



# AMITY UNIVERSITY MAHARASHTRA

Established vide Maharashtra Act No. 13 of 2014, of Government of Maharashtra, and recognized under section 2(f) of UGC Act 1956.

## A Report on



### **GOAL 9: Industry, Innovation and Infrastructure**

## Sustainable Development Goals

Year 2020

Amity University Maharashtra, Bhatan Post - Somathne,  
Mumbai - Pune Expy, Panvel, Bhatan Pada,  
Maharashtra 410206



## GOAL 9: Industry, Innovation and Infrastructure

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## GOAL 9: Industry, Innovation and Infrastructure

### GOAL 9: Industry, Innovation and Infrastructure

The University has Strategic Partnerships with Tata Technologies. The collaboration with Tata Technologies has established the Laboratories on Automobile and Aeronautical Engineering with cutting-edge industrial equipment like 3D-Printer, Computer Numerical Control Lab consisting of several equipments, Vistara Aeroplane Design facilities, and Simulation setup at the AUM premises. In addition, Tata Technologies provides industry experts and student placements AUM's Philosophy of Developing the Strategic Partnership has brought the Industry to the doorstep of the Academic Institution with the high rate of placements.

### Partners for SDG

Level	Partner for SDG	Contribution to SDG
National	JMS Mining Pvt Ltd.	SDG9
National	CEMS	SDG9
Regional	Instron Technologies	SDG9
Regional	Digitech Confidential	SDG9

### Innovation Equipments

- 1) Equipment purchase and delivery bills for CNC Lab (04 Bills Number)
- 2) Photographs of CNC Machine, 3D- Printing, CNC Laser Cutting Machine, Computer Lab, Robotic Assembly line, Welding Robots at Amity University Mumbai.
- 3) Events Photographs Conducted under the CNC Lab.
  - Design Autodesk Fusion 360 on 8 October 2020, 7th June - 11 June 2021.

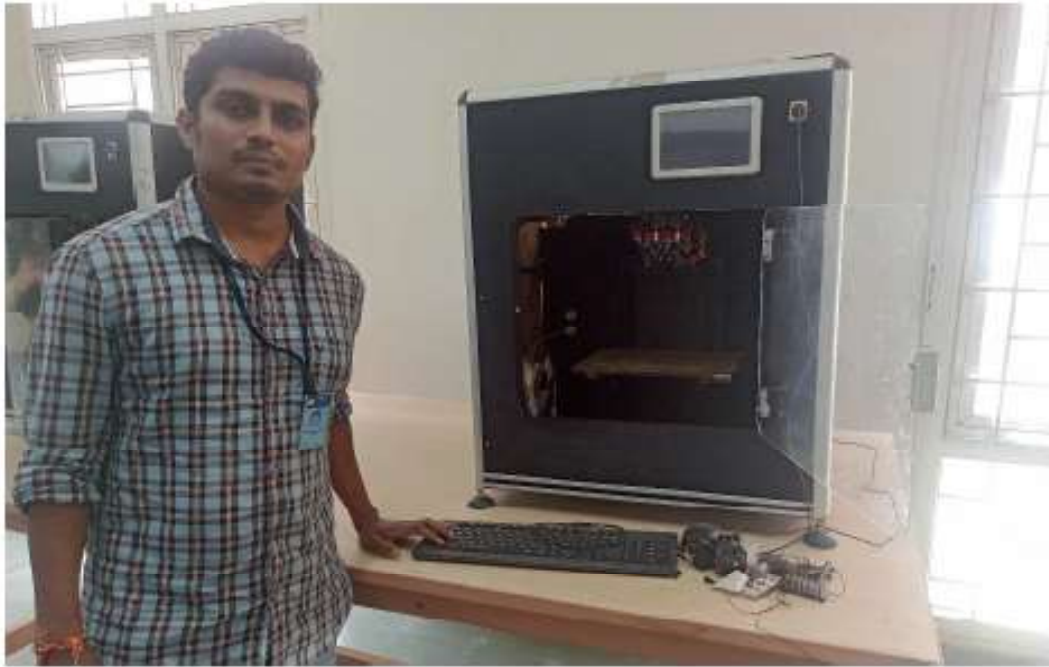
GOAL 9: Industry, Innovation and Infrastructure

- Innovation Day Webinar on " Innovation and Opportunities in 3D Printing"



GOAL 9: Industry, Innovation and Infrastructure

3-D Printer



CNC Laser Cutting Machine



GOAL 9: Industry, Innovation and Infrastructure





## GOAL 9: Industry, Innovation and Infrastructure



### MoU Signed with CEMS

The AUM's Steps towards the Industry, Innovations and the Infrastructure Development the Memorandum of Understanding is signed between the Amity School of Engineering & Technology, AMITY University Maharashtra and Centre of Excellence in Maritime & Shipbuilding (CEMS).

Amity School of Engineering & Technology, Amity University Maharashtra, has signed MOU with the Centre of Excellence in Maritime & Shipbuilding (CEMS) on 3rd Feb 2020. CEMS is promoted by the Indian Registrar of Shipping, Sagarmala, Ministry of Shipping, Govt of India. CEMS has Software and Physical Lab facilities in Mumbai and Vizag set up by Siemens India Ltd of worth Rs 800 Crore. This will help to avail lab facilities set up by Siemens at Powai and Vizac for students and faculty of Amity.

The main objectives of MOU are:

- Access and training for students of Amity
- Diploma and Certificate courses at nominal cost



## GOAL 9: Industry, Innovation and Infrastructure

- Training for pass-out students
- Internships to the Amity students
- Faculty Development programs and access to the labs
- Availability of labs for undertaking industry projects and experiments
- Research scholars can use CEMS labs
- CEMS will set up a remote centre at Amity.

Further, there will be access to high-end software and facilities like CAD/CAM, Robotics, Plant Design, Product Design, and Digital manufacturing, applicable to some schools and research scholars/students.

### **MoU with JMS Mining Pvt. Ltd.**

Memorandum of Understanding (MoU) Between Amity School of Engineering & Technology, Amity University, Maharashtra And JMS Mining Pvt. Ltd. Dongfang Electric (DEC) Building, 3rd Floor, Premises No. - 16, MAR - 1111, Action Area - 1A, New Town, Rajarhat, Kolkata - 700 163, WB, India Is signed on 03/06/2021. JMS (A Simplex Infrastructures Associate Company) is a mining company that has pioneered in introducing Mass Production Technology (MPT) using Continuous Miners (CM) in underground coal mines in India and is leading in the Industry. The scope of the activity under this collaboration will be contained with respect to Coal mines for Proximity Detection.

### **MoU with Instron Technologies**

Amity Institute of Information Technology has entered into the MoU with Instron Technologies with the following objective.

- The MoU is for the research and academic development of faculty and students of the Institution and the mutual benefits of both collaborating parties.





## GOAL 9: Industry, Innovation and Infrastructure

- These functional MoUs with institutions/industries will allow the students for internship, on-the-job training, project work, student and faculty exchange and collaborative research with the mutual understanding between both parties.
- Bridge the gap between Industry and academics by training students in industrial approaches and technologies.
- Train and motivate students to ideate and implement their ideas that solve social and industrial problems.
- Bringing holistic thinking in students, and train students, and doing initial mentorship.
- Enable students to participate and bag laurels at National and International level Conferences/Seminars/Contests.
- Increase employability by developing technical skills in the students.
- Providing the best technical internships to the students from the college.
- Conducting workshops on the latest technologies by industry experts.
- Encourage cross-functional learning by facilitating multi-disciplinary areas.
- Connect with student in the college and have a constant conversation with them to motivate them to become best IT professional possible.
- Facilitate joint research using company's and college premises.
- Provide research projects to teaching faculties to enhance the quality of education.
- Educating the students about the various opportunities available in the IT Industry.

### MoU with Digitech Confidential

- Amity Institute of Information Technology has entered into the MoU with Digitech Confidential dated 8<sup>th</sup> June 2020 with **the** following objective.
- The MoU is for the research and academic development of faculty and students of the Institution and the mutual benefits of both collaborating parties.
- Bridge the gap between Industry and academics by training students in industrial approaches and technologies.
- Train and motivate students to ideate and implement their ideas that solve social and industrial problems.



## GOAL 9: Industry, Innovation and Infrastructure

- Bringing holistic thinking in students, and train students, and doing initial mentorship.
- Enable students to participate and bag laurels at National and International level Conferences/Seminars/Contests.
- Increase employability by developing technical skills in the students.
- Providing the best technical internships to the students from the college.
- Industry experts will conduct workshops in the latest technologies like GDPR & Data Protection Policies, Data Subject Access Requests, and Data Processing Agreements.
- Encourage cross-functional learning by facilitating multi-disciplinary data protection and security-related projects.
- Establish connect with the student in the college and have a constant conversation with them to motivate them to become the best IT professionals possible.
- Facilitate joint research using company's and college premises.
- Provide research projects to teaching faculties to enhance the quality of education.
- Educating the students about the various opportunities available in the IT Industry.

## Amity Centre of Excellence in Astrobiology MoUs



## Paras Defense and Space Technologies Limited

### Space Technology Development

Amity University has signed an MoU with Paras Defence and Space Technologies Ltd. to collaborate on the design and development of microgravity-based research hardware. This allows Amity's students to undertake hands-on training in building spaceflight hardware and software systems.



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### **Open University UK**

#### **Astrobiology Research, Student Training and Education Outreach**

Amity University and Open University UK signed an MoU in September 2019. One of the primary focal areas of collaboration is the exploration of hypersaline microbial environments that are early Mars analogues. Amity and OU are also partnering on engaging with the general population for Space education outreach.

### **Blue Marble Space Institute of Science**

#### **Astrobiology Education and Communication**

Amity and BMSIS have been collaborating since August 2016 on Astrobiology education, outreach and science communication. Blue Marble Space has a vast network of space scientists from NASA, NSF and major universities in the US, Europe and other parts of the world.

### **Mars Society Australia**

#### **Mars Analogue Research and Education**

Amity and Mars Society Australia (MSA) have been partners since August 2016 while exploring Ladakh, India, as an early Mars analogue. MSA researchers have mentored Amity students on Mars habitat design projects.

### **Birbal Sahni Institute of Palaeo sciences**

#### **Mars Analogue Research and Education**

Amity students and researchers are actively collaborating with scientists at BSIP to work on the geo-scientific aspect of the field.

### **SatSure**

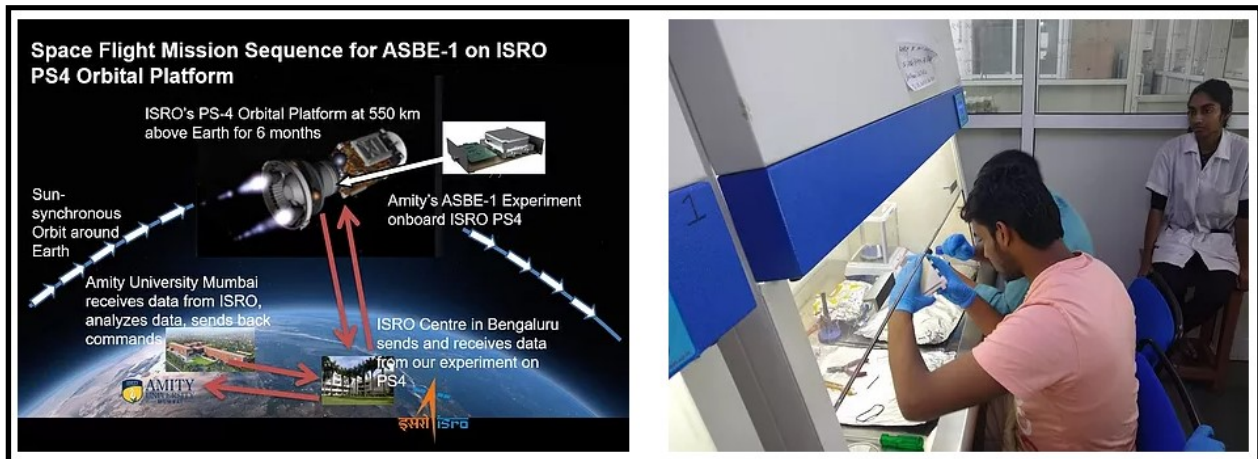
#### **Mars Analogue Research and Education**

## GOAL 9: Industry, Innovation and Infrastructure

SatSure is providing remote sensing data to the researchers. The data about Earth will help researchers understand more about particular analogue sites.

### Amity Centre of Excellence in Astrobiology Research

#### Microgravity Bioscience Experiments For Low Earth Orbit

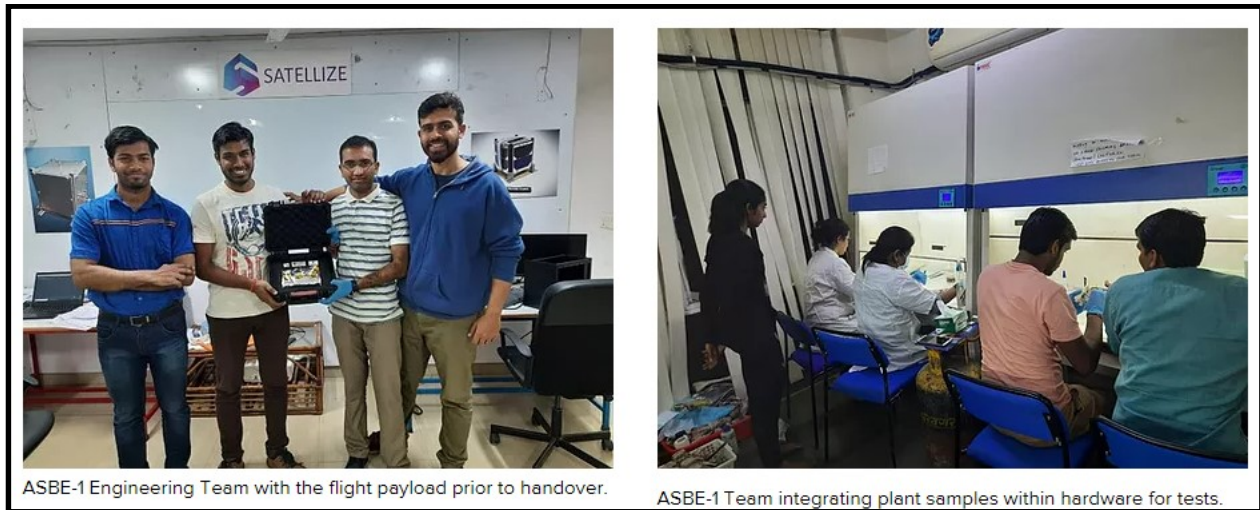


Our Centre is involved in studying the impact of reduced gravity on the growth and health of high-yielding plant crops. We have designed and developed in partnership with Paras Defence and Space Technologies Limited, the Amity Space Biology Experiment-1 (ASBE-1) selected for flight as part of the Satellite SpaceShare Package on the ISRO PSLV C49 PS-4 platform.

#### Amity Space Biology Experiment-1 (ASBE-1)

The Amity Space Biology Experiment-1 (ASBE-1) is our first spaceflight experiment. It has been designed and developed at Amity University Maharashtra in partnership with Paras Defence and Space Technologies Limited. The experiment has been selected for flight as part of Satellite SpaceShare Package on ISRO PSLV C49 PS-4 platform. This will be India's first biological experiment in Space.

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ASBE-1 Engineering Team with the flight payload prior to handover.

ASBE-1 Team integrating plant samples within hardware for tests.

### Research Motivation

- Gravity sensors are critical to plant survival, affect fundamental plant biology.
- To support humans in space, need to study the effect of space environment, mainly microgravity on the growth of high-yield plants.
- Learning exercise for students in design, assembly of space payload.
  - Hardware design, fabrication and assembly
  - Spaceflight software coding and testing
  - Life science payload handling and integration
  - Spaceflight Documentation and Presentation

### Callus samples

**Why plant?**

- Remarkable developmental plasticity = Regeneration capacity
- High versatility. respond to environmental challenges

**Why Callus?**

- Whole plant can be regenerated in one step
- Slow growth, time to study each stage of changes

Fengler et al., 2015, Arabidopsis callus

Our payload image: Callus Niveltiana - 1 month old

### ASBE-1 Team

Project Manager: Dr Siddharth Pandey

Science Leads: Dr Renitta Jobby (Assistant Professor, Biotechnology, Amity University Maharashtra)

Dr Pamela Jha (Assistant Professor, Biotechnology, Amity University Maharashtra)

Mechanical Engineer: Mr Kartik Agrawal (B Tech AE 4th year, Amity University Maharashtra)

Electrical Engineer: Mr Akshay Ghaywat (B Tech EE 4th year, Amity University Maharashtra)

Software Engineer: Mr Ashish Sam (B Tech CSE 4th year, Amity University Maharashtra)

Biotechnologist: Ms Abigail Fernandes (MSc Biotech, Amity University Maharashtra)



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### **Off-Earth Drilling Technology Development**

Lunar water and minerals are precious space resources that will support human exploration and future trade and commerce. With Chandrayaan-1, India has confirmed a significant presence of water in the Lunar south pole region. Data from Chandrayaan-2 will reveal the global abundance and locations for further analysis. The subsequent missions would require acquiring subsurface samples to characterize the volatiles and identify the locations at the south polar region. Drilling is a crucial piece of technology that would be required to search for signs of life under the surface of Mars and Icy Moons. Our lab is involved in studying the effect of the lunar near-surface and subsurface environment on the performance of drill systems for sample collection and handling systems.

### **Lunar Drill Development Summer Internship 2020**

Students from Amity University Maharashtra and IIT Bombay are currently undertaking summer internships with Dr Siddharth Pandey, studying various aspects of lunar drill design and analysis.

#### **Team**

Neha Maanju, B Tech 2nd Year, ME, IIT Bombay

Nilay Awasthi, B Tech 3rd Year, ECE, Amity University Maharashtra

Sipra Sonali Pradhan, B Tech 2nd Year, ME, IIT Bombay

Vedanth Sharma, BTech 2nd Year, AE, IIT Bombay

### **MoUs Signed by Amity Institute of Bio-Technology**

#### **MOU with Prokayote Lab (Hydrocarbon)**

Amity Institute of Biotechnology at Amity University Maharashtra and Prokaryotes Lab Pvt. Ltd, Bangalore, India entered into 15th July 2019 on Sustainable Development Goals and following objectives





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- a) Conduct joint research activities on the project entitled "Development of Hydrocarbon degrading Kit" and within the fields of interest with mutually agreed-upon projects and subject to the availability of funds.
- b) Participate in conferences, symposia and seminars of mutual interest
- c) Collaborate in joining research in the thrust areas of the respective company institute, file patents, and publish research findings.
- d) Cooperate to solicit joint proposals for funding from various funding agencies and exchange scientific information and documentation, both written and electronic.

### **MOU with Vrovafacets**

Amity University Maharashtra and Vrovafacets Private Limited Bangalore Singed MOU on 5th January 2021 for Sustainable Development Goals and in the benefits of the Community with the following objectives:

- a) Conduct joint research activities on the project entitled "Product of high-quality food-grade agar from seaweed" and within the fields of interest with projects that are mutually agreed upon and subject to availability of funds.
- b) Participate in conferences, symposia and seminars of mutual interest
- c) Collaborate in joint research in the thrust areas of the respective Company-University, file patents and publish research findings.
- d) Cooperate to solicit joint proposals for funding from various funding agencies and exchange scientific information and documentation, both written and electronic

### **MOU with Annotation Analytics**

Amity University Maharashtra and Annotation Analytics Pvt. Ltd, Gurgaon Haryana, Singed MOU on 9th December 2019 for Sustainable Development Goals and in the benefits of the Community with the following objectives:

- a) Conduct joint research activities on the project entitled "Product of high-quality food-grade agar from seaweed" and within the fields of interest with mutually agreed-upon projects and subject to availability of funds.



## GOAL 9: Industry, Innovation and Infrastructure

- b) Participate in conferences, symposia and seminars of mutual interest
- c) Collaborate in joint research in the thrust areas of the respective Company-University, file patents, and publish research findings.
- d) Cooperate to solicit joint proposals for funding from various funding agencies and exchange scientific information and documentation, both written and electronic

### **MOU with Gumpro**

Amity University Maharashtra and Gumpro Drilling Fluids Pvt Ltd, Mumbai Signed MOU on 6 November 2019 for Sustainable Development Goals and in the benefits of the Community with the following objectives to execute the project entitled "Production of Gum for drilling fluids using biotechnological approach", subject to the availability of funds. Under the collaboration, the Chiller Unity for Reactor equipment was delivered and installed.