
Rocket Design
By Olivier Laurent & Johnny Yammine
START
United States
Discovery

QUICK OVERVIEW

1556

708

965

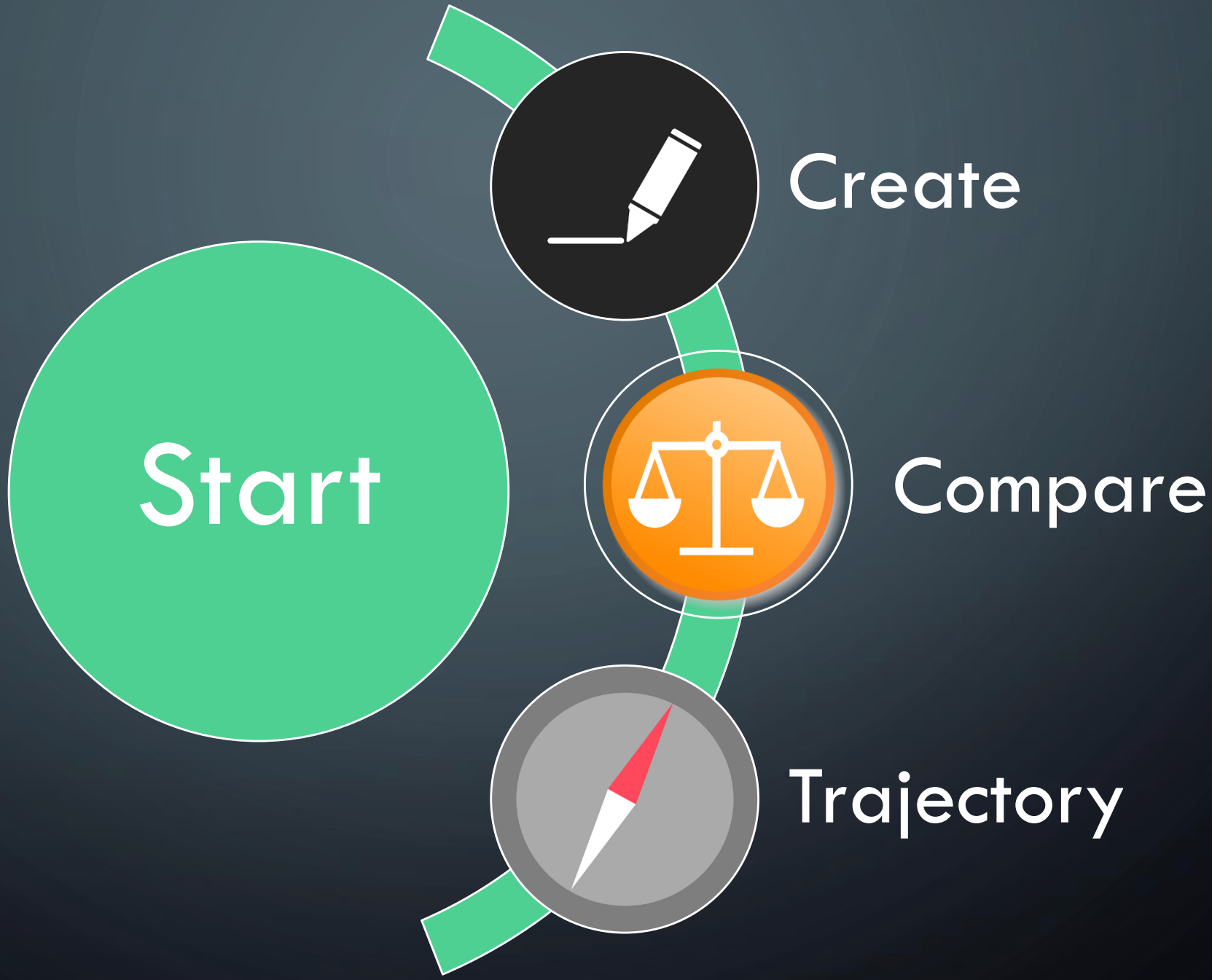
2427

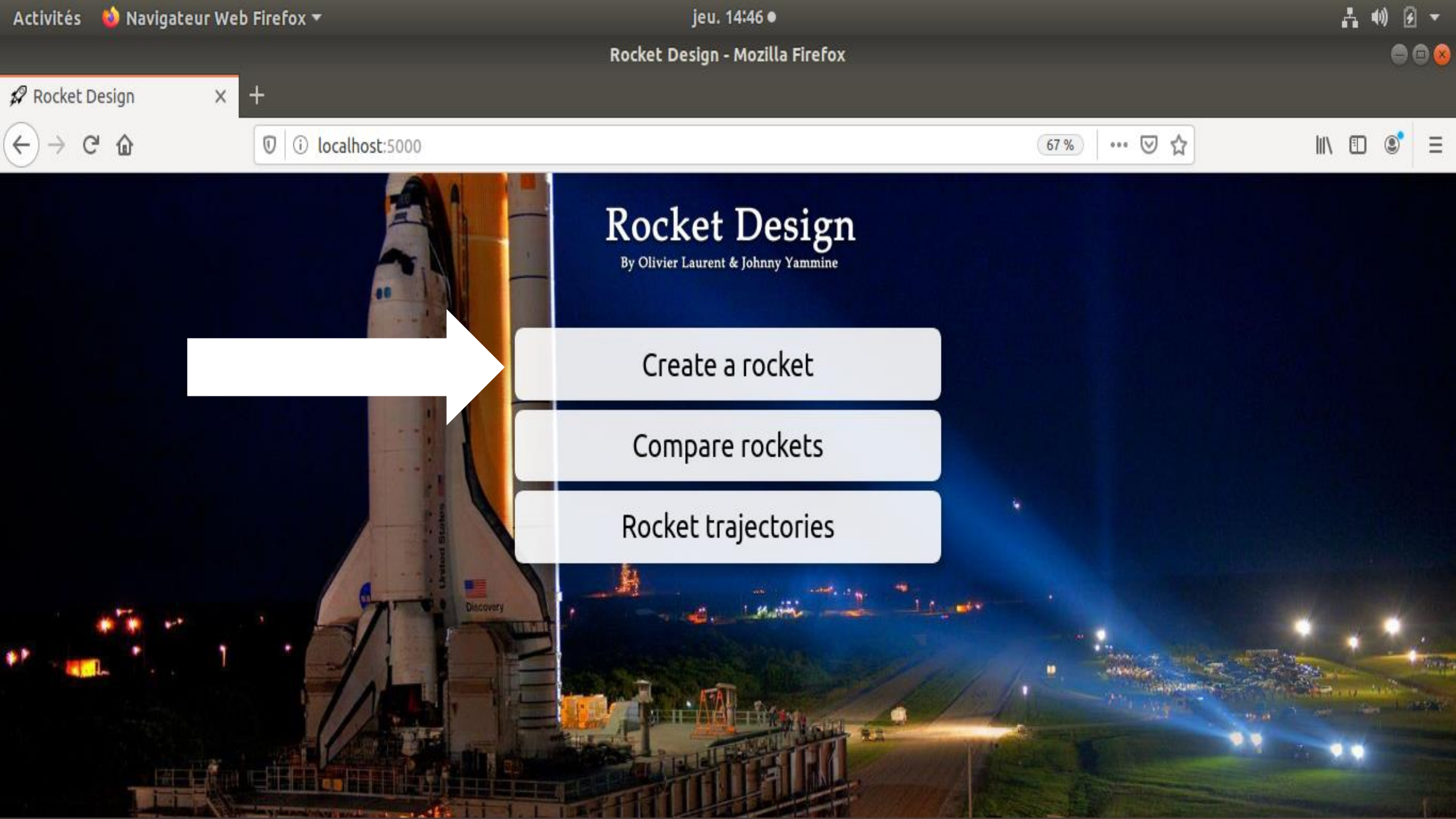
340

42

HOW TO LAUNCH THE GUI

```
johnny@johnny-VirtualBox:~/rocket-design$ export FLASK_APP=app.py
johnny@johnny-VirtualBox:~/rocket-design$ export FLASK_ENV=development
johnny@johnny-VirtualBox:~/rocket-design$ flask run
 * Serving Flask app "app.py" (lazy loading)
 * Environment: development
 * Debug mode: on
 * Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 897-001-402
```


Start
Create
Compare
Trajectory


Activités
Navigateur Web Firefox
jeu. 14:46
Rocket Design - Mozilla Firefox
Rocket Design
localhost:5000
67 %
Rocket Design
By Olivier Laurent & Johnny Yammine
Create a rocket
Compare rockets
Rocket trajectories
Discovery

Activités Navigateur Web Firefox jeu. 14:48
Design Your Rocket - Mozilla Firefox
Design Your Rocket
localhost:5000/designrocket.html 67 %

Go back!

Design your own rocket !

START FROM AN EXISTING MODEL

General Information

Name : Soyuz

Date of the first launch (YYYY): 1966

Country : USSR

Mission : LEO

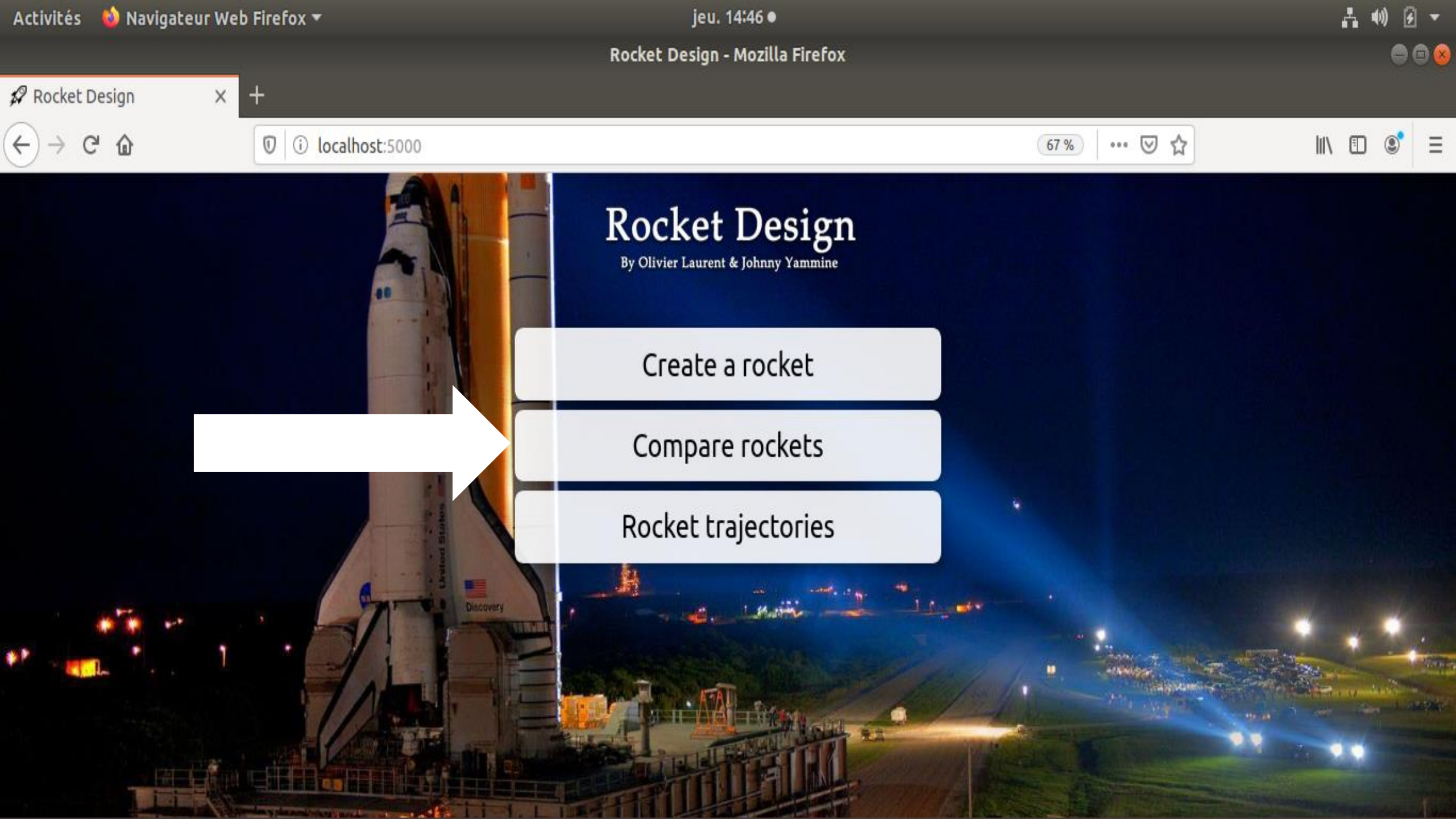
Stage Number: Two Stages

Boosters: No Boosters

Total Height (m): 45,6

Lift-off mass (tons): 308

Show Fairing 140 Show fuel


Activités
Navigateur Web Firefox
jeu. 14:46
Rocket Design - Mozilla Firefox
Rocket Design
localhost:5000
67 %
Rocket Design
By Olivier Laurent & Johnny Yammine
Create a rocket
Compare rockets
Rocket trajectories
Discovery
United States

Activités Navigateur Web Firefox jeu. 14:49

Design Rocket - Mozilla Firefox

Design Rocket

localhost:5000/compare_rockets.html 67 %

LOAD A ROCKET

LOAD A ROCKET

General Specifications

Name:
R-7 Semiorka
Year of first launch:
1957
Country:
USSR
Mission:
LEO
Number of stages:
2
Boosters:
false
Total Height (m):
28
Lift-off Mass (tons):
273
Payload Mass (kg):
83.6

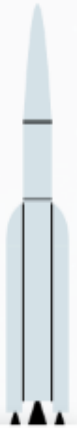
First Stage Specifications

Booster Specifications

Show Fairing

140

Show fuel

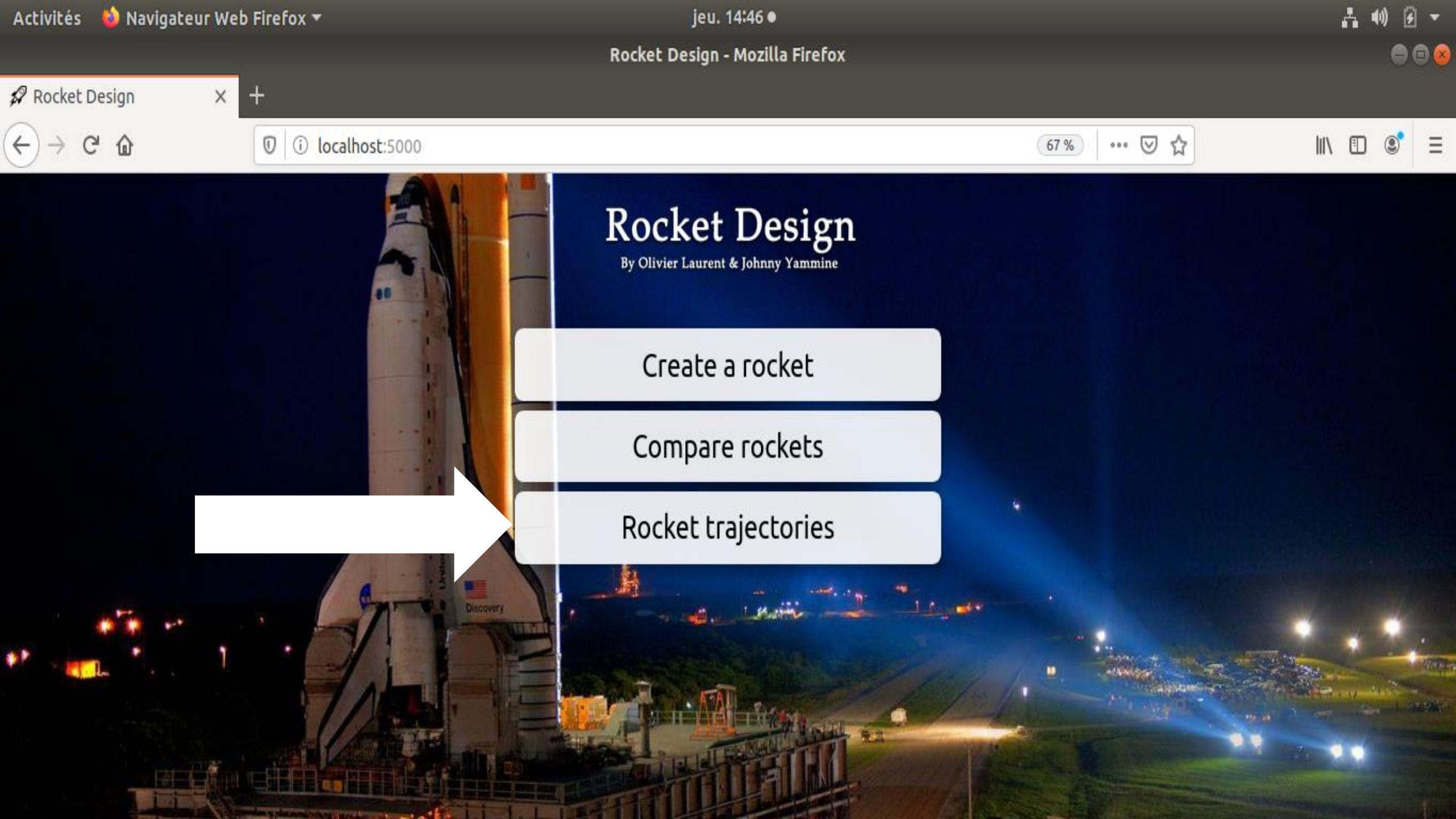


General Specifications

Name:
Ariane 5
Year of first launch:
1998
Country:
Europe
Mission:
LEO
Number of stages:
2
Boosters:
true
Total Height (m):
52
Lift-off Mass (tons):
777
Payload Mass (kg):
6950

First Stage Specifications

Booster Specifications


Activités
Navigateur Web Firefox
jeu. 14:46
Rocket Design - Mozilla Firefox
Rocket Design
localhost:5000
67 %
Rocket Design
By Olivier Laurent & Johnny Yammine
Create a rocket
Compare rockets
Rocket trajectories
Discovery

Go back!

CHOOSE YOUR ROCKET

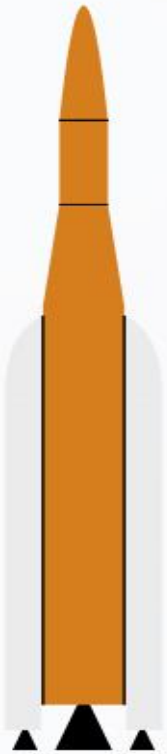
General Specifications −

SLS B1 2021 US
Mission:
GTO
Number of stages:
2
Boosters:
true
Total Height (m):
111.25
Lift-off Mass (tons):
2650
Payload Mass (kg):
95000

First Stage Specifications +

Booster Specifications +

Second Stage Specifications +



140

Show fuel

Mission Panel

Type of mission: GTO

Altitude/Semi-major axis (km): Altitude

Excentricity Target: Excentricity

Payload mass (kg): 95000

Simulation Panel

Type of algorithm : Genetic Optimizer

Population Size: 50

Selection rate: (1 kept every ... people) 2

Number of iterations: 10

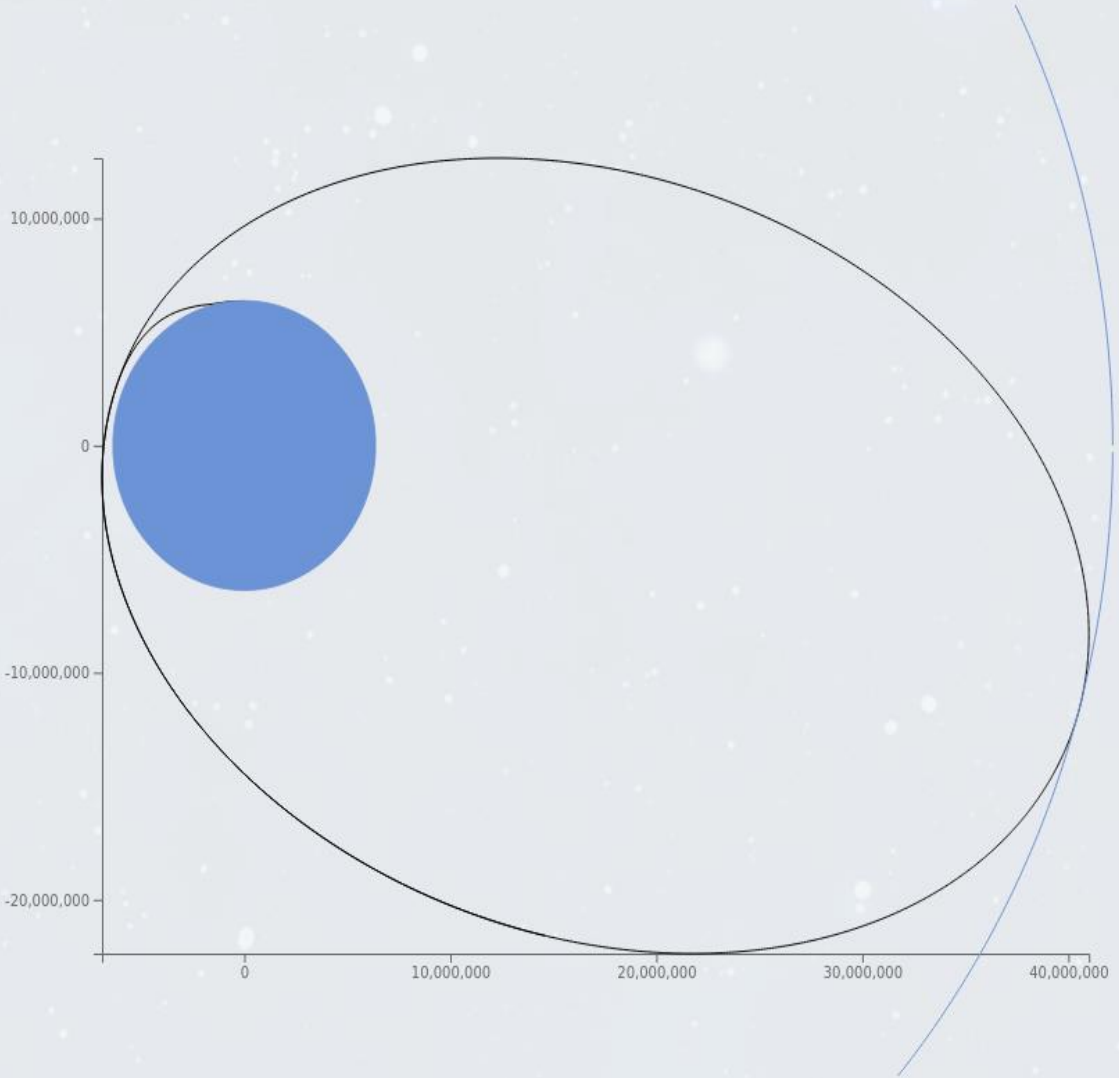
Gradient steps: 500

Dimension: 2

LAUNCH !

```
first quantile :  8.965374903738594e-05 minimum : 6.042162819029482e-08
Betterment |                                        | 400/400
--------------- epoch 15 ---------------
first quantile :  8.196529686123012e-05 minimum : 6.042162819029482e-08
Betterment |                                        | 400/400
--------------- epoch 16 ---------------
first quantile :  7.014061813627481e-05 minimum : 6.042162819029482e-08
Betterment |                                        | 400/400
--------------- epoch 17 ---------------
first quantile :  6.20394839374656e-05 minimum : 1.2911375870920836e-08
Betterment |                                        | 400/400
--------------- epoch 18 ---------------
first quantile :  5.550570680955381e-05 minimum : 1.2911375870920836e-08
Betterment |                                        | 400/400
--------------- epoch 19 ---------------
first quantile :  4.868378389747374e-05 minimum : 5.668004319414079e-10
Betterment |                                        | 400/400
--------------- epoch 20 ---------------
first quantile :  3.7849471139330596e-05 minimum : 5.668004319414079e-10
Betterment |                                        | 400/400
Finalization |                                      | 100/100
Final command: [ 2.57390888 -2.21438831]
Final cost value: 4.6047369185088854e-10
(.python-env) olivier@hmc-olivier:~/Documents/ENSTA1A/rocket-design$
```

Go back!


10,000,000
0
-10,000,000
-20,000,000
0
10,000,000
20,000,000
30,000,000
40,000,000

HOW FAR COULD WE LAUNCH OUR PROJECT…?