



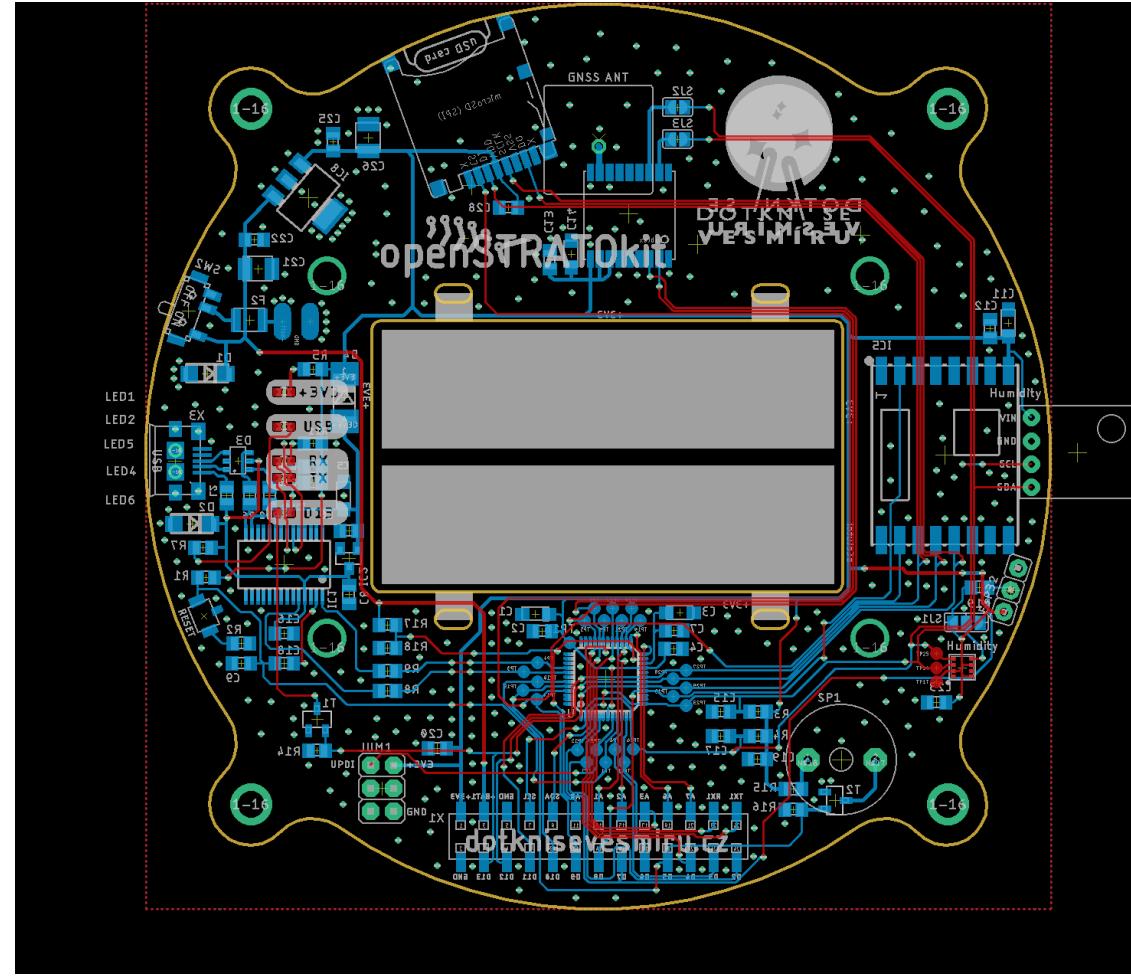
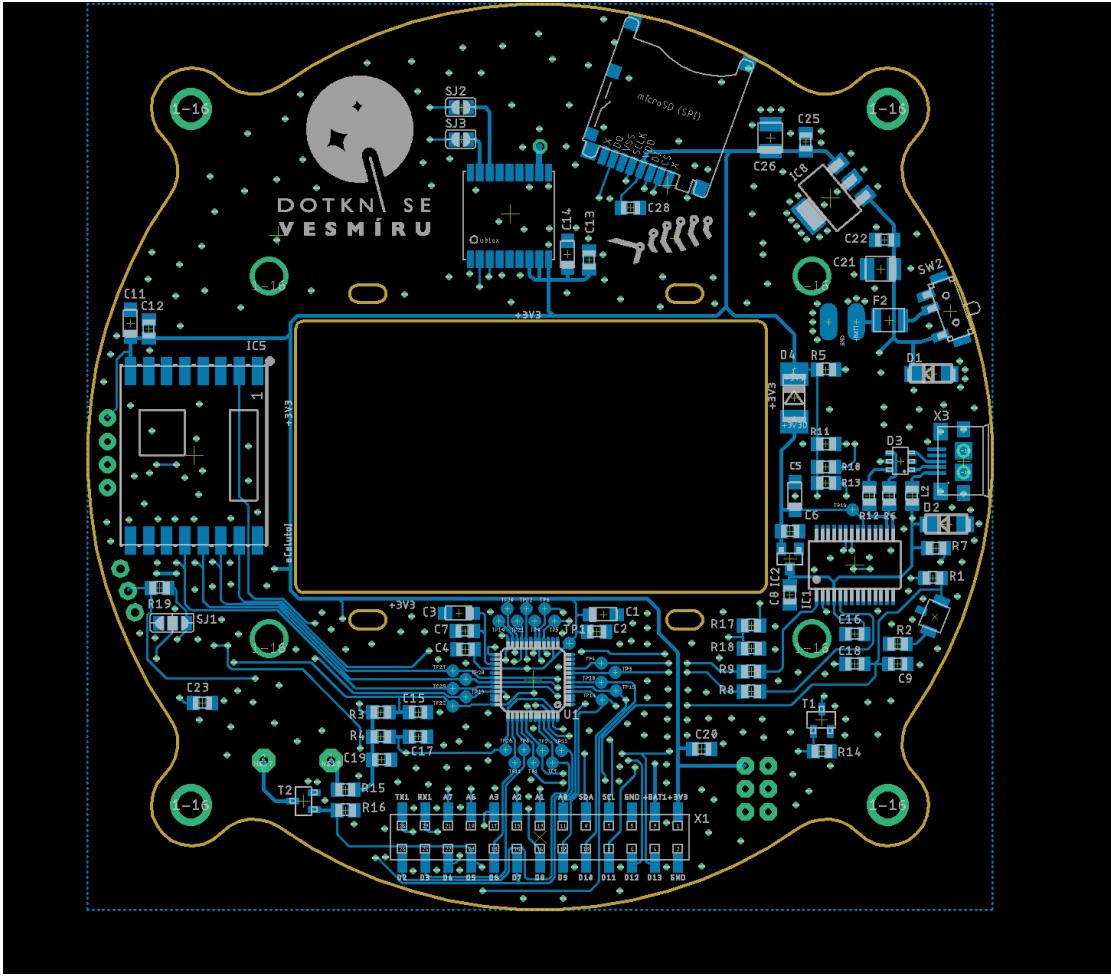
DOTKNÍSE
VESMÍRU

TOUCH THE UNIVERSE



**Make the first
step to space
with us!**

**Opening the window to
space is as difficult as
opening a textbook.**



A stratospheric balloon

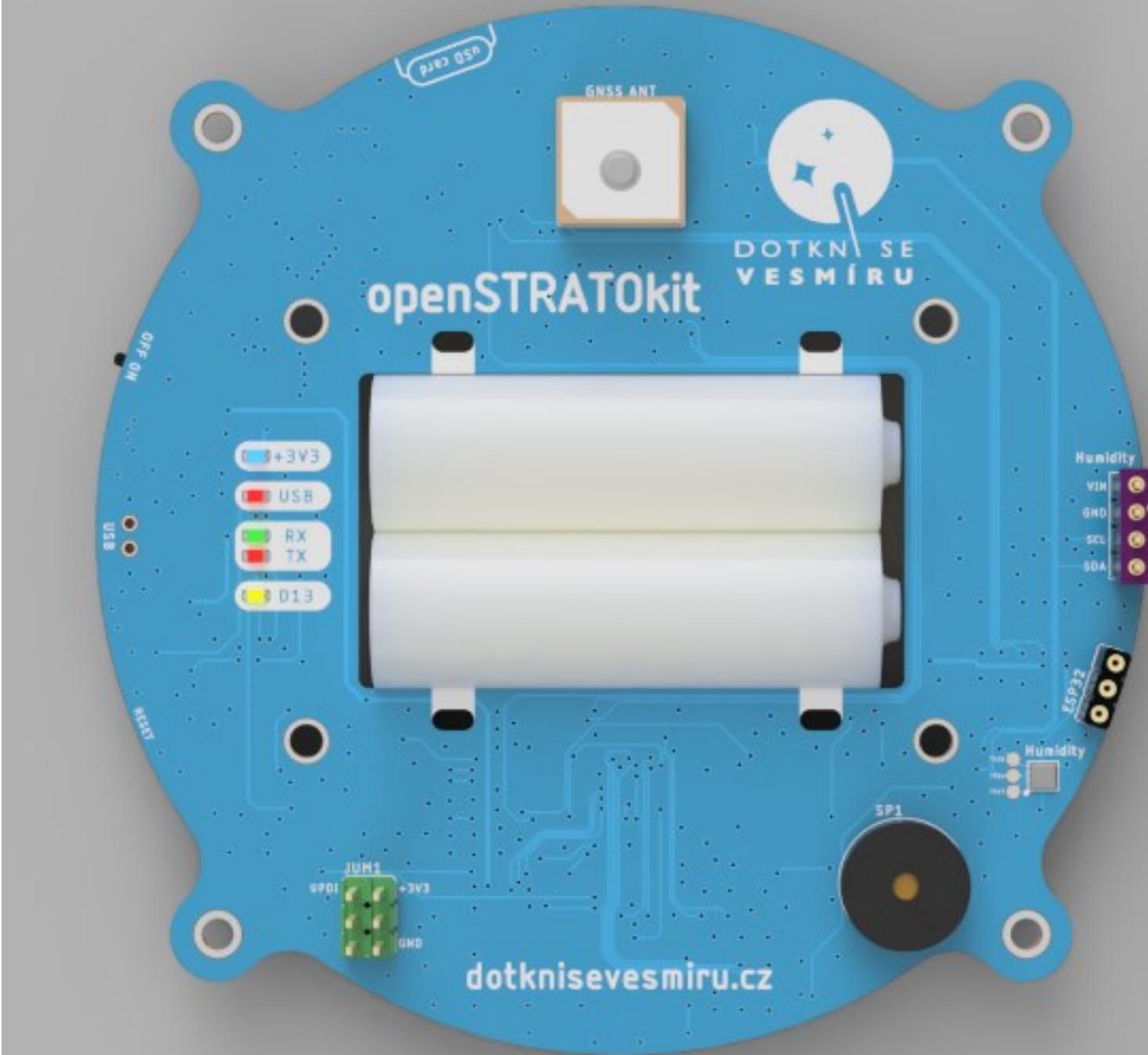
The project
organisers



SCIENCE
TECHNOLOGY
ENGINEERING
ARTS
MATH



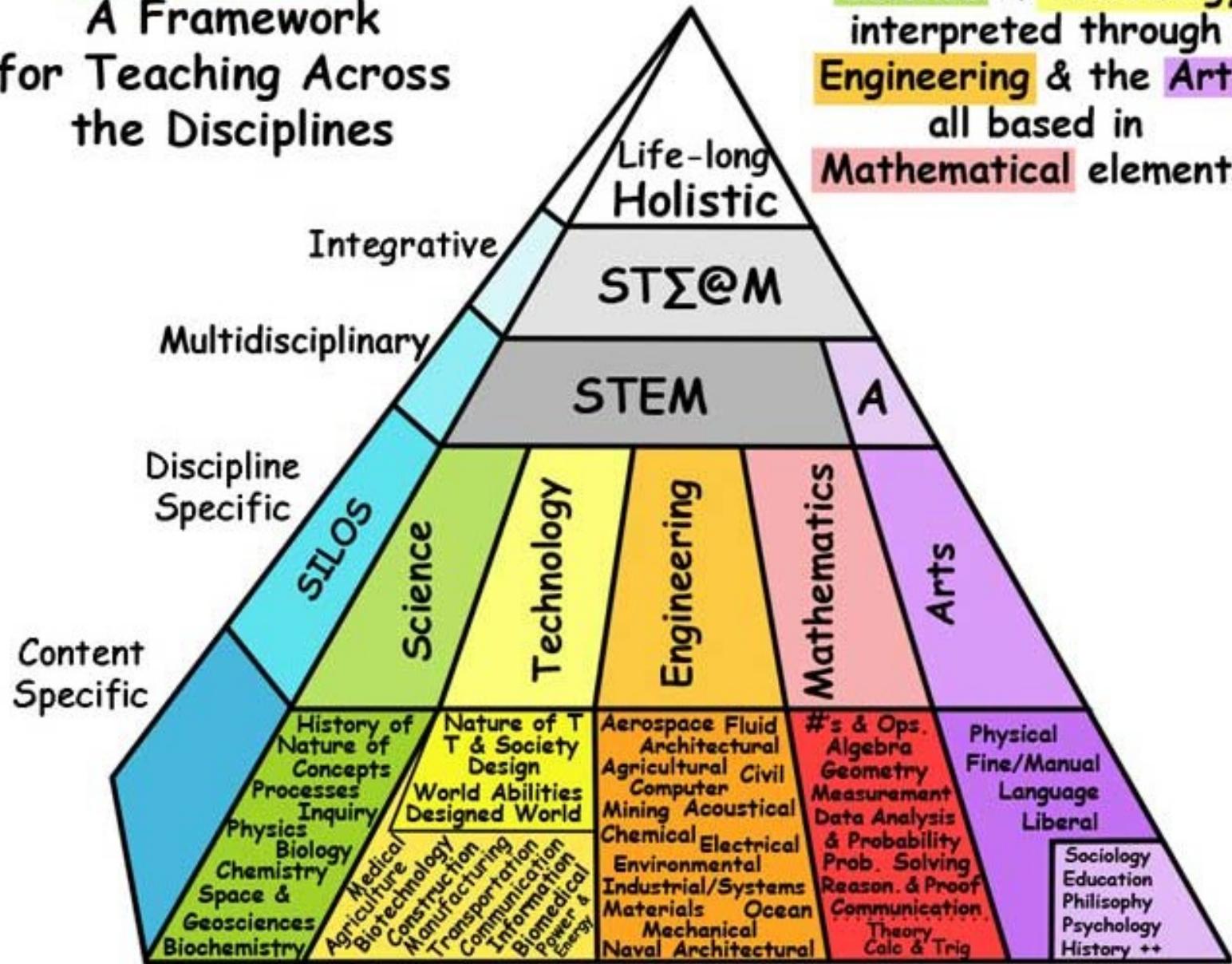
Project Description



Enter STEAM projects with us

STΣ@M:
A Framework
for Teaching Across
the Disciplines

STΣ@M =
Science & Technology
interpreted through
Engineering & the Arts,
all based in
Mathematical elements.



28. 3. 2021

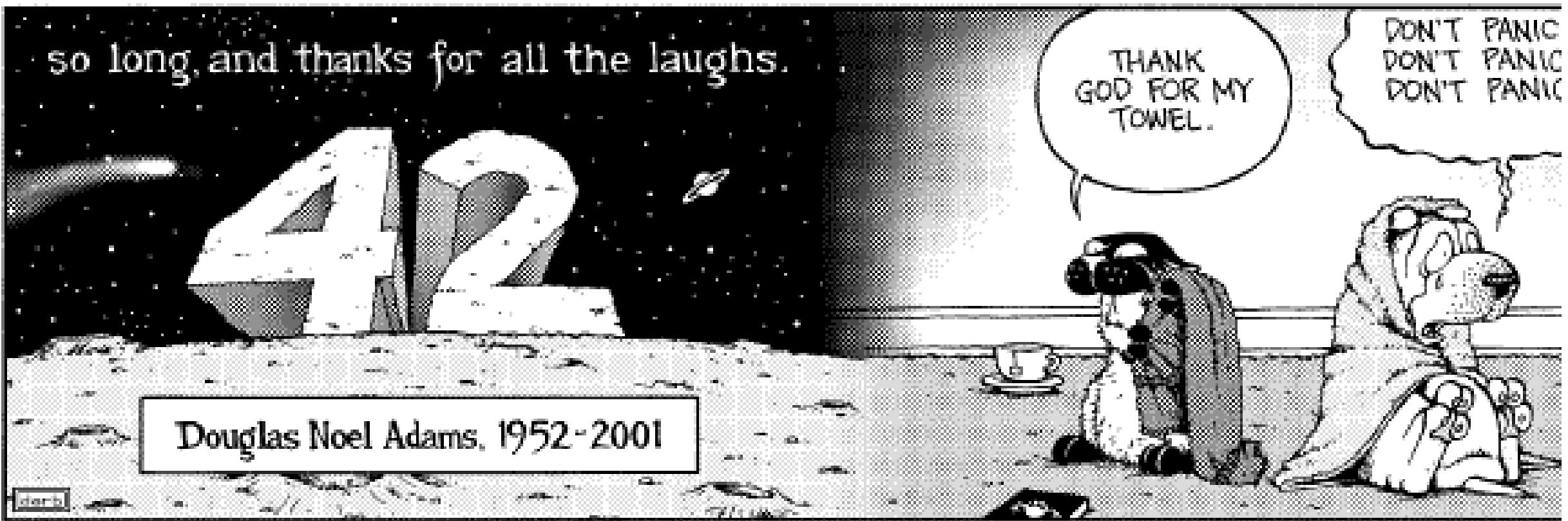
11. – 12.12.
2021



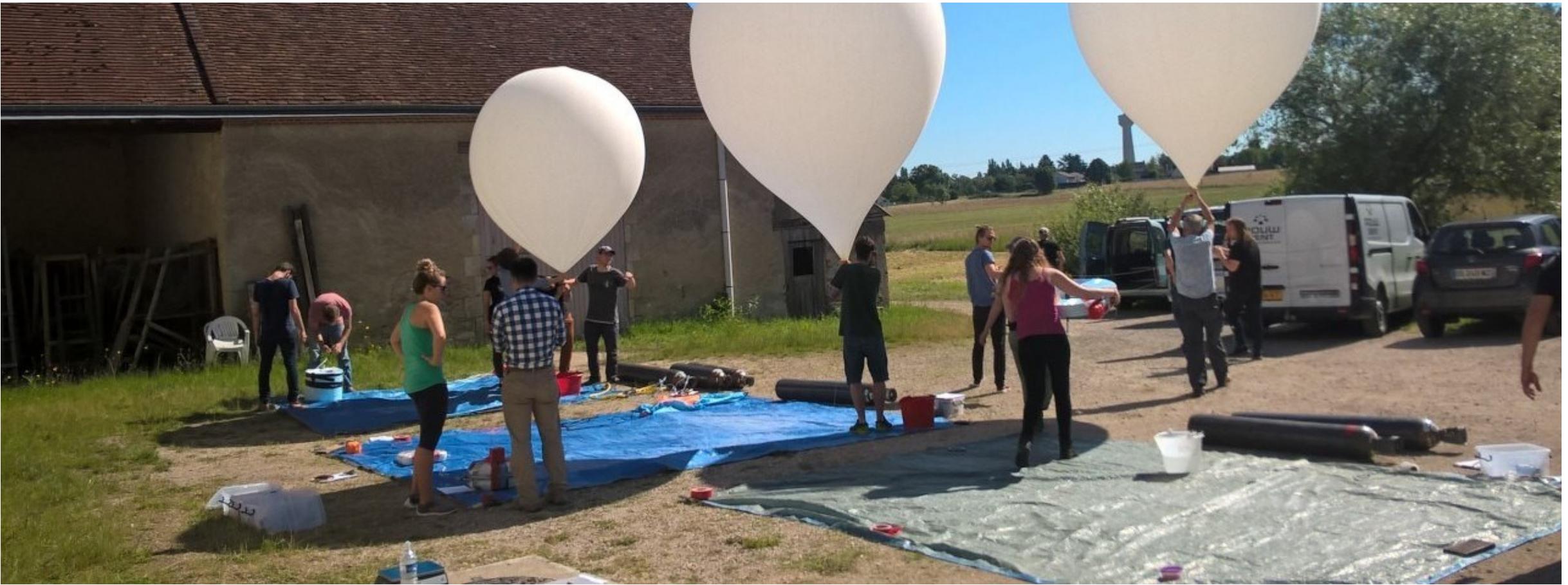
Who is the project for?



- Schools / Primary schools, Secondary schools, Grammar schools, Lyceum, Vocational/
- Scientific institutions / we cooperate with scientific institutes
- Centre for children and youth activities.
- Polytechnic and programming circles.
- Every member of the community



- **Hitchhiker's Guide to the Galaxy** - the answer to the basic question of life, the universe and everything.



- Pilots + searchers of inter-school cooperation

- The project team - / pilots / launches the probe, creates 5 worksheets.
- The support team - / searchers / helps the school track the probe.



Worksheets

Activities

- planning
- organization
- experiments
- changing roles and taking responsibility
- soft skills
- self-evaluation
- project logbook
- elaboration of 5 worksheets
- presentation, video from the project





A stratospheric flight of the STEAM balloons

-
- We have developed a space probe that can be launched by 42 schools in the Czech Republic in September 2021, reaching the height of 30 – 35 kilometres.
 - The project will take place between 23 March and 12 December 2021
 - We are going to provide methodological support for participating schools and teach them how to work in various scientific areas and disciplines across the school subjects and curriculum by the STEAM pedagogy.
 - Students will learn programming, how to measure physical quantities in real-time during a concrete project.
 - They will take original photos and videos of Earth.
 - The probe is modular, and after returning from space, can be reused in other projects, such as a meteorological station.

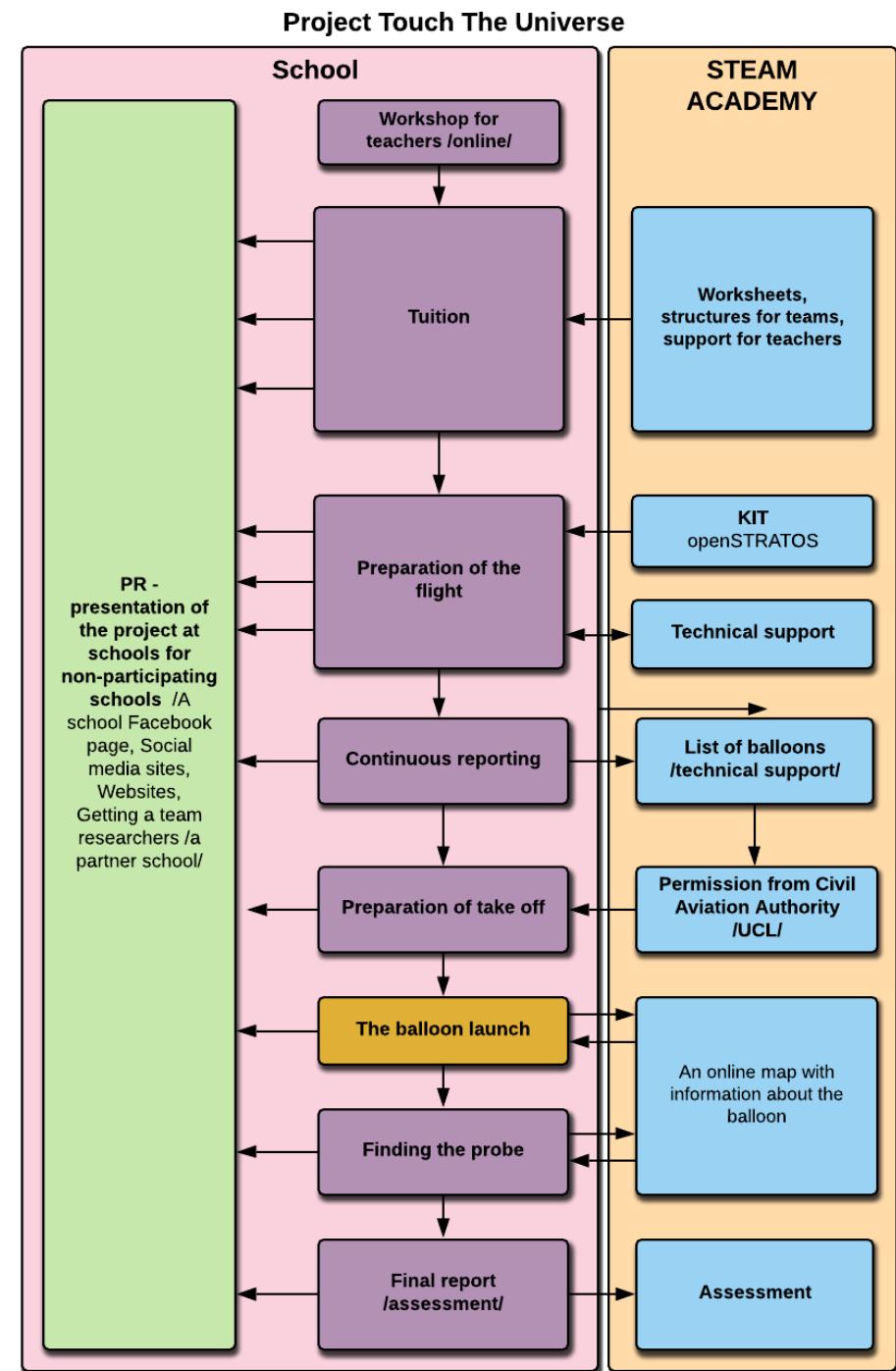


42 + 42 teams – Registration (login)

- the number of team members is not limited
- the team is led by a "flight commander"
- each project team has a support team
- Support; minimum of one teacher (contact person)

What does project bring?

- STEAM technology for schools
- Intersection through objects and the curriculum of SCIENCE objects
- Collaboration of students on the scientific ‘space’ project
- Activities, experiments, experiments and research / in the project, teams will count, verify, test, program, find out, cooperate and decide /

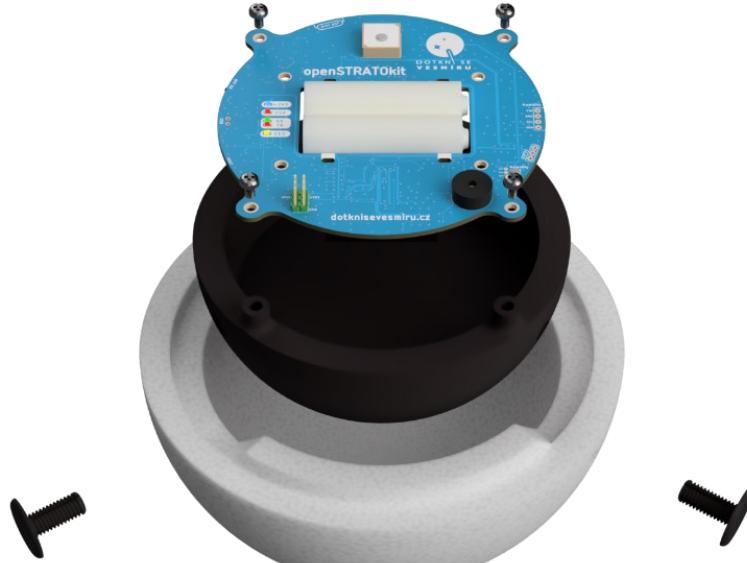




Basic parameters of the payload:

- We measure **temperature, pressure, humidity, position** (GPS), height and data are being stored on the microSD card
- The probe transmits its radio signal to all the receiving stations in the ISM band 433 MHz (range more than 100 km)
- The probe takes photos once per the set time interval (15s) and records them onto the microSD card
- The probe signals acoustically that it is functional and ready for launch, which also assists with its identification on the ground after landing
- Its battery lasts for about 12 h

KIT – Basic or Custom



Basic assembles the kit according to the instructions and activates without the need for programming or soldering.

Custom – The kit can be modified, reprogrammed; complete software and hardware documentation is supplied; sensors and any other ideas may be added but within the weight limits of the probe.

Another board may be connected to the motherboard; there, sensors may be placed etc.

It is possible to modify and print an insert on the 3D printer.

It will be possible to listen to the balloon probes during their flight and identify the place of landing with the help of the receiving stations. The information will be transmitted to the server and subsequently visualised.

2 weight versions

A – 150 grams

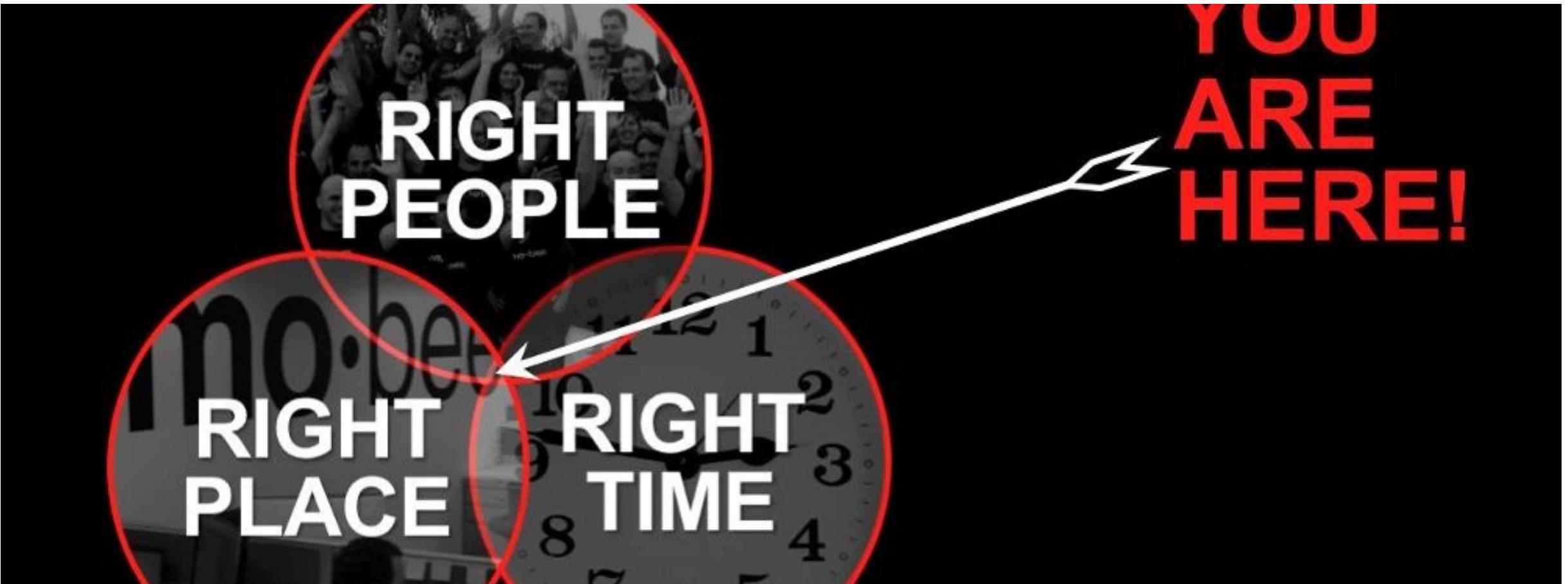
B – 300 grams

/it can carry a GoPro camera, a cosmic rays' detector, or some other device /



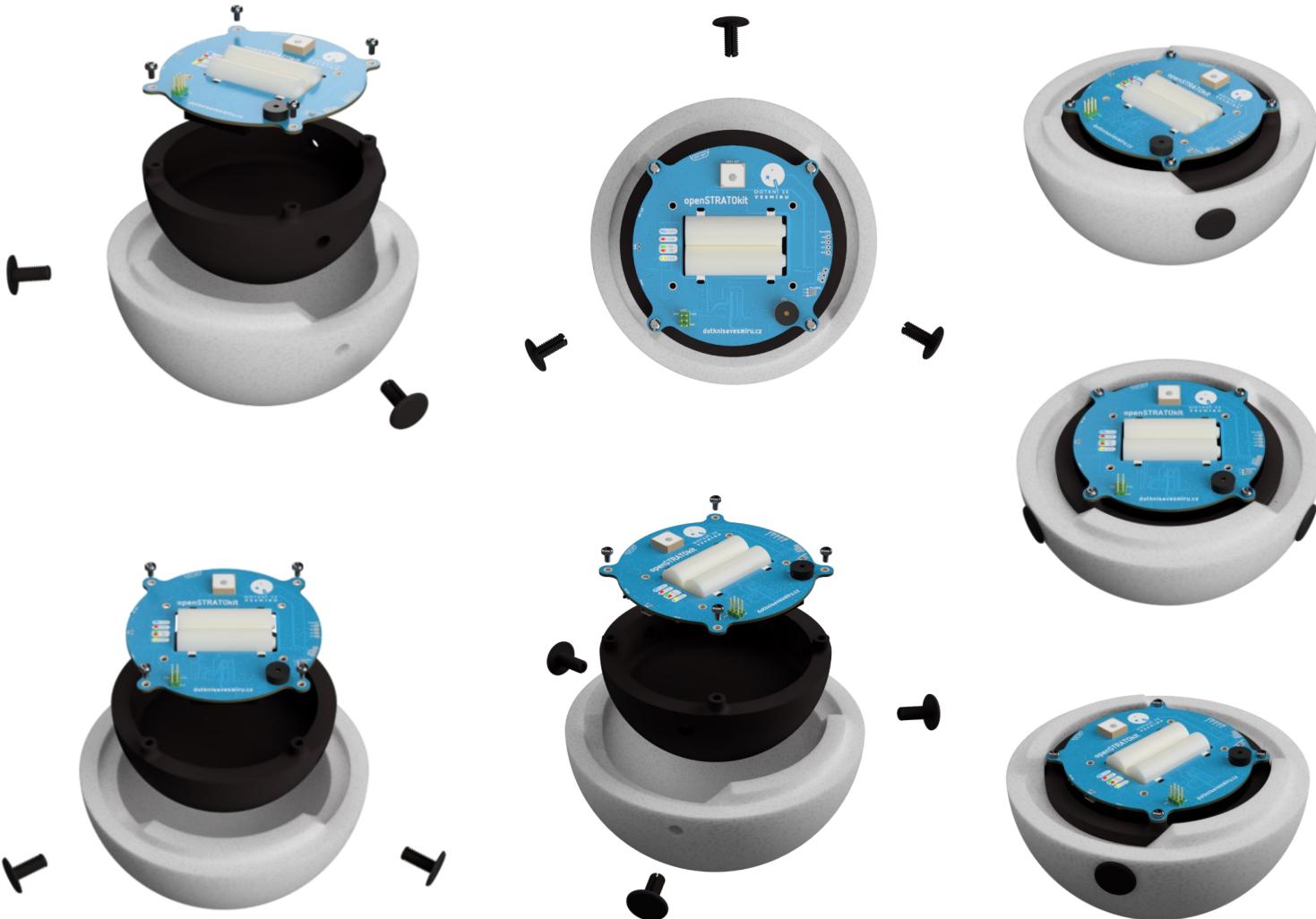
- The school is not entitled to interfere in any way with the outer casing of the probe and electronic equipment without the written consent of the organizer or the technical support team.



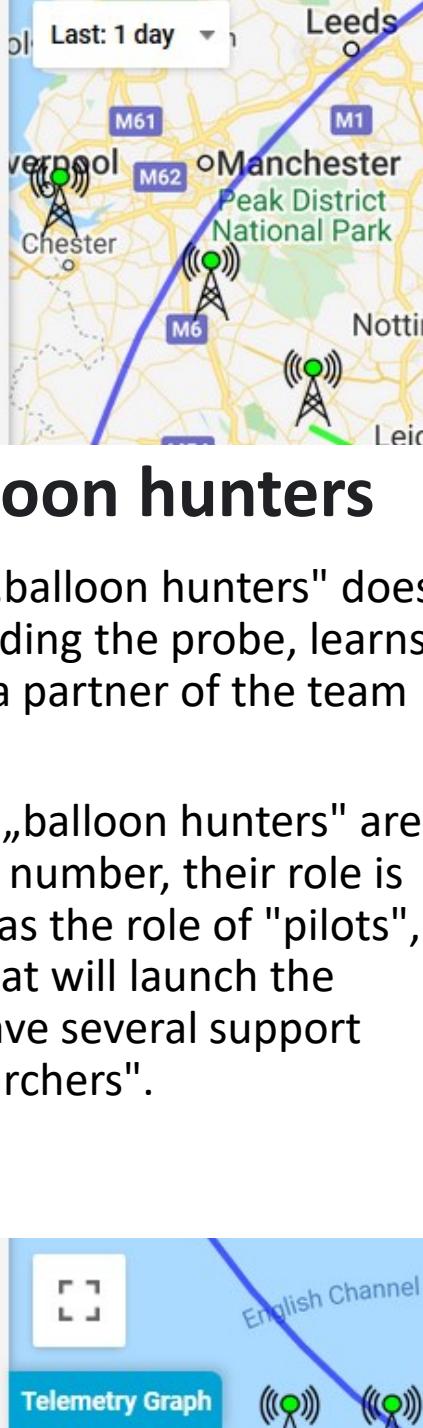


The school that will release the balloon will ensure that the project and support team and the probe are ready at the time and place / Prague / from which the balloons will be released. The balloons will be launched during the day according to the rules of air traffic valid in the Czech Republic.

A
PROTOTYPE
HAS BEEN
MADE

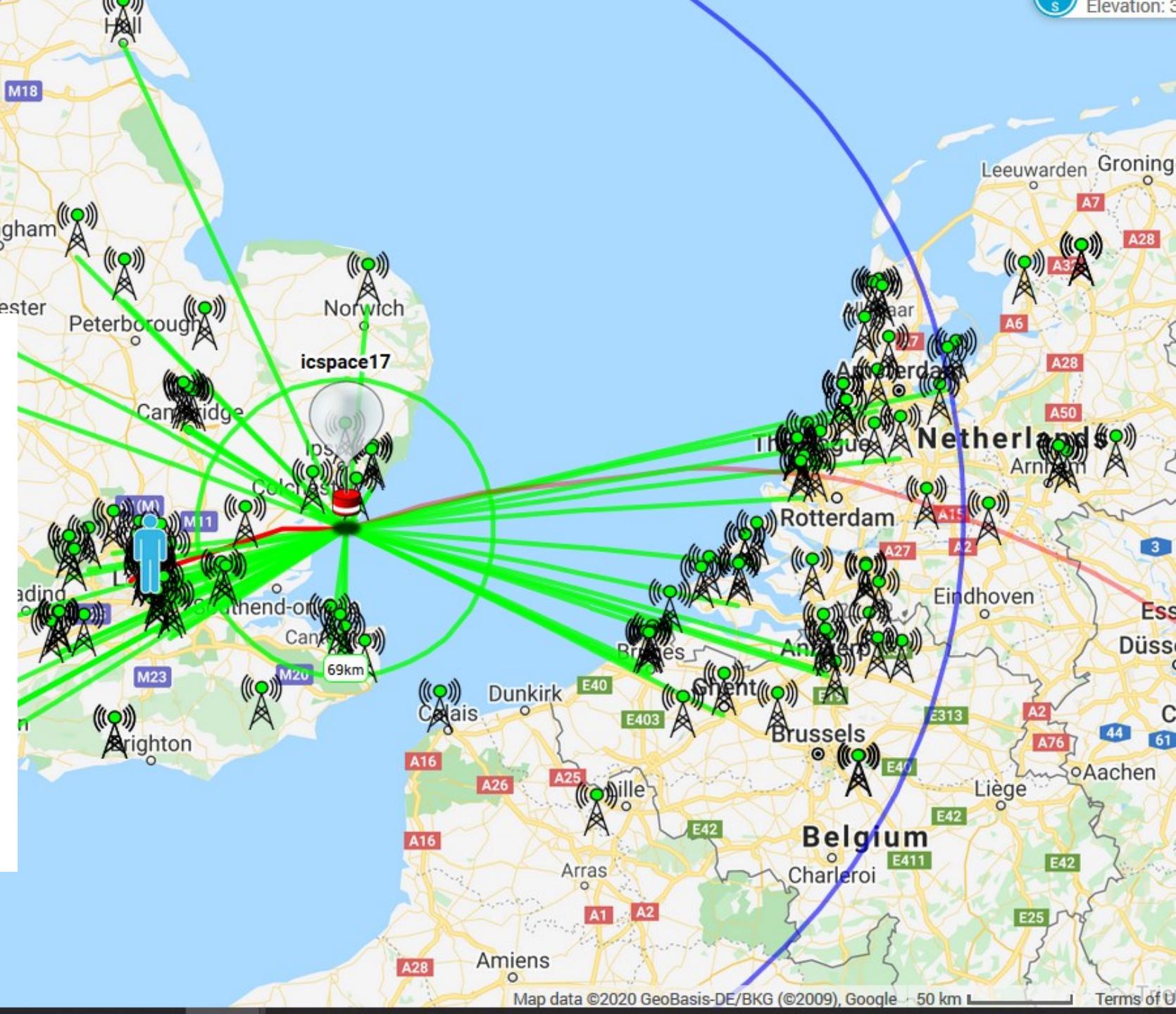


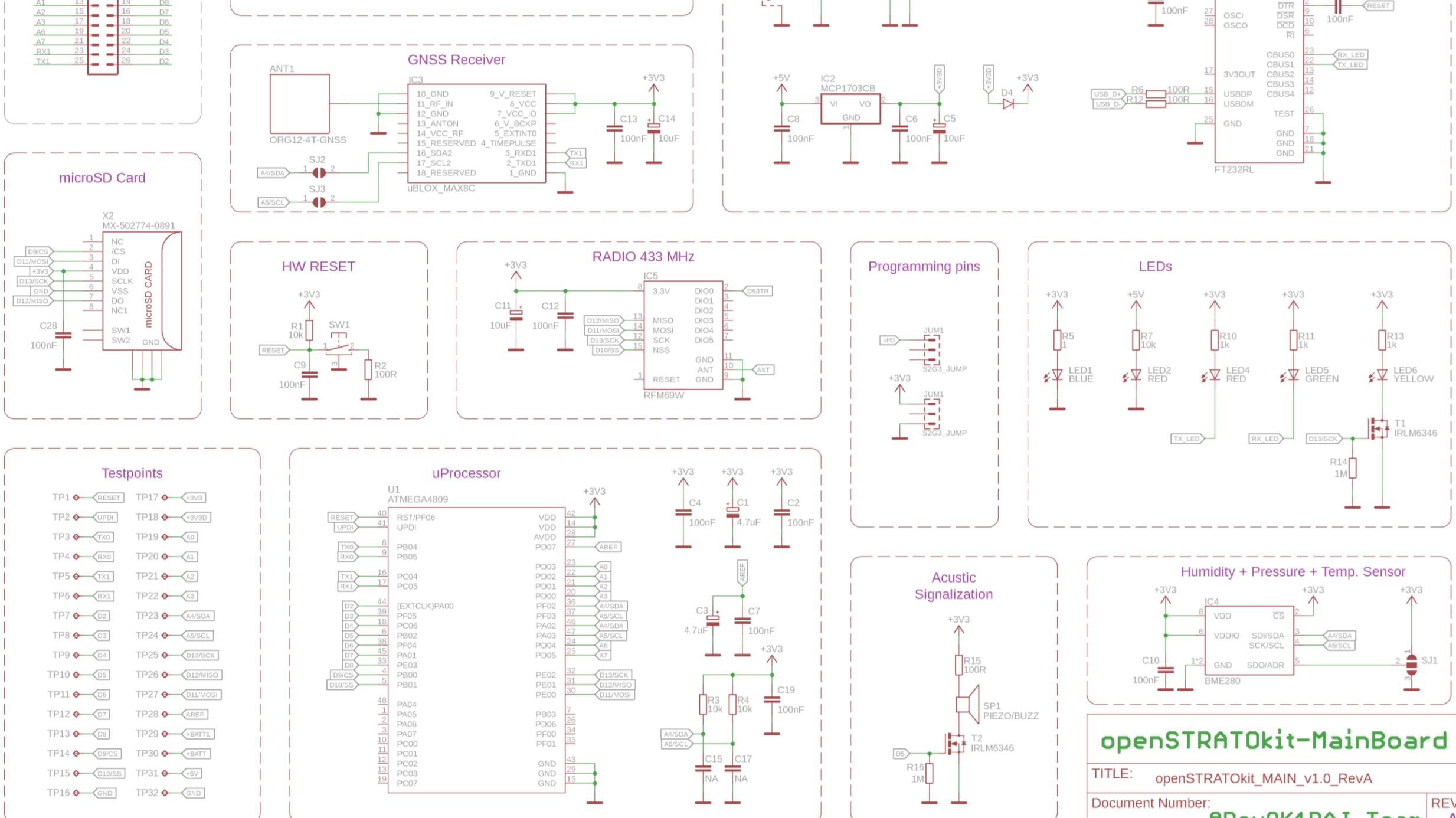
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The balloon hunters

- The team of „balloon hunters“ does support in finding the probe, learns telemetry, is a partner of the team of "pilots".
- The teams of „balloon hunters“ are not limited in number, their role is as important as the role of "pilots", one school that will launch the probe may have several support teams of "searchers".





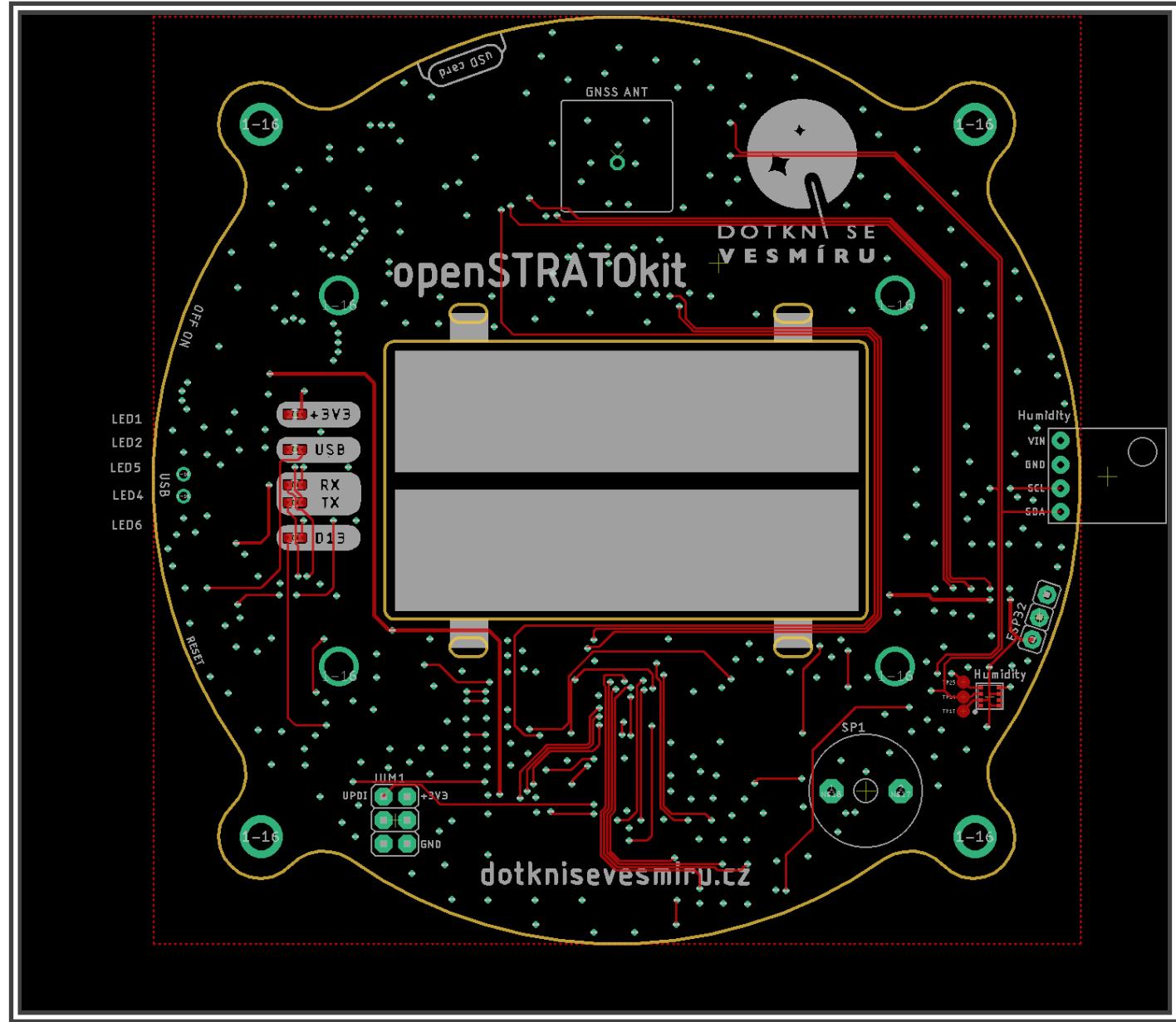
The Project implementation

- 18/ 1/ 2021 – the first promotional webinar for schools
- 1/ 2/ 2021 – the second promotional webinar for schools
- 22/ 2/ 2021 – a website ready to become fully operational
- 1/ 3/ 2021 – launch for schools: accepting applications from schools
- April 2021 – schools will receive the ordered probes; until then, they work with the 3D visualisation of the probe
- 1/4/2021 – the introduction of the web project for schools, including participating schools
- 1/5/ 2021 – a webinar for schools /telemetry/
- 15/ 5/2021 – submission deadline for the first worksheet
- 15/ 6/ 2021 – submission deadline for the second worksheet
- 15/9/ 2021 – submission deadline for the third worksheet
- 15/ 10/ 2021 – submission deadline for the fourth worksheet
- October 2021 – the launch of the probes
- 15/ 11/ 2021 – submission deadline for the fifth worksheet
- 11/12 – 12/ 12/2021 – a conference with presentations from schools





Goals of the Project



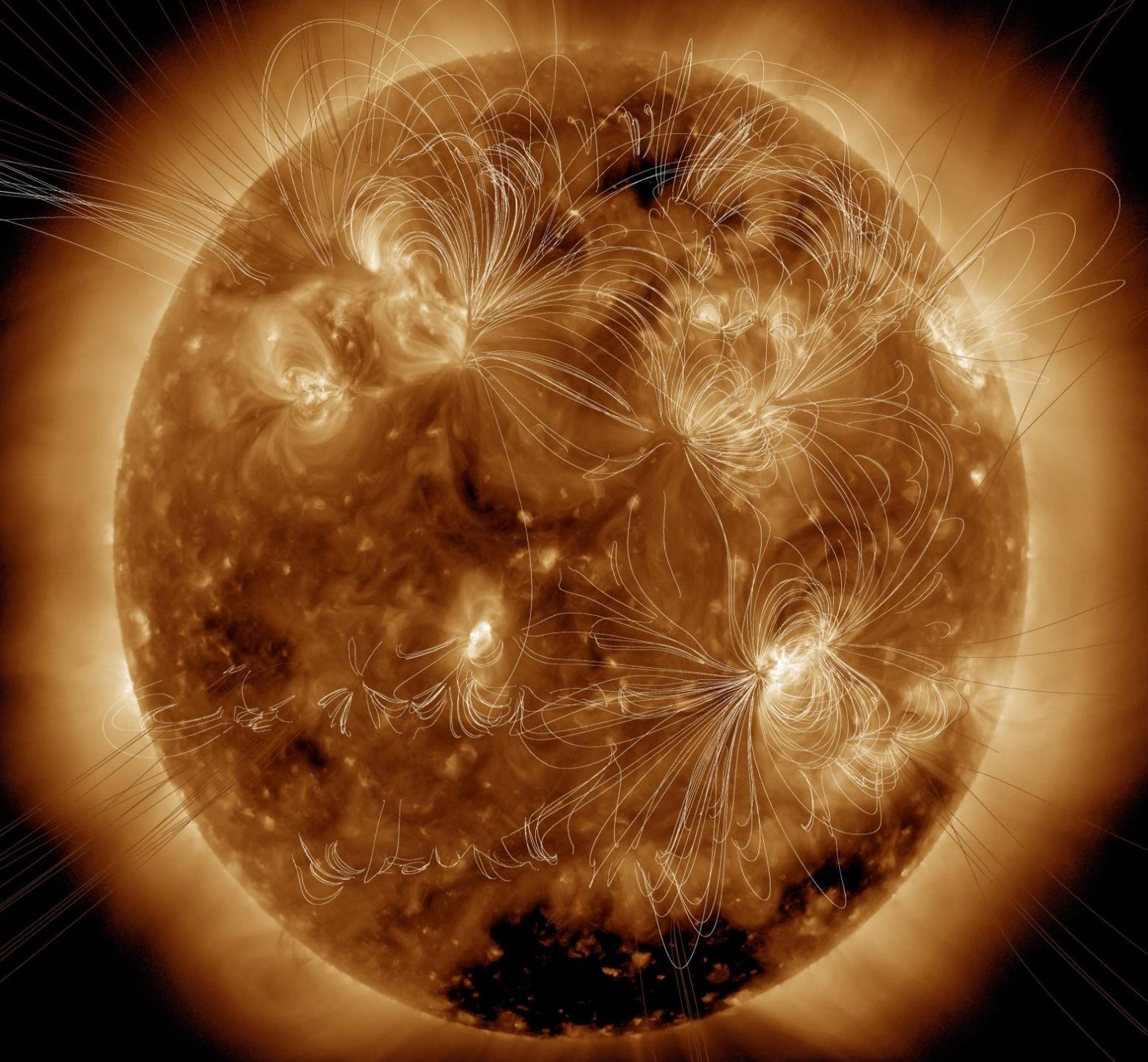
- You will learn everything you need to know to be able to launch a stratospheric balloon that will reach the edge of space.
- Is it cold in space? Let us measure it together!
- You will deepen your knowledge from many scientific fields and disciplines, of which you may have never heard before.
- You will be responsible for the final shape and launch of the stratospheric probe as well as communication in your team.
- You will learn how to communicate and how to program the probe in its language if you wish.
- You can already make bets with anyone that Earth is spherical – you will make a photo that will prove it.
- You will get a video from the height, not even the birds fly to; your probe will fly three times as high.
- You will measure various physical quantities connected with space flights.
- You will calculate the direction, speed and probable touchdown place of your probe.



Accompanying events of project partners

PLANETUM

- All schools 42 + 42 can use free online lectures from 1 March to 15 October 2021 for an unlimited number of pupils from a given school. The lecture will be 45 minutes long and can take place up to 4 times in one morning (four lessons).
- There will be a choice of two lecture topics and it is possible to combine in the morning:
- **Space opportunities in the Czech Republic for children and pupils** (from the 4th grade of primary school to the graduation year of secondary school)
- **What do we know about the universe?** (from the 2nd grade of elementary school to the graduation years of high school)
- The date of the lecture is set by prior arrangement with **Jan Spratek**:
- spratek@planetum.cz,
- Phone: +420 731 435 236



Institute of Nuclear Physics

- lectures
- seminars
- school visits
- radioactivity measurement...



WWW.LABORKY.CZ

- All teams - "pilots" can use the workshop full of attempts, experiments, ideas and explosions for one day in the great Laboratory in Gymnázium Slaný / max. 30 students
- Participating schools in the project can use 3D printers I3MK3S PRUSA / MMU2 - multimaterial /, PRUSA SL1 with curing station, 3D scanners / printing support, planning, consultations / contact:
[dilna@gymnaziumslany.cz/](mailto:dilna@gymnaziumslany.cz)



Collaboration
with
Experts



planetum



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ústav

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addi(c)tive polymers



The pilot project
“Touch the Universe”
will launch other
polytechnical
education in an
engaging, yet scientific
way accessible for
most schools.
/Primary, secondary
and grammar schools/



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