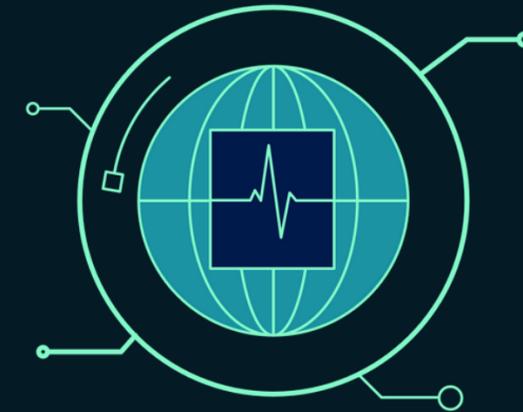
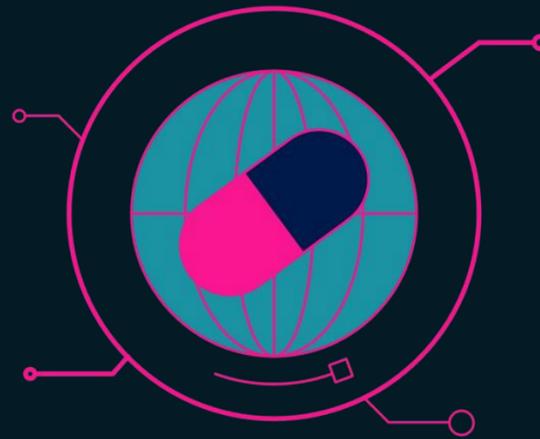


# Role of Space during Pandemics



**Reporting the Team Project findings of the Interactive Space program 2020**

*ISU presentation for the 58th session of the Scientific and Technical Subcommittee*

Presented by May Li Uy  
Oscar Miles & Karlijn Korpershoek  
Project Chair & Lead: Dr. Farhan M. Asrar

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# Content

Part 1: Introduction to the Interactive  
Space Program

Part 2: Overview of Team Project

Part 3: Highlighting study findings

Part 4: Reporting on challenges and  
recommendations

Part 5: Conclusion





# Interactive Space Program

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## **International Space University:**

Space Education for a Changing World

Inaugural virtual program: five-week intense online program with a focus on the role of space during pandemics

Over 100 professionals, learners, and experts from different nations, cultural and disciplinary backgrounds

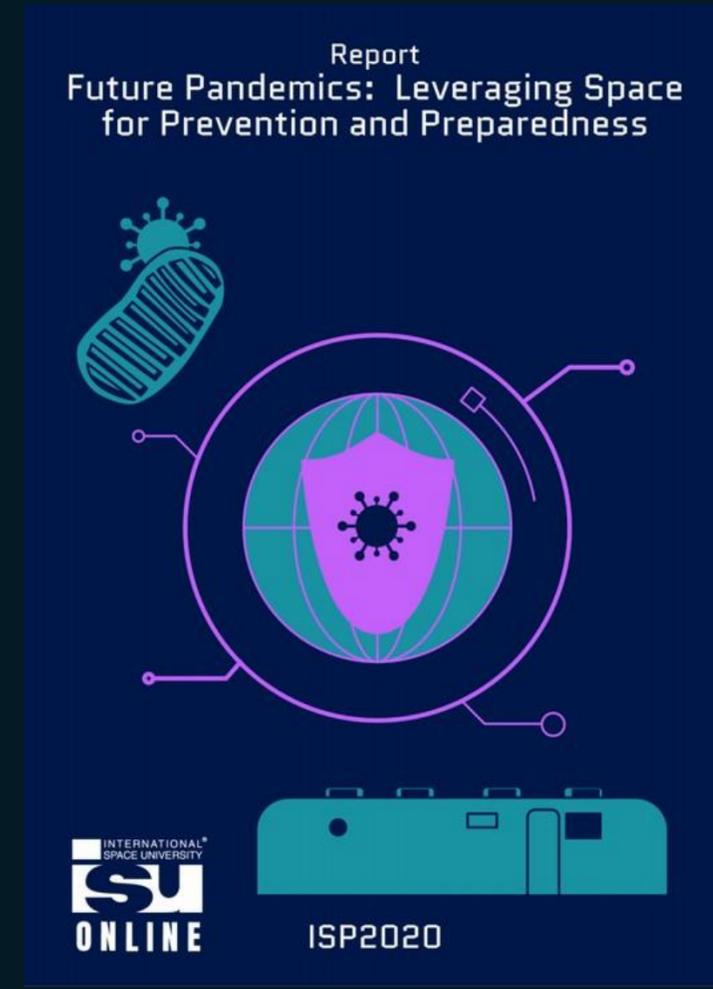
30+ countries, spanning different timezones

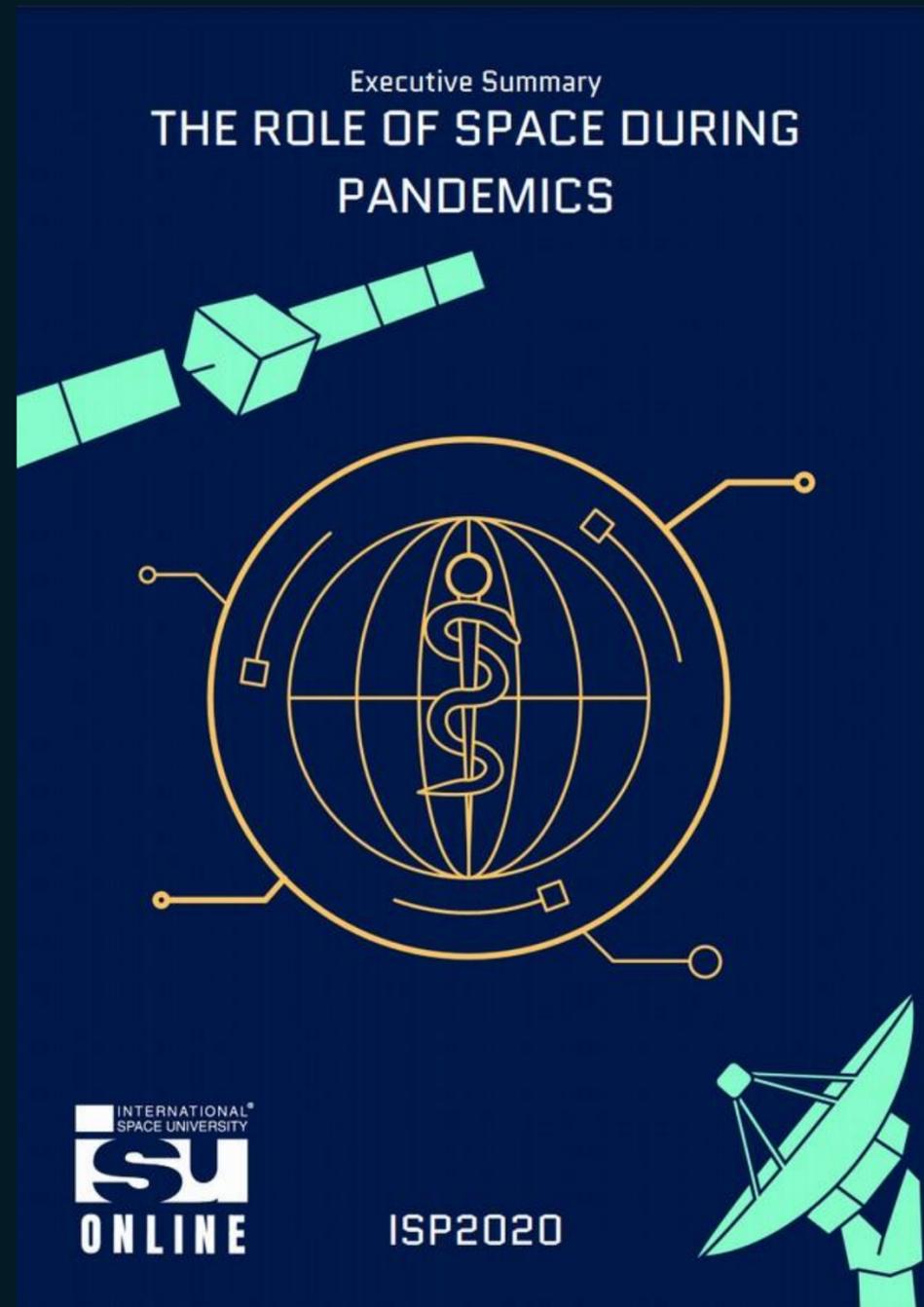
# Study Objectives



- Investigate how space can support monitoring and mitigation of the current Covid-19 pandemic, as well assist with pandemic preparedness and prevention.
- Utilize the 3Is (interdisciplinary, intercultural and international) approach for pandemic monitoring, mitigation and prevention.
- Assess current mitigation efforts by major stakeholders and identify areas of need that space assets could assist with.
- Explore possibilities of international cooperation on pandemics using space assets as a mean to bring nations together.
- Explore options of utilizing Artificial Intelligence (AI), machine learning and space assets in the possibility of preventing/predicting and managing pandemics.
- Highlight Space Assets' contributions to address Covid-19
- Propose an innovative approach to addressing pandemics

# Utilization of Space Technologies during Pandemics





# Overview of Study Findings

Earth Observation for **awareness**

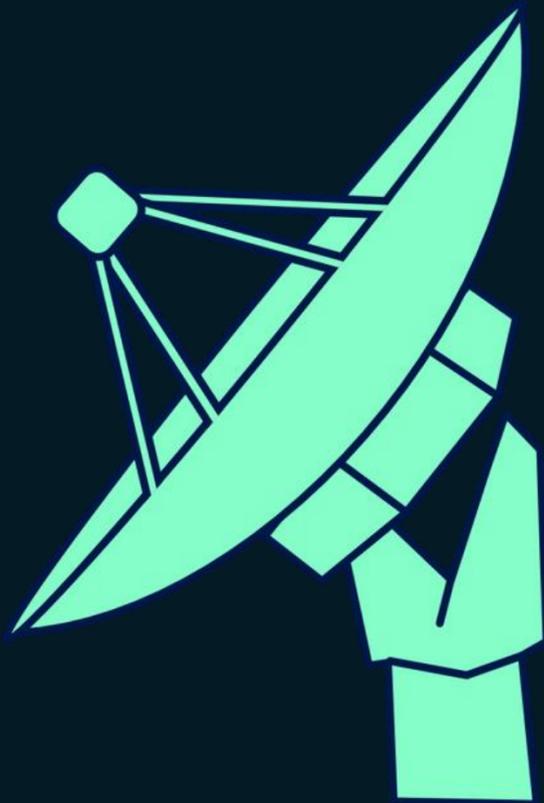
Satellite Communications for **connectivity**

Global Navigation Satellite Systems (GNSS) for **automated infrastructure**

Geographical Information Systems (GIS) for **mapping and tracking**

Space technology spinoffs as **innovation**

# Big data, better analytics



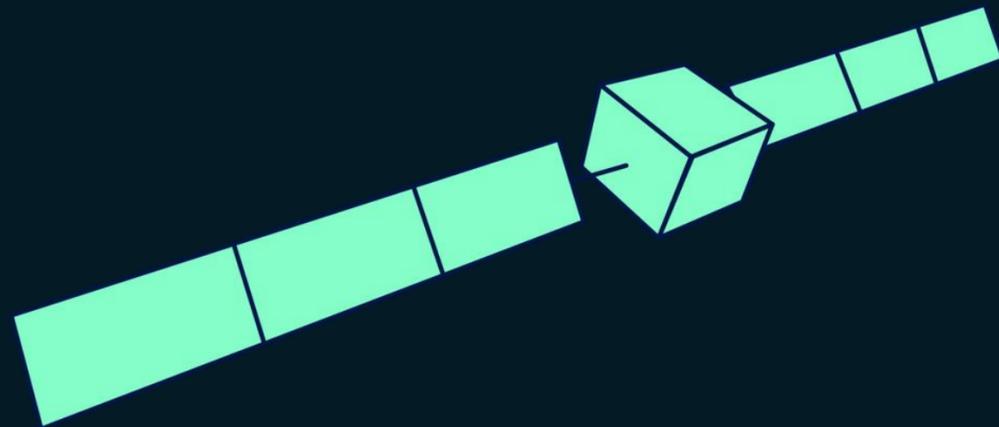
## Recommendations

1. Integrate EO and GIS data with crowd sourced data to monitor severity and spread of infection
2. Provide education and training for data collection and analysis for health personnel, rapid responders, and decision-makers
3. Create predictive risk models to prevent and prepare for disease outbreaks
4. Track supply chain networks to identify safe and viable transportation routes

## Related SDGs



# Development of Automation Systems



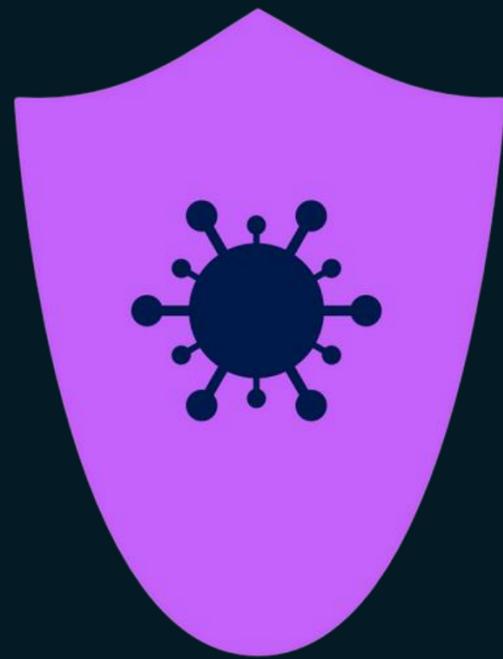
## Recommendations

1. Automated Transportation using GNSS and an extensive wireless communication network
2. Automated identification system (AIS) for maintaining records of critical resources
3. Unmanned aerial vehicles (UAV) to be implemented for smart quarantine.
4. A swift [SPACE +] communication mechanism to inform people about local pandemic guidelines

## Related SDGs



# Spinoff Technologies



## Recommendations

1. Microgravity as a resource to streamline pathogenic research with improved scientific parameters
2. In-Situ Production using spin-off technology and practices from space, such as 3D printing
3. Medical technology transfer and knowledge sharing from ISS on telemedicine
4. Invoke 'overview effect' to inspire better stewardship of our planet
5. Sharing of experience of social isolation by astronauts in space

## Related SDGs



# International Collaboration and Outreach



## Recommendations

1. An international framework specific for pandemic handling, aligned with the work of the WHO
2. Space Consortium at a global level - that formulates a space charter whereby satellite data is shared for the management of pandemics
3. Linking the Space Station with Medical Virulence Researchers
4. Bridging the Gap by reducing international inequalities through upgraded protocols to promote sharing of information between space-faring and non-space faring nations

## Related SDGs



# Conclusion:

Space technologies play a vital role in monitoring, mitigation and the preparedness/prevention of pandemics



## Data collection and analysis

- Collecting and analysing data on relevant economic, health and social parameters to track the spread of and impact of pandemics



## Automation systems

- Utilizing existing space technologies to optimize and automate transport routes as well as providing relevant local and global pandemic updates through wireless communication networks



## Spin off technologies

- Sharing of knowledge from space exploration relating to extensive social isolation and transferring of information on optimization of telemedicine practices
- Enabling the International Space Station to conduct relevant research



## International collaboration

- Enabling existing multilateral space agreements to convene on pandemic prevention, mitigation and monitoring.
- Strengthening of international agreements to share relevant space data and knowledge

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- Alex Ryan, ISU *Academic Coordinator*
- Sébastien Bessat, ISU *Logistics Coordinator*
- Lisa Kucher, ISP20 *Communications Commander*
- Pete Worden, Gary Martin, Liang Chen & Scott Schneider, *Team Commander*

## Access to Team Reports:

[https://isulibrary.isunet.edu/index.php?lvl=notice\\_display&id=11027](https://isulibrary.isunet.edu/index.php?lvl=notice_display&id=11027)

"Executive summary"

(summary of the three team reports)

"Future pandemics: Leverage space for prevention and preparedness."

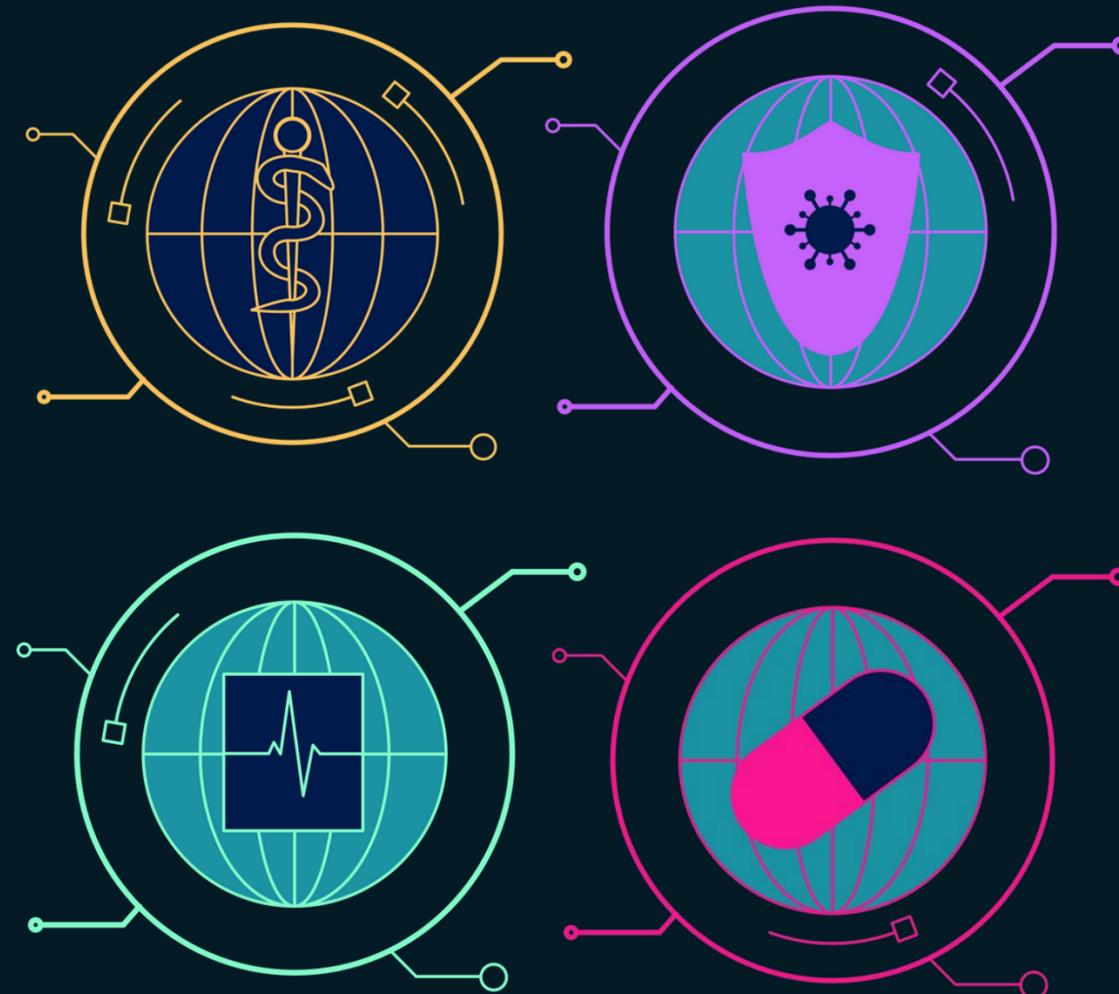
International Space University, August 2020

"Monitoring of Pandemics from Outer Space".

International Space University, August 2020

"Utilizing space-enabled capabilities for the mitigation of COVID19 and future pandemics."

International Space University, August 2020



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