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

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Evaluating The Effectiveness of Space Education Programs

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TOPICS

- Capacity Enhancement Initiatives in Space Technology for Egypt
- Middle School and High School Programs
- College and University Programs
- Advanced Education for Graduates – Innovation Programs
- International Space Training Program
- Lessons learned in building education and capacity-building opportunities

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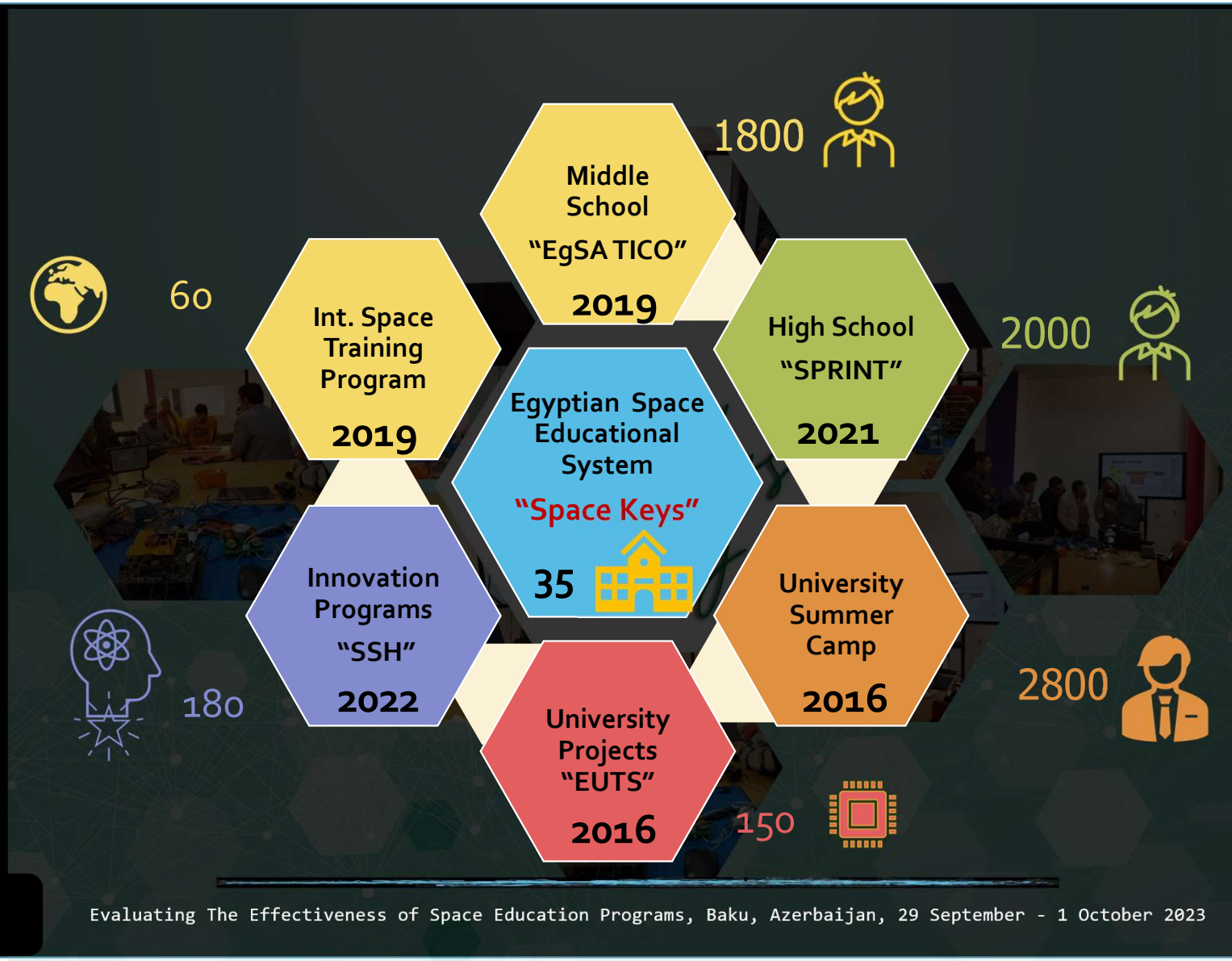
Capacity Enhancement Initiatives in Space Technology for Egypt

7 Programs

Egypt's Space Technology Capacity Building



Middle School Program "EgSA TICO"

2019

1800

In middle school, students can dive deeper into space education. They can explore topics like the history of space exploration, the International Space Station (ISS), and the basics of rocket science. Hands-on experiments, such as launching simple rockets or studying the phases of the moon, can foster a deeper understanding of space concepts.

Middle School Program "EgSA TICO"

2019

1800

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High School Program "SPRINT"

SPRINT space science laboratories in Egypt's private schools.

The initiative aims to integrate space sciences into the curriculum, with teachers designing age-appropriate content. Students will engage in competitions to create innovative space science models, incorporating space science and technology into teaching. Participants will learn from experts, engage in interactive activities, and enjoy space-themed events.

2021

2000

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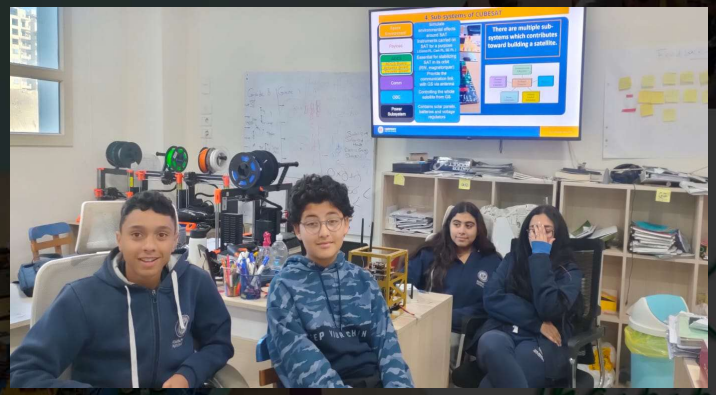
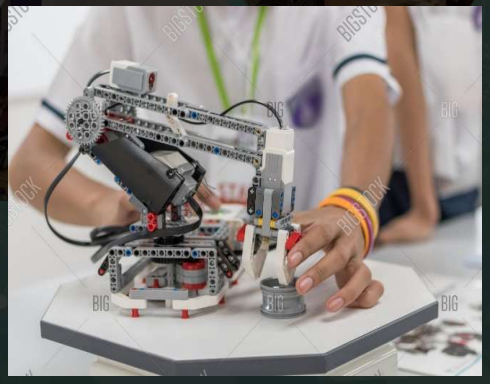
High School Program "SPRINT"

SPRINT

2021

2000





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University Summer Camp

Since 2016, the University Summer Camp has been an annual event welcoming students from diverse Egyptian universities. With an average attendance of 500 students each year, this camp is entirely free. The program encompasses a comprehensive three-week theoretical lecture series, complemented by a one-month practical training session in various aspects of space science and technology.

2016

2800

University Summer Camp

2016

2800

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University Projects "EUTS"

Space Project Under Supervision by EgSA Team

Graduation project in most universities is one of the requirements for the completion of the graduation degree. It can be described as a research experience, where the problem is defined, a hypothesis is created, experiments are designed to test the hypothesis, and conclusions are drawn. In parallel with this methodology, this program was designed to be compatible with the space industry, so that graduation projects are directed to produce parts or systems related to the space or ground segment, under the technical supervision of the Egyptian Space Agency team.

2016

150 Project

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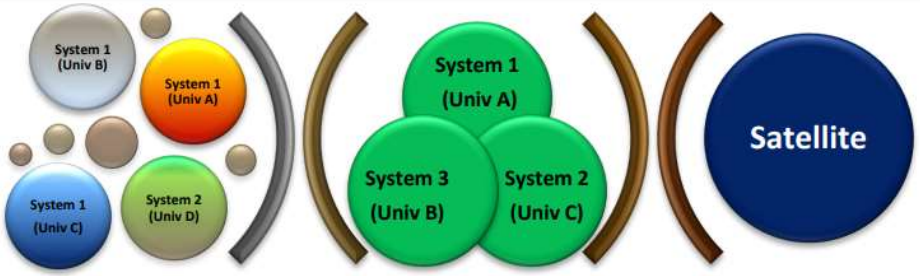
EUTS
Egyptian Universities Training Satellite

2016

150 Project



	Phase 1	Phase 2	Phase 3
Phase Description	Each university can participate in more than one team to implement a part or system, and more than one university can implement the same system,	The best designs are selected from various universities and qualified to produce the flight model	All selected systems collect in the EGSA facility for functional testing and AIT process to an integrated satellite
Phase Drivable	System Detail design /prototype / Modeling	System Engineering Model	Integrated Satellite 1U / 2U / 3 U

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Space Innovation lab

Career Development Opportunities

Throughout the Space Innovation Lab (SIL), we want students to have a multidisciplinary experience. Our goals are not just to acquire high-tech engineering skills but also to understand the contemporary space industry's operation in terms of business, This makes the students more attractive to employers inside and outside of the space industry .

SII

Complying With Academic Regulations In Colleges of Engineering.

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Space Keys
We're Unlocking the Space for Everyone

Our Products & Services

Unparalleled Learning Resources

Hands-On Learning by Our Educational Satellite Laboratory is equipped with cutting-edge technology and resources for

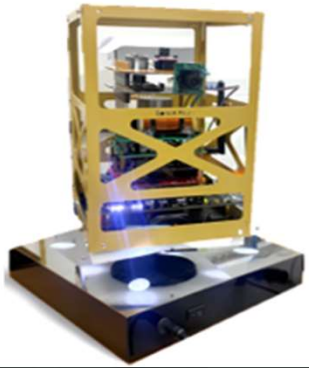
1

10 Engineering Courses

- Electric Circuits I & II
- Electronic Circuits I & II
- Digital Signal Processing
- Measurements and Instrumentation
- Microprocessors Based Systems
- Digital Communications
- Information and Coding Theory
- Electronics and Communications Engineering Project
- Electronic Systems Design
- Satellite Communication System

2

Full Satellite Systems and Ground Stations



1. Hands-On Learning
2. Exceptional Educational Resources
3. Networking Opportunities
4. Career Advancement

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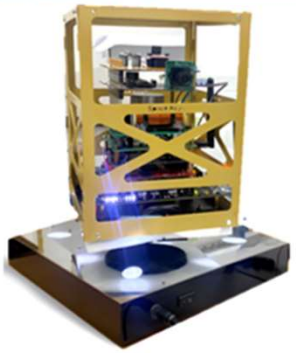
Space Innovation Lab in 32 in the school of Engineering and Science

Space Innovation Lab (SIL)

Content



8 x Full Satellite Systems and Ground Stations

Required Electronic Components

Required Instrumentation

High-performance Computing Facilities

Real-time data acquisition and analysis systems

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Space Innovation Lab in 32 in the School of Engineering and Science

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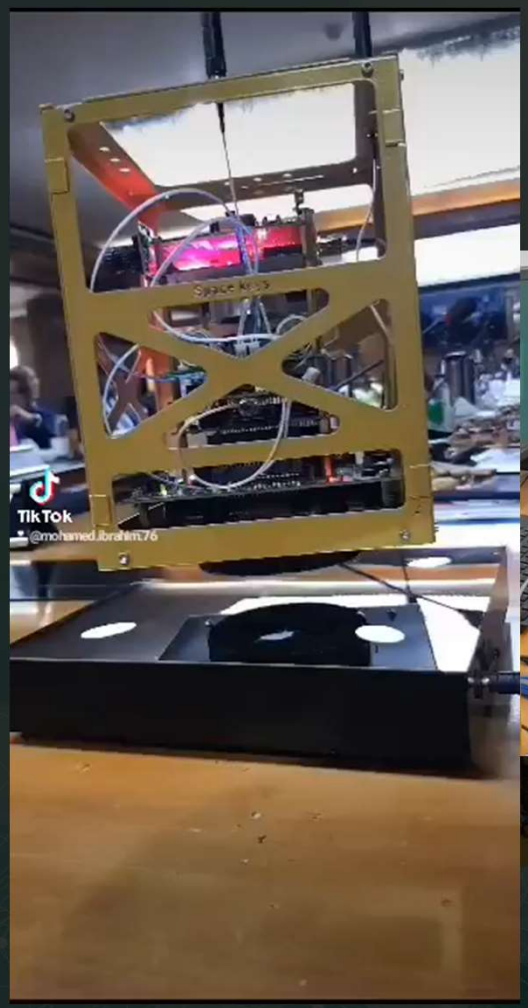
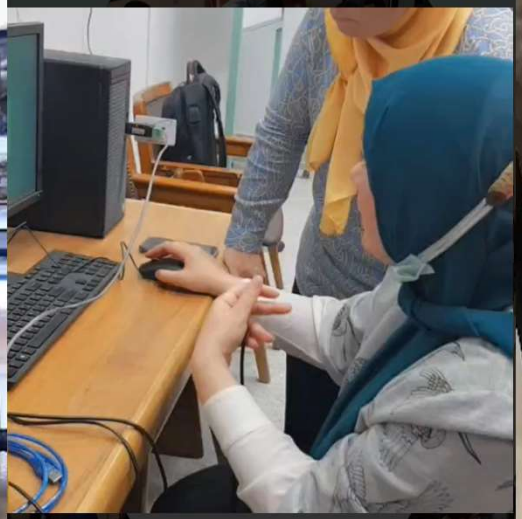
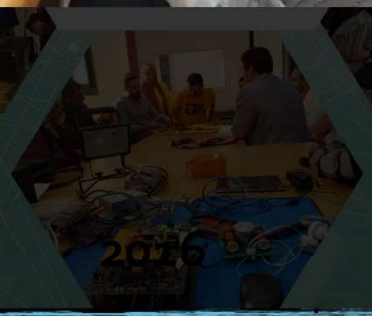
Space Innovation Lab in 32 in the school of Engineering and Science







International Space Training Program

2019

6o Int. Trainee

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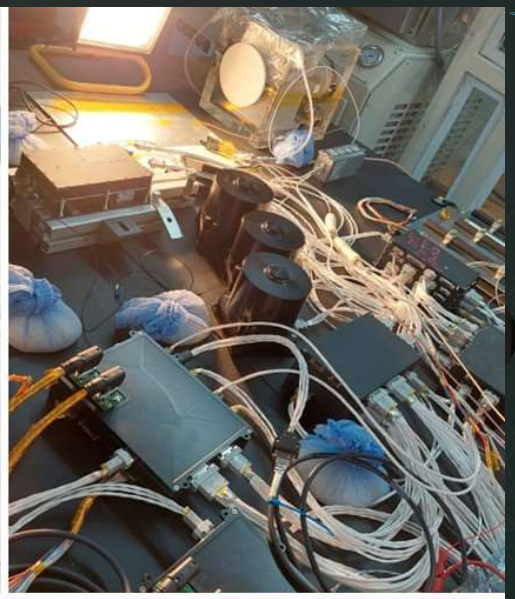
International Space Training Program





2019

6o Int.
Trainee

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Comprehensive Space Technology and Testing Workshop

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Space Innovation Center

Space Academy – Egyptian Space Agency

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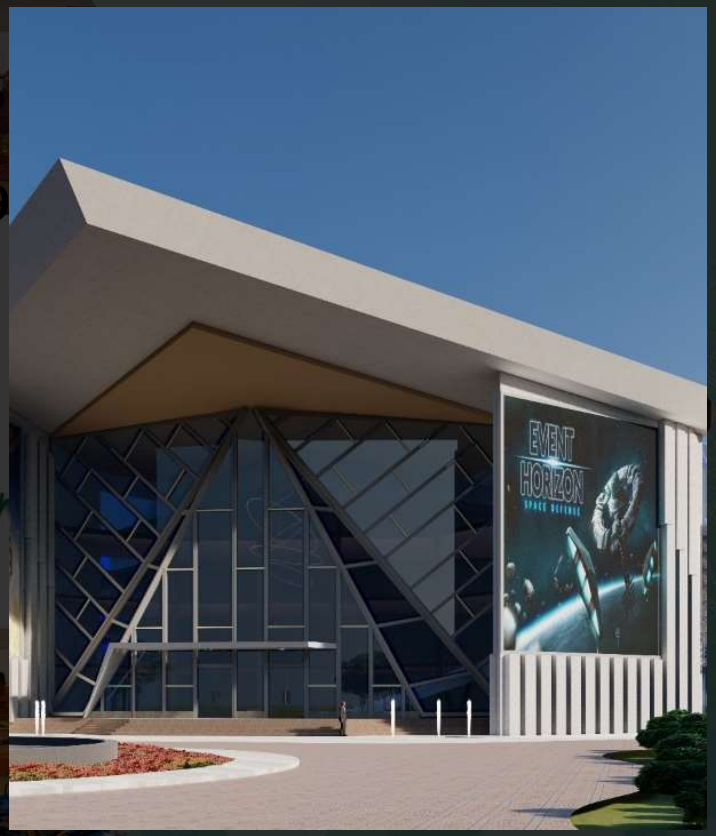
Space Academy



2016

Space Innovation Center Programs

Professional Qualification Program	Fees Fully Funded Scholarship	Job Profiles 29 Profiles	Duration 9 Month
Vocational Rehabilitation Program	Fees Fully Funded Scholarship	Job Profiles 15 Profiles	Duration 6 Month
Skilled to Entrepreneur (S-E) Program	Fees Fully Funded Scholarship	Job Profiles 50 Profiles	Duration 3 Month

Skilled to Entrepreneur Program

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Professional Qualification Program

Vocational Rehabilitation Program

Skilled to Entrepreneur Program

3 Month

Entrepreneurs tackling critical issues and Change-making

50 Startup / Year

150 - 250 Job creation / Year

The greatest challenges for each geographical area

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Lessons Learned In Building Education and Capacity-building Opportunities

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Lessons Learned In

During Middle School and High School Programs

Integrating space science and technology activities into the school curriculum enhances students' engagement and sustains their interest over time. When these subjects are seamlessly woven into various academic stages, we witness a remarkable surge in students' interest, participation, and interaction, often surpassing a **60% improvement**. In contrast, when space science education activities are taught separately from the standard curriculum, students tend to initially struggle and then lose enthusiasm.

Lessons Learned In

During College and University Programs

Initially, educational satellite laboratories were established with a specific focus on space science and technology, offering direct satellite experiments. However, their utilization by academic staff was minimal, at less than 5% annually. This low usage stemmed from a lack of direct relevance between the scientific experiments conducted in the educational satellite labs and the subject matter taught in one particular course, namely Communication Satellite Systems. Moreover, professors responsible for other courses failed to integrate satellite-related topics into their curricula.

Lessons Learned In

During College and University Programs

Subsequently, significant enhancements were made to the content of these space innovation laboratories. Practical experiences were incorporated, aligning with ten different engineering courses. This comprehensive approach encompassed curriculum development, assessment and evaluation methods, teaching resources, student support mechanisms, assessment of learning outcomes, and an extensive question bank. As a result of these improvements, the teaching of space technology in the context of various engineering courses became feasible, leading to a remarkable increase in laboratory utilization. **Usage rates exceeded 30%** of the total credit hours for each linked course.

Lessons Learned In

During Advanced Education for Graduates – Innovation Programs

Following the introduction of training camps in both space technology and business skills, the Egyptian Space Agency witnessed a substantial surge in the acceptance rates of graduation projects and ideas submitted for incubation in their business incubator. Prior to the implementation of these training programs, the acceptance rate stood at 35% for graduation projects and a mere 10% for ideas approved for entry into the business incubator. Post-training, these figures saw a remarkable improvement, with the acceptance rate for graduation projects rising to 75% and the acceptance rate for incubated ideas reaching 65%.

Lessons Learned In

During International Space Training Program

Following the transition to a training program that emphasized 80% practical learning and 20% theoretical instruction, the Egyptian Space Agency experienced a substantial increase in applications from African countries. The number of specialist applicants from 37 African nations surged to 260. Prior to this change, when the training program was predominantly theoretical (70%) with a smaller practical component (30%), there were only 40 applicants from 8 countries.