



ICECUBES
BY SPACE APPLICATIONS SERVICES



ICE CUBES SERVICE

Current applications & future vision

ESA Space for Inspiration
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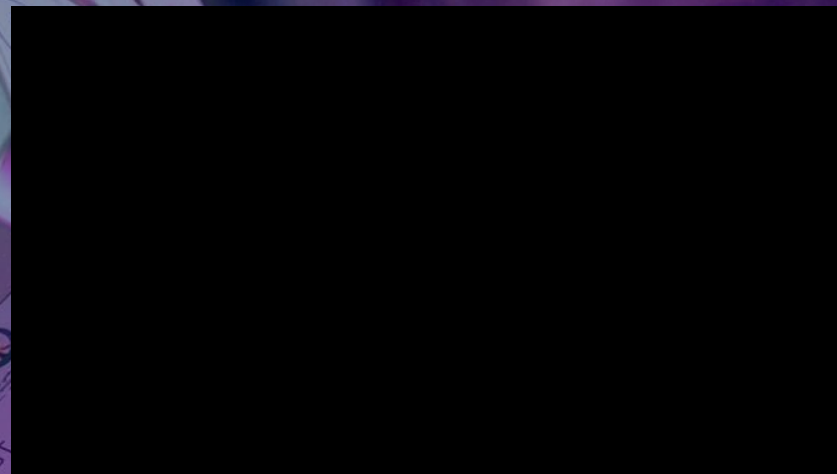


ICE CUBES SERVICE WHO ARE WE?



- SPACE / INTERNATIONAL SPACE STATION ACCESSIBLE
- END-TO-END SERVICE
- FAST-TRACK REGULAR ACCESS
- OWN FACILITY INSIDE SPACE STATION
- PPP PARTNERSHIP ESA
- WORK WITH ISS NATIONAL LAB / NASA





RESEARCH / TECHNOLOGY / EDUCATION in CUSTOMISABLE MODULES

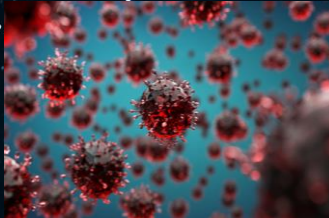
WHY SPACE FOR PHARMA & BIOTECH R&D?



OPPORTUNITIES FOR R&D

- Ageing / Disease modelling,
- Drug discovery & testing,
- Tissue engineering, and biofabrication
- Tumours, organoids and spheroids
- Improved crystallisation

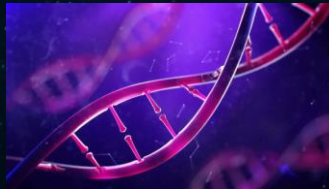
ICE CUBES SERVICE SUCCESS STORIES



First ever COVID drug research in space

Through protein crystallization service

<https://www.icecubesservice.com/journal/first-ever-covid-19-drug-research-in-space/>



Stress and DNA damage response during
Spaceflight

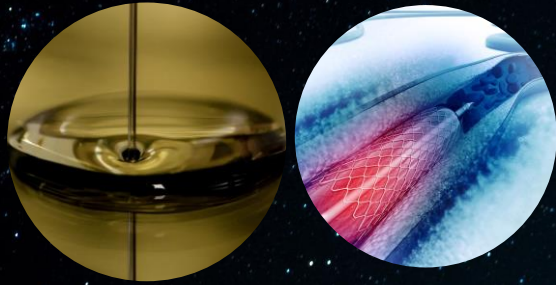
Through microfluidic Lab-on-chip

<https://www.icecubesservice.com/journal/axiom-1-rakia-stress-and-dna-damage-response-during-spaceflight/>

TEDx: HOW NEW DRUGS COULD COME FROM SPACE

https://youtu.be/cTEDivtJbGI?si=ZQguFyq2hM_UPv66

WHY SPACE FOR MATERIALS & MANUFACTURING APPLICATIONS?



OPPORTUNITIES FOR APPLICATIONS

- New types of formulations and novel materials
- Nanomaterials
- Manufacturing
- Improve synthesis of semiconductor crystalline structure
- 2D materials

ICE CUBES SERVICE SUCCESS STORIES



First ever Cellulose Synthesis in Space
Through protein crystallization service

<https://www.icecubesservice.com/journal/cellulose-synthesis-in-space/>

WHY SPACE FOR AGRIFOOD APPLICATIONS?



OPPORTUNITIES FOR APPLICATIONS

- Stress-resisted Plants
- Cellular agriculture
- Crop management and monitoring
- Bioregenerative Life Support Systems

ICE CUBES SERVICE SUCCESS STORIES



Cow cells orbit Earth for high steaks

Through microfluidic Lab-on-chip

<https://www.icecubesservice.com/journal/cow-cells-orbit-earth-for-high-steaks/>



Plants Engineering to bio-manufacture proteins

Through greenhouse

<https://www.icecubesservice.com/journal/plants-engineered-to-bio-manufacture-specific-proteins/>

SPACE INNOVATION LABS

GLOBAL NETWORK



The global network of Space Innovation Labs (SILs)

SYNERGY:

- Space Infrastructure
- Ground infrastructure
- Immersive tech access

- Space building
- Research collaborations



Oxford Noordwijk
Strasbourg
Brussels Malta
Jeddah Doha
Dubai

New York

San Francisco

As of today, **10 Space Innovation Labs initiated.**
Our mission is to have by the year 2025, 25 SIL's in
every continent on Earth

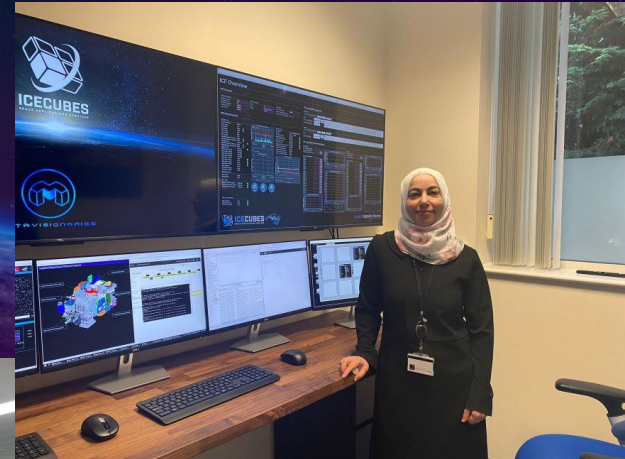
MALTA SPACE INNOVATION LAB:

- Malta I-II-III missions to ISS
- Diabetes
- Genetic study on Human Skin Microbiome samples



OXFORD SPACE INNOVATION LAB:

- Ageing
- Organoids
- Treatments



KAUST SPACE INNOVATION LAB:

- Brain
- Biotech & other applications



CAPACITY BUILDING EXECUTIVE SPACE COURSES COLLABORATIONS

Oxford (UK) – Nov2023

Jeddah (KSA) – Jan2024

Dubai (UAE) – Feb2024

Malta (MAL) – tbd2024

Rijadh (KSA) – tbd2024

Oxford – Jul2024

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What Skills Will You gain with the

HEALTH FOR EARTH AND SPACE COURSE

- Foundational Knowledge** on how space affects the **human body** from metabolism to aging with insights from **Dr. Jim Green**, the **former chief scientist of NASA**.
- Practical understanding** in the nuances and best practices of providing **medical care during space missions**.
- Learn the intricacies of '**omics**' in precision **medical care**, and get firsthand knowledge of how sequencing **operates in microgravity**.
- Gain knowledge** into the innovative ways gaming can be leveraged for **health applications and space**.
- Learn the fundamentals of **Artificial Intelligence**, and hands-on understanding of **Augmented and Virtual Reality** in space health, revolutionizing **patient care and diagnostics**.
- Understand the fundamentals of **content creation** to produce compelling **space-health content**, understand the intricacies of **obtaining sponsorships**, and master the art of fundraising for **pioneering projects**.
- Receive invaluable insights** on how to apply your **newfound knowledge** to businesses within the space industry, ensuring you're **primed for success**.

Empower your future in healthcare and space
Register today and become a leader in the new frontier!

January 7th to 11th in Jeddah, Saudi Arabia







Metavisionaries.io



COMMERCIAL LEO R&D ICE CUBES FUTURE

Transition to Commercial LEO Destinations & unmanned platform

Going through phase of hype and enthusiasm

Microgravity R&D to take off as commercial branch of space activities

Commercial services move away from “one-offs” / aim for upscaling

Microgravity pharma R&D + In-space construction & manufacturing projected to grow to market value of \$14B annual sales by 2040

Risk of space sector still isolated island in global economy.

Space to become one of key sectors shaping global economy. It will require non-space industries to integrate space supply chain segments.

Citi Research: Growth in New Industries

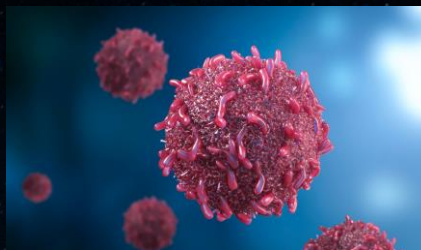
https://www.citigroup.com/global/insights/citigps/space_20220509

McKinsey – <https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/the-potential-of-microgravity-how-companies-across-sectors-can-venture-into-space>

Revenue growth forecasts of selected industries if they collaborate with space companies

	Annual revenue at maturity, \$ billion	Impact timing
Pharmaceuticals ¹	2.8–4.2	Short to medium term
Beauty and personal care ²	0.6–1.0	Medium term
Semiconductors ³	0.4–0.6	Medium to long term
Food and nutrients ⁴	0.4–0.6	Medium to long term

NEW PROJECTS / PLATFORMS

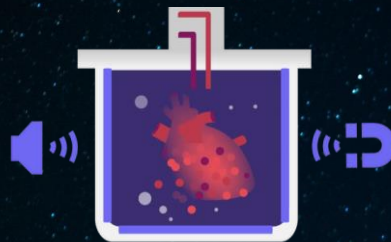


Tumours, Organoids, and Spheroids in Space:
Microgravity for Personalised Medicine

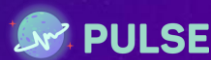


Co-funded by
the European Space Agency

<https://m4pm.space/>



Magneto-acoustic bioprinting in space



European
Innovation
Council



Funded by
the European Union

<https://pulse-eic.eu/>



Heart organ-on-a-chip for studies of cardiac
ageing in space



Funded by
VLAIO



Gefinancierd door
de Europese Unie
NextGenerationEU



Sector specific scalable platforms

- High throughput drug screening platform
- High throughput plants & seeds greenhouse platform
- High throughput crystallization platform

Global Network of Space Innovation Labs

- Education, Outreach and Capacity Building
- Generative AI driven
- International Collaborations

Space Supply & Value Chains through partnerships

- Commercial LEO destinations / Unmanned platforms
- Logistics / Transportation / Supply Chains
- Simpler processes, quick iterations





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METASPACE



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