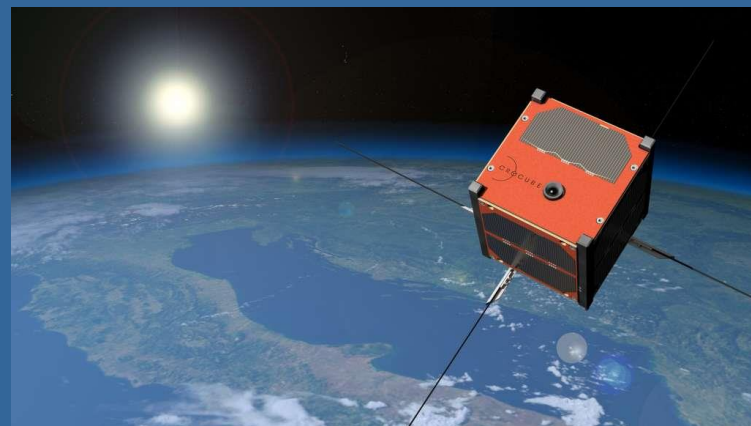


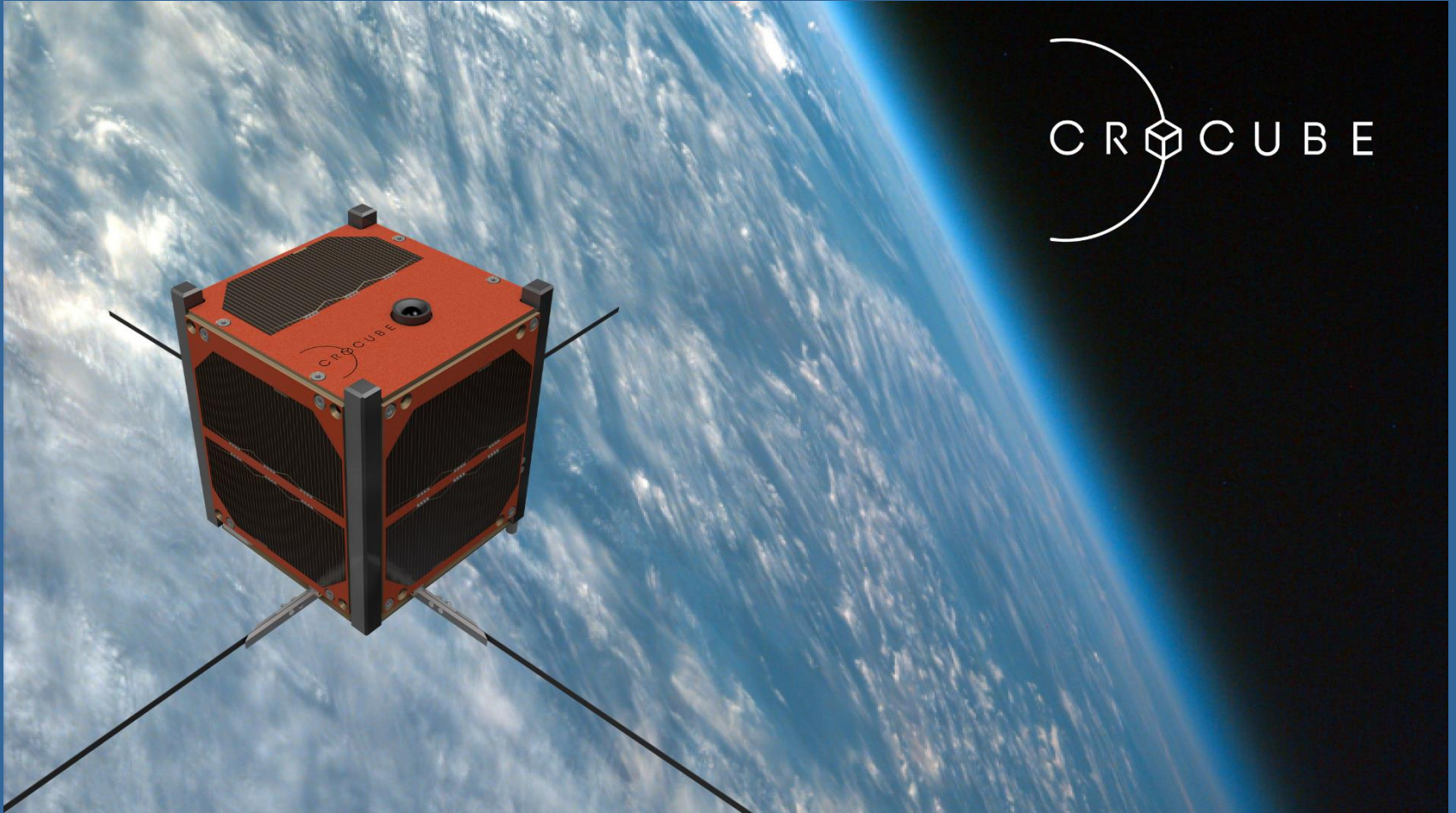


mr.sc. ŽELJKO ULIP, dipl.ing.

KAKO JE NAPRAVLJEN CroCube 1. HRVATSKI SATELIT

**OŠ „SLAVA RAŠKAJ”
OZALJ
08.12.2025.**

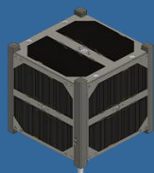




POLAZNA IDEJA ZA CroCube SATELIT

- **OBLIK: CUBE SAT 1 U (10x10x10 cm, 1 kg)**
- **VRSTA ORBITE: EKVATORIJALNA**
- **PARAMETRI ORBITE: VISINA 550 km, NAGIB 45°**
- **VRIJEME OPHODA: 95 min**
- **CILJNA SKUPINA: RADIOAMATERI, STUDENTI, UČENICI**
- **KOMUNIKACIJE: AMATERSKA SATELITSKA SLUŽBA**
- **VRSTE: TLM, RADIJSKI FAR, SSDV SLIKE, DIGIPITER**
- **KOORDINACIJA: HRS, HAKOM, IARU, ITU**
- **LANŠIRANJE: SPACE X, RAKETA FALCON 9**
- **RADNI VIJEK: 2-3 GODINE**
- **POVRATAK U ATMOSFERU: 5-7 GODINA**

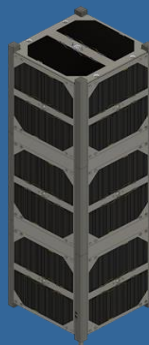
OBLICI SATELITA CUBESAT TEHNOLOGIJE



1U



2U



3U

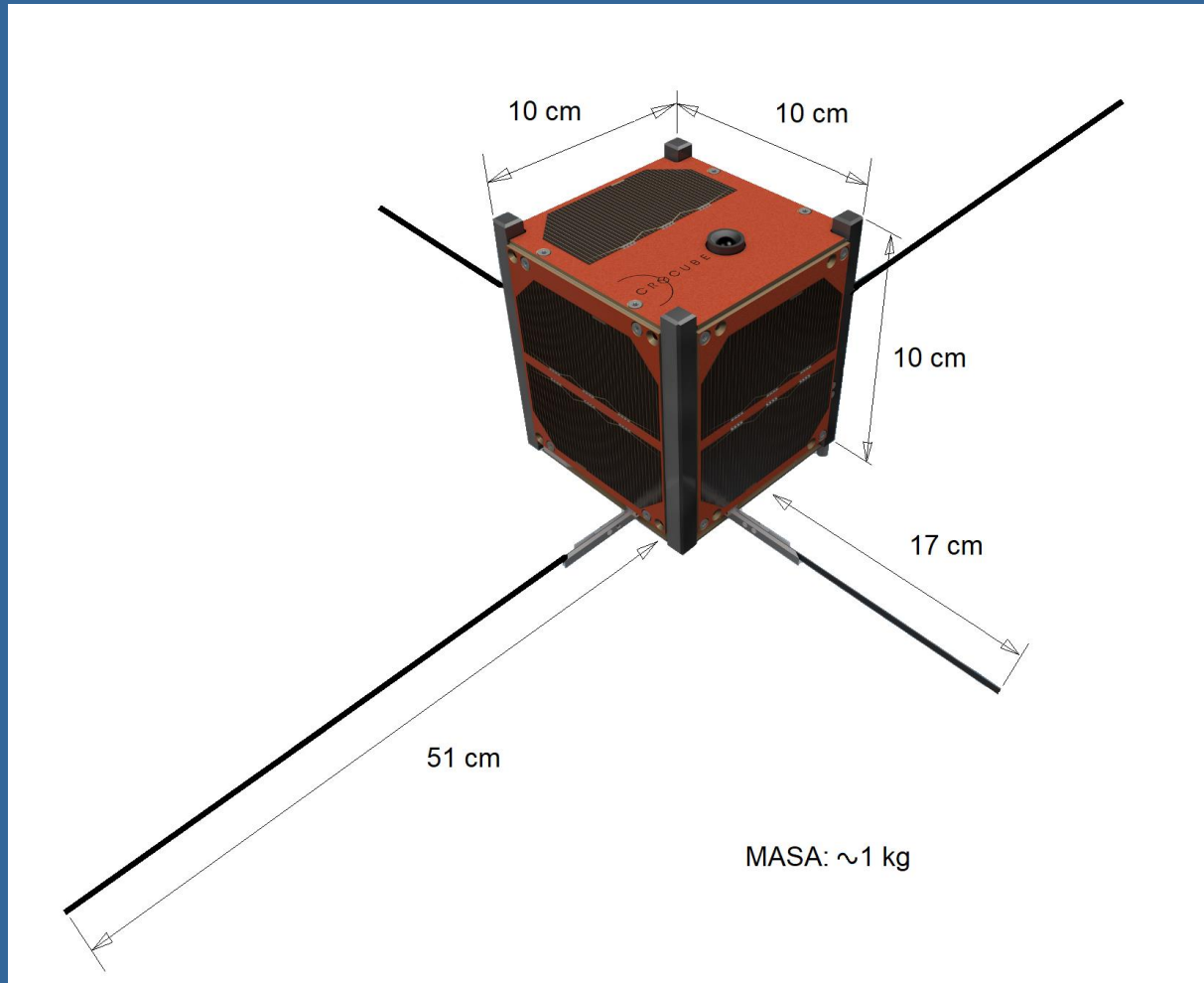


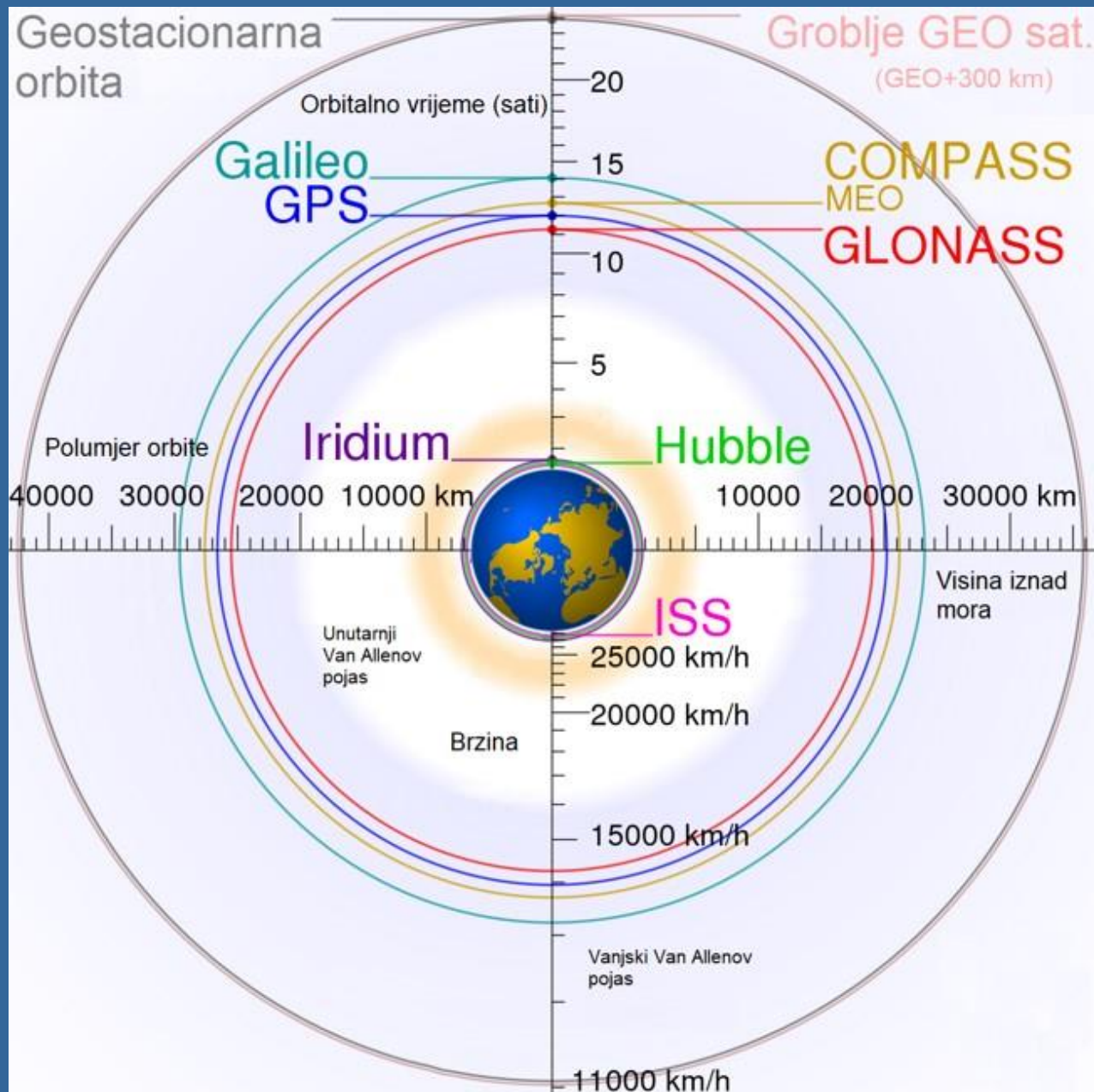
6U



12U

DIMENZIJE CroCube SATELITA





MEĐUNARODNA KOORDINACIJA (HRS, HAKOM, IARU, ITU)



Amateur Satellite Frequency Coordination Request v01 Page 1

The International Amateur Radio Union

AMATEUR SATELLITE FREQUENCY COORDINATION REQUEST

(Make a separate request for each space station to be operated in the amateur satellite service.)

PDF crocubereq2309...

CROCUBE

Amateur Satellite Frequency Coordination Request v01 Page 1

Crocube Mission HQ

September 21st, 2017, Split, Croatia

PDF appendix 2.pdf

Amateur Satellite Frequency Coordination Request v01 Page 1

The International Amateur Radio Union

AMATEUR SATELLITE FREQUENCY COORDINATION REQUEST

(Make a separate request for each space station to be operated in the amateur satellite service.)

PDF appendix 1.pdf

Amateur Satellite Frequency Coordination Request v01 Page 1

The International Amateur Radio Union

AMATEUR SATELLITE FREQUENCY COORDINATION REQUEST

(Make a separate request for each space station to be operated in the amateur satellite service.)

PDF crocubereq2309...

CROCUBE

Amateur Satellite Frequency Coordination Request v01 Page 1

Crocube Linkbud...

XLSX CroCube_Linkbud...

CROCUBE

Amateur Satellite Frequency Coordination Request v01 Page 1

Crocube Linkbud...

XLSX CroCube_Linkbud...



145,975 MHz

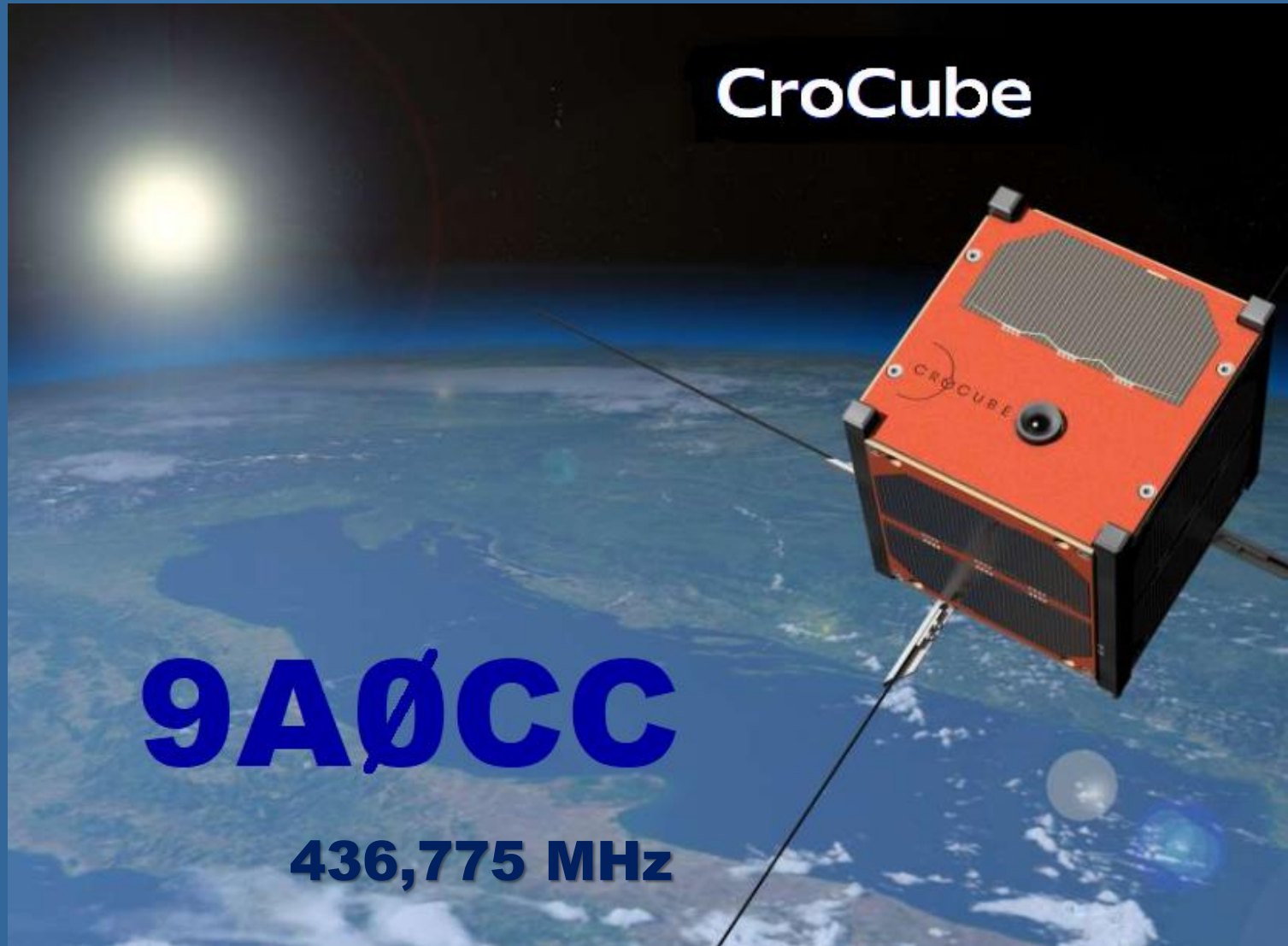


436,775 MHz

CroCube

9A0CC

436,775 MHz



KLJUČNI PARTNER I SURADNIK SPACEMANIC, SLOVAČKA



SPACEMANIC

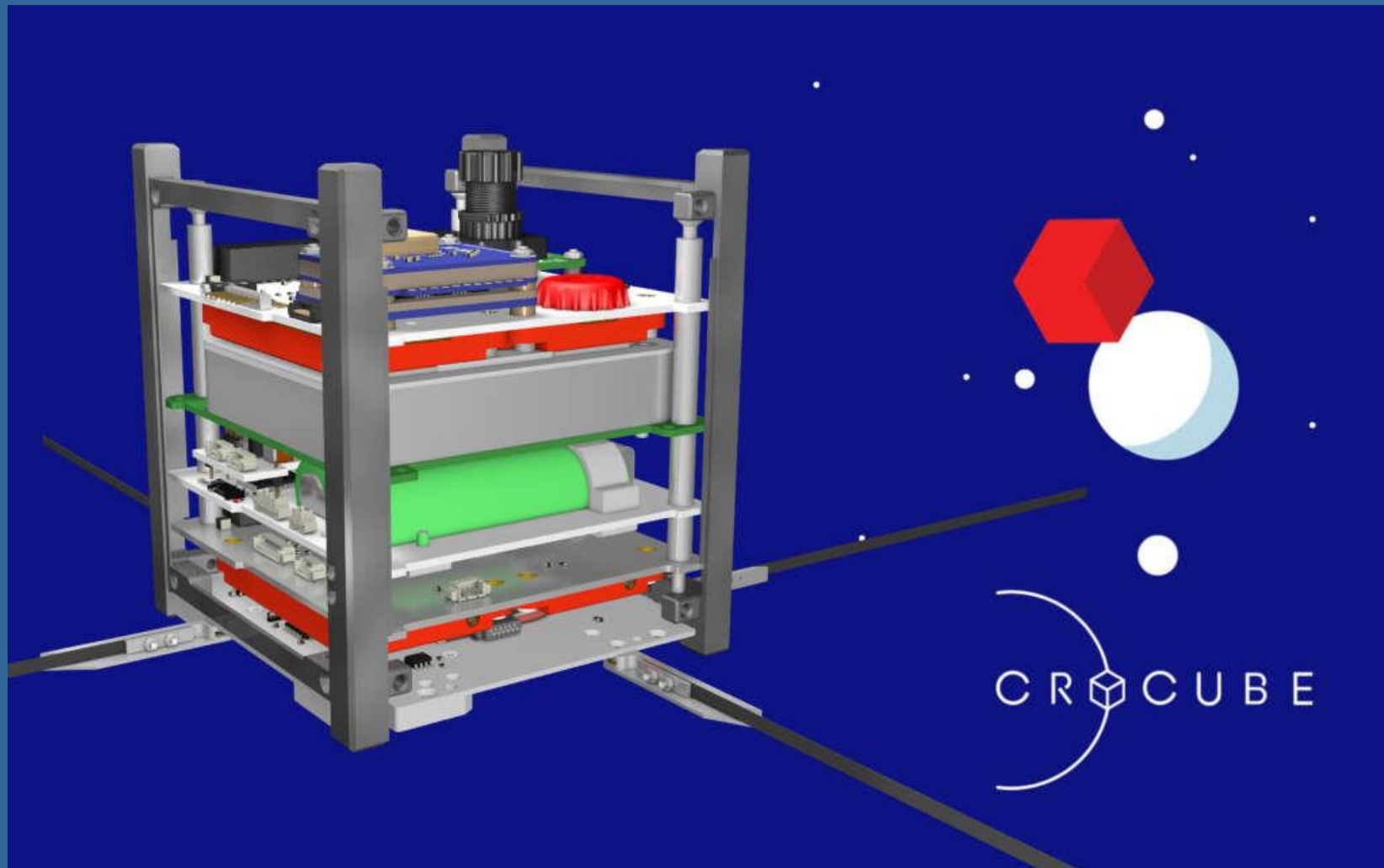


Our mission is to provide
a time and cost-effective
satellite as a service
solution for our customers

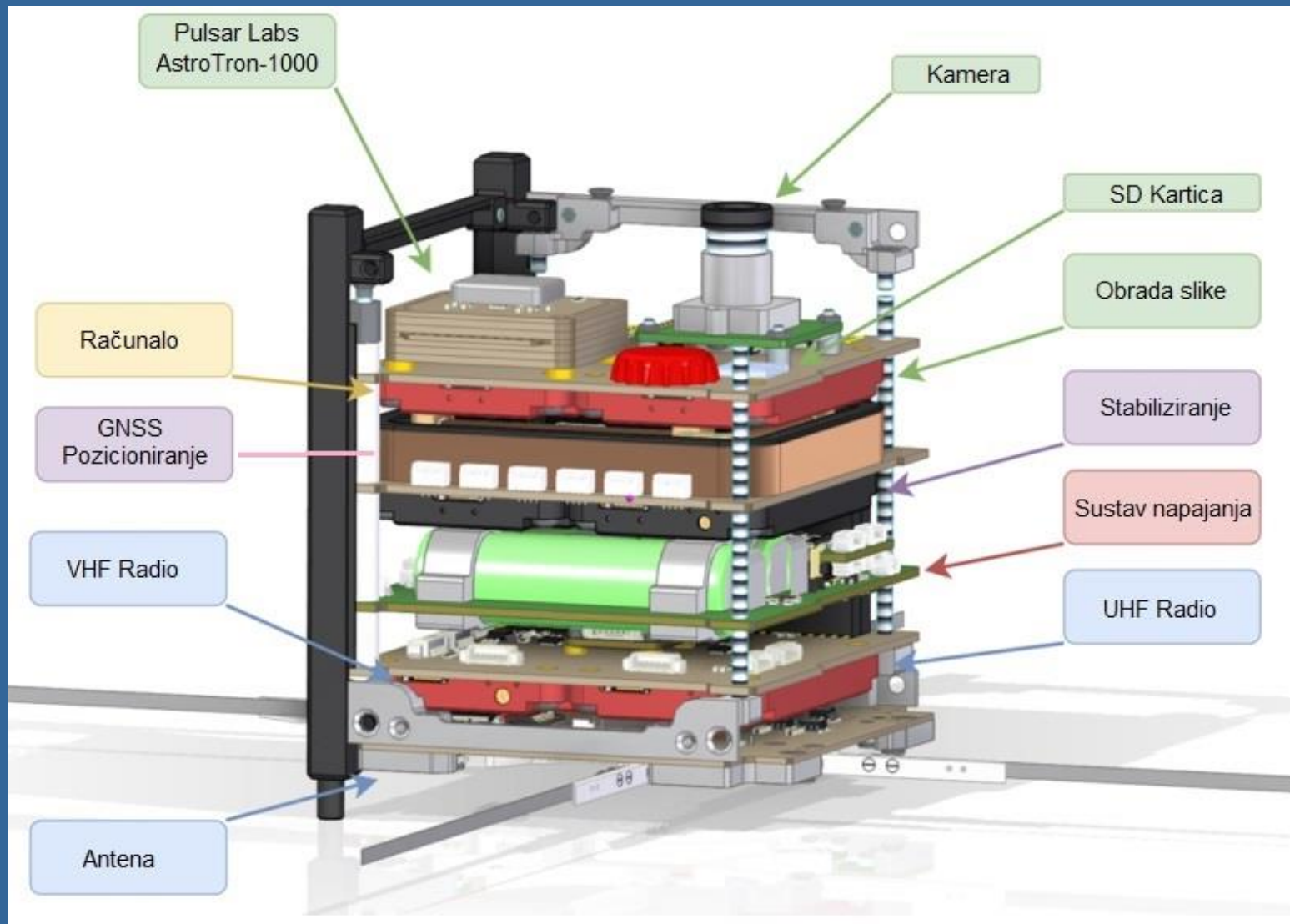
EDUKACIJA



ALAT U RUKE!



SASTAVNICE SATELITA

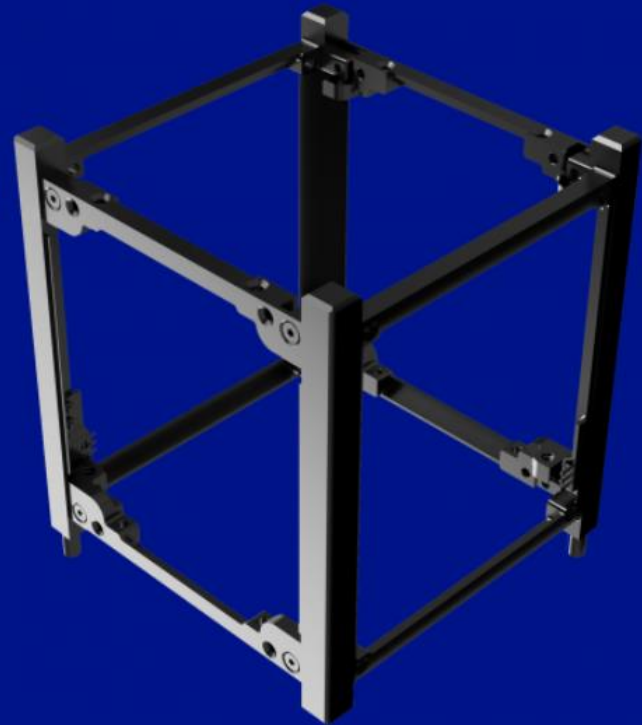


Struktura

Konstrukcija koja pruža potporu i stabilnost svim ostalim podsustavima satelita.

Struktura mora izdržati stres proizvodnje, sastavljanja, testiranja i transporta.

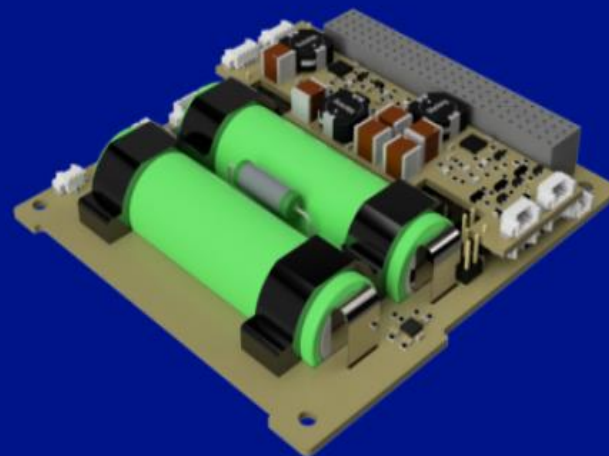
Napravljena je od aluminija a najčešće je mase manje od 0.5 kg.



Napajanje

Sustav opskrbe energijom je glavni izvor napajanja za cijeli sustav, tzv. "srce" satelita.

Sastoji se od solarnih panela i baterija, a zadužen je za upravljanje proizvodnjom, pohranom i distribucijom energije.

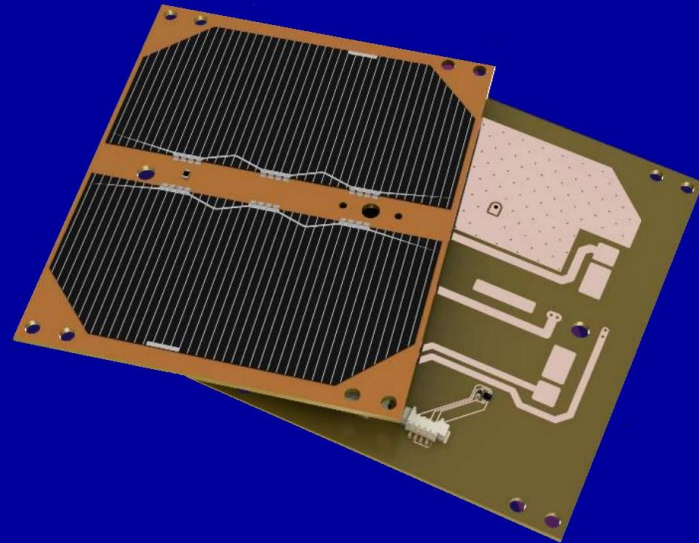


Solarni paneli

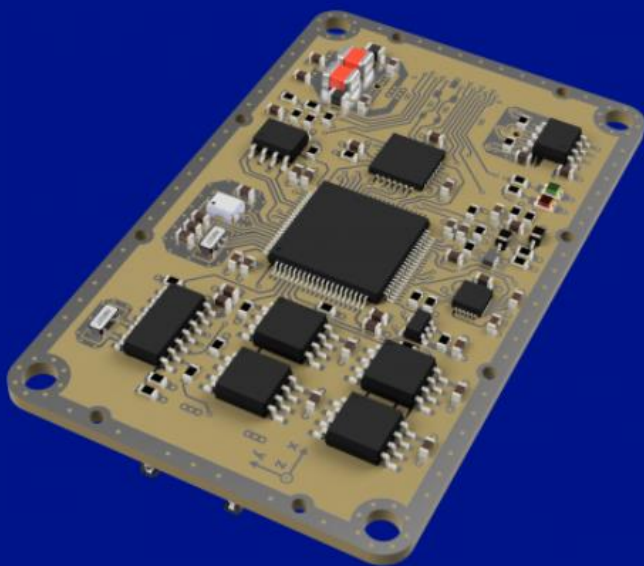
Nominalni napon: 4,82 V

Struja: 0,5 A

Iskoristivost: 30%

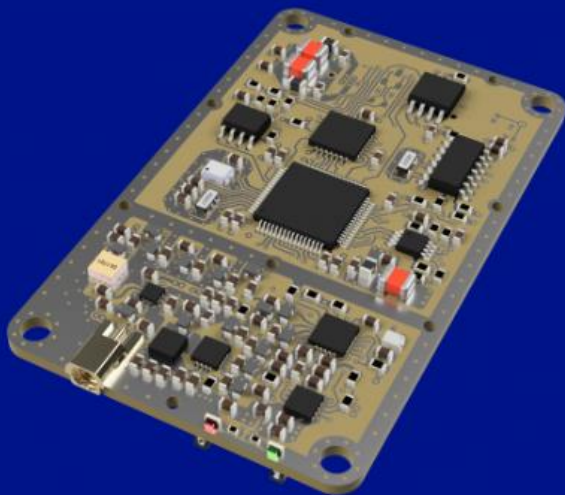


Računalo



Tzv. "mozak" satelita, povezuje sve podsustave, kontrolira ih i daje im upute za rad.

Sustav komunikacije



Jedan od najvažnijih podsustava satelita je radio. Njegov glavni zadatak je slanje i primanje radio signala sa zemaljske stanice putem UHF / VHF antena.

Nadalje tu je i deployable antenna – antena koja se razvije van iz satelita kad satelit dodje na odrediste u orbiti. Radio iskoristi antenu kako bi svoj signal pojačalo i doprlo do zemaljske stanice, gdje će podatci biti obrađeni preko software-a.

Sustav orijentacije i stabilizacije

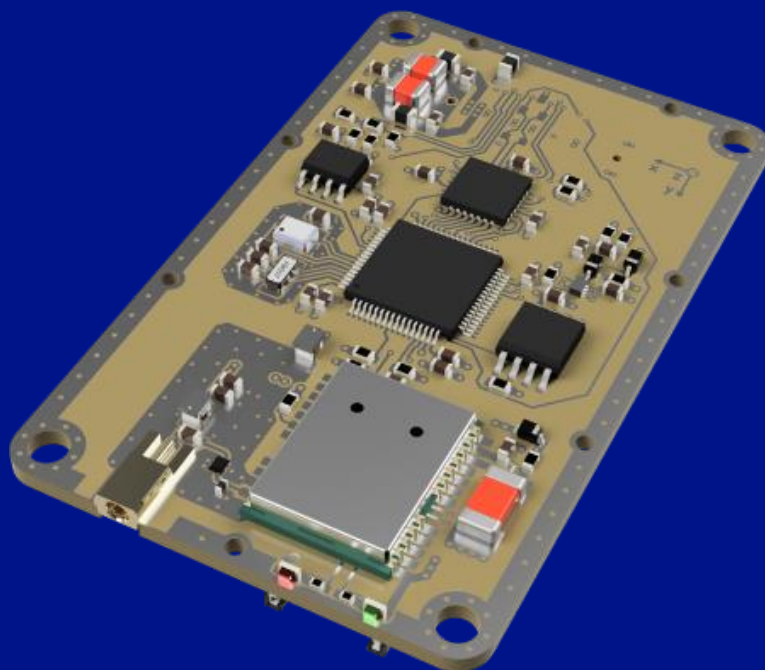
Satelit će za orijentaciju koristiti zavojnice tvrtke Serenum Space, koje će mu pomoći kod zaokretanja i stabilizacije. Stabilizacija se vrši pomoću magnetometra i gyroskopa, koji će omogućiti djelomično manevriranje i kompenzirati rotaciju u tri osi takozvani "detumbling"

Kamera



Glavni teret satelita je UCAM-III tvrtke 4D systems, koja će fotografirati površinu Zemlje s 500 km visine.

Sustav za pozicioniranje (GNSS)



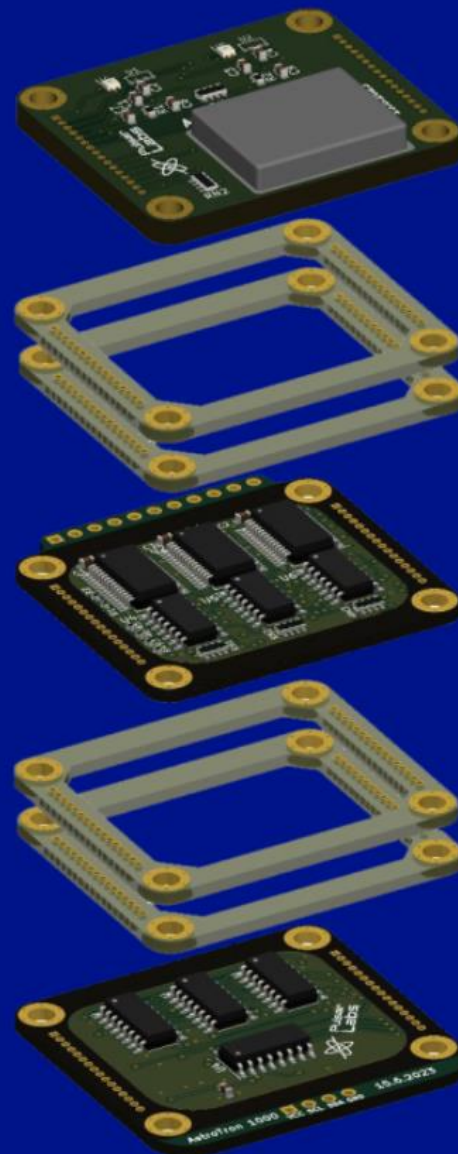
AstroTron 1000

Hrvatska tvrtka **Pulsar Labs**, osmislila je hrvatski modul – AstroTron

AstroTron je sustav s trostrukim mikrokontrolerima i trostrukim sensorima koji je osmišljen kako bi revolucionirao jeftinu elektroniku u svemiru. Sa redundancijom i autonomnim radom.

Tri mikrokontrolera djeluju kao jedinstvena cjelina, provode sustavne testove i bilježe greške. Šest svjetlosnih senzora, uključujući dva skrivena senzora za mjerenje šuma. Koristeći CSP protokol preko I2C, AstroTron je eksperiment u kojem se istovremeno ispituje izdržljivost mikrokontrolera, performanse svjetlosnih senzora i I2C matrica prebacivanja s arbitražnim krugom.

AstroTron ima za cilj postati pouzdana, ekonomična i jednostavna za korištenje platforma za Cubesatove koja podržava različite eksperimente. Njegove tri ploče nude senzore, mikrokontrolere s arbitražom i I2C povezivanje s inteligentnim mogućnostima zaobilaznja kvarova.

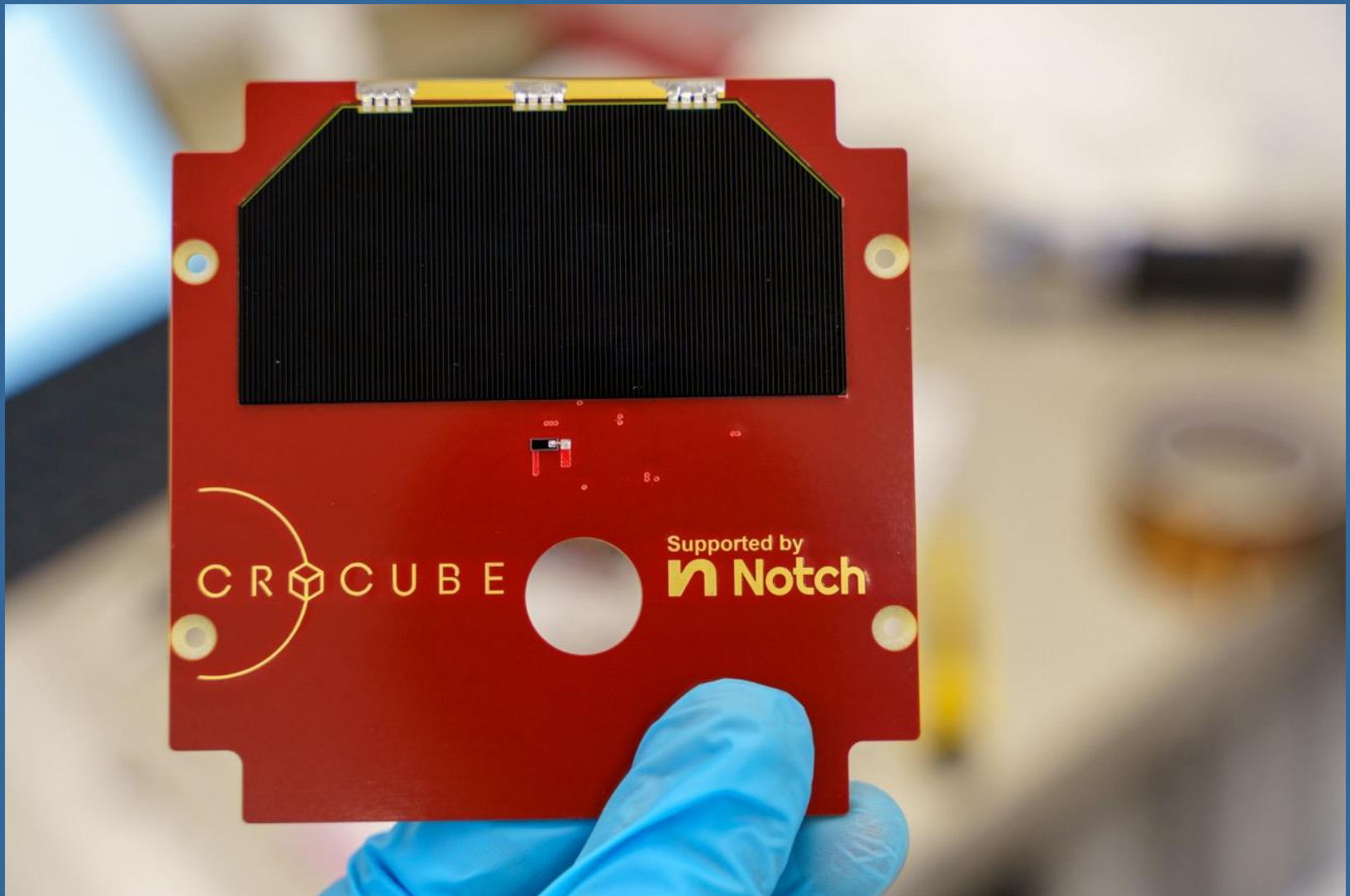


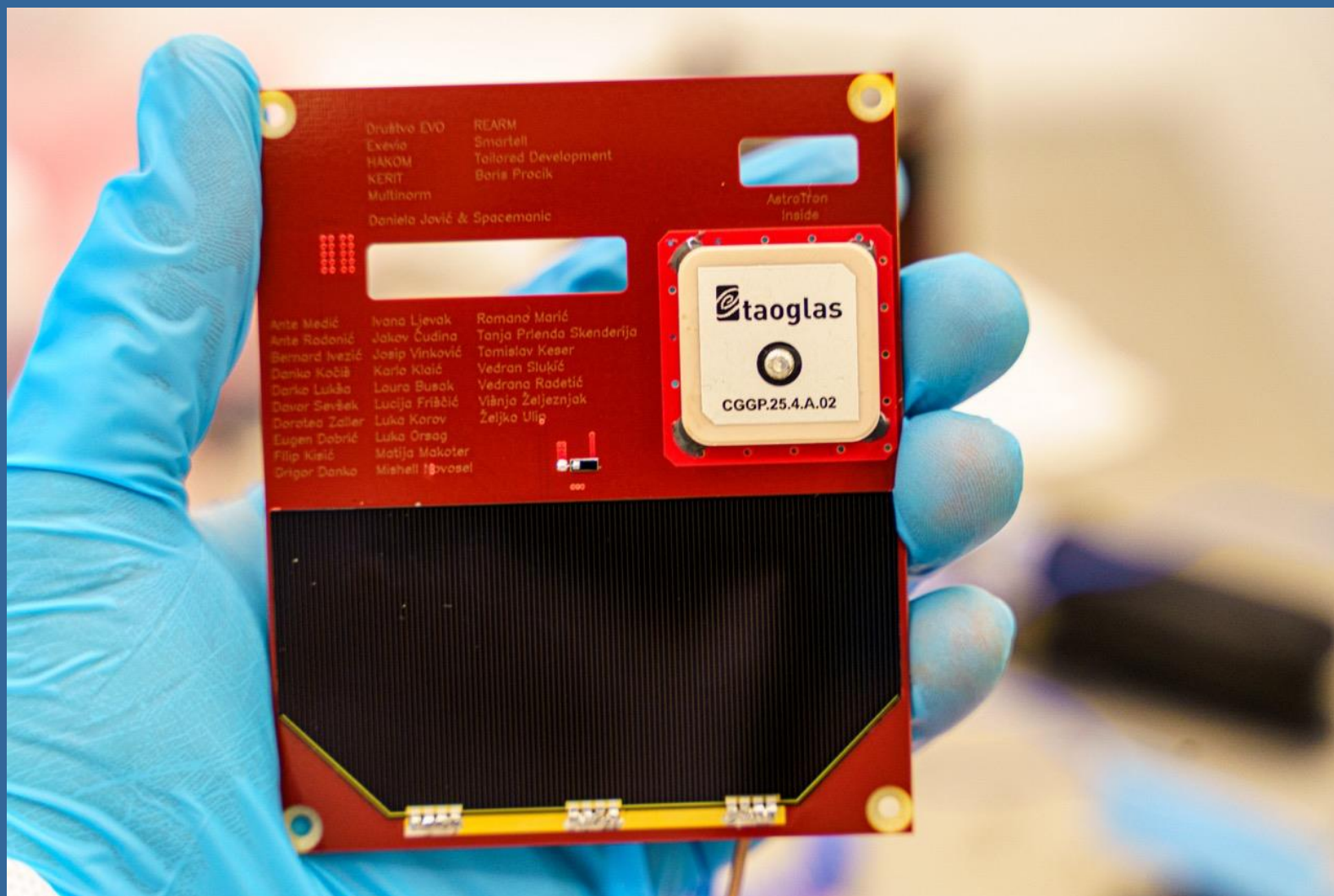
INSTITUT ZA FIZIKU, ČISTA SOBA



Institut za fiziku



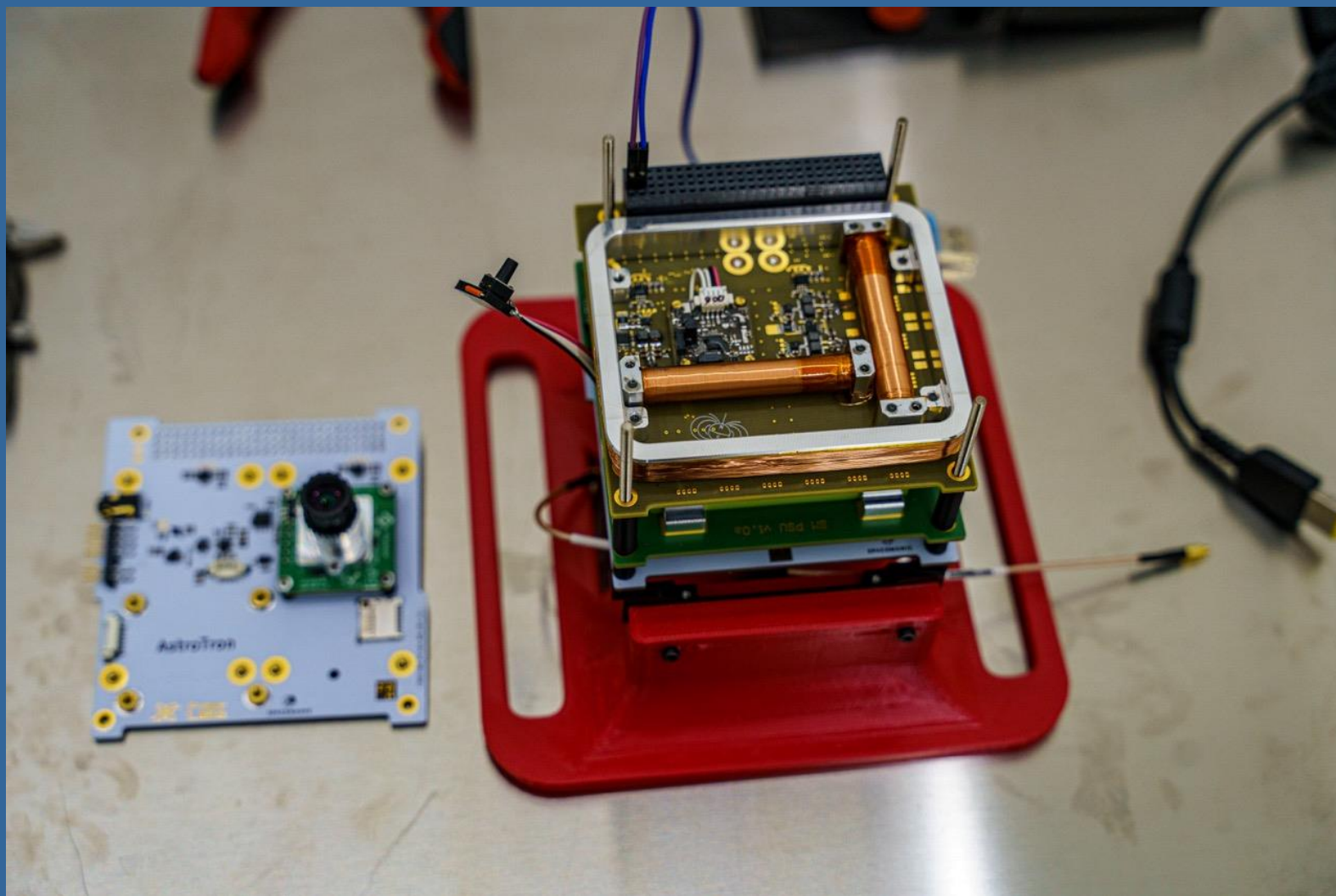


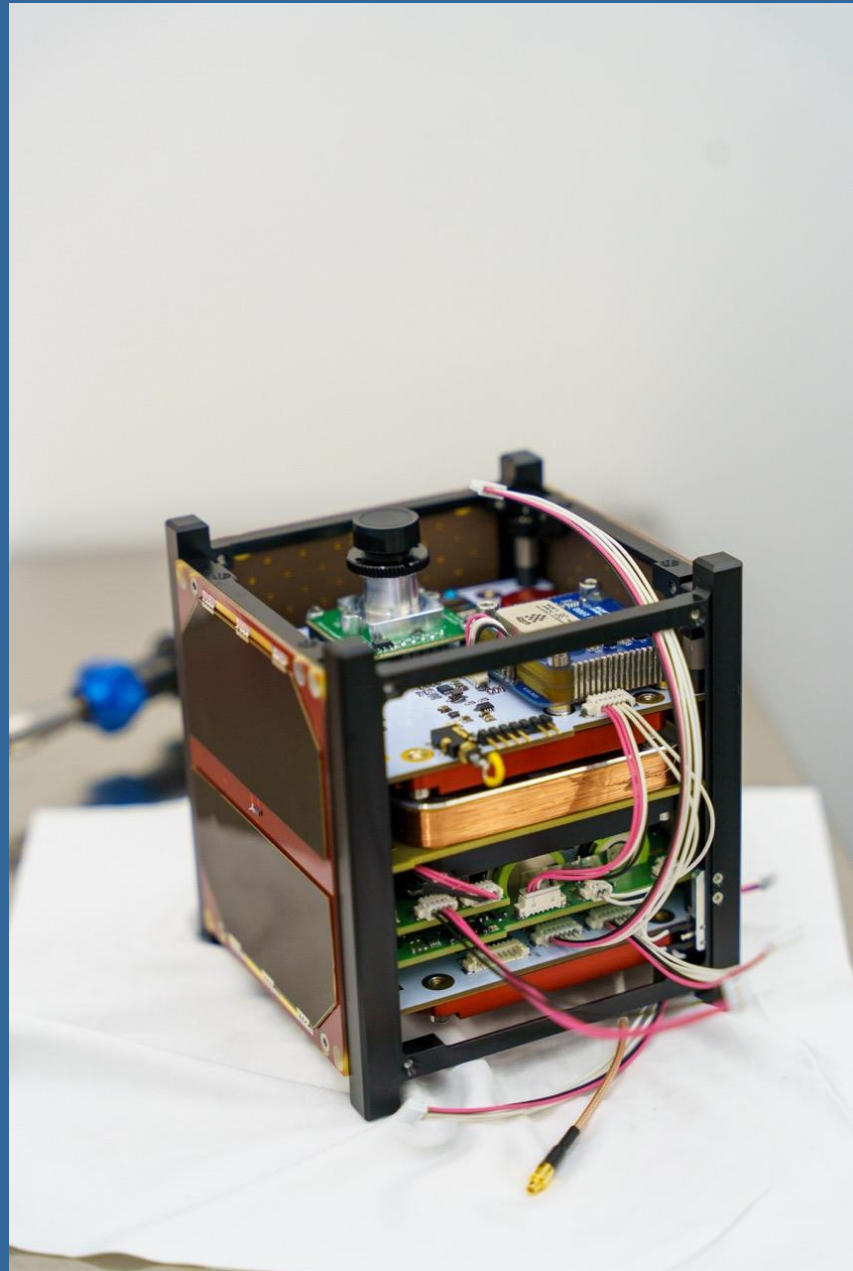


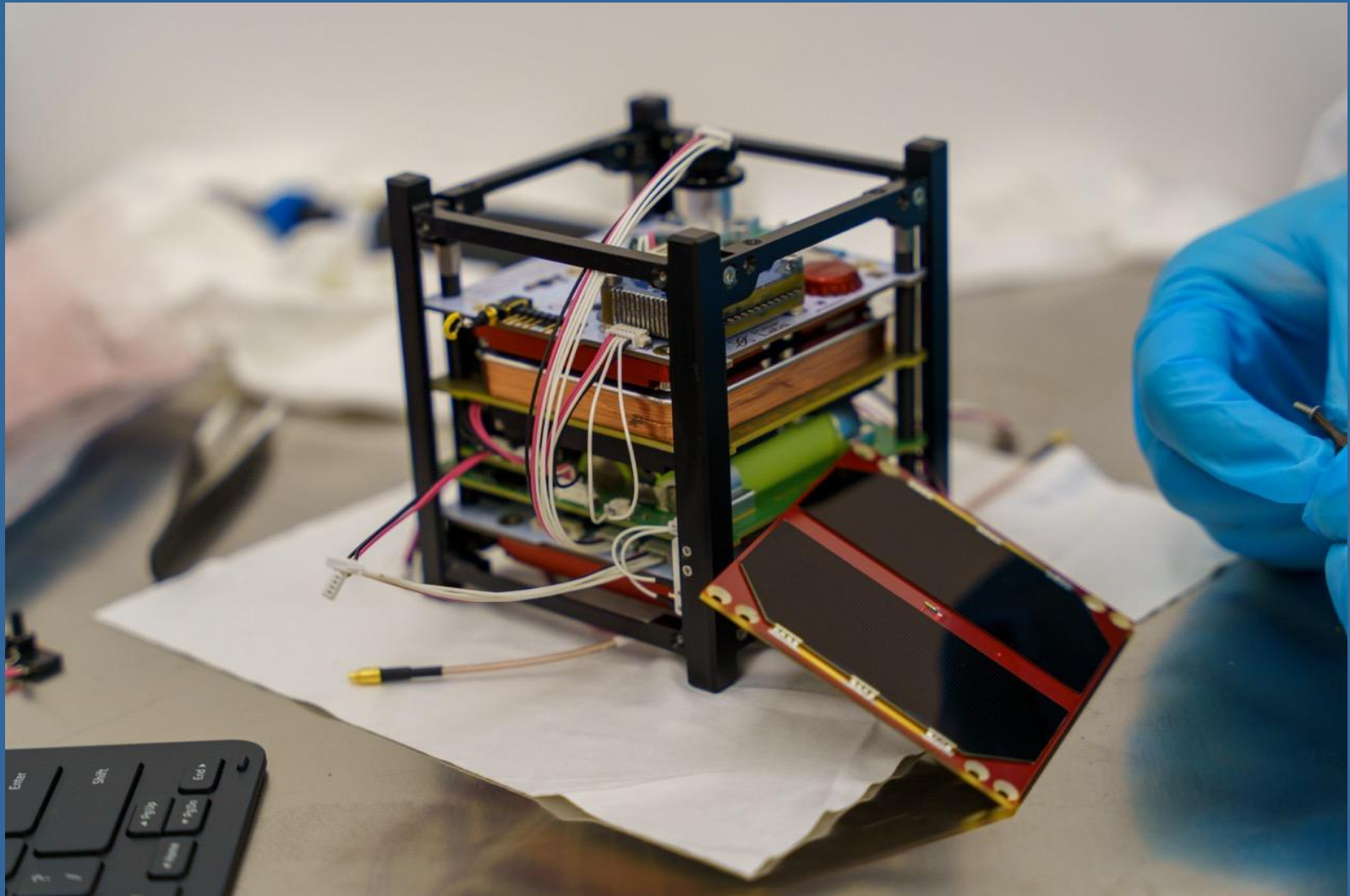


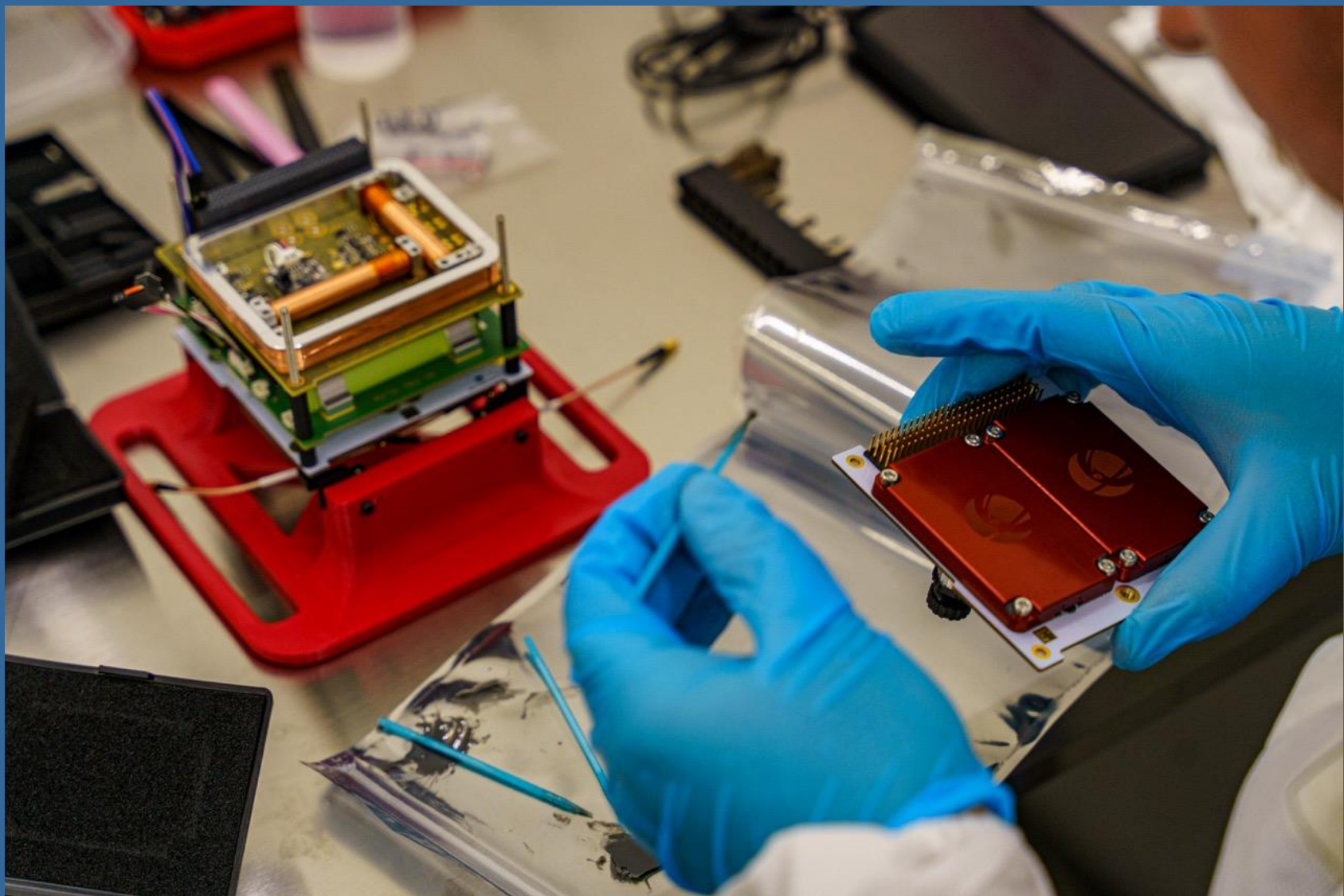


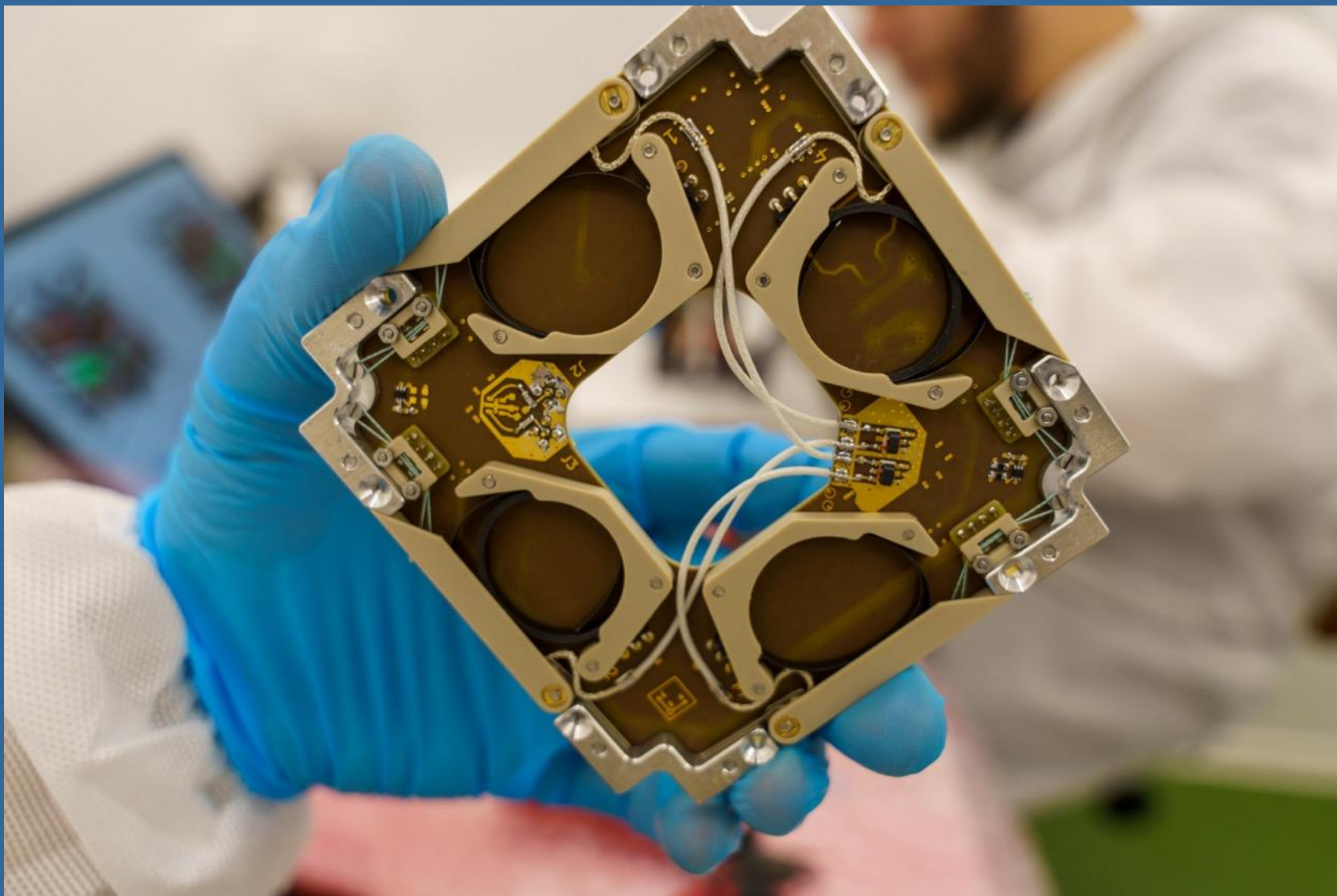




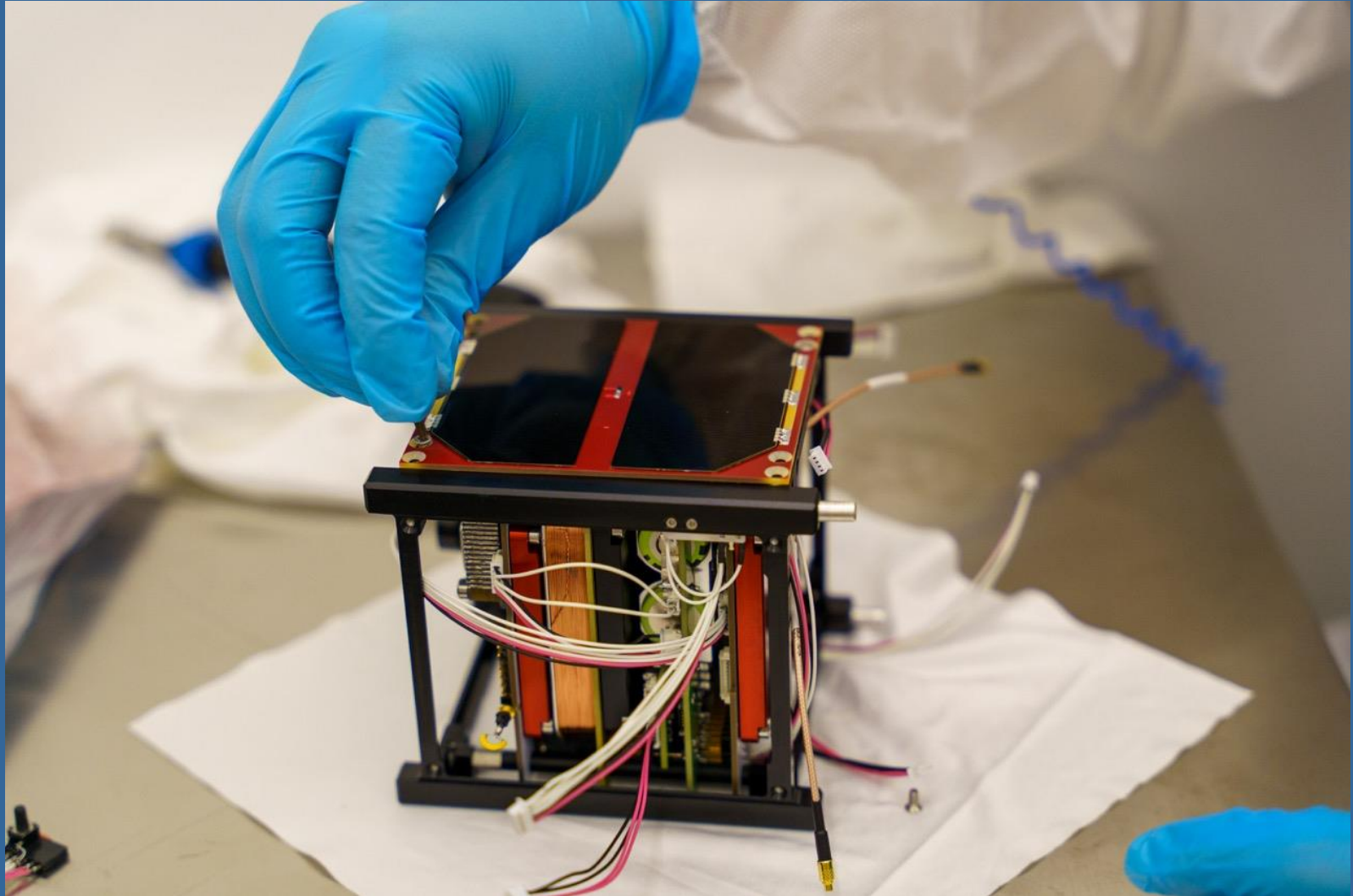


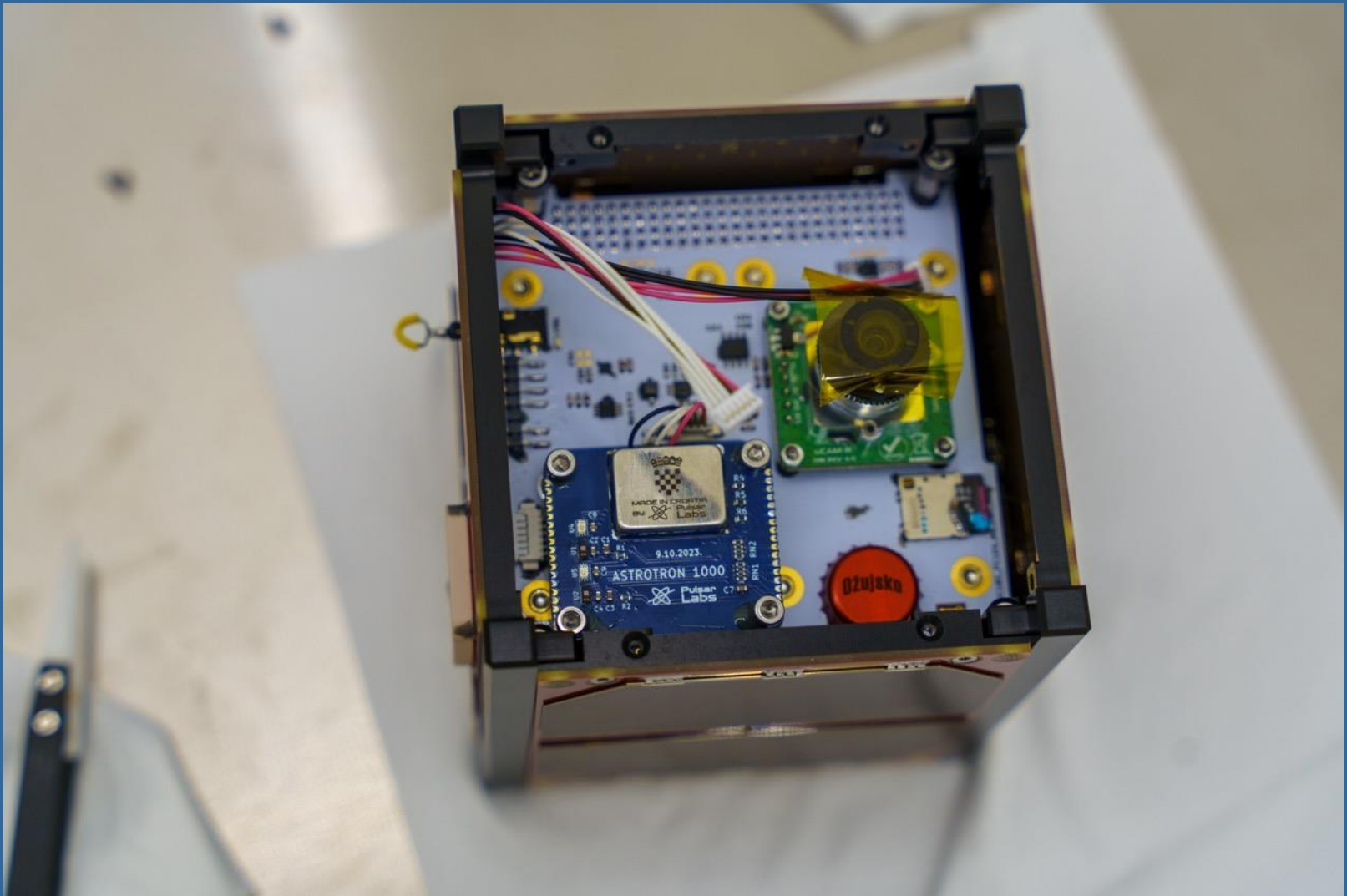






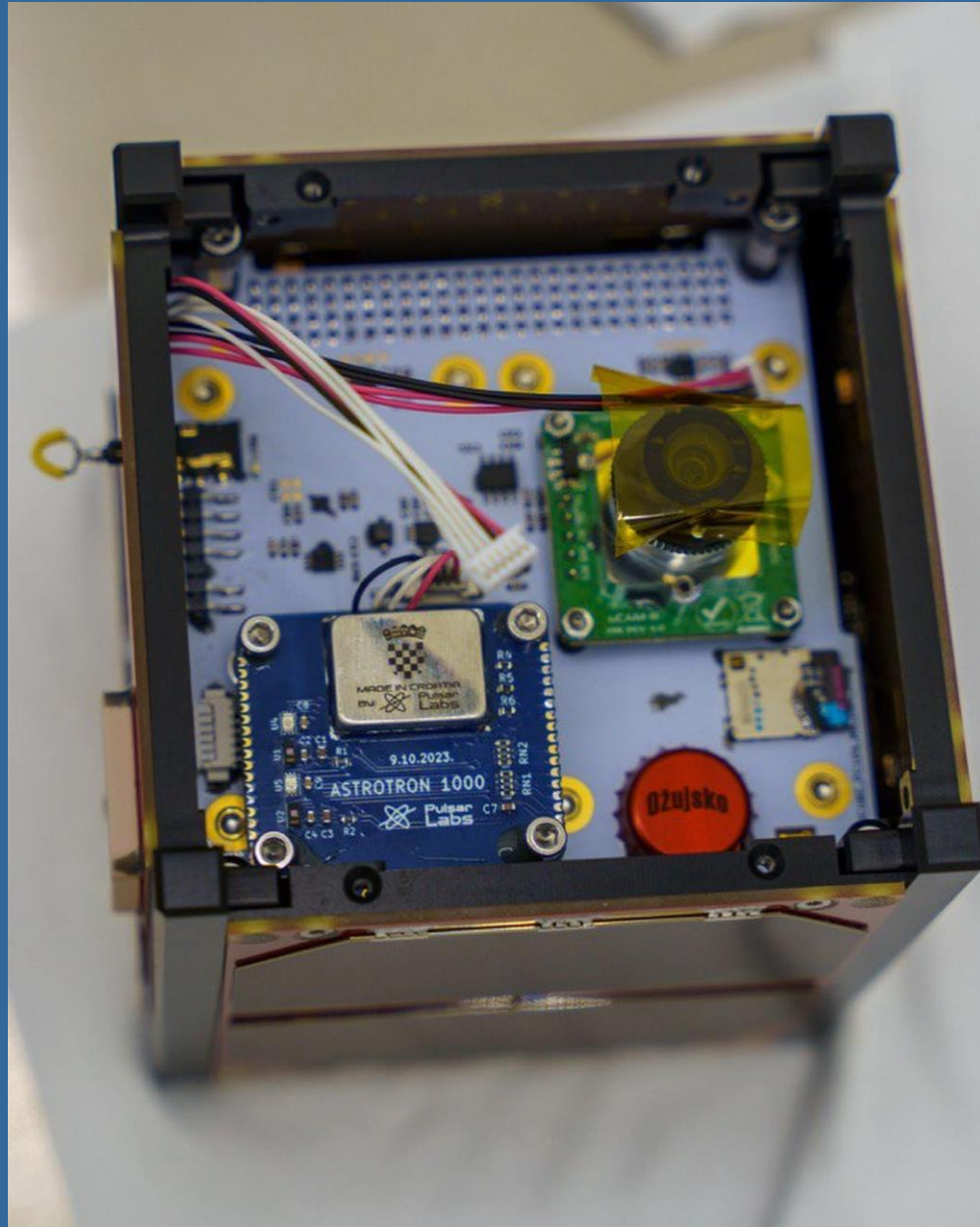




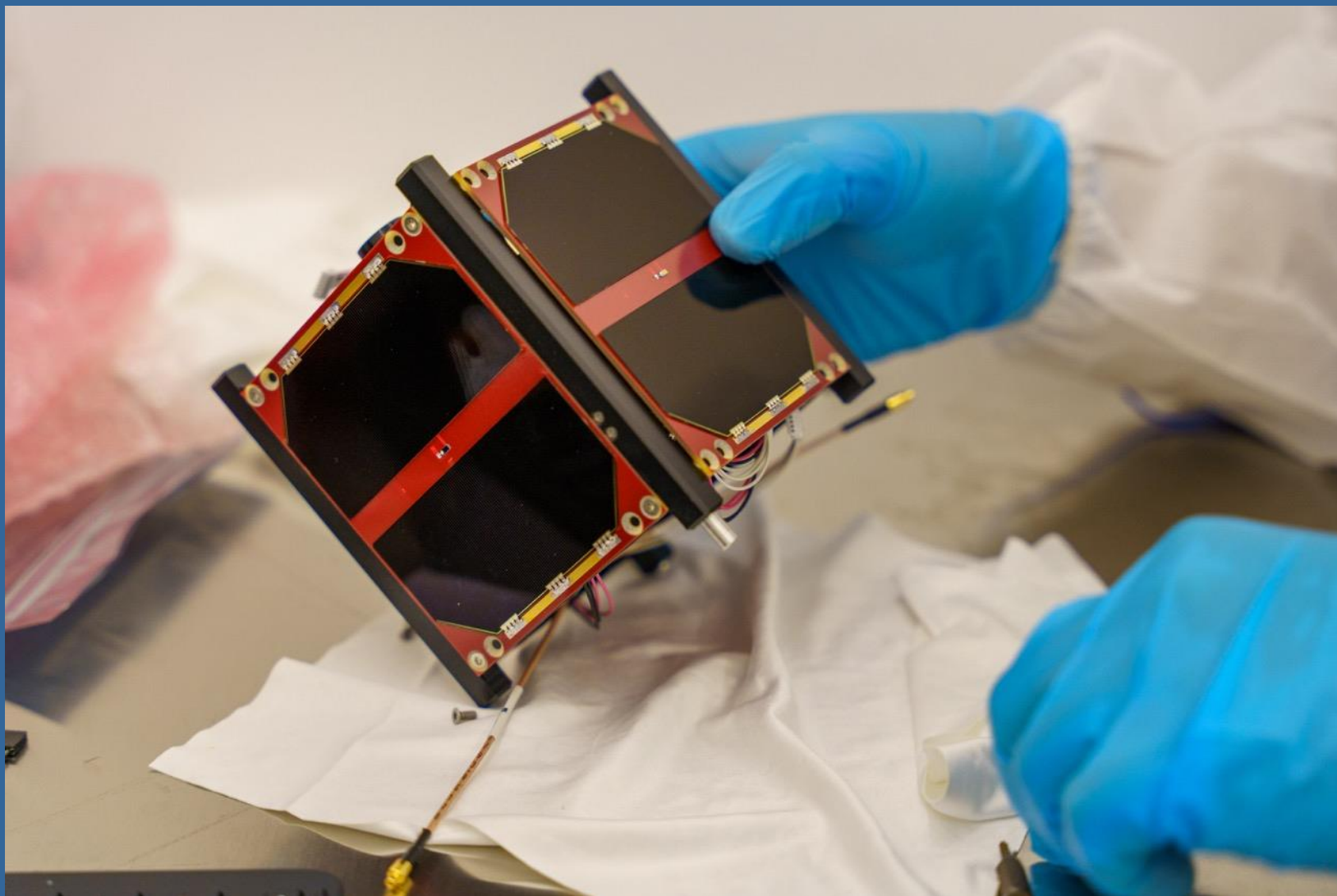


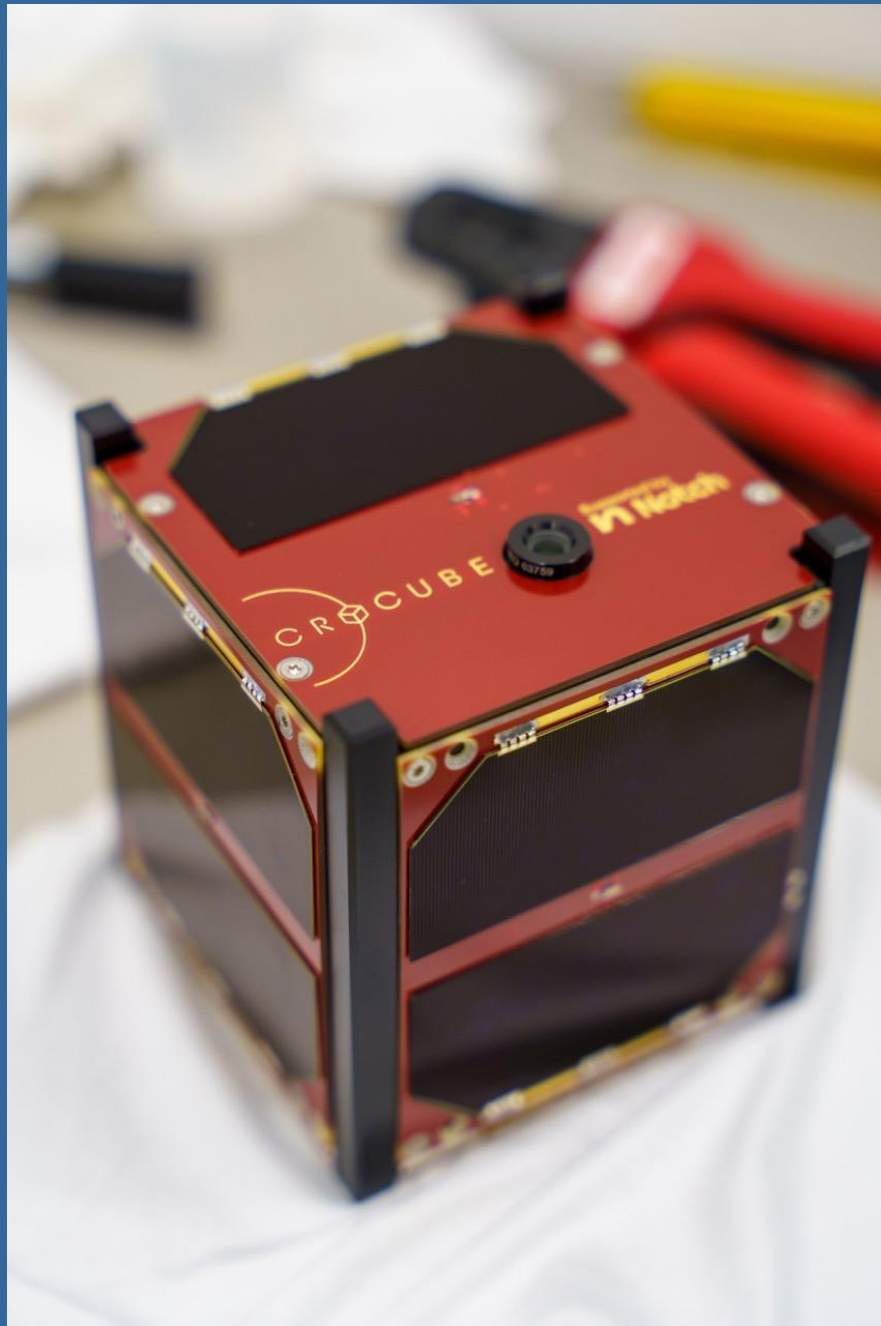


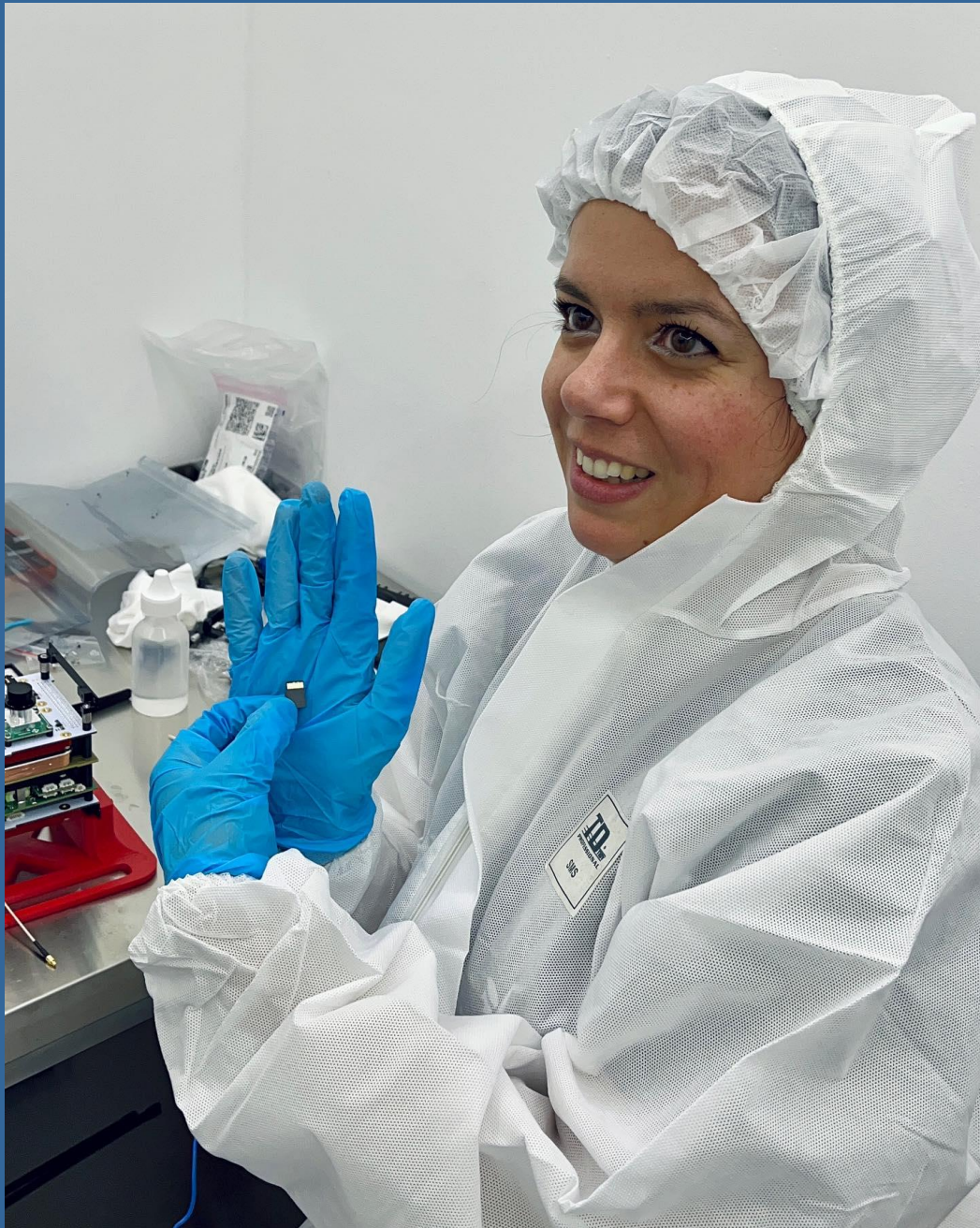


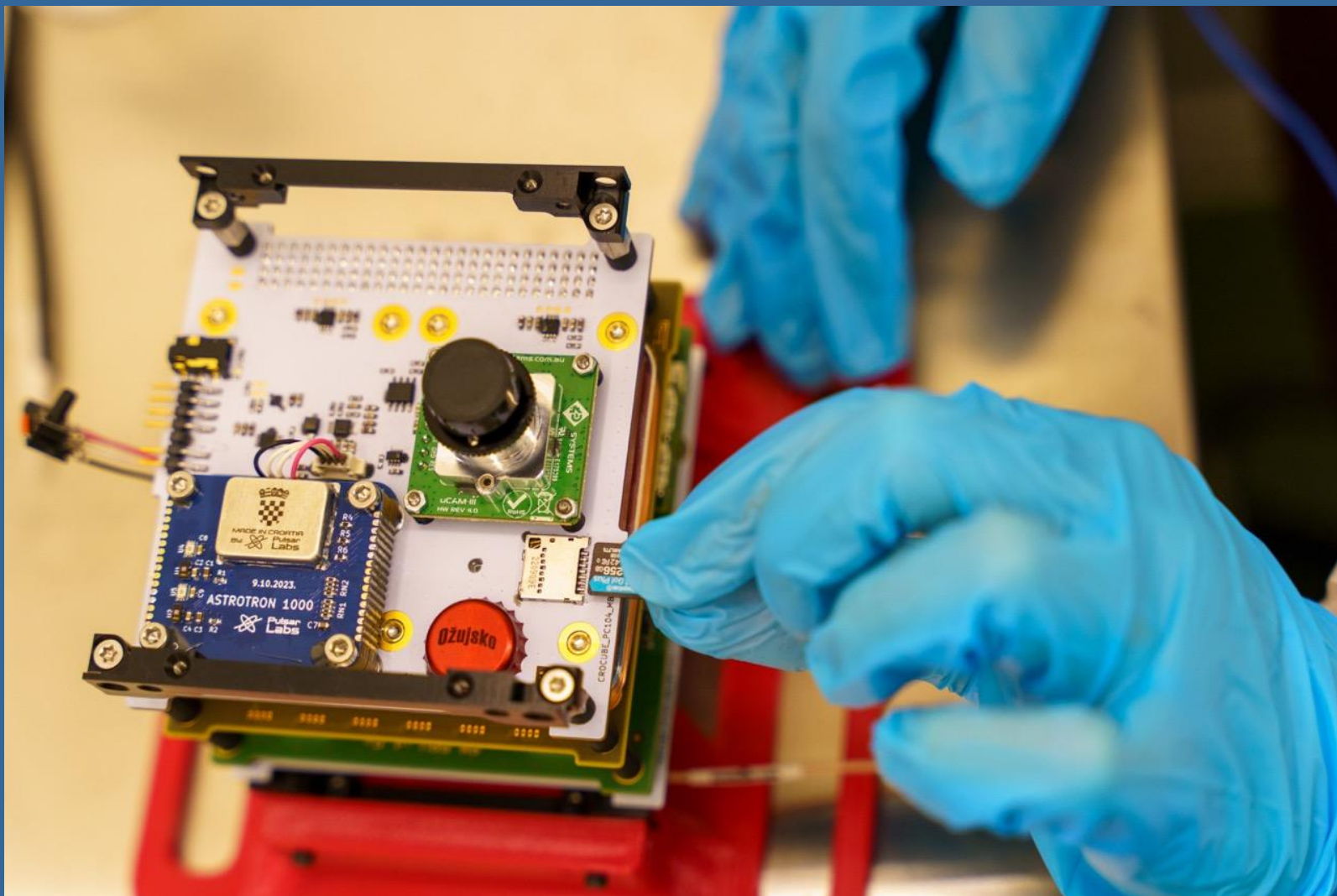












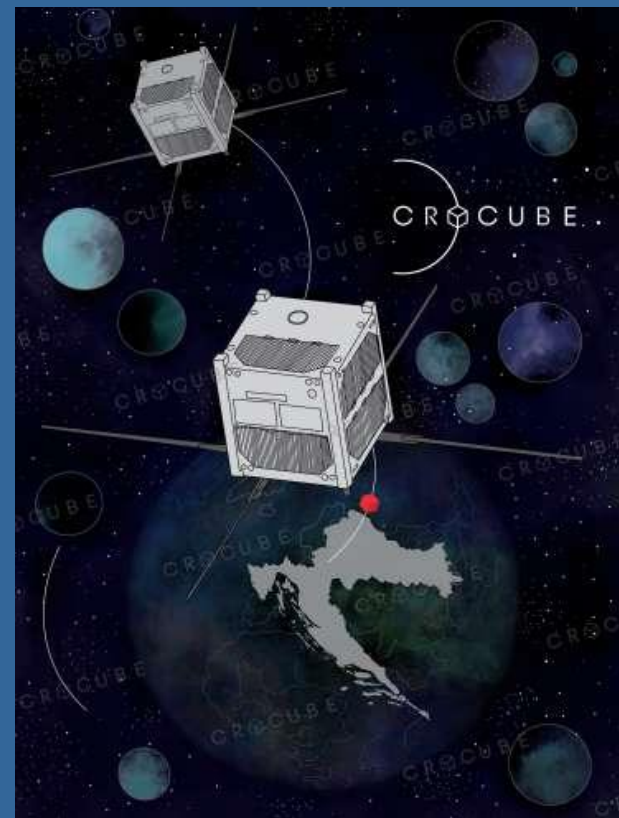
UMJETNIČKI RADOVI NA microSD KARTICI



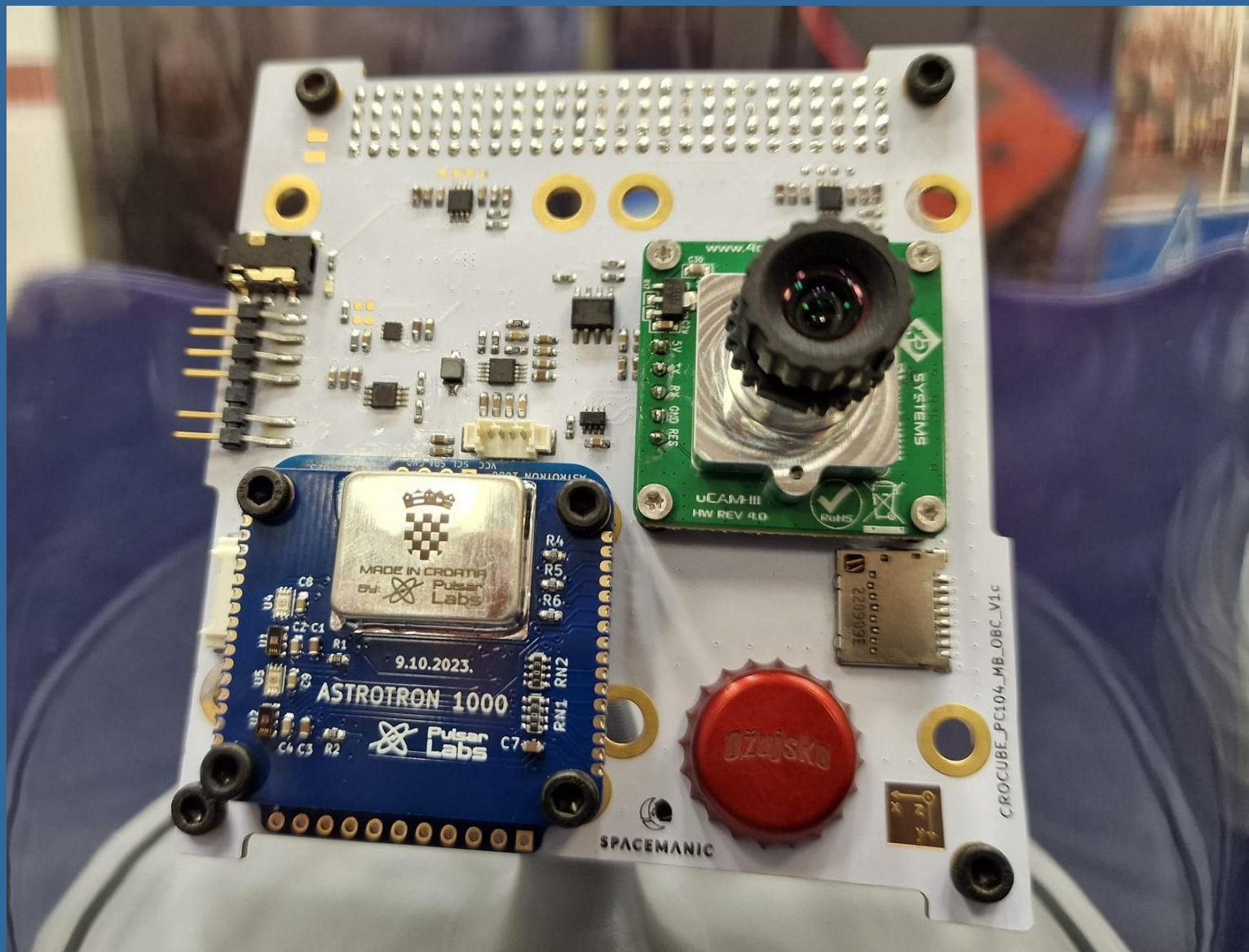
**DJECA IZ
OŠ BUDROVCI**

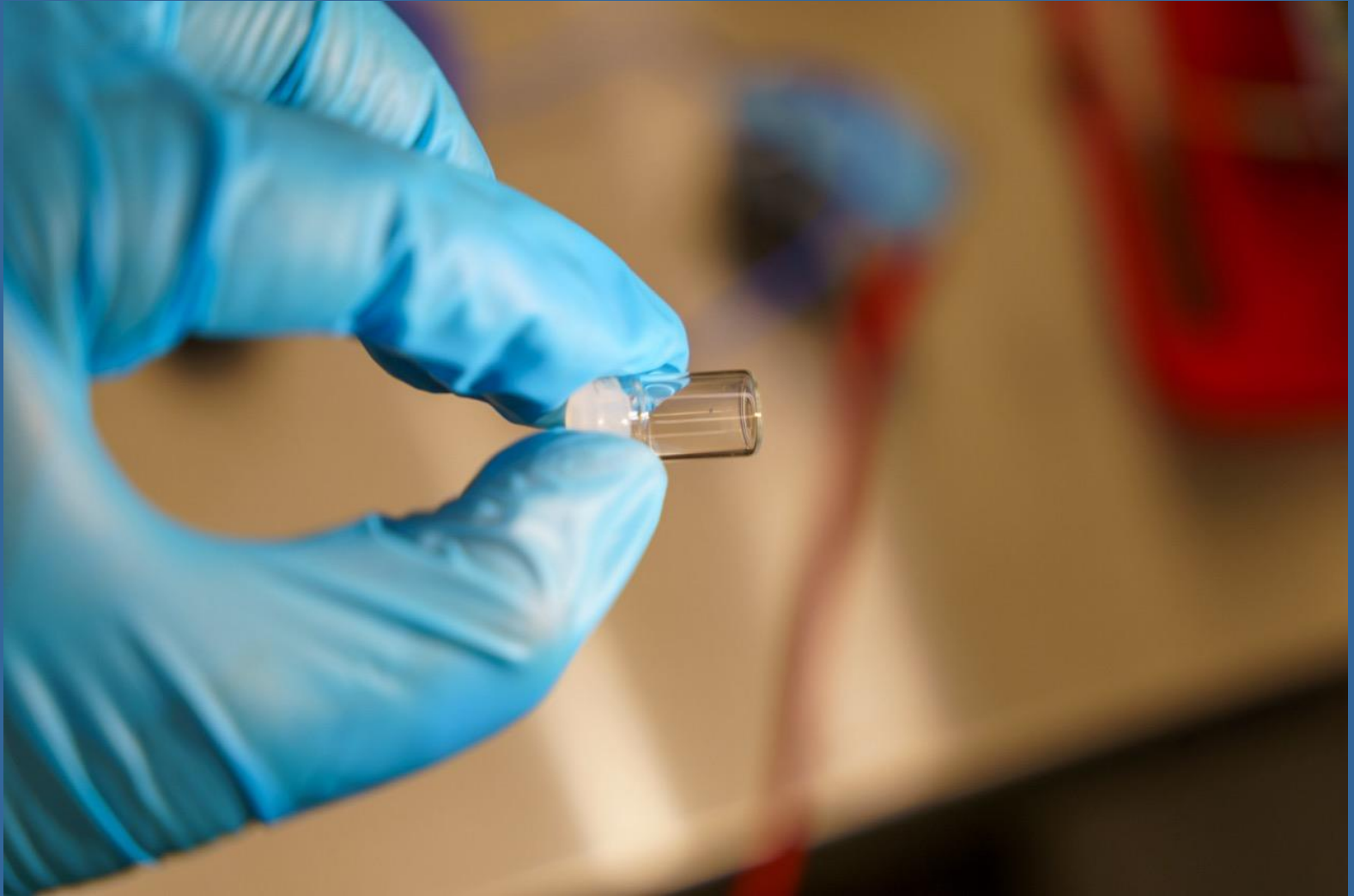


MLADEN SPEVAN

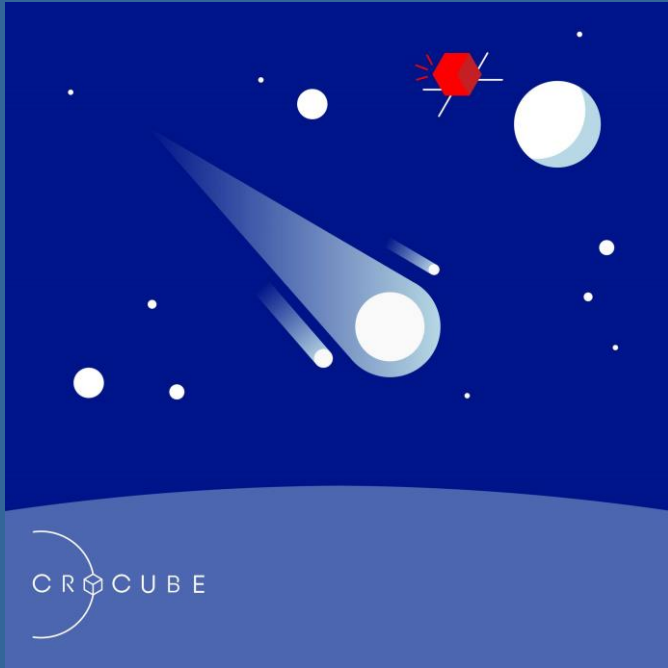


LARA KOMADINA

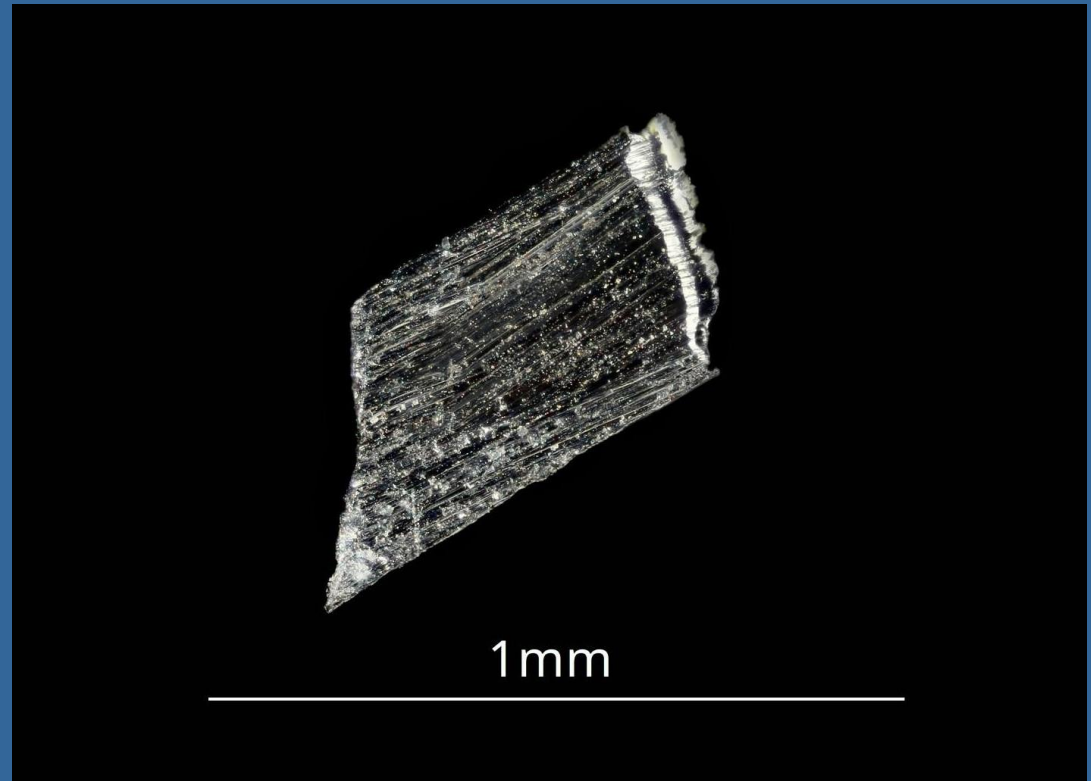




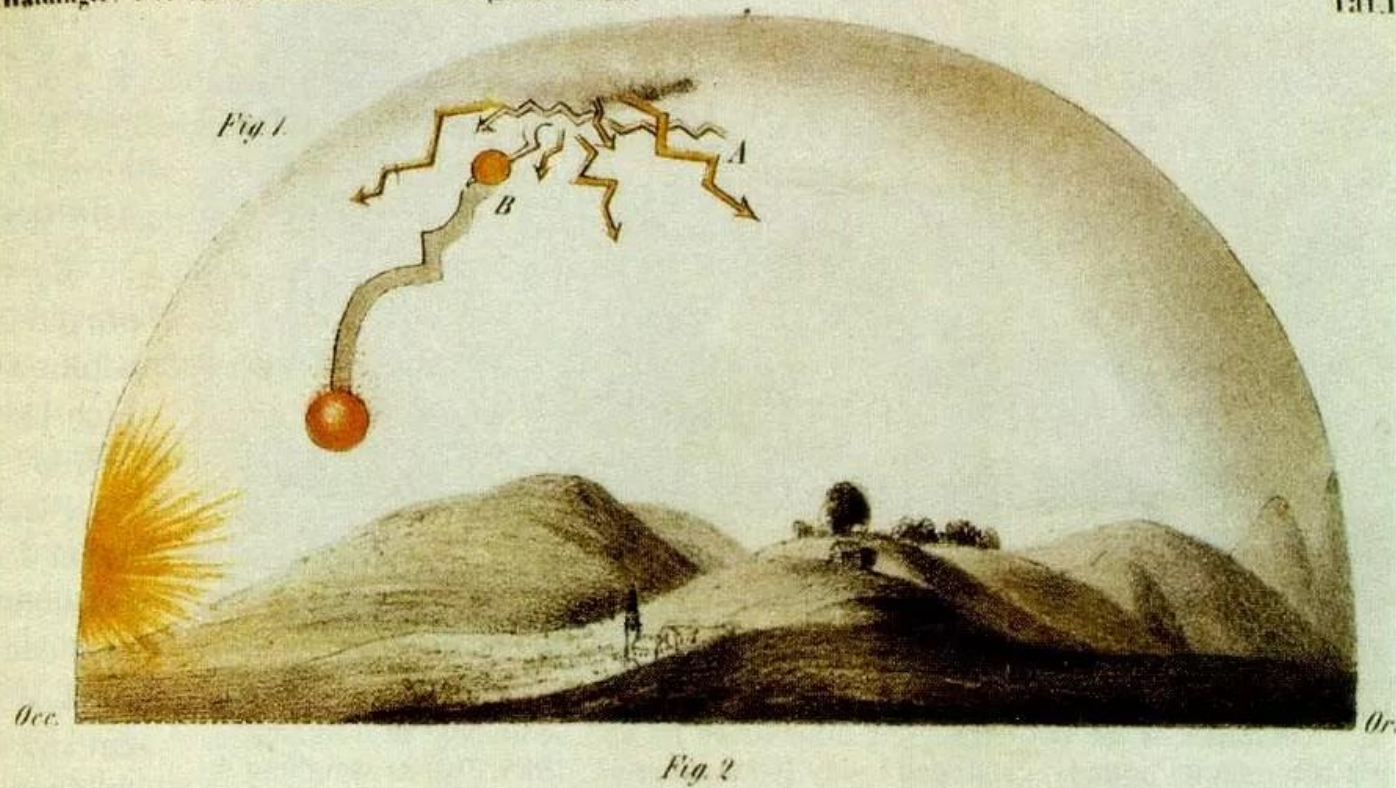
HRAŠČINSKI METEORIT



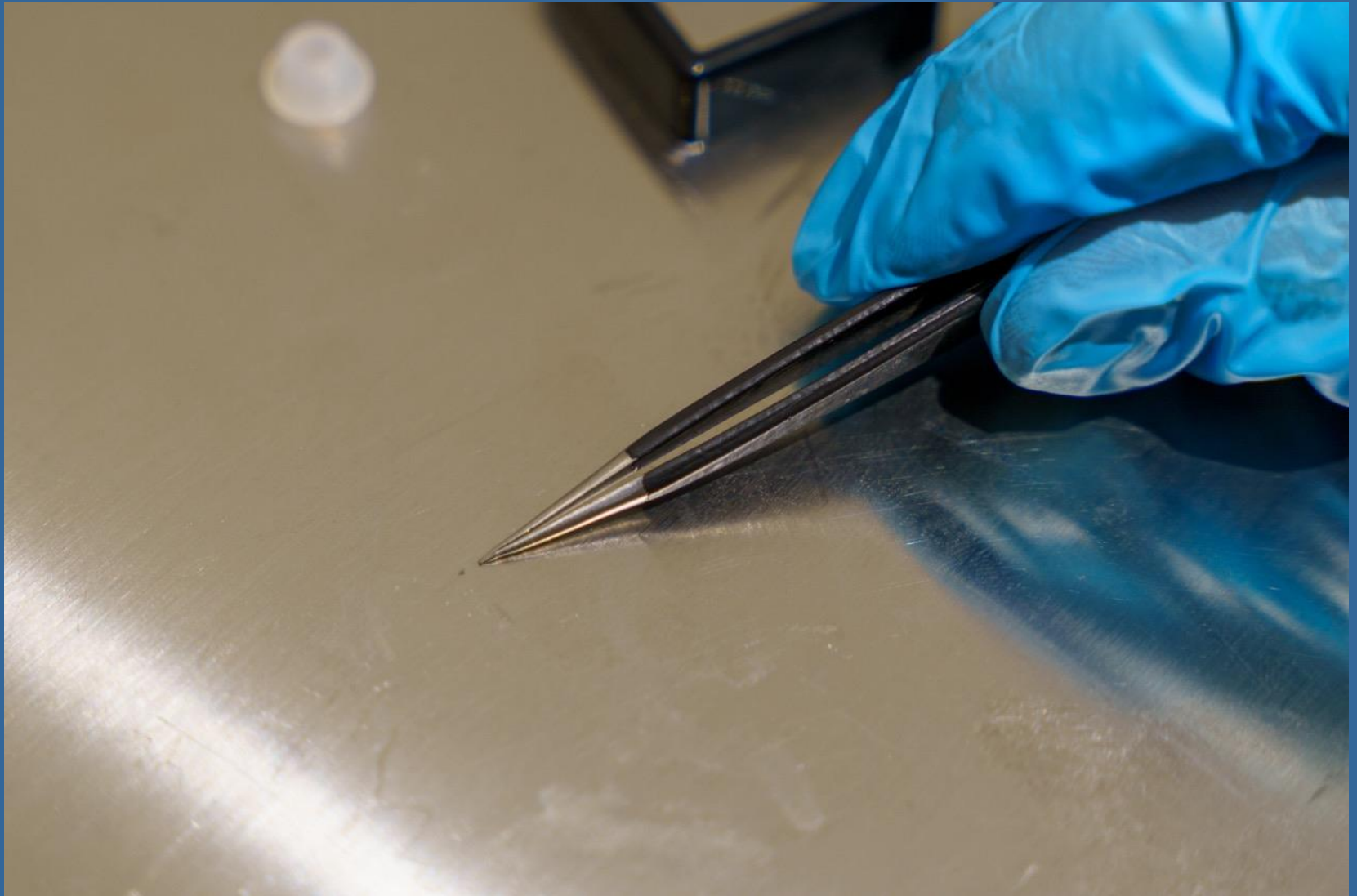
**DAR PROFESORA
DOMYANA SVILKOVICHA**

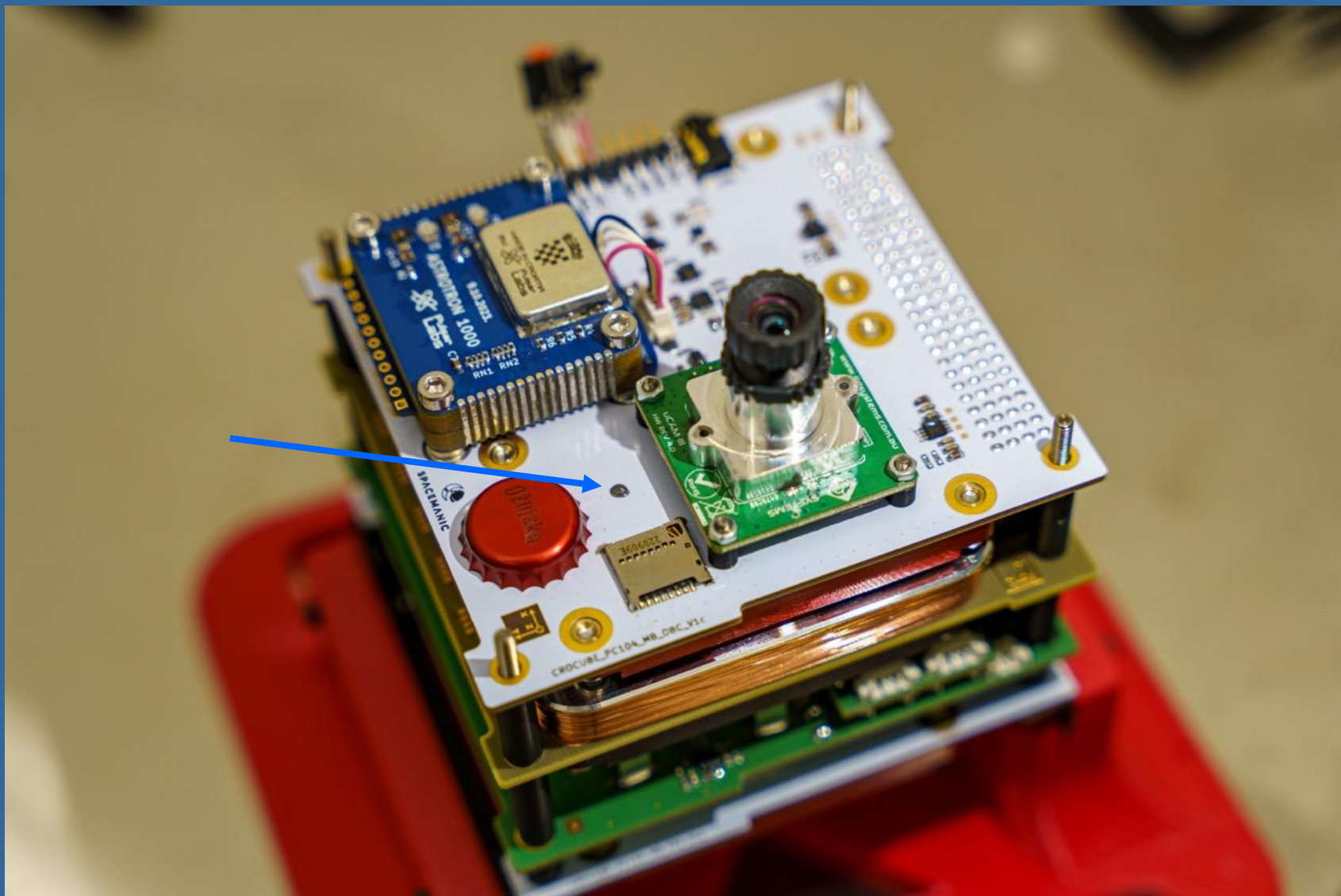


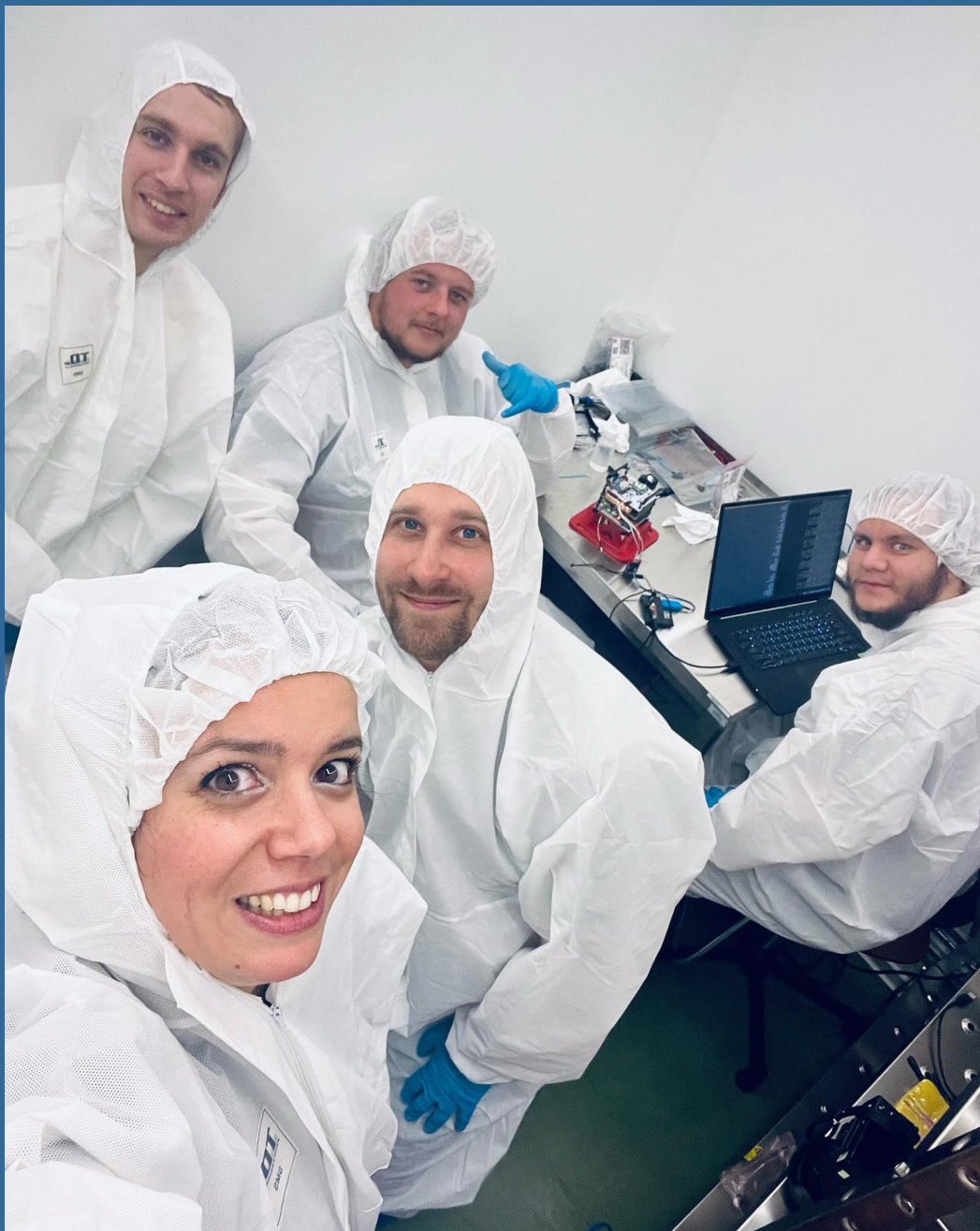












CroCube SATELIT KREĆE NA PUT



PREDSTAVLJANJE CroCube SATELITA

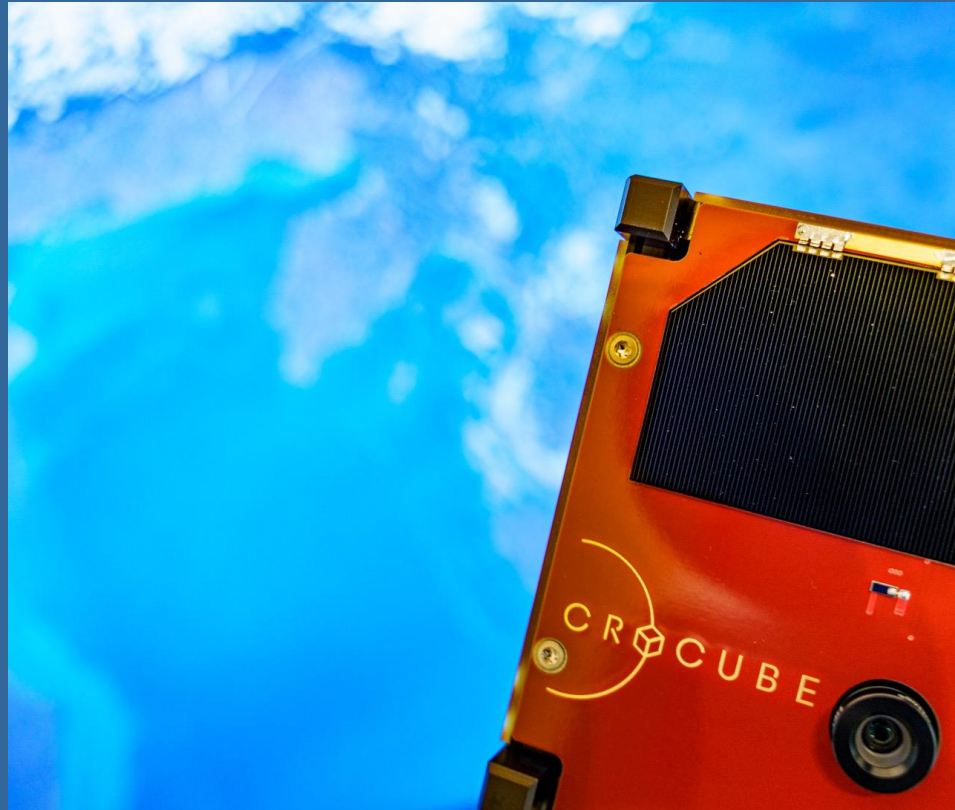
ZICER, 10.11.2023.



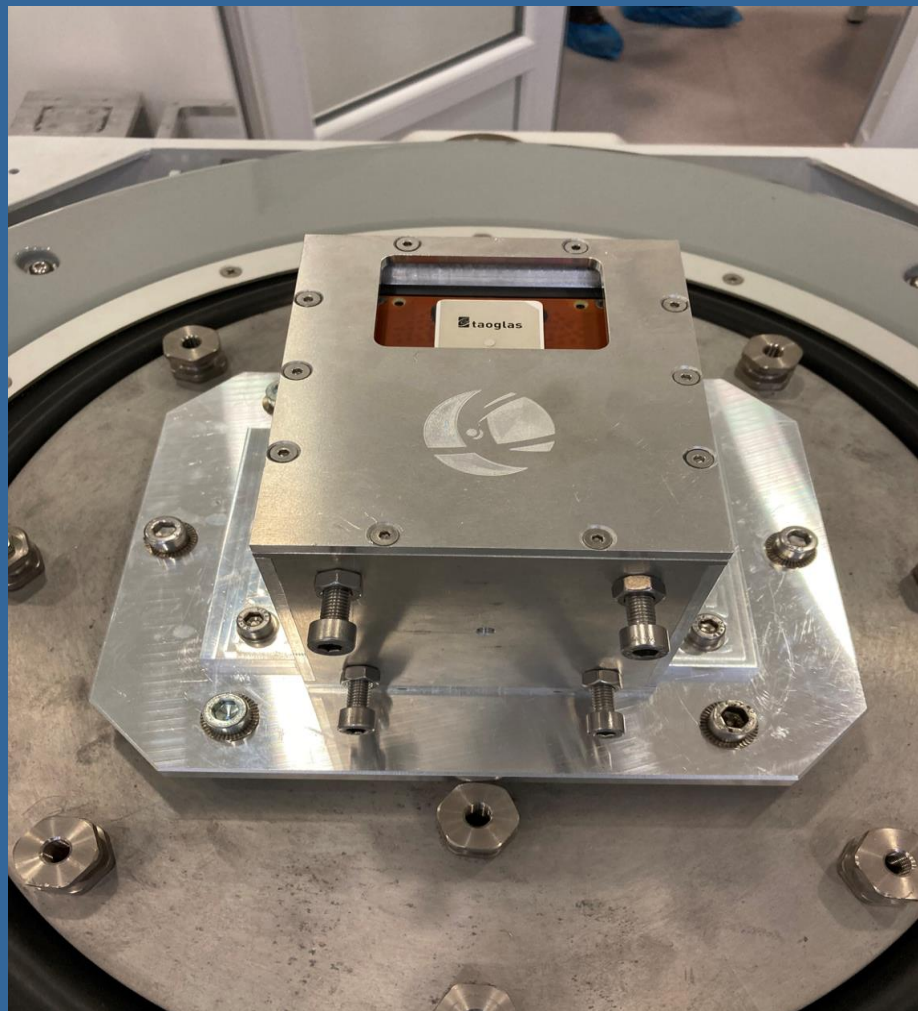


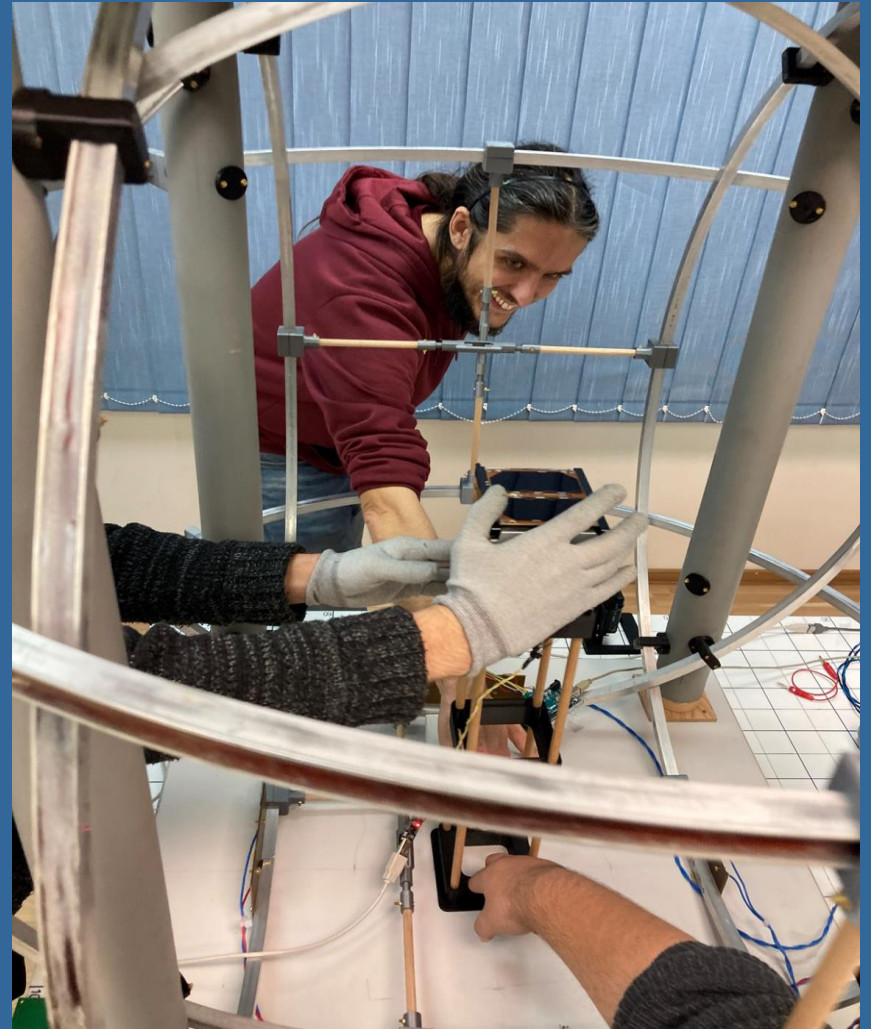
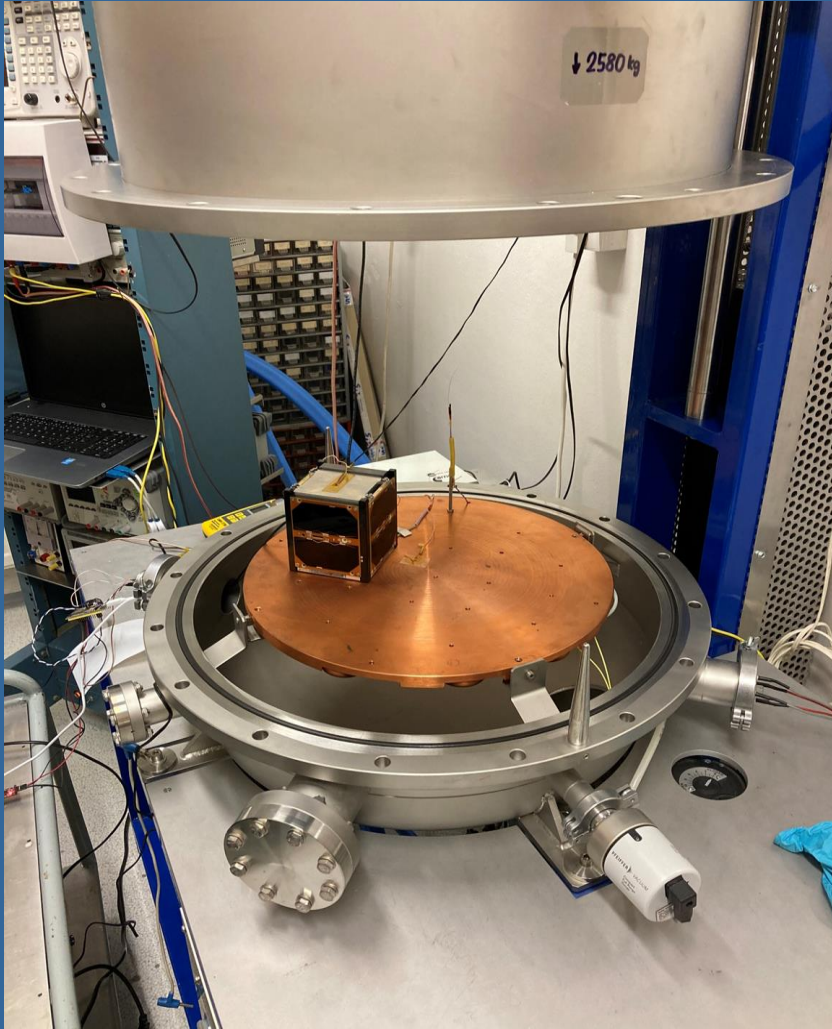


PA, PA, CroCube! SRETAN PUT!



TESTIRANJE NA VIBRACIJE, VAKUUM, TEMPERATURU



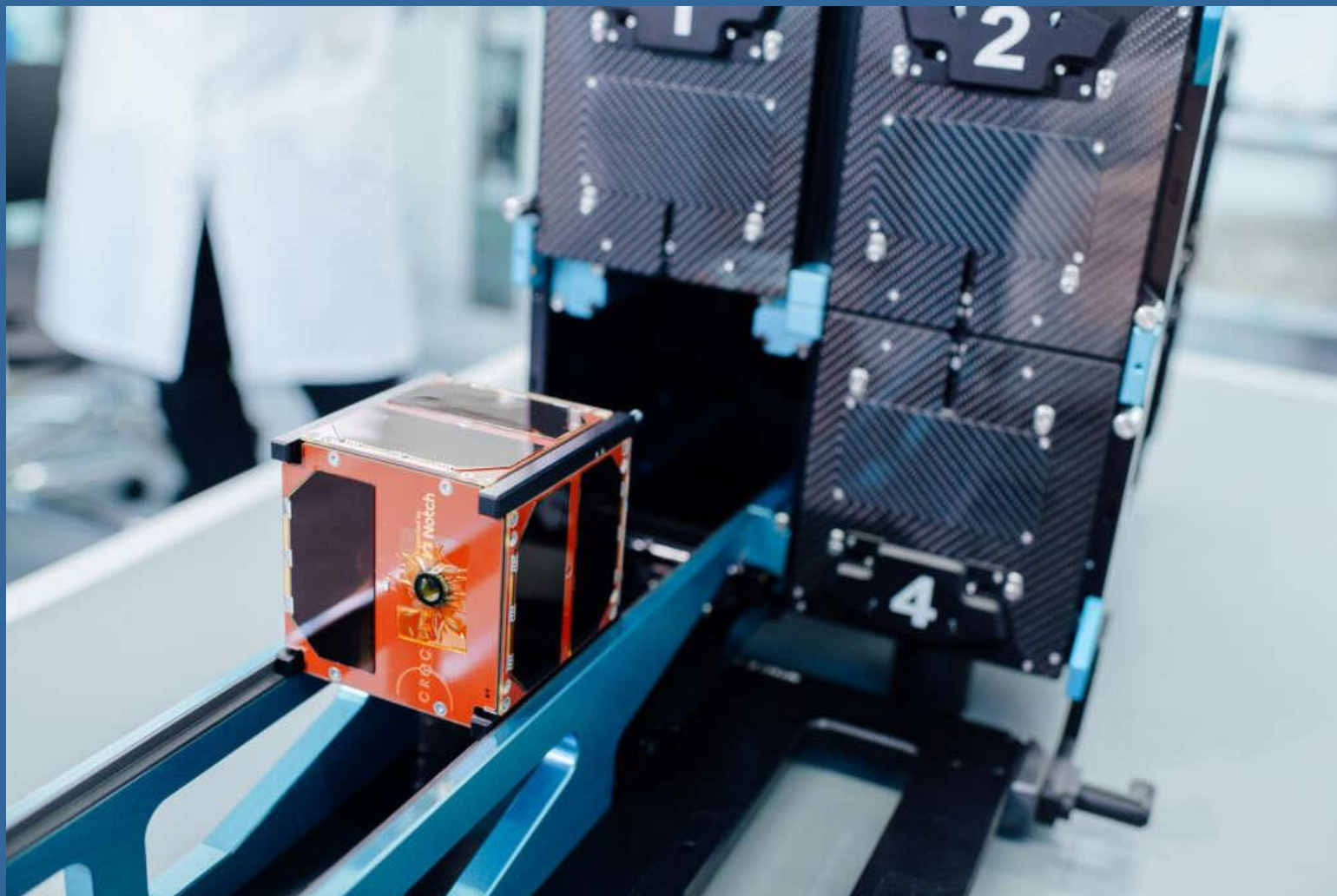


TVRTKA INTEGRATOR

EXOLAUNCH









IZ BERLINA U VANDENBERG



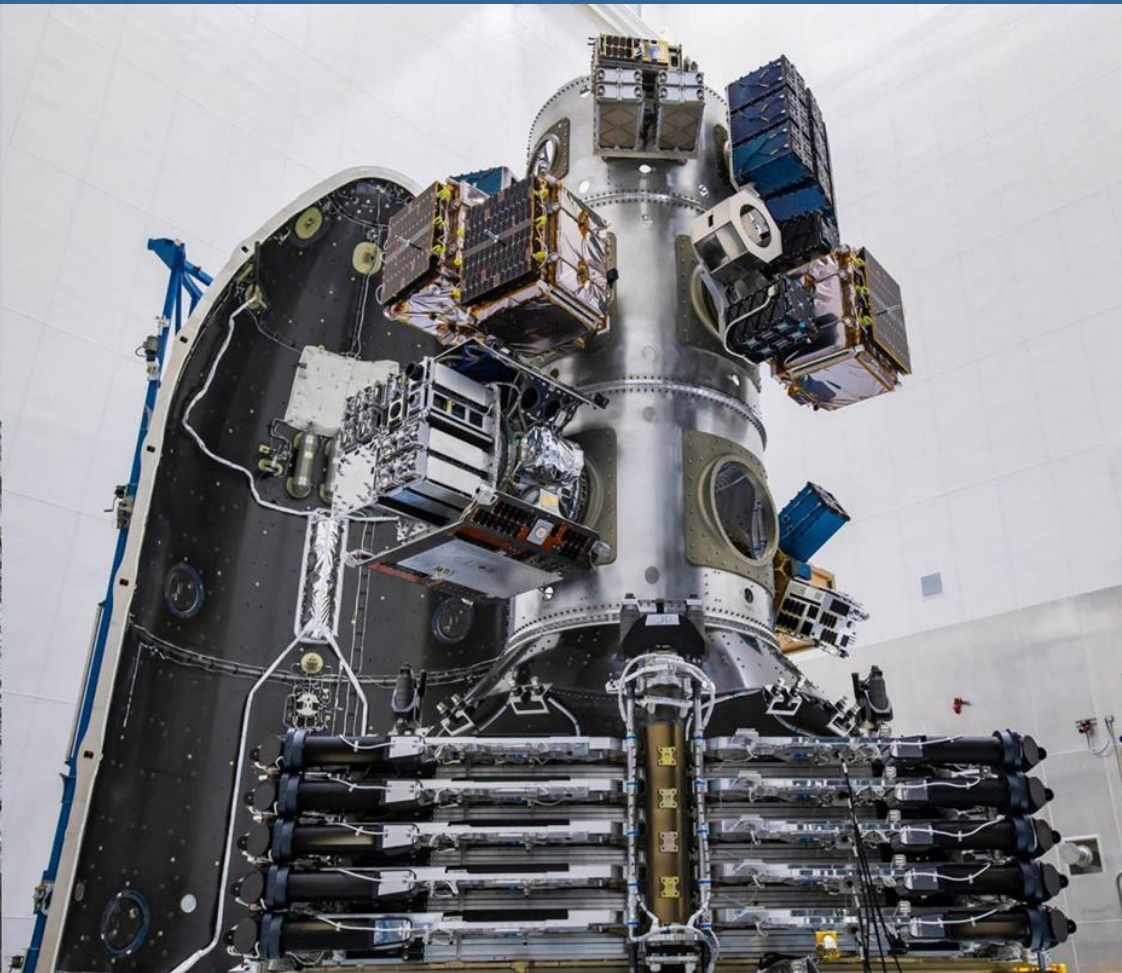
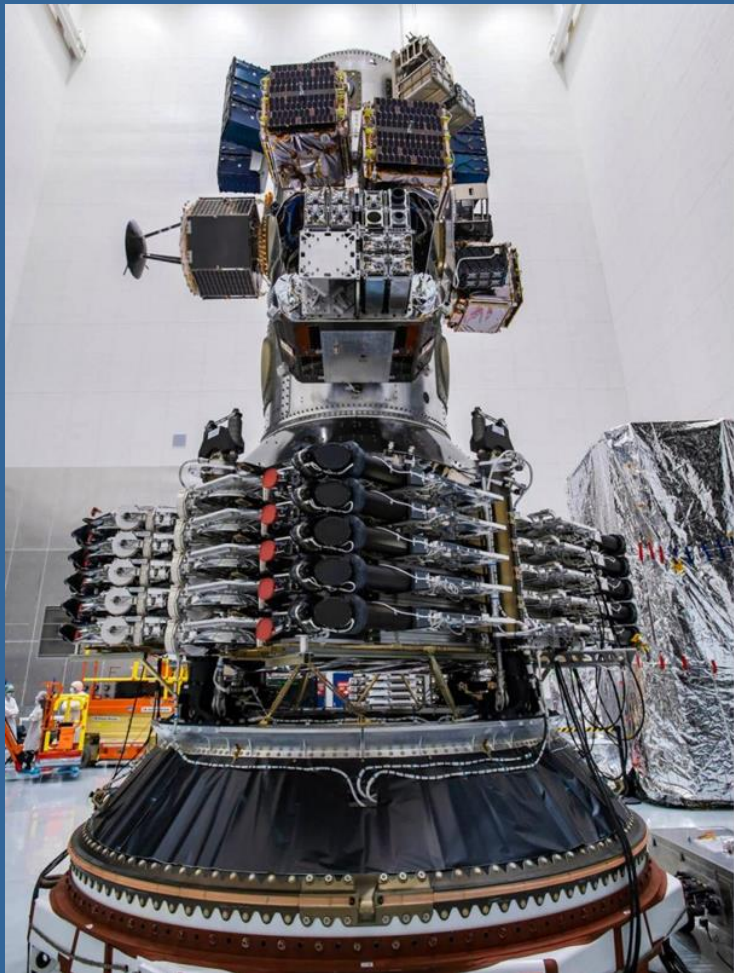
TIM TVRTKE EXOLAUNCH NA POSLU

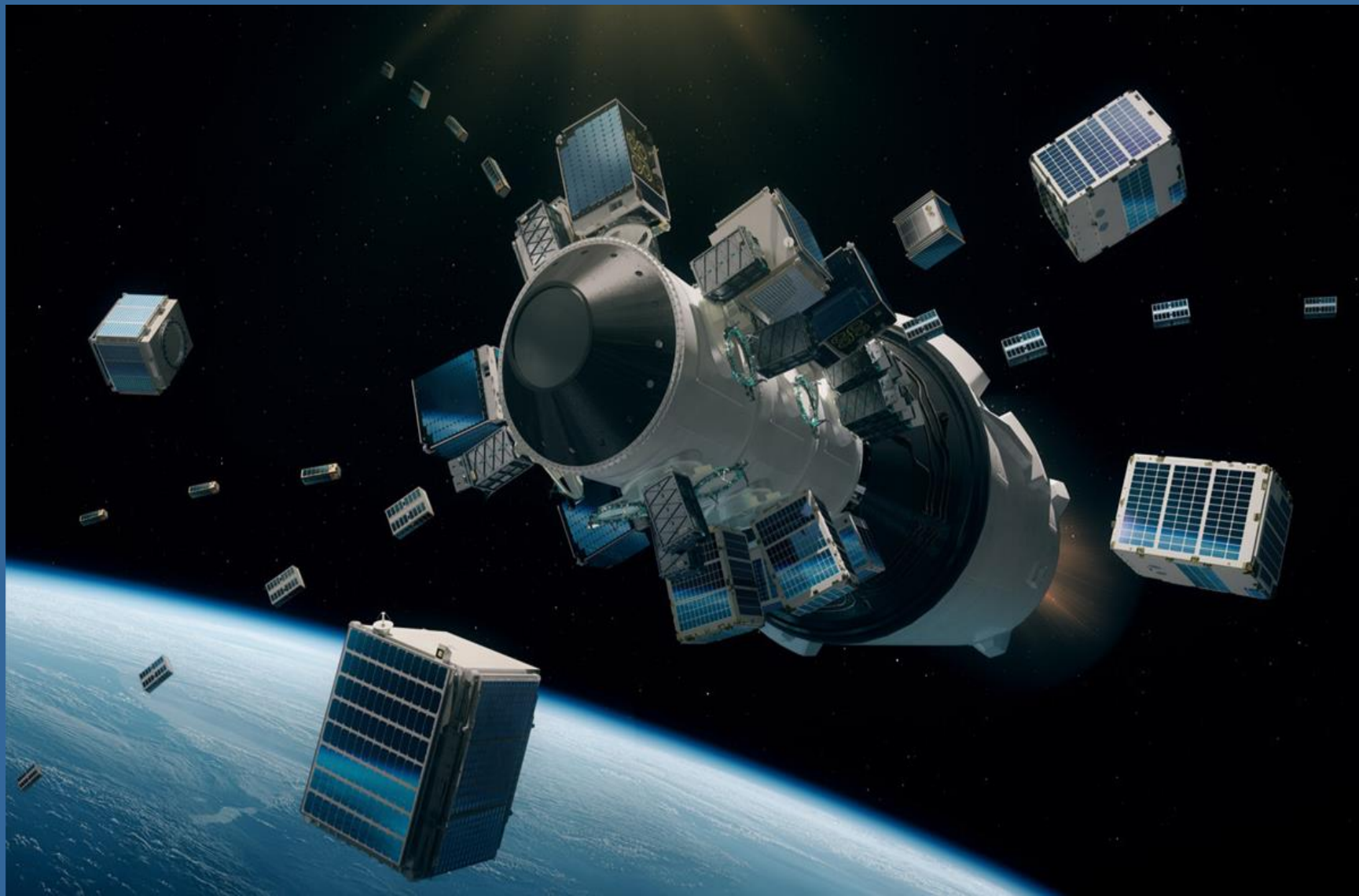


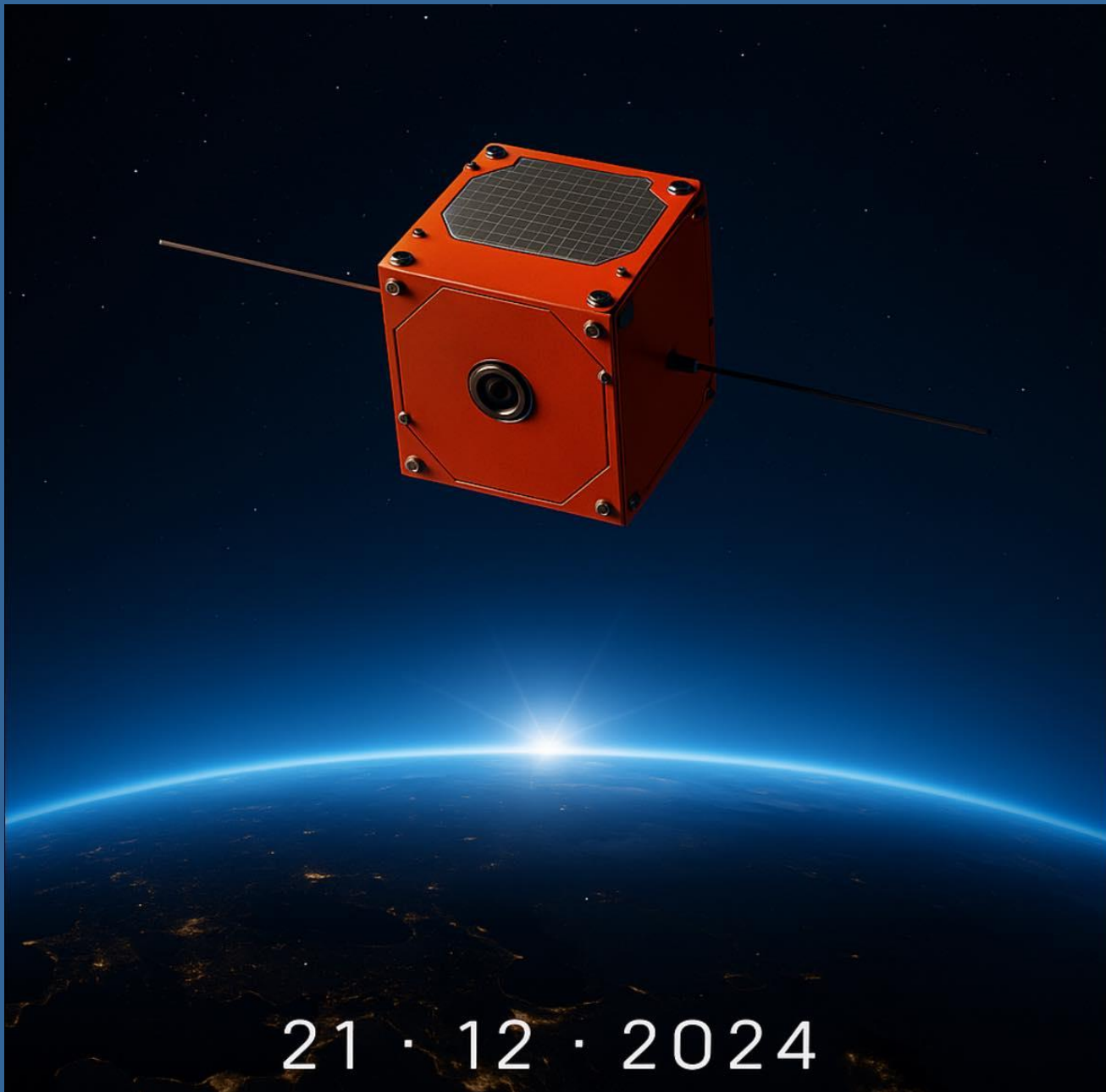












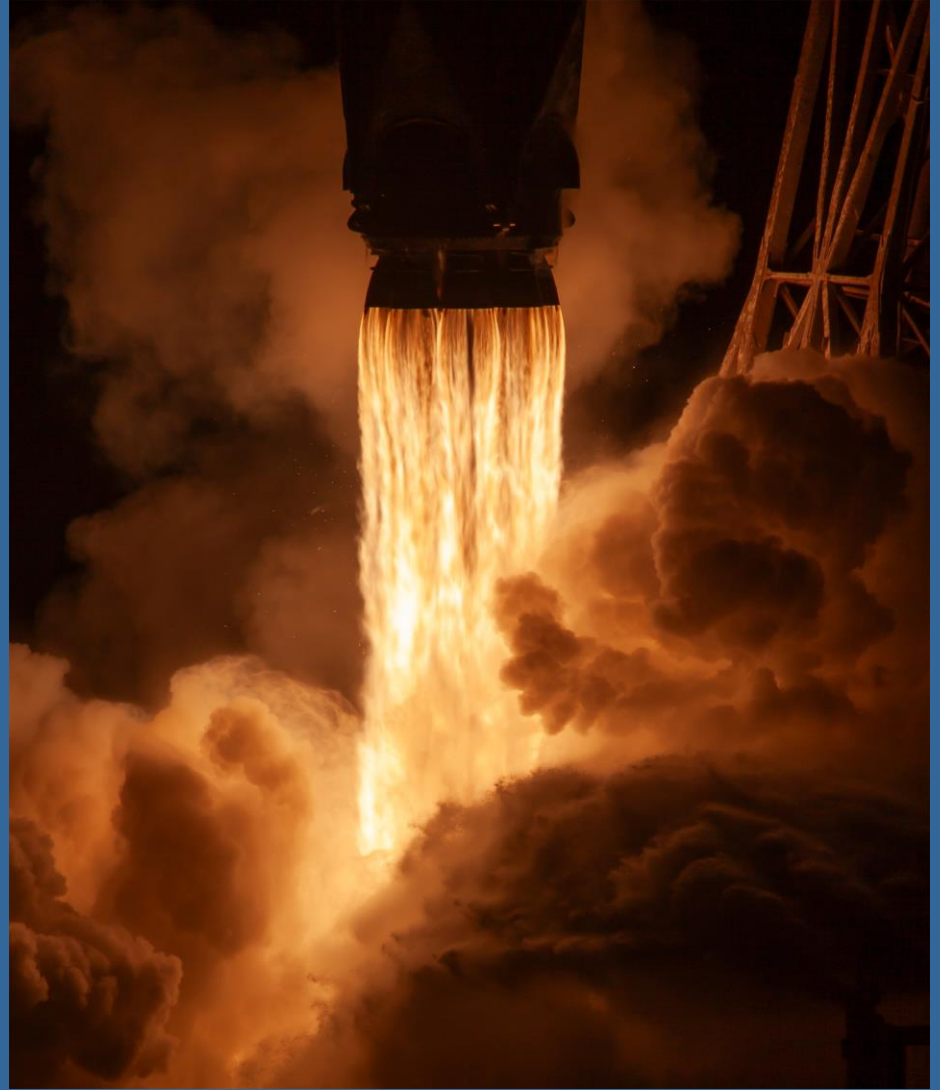
21 · 12 · 2024

TEHNIČKI MUZEJ NIKOLA TESLA 21.12.2024.



SpaceX, FALCON 9
BANDWAGON-2
VANDENBERG SFB, CALIFORNIA, USA
21.12.2024. 12.34 CET





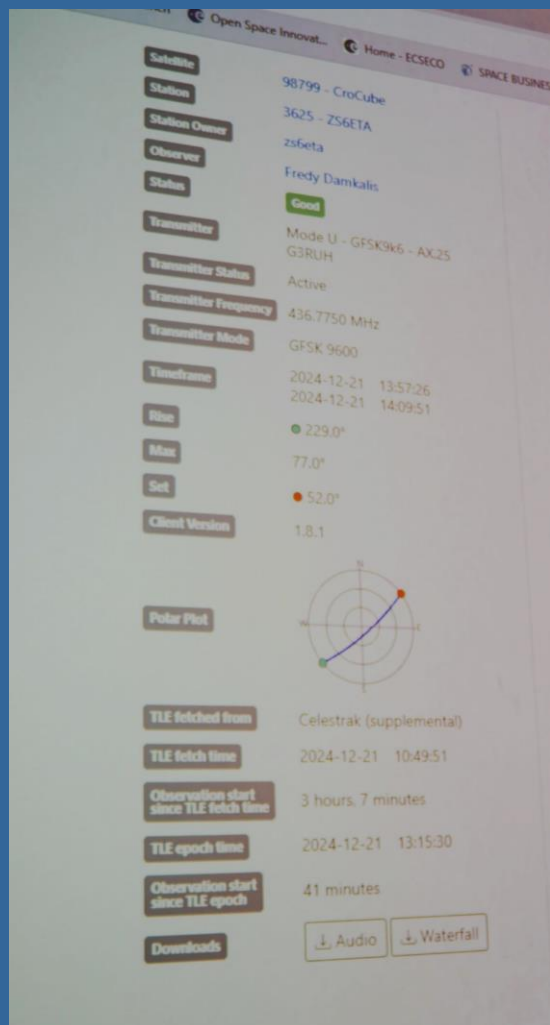
NA MJESTU IZBACIVANJA CroCube SATELITA



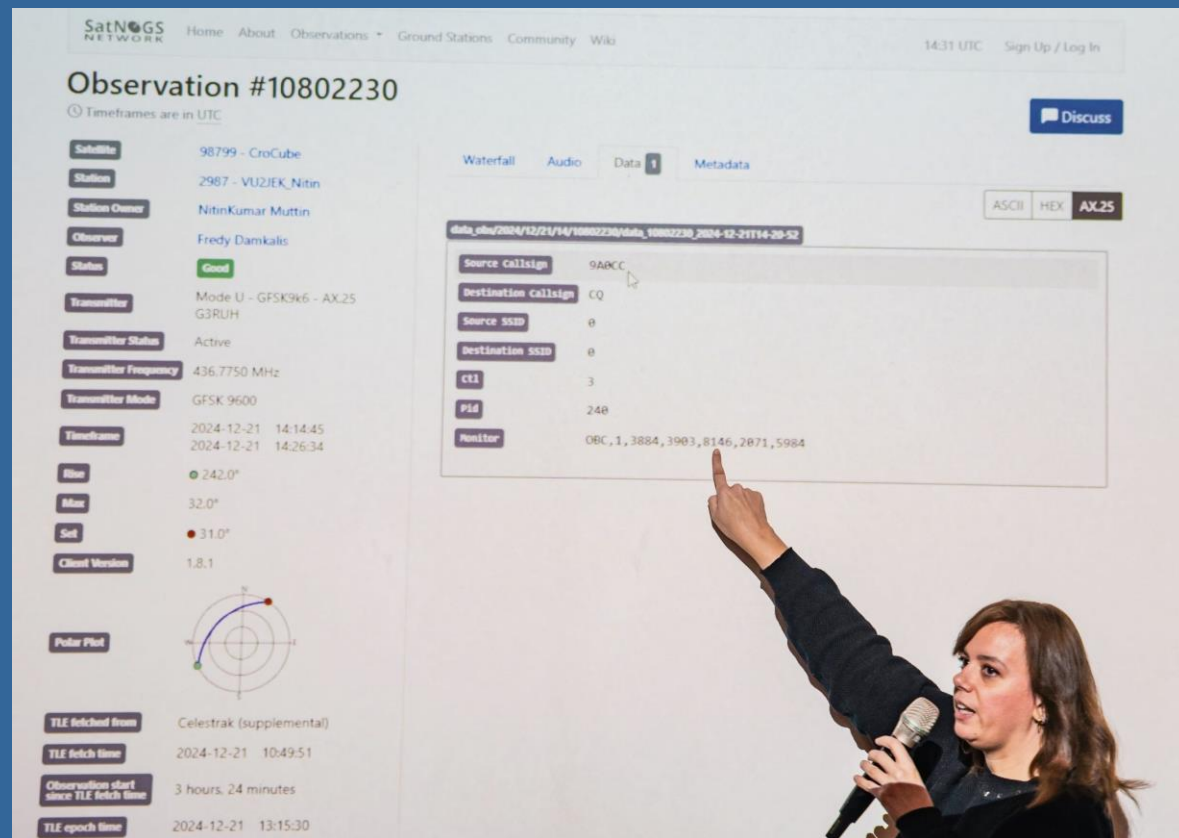


PRVI TLM PODACI PRIMLJENI U:

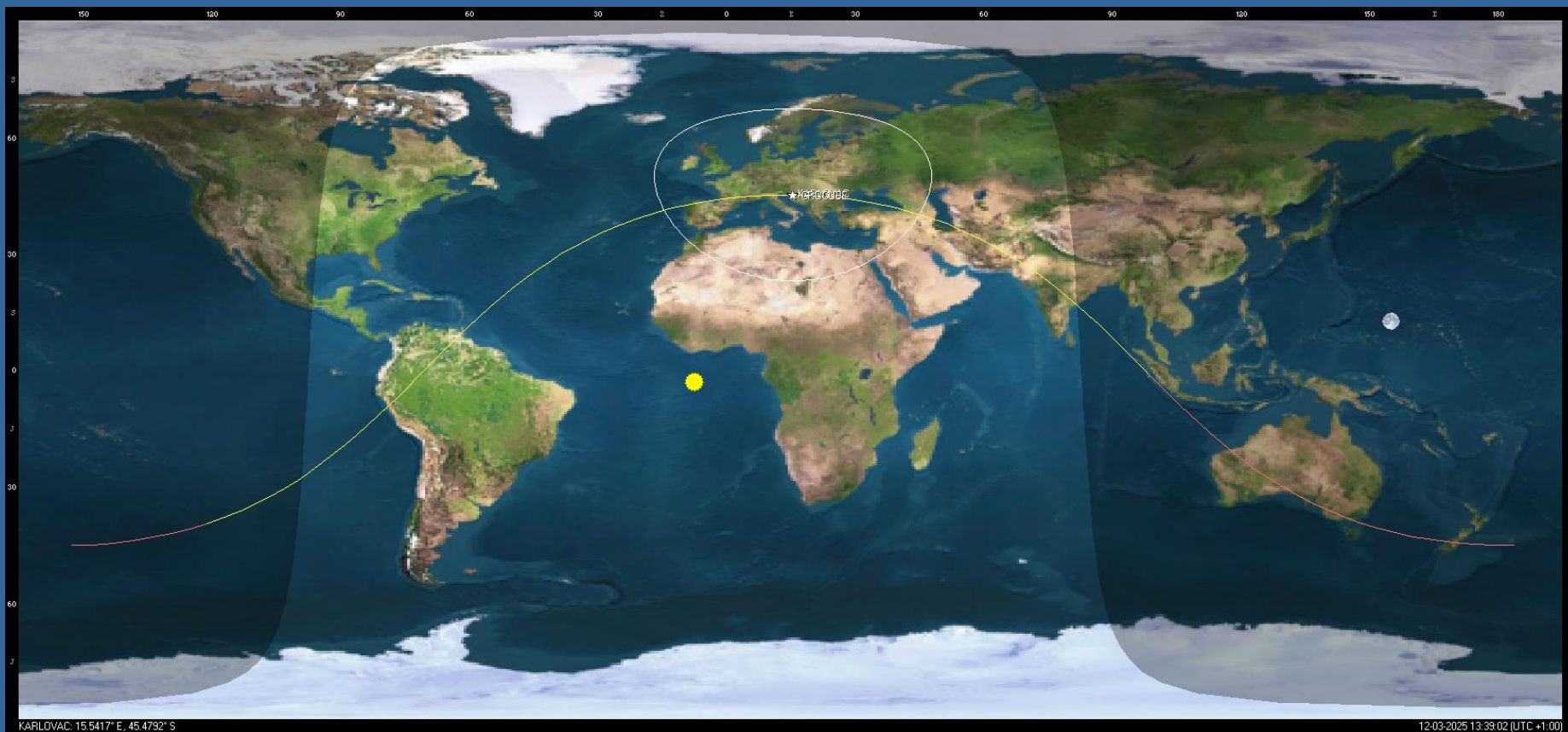
JAR



INDIJI

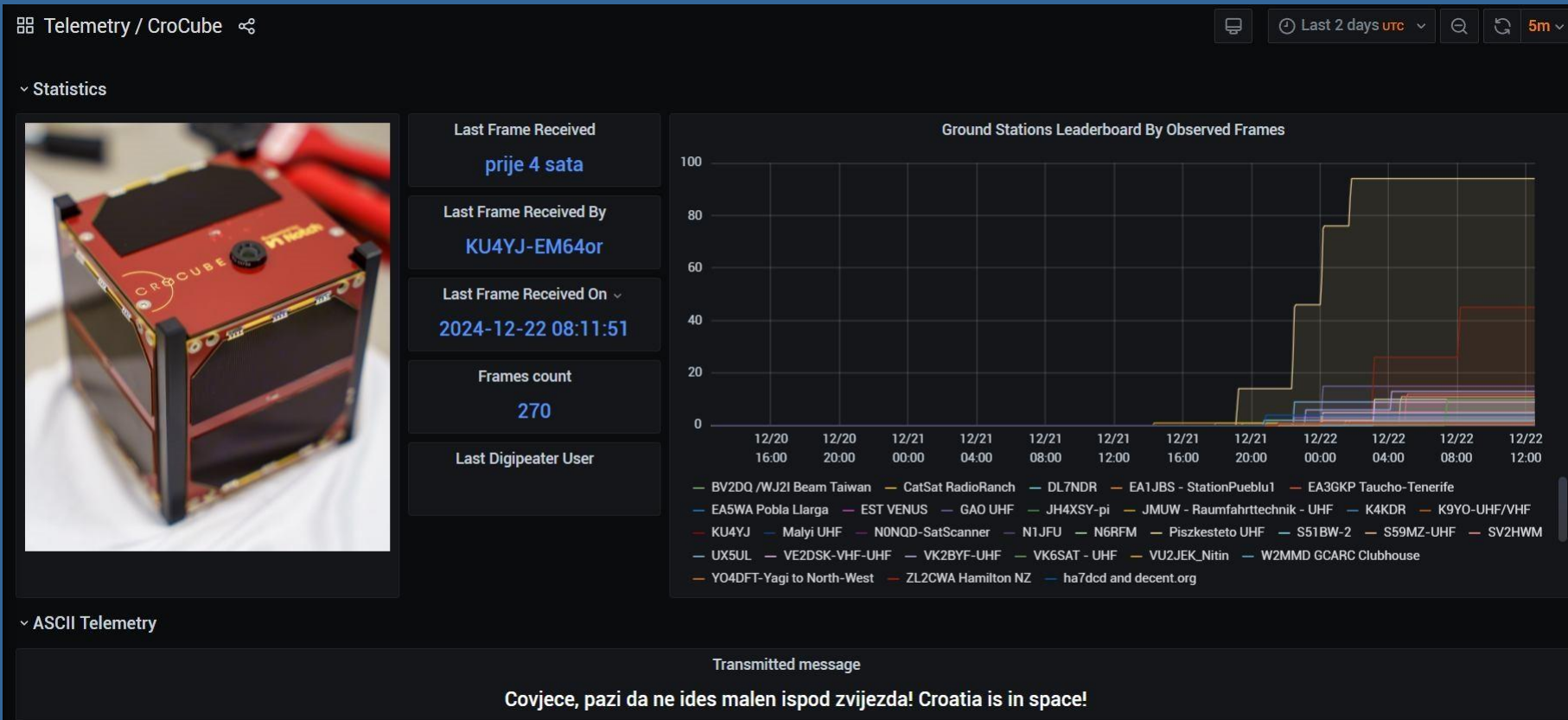


PUTANJA I ZONA POKRIVANJA SATELITA



Covjece, pazi da ne ides malen ispod zvijezda! Croatia is in space!

„Čovječe, pazi da ne ideš malen ispod zvijezda”
stih iz pjesme „Opomena” Antuna Branka Šimića



Telemetry / CroCube

Last 2 days UTC

Last Frame Received
prije 17 minuta

Last Frame Received By
EA6TC-JM19jn

Last Frame Received On
2025-03-12 09:16:19

Frames count
180

Last Digipeater User
DL7NDR

Ground Stations Leaderboard By Observed Frames

Station	Observed Frames
DL7NDR	180
EuroSpaceHub-UCM	~15
JA3BLZ	~10
M7RED	~5
Others	< 5

ASCII Telemetry (7 panels)

CW Beacon (8 panels)

Power

PSU Battery

PSU Cur. In

139 mA

PSU Uptime (s)

3450004

PSU Uptime

5.704 week

System state

Full

PSU Resets in ...

12

Battery Current (mA)

min	max	current
In	5	315
Out	86	123
Current	139	121

PSU Temperatures (°C)

min	max	current
Battery	3.73	11.25
System	5.04	16.16
Temperatures	8.42	8.42

Battery (V)

min	max	current
Battery	8.16700	8.20500
Voltage	8.1861	8.1861

PSU GWD Tim...

3.000 day

PSU Cur. Out

121 mA

PSU Uptime To...

6964890

PSU Uptime Tot.

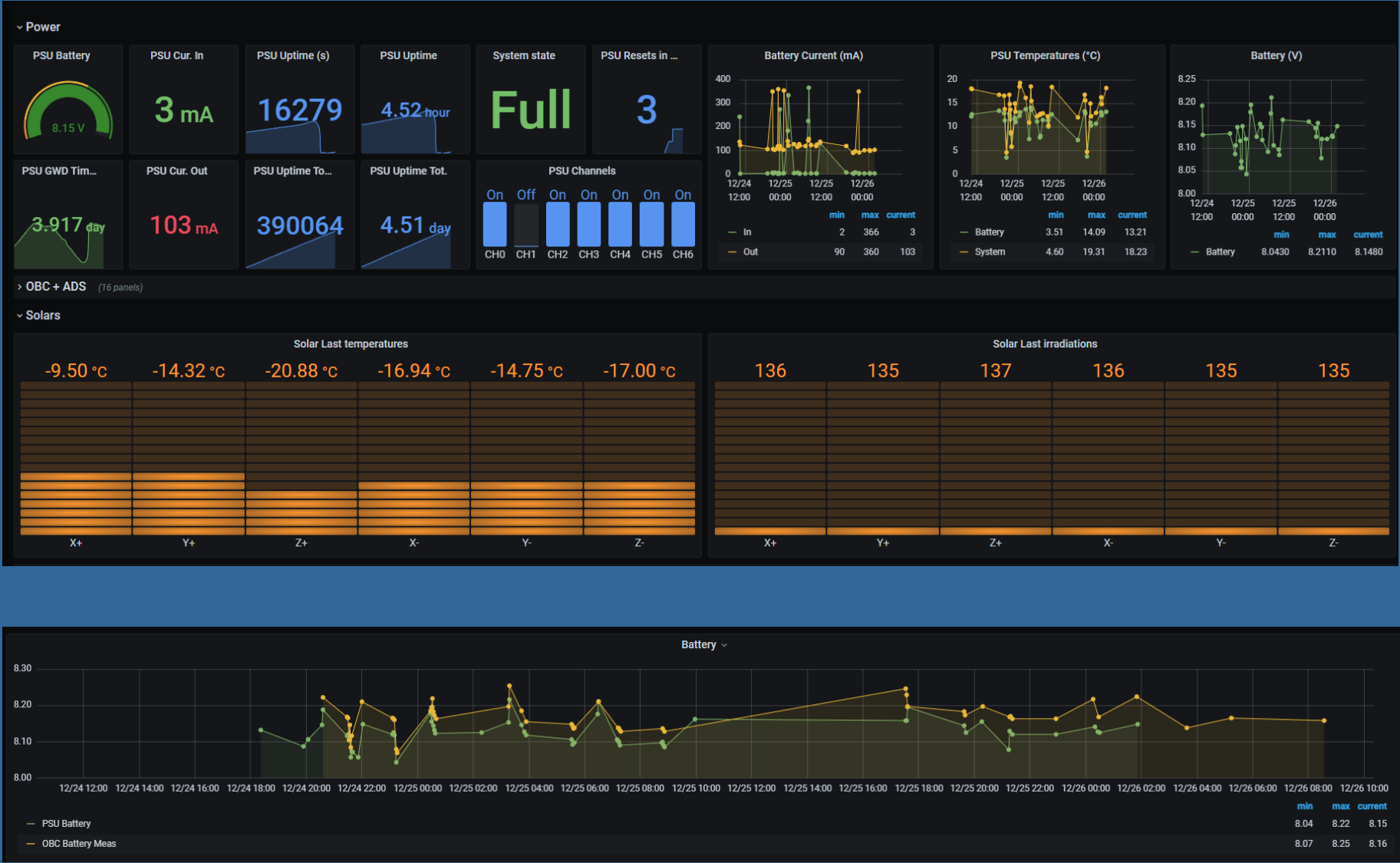
11.516 week

PSU Channels

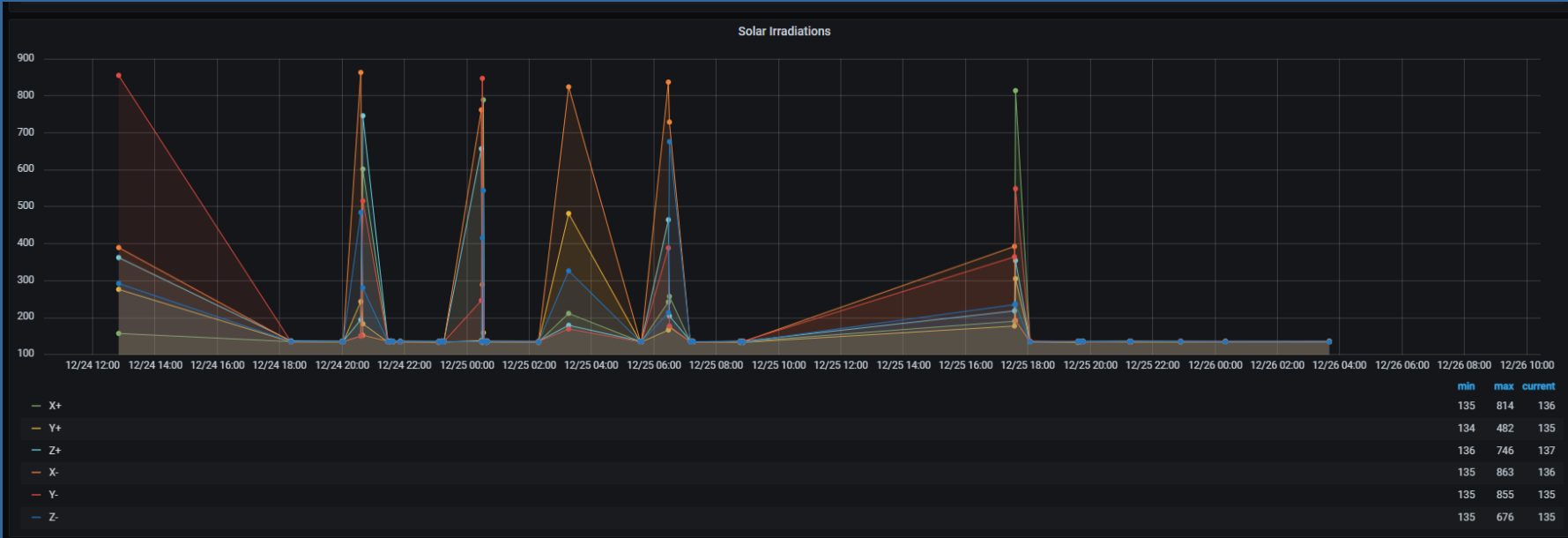
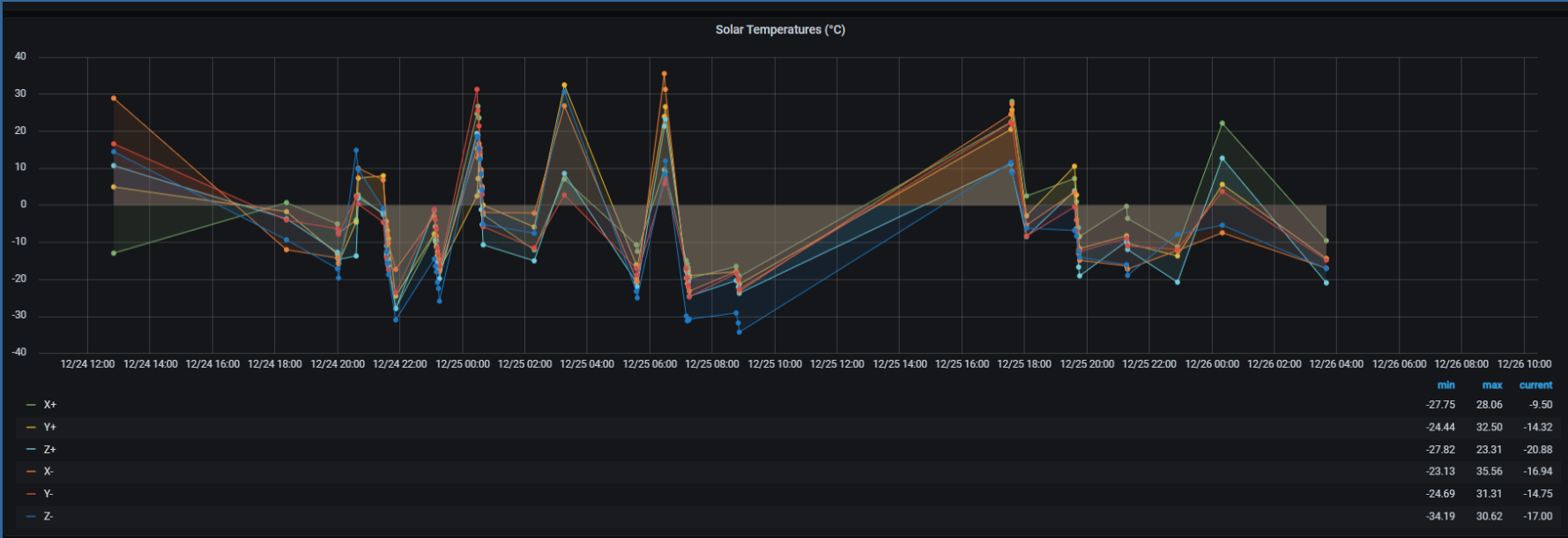
On	Off	On	On	Off	On	On
CH0	CH1	CH2	CH3	CH4	CH5	CH6

OBC + ADS (16 panels)

TELEMETRIJSKI PODACI SUSTAVA NAPAJANJA

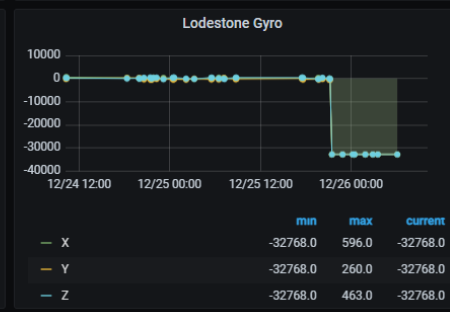
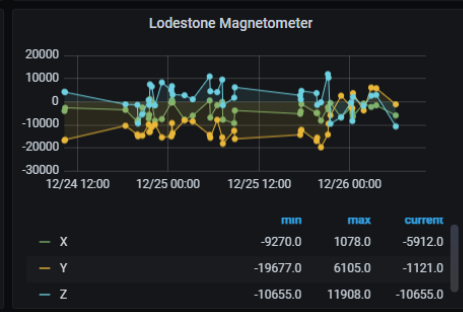
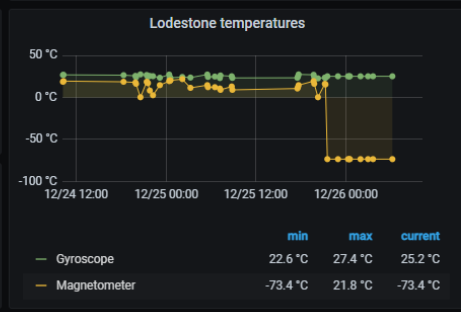
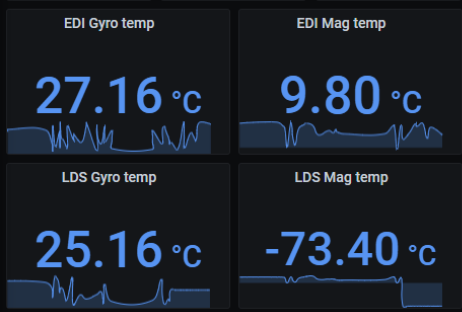
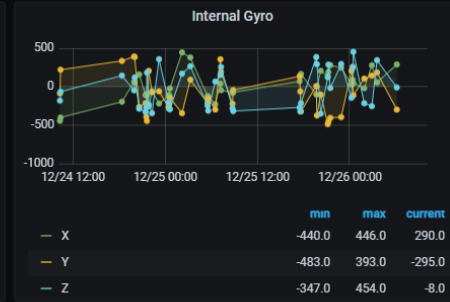
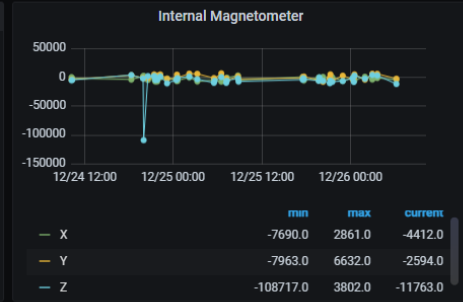
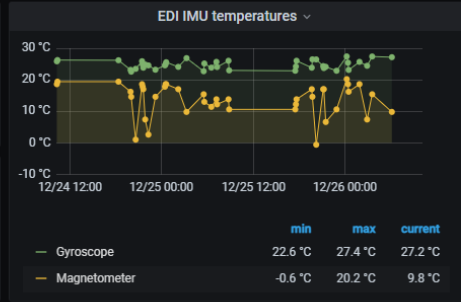
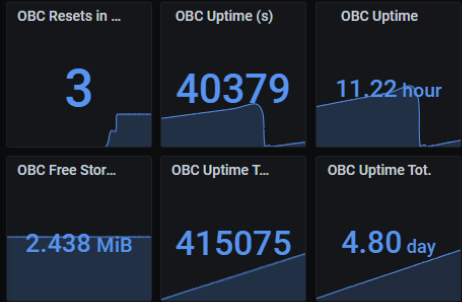


TELEMETRIJSKI PODACI O SUNČANIM PANELIMA

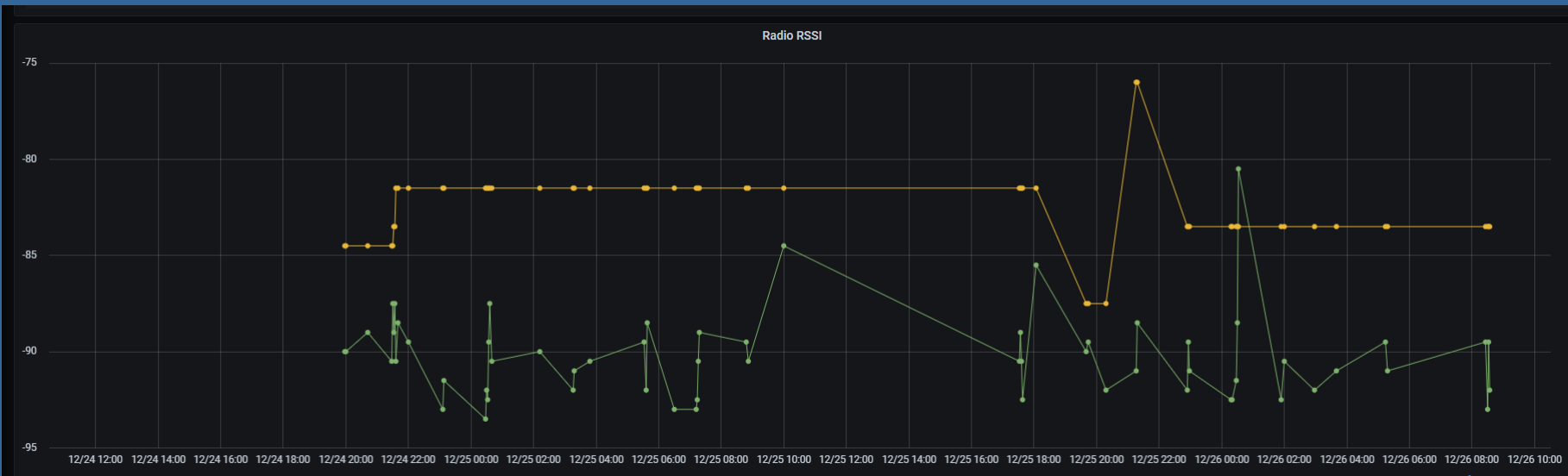
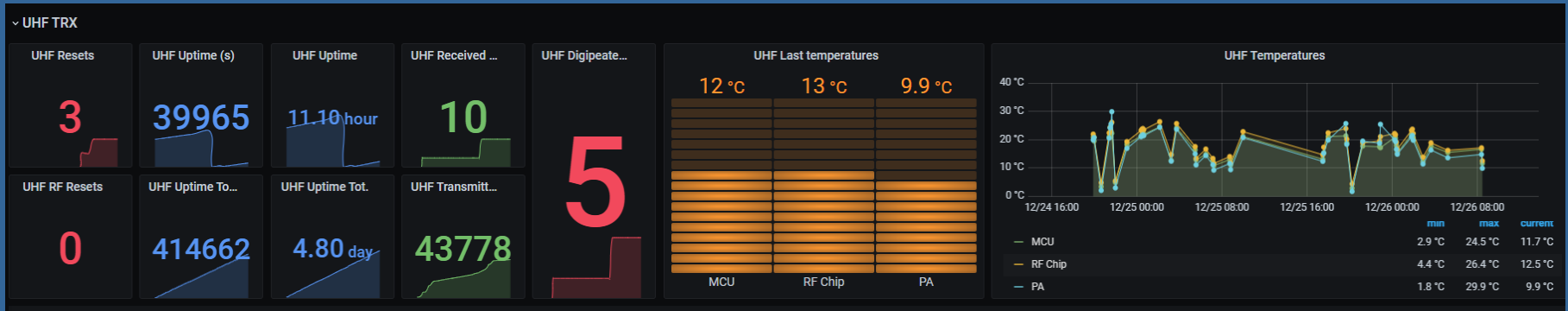


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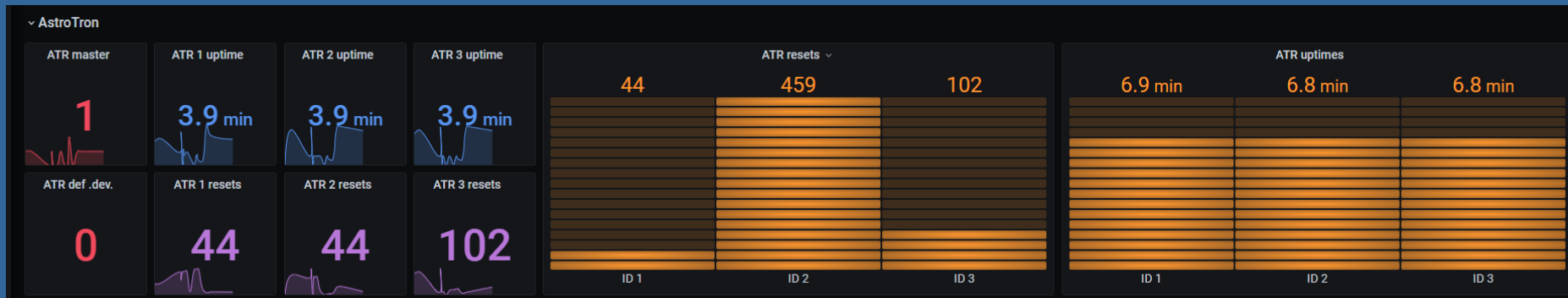
~ OBC + ADS



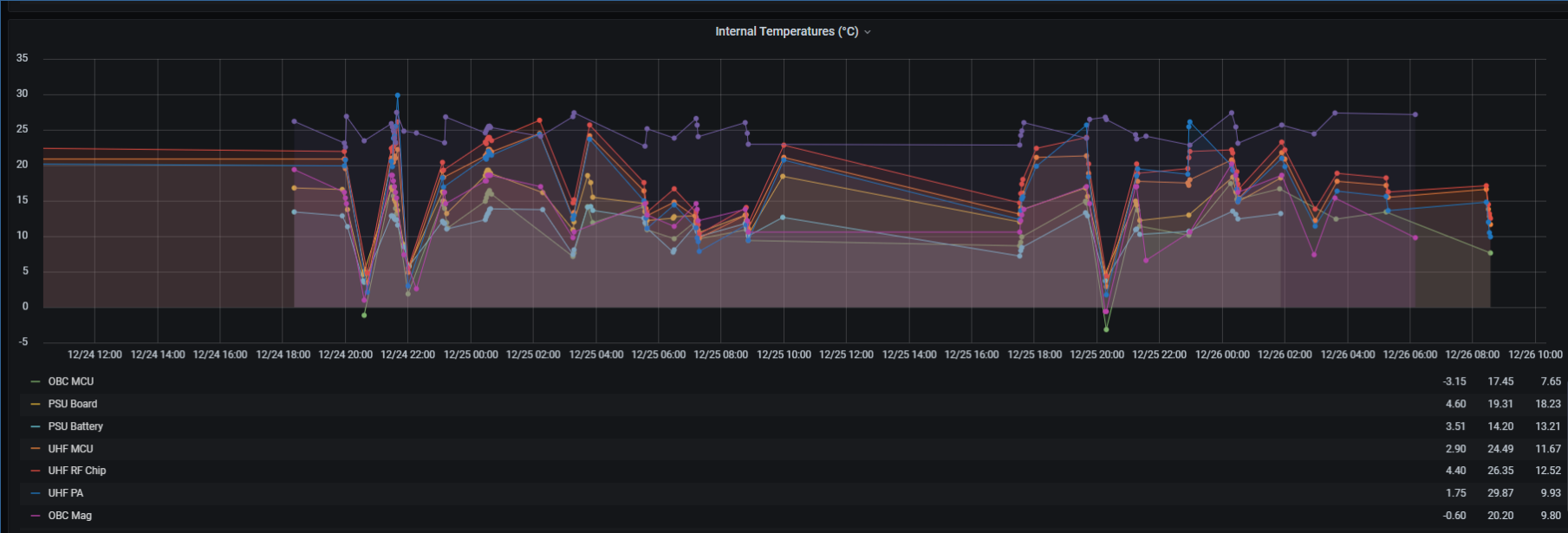
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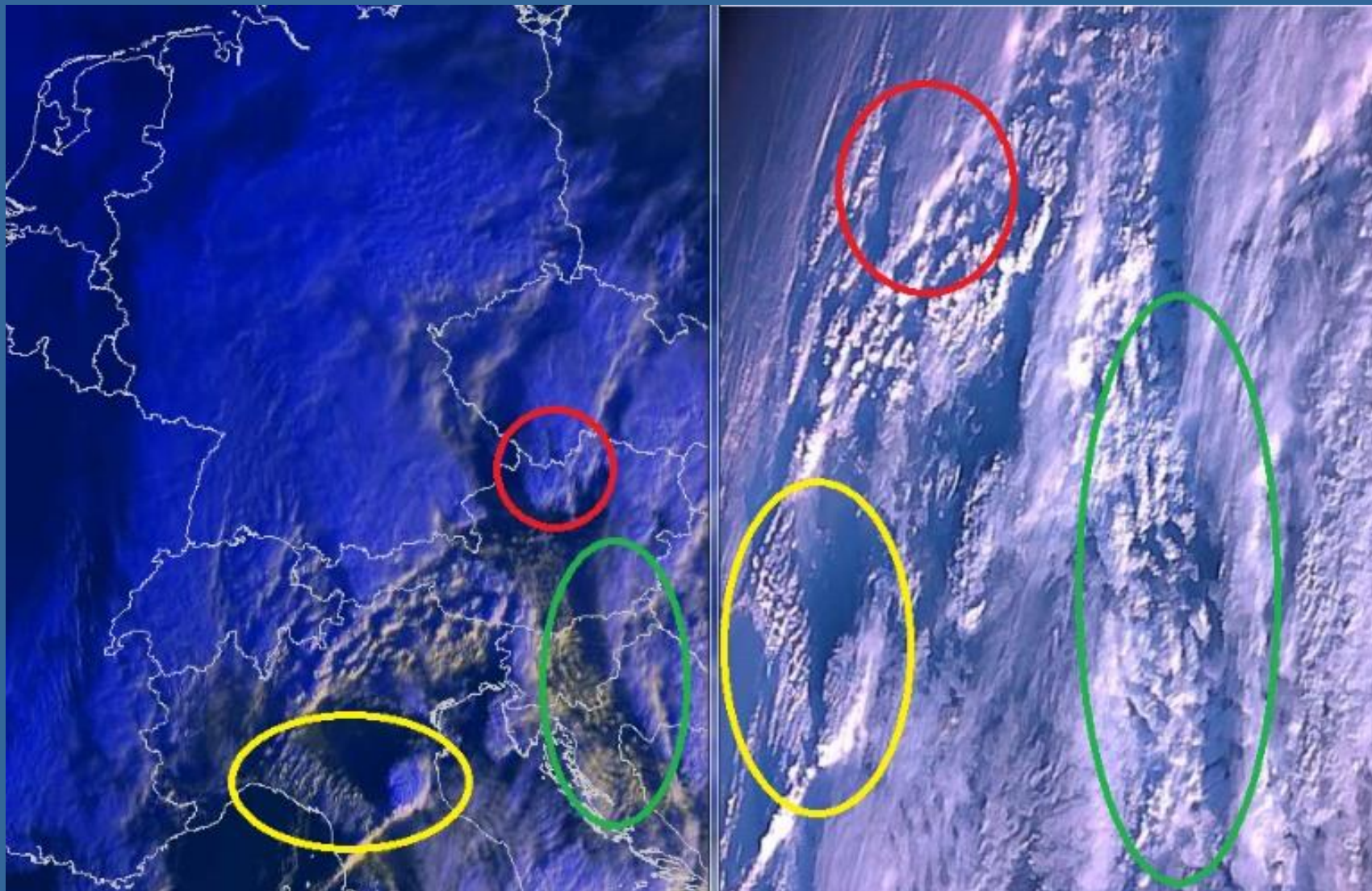
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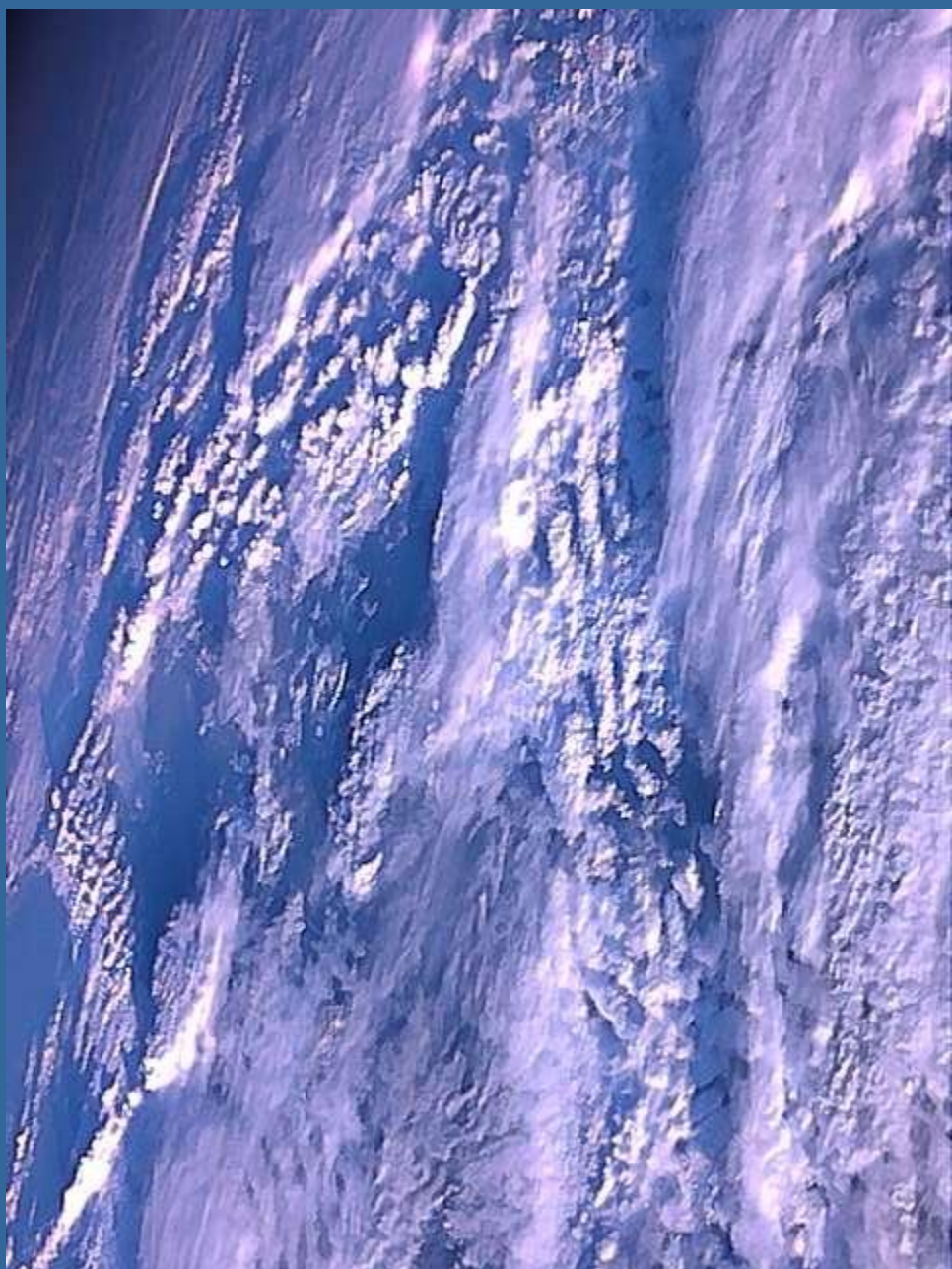


TELEMETRIJSKI PODACI O TEMPERATURAMA

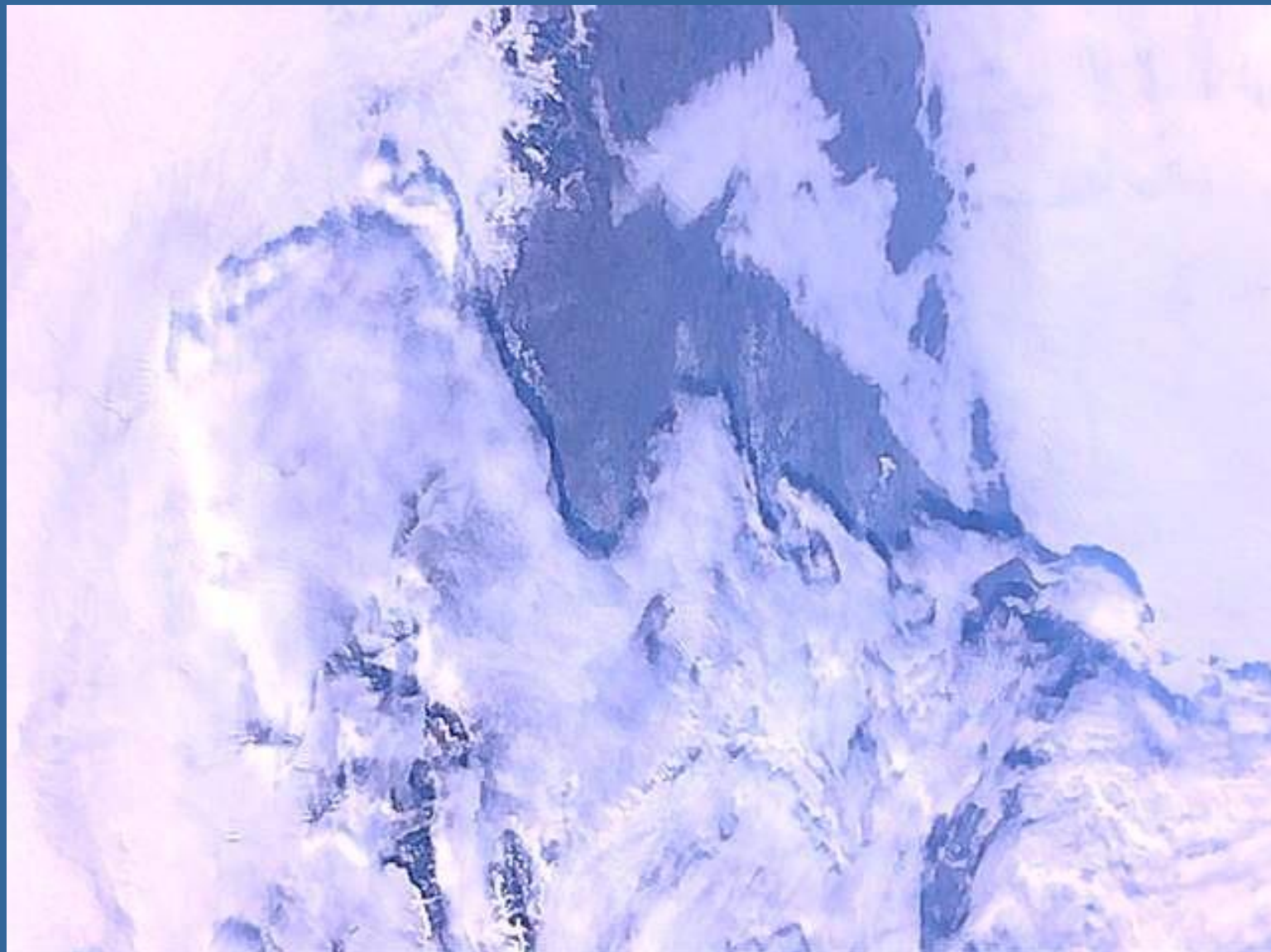


PRVE SLIKE 28.01.2025. U 8:16



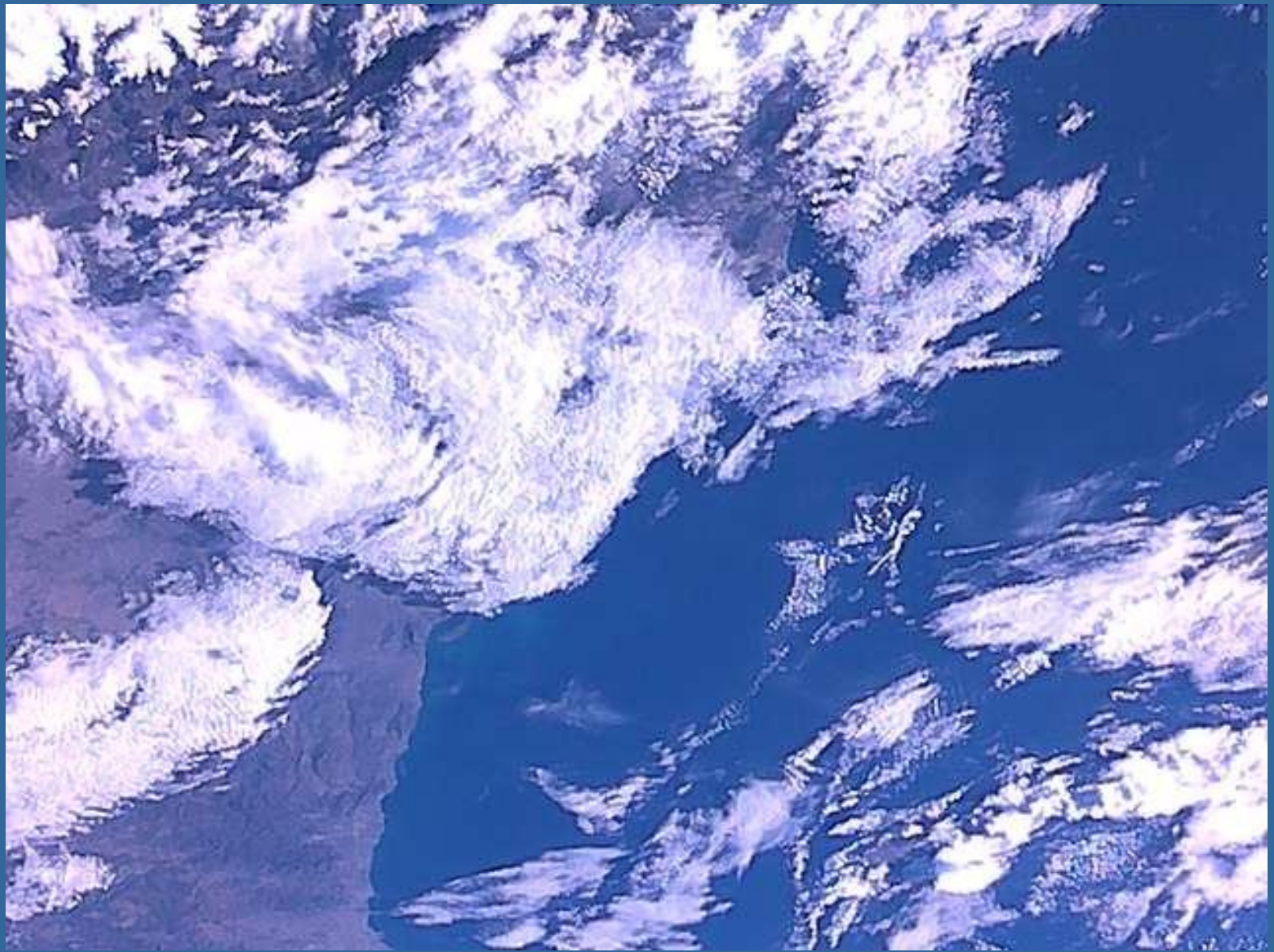










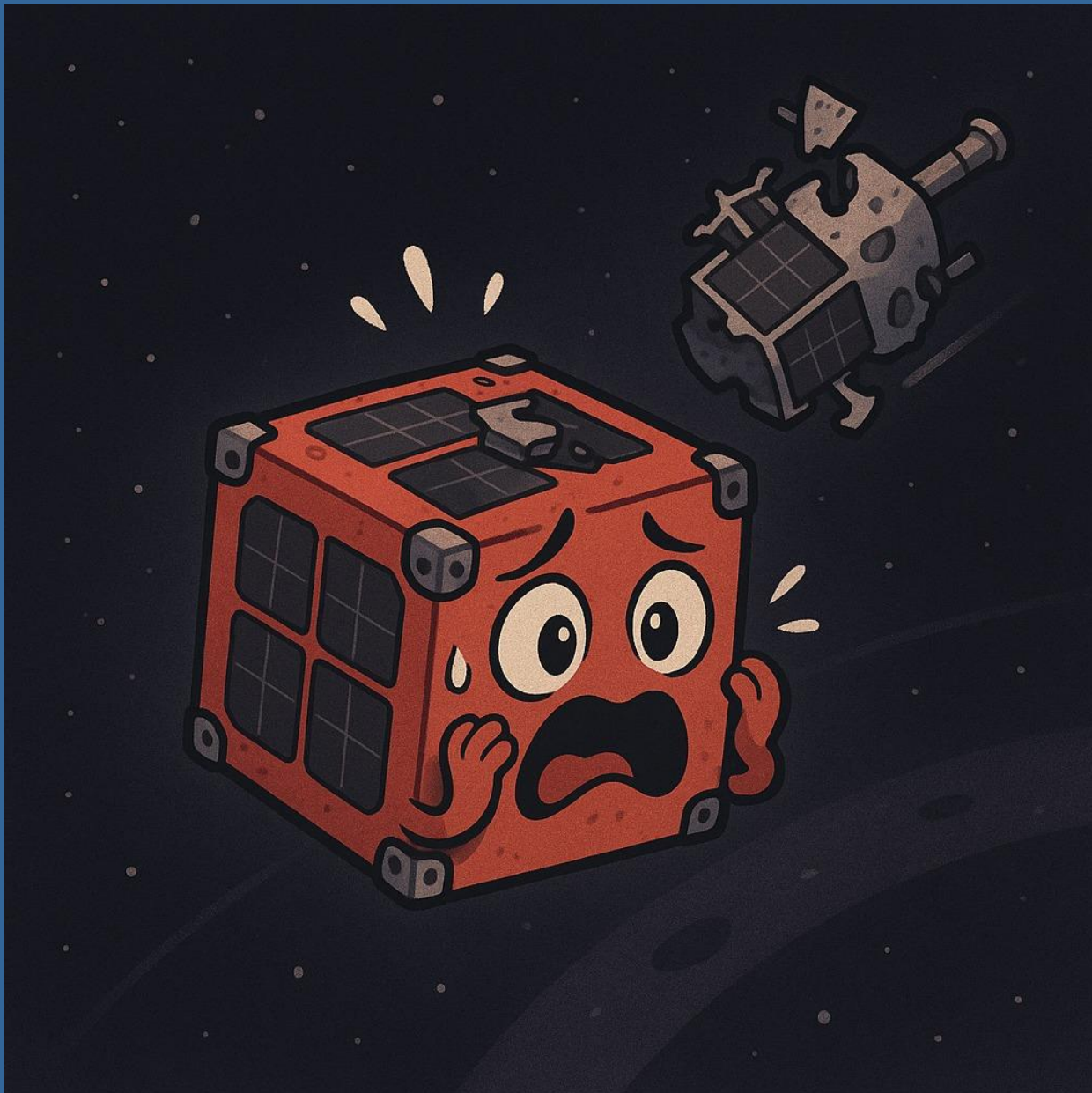












MUZIKA.HR VIJESTI RECENZIJ E IZVJEŠTAJI KALENDAR

Singlovi

Prva hrvatska pjesma lansirana u svemir bit će “Svemir ima novi pozivni” grupe Chui

Lucija Očko · 28. velj 24.

Eksperimentalni jazz bend **Chui** objavili su novi singl, “Svemir ima novi pozivni” koji je skladan kao himna prvog hrvatskog satelita koji će biti lansiran u svemir.



<https://www.youtube.com/watch?v=pFn7m2j41kQ>

KVIZ „POTJERA”



KVIZ „TKO ŽELI BITI MILIJUNAŠ?”



Kad se prvi hrvatski satelit CroCube javio iz orbite, poruka je sadržavala stih kojeg pjesnika?

♦ A: Dragutina Tadijanovića

♦ B: Tina Ujevića

♦ C: Antuna Branka Šimića

♦ D: Dobriše Cesarića



Proslavi s nama:

Prva obljetnica lansiranja satelita

CroCube

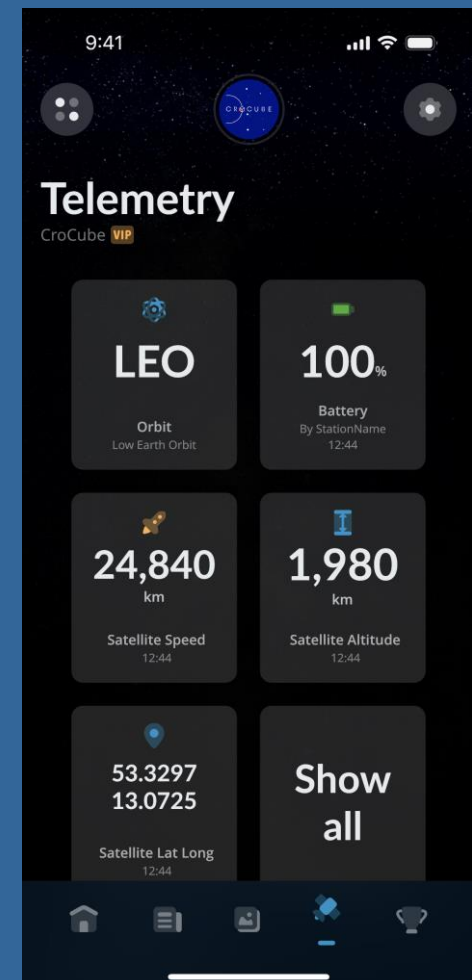
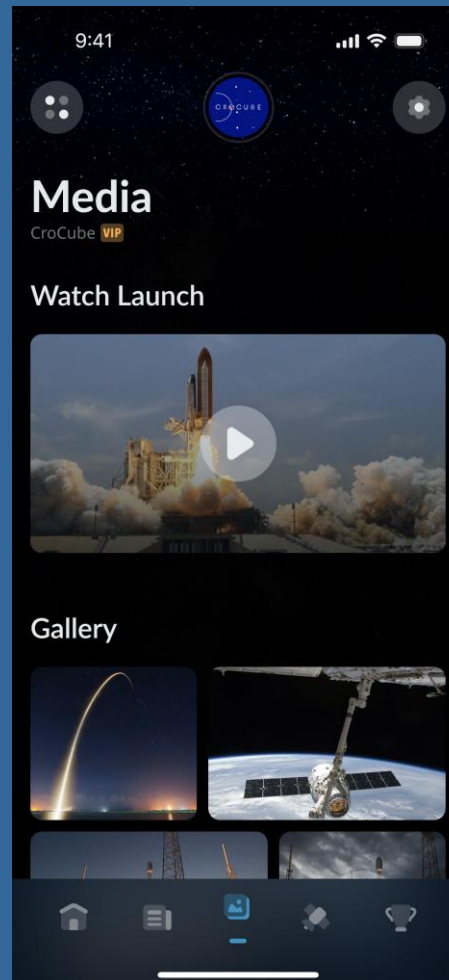
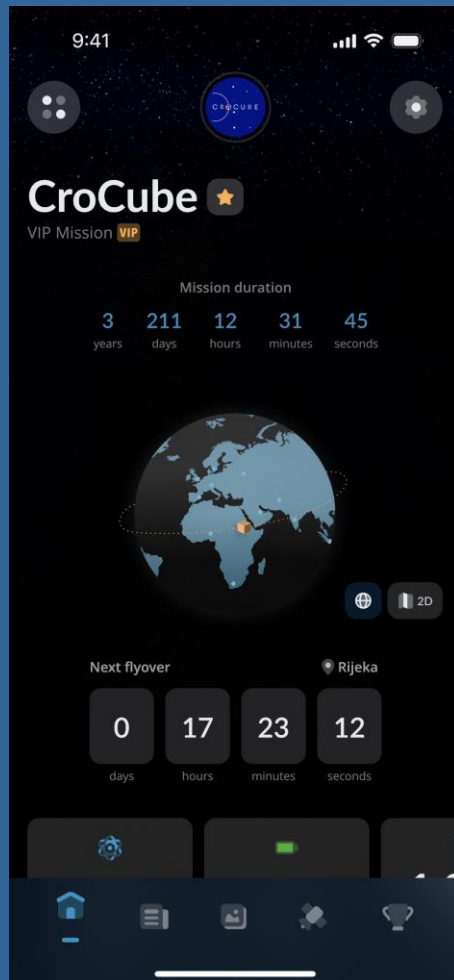
20.12.2025
18:00

TMH
TEHNIČKI MUZEJ
NIKOLA TESLA





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73

ŽELJKO 9A2EY