User requirement specifications

Individual assignment – Balan Mihai

Contents

Final iteration of project

	Must have	Should have	Could have	Will not have
Administrator	1. Log in: G-01, FR-01 2. Add employee:AD-01, FR-02 3. Remove employees:AD-02, FR-03 4. View all data of registered space objects in desktop:G-02, FR-05 5. View all data of registered space objects in web:G-03, FR-06 6. View details of objects in web: G-04, FR-07 7. Search for specific objects: G-05, FR-11 8. Change object view in desktop: G-06, FR-08 9. Edit own profile in website: G-07, FR-09 10. View map of objects: G-08, FR-18 11. Recover password: G-09, FR-19 12. View users statistics: AD-03, FR-12 13. Edit data of registered users: AD-04, FR-10		1. Posting announcements	1. Live simulation of time and objects movement

Employee	1. Log in: G-01, FR-01 2. View all data of registered space objects in desktop:G-02, FR-05 3. View all data of registered space objects in web:G-03, FR-06 4. View details of objects in web: G-04, FR-07 5. Search for specific objects: G-05, FR-11 6. Change object view in desktop: G-06, FR-08 7. Edit own profile in website: G-07, FR-09 8. View map of objects: G-08, FR-18 9. Recover password: G-09, FR-19 10. Add space object: EM-01, FR-13 11. Remove space objects: EM-02, FR-14 12. Edit existing objects: EM-03, FR-15		1. Calculate communication path: EM-04, FR-20	2. View statistics from other employees
Guest	1. Log in: G-01, FR-01 2. View all data of registered space objects in desktop:G-02, FR-05 3. View all data of registered space objects in web:G-03, FR-06 4. View details of objects in web: G-04, FR-07 5. Search for specific objects: G-05, FR-11 6. Change object view in desktop: G-06, FR-08 7. Edit own profile in website: G-07, FR-09 8. View map of objects: G-08, FR-18 9. Recover password: G-09, FR-19			• Access to communication or other complex features

	10. Create an account: GU-01, FR-16 11. Delete personal account: GU-02, FR-17			

Non-functional Requirements

*All of the functional requirements are of “Must Have” priority.

Remote Access: NFR-01

- The application should allow employees of Astra Dynamics and regular people to access the system remotely, using a secure login.
- The web site should have a mobile-friendly interface for remote access.

Performance: NFR-02

- The application should be able to handle a large amount of space objects
- The application should respond quickly to user inputs

Expandability: NFR-03

- The application should be designed to allow for future expansion and development.
- The system should have modular architecture and well-documented code.
- The system should be designed to integrate with other software or services in the future.

Security: NFR-04

- The application should be secure and protect sensitive data.

- The system should have user authentication and authorization controls.
- The system should encrypt data in transit and at rest.

Accessibility and Usability: NFR-05

- The application should be easy to use and accessible to all users.
- The system should have clear and intuitive user interfaces.

Use Cases

General

Use case: G-01
Functional requirement: FR-01
Actor: Any user
Description: User uses his credentials to log into the system
Main success scenario:

1.Actor inputs name and password
2.Actor confirms
3.Credentials validated, actor is logged in.
4.System displays the main page

Extensions:
3a. Credentials did not match

.1: System displays message saying credentials did not match
.2: End of use case

Use case: G-02
Functional requirement: FR-05
Actor: Any user
Description: User views data of a space object in desktop app

Pre-condition: User is logged in
Main success scenario:

1. Actor selects an object from the list
2. System displays the information in the user interface

Use case: G-03
Functional requirement: FR-06
Actor: Any user
Description: User views data of a space object in website
Pre-condition: User is logged in
Main success scenario:

1. Actor clicks the tab Satellites/Stations/Debris
2. System displays the Satellites/Stations/Debris page
3. Information is visible in the website

Use case: G-04
Functional requirement: FR-07
Actor: Any user
Description: User views details of a selected object in web
Pre-condition: User is logged in
Main success scenario:

1. Actor clicks the tab Satellites/Stations/Debris
2. System displays the Satellites/Stations/Debris page
3. For individual object, actor clicks on the “Details” link
4. System displays the details page

Extensions:

2a. There were no objects available

.1: Details page is inaccessible

.2: End of use case

Use case: G-05
Functional requirement: FR-11
Actor: Any user
Description: User searches for a object in desktop
Pre-condition: User is logged in

Main success scenario:

1. Actor types in the search bar what he is looking for
2. List contains all matches, if any

Use case: G-06

Functional requirement: FR-05
Actor: Any user
Description: User changes the view of the object in desktop
Pre-condition: User is logged in
Main success scenario:

1. Actor selects an object
2. Actor selects between the “Model View”, “Blueprint View” and “Map View” buttons.
3. Picture is changed.

Extensions:

2a. No object was selected

.1: The default “Not Available” picture is visible

.2: End of use case

Use case: G-07

Functional requirement: FR-09
Actor: Any user
Description: User edits his profile in the website
Pre-condition: User is logged in
Main success scenario:

1. Actor clicks the profile button
2. System displays the profile page
3. Actor modifies his details
4. Actor clicks the “Save Changes” button
5. System displays the index page
6. Changes are reflected in the profile page

Extensions:

3a. The new details were invalid

.1: System displays an “Invalid Data” message

.2: Changes are not made

.3: End of use case

Use case: G-08
Functional requirement: FR-18
Actor: Any user
Description: User views the map of objects in orbit
Pre-condition: User is logged in
Main success scenario:

1. Actor clicks on the “Map” tab
2. System displays the math
3. The map is centered on the first object added, chronologically

Use case: G-09
Functional requirement: FR-19
Actor: Any user
Description: User recovers his forgotten password
Pre-condition: None
Main success scenario:

1. Actor clicks the “Forgot Password” tab
2. System displays the “Forgot Password” interface
3. Actor inputs his email
4. Actor clicks “Send Recovery Email”
5. Email will arrive with a new password in actor’s inbox

Extensions:

3a. Email was in incorrect format
.1: System displays a “Email address is invalid” message
.2: End of use case

3b. Email was in correct format, but not registered
.1: System displays a “No account registered with this email” message
.2: End of use case

Administrator

Use case: AD-01
Functional requirement: FR-02
Actor: Administrator
Description: User adds a new employee, by filling in all data
Pre-conditions: Logged in as administrator
Main success scenario:

1. Actor clicks the “Add User” button
2. System displays the user adding page
3. Actor enters the info of the new employee
4. Actor clicks the ‘Add’ button
5. System displays a confirmation

Extensions:

3a. Data entered was invalid
.1: System displays error message saying data is invalid
.2: End of use case
3b. Email already existed
.1: System displays error message saying the email was already in use
.2: End of use case

Use case: AD-02
Functional requirement: FR-03
Actor: Administrator
Description: User removes a selected employee from the system
Pre-conditions: Logged in as administrator
Main success scenario:

1. Actor clicks the “Edit Users” tab
2. System displays the Edit Users interface
3. Actor selects a user
4. Actor clicks “Remove” button
5. System displays a confirmation

Extensions:

3a. Database did not respond

.1 System displays a message saying a connection error has occurred

.2 End of use case

Use case: AD-03

Functional requirement: FR-12

Actor: Administrator

Description: User views statistics of users

Pre-conditions: Logged in as administrator

Main success scenario:

1. Statistics are visible in the user interface, under the category “Users”

Use case: AD-04

Functional requirement: FR-10

Actor: Administrator

Description: User edits the data of another registered user

Pre-conditions: Logged in as administrator

Main success scenario:

1. Actor clicks the “Edit users” button
2. System displays the “Edit Users” interface
3. Actor selects a user
4. Actor modifies the user data
5. Actor inputs the user’s password
6. Actor clicks the “Save changes” button
7. System displays confirmation

Extensions:

5a. New data was invalid

.1: System displays an “Invalid Data” error message

.2: Changes are not saved

.3: End of use case

5b. Input password is incorrect

.1: System displays an “Invalid Password” error message

.2: Changes are not saved

.3: End of use case

Employee

Use case: EM-01
Functional requirement: FR-13
Actor: Employee
Description: User adds a new space object
Pre-condition: Logged in as Employee
Main success scenario:

1. Actor clicks the Add Satellite/Add Station/Add Debris button
2. System displays the user interface for adding
3. Actor fills in all necessary fields
4. Actor clicks the “Add” button
5. System displays a confirmation of success

Extensions:

3a. Submitted data was invalid

.1: System displays an “Invalid data” error message

.2: End of use case.

Use case: EM-02
Functional requirement: FR-14
Actor: Employee
Description: User removes a selected object
Pre-condition: Logged in as Employee
Main success scenario:

1. Actor clicks the tab Edit Objects
2. System displays the “Edit Objects” interface
3. Actor selects an object
4. Actor clicks the “Remove” button
5. System displays a confirmation message

Extensions:

3a. No object was selected

.1: System displays a “No object selected” error message
.2: End of use case

Use case: EM-03
Functional requirement: FR-15
Actor: Employee
Description: User edits a selected object
Pre-condition: Logged in as Employee
Main success scenario:

1. Actor clicks the tab Edit Objects
2. System displays the Edit Objects interface
3. Actor selects an object
4. Actor edits the available fields of the object
5. Actor clicks the “Save changes” button
6. System displays a confirmation message

Extensions:
4a. New data in incorrect format
.1: System displays an “Invalid Data” error message
.2: Changes are not saved
.3: End of use case

Use case: EM-04
Functional requirement: FR-20
Actor: Employee
Description: User calculates the minimum path from a communication satellite from another
Pre-condition: Logged in as Employee
Main success scenario:

1. Actor clicks “Communications” button
2. System displays the “Communications” interface
3. Actor selects the source
4. Actor selects the destination
5. Actor clicks “ Calculate” button
6. System displays a list of Satellites the message has to pass through

Extensions:

5a. A path could not be found
.1: System displays the message “No path found”
.2: End of use case

Guest

Use case: GU-01
Functional requirement: FR-16
Actor: Guest
Description: User creates a guest account
Pre-conditions: None
Main success scenario:
1. Actor clicks the “Get Started”/”Register”
2. System displays the registering interface
3. Actor fills in his details
4. Actor clicks the “Create Account” button.
5. System displays a confirmation
6. System displays the Login Page

Extensions:
3a. Input details were missing or in incorrect
.1: System displays specific error messages for every wrongfully completed field
.2: Account is not created
.3: End of use case

Use case: GU-02
Functional requirement: FR-17
Actor: Guest
Description: User deletes his personal account
Pre-conditions: None
Main success scenario:
1. Actor goes to the profile page
2. System displays the profile page
3. Actor clicks the “Delete account” button

4. Actor confirms his action
5. Account is deleted, actor is logged out

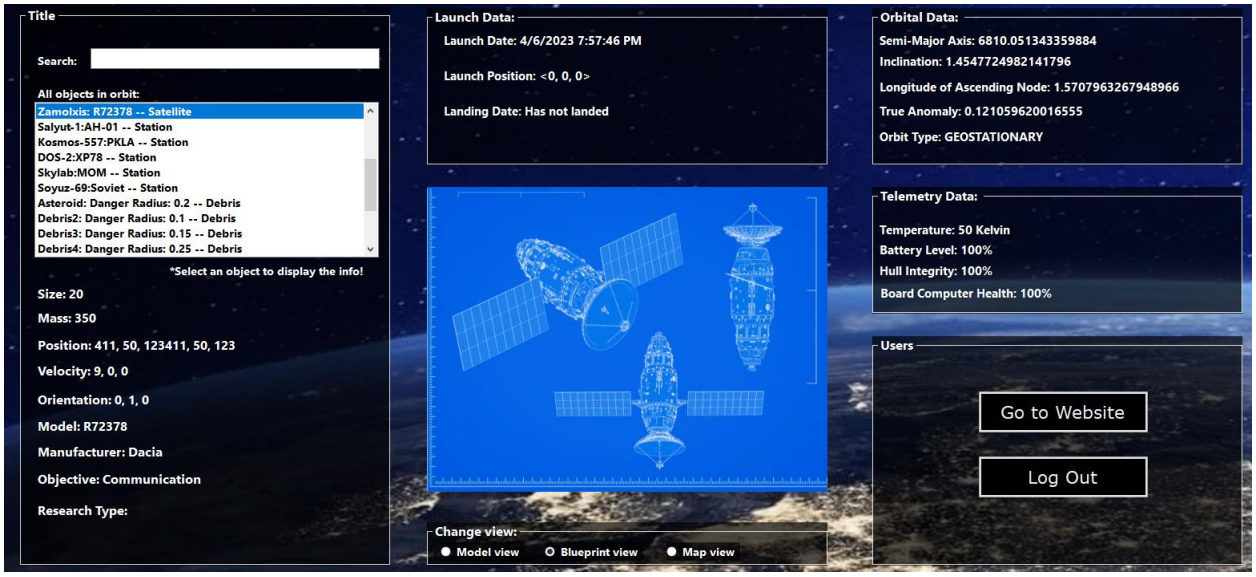
Extensions:

3a. Actor does not confirm his action

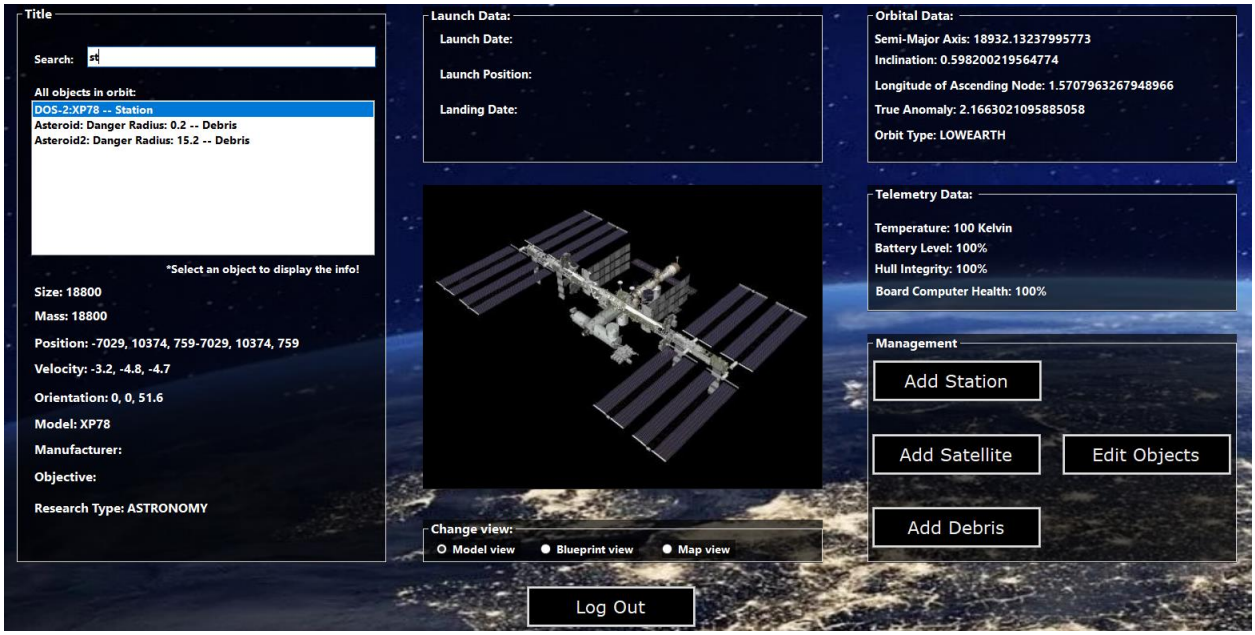
.1: End of use case

User interfaces:

- Guest desktop:



- Employee desktop:

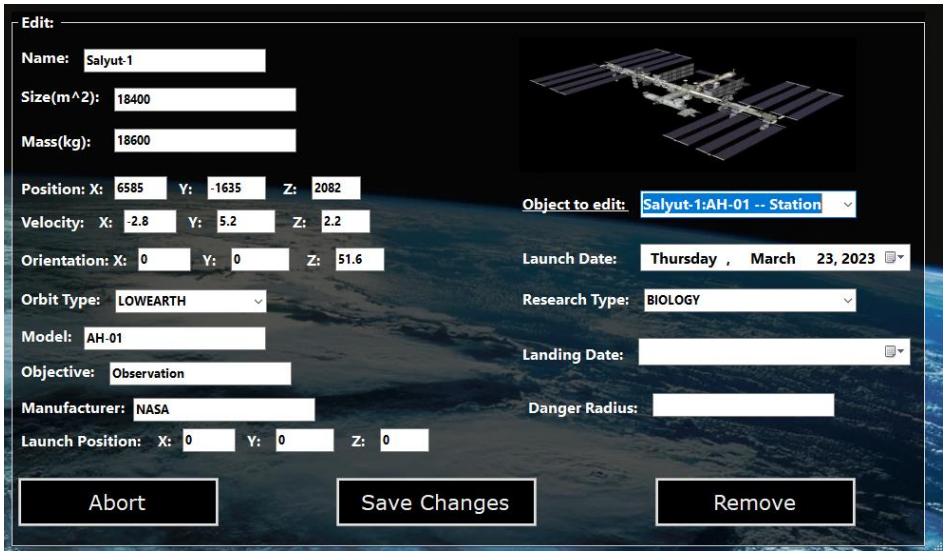


- Add Satellite:

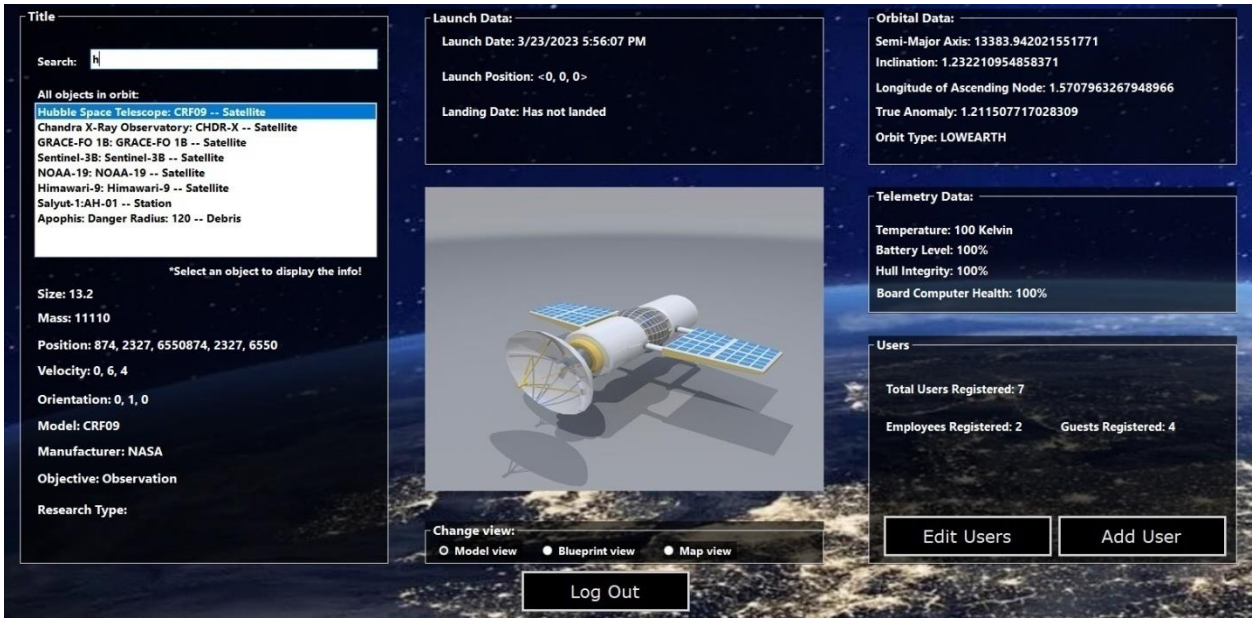
- Add Station:

- Add Debris:

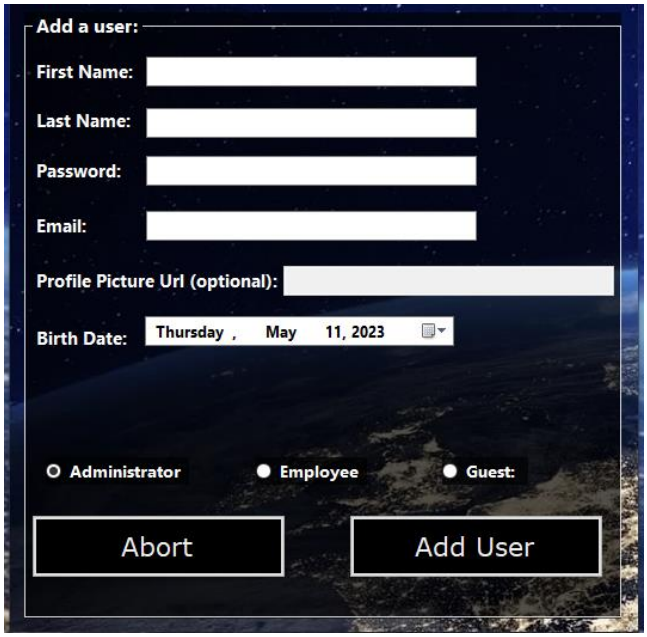
- Edit object:



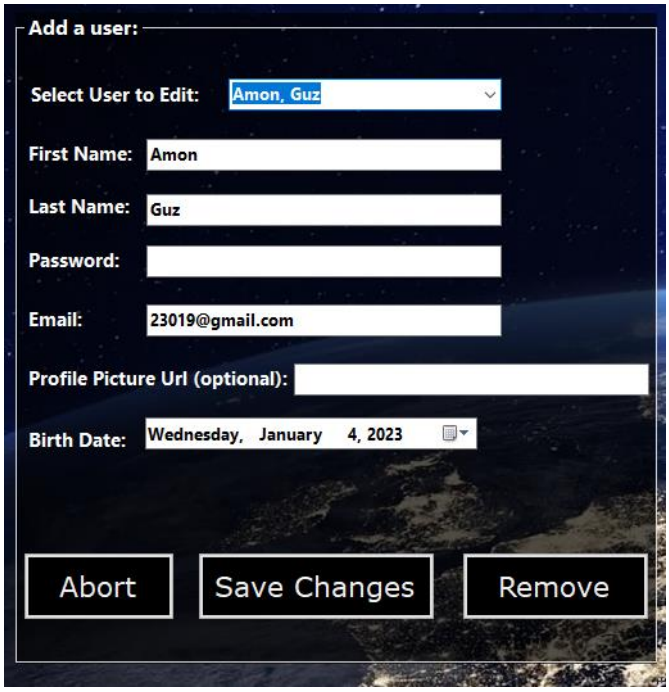
- Admin desktop:



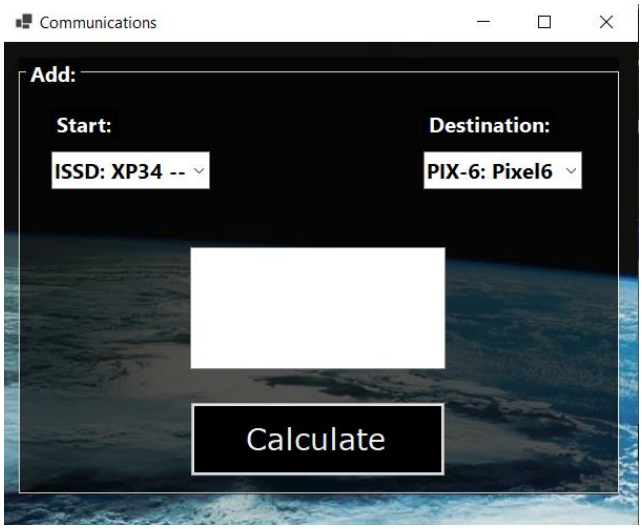
- Add user:



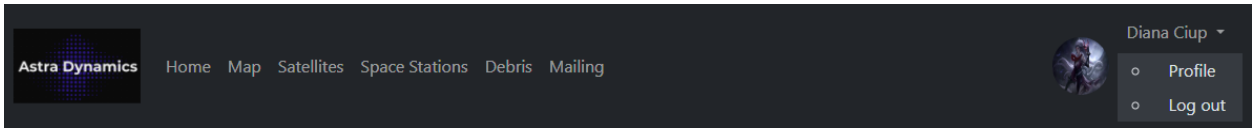
- Edit user:



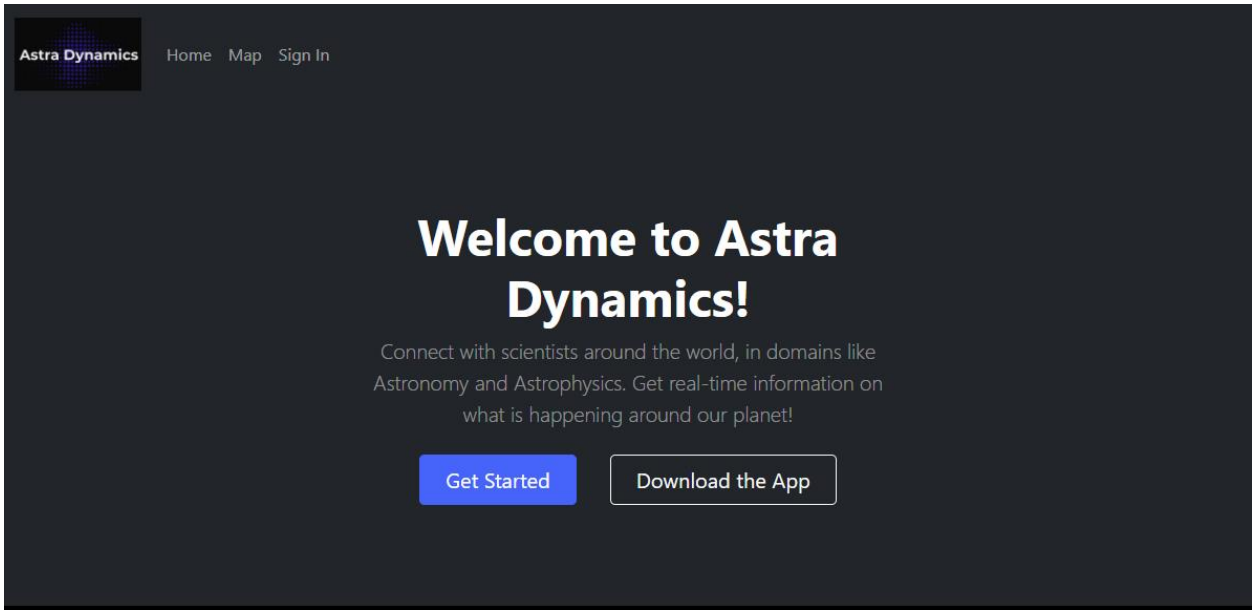
- Employee Communications calculator:



- Web landing page navbar(logged in):



- Web landing page:



Who are we?

Astra Dynamics is a small company that provides IT management systems for spatial objects of high relevance to our daily lives, like satellites, space stations and other natural objects, like comets or asteroids.

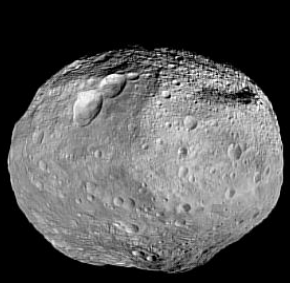
More →

Help manage satellites!

If you have ever user a GPS or watched TV, you have made use of a satellite. These pieces of machinery assist every system we are using, to a grater extend than the average person is aware of.

We keep track of all objects in Earh's orbit, whether they help us or endanger us. Our software is used by scientists that have exact data and by regular people who want to contribute in their own way.

More →

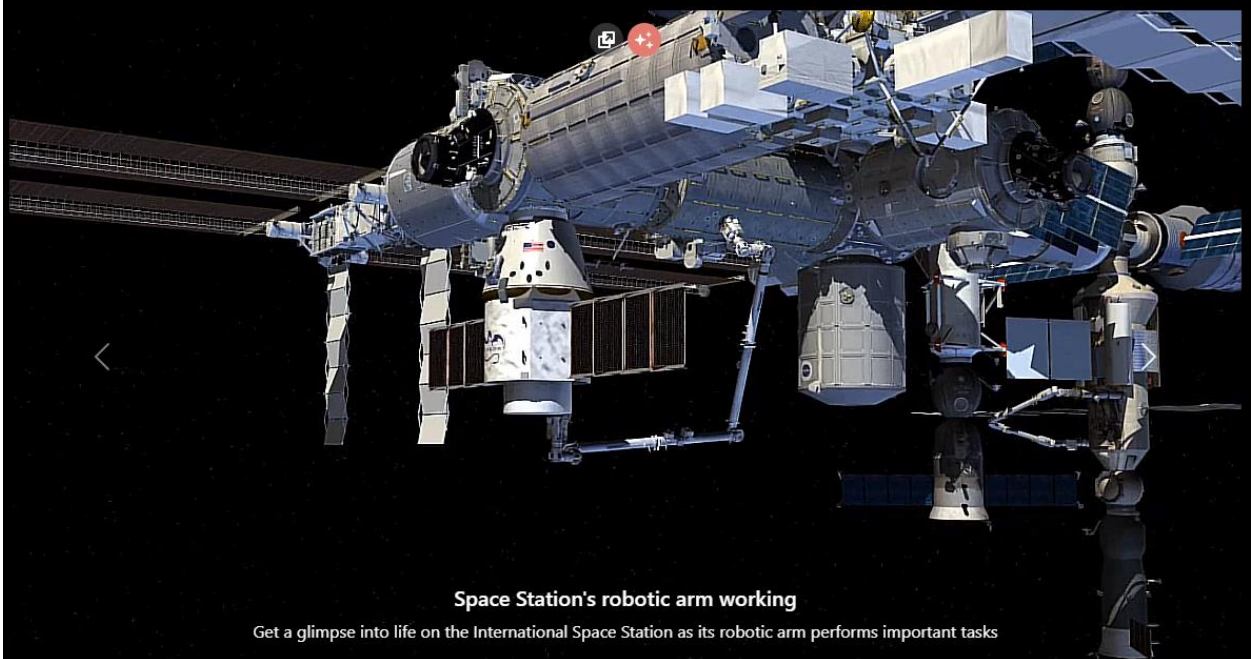


Help with threat detection!

Hundreds of objects fly by Earth on a daily basis. We do not notice them due to their small size, the distance at which they pass by, or because of their speed. Even if unoticeable to a person on the ground, for something in orbit, an interaction with such an object can be catastrophical.

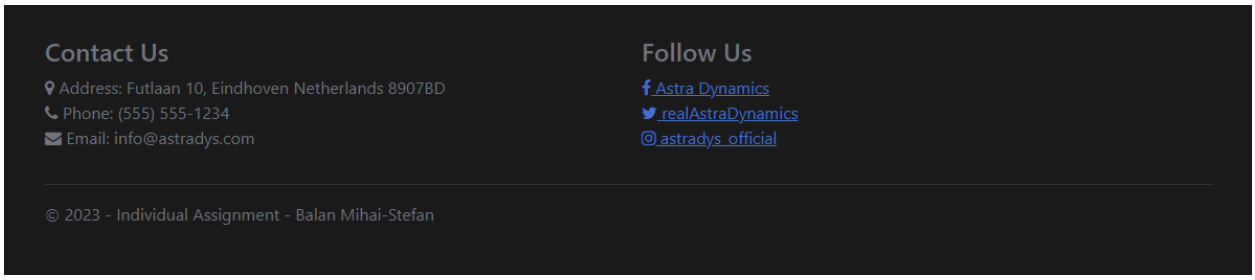
More →

Our Gallery

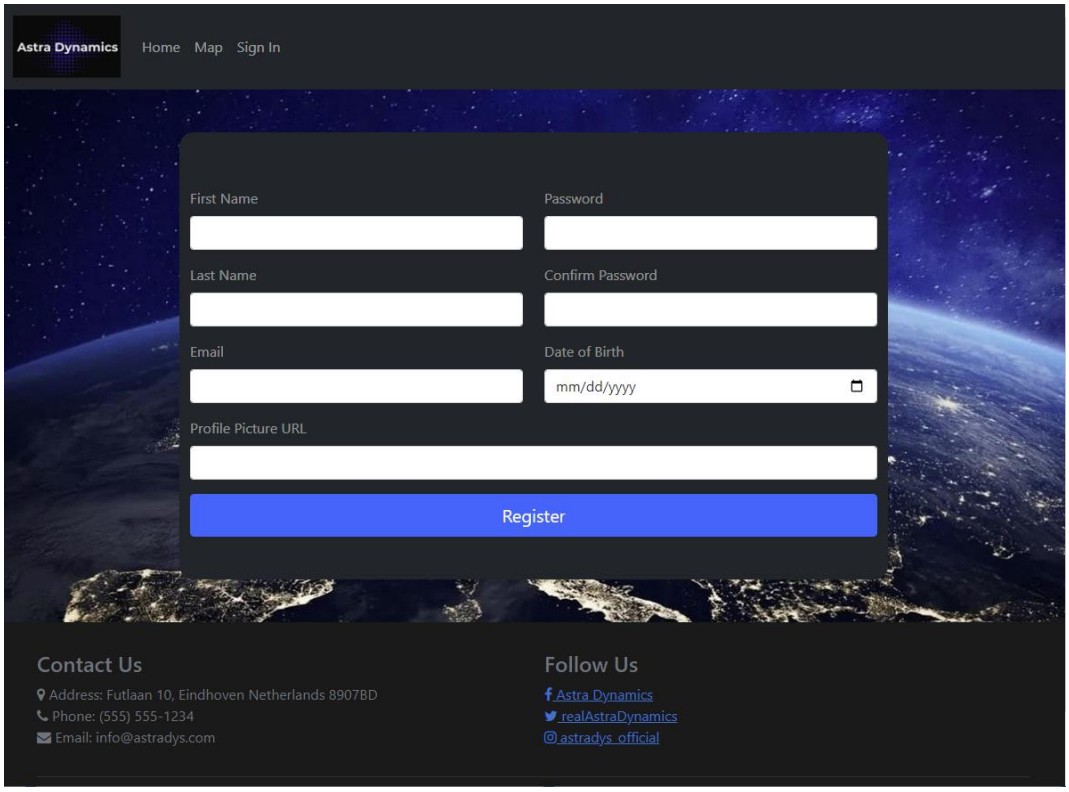


Space Station's robotic arm working

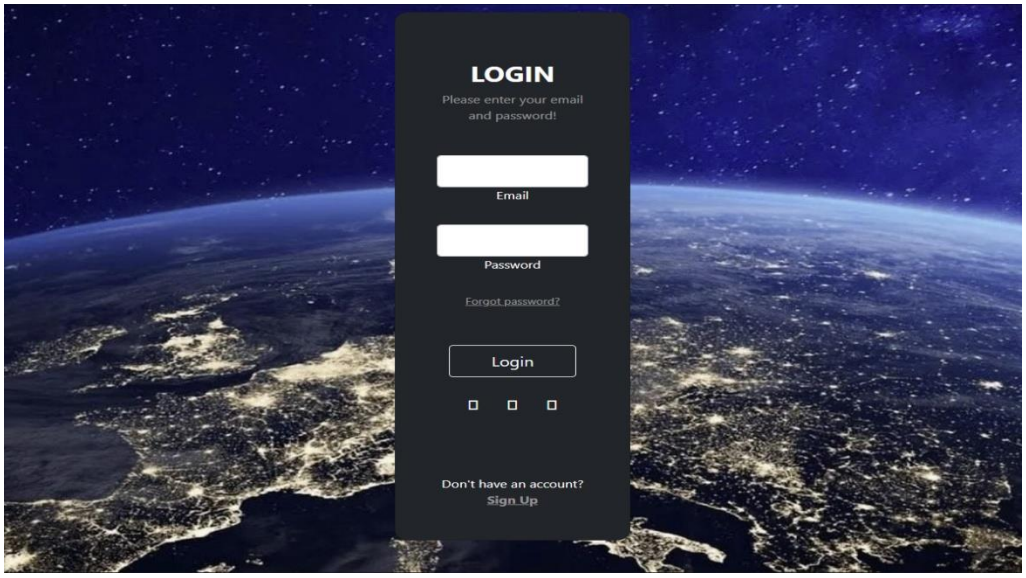
Get a glimpse into life on the International Space Station as its robotic arm performs important tasks



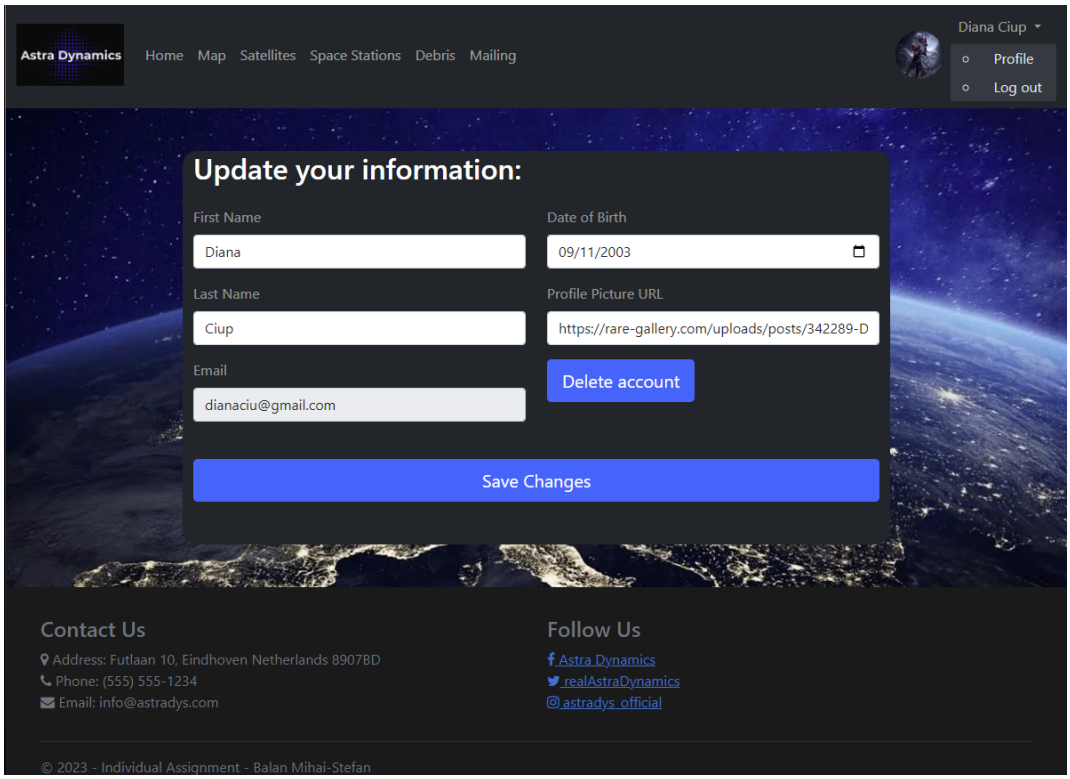
- Create account:



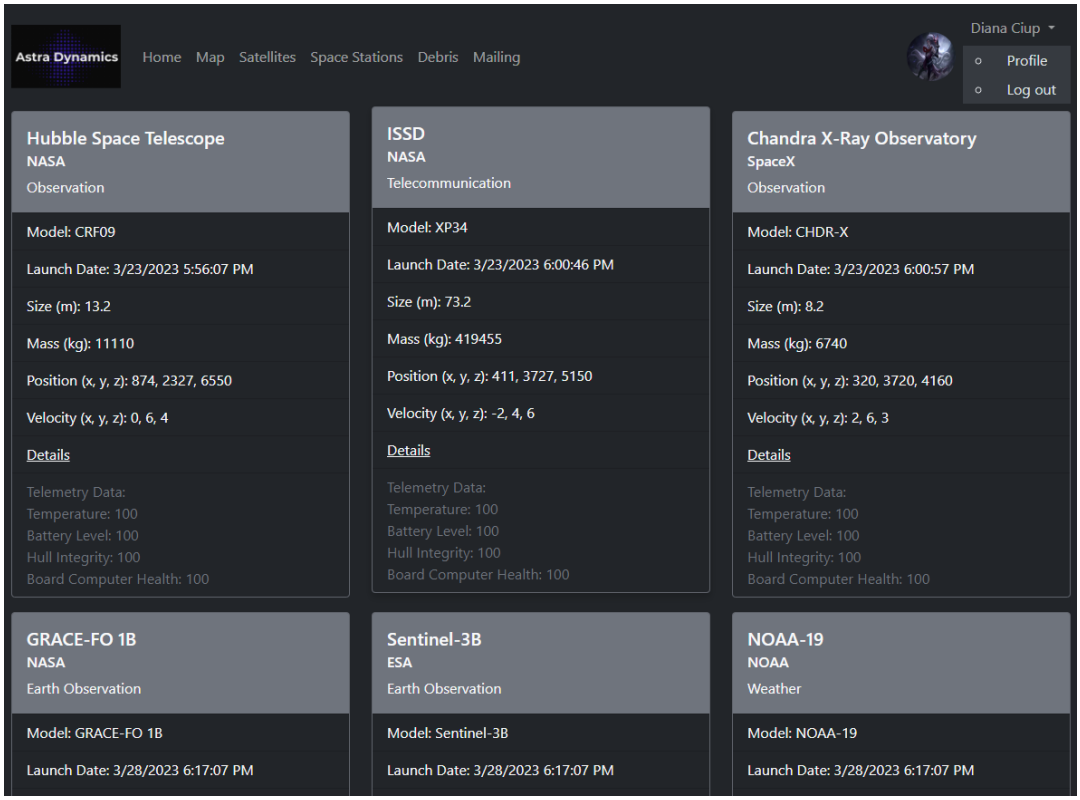
- Log In:



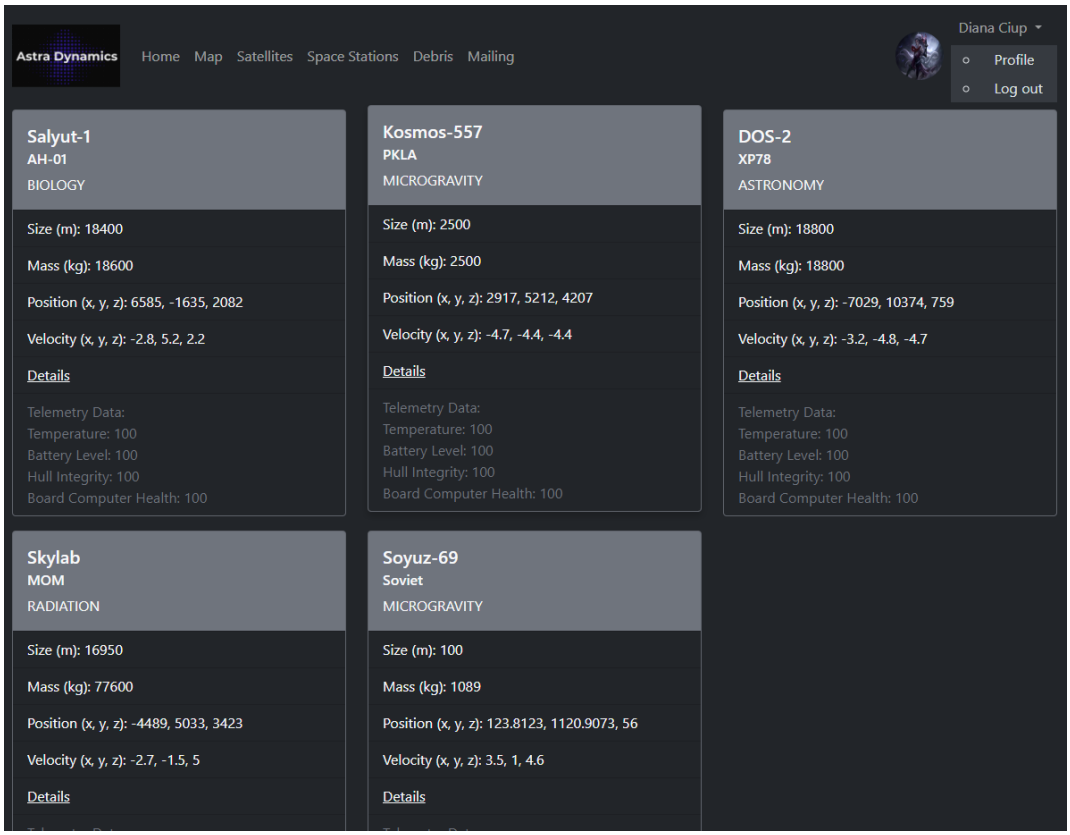
- Profile:



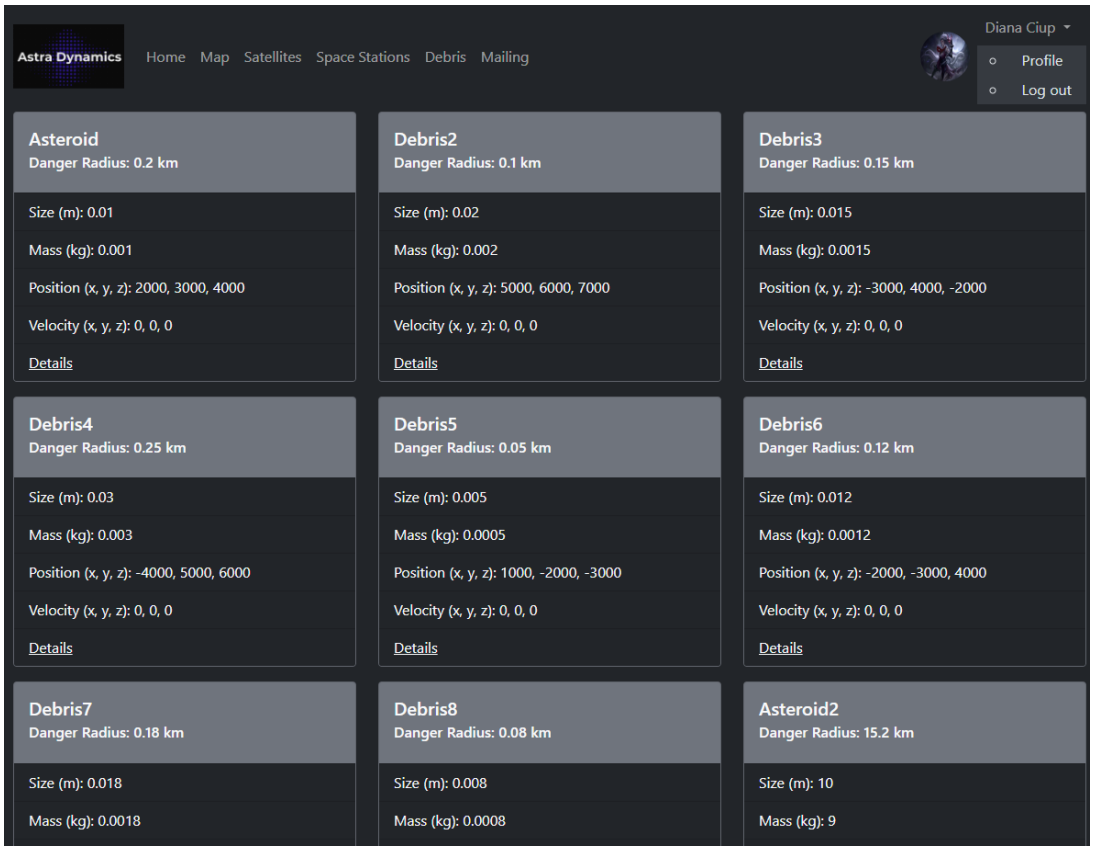
- Satellites:


Astra Dynamics
Home Map Satellites Space Stations Debris Mailing
Diana Ciup
Profile
Log out
Hubble Space Telescope
NASA
Observation
Model: CRF09
Launch Date: 3/23/2023 5:56:07 PM
Size (m): 13.2
Mass (kg): 11110
Position (x, y, z): 874, 2327, 6550
Velocity (x, y, z): 0, 6, 4
Details
Telemetry Data:
Temperature: 100
Battery Level: 100
Hull Integrity: 100
Board Computer Health: 100
ISSD
NASA
Telecommunication
Model: XP34
Launch Date: 3/23/2023 6:00:46 PM
Size (m): 73.2
Mass (kg): 419455
Position (x, y, z): 411, 3727, 5150
Velocity (x, y, z): -2, 4, 6
Details
Telemetry Data:
Temperature: 100
Battery Level: 100
Hull Integrity: 100
Board Computer Health: 100
Chandra X-Ray Observatory
SpaceX
Observation
Model: CHDR-X
Launch Date: 3/23/2023 6:00:57 PM
Size (m): 8.2
Mass (kg): 6740
Position (x, y, z): 320, 3720, 4160
Velocity (x, y, z): 2, 6, 3
Details
Telemetry Data:
Temperature: 100
Battery Level: 100
Hull Integrity: 100
Board Computer Health: 100
GRACE-FO 1B
NASA
Earth Observation
Model: GRACE-FO 1B
Launch Date: 3/28/2023 6:17:07 PM
Sentinel-3B
ESA
Earth Observation
Model: Sentinel-3B
Launch Date: 3/28/2023 6:17:07 PM
NOAA-19
NOAA
Weather
Model: NOAA-19
Launch Date: 3/28/2023 6:17:07 PM

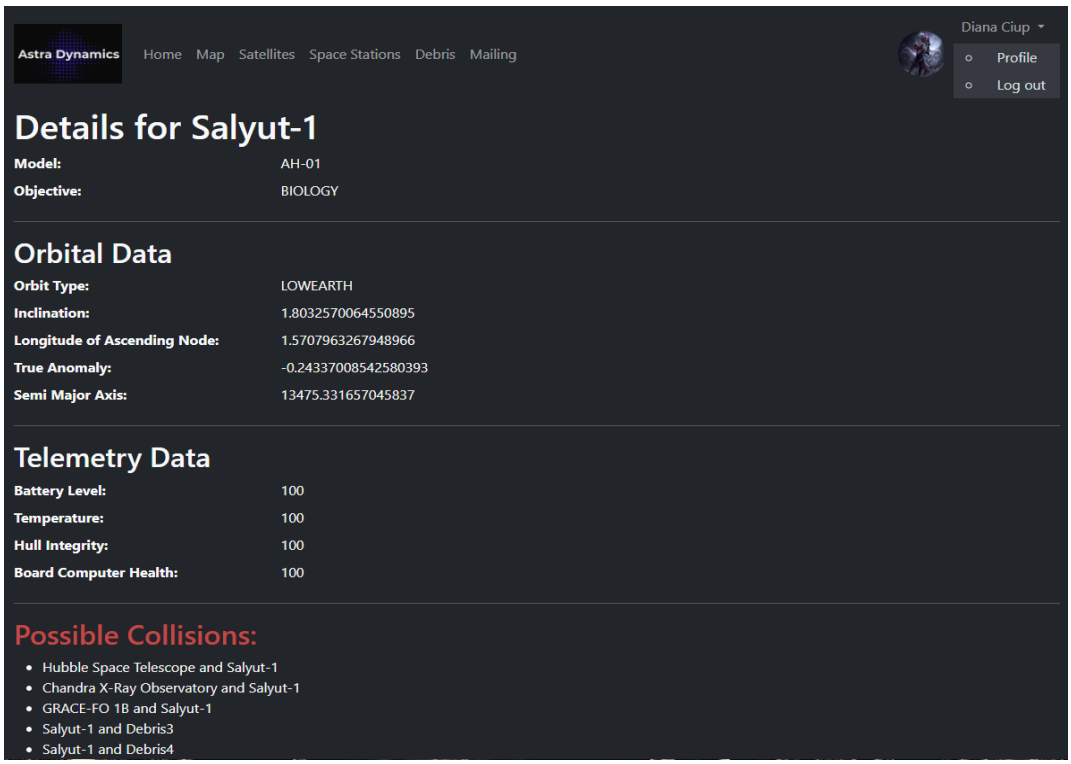
- Stations:


Astra Dynamics
Home Map Satellites Space Stations Debris Mailing
Diana Ciup
Profile
Log out
Salyut-1
AH-01
BIOLOGY
Size (m): 18400
Mass (kg): 18600
Position (x, y, z): 6585, -1635, 2082
Velocity (x, y, z): -2.8, 5.2, 2.2
Details
Telemetry Data:
Temperature: 100
Battery Level: 100
Hull Integrity: 100
Board Computer Health: 100
Kosmos-557
PKLA
MICROGRAVITY
Size (m): 2500
Mass (kg): 2500
Position (x, y, z): 2917, 5212, 4207
Velocity (x, y, z): -4.7, -4.4, -4.4
Details
Telemetry Data:
Temperature: 100
Battery Level: 100
Hull Integrity: 100
Board Computer Health: 100
DOS-2
XP78
ASTRONOMY
Size (m): 18800
Mass (kg): 18800
Position (x, y, z): -7029, 10374, 759
Velocity (x, y, z): -3.2, -4.8, -4.7
Details
Telemetry Data:
Temperature: 100
Battery Level: 100
Hull Integrity: 100
Board Computer Health: 100
Skylab
MOM
RADIATION
Size (m): 16950
Mass (kg): 77600
Position (x, y, z): -4489, 5033, 3423
Velocity (x, y, z): -2.7, -1.5, 5
Details
Soyuz-69
Soviet
MICROGRAVITY
Size (m): 100
Mass (kg): 1089
Position (x, y, z): 123.8123, 1120.9073, 56
Velocity (x, y, z): 3.5, 1, 4.6
Details

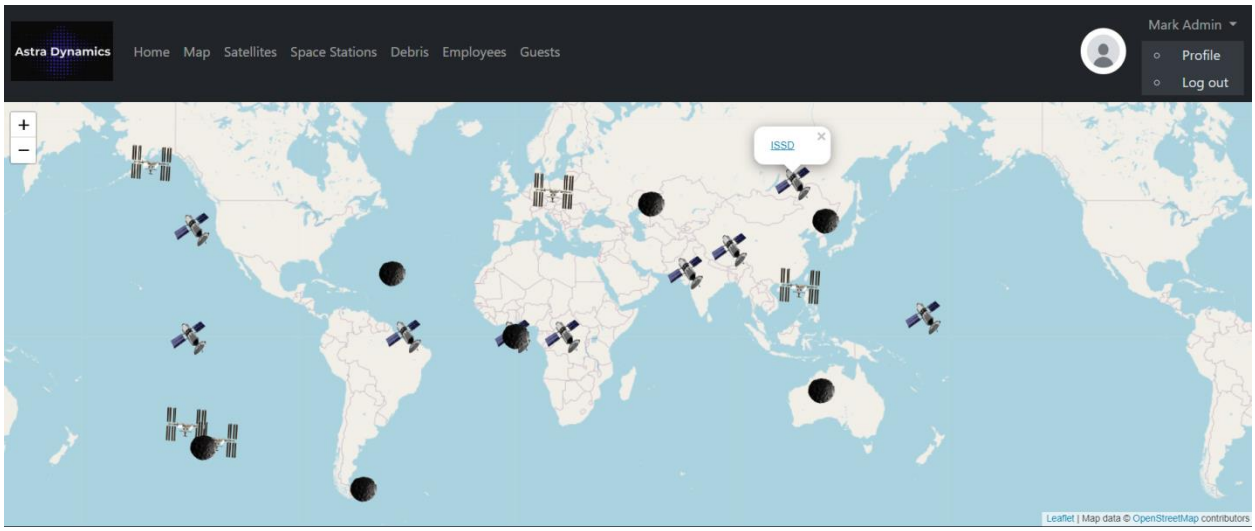
- Debris:



- Details:



- Map:


Astra Dynamics
Home
Map
Satellites
Space Stations
Debris
Employees
Guests
Mark Admin
Profile
Log out
ISSD
Leaflet | Map data © OpenStreetMap contributors