



# European Space Camp 2024

24 PARTICIPANTS

August 4<sup>th</sup> – 11<sup>th</sup>, 2024

## Contributors

Initials	Name	Affiliation	Role
		Norwegian Parliament	Member of Parliament
<b>AK</b>	Anna Krajewski	Team European Space Camp	Webmaster ESC
<b>BÅB</b>	Bjarne Ådnanes Bergtun	Andøya Space Education	Teacher, Physicist, MSc
<b>FS</b>	Figaro Stenlund	Team European Space Camp	Webmaster Trainee ESC
<b>JMGP</b>	José Miguel González Pérez	Andøya Space Education	Teacher, Astrophysicist, PhD
<b>KE</b>	Kristian Enoksen	Andøya Space Education	Teacher, Astrophysicist
<b>LK</b>	Lukass Kellijs	Team European Space Camp	Head of ESC, PR Manager ESC
<b>LW</b>	Leanda Wenus	Team European Space Camp	Treasurer ESC
<b>MF</b>	Marcos Fraga	Andøya Space Education	Teacher, Engineer
<b>ML</b>	Morten Larsen	Andøya Space	Head of Operation
<b>MR</b>	Marcus Ringmar	Team European Space Camp	Sponsorship Manager ESC
<b>SA</b>	Sophie Allen	National Space Agency, UK	Teacher, Astrophysicist
<b>SB</b>	Simen Bergvik	Andøya Space Education	Teacher
<b>TØ</b>	Truls Ørdal	Andøya Space Education	Teacher

## GENERAL INFORMATION FOR COURSE PARTICIPANTS

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## Overall learning outcome

There are two overarching goals of the European Space Camp:

- A better understanding of scientific rocket campaigns based on first-hand experience
- Sharpened collaborative skills and valuable experience in international scientific project collaboration

More specifically, you will gain a better understanding of

- preparations and processes related to a rocket launch
- the phases of a sounding rocket project: defining scientific objectives, building sensors, payload integration and testing, telemetry, data analysis and presentation of findings
- working in international coalitions
- signal theory and basic electronics—A/D conversion, encoding/decoding, telemetry and radio-communication
- the use of rockets, balloons and ground-based instruments for studying processes in the atmosphere
- basic rocket propulsion (solid, liquid and hybrid) and rocket nozzle design

## Day 1 — Sunday August 4<sup>th</sup> — Arrival

Welcome!

Time	Activity	Responsible	Location	Note
10:45	Arrival at Andøya Airport			
<b>12:30–13:15</b>	<b>Lunch</b>	<b>Kitchen</b>	<b>Havblikk</b>	
15:40	Arrival at Andøya Airport	—	Andøya Airport	
15:50–16:00	Transport from Andøya Airport to Andøya Space	Team	Andøya Airport	
16:00–16:30	Welcome and check-in	Team	Andøya Space	
<b>16:30–17:30</b>	<b>Dinner</b>	<b>Kitchen</b>	<b>Havblikk</b>	
17:30	Arrival at Andøya Airport	—	Andøya Airport	
17:45–18:00	Transport from Andøya Airport to Andøya Space	Team	Andøya Airport	
18:00–18:30	Welcome and Check-in	Team	Andøya Space	
19:00–20:30	Ice-breaker activity	Team	Andøya Space	
<b>20:30–21:00</b>	<b>Pizza party</b>	<b>Kitchen</b>	<b>Havblikk</b>	
21:05	Arrival at Andøya Airport	—	Andøya Airport	
21:20–21:30	Transport from Andøya Airport to Andøya Space	Team	Andøya Airport	
21:30–22:00	Welcome and Check-in	Team	Andøya Space	

## Day 2 — Monday August 5<sup>th</sup> — Campaign start

### Learning outcomes

You will learn more about

- Scientific rocket campaigns
- Andøya Space
- Norwegian Space Activities
- Team specific learning outcomes

Time	Activity	Responsible	Location	Note
07:45–08:00	Morning activities	Team	Outside	
<b>08:00–08:30</b>	<b>Breakfast</b>	<b>Kitchen</b>	<b>Havblikk</b>	
09:00–09:20	Official opening of ESC 2024		Outside	
09:25–09:40	Speech to ESC 2024		Saturn	
09:45–10:45	Welcome, expectation analysis, plan for the week	BÅB, SB, KE, JMGP, MF	Saturn	
<b>10:45–11:00</b>	<b>Fruit and Coffee break</b>	<b>Kitchen</b>	<b>Foyer</b>	
11:00–12:30	Tour of Andøya Space	BÅB, TØ, KE	Andøya Space	Bring warm clothes!
<b>12:30–13:15</b>	<b>Lunch</b>	<b>Kitchen</b>	<b>Havblikk</b>	
13:15–13:30			Saturn	
13:30–15:15	Student rocket work	BÅB, SB, KE, JMGP, MF	Saturn, Pluto	
15:30–16:15	Workshop: Ideas for scientific cases	PI team	Saturn	PI team meet at 15:15!
16:15–16:30	Status meeting	PI team	Saturn	
<b>16:30–17:15</b>	<b>Dinner</b>	<b>Kitchen</b>	<b>Havblikk</b>	
17:30–22:00	Mountain Hiking	Team	To Ramnan	
<b>22:00–22:30</b>	<b>Evening meal</b>	<b>Kitchen</b>	<b>Havblikk</b>	<b>Self-service</b>

## Day 3 — Tuesday August 6<sup>th</sup> — Student rocket work

### Learning outcome

You will learn more about

- Scientific balloons & atmospheric physics
- Rocket engines & trajectories
- Team specific learning outcomes

Time	Activity	Responsible	Location	Note
07:45–08:00	Morning activities	Team	Outside	
<b>08:00–08:30</b>	<b>Breakfast</b>	<b>Kitchen</b>	<b>Havblikk</b>	
08:45–09:00	Status meeting	PI team	Saturn	
09:00–10:30	Student rocket work	BÅB, SB, KE, JMGP, MF	Pluto	
10:30–10:45	<b>Fruit and Coffee break</b>	<b>Kitchen</b>	<b>Foyer</b>	
10:45–12:30	Student rocket work	BÅB, SB, KE, JMGP, MF	Pluto	
12:30–13:15	<b>Lunch</b>	<b>Kitchen</b>	<b>Havblikk</b>	
13:15–14:00	Lecture: Balloons and radiosondes	JMGP	Saturn	
14:00–16:00	Student rocket work	BÅB, SB, KE, JMGP, MF	Pluto	First possibility for PTU (balloon) release
14:00–16:00	Trajectory simulations	JMGP	Saturn	Science Experiment + parts of Sensor Experiment
16:00–16:30	Status meeting	PI team	Saturn	Presentation & discussion of results from trajectory simulation
16:30–17:15	<b>Dinner</b>	<b>Kitchen</b>	<b>Havblikk</b>	
17:30–18:15	Lecture: James Webb Space Telescope	SA	Saturn	
18:30–19:30	Lecture: Mars	SA	Saturn	
19:30–20:30	Team ESC activity	Team	Andøya Space	
<b>20:30–21:00</b>	<b>Evening meal</b>	<b>Kitchen</b>	<b>Havblikk</b>	<b>Self-service</b>



## Day 4 — Wednesday August 7<sup>th</sup> — Final integration

### Learning outcome

You will learn more about

- Team specific learning outcomes

Time	Activity	Responsible	Location	Note
07:45–08:00	Morning activities	Team	Outside	
<b>08:00–08:30</b>	<b>Breakfast</b>	<b>Kitchen</b>	<b>Havblikk</b>	
08:45–09:15	Status meeting	PI team	Saturn	Extra time for settling scientific cases
09:15–10:30	Student rocket work	BÅB, SB, KE, JMGP, MF	Pluto, Saturn	
10:30–10:45	<b>Fruit and Coffee break</b>	<b>Kitchen</b>	<b>Foyer</b>	
10:45–12:30	Student rocket work	BÅB, SB, KE, JMGP, MF	Pluto, Saturn	Last possibility for PTU release
12:30–13:15	<b>Lunch</b>	<b>Kitchen</b>	<b>Havblikk</b>	
13:15–14:15	Student rocket work	BÅB, SB, KE, JMGP, MF	Pluto, Saturn	
14:15–15:45	Final integration and testing	BÅB, SB, KE, JMGP, MF	Pluto, Saturn	
15:45–16:15	Rocket signing and photoshoot	TBD	Saturn	
16:15–16:30	Status meeting	PI team	Saturn	
16:30–17:15	<b>Dinner</b>	<b>Kitchen</b>	<b>Havblikk</b>	
17:30–19:15			Saturn	
19:30–21:00	Team ESC activity	Team	Andøya Space	
21:00–21:30	<b>Evening meal</b>	<b>Kitchen</b>	<b>Havblikk</b>	<b>Self-service</b>



## Day 5 — Thursday August 8<sup>th</sup> — Launch day!

### Learning outcome

You will learn more about

- Scientific rocket campaign
- Kongsberg Defence and Aerospace
- Team specific learning outcomes

Time	Activity	Responsible	Location	Note
07:45–08:00	Morning activities	Team	Outside	
<b>08:00–0830</b>	<b>Breakfast</b>	<b>Kitchen</b>	<b>Havblikk</b>	
08:45–09:00	Status meeting	PI team	Saturn	
09:00–10:00	Pre-flight meeting and safety brief	KHO	Birkeland Auditorium	
10:15–10:30	Presentation of balloon trajectory	PTU team	Saturn	
10:30–10:45	<b>Fruit and Coffee break</b>	<b>Kitchen</b>	<b>Foyer</b>	
10:45–11:15	Python script walkthrough	BÅB	Saturn	
11:15–12:00	Start preparing scripts for data analysis	PI team	Saturn	Test data will be provided
12:00–12:15	Prepare for launch	BÅB, SB, KE, JMGP, MF	Designated areas	
12:15–13:00	<b>Lunch</b>	<b>Kitchen</b>	<b>Havblikk</b>	Note early start!
13:00–14:30	Rocket operation	BÅB, SB, KE, JMGP, MF	Designated areas	
14:30–15:15	Post-flight meeting	<b>ML</b>	Birkeland Auditorium	Exact time announced during launch operation
15:30–16:15	Case work	BÅB, JMGP	Saturn	Data analysis and preparation for presentations
16:15–16:30	Status meeting	PI team	Saturn	
16:30–17:15	<b>Dinner</b>	<b>Kitchen</b>	<b>Havblikk</b>	
17:30–19:30	Case work	PI team	Saturn	
19:30–20:30	Team ESC activity	Team	Andøya Space	
20:30–21:00	<b>Evening meal</b>	<b>Kitchen</b>	<b>Havblikk</b>	<b>Self-service</b>

## Day 6 — Friday August 9<sup>th</sup> — Campaign end

### Learning outcome

You will learn more about

- Physics
- Data analysis and presentation

Time	Activity	Responsible	Location	Note
07:45–08:00	Morning activities	Team	Outside	
<b>08:00–08:30</b>	<b>Breakfast</b>	<b>Kitchen</b>	<b>Havblikk</b>	
08:45–09:00	Status meeting	PI team	Saturn	
09:00–09:45	Lecture: Norwegian Space history	MM	Saturn	Digital
10:00–10:45	Lecture: Making use of space	MM	Saturn	Digital
10:45–11:00	<b>Fruit and Coffee break</b>	<b>Kitchen</b>	<b>Foyer</b>	
11:00–12:30	Case work	PI team	Saturn	
12:30–13:15	<b>Lunch</b>	<b>Kitchen</b>	<b>Havblikk</b>	
13:15–14:15	Case work	PI team	Saturn	
14:30–16:00	Case presentations	PI team	Saturn	
16:00–16:30	Sum-up of the week		Saturn	
16:30–17:15	<b>Dinner</b>	<b>Kitchen</b>	<b>Havblikk</b>	
17:30–18:15			Saturn	
18:30–19:15			Saturn	
20:30–21:00	<b>Evening meal</b>	<b>Kitchen</b>	<b>Havblikk</b>	<b>Self-service</b>
21:00–02:00	Sun-set and sun-rise tour	Team	Andøya Space	

## Day 7 — Saturday August 10<sup>th</sup> — Evaluation and Official Closing

### Learning outcome

You will learn more about

- GPS

Time	Activity	Responsible	Location	Note
09:45–10:00	Morning activities	Team	Outside	
<b>10:00–10:30</b>	<b>Breakfast</b>	<b>Kitchen</b>	<b>Havblikk</b>	
10:30–12:30	GPS hunt	Team	Andøya Space	
12:30–13:15	<b>Lunch</b>	<b>Kitchen</b>	<b>Havblikk</b>	
13:15–14:15	Team ESC activity	Team	Saturn	
14:15–15:00	Evaluation of ESC 2024	Team	Saturn	
15:00–16:00	Official closing ESC 2024	JG/LK	Saturn	
16:00–16:30	<b>Waffles</b>	<b>Kitchen</b>	<b>Havblikk</b>	
16:30–19:00	Prepare for ESC Show	Team	Andøya Space	
16:30–19:00	Travel to Mars	Guides	Spaceship Aurora	
19:00–21:00	<b>Farewell dinner</b>	<b>Kitchen</b>	<b>Havblikk</b>	
21:00–23:00	Farewell party and ESC show 2024	Team	Andøya Space	

## Day 8 — Sunday August 11<sup>th</sup> — Departure

Time	Activity	Responsible	Location	Note
08:45–09:00	Morning activities	Team	Outside	
<b>09:00–09:30</b>	<b>Breakfast</b>	<b>Kitchen</b>	<b>Havblikk</b>	
09:00–10:30	Check out from your rooms	Participants	Andøya Space	Place your luggage in the classroom
10:00	Transport to Andøya Airport	Team	Reception	Hand in your key-card before you leave!!
10:30–10:45	<b>Fruit and Coffee break</b>	<b>Kitchen</b>	<b>Foyer</b>	
10:45–12:30	Team ESC activity	Team	Saturn	
12:30–13:15	<b>Lunch</b>	<b>Kitchen</b>	<b>Havblikk</b>	Hand in your key-card before you leave!!
15:00	Transport to Andøya Airport	Team	Reception	
<b>16:30–17:30</b>	<b>Dinner</b>	<b>Kitchen</b>	<b>Havblikk</b>	
20:00	Transport to Andøya Airport	Team	Reception	

Safe travels!

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### Revisions

Date	Who	Note
14/12/2023	HMS	Created the first version of the program
14/02/2024	HMS	Logos

### Logos

