SUNEDU), by 2023 there are 96 licensed universities in Peru.
- ❖ Which can be divided into two types of management: public and private.
- ❖ The types of management respond to different modes of organization, financing, government and teacher professional development, among others.

Peruvian universities



Universidad de Ciencias y Humanidades

- ❖ The Universidad de Ciencias y Humanidades (UCH) is a non-profit Civil Association, created in 2006. It has obtained its institutional license on November 21, 2017.
- ❖ It has 25 laboratories; including 9 of computing, 5 of electronics and 1 of biotechnology.
- ❖ It has three Research Centers: INTI-Lab, CIICS and e-Health.

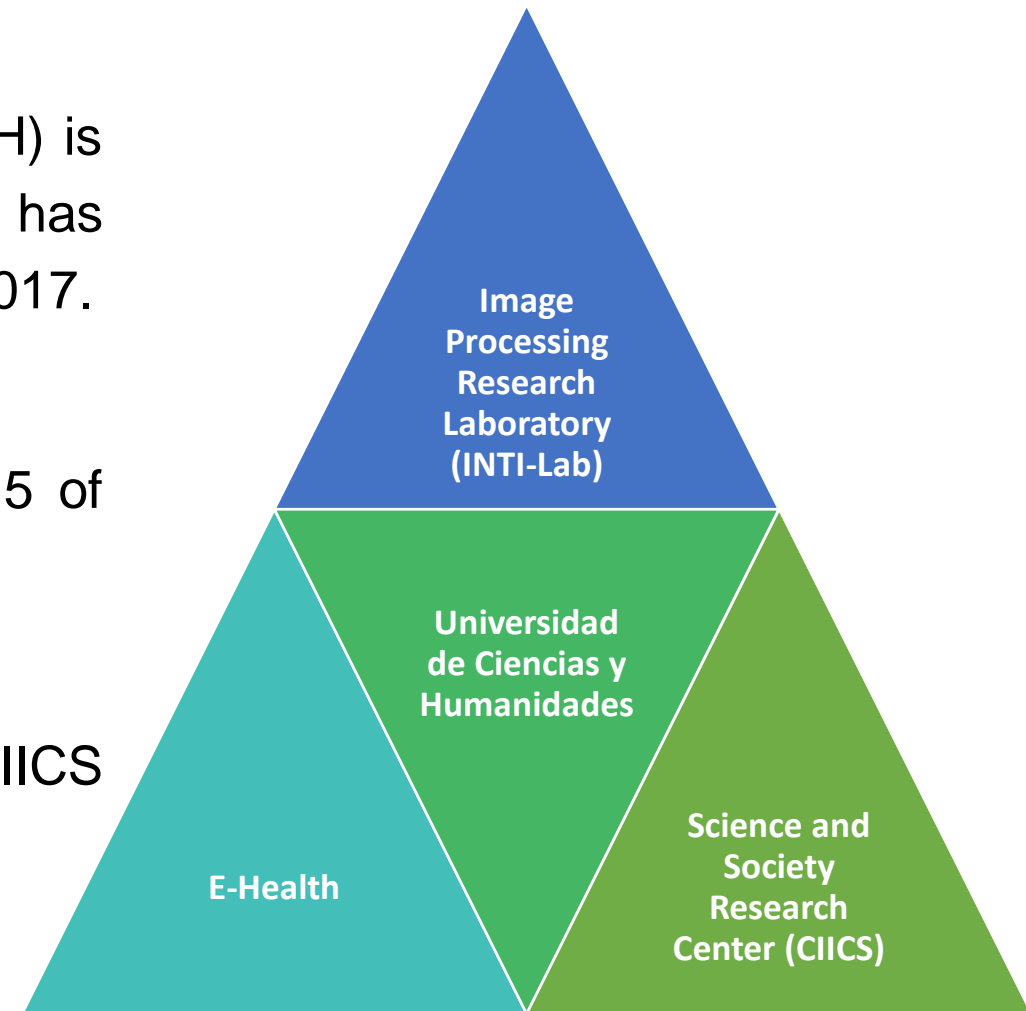


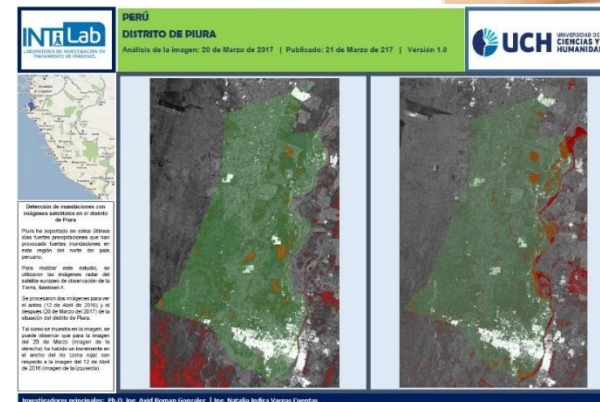
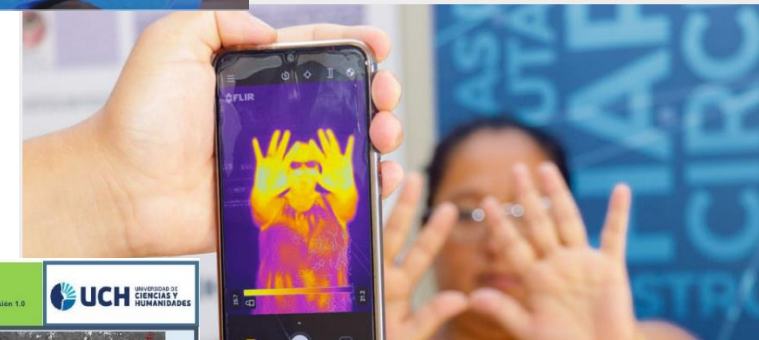
Image Processing Research Laboratory (INTI-Lab)

- ❖ The Image Processing Research Laboratory (INTI-Lab) was created on June 23, 2016 by Resolution No. 090-2016-CU-UCH.
- ❖ INTI-Lab is a research center dedicated mainly to the development of projects related to signal and image processing, aerospace technology, development of electronic systems, computer systems and artificial intelligence.



Research topics

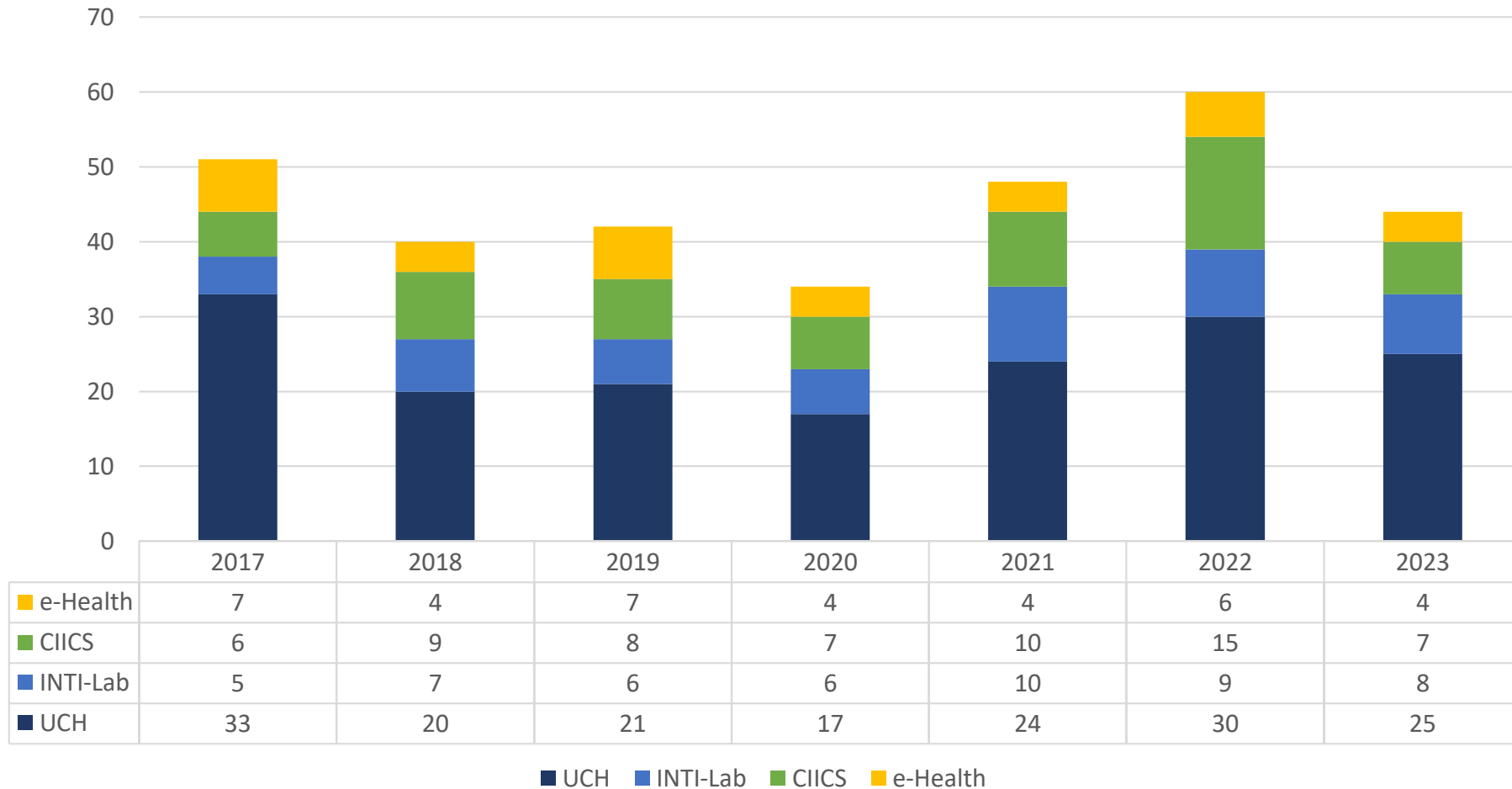
- ❖ Electronic Circuits and Communication Systems.
- ❖ Computing, Systems and Informatics.
- ❖ Industrial Applications.
- ❖ Biomedical Technology.
- ❖ Aerospace Systems.
- ❖ ICT management.



Scientific production

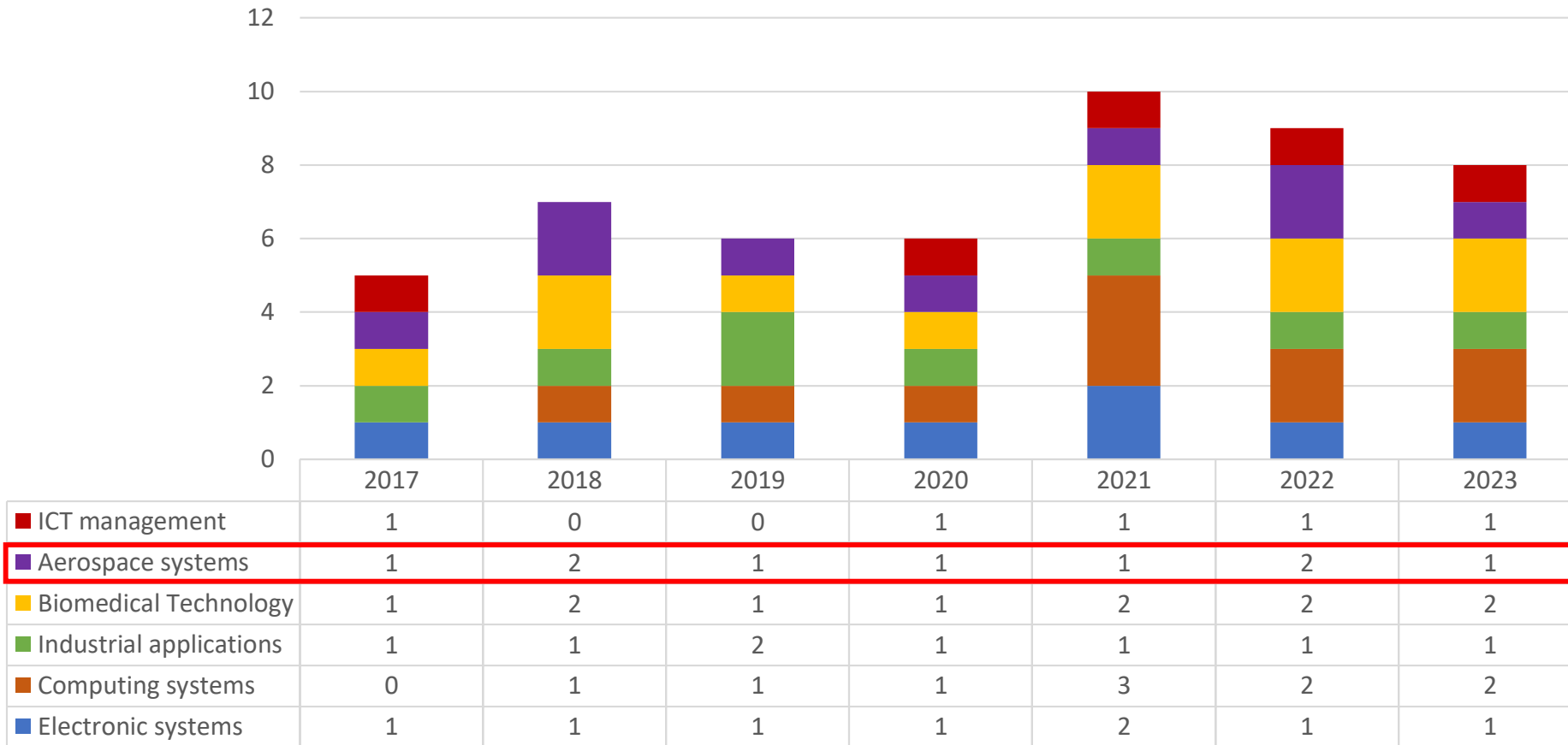
UCH Research Projects

Research projects from 2017 to 2023



INTI-Lab Research Projects

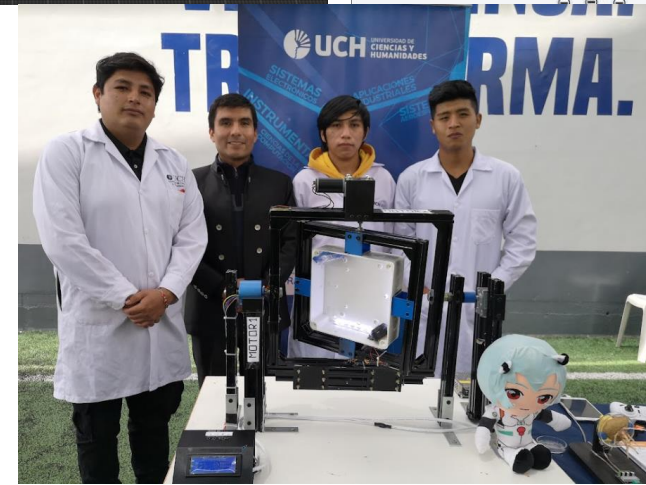
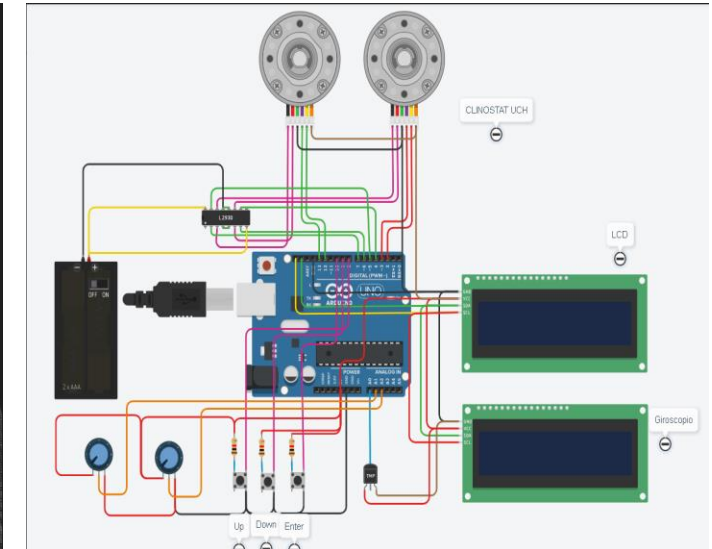
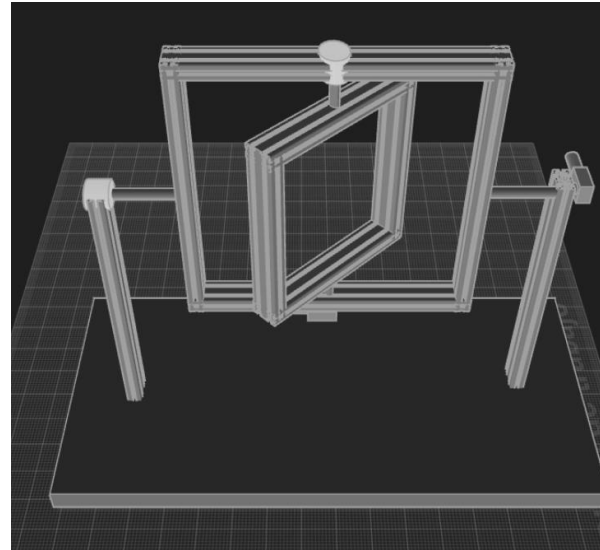
INTI-Lab research projects from 2017 to 2023



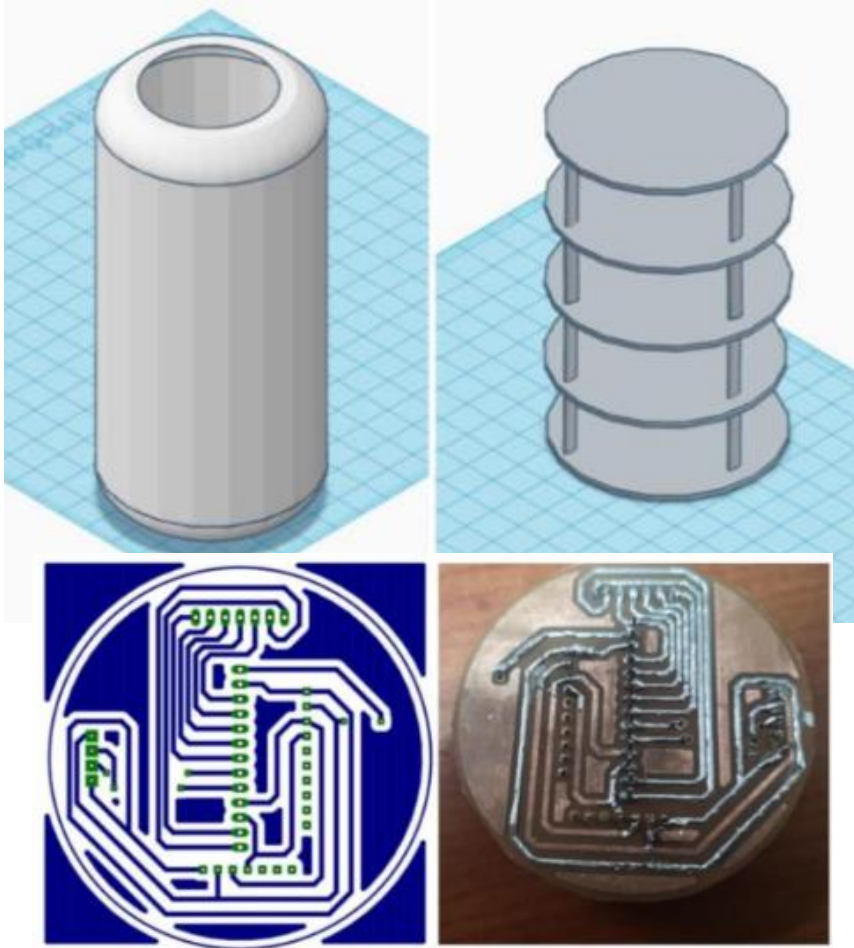
■ Electronic systems
 ■ Computing systems
 ■ Industrial applications
■ Biomedical Technology
 ■ Aerospace systems
 ■ ICT management

Design of a Clinostat for the Simulation of Microgravity and its Applications in Aerospace Technology

- ❖ The clinostat is composed of two frames and a support structure.
- ❖ Inside the frames of the clinostat there is a space to place a payload.
- ❖ Its operation is characterized by random rotational movements in two axes, this is done by two actuators.



CANSAT



- ❖ The picosatellite was composed of different subsystems and different instruments such as;
 - ✓ Sensors of inertial measurement,
 - ✓ Temperature
 - ✓ Atmospheric pressure
 - ✓ Positioning devices
 - ✓ Video camera.

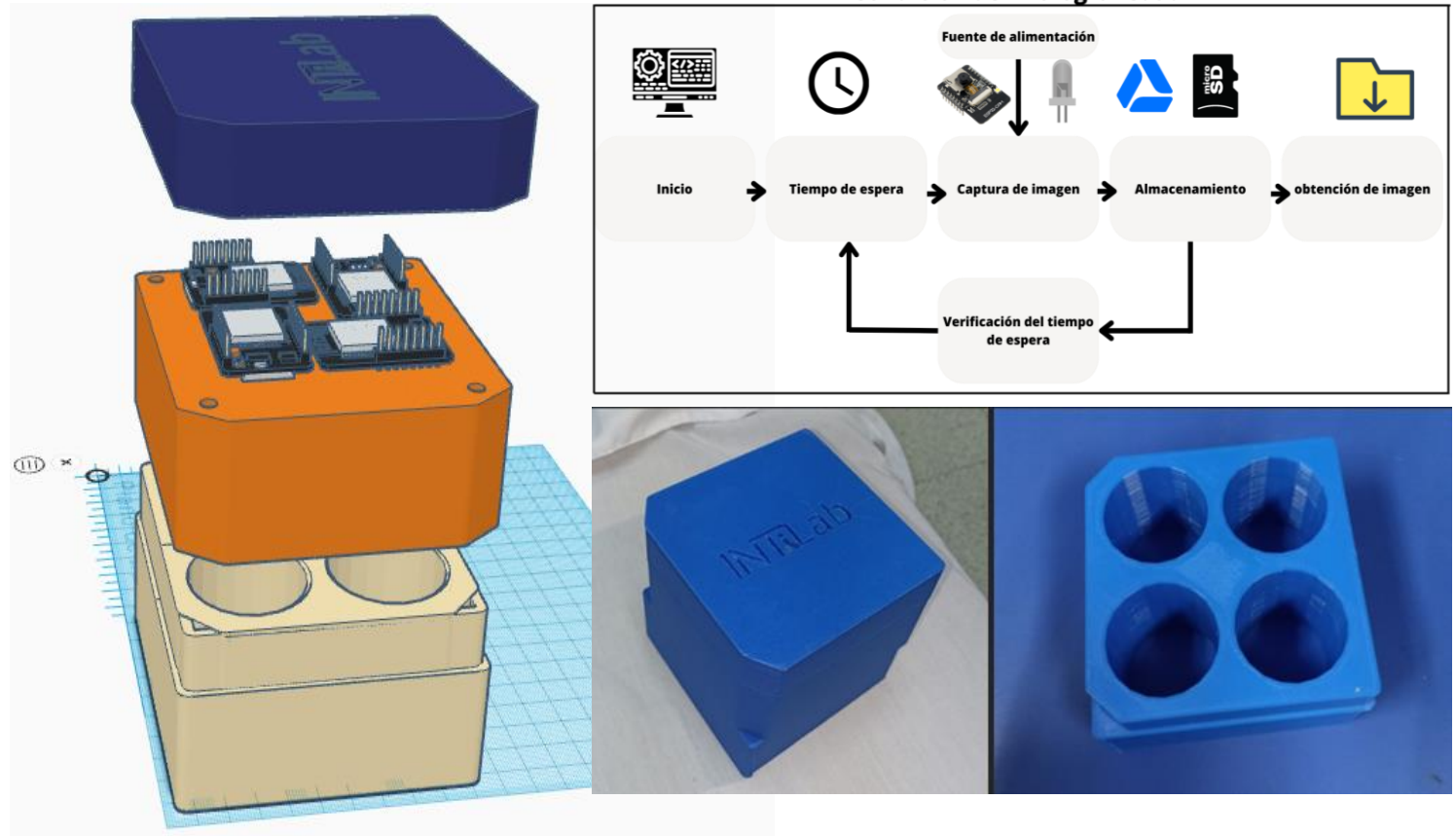
CANSAT

- ❖ The main objective of the CanSat was educational, it was tested from a height of 24 meters and with a parachute.



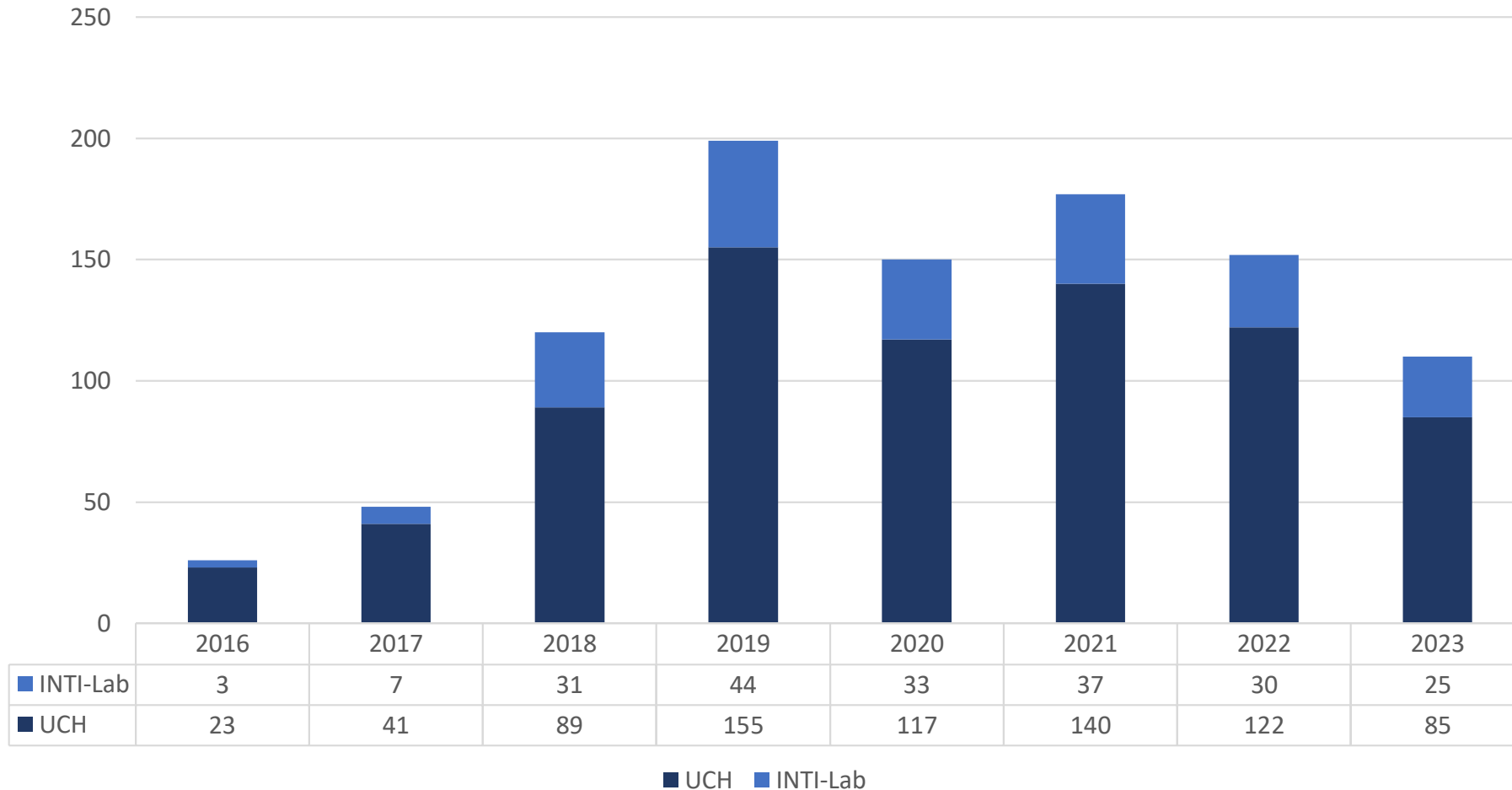
Design of a payload for the evaluation of the effect of hypergravity on the resistance and efficacy of antibiotics

- ❖ The payload consisted of a container to place biological samples.
- ❖ An electronic board with a microcontroller, SD memory, cameras and LEDs was conditioned to the payload.



Research Publications

Research publications indexed in SCOPUS from 2016 to 2023



On going projects

APSCO Cubesat Competition (ACC) Project

- ❖ Our university is part of the APSCO Cubesat Competition (ACC) Project.
- ❖ We are part of one of the three teams that represent Peru in this competition.
- ❖ Currently, we are in phase 0 of the competition and we hope to move to phase A.





- ❖ A strategic cooperation alliance has been established between the Peruvian space agency and public and private universities.
 - ✓ National Commission for Aerospace Research and Development (CONIDA).
 - ✓ Universidad Nacional de Ingeniería (UNI).
 - ✓ Universidad de Ciencias y Humanidades (UCH).
 - ✓ Pontificia Universidad Católica del Perú (PUCP).
- ❖ The objective of this cooperation alliance is to jointly develop a nanosatellite built in Peru.

And we want to go further...



M.Sc. Natalia Indira Vargas Cuentas

Thank you!

natalia.i.vargascuentass@ieee.org