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DIMEG

SEE
Simulation Exploration Experience

University of Calabria MSC-LES Team

Our 'Simulation Exploration Experience'

Faculty Advisor
Prof. Francesco Longo

Student Team Leader
Antonio Padovano

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Summary

- Some pictures from our last SEE experiences in the past years
- Comments and opinions about SEE from:
  - Our faculty advisor, Prof. Francesco Longo
  - Our team leader, Antonio Padovano
  - The Student Team Members
- Some of our SEE-related events over the past years
  - SpringSIM 2014
  - SpringSIM 2016
  - ICAMES 2016
  - I3M

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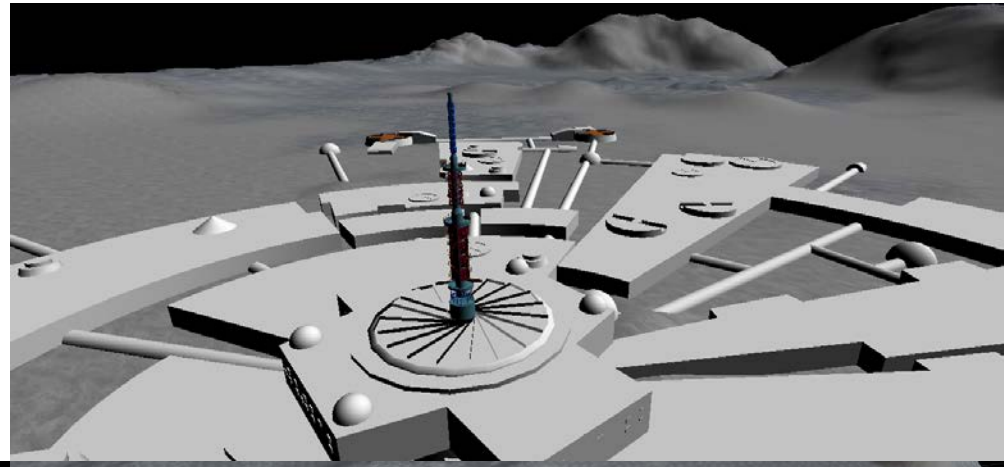
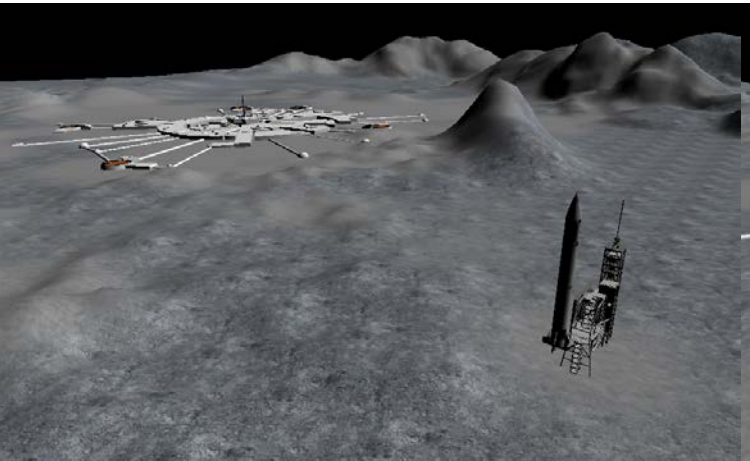
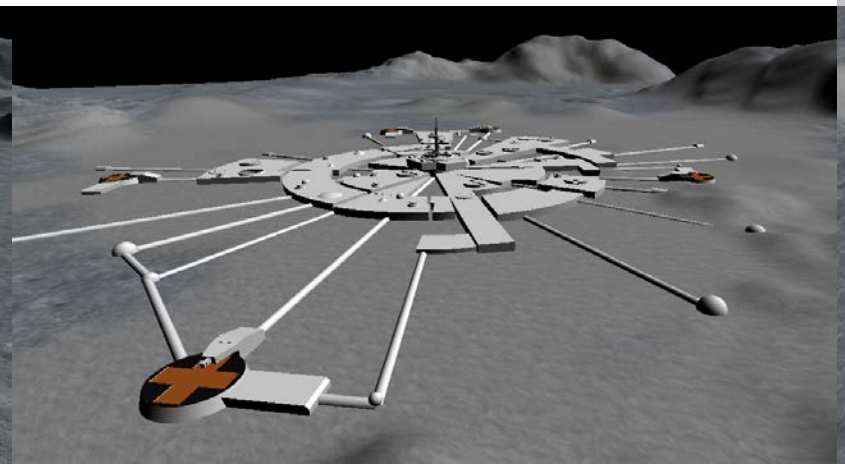
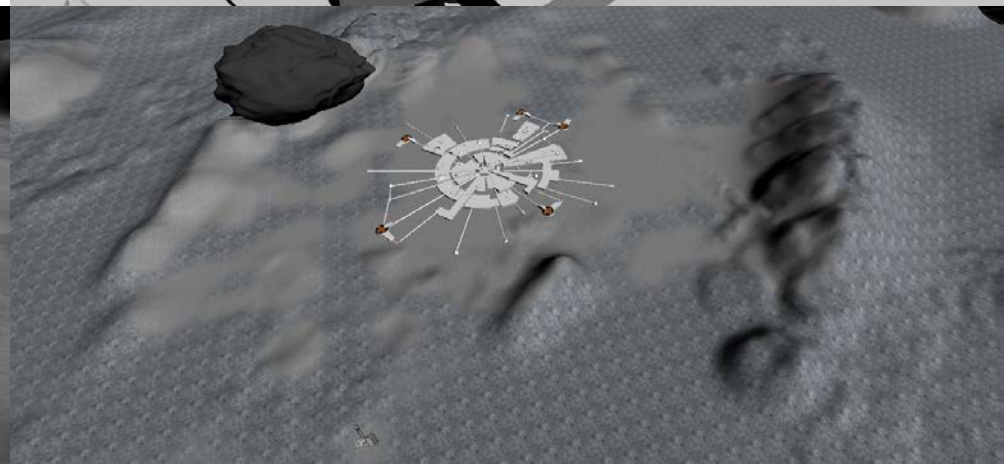
Some pictures from our last SEE experiences in the past years

- The experience of the **University of Calabria MSC-LES team** with the **SEE (Simulation Exploration Experience) event** (formerly named “Smackdown”) started in 2011.
- Over the years, the team has been in charge of the development of different solutions (flexible communication services to the other entities populating a Moon base simulated scenario, entities such as drones flying into the moon base as well as 3D real-time visualization services).









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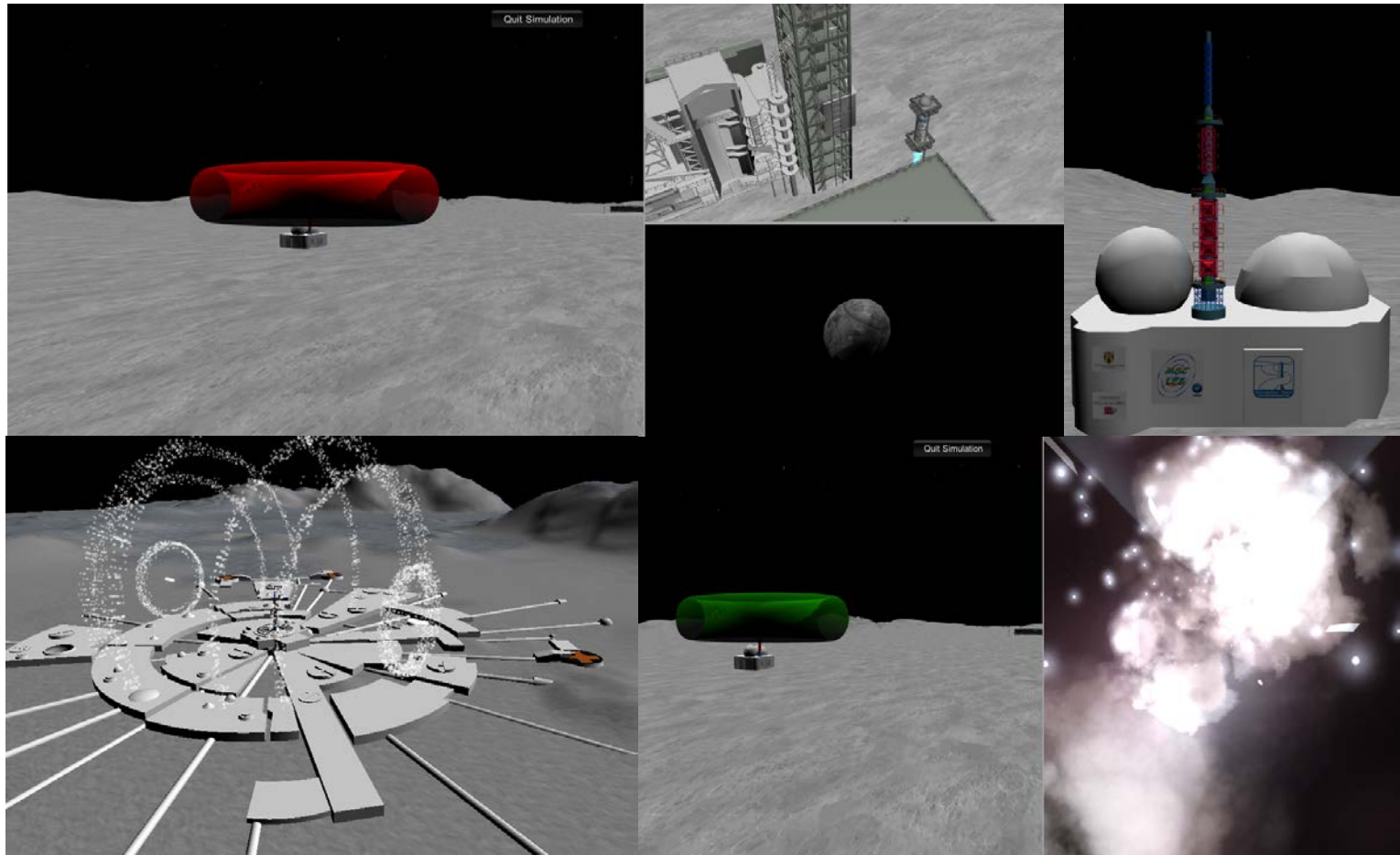
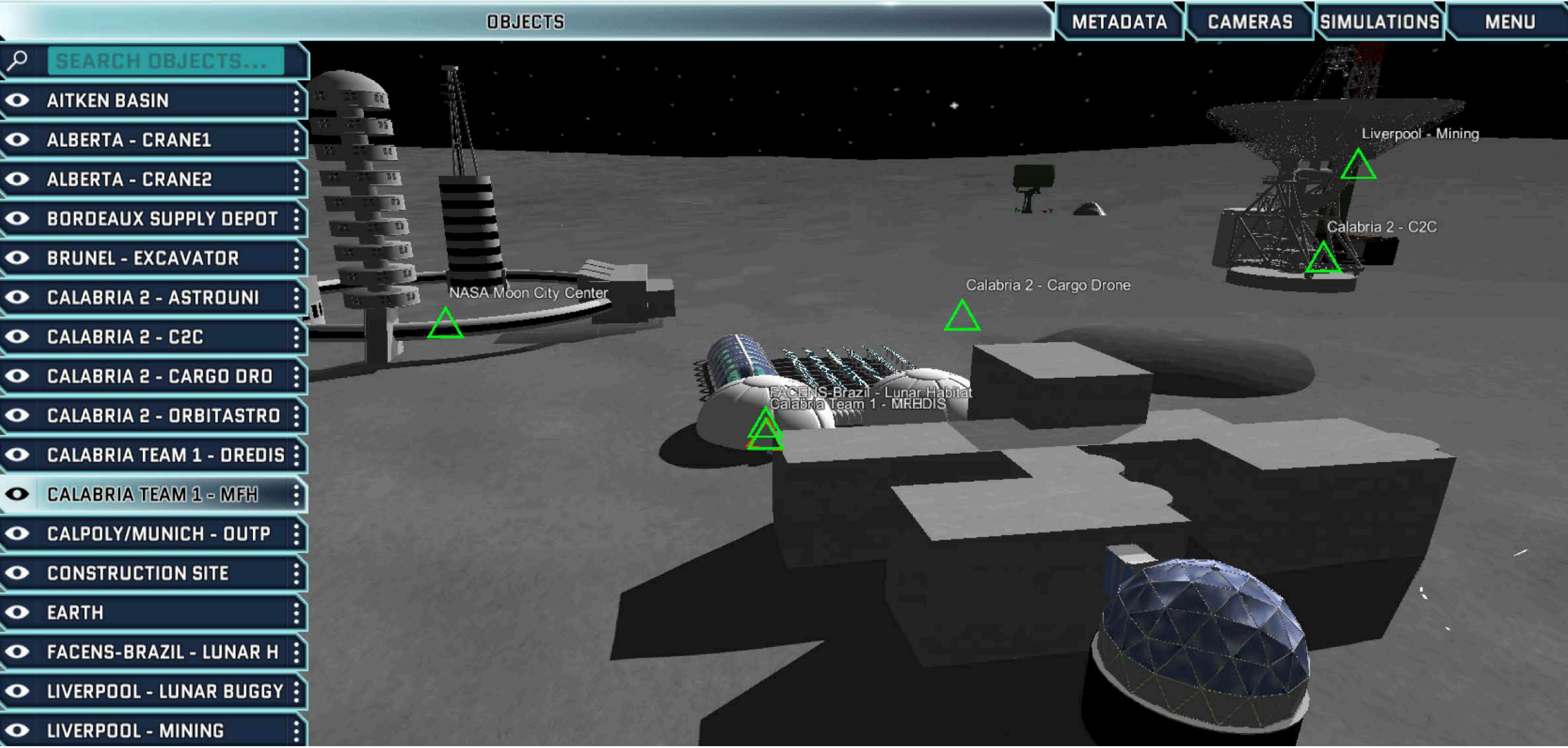
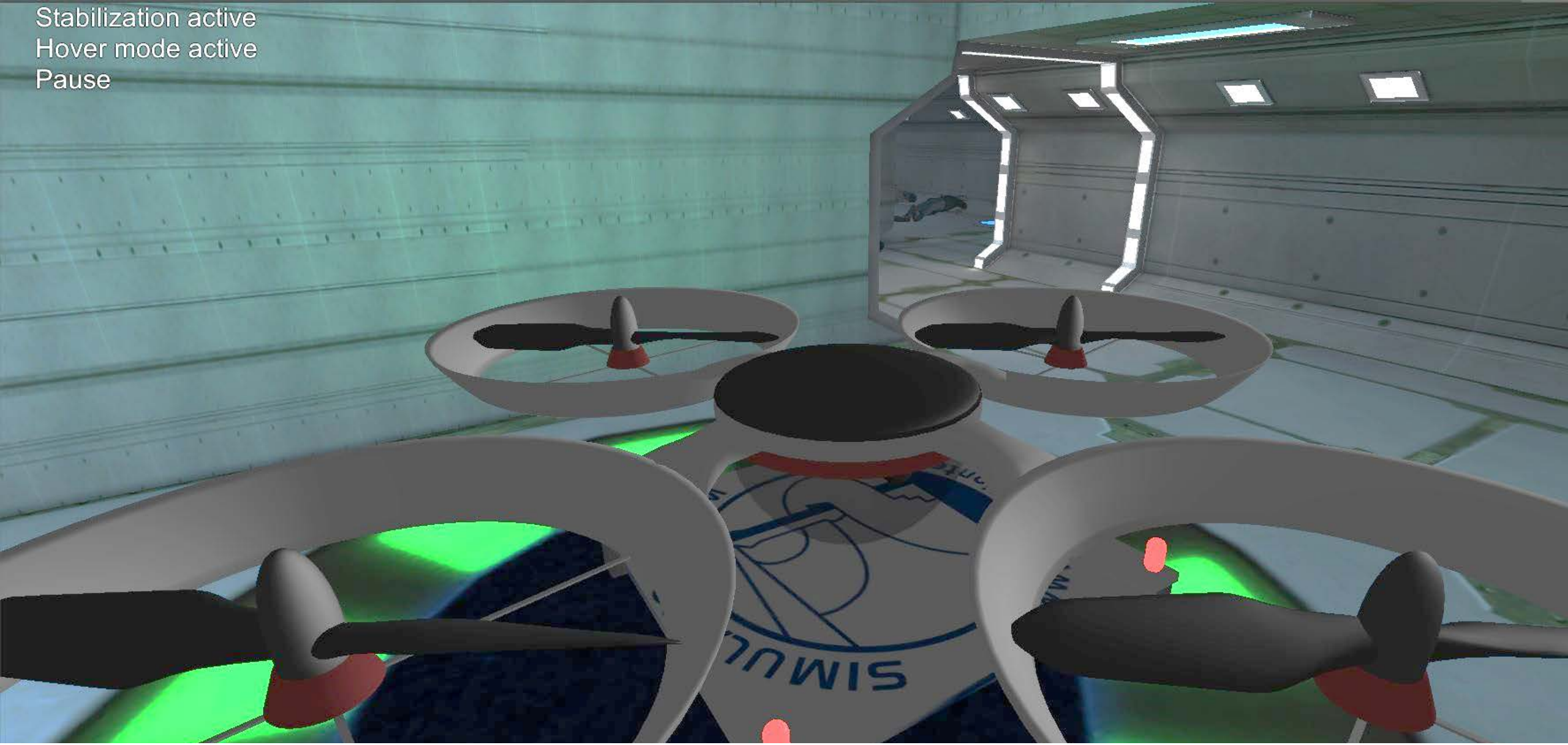
Some pictures from our last SEE experiences in the past years

- We have executed tests with 3 federates connected:
  - **IPHITOS** (sending the interaction about the incoming asteroids);
  - UNICOM communication;
  - **UNICOM visualization** (real-time visualization of message sending and missile moving to intercept the asteroid).
- In particular, the latter provide an effective solution, based on popular tools such as Unity, for adding 3D real-time visualization capabilities to HLA-based distributed simulation.

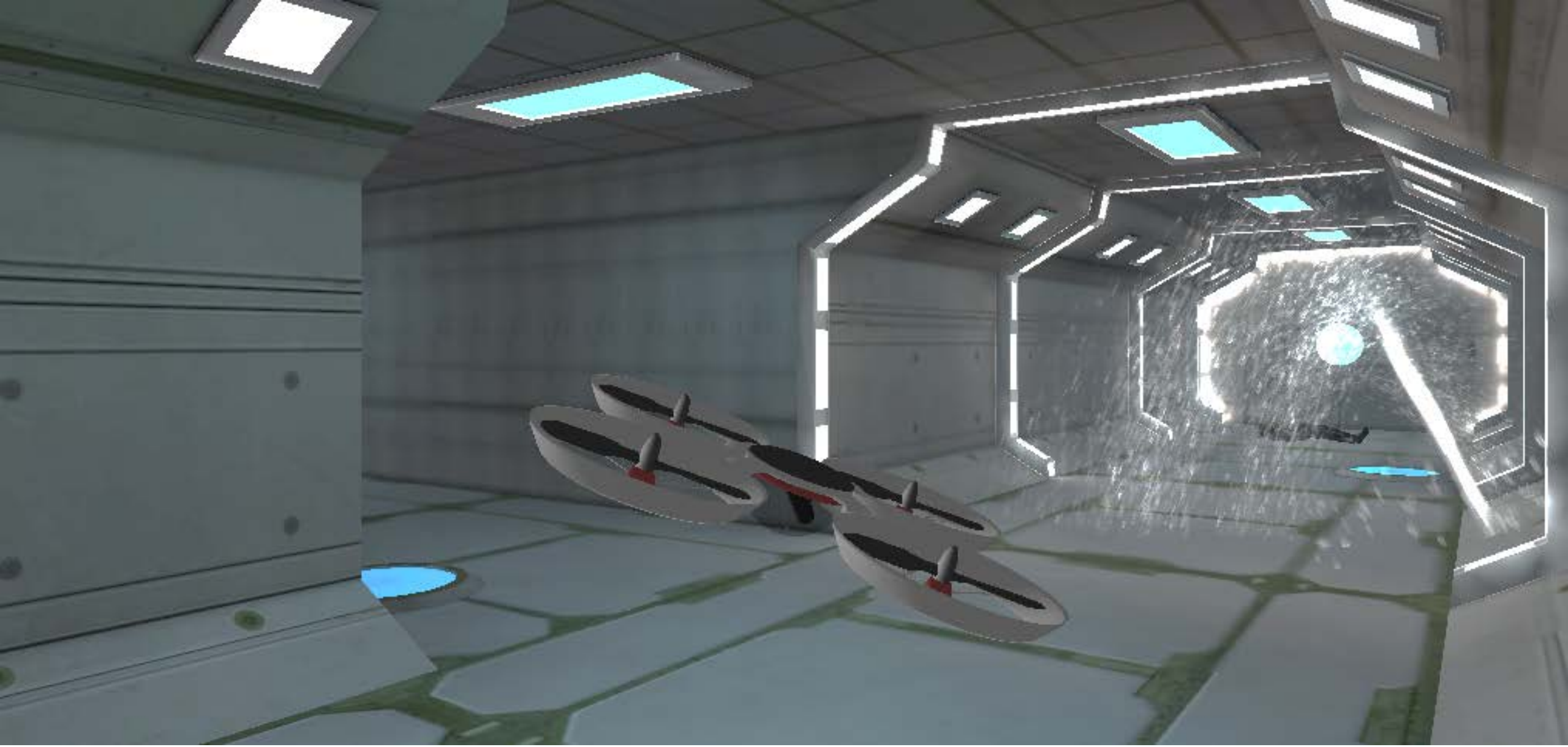




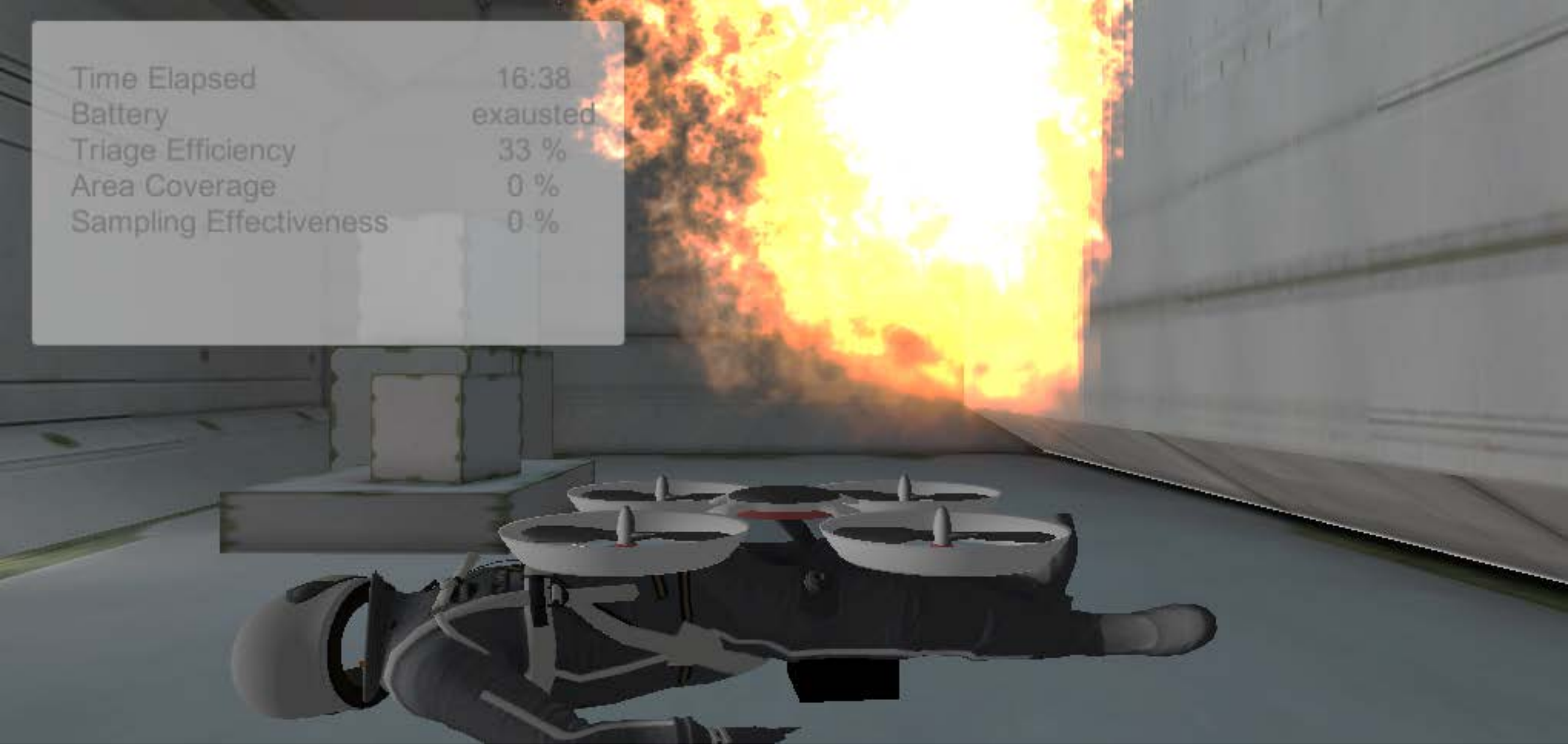
The **University of Calabria MSC-LES team** joined the SEE2016 and 2017 federation with two federates, both of them moving into an **ad-hoc constructed moon base** (the gray-coloured building).



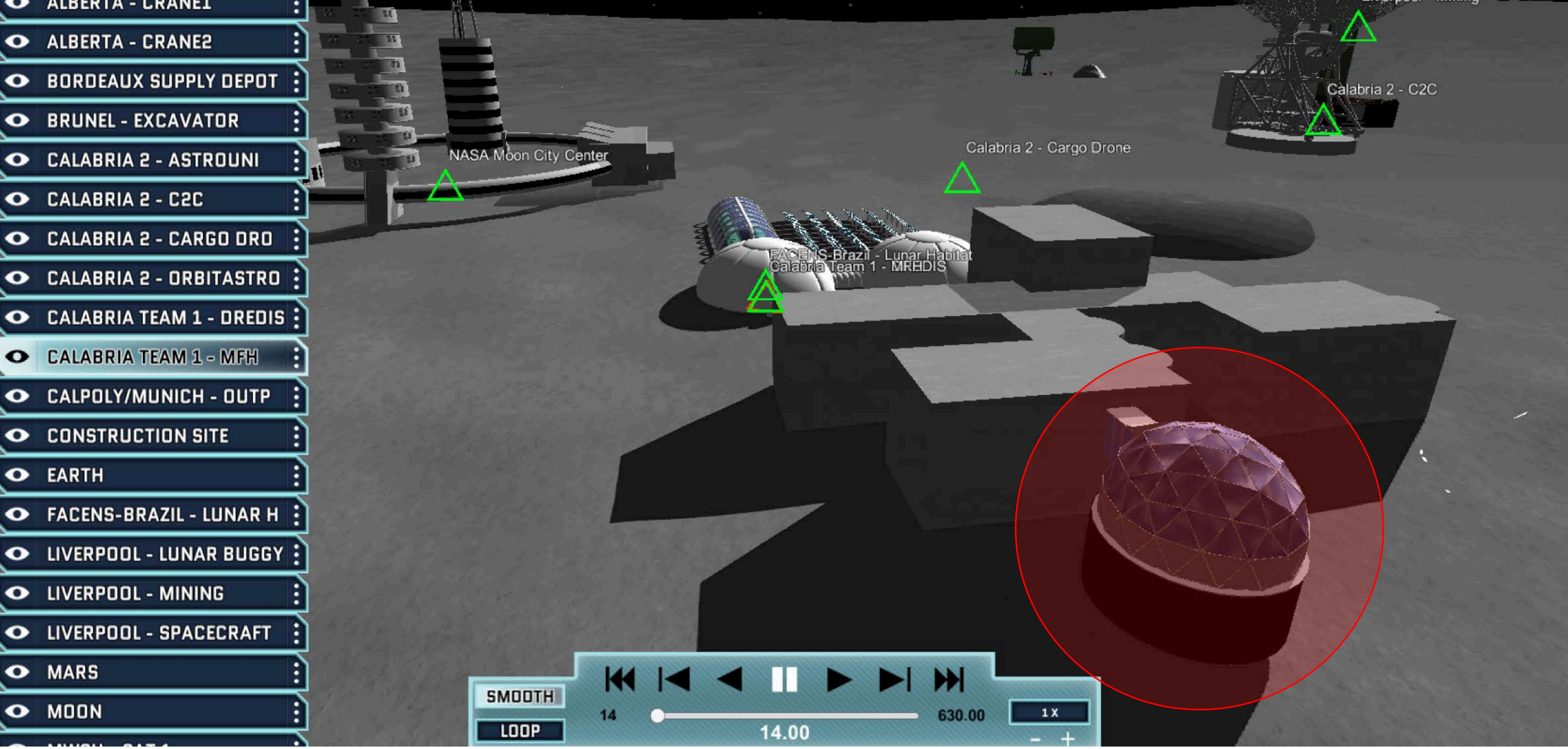
The first proposed federate is named **DREDIS (Drone-based Relief on Disaster Simulation)**.



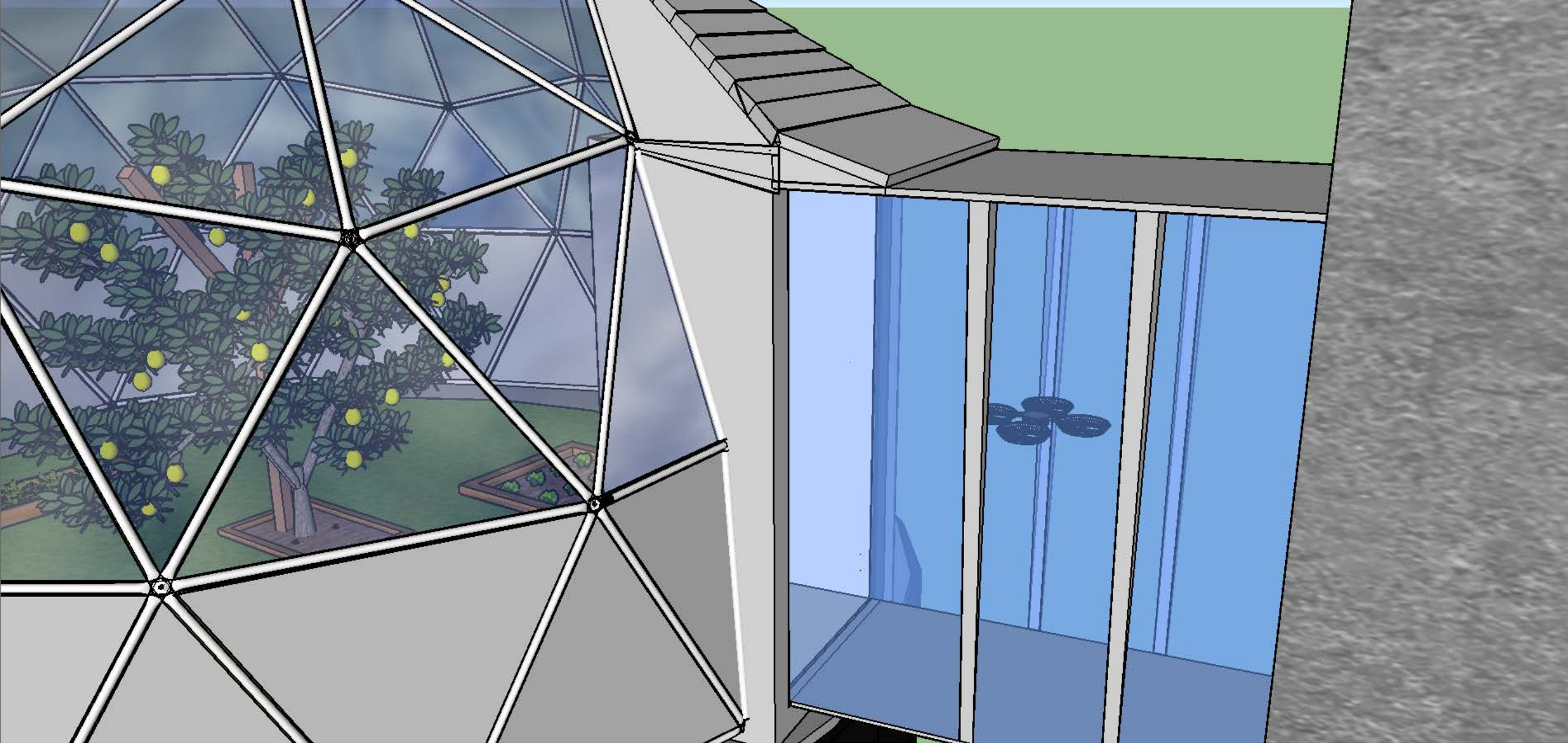
In the moon base, where conventional emergency procedures may be pointless in case of unknown causes of a potential disaster, DREDIS proposes an innovative solution based on using drones inside the lunar base for reconnaissance and exploration missions, thus considering drones as a lifesaving resource that increases safety for a traditionally hazardous situation.



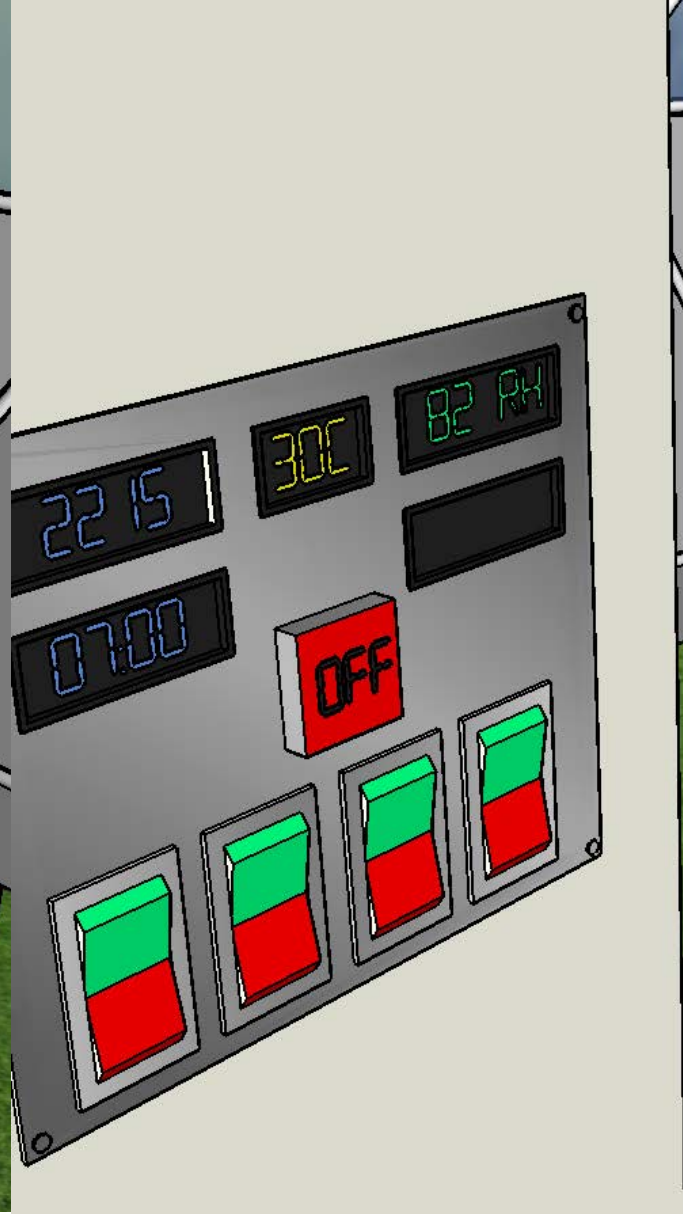
The drone flies around the base (for about 30/60 seconds during the SEE2017 event), collecting data on potentially released hazardous gases, monitoring the situation and checking possible disasters (e.g. fire or water leakage) as well as the presence of injured astronauts. Such parameters are shared with the other teams via HLA.



Long-term explorers on the Moon, or other planetary bodies, will also need to grow plants: for food, for recycling, for replenishing the air. This year, the moon base has been updated with a futuristic moon greenhouse with experimental plantations inside that will be monitored by a **second drone-based federate**: the **Moon Farm Hawk**.



The developed simulated agri-equipped quadcopter, named Moon Farm Hawk, will move to the greenhouse to capture accurate images of the crops inside the moon greenhouse, to inspect and analyze the plantations, carry out treatments or farming practices, and harvest crops.



Inside the greenhouse the drone will collect data about the temperature, the level of oxygen and CO2, the humidity level and other significant parameters that are shared with the other teams via HLA.

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Our SEE 2016 team's postcards

Prof. Francesco Longo

'Every year SEE renovates the opportunity for people with heterogeneous scientific professional background to put together their knowledge and enthusiasm in the achievement of an amazing simulated mission out of the ends of the earth. As University of Calabria – Team 1, we have participated to every year's edition of SEE (the first year in 2011 we participated as observer team and then we immediately committed to the mission) with different simulators and federates always in strict cooperation with the Genoa Team and interacting with Universities located worldwide.
As the SEE's focus is the student and his/her continuous learning throughout the program, the students have the opportunity to take part to this extremely fascinating and exciting experience with the ultimate aim to improve their team working skills and to put them in direct contact with the potential of HLA and distributed simulation in an international context.'

Antonio Padovano

'As part of the University of Calabria Team, this is the third year (two as team leader and one as student member) I've participated in SEE and I can definitely say that every year SEE is pushing beyond its own boundaries. As team, this year we had the opportunity to propose a completely new federate in addition to last year's one as result of different activities carried out in our laboratories at the University. In such framework, professors, industry professionals and NASA representatives greatly acted as advisors, mentors and counselors and this makes SEE incredibly flexible, student-centered and innovative. The reason why I take part to SEE? Simulation and interoperability is gaining a lot of success in several application contexts and SEE can be considered as one of the most important high-level platforms of collaboration among people from all over the world aiming at achieving a greater level of knowledge about simulation and interoperability in a fascinating space scenario. If you can not travel to the moon, simulate it!'

Marco Vetrano – Nicola Cersullo – Beatrice Zaccaro

'We loved so much being part of this edition of SEE. We faced multiple difficulties throughout this journey but it was so fulfilling and rewarding to see the results of our work in the relevant and stimulating context provided by SEE and to share our results at the end with everyone else was involved in this program and with NASA professionals. Thanks to a shared sense of local community created in these months in so many ways, we were able to get in contact with several people, colleagues from different parts of the world, sharing ideas, dilemmas and wins. This allowed us to grow as professionals as well as in human and personal terms and we will surely employ such lessons learned in our future and provide our contribution to the next editions of SEE.'

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Our SEE events: from 2014…

SpringSIM 2014, Orlando, Florida (USA)

Falcone, A., Garro, A., Longo, F., & Spadafora, F. (2014, October). Simulation exploration experience: A communication system and a 3D real time visualization for a moon base simulated scenario. In Distributed Simulation and Real Time Applications (DS-RT), 2014 IEEE/ACM 18th International Symposium on (pp. 113-120). IEEE.

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Our SEE events: to 2016…

SpringSIM 2016, Pasadena, California (USA)

Longo F., Bruzzone A.G., Padovano A., Vetrano M. (2016). Drones based relief on moon disaster simulation. In: Simulation Series. Modeling and Simulation of Complexity in Intelligent, Adaptive and Autonomous Systems 2016, MSCIAAS 2016 and Space Simulation for Planetary Space Exploration, SPACE 2016, part of the 2016 Spring Simulation Multi-Conference, SpringSim 2016; Pasadena; United States; 3-6 April 2016. Volume 48, Issue 5, Pages 92-98.

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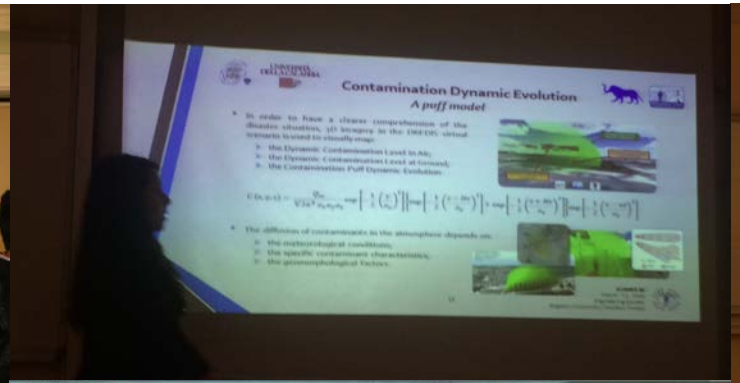

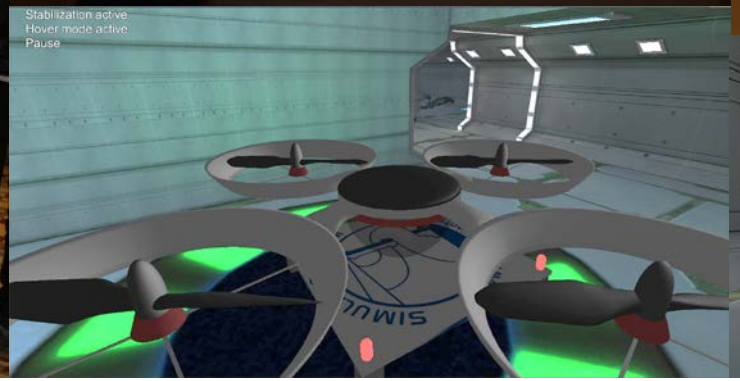

SEE DREDIS federate winning at ICAMES 2016

In 2016, our team proposed the SEE DREDIS federate at the **International Cultural and Academic Meeting of Engineering Students (ICAMES)** promoted by the Engineering Society at the **Bogazici University** of **Istanbul, Turkey**, and won the **First Award in the Simulation Category**.

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Stories of the Simulation Exploration Experience

…at the International Multidisciplinary Modeling & Simulation Multiconference

- Every year, **Prof. Agostino Bruzzone** and **Prof. Francesco Longo**, as General and Program Chair of the International Multidisciplinary Modeling & Simulation Multiconference (I3M) renovate a keynote about the Simulation Exploration Experience.
- Next year, the conference will be held in Budapest where all the SEE participants, faculty members, student teams, SEE alumni, industry partners are kindly invited.

Simulation Team
www.simulationteam.com

UNIVERSITÀ DEGLI STUDI DI GENOVA

EMSS 2015 MAS 2015 HMS 2015 DHSS 2015 IWISH 2015 The International Workshop on Innovative Simulation for Health Care IMAACA SESAE

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Our SEE 2018 team is ready to go!

MEMBERS

Prof. Francesco Longo
Antonio Padovano
Marco Vetrano
Alessandro Chiurco
Sabrina Iannò
Dario Sutera Sardo
Valentina Giovinco

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Thank you all and **SEE** you soon!