

ESA/ASI WORKSHOP "SPACE RIDER, THE
EUROPEAN RETURN TICKET TO SPACE"

ESA-ESRIN (FRASCATI – ITALY), JUNE 7TH 2018



Group of Astrodynamics for the Use of Space Systems

GLIOSPACE PROJECT

BRIEF OVERVIEW

2018

Chantal Cappelletti, Riccardo Di Roberto - GAUSS Srl



GlioSpace Consortium



GAUSS Srl

- Small Satellites (Micro, nano, pico, femto)
- System design



Group of Astrodynamics for the Use of Space Systems

University of Nottingham

- Optical devices
- Lab on a chip
- Additive Manufacturing



University of
Nottingham

UK | CHINA | MALAYSIA

Istituto di Ricovero e Cura a Carattere Scientifico Casa Sollievo della Sofferenza

- Medical Genetics
- Cellular ANGM CSS-line patent
- Genome and transcription of RNA, DNA analysis



FONDAZIONE
**CASA SOLLIEVO DELLA
SOFFERENZA**
OPERA DI SAN PIO DA PIETRELCINA
SAN GIOVANNI ROTONDO



GlioSpace Goals



Biomedical Goals

Investigate the combined effects of microgravity and ionizing radiation on the gene expression of Glioblastoma multiforme

Technological Goals

Design and test in orbit a flexible system able to board and test different kinds of biological samples for biomedical research in space

Benefits for Future Space Exploration

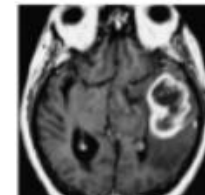
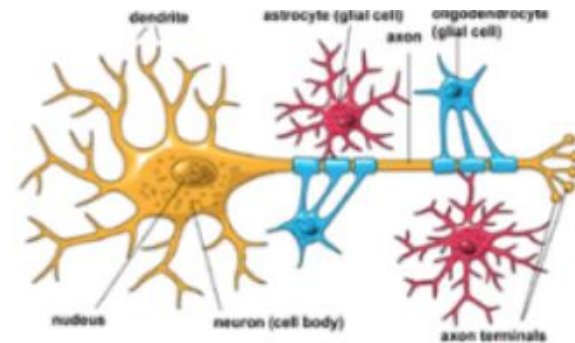
Life Science, Benefits for Earth, Low Earth Orbit, Moon, Mars & Beyond, Manufacturing, Materials research, Society and Tourism

GlioSpace Motivations



The space environment is a unique environment that allows cell developments that cannot be reproduced on Earth.

GBM is the most common form of malignant brain tumors with a median survival of patients with less than one year. It represents 52% of all cases of primary brain tumor and 20% of all intracranial tumors.



Survival rate:
57% @ 1 year,
16% @ 2 year
7% @ 3 year

The space environment could promote, hinder or have no effect on these cells but in any case, each result obtained would be of fundamental importance to increase the knowledge about proliferation mechanism of some tumors.

GlioSpace Description



Experiment Description

For the biological purposes of our project, Normal Human Astrocytes, ANGM-CSS and two other cellular control lines, (one radioresistant, the other radiosensitive) will be exposed to the space environment. A control experiment will simultaneously be conducted on the ground.

Platform Description

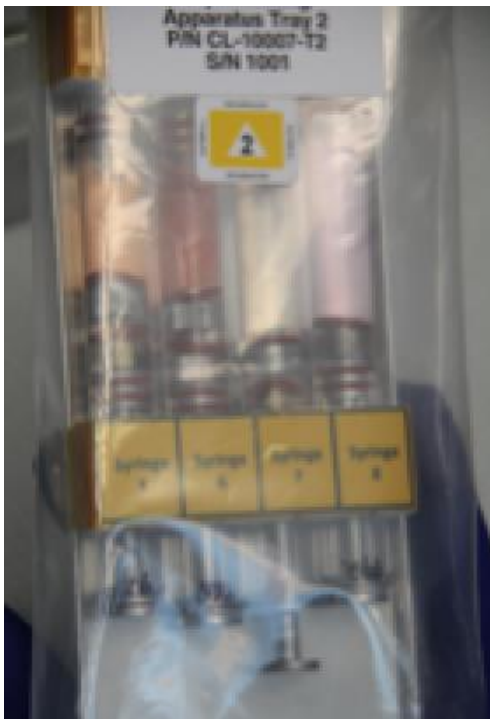
3U CubeSat Form Factor equipped with:

- **Monitoring System**
based on Lab-on-Chip and Impedance system technologies
- **Sample Maintaining System**
designed using new materials and additive manufacturing technologies



Previous Results

The results achieved during Shuttle *STS-134* and *STS-135* missions showed a modification on RNA and DNA

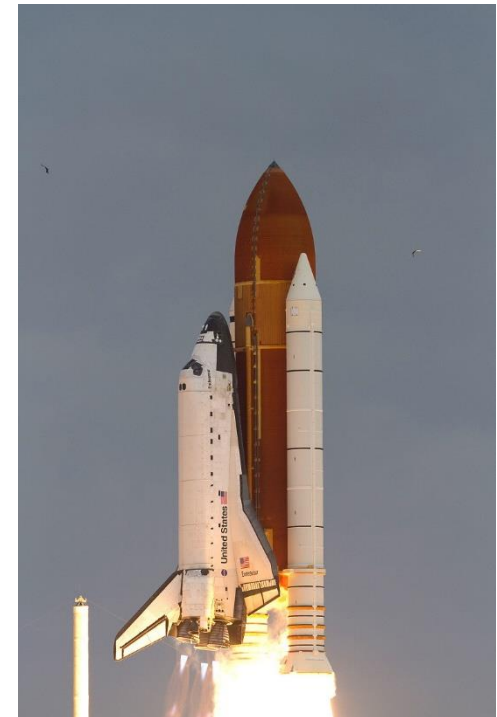


STS-134 Mission

- 🟢 Launch: 16th May 2011
- 🟢 Landing: 1st June 2011

STS-135 Mission

- 🟢 Launch: 8th July 2011
- 🟢 Landing: 21st July 2011





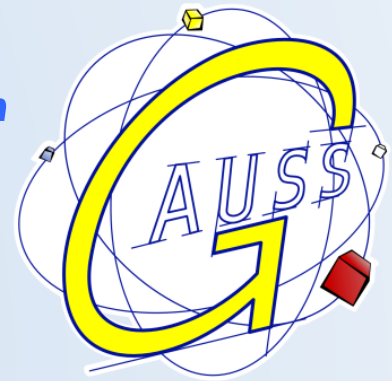
Contacts:

GlioSpace PM

Chantal Cappelletti

chantal.cappelletti@gaussteam.com

- Web: gaussteam.com
- Email: info@gaussteam.com – launch@gaussteam.com
-  [@gaussteam](https://twitter.com/gaussteam)
-  facebook.com/GaussSrl
-  [gauss-srl](https://in.gauss-srl)



Group of Astrodynamics for the Use of Space Systems