Welcome at the LDE Space Day, a joint initiative of Leiden-Delft-Erasmus Universities, in collaboration with NL Space Campus, ESA ESTEC and many other partners from the space industry. With a program packed full with theme sessions, presentations and lots of opportunities to meet your peers, the LDE Space Day is the place to be for everyone in space research and industry.

Professionals, like scientists, researchers, developers and representatives of the space industry as well as governmental organisations, are invited to join the full day program.

The LDE Space Day will host the next edition of the NL Space Campus Curiosity Series with this edition two sessions!

We will furthermore be celebrating the 10 years anniversary of LDE Universities with a panel discussion on the challenges and opportunities of space for science and society.

Sign up for the LDE Space Day via online registration form at the LDE Space website

https://www.lde-space.nl/home

Discover your space

Discover Your Space, a special event for students, organised by NVR, SpaceNed, SGAC, VSV 'Leonardo da Vinci' and NL Space Campus, will take place in the evening. Both are located at the Auditorium, at the TU Delft campus. Students can sign up for Discover your Space via www.discoveryourspace.com

Please register before November 21 to get your seat at this special event. See you at the 2022 edition of LDE Space Day!

Leiden-Delft-Erasmus
Universities

Programme LDE Space Day 2022

9:30 – 10:00 Registration and coffee at the TU Delft Auditorium

10:00 – 10:45 Opening and ESA Key Note presentation on the challenges of working together with different disciplines

10:45 – 11:15 Coffee break

11:15 – 12:45 Theme sessions part 1 (4 sessions) (see session descriptions below)

- *Climate Space NL*
- *G4AW – Space for sustainable Agriculture*
- *Space Robotics – What to do with a swarm of rovers*
- *Solaris – Space-Based Solar Power feasibility*

12:45 – 14:00 Lunch break with PhD posters at the TU Delft Auditorium

14:00 – 15:30 Theme sessions part 2 (4 sessions) (see session descriptions below)

- *Space Traffic Management*
- *Space & Society: Engaging the Public*
- *Φ-Lab: Accelerating transformational innovations*
- *Digital Twinning of Earth II*

15:30 – 16:00 Coffee Break

16:00 – 17:00 Panel discussion LDE 10 years

17:00 – 18:30 Networking drinks with company stands at the TU Delft Auditorium

In the evening the program continues with the special *Curiosity Program* for students.

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Theme Sessions LDE Space Day 2022

Climate Space NL: *More information will follow shortly*

Space Traffic Management: Sustainable future of LEO

The increase of satellites in Low Earth Orbit with the launch of non-manoeuvrable small satellites and mega constellations, like Starlink, has accelerated the discussion on Space Traffic Management. The "contested, congested, and competitive" environment in LEO poses a higher risk of orbital collisions, threatens accessibility to outer space and interferes with the clear night sky and the observations of astronomers.

The International Academy of Astronautics (IAA) defines Space Traffic Management as the set of technical and regulatory provisions for promoting safe access into outer space, operations in outer space and return from outer space free from physical or radio-frequency interference. In this session we will discuss in subgroups several aspects that are relevant to Space Traffic Management, such as:

- Emergence of STM regimes around the world and recent developments in the EU
- Legal aspects of STM: space situational awareness, space debris, on-orbit collisions, orbital manoeuvring capabilities
- 'Darkening satellites': making LEO satellites less visible on Earth to improve observing the sky
- Orbital debris mitigation and removal: required engineering, policies and business models

Session leaders: Tanja Masson-Zwaan & Dimitra Stefoudi

Interesting for: Space Law & Policy makers, Spacecraft Engineers, Space Propulsion Engineers, Astronomers, Space Business

G4AW – Space for sustainable agriculture

Efficient and effective food production will become more and more important. Join the G4AW workshop to explore and discuss how space (data) can be used to improve food and water security and how this can (or should) determine the future space assets and data usage.

Session lead: Joanna Ruiter - NSO

Interesting for: agriculture, biologist, chemists, climate experts, (space) instrument developers, mission planners, Earth Observation specialists, Business

Space & Society: Engaging the Public

Informing and engaging the public about space activities and their benefits for society is a vital task of the space community. Not only because it is important maintain public support for space activities but also to guarantee that the knowledge and technologies of space are appropriated by society.

In this session Pedro Russo will provide an overview of the ongoing research & development activities in societal engagement with space topics. The presentation will be followed with a discussion round to ask question and spark new ideas.

Join this session if you want to learn about and exchange on ideas for public engagement.

Presenter: Pedro Russo – Leiden University - Observatory

Interesting for: all who are interested or active in space public outreach activities

Space Robotics: What to do with a swarm of rovers?

The TU Delft Lunar Zebro team has developed simple micro Lunar Rovers ready and capable to swarm on the Moon, Mars but also on Earth.

The question now is: what shall we do with it? Join this session to bring in your expertise and discuss the possibilities. During the session, answer to the following questions among others will be searched for:

- How can lunar astronauts use a swarm of rovers and for what type of missions? How would they interact with and use such a system?
- What science mission, astronomy, planetary science or other, can we do with a swarm of lunar zebros?
- What is Artificial Intelligence in the context of a swarm of rovers? How would it look like and function?
- What can we do with swarms of rovers on Earth?

Session Leads: Chris Verhoeven, Marnix Verkammen & Lunar Zebro team

Interesting for: Space Engineers, Robotic Engineers, Scientist, Planetary Scientists, Astronomers, AI experts, data analytics

Φ-Lab: Accelerating transformational innovations

ESA has started the Φ-Lab mission to accelerate innovation in the domain of Earth Observation.

The **NL Space Campus** is a possible site for a Φ-Lab to bring people, academia and companies together to stimulate innovation with the innovation pipeline. The NL Space Campus Φ-lab application is targeting a subset on Earth observation themes and added Navigation and telecom topics as specialization areas

Join this workshop session to discuss ideas and topics for innovation projects and activities at the NL Space Campus Φ-Lab programme utilizing the local academic and industrial expertise.

Session Lead: Raoul Voeten & Niels Eldering

Interesting for: Researchers, Engineers, Scientists, Business, Companies, Innovators

Curiosity Series at LDE Space Day 2022

The Curiosity Series will take place at the LDE Space Day, in the evening at the TU Delft Auditorium. This time with two sessions:

1.Solaris: Feasibility of Space-Based Solar Power

ESA has proposed the SOLARIS programme to prepare for a possible decision on a full development programme for Space-Based Solar Power. In this Curiosity Series edition we will discuss and explore the various aspects of Space-Based Solar Power like:

- Solar power for in space distribution or to ground as well?
- For which applications would it be feasible?
- What technical challenges need to be solved?
- Under what conditions would Space-Based Solar Power be a viable Business Case?

After an introduction presentation there will be a moderated discussion to exchange ideas and information and determine possible topics for follow up and shared research activities.

Session Lead: will be announced shortly

Interesting for: Space Engineering, Solar Power experts, Space Law, Space Business, Energy sector

2.Digital Twinning of Earth part II

In this follow up session of the Curiosity Series – Digital Twinning of Earth that took place on June 9th, we will dive deeper into the challenges and gaps that are currently in place for creating Digital Twins to better understand Earth, its climate, biodiversity and nature. We invite researchers and scientists who are working on modelling (elements of) the Earth and its climate and Biosphere.

Session Lead: will be announced shortly

Interesting for: Data analysts, Climate Scientists/researchers, Policy makers