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# **Exploring the Universe: Building a React Web Application with NASA Open APIs**

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## Contents

Introduction .....	4
Scope.....	4
Github and Installation .....	4
Technologies Used .....	5
Features and Components.....	5
Astronomy Picture of the Day (APOD).....	5
<b>Request URL:</b> .....	6
<b>Data received:</b> .....	6
Near Earth Objects (NEOs).....	6
<b>Request URL:</b> .....	6
<b>Parameters</b> .....	7
<b>Data received:</b> .....	7
<b>Components:</b> .....	7
Earth Observatory Natural Events Tracker (EONET).....	8
<b>Request URL:</b> .....	8
<b>Parameters:</b> .....	9
<b>Data received:</b> .....	9
<b>Components:</b> .....	9
General Components .....	10
Navigation Bar.....	10
Header and SubHeader .....	10
Loader .....	10
Responsiveness .....	11
Deployment .....	11
Conclusion.....	11

## Introduction

This documentation provides an overview and description of a web application created using [NASA Open APIs](#). The application utilizes NASA's API data to provide users with information about the Astronomy Picture of the Day, Near Earth Objects (NEOs), and events from the Earth Observatory Natural Event Tracker (EONET). It is built using ReactJS and React-Bootstrap, and it utilizes various features and components to present information in an interactive manner. The application is designed to be responsive and user-friendly, offering an intuitive navigation experience and interactive features. The live version of the application can be accessed at <https://nasa-api-ds.netlify.app/>.

## Scope

The purpose of the web application is to provide to the users access to various data and information obtained from the NASA API. The application aims to present this data in an intuitive and user-friendly manner, allowing users to explore and learn about space-related content provided by NASA.

The document covers the key aspects of the web application, including its purpose, features, and the steps involved in integrating the NASA API. It also provides guidance for deployment and installation.

## Github and Installation

The application is integrated with GitHub for version control. This allow us to track changes and manage different versions of the application.

To run the web application locally, you need to follow these installation steps:

1. Clone the GitHub repository: [https://github.com/stellasotirianou/NASA\\_APP.git](https://github.com/stellasotirianou/NASA_APP.git)
2. Make sure you have node.js installed.
3. Open a terminal and navigate to the project's root directory.
4. Run the command ***npm install*** to install the project dependencies.
5. After the installation is complete, run the command ***npm start*** to start the development server.
6. Open your web browser and access the application at <http://localhost:3000>.

## Technologies Used

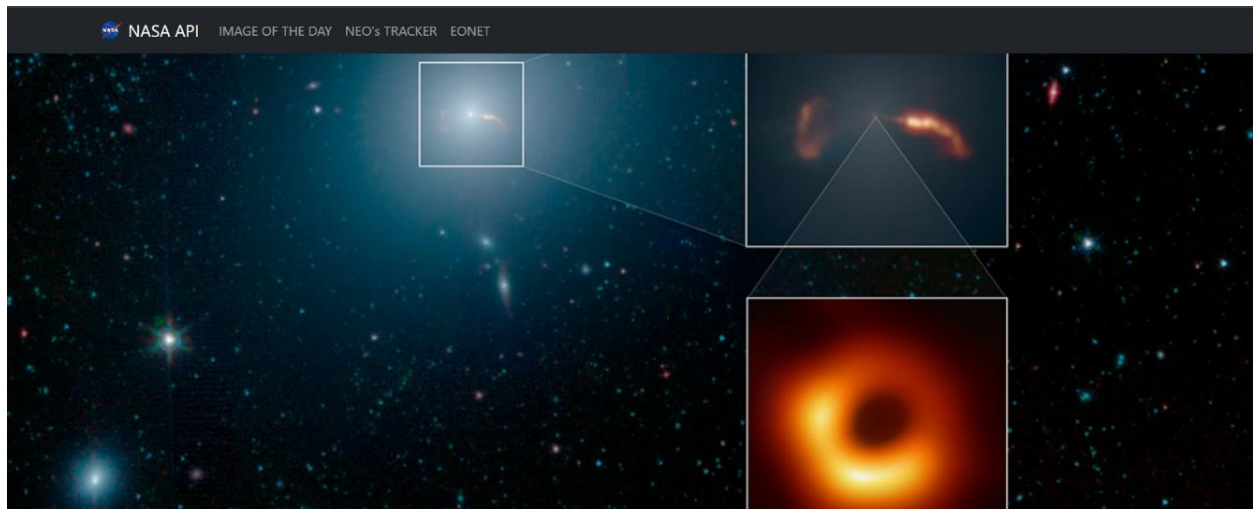
The web application utilizes the following technologies and frameworks:

- **ReactJS:** JavaScript library for building user interfaces.
- **React Router:** A library for routing and navigation within a React application.
- **React Bootstrap:** A popular UI framework for React applications, providing pre-designed components.
- **Webpack:** A module bundler used to bundle the application's assets.
- **NASA API:** Provides access to NASA's Image of the Day, Near Earth Objects, and EONET data.
- **GitHub Integration:** The application is integrated with GitHub for version control and code management.

## Features and Components

The web application consists of three main pages: "Image of the Day," "Near Earth Objects (NEOs)," and "EONET". Each page serves a specific purpose and utilizes components to display the retrieved data.

### Astronomy Picture of the Day (APOD)



#### The Galaxy, the Jet, and a Famous Black Hole

Bright elliptical galaxy Messier 87 (M87) is home to the supermassive black hole captured in 2017 by planet Earth's Event Horizon Telescope in the first ever image of a black hole. Giant of the Virgo galaxy cluster about 55 million light-years away, M87 is the large galaxy rendered in blue hues in this infrared image from the Spitzer Space telescope. Though M87 appears mostly featureless and cloud-like, the Spitzer image does record details of relativistic jets blasting from the galaxy's central region. Shown in the inset at top right, the jets themselves span thousands of light-years. The brighter jet seen on the right is approaching and close to our line of sight. Opposite, the shock created by the otherwise unseen receding jet lights up a fainter arc of material. Inset at bottom right, the historic black hole image is shown in context, at the center of giant galaxy and relativistic jets. Completely unresolved in the Spitzer image, the supermassive black hole surrounded by infalling material is the source of enormous energy driving the relativistic jets from the center of active galaxy M87. The Event Horizon Telescope image of M87 has now been enhanced to reveal a sharper view of the famous supermassive black hole. At NASA: Black Hole Week

This page presents the astronomy picture of the day received from NASA's API APOD. The page consists of a card component with an image, a title and a description of the corresponding image.

Request URL:

<https://api.nasa.gov/planetary/apod>

Data received:

- image URL
- image's title
- image's explanation

The date of the APOD image to retrieve is by default "today".

## Near Earth Objects (NEOs)

The screenshot shows the NASA Near Earth Object Tracker interface. At the top, there's a navigation bar with links: NASA API, IMAGE OF THE DAY, NEO's TRACKER, and EONET. The main heading is "Near Earth Object Tracker" with a subtitle: "A list of Near Earth Objects (NEOs) - Asteroids which are having their closest approach to Earth on the selected date." Below this, the selected date is "MAY 04, 2023", with a "Change Date" link. The main content area displays six cards for different asteroids, arranged in two rows of three. Each card includes the NEO reference ID, the asteroid name, and key data points: "Is potential hazardous", "Relative Velocity", "Earth miss distance", and "Estimated diameter". Each card also has a "LEARN MORE" link.

NEO Ref. ID	Asteroid Name	Is potential hazardous	Relative Velocity	Earth miss distance	Estimated diameter
2005731	Asteroid 5731 Zeus (1988 VP4)	No	89672.50 kmph	56036151.54 kms	2.17 - 4.85 kms
2450237	Asteroid 450237 (2002 XY38)	No	23951.39 kmph	36670481.85 kms	0.06 - 0.14 kms
3440396	Asteroid (2008 WT62)	No	69182.73 kmph	64789401.73 kms	0.06 - 0.14 kms
3554011	Asteroid (2010 XX72)	No	41095.43 kmph	51861443.47 kms	0.10 - 0.23 kms
3719015	Asteroid (2015 HY176)	No	71206.57 kmph	55208818.90 kms	0.12 - 0.27 kms
3791243	Asteroid (2017 XA1)	Yes	52611.31 kmph	54473538.07 kms	0.15 - 0.33 kms

This page presents data for Near Earth Objects – Asteroids that have their closest approach date to Earth. The user can either browse information about asteroids on the current date (by default) or change the date selected. More information can be found through a modal that opens up when the user clicks on the "Learn more" link.

Request URL:

[https://api.nasa.gov/neo/rest/v1/feed?start\\_date=\\${selectedDate}&end\\_date=\\${selectedDate}&detailed=true](https://api.nasa.gov/neo/rest/v1/feed?start_date=${selectedDate}&end_date=${selectedDate}&detailed=true)

## Parameters:

**start\_date/end\_date** ,based on the selected date by the user, “today” by default.

**detailed** ,for more information

## Data received:

- NEO's reference ID
- NEO's name
- Is potential hazardous asteroid (Boolean)
- Relative velocity (kmph)
- Earth miss distance (kms)
- Estimated diameter (kms)
- Relative velocity kms per hour
- Relative velocity kms per second
- Earth miss distance lunar distance
- Earth miss distance AU
- Estimated diameter min-max (kms)
- Earth closest approach date
- Earth closest approach date full
- First observation date
- Orbital period
- Orbit class type
- Orbit class description

All data received are modified and parsed to be more presentable.

## Components:

- **Selected date:** the component receives the selected date and formats it to be more presentable.
- **Change date modal:** the user has the option to choose another date.
- **Information card:** a card for every asteroid that consists some basic information.
- **More information modal:** it can be accessed through the “LEARN MORE” link and provides additional information about the asteroids.

Choose Date

mm/dd/yyyy

May 2023

Su	Mo	Tu	We	Th	Fr	Sa
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Clear Today

Update

## More Information

NEO Reference ID : 54330573

Relative velocity kms per hour: 50648.29

Relative velocity kms per second: 14.07

Earth miss distance kms: 66676681.70

Earth miss distance lunar distance: 173

Earth miss distance AU : 0.446 \*\*

Estimated diameter : 0.07 - 0.16 kms

Is potential hazardous : No

Earth closest approach date : 2023-05-04

Earth closest approach date full : 2023-May-04 02:27

First observation date : 2022-11-26

Orbital period : 512 days

Orbit class type : APO

Orbit class description : Near-Earth asteroid orbits which cross the Earth's orbit similar to that of 1862 Apollo

## Earth Observatory Natural Events Tracker (EONET)

NASA API IMAGE OF THE DAY NEO's TRACKER EONET

### Earth Observatory Natural Event Tracker

A list of natural events that occurred and are still occurring from the past 20 days until today.

MAY 04, 2023

27 events found for the past 20 days

Category : All

**Iceberg B46**

April 28, 2023

Category: Sea and Lake Ice

Coordinates: [ -101.27 , -75.04 ]

[More Information](#)

**Iceberg B39**

April 28, 2023

Category: Sea and Lake Ice

Coordinates: [ 117.66 , -65.55 ]

[More Information](#)

**Iceberg D27**

April 28, 2023

Category: Sea and Lake Ice

Coordinates: [ 81.86 , -67.27 ]

[More Information](#)

**Iceberg A70**

April 28, 2023

Category: Sea and Lake Ice

Coordinates: [ -59.64 , -72.35 ]

[More Information](#)

**Iceberg D29C**

April 28, 2023

Category: Sea and Lake Ice

Coordinates: [ 22.15 , -69.77 ]

[More Information](#)

**Iceberg D30A**

April 28, 2023

Category: Sea and Lake Ice

Coordinates: [ 18.59 , -69.46 ]

[More Information](#)

This page presents data from NASA's EONET API, an earth observatory event tracker which presents a list of events that occurred and still occurring from the past 20 days until today.

Request URL:

<https://eonet.gsfc.nasa.gov/api/v2.1/events?days=30&status=open>



## Parameters:

**days** ,the number of prior days (including today) from which events will be returned

**status** ,open will return only the currently open events

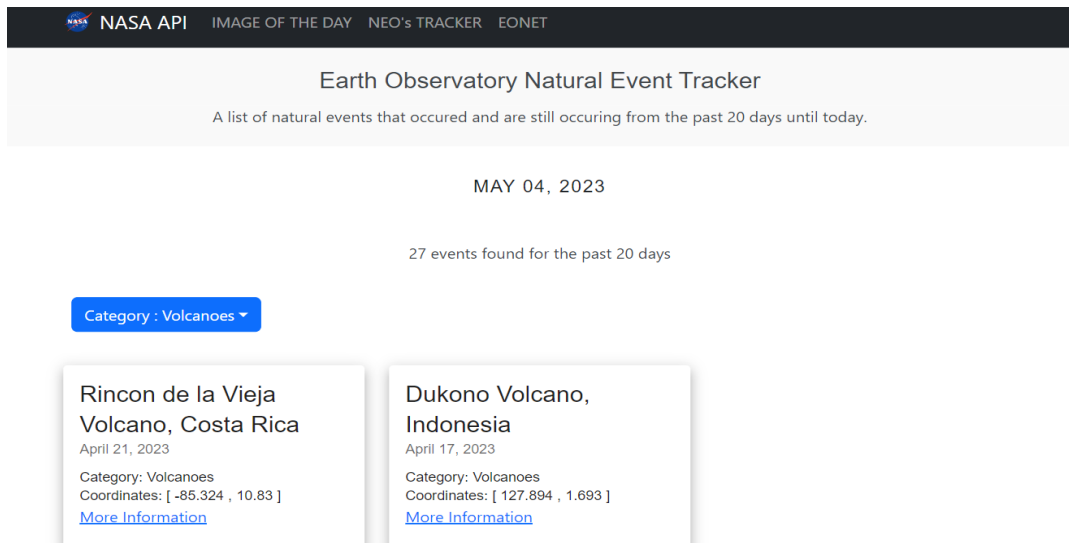
## Data received:

- Event's title
- Event's start date
- Event's category
- Event's coordinates

All data received are modified and parsed to be more presentable.

## Components:

- **Current date:** displays the current date
- **Result Number:** displays the number of events found
- **Category dropdown menu:** consists all the possible categories of an event and filters the data shown based on the selected category by the user. By default is all categories
- **Information Card:** a card for every event retrieved, that consists basic information about it
- **More Information button:** the action of this button really depends on the event. Sometimes it may open a new web page that consists more information about the event or download an .excel file.

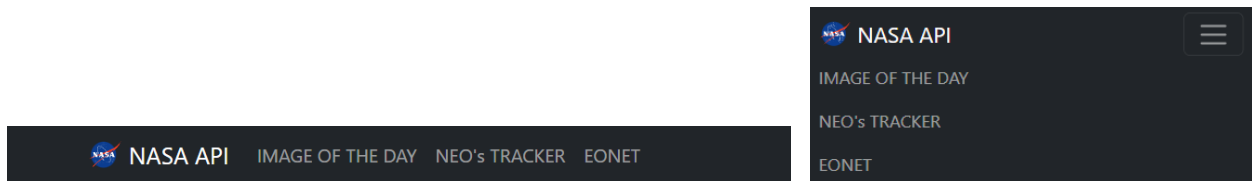


## General Components

This components are reusable through the whole application.

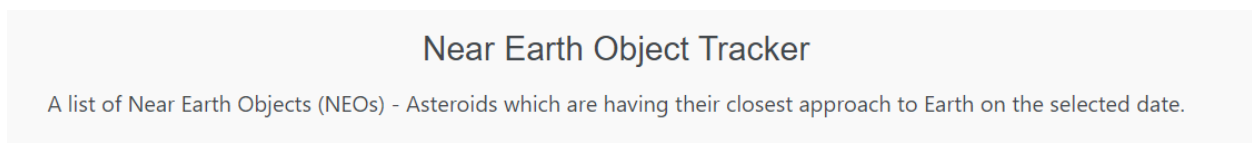
### Navigation Bar

The navigation menu is created using react-router. I used the Link component from 'react-router-dom' to create clickable links to the respective routes. The component is responsive to all device types.



### Header and SubHeader

This component takes as props a header title and a subtitle. It is being reused in NEOS's TRACKER and EONET pages.



### Loader

The Loader component is created using "react-loader-spinner" and it is being displayed every time data are being fetched. When making API requests a loader is shown until the data are retrieved.

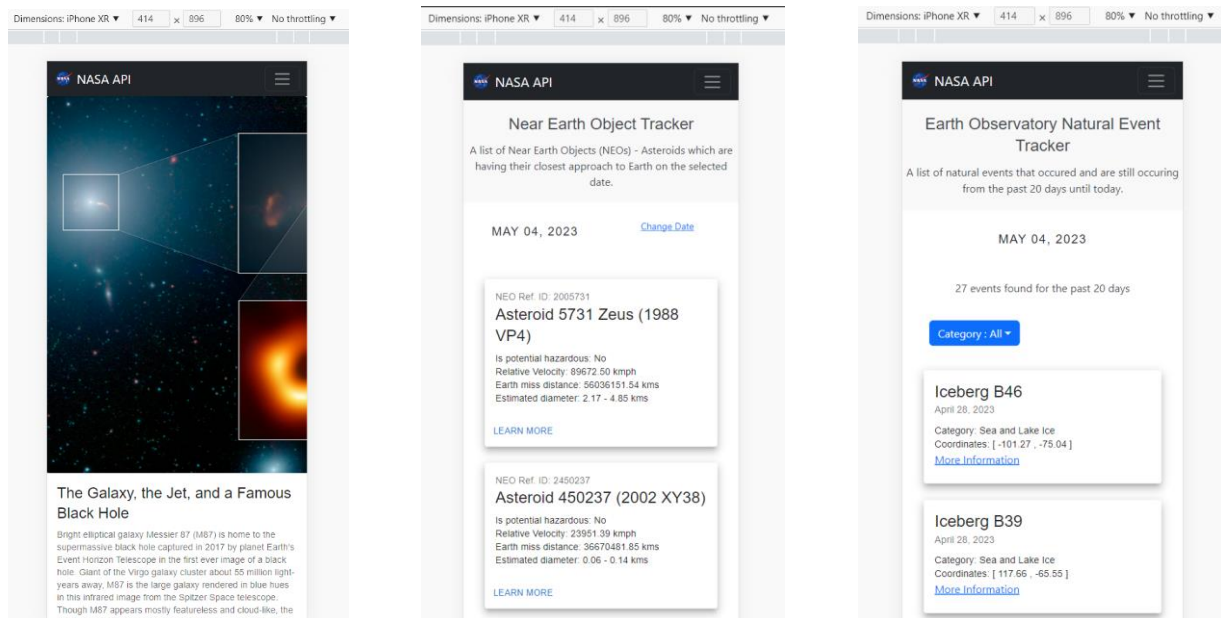
MAY 10, 2023

[Change Date](#)



## Responsiveness

The web application is fully responsive, adapting to different screen sizes and devices. It utilizes responsive design techniques and the React Bootstrap framework to ensure optimal user experience across desktops, tablets, and mobile devices.



## Deployment

The web application is deployed using Netlify, a popular hosting platform. The deployment process is automated, and the latest version of the application is always available at <https://nasa-api-ds.netlify.app/>. Netlify offers scalability, reliability, and easy integration with GitHub for seamless continuous deployment.

## Conclusion

The web application successfully utilizes NASA API data to provide users with information about the Image of the Day, Near Earth Objects, and events from the Earth Observatory Natural Event Tracker. With its intuitive navigation, interactive features, and responsive design, the application offers an engaging and informative experience for users interested in NASA's data and discoveries.