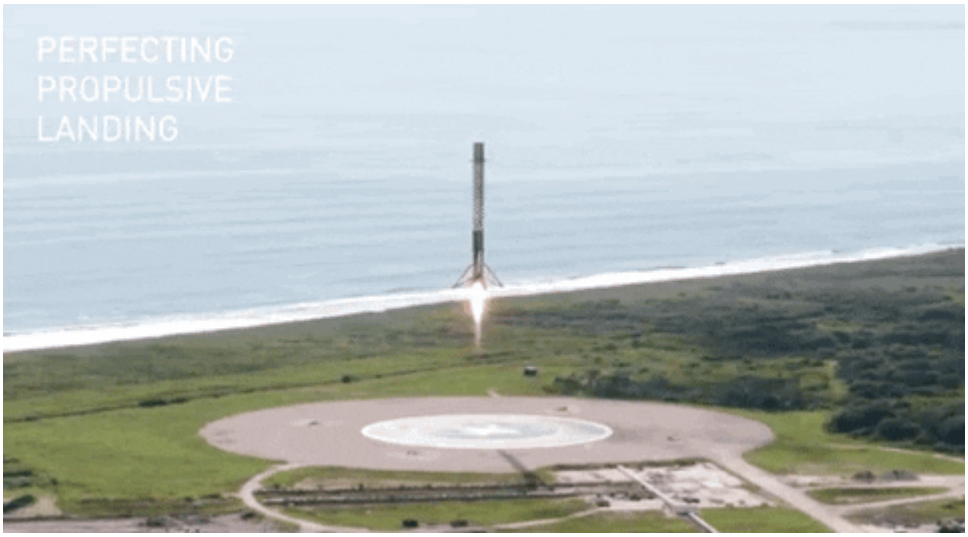
SpaceX Falcon 9 first stage Landing Prediction

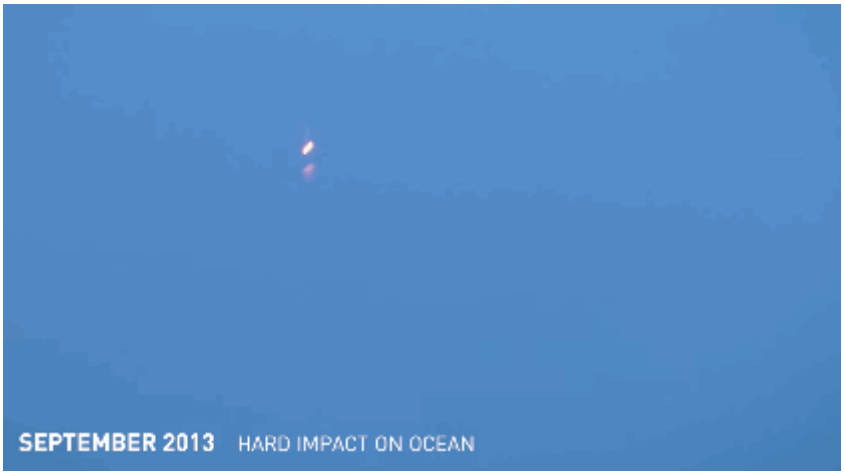
Lab 1: Collecting the data

Estimated time needed: **45** minutes

In this capstone, we will predict if the Falcon 9 first stage will land successfully. SpaceX advertises Falcon 9 rocket launches on its website with a cost of 62 million dollars; other providers cost upward of 165 million dollars each, much of the savings is because SpaceX can reuse the first stage. Therefore if we can determine if the first stage will land, we can determine the cost of a launch. This information can be used if an alternate company wants to bid against SpaceX for a rocket launch. In this lab, you will collect and make sure the data is in the correct format from an API. The following is an example of a successful and launch.



Several examples of an unsuccessful landing are shown here:



Most unsuccessful landings are planned. Space X performs a controlled landing in the oceans.

Objectives

In this lab, you will make a get request to the SpaceX API. You will also do some basic data wrangling and formating.

- Request to the SpaceX API
- Clean the requested data

Import Libraries and Define Auxiliary Functions

We will import the following libraries into the lab

In [1]:
```
# Requests allows us to make HTTP requests which we will use to get data from an AP
import requests
# Pandas is a software library written for the Python programming language for data
import pandas as pd
# NumPy is a library for the Python programming language, adding support for large,
import numpy as np
# Datetime is a library that allows us to represent dates
import datetime

# Setting this option will print all collumns of a dataframe
pd.set_option('display.max_columns', None)
# Setting this option will print all of the data in a feature
pd.set_option('display.max_colwidth', None)
```

Below we will define a series of helper functions that will help us use the API to extract information using identification numbers in the launch data.

From the `rocket` column we would like to learn the booster name.

In [2]:
```
# Takes the dataset and uses the rocket column to call the API and append the data
def getBoosterVersion(data):
    for x in data['rocket']:
       if x:
```

```
        response = requests.get("https://api.spacexdata.com/v4/rockets/"+str(x)).js
        BoosterVersion.append(response['name'])
```

From the `launchpad` we would like to know the name of the launch site being used, the logitude, and the latitude.

In [21]:
```
# Takes the dataset and uses the launchpad column to call the API and append the da
def getLaunchSite(data):
    for x in data['launchpad']:
       if x:
         response = requests.get("https://api.spacexdata.com/v4/launchpads/"+str(x)
         Longitude.append(response['longitude'])
         Latitude.append(response['latitude'])
         LaunchSite.append(response['name'])
```

From the `payload` we would like to learn the mass of the payload and the orbit that it is going to.

In [3]:
```
# Takes the dataset and uses the payloads column to call the API and append the dat
def getPayloadData(data):
    for load in data['payloads']:
       if load:
        response = requests.get("https://api.spacexdata.com/v4/payloads/"+load).jso
        PayloadMass.append(response['mass_kg'])
        Orbit.append(response['orbit'])
```

From `cores` we would like to learn the outcome of the landing, the type of the landing, number of flights with that core, whether gridfins were used, wheter the core is reused, wheter legs were used, the landing pad used, the block of the core which is a number used to seperate version of cores, the number of times this specific core has been reused, and the serial of the core.

In [4]:
```
# Takes the dataset and uses the cores column to call the API and append the data t
def getCoreData(data):
    for core in data['cores']:
            if core['core'] != None:
                response = requests.get("https://api.spacexdata.com/v4/cores/"+core
                Block.append(response['block'])
                ReusedCount.append(response['reuse_count'])
                Serial.append(response['serial'])
            else:
                Block.append(None)
                ReusedCount.append(None)
                Serial.append(None)
            Outcome.append(str(core['landing_success'])+' '+str(core['landing_type'
            Flights.append(core['flight'])
            GridFins.append(core['gridfins'])
            Reused.append(core['reused'])
            Legs.append(core['legs'])
            LandingPad.append(core['landpad'])
```

Now let's start requesting rocket launch data from SpaceX API with the following URL:

In [5]:
```
spacex_url="https://api.spacexdata.com/v4/launches/past"
```

In [6]:
```
response = requests.get(spacex_url)
```

Check the content of the response

In [7]:
```
print(response.content)
```

b'[{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/94/f2/NN6Ph45r_o.png","large":"https://images2.imgbox.com/5b/02/QcxHUb5V_o.png"},"reddit":{"campaign":null,"launch":null,"media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":null,"webcast":"https://www.youtube.com/watch?v=0a_00nJ_Y88","youtube_id":"0a_00nJ_Y88","article":"https://www.space.com/2196-spacex-inaugural-falcon-1-rocket-lost-launch.html","wikipedia":"https://en.wikipedia.org/wiki/DemoSat"},"static_fire_date_utc":"2006-03-17T00:00:00.000Z","static_fire_date_unix":1142553600,"net":false,"window":0,"rocket":"5e9d0d95eda69955f709d1eb","success":false,"failures":[{"time":33,"altitude":null,"reason":"merlin engine failure"}],"details":"Engine failure at 33 seconds and loss of vehicle","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4b5b6c3bb0006eeb1e1"],"launchpad":"5e9e4502f5090995de566f86","flight_number":1,"name":"FalconSat","date_utc":"2006-03-24T22:30:00.000Z","date_unix":1143239400,"date_local":"2006-03-25T10:30:00+12:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e289df35918033d3b2623","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cd9ffd86e000604b32a"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/f9/4a/ZboXReNb_o.png","large":"https://images2.imgbox.com/80/a2/bkWotCIS_o.png"},"reddit":{"campaign":null,"launch":null,"media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":null,"webcast":"https://www.youtube.com/watch?v=Lk4zQ2wP-Nc","youtube_id":"Lk4zQ2wP-Nc","article":"https://www.space.com/3590-spacex-falcon-1-rocket-fails-reach-orbit.html","wikipedia":"https://en.wikipedia.org/wiki/DemoSat"},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":0,"rocket":"5e9d0d95eda69955f709d1eb","success":false,"failures":[{"time":301,"altitude":289,"reason":"harmonic oscillation leading to premature engine shutdown"}],"details":"Successful first stage burn and transition to second stage, maximum altitude 289 km, Premature engine shutdown at T+7 min 30 s, Failed to reach orbit, Failed to recover first stage","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4b6b6c3bb0006eeb1e2"],"launchpad":"5e9e4502f5090995de566f86","flight_number":2,"name":"DemoSat","date_utc":"2007-03-21T01:10:00.000Z","date_unix":1174439400,"date_local":"2007-03-21T13:10:00+12:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e289ef35918416a3b2624","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cdaffd86e000604b32b"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/6c/cb/na1tzhHs_o.png","large":"https://images2.imgbox.com/4a/80/k1oAkY0k_o.png"},"reddit":{"campaign":null,"launch":null,"media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":null,"webcast":"https://www.youtube.com/watch?v=v0w9p3U8860","youtube_id":"v0w9p3U8860","article":"http://www.spacex.com/news/2013/02/11/falcon-1-flight-3-mission-summary","wikipedia":"https://en.wikipedia.org/wiki/Trailblazer_(satellite)"},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":0,"rocket":"5e9d0d95eda69955f709d1eb","success":false,"failures":[{"time":140,"altitude":35,"reason":"residual stage-1 thrust led to collision between stage 1 and stage 2"}],"details":"Residual stage 1 thrust led to collision between stage 1 and stage 2","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4b6b6c3bb0006eeb1e3","5eb0e4b6b6c3bb0006eeb1e4"],"launchpad":"5e9e4502f5090995de566f86","flight_number":3,"name":"Trailblazer","date_utc":"2008-08-03T03:34:00.000Z","date_unix":1217734440,"date_local":"2008-08-03T15:34:00+12:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e289ef3591814873b2625","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cdbffd86e000604b32c"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/95/39/sRqN7rsv_o.png","large":"https://images2.imgbox.com/a3/99/qswRYzE8_o.png"},"reddit":{"campaign":null,"launch":null,"media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":null,"webcast":"https://www.youtube.com/watch?v=dLQ2tZEH6G0","youtube_id":"dLQ2tZEH6G0","article":"https://en.wikipedia.org/wiki/Ratsa

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lcon-1-flight-5","wikipedia":"https://en.wikipedia.org/wiki/RazakSAT"},"static_fir
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payload was inserted into abnormally low orbit and lost due to Falcon 9 boost stag
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denberg/","wikipedia":"https://en.wikipedia.org/wiki/CASSIOPE"},"static_fire_date_
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s":"Commercial mission and first Falcon 9 v1.1 flight, with improved 13-tonne to L
EO capacity. Following second-stage separation from the first stage, an attempt wa
s made to perform an ocean touchdown test of the discarded booster vehicle. The te
st provided good test data on the experiment-its primary objective-but as the boos
ter neared the ocean, aerodynamic forces caused an uncontrollable roll. The center
engine, depleted of fuel by centrifugal force, shut down resulting in the impact a
nd destruction of the vehicle.","crew":[],"ships":["5ea6ed2d080df4000697c903"],"ca
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alcon-9-v1-1-milestone-ses-8-launch/","wikipedia":"https://en.wikipedia.org/wiki/S
ES-8"},"static_fire_date_utc":"2013-11-22T06:26:00.000Z","static_fire_date_unix":1
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9spacex-delivers-thaicom-6-satellite-to-orbit/","wikipedia":"https://en.wikipedia.
org/wiki/Thaicom_6"},"static_fire_date_utc":"2013-12-28T00:00:00.000Z","static_fir
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c","success":true,"failures":[],"details":"Second GTO launch for Falcon 9. The USA
F evaluated launch data from this flight as part of a separate certification progr
am for SpaceX to qualify to fly U.S. military payloads and found that the Thaicom
6 launch had \\"unacceptable fuel reserves at engine cutoff of the stage 2 second
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pedia.org/wiki/SpaceX_CRS-3"},"static_fire_date_utc":"2014-03-08T00:00:00.000Z","s
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a809d1ec","success":true,"failures":[],"details":"Following second-stage separatio
n, SpaceX conducted a second controlled-descent test of the discarded booster vehi
cle and achieved the first successful controlled ocean touchdown of a liquid-rocke
t-engine orbital booster. Following touchdown the first stage tipped over as expec
ted and was destroyed. This was the first Falcon 9 booster to fly with extensible
landing legs and the first Dragon mission with the Falcon 9 v1.1 launch vehicl
e.","crew":[],"ships":["5ea6ed2d080df4000697c902"],"capsules":["5e9e2c5bf3591859a6
3b2668"],"payloads":["5eb0e4bbb6c3bb0006eeb1f1"],"launchpad":"5e9e4501f509094ba456
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s://en.wikipedia.org/wiki/Falcon_9_flight_10"},"static_fire_date_utc":"2015-12-19T
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d mass was 1,316 kg (2,901 lb) : 6 satellites weighing 172 kg each, plus two 142-k
g mass simulators. This was the second Falcon 9 booster equipped with landing leg
s. Following second-stage separation, SpaceX conducted a controlled-descent test o
f the first stage, which successfully decelerated from\xc2\xa0hypersonic velocity
in the upper atmosphere, made reentry and landing burns, deployed its legs and tou
ched down on the ocean surface. As with the previous mission, the first stage then
tipped over as expected and was not recovered.","crew":[],"ships":[],"capsules":
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e":"https://spaceflightnow.com/2015/01/10/dragon-successfully-launched-rocket-reco
very-demo-crash-lands/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-
5"},"static_fire_date_utc":"2014-12-19T00:00:00.000Z","static_fire_date_unix":1418
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est flight which attempted to return the first stage of the Falcon 9 through the a
tmosphere and land it on an approximately 90-by-50-meter (300 ft x 160 ft) floatin
g platform-called the autonomous spaceport drone ship. Many of the test objectives
were achieved, including precision control of the rocket\'s descent to land on the
platform at a specific point in the Atlantic ocean, and a large amount of test dat
a was obtained from the first use of grid fin control surfaces used for more preci
se reentry positioning. The grid fin control system ran out of hydraulic fluid a m
inute before landing and the landing itself resulted in a crash.","crew":[],"ship
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w.com/2015/02/12/space-weather-observatory-blasts-off-after-17-year-wait/","wikipe
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e,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"det
ails":"First launch under USAF\'s OSP 3 launch contract. First SpaceX launch to pu
t a satellite to an orbit with an orbital altitude many times the distance to the
Moon: Sun-Earth libration point L1. The first stage made a test flight descent to
an over-ocean landing within 10 m (33 ft) of its intended target.","crew":[],"ship

s":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c"],"capsules":[],"payloads":["5eb0e4bdb6c3bb0006eeb1f7"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":20,"name":"DSCOVR","date_utc":"2015-02-11T23:03:00.000Z","date_unix":1423695780,"date_local":"2015-02-11T19:03:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a0f3591885be3b2636","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"Ocean","landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87ceaffd86e000604b33d"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/2b/65/8Hd65fHz_o.png","large":"https://images2.imgbox.com/3f/c9/ZczpJ97M_o.png"},"reddit":{"campaign":null,"launch":"http://www.reddit.com/r/spacex/comments/2x81fc","media":"https://www.reddit.com/r/spacex/comments/2xmumx","recovery":null},"flickr":{"small":[],"original":["https://farm9.staticflickr.com/8749/16788442562_ed460c2d9e_o.jpg","https://farm9.staticflickr.com/8586/16510243060_48d6a9b1f6_o.jpg","https://farm9.staticflickr.com/8641/16490359747_c043b8c61a_o.jpg","https://farm9.staticflickr.com/8636/16510241270_ca83157509_o.jpg","https://farm8.staticflickr.com/7618/16601658850_13b826e705_o.jpg","https://farm9.staticflickr.com/8617/16510041628_883af57512_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/abs-eutelsatfactsheet.pdf","webcast":"https://www.youtube.com/watch?v=mN7lyaCBzT8","youtube_id":"mN7lyaCBzT8","article":"https://www.space.com/28702-spacex-rocket-launches-satellites-video.html","wikipedia":"https://en.wikipedia.org/wiki/ABS-3A"},"static_fire_date_utc":"2015-02-25T19:10:00.000Z","static_fire_date_unix":1424891400,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"The launch was Boeing\'s first-ever conjoined launch of a lighter-weight dual-commsat stack that was specifically designed to take advantage of the lower-cost SpaceX Falcon 9 launch vehicle. Per satellite, launch costs were less than $30 million. The ABS satellite reached its final destination ahead of schedule and started operations on September 10.","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4bdb6c3bb0006eeb1f8","5eb0e4bdb6c3bb0006eeb1f9"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":21,"name":"ABS-3A / Eutelsat 115W B","date_utc":"2015-03-02T03:50:00.000Z","date_unix":1425268200,"date_local":"2015-03-02T23:50:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a0f35918c0893b2637","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87ceaffd86e000604b33e"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/75/39/TJU6xWM5_o.png","large":"https://images2.imgbox.com/c7/02/2XvCh1yD_o.png"},"reddit":{"campaign":null,"launch":"https://www.reddit.com/r/spacex/comments/32jnyd","media":"https://www.reddit.com/r/spacex/comments/32lw5y","recovery":null},"flickr":{"small":[],"original":["https://farm8.staticflickr.com/7624/17170624642_e5949d160e_o.jpg","https://farm8.staticflickr.com/7708/17170624402_f6de506461_o.jpg","https://farm8.staticflickr.com/7658/17170624462_2efc977fee_o.jpg","https://farm8.staticflickr.com/7611/17171659711_42597fefed_o.jpg","https://farm9.staticflickr.com/8774/17170624412_7091dbd04a_o.jpg"]},"presskit":"https://www.nasa.gov/sites/default/files/files/SpaceX_NASA_CRS-6_PressKit.pdf","webcast":"https://www.youtube.com/watch?v=csVpa25iqH0","youtube_id":"csVpa25iqH0","article":"https://spaceflightnow.com/2015/04/14/falcon-9-successfully-launches-descends-to-off-balance-landing/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-6"},"static_fire_date_utc":"2015-04-11T00:00:00.000Z","static_fire_date_unix":1428710400,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Following the first-stage boost, SpaceX attempted a controlled-descent test of the first stage. The first stage contacted the ship, but soon tipped over due to excess lateral velocity caused by a stuck throttle valve resulting in a later-than-intended downthrottle.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed2f080df4000697c90f","5ea6ed30080df4000697c912"],"capsules":["5e9e2c5cf359188bfb3b266b"],"payloads":["5eb0e4bdb6c3bb0006eeb1fa"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":22,"name":"CRS-6","date_utc":"2015-04-14T20:10:00.000Z","date_unix":1429042200,"date_local":"2015-04-14T16:10:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a1f359186d533b2638","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":false,"landing_type":"ASDS","lan

dpad":"5e9e3032383ecb761634e7cb"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cecffd86e000604b33f"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/a6/9b/IzWT1pYC_o.png","large":"https://images2.imgbox.com/a1/dc/grsyEfA5_o.png"},"reddit":{"campaign":null,"launch":"https://www.reddit.com/r/spacex/comments/33xqcj","media":"https://www.reddit.com/r/spacex/comments/3439s3","recovery":null},"flickr":{"small":[],"original":["https://farm8.staticflickr.com/7695/17138865668_18dcce7072_o.jpg","https://farm8.staticflickr.com/7677/16706406093_61a8f9c2f8_o.jpg","https://farm8.staticflickr.com/7691/17324793792_2dd13ea3f3_o.jpg","https://farm8.staticflickr.com/7691/17139094400_b94ce1ff56_o.jpg","https://farm9.staticflickr.com/8739/17140415959_38b5ee8bc6_o.jpg","https://farm8.staticflickr.com/7735/16704192574_e3a0a6fac2_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/spacexthalesfactsheet_final.pdf","webcast":"https://www.youtube.com/watch?v=nBwAYT_ogj4","youtube_id":"nBwAYT_ogj4","article":"https://spaceflightnow.com/2015/04/28/falcon-9-rocket-powers-into-space-with-satellite-for-turkmenistan/","wikipedia":"https://en.wikipedia.org/wiki/T%C3%BCrkmen%C3%84lem_52%C2%B0E_/_MonacoSAT"},"static_fire_date_utc":"2015-04-22T11:11:00.000Z","static_fire_date_unix":1429701060,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4beb6c3bb0006eeb1fb"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":23,"name":"T\xc3\xbcrkmen\xc3\x84lem 52\xc2\xb0E / MonacoSAT","date_utc":"2015-04-27T23:03:00.000Z","date_unix":1430175780,"date_local":"2015-04-27T19:03:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a1f35918233f3b2639","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cedffd86e000604b340"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/53/12/gFtcOQuX_o.png","large":"https://images2.imgbox.com/7a/51/NfgiMpar_o.png"},"reddit":{"campaign":null,"launch":"https://www.reddit.com/r/spacex/comments/3b27hk","media":"https://www.reddit.com/r/spacex/comments/3berj3","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/344/19045370790_f20f29cd8d_o.jpg","https://farm1.staticflickr.com/287/18999110808_6e153fed64_o.jpg"]},"presskit":"https://www.nasa.gov/sites/default/files/atoms/files/spacex_nasa_crs-7_presskit.pdf","webcast":"https://www.youtube.com/watch?v=PuNymhcTtSQ","youtube_id":"PuNymhcTtSQ","article":"https://spaceflightnow.com/2015/06/28/falcon-9-rocket-destroyed-in-launch-mishap/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-7"},"static_fire_date_utc":"2015-06-26T05:00:00.000Z","static_fire_date_unix":1435294800,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":false,"failures":[{"time":139,"altitude":40,"reason":"helium tank overpressure lead to the second stage LOX tank explosion"}],"details":"Launch performance was nominal until an overpressure incident in the second-stage LOX tank, leading to vehicle breakup at T+150 seconds. The Dragon capsule survived the explosion but was lost upon splashdown because its software did not contain provisions for parachute deployment on launch vehicle failure.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c"],"capsules":["5e9e2c5cf35918407d3b266c"],"payloads":["5eb0e4beb6c3bb0006eeb1fc"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":24,"name":"CRS-7","date_utc":"2015-06-28T14:21:00.000Z","date_unix":1435501260,"date_local":"2015-06-28T10:21:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a1f35918683c3b263a","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":null,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87ceeffd86e000604b341"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/6a/7e/J7IQfBqg_o.png","large":"https://images2.imgbox.com/99/d4/0aIlpFpw_o.png"},"reddit":{"campaign":null,"launch":"https://www.reddit.com/r/spacex/comments/3xgxh5","media":"https://www.reddit.com/r/spacex/comments/3xm83h/","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1648/23827554109_837b21739e_o.jpg","https://farm1.staticflickr.com/597/23802553412_d41e4dcc64_o.jpg","https://farm6.staticflickr.com/5806/23802550622_9ff8c90098_o.jpg","https://farm1.staticflickr.com/571/23604164970_2a1a2366e4_o.jpg","https://farm6.staticflickr.com/5773/23271687254_5e64d726ba_o.jp

g","https://farm6.staticflickr.com/5766/23526044959_5bfe74bc88_o.jpg","https://farm6.staticflickr.com/5723/23785609832_83038751d1_o.jpg","https://farm1.staticflickr.com/715/23833499336_d3fde6a25a_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/spacex_orbcomm_press_kit_final2.pdf","webcast":"https://www.youtube.com/watch?v=O5bTbVbe4e4","youtube_id":"O5bTbVbe4e4","article":"https://spaceflightnow.com/2015/12/22/round-trip-rocket-flight-gives-spacex-a-trifecta-of-successes/","wikipedia":"https://en.wikipedia.org/wiki/Falcon_9_flight_20"},"static_fire_date_utc":"2015-12-19T00:09:00.000Z","static_fire_date_unix":1450483740,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Total payload mass was 2,034 kg (4,484 lb) : 11 satellites weighing 172 kg each, plus a 142-kg mass simulator. This was the first launch of the upgraded v1.1 variant (later called Falcon 9 Full Thrust), with a 30 percent power increase. Orbcomm had originally agreed to be the third flight of the enhanced-thrust rocket, but the change to the maiden flight position was announced in October 2015. SpaceX received a permit from the FAA to land the booster on solid ground at Cape Canaveral, and succeeded.","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4beb6c3bb0006eeb1fd"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":25,"name":"OG-2 Mission 2","date_utc":"2015-12-22T01:29:00.000Z","date_unix":1450747740,"date_local":"2015-12-22T21:29:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a1f3591867753b263b","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cefffd86e000604b342"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/8a/44/PSksEBjD_o.png","large":"https://images2.imgbox.com/d9/c9/57ioWDgW_o.png"},"reddit":{"campaign":null,"launch":"https://www.reddit.com/r/spacex/comments/417weg","media":"https://www.reddit.com/r/spacex/comments/41cvdm","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1460/24382360351_9b1f2fcabc_o.jpg","https://farm2.staticflickr.com/1669/24423604506_27d3c4548b_o.jpg","https://farm2.staticflickr.com/1618/24151425850_1cb6040569_o.jpg","https://farm2.staticflickr.com/1622/24127012370_07edc62046_o.jpg","https://farm2.staticflickr.com/1508/24127011190_92ef932c96_o.jpg","https://farm2.staticflickr.com/1591/23778325594_08231286fc_o.jpg","https://farm2.staticflickr.com/1542/24038722499_34c10216a3_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/spacex_jason3_press_kit.pdf","webcast":"https://www.youtube.com/watch?v=ivdKRJzl6y0","youtube_id":"ivdKRJzl6y0","article":"https://spaceflightnow.com/2016/01/18/satellite-launched-to-measure-motions-of-the-oceans/","wikipedia":"https://en.wikipedia.org/wiki/Jason-3"},"static_fire_date_utc":"2016-01-11T18:42:00.000Z","static_fire_date_unix":1452537720,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"First launch of NASA and NOAA joint science mission under the NLS II launch contract (not related to NASA CRS or USAF OSP3 contracts). Last launch of the original Falcon 9 v1.1 launch vehicle. The Jason-3 satellite was successfully deployed to target orbit. SpaceX again attempted a recovery of the first stage booster by landing on an autonomous drone ship; this time located in the Pacific Ocean. The first stage did achieve a soft-landing on the ship, but a lockout on one of the landing legs failed to latch, so that the booster fell over and exploded.","crew":[],"ships":["5ea6ed2f080df4000697c910","5ea6ed30080df4000697c912","5ea6ed30080df4000697c914"],"capsules":[],"payloads":["5eb0e4beb6c3bb0006eeb1fe"],"launchpad":"5e9e4502f509092b78566f87","flight_number":26,"name":"Jason 3","date_utc":"2016-01-17T15:42:00.000Z","date_unix":1453045320,"date_local":"2016-01-17T08:42:00-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a1f3591842fa3b263c","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":false,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cf0ffd86e000604b343"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/7f/15/rjv54Es5_o.png","large":"https://images2.imgbox.com/c9/7f/EQ1g4Iv2_o.png"},"reddit":{"campaign":null,"launch":"https://www.reddit.com/r/spacex/comments/48u4yq","media":"https://www.reddit.com/r/spacex/comments/472k8c","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1623/25395662282_942fd68ba3_o.jpg","https://farm2.staticflickr.com/1458/25395661442_bfd783

f18a_o.jpg","https://farm2.staticflickr.com/1641/25421381351_38390bcb8e_o.jpg","ht
tps://farm2.staticflickr.com/1616/25514167315_b19b0a4365_o.jpg","https://farm2.sta
ticflickr.com/1482/24883160354_b03cefd416_o.jpg","https://farm2.staticflickr.com/1
653/25420915781_8fc648b4a4_o.jpg","https://farm2.staticflickr.com/1610/25486858116
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pg","https://farm2.staticflickr.com/1533/24631230904_83b1624807_o.jpg","https://fa
rm2.staticflickr.com/1627/25145624551_1b8743116f_o.jpg","https://farm2.staticflick
r.com/1622/25120540712_7fc1a5ed72_o.jpg","https://farm2.staticflickr.com/1550/2458
5667074_aa712b13a8_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/s
pacex_ses9_press_kit_final.pdf","webcast":"https://www.youtube.com/watch?v=muDPSyO
7-A0","youtube_id":"muDPSyO7-A0","article":"https://spaceflightnow.com/2016/03/05/
tv-broadcasting-satellite-finally-launched-on-falcon-9/","wikipedia":"https://en.w
ikipedia.org/wiki/SES-9"},"static_fire_date_utc":"2016-10-02T14:11:00.000Z","stati
c_fire_date_unix":1475417460,"net":false,"window":5400,"rocket":"5e9d0d95eda69973a
809d1ec","success":true,"failures":[],"details":"Second launch of the enhanced Fal
con 9 Full Thrust launch vehicle. Following the launch, SpaceX attempted an experi
mental landing test to a drone ship, although a successful landing was not expecte
d because launch mass exceeded previously indicated limit for a GTO there was litt
le fuel left. As predicted, booster recovery failed: the spent first stage \\"land
ed hard\\", but the controlled-descent, atmospheric re-entry and navigation to the
drone ship were successful and returned significant test data on bringing back hig
h-energy Falcon 9s.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4
000697c90b","5ea6ed2f080df4000697c90c","5ea6ed30080df4000697c913"],"capsules":
[],"payloads":["5eb0e4beb6c3bb0006eeb1ff"],"launchpad":"5e9e4501f509094ba4566f8
4","flight_number":27,"name":"SES-9","date_utc":"2016-03-04T23:35:00.000Z","date_u
nix":1457134500,"date_local":"2016-03-04T19:35:00-04:00","date_precision":"hou
r","upcoming":false,"cores":[{"core":"5e9e28a1f359188def3b263d","flight":1,"gridfi
ns":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":fals
e,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":tru
e,"tbd":false,"launch_library_id":null,"id":"5eb87cf2ffd86e000604b344"},{"fairing
s":null,"links":{"patch":{"small":"https://images2.imgbox.com/72/1e/mA23xHqe_o.pn
g","large":"https://images2.imgbox.com/36/d8/RyPKsTpC_o.png"},"reddit":{"campaig
n":null,"launch":"https://www.reddit.com/r/spacex/comments/4dtoly","media":"http
s://www.reddit.com/r/spacex/comments/4dtpxn/","recovery":"https://www.reddit.com/
r/spacex/comments/4ee2zy"},"flickr":{"small":[],"original":["https://farm2.staticf
lickr.com/1633/25788014884_6a3f9ae183_o.jpg","https://farm2.staticflickr.com/1650/
26300505022_8b8b9035e8_o.jpg","https://farm2.staticflickr.com/1486/25787998624_3ca
213be1e_o.jpg","https://farm2.staticflickr.com/1450/26326628031_e1b08ec0b3_o.jp
g","https://farm2.staticflickr.com/1670/26239020092_05e5e4c538_o.jpg","https://far
m2.staticflickr.com/1709/26305479266_76b4d01caf_o.jpg","https://farm2.staticflick
r.com/1645/26239017922_28c7ac50e0_o.jpg","https://farm2.staticflickr.com/1559/2628
8402056_6c5997ce66_o.jpg","https://farm2.staticflickr.com/1449/25709481274_60f8c77
358_o.jpg","https://farm2.staticflickr.com/1671/26217360302_b66c3e384e_o.jpg","htt
ps://farm2.staticflickr.com/1704/26283822056_838c1103b9_o.jpg","https://farm2.stat
icflickr.com/1508/26217345472_118767c608_o.jpg","https://farm2.staticflickr.com/14
95/25916886442_821a152917_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/
files/spacex_crs8_press_kit.pdf","webcast":"https://www.youtube.com/watch?v=7pUAyd
jne5M","youtube_id":"7pUAydjne5M","article":"https://spaceflightnow.com/2016/04/0
8/spacex-lands-rocket-on-floating-platform-after-station-resupply-launch/","wikipe
dia":"https://en.wikipedia.org/wiki/SpaceX_CRS-8"},"static_fire_date_utc":"2016-04
-05T00:00:00.000Z","static_fire_date_unix":1459814400,"net":false,"window":0,"rock
et":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Dragon carr
ied over 1500 kg of supplies and delivered (stowed in its trunk) the inflatable Bi
gelow Expandable Activity Module (BEAM) to the ISS for two years of in-orbit test
s. The rocket\'s first stage landed smoothly on SpaceX\'s autonomous spaceport dro
ne ship 9 minutes after liftoff, making this the first ever successful landing of
a rocket booster on a ship at sea as part of an orbital launch. The first stage B1
021 was later also the first orbital booster to be used again, when launching SES-
10 on March 30, 2017.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080d
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d1ec","success":true,"failures":[],"details":"Manufactured by Orbital ATK, the 3,100-kilogram (6,800 lb) Thaicom 8 communications satellite will serve Thailand, India and Africa from the 78.5\xc2\xb0 East geostationary location. It is equipped with 24 active Ku-band transponders.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4bfb6c3bb0006eeb202"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":30,"name":"Thaicom 8","date_utc":"2016-05-27T21:39:00.000Z","date_unix":1464385140,"date_local":"2016-05-27T17:39:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a2f3591845c73b2640","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cf6ffd86e000604b347"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/36/a4/J5gJWxuC_o.png","large":"https://images2.imgbox.com/c6/d2/MIC8sIE4_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/4ksdy3","launch":"https://www.reddit.com/r/spacex/comments/4o5u6r","media":"https://www.reddit.com/r/spacex/comments/4o5j6o","recovery":"https://www.reddit.com/r/spacex/comments/4on75l"},"flickr":{"small":[],"original":["https://farm8.staticflickr.com/7088/27661326426_ce3c3f320d_o.jpg","https://farm8.staticflickr.com/7698/27661325446_affb08be24_o.jpg","https://farm8.staticflickr.com/7733/27661322976_073466e80c_o.jpg","https://farm8.staticflickr.com/7218/27661320706_4c16f3b76b_o.jpg","https://farm8.staticflickr.com/7340/27661315686_6dcb2ce6f9_o.jpg","https://farm8.staticflickr.com/7656/27661313956_e1ac9650b9_o.jpg","https://farm8.staticflickr.com/7616/27661312516_640764f8fd_o.jpg","https://farm8.staticflickr.com/7413/27078893234_0142dd80f0_o.jpg","https://farm8.staticflickr.com/7334/27078889924_8819fd55ea_o.jpg"]},"presskit":"https://drive.google.com/open?id=0BwA3a65ef1OvMGpJSlpDNHhjelU","webcast":"https://www.youtube.com/watch?v=gLNmtUEvI5A","youtube_id":"gLNmtUEvI5A","article":"https://spaceflightnow.com/2016/06/15/spacex-successfully-fires-satellites-into-orbit-but-loses-booster-on-landing/","wikipedia":"https://en.wikipedia.org/wiki/ABS_(satellite_operator)"},"static_fire_date_utc":"2016-06-13T15:03:00.000Z","static_fire_date_unix":1465830180,"net":false,"window":2700,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"One year after pioneering this technique on flight 16, Falcon again launched two Boeing 702SP gridded ion thruster satellites in a dual-stack configuration, with the two customers sharing the rocket and mission costs. First stage landing attempt on drone ship failed on landing due to low thrust on one of the three landing engines.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4bfb6c3bb0006eeb203","5eb0e4bfb6c3bb0006eeb204"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":31,"name":"ABS-2A / Eutelsat 117W B","date_utc":"2016-06-15T14:29:00.000Z","date_unix":1466000940,"date_local":"2016-06-15T10:29:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a2f359184f403b2641","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":false,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cf8ffd86e000604b348"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/bb/0d/aLsm9QDC_o.png","large":"https://images2.imgbox.com/56/af/b7fNzZGo_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/4ksedl","launch":"https://www.reddit.com/r/spacex/comments/4t2umd/","media":"https://www.reddit.com/r/spacex/comments/4tayth","recovery":"https://www.reddit.com/r/spacex/comments/4znsvo"},"flickr":{"small":[],"original":["https://farm9.staticflickr.com/8819/27776240293_fcbf8c4a0a_o.jpg","https://farm8.staticflickr.com/7720/27776237513_038971797c_o.jpg","https://farm8.staticflickr.com/7594/27776235133_d794ce01f4_o.jpg","https://farm8.staticflickr.com/7759/27776229243_a0674e590f_o.jpg","https://farm8.staticflickr.com/7512/27776228443_6652c6baea_o.jpg","https://farm9.staticflickr.com/8038/27776218453_34112abbc1_o.jpg","https://farm8.staticflickr.com/7636/27776215913_3f9f1b05df_o.jpg","https://farm8.staticflickr.com/7740/28358960896_9785456101_o.jpg","https://farm8.staticflickr.com/7488/27776206663_262526ba5f_o.jpg","https://farm8.staticflickr.com/7656/28358955546_ce55d65e16_o.jpg","https://farm8.staticflickr.com/7467/27776204693_68b4ed82c9_o.jpg","https://farm8.staticflickr.com/7693/28348649546_0a54b1aa44_o.jpg","https://farm8.staticflick

r.com/7540/28291786662_5e2e874576_o.jpg"]},"presskit":"https://drive.google.com/open?id=0BwA3a65ef1OvM0JpSXdDUUJMRVk","webcast":"https://www.youtube.com/watch?v=ThIdCuSsJh8","youtube_id":"ThIdCuSsJh8","article":"https://spaceflightnow.com/2016/07/18/spacex-sends-supplies-to-space-station-lands-another-falcon-rocket/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-9"},"static_fire_date_utc":"2016-07-16T02:31:47.000Z","static_fire_date_unix":1468636307,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Among other cargo, an International Docking Adapter (IDA-2) was carried to the ISS. This mission had a successful first-stage landing at Cape Canaveral.*Including the reusable Dragon Capsule, total payload to orbit was 6457 kg.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed300800df4000697c912"],"capsules":["5e9e2c5cf359183bb73b266e"],"payloads":["5eb0e4c0b6c3bb0006eeb205"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":32,"name":"CRS-9","date_utc":"2016-07-18T04:45:00.000Z","date_unix":1468817100,"date_local":"2016-07-18T00:45:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a2f359187f273b2642","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cf9ffd86e000604b349"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/22/cc/DjPcsMhb_o.png","large":"https://images2.imgbox.com/0b/3e/aQpLZQHt_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/4pv6ws","launch":"https://www.reddit.com/r/spacex/comments/4xi7uq","media":"https://www.reddit.com/r/spacex/comments/4xkdfj","recovery":"https://www.reddit.com/r/spacex/comments/4y5xd1"},"flickr":{"small":[],"original":["https://farm9.staticflickr.com/8699/28965678292_17533229f3_o.jpg","https://farm9.staticflickr.com/8173/28453337463_b9d11eeb4c_o.jpg","https://farm8.staticflickr.com/7793/28453335533_3f5a0a5760_o.jpg","https://farm9.staticflickr.com/8784/28938085496_74b3fd0527_o.jpg","https://farm9.staticflickr.com/8337/28969742675_15f78369a1_o.jpg","https://farm9.staticflickr.com/8691/28353012603_ab83b6f5aa_o.jpg","https://farm9.staticflickr.com/8078/28351782813_58ca783e51_o.jpg"]},"presskit":"https://drive.google.com/open?id=0BwA3a65ef1Ovb0FkYnE5dElZRlU","webcast":"https://www.youtube.com/watch?v=QZTCEO0gvLo","youtube_id":"QZTCEO0gvLo","article":"https://spaceflightnow.com/2016/08/14/falcon-9-rocket-launches-japanese-satellite-then-nails-bullseye-landing/","wikipedia":"https://en.wikipedia.org/wiki/JCSAT-16"},"static_fire_date_utc":"2016-08-11T04:01:00.000Z","static_fire_date_unix":1470888060,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"First attempt to touchdown from a ballistic trajectory using a single-engine landing burn. All previous landings from a ballistic trajectory had fired three engines on the landing-burn, which provided more braking force, but subjected the vehicle to greater structural stresses. The single-engine landing burn takes more time and fuel, but puts less stress on the vehicle.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4c1b6c3bb0006eeb206"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":33,"name":"JCSAT-16","date_utc":"2016-08-14T05:26:00.000Z","date_unix":1471152360,"date_local":"2016-08-14T01:26:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a2f35918b8243b2643","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cfaffd86e000604b34a"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/0d/5b/8X01C3ov_o.png","large":"https://images2.imgbox.com/ff/19/KCI4DVla_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/4pv7jl","launch":null,"media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":null,"webcast":"https://www.youtube.com/watch?v=_BgJEXQkjNQ","youtube_id":"_BgJEXQkjNQ","article":"https://spaceflightnow.com/2016/09/01/spacex-rocket-and-israeli-satellite-destroyed-in-launch-pad-explosion/","wikipedia":"https://en.wikipedia.org/wiki/Amos-6"},"static_fire_date_utc":"2016-09-01T13:07:00.000Z","static_fire_date_unix":1472735220,"net":false,"window":null,"rocket":"5e9d0d95eda69973a809d1ec","success":false,"failures":[{"time":-165180,"altitude":0,"reason":"buckled liner in several of the COPV tanks, causing

perforations that allowed liquid and/or solid oxygen to accumulate underneath the lining, which was ignited by friction."}],"details":"The rocket and Amos-6 payload were lost in a launch pad explosion on September 1, 2016 during propellant fill prior to a static fire test. The pad was clear of personnel and there were no injuries.","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4c1b6c3bb0006eeb207"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":34,"name":"Amos-6","date_utc":"2016-09-01T13:07:00.000Z","date_unix":1472735220,"date_local":"2016-09-01T09:07:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a2f359187ee83b2644","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":null,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cfbffd86e000604b34b"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/89/2a/bkI6LN0R_o.png","large":"https://images2.imgbox.com/24/c3/9MKjvOdD_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/5dii6z","launch":"https://www.reddit.com/r/spacex/comments/5nsaqm","media":"https://www.reddit.com/r/spacex/comments/5nsico","recovery":"https://www.reddit.com/r/spacex/comments/5oe9kk"},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/658/32394688795_55a9873ea7_o.jpg","https://farm1.staticflickr.com/506/32394688095_a3339f3c6d_o.jpg","https://farm1.staticflickr.com/745/32394687645_63ae2b4740_o.jpg","https://farm1.staticflickr.com/318/31548291014_e3a30abca8_o.jpg","https://farm1.staticflickr.com/670/32351549066_e9cffe8d2b_o.jpg","https://farm6.staticflickr.com/5518/31579784413_83aeac560a_o.jpg","https://farm6.staticflickr.com/5556/32312421135_22c197c156_o.jpg","https://farm1.staticflickr.com/529/32312420015_5d2403a847_o.jpg","https://farm1.staticflickr.com/435/32312417695_19c0e50c4b_o.jpg","https://farm1.staticflickr.com/735/32312416415_b90892af0a_o.jpg","https://farm1.staticflickr.com/293/32312415025_cae16d1994_o.jpg","https://farm1.staticflickr.com/738/31467130724_92e02c9524_o.jpg","https://farm1.staticflickr.com/464/31467130374_9f7a7d380e_o.jpg","https://farm1.staticflickr.com/581/31467129424_bac77d594a_o.jpg","https://farm1.staticflickr.com/380/32308163845_c1731a4b1f_o.jpg","https://farm1.staticflickr.com/447/31450835954_72ed10a19e_o.jpg","https://farm1.staticflickr.com/507/31450834974_b8a3f4aca5_o.jpg"]},"presskit":"https://drive.google.com/open?id=0BwA3a65ef1OvZC1aU3FuMlQzalE","webcast":"https://www.youtube.com/watch?v=7WimRhydggo","youtube_id":"7WimRhydggo","article":"https://spaceflightnow.com/2017/01/14/spacex-resumes-flights-with-on-target-launch-for-iridium/","wikipedia":"https://en.wikipedia.org/wiki/Iridium_satellite_constellation#Next-generation_constellation"},"static_fire_date_utc":"2017-01-05T19:40:00.000Z","static_fire_date_unix":1483645200,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Return-to-flight mission after the loss of Amos-6 in September 2016. Iridium NEXT will replace the original Iridium constellation, launched in the late 1990s. Each Falcon mission will carry 10 satellites, with a goal to complete deployment of the 66 plus 9 spare satellite constellation by mid 2018. The first two Iridium qualification units were supposed to ride a Dnepr rocket in April 2016 but were delayed, so Iridium decided to qualify the first batch of 10 satellites instead.","crew":[],"ships":["5ea6ed2f080df4000697c910","5ea6ed30080df4000697c912","5ea6ed30080df4000697c915"],"capsules":[],"payloads":["5eb0e4c2b6c3bb0006eeb208"],"launchpad":"5e9e4502f509092b78566f87","flight_number":35,"name":"Iridium NEXT Mission 1","date_utc":"2017-01-14T17:54:00.000Z","date_unix":1484416440,"date_local":"2017-01-14T10:54:00-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a3f359189e3a3b2645","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cfdffd86e000604b34c"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/11/eb/qqrhHFhv_o.png","large":"https://images2.imgbox.com/ea/43/D4tA0WaM_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/5n2eqx","launch":"https://www.reddit.com/r/spacex/comments/5uw4bh","media":"https://www.reddit.com/r/spacex/comments/5uoy8o","recovery":"https://www.reddit.com/r/spacex/comments/609aq4"},"flickr":{"small":[],"original":["https://farm3.staticflickr.com/2815/32761844973_d2e8d76e9c_o.jpg","https://farm4.staticflickr.com/3878/32761843663_8e366494f4_o.jpg","https://farm3.staticflickr.com/2790/32852846842_6f1f7b26b9_o.jpg","https://farm3.staticflickr.com/2295/32852845662_e7ae0daf4a_o.jp

g","https://farm4.staticflickr.com/3888/33000639155_2a6e2bb23d_o.jpg","https://far
m1.staticflickr.com/405/33000638185_b4ec7c7b93_o.jpg","https://farm1.staticflickr.
com/574/32874779241_9f463de901_o.jpg","https://farm4.staticflickr.com/3710/3215343
3074_96337a54db_o.jpg","https://farm1.staticflickr.com/327/32153432924_09dd1482d8_
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s://farm3.staticflickr.com/2362/32183025493_2a37b4e22c_o.jpg","https://farm1.stati
cflickr.com/504/32178458813_ff47f61bb9_o.jpg","https://farm1.staticflickr.com/265/
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d289ed_o.jpg","https://farm3.staticflickr.com/2105/32945170805_553d45ca56_o.jp
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tps://www.youtube.com/watch?v=giNhaEzv_PI","youtube_id":"giNhaEzv_PI","article":"h
ttps://spaceflightnow.com/2017/02/19/historic-launch-pad-back-in-service-with-thun
dering-blastoff-by-spacex/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-
10"},"static_fire_date_utc":"2017-02-12T21:30:00.000Z","static_fire_date_unix":148
6935000,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":tru
e,"failures":[],"details":"First Falcon 9 flight from the historic LC-39A launchpa
d at Kennedy Space Center, carrying supplies and materials to support dozens of sc
ience and research investigations scheduled during ISS Expeditions 50 and 51. The
 first stage returned to launch site and landed at LZ-1.","crew":[],"ships":["5ea6
ed30080df4000697c912"],"capsules":["5e9e2c5cf359185d753b266f"],"payloads":["5eb0e4
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cal":"2017-02-19T10:39:00-04:00","date_precision":"hour","upcoming":false,"cores":
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d":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","land
pad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_i
d":null,"id":"5eb87cfeffd86e000604b34d"},{"fairings":{"reused":false,"recovery_att
empt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://image
s2.imgbox.com/56/9d/gvzAqLFg_o.png","large":"https://images2.imgbox.com/52/a0/z8Dw
flcz_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/5n2e1
0/echostar_23_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/c
omments/5z8dkm/welcome_to_the_rspacex_echostar23_official_launch/","media":"http
s://www.reddit.com/r/spacex/comments/5z8if6/rspacex_echostar_23_media_thread_video
s_images/","recovery":null},"flickr":{"small":[],"original":["https://farm4.static
flickr.com/3819/33094074350_ae56bd5c73_o.jpg","https://farm3.staticflickr.com/293
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a85e82ba_o.jpg","https://farm3.staticflickr.com/2876/33094072100_546090a4f3_o.jp
g","https://farm3.staticflickr.com/2860/32626053254_d702922d87_o.jpg","https://far
m3.staticflickr.com/2904/32654666113_ba833971e0_o.jpg","https://farm1.staticflick
r.com/677/32654665263_751d29ded1_o.jpg","https://farm3.staticflickr.com/2936/33299
697331_09313ac49d_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/ec
hostarxxiiifinal.pdf","webcast":"https://www.youtube.com/watch?v=lZmqbL-hz7U","you
tube_id":"lZmqbL-hz7U","article":"http://spacenews.com/spacex-launches-echostar-2
3/","wikipedia":"https://en.wikipedia.org/wiki/EchoStar#Satellite_fleet"},"static_
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s":[],"details":"Communications satellite for EchoStar Corp. EchoStar XXIII, based
on a spare platform from the cancelled CMBStar 1 satellite program, will provide d
irect-to-home television broadcast services over Brazil. There was no attempt at a
first-stage recovery so this rocket did not have landing legs or grid fins.","cre
w":[],"ships":[],"capsules":[],"payloads":["5eb0e4c3b6c3bb0006eeb20a"],"launchpa
d":"5e9e4502f509094188566f88","flight_number":37,"name":"EchoStar 23","date_ut
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{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":
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arge":"https://images2.imgbox.com/9c/cf/tRe9z6t8_o.png"},"reddit":{"campaign":"htt

ps://www.reddit.com/r/spacex/comments/5sjrzj/ses10_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/62aqi7/rspacex_ses10_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/62aqad/rspacex_ses10_media_thread_videos_images_gifs/","recovery":"https://www.reddit.com/r/spacex/comments/634gmr/b1021ses10_recovery_thread/"},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/601/33026465643_462ef7a2cb_o.jpg","https://farm3.staticflickr.com/2850/32996438264_b79ca3664b_o.jpg","https://farm4.staticflickr.com/3956/32996437434_4dab1ae8e3_o.jpg","https://farm4.staticflickr.com/3831/32996435084_6c5662caca_o.jpg","https://farm4.staticflickr.com/3775/32915200224_b6ecfabd7e_o.jpg","https://farm4.staticflickr.com/3886/32915199874_b826eac153_o.jpg","https://farm3.staticflickr.com/2842/32915199514_6c44178e87_o.jpg","https://farm4.staticflickr.com/3771/32915198904_2df85aed05_o.jpg","https://farm4.staticflickr.com/3668/32915198334_d2fa2f16ab_o.jpg","https://farm4.staticflickr.com/3955/32915197674_24d6e27cf5_o.jpg","https://farm4.staticflickr.com/3830/33616913981_f04b6e2351_o.jpg","https://farm4.staticflickr.com/3819/33616913111_e699b48d66_o.jpg","https://farm4.staticflickr.com/3835/33361035860_c57ed61239_o.jpg","https://farm4.staticflickr.com/3783/33361035200_bfb797d38f_o.jpg","https://farm4.staticflickr.com/3698/33611796351_54d5a6d65a_o.jpg","https://farm3.staticflickr.com/2857/33611795531_82cc2d8789_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/finalses10presskit.pdf","webcast":"https://www.youtube.com/watch?v=xsZSXav4wI8","youtube_id":"xsZSXav4wI8","article":"https://spaceflightnow.com/2017/03/31/spacex-flies-rocket-for-second-time-in-historic-test-of-cost-cutting-technology/","wikipedia":"https://en.wikipedia.org/wiki/SES-10"},"static_fire_date_utc":"2017-03-27T18:00:00.000Z","static_fire_date_unix":1490637600,"net":false,"window":9000,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"First payload to fly on a reused first stage, B1021, previously launched with CRS-8, which also landed a second time. In what is also a first, the payload fairing remained intact after a successful splashdown achieved with thrusters and a steerable parachute.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4c3b6c3bb0006eeb20b"],"launchpad":"5e9e4502f509094188566f88","flight_number":38,"name":"SES-10","date_utc":"2017-03-30T22:27:00.000Z","date_unix":1490912820,"date_local":"2017-03-30T18:27:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a2f359182d0b3b263e","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d00ffd86e000604b34f"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/e5/2d/IZB4g6Ra_o.png","large":"https://images2.imgbox.com/9d/76/kMetaHqz_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/601ykx","launch":"https://www.reddit.com/r/spacex/comments/68bn8y/","media":"https://www.reddit.com/r/spacex/comments/68bpii","recovery":null},"flickr":{"small":[],"original":["https://farm3.staticflickr.com/2922/33578359423_4169ac8f98_o.jpg","https://farm3.staticflickr.com/2900/33578357343_85c247ebce_o.jpg","https://farm5.staticflickr.com/4166/34006001860_8c45f28e69_o.jpg","https://farm5.staticflickr.com/4166/34005999880_77684dba4b_o.jpg","https://farm3.staticflickr.com/2934/34005998140_c77076b6fb_o.jpg","https://farm5.staticflickr.com/4191/34005996220_fe9e4342d3_o.jpg","https://farm3.staticflickr.com/2883/33575654563_699c544776_o.jpg","https://farm3.staticflickr.com/2902/33575652913_0dece34db4_o.jpg","https://farm5.staticflickr.com/4163/33575651063_24e05826c5_o.jpg","https://farm3.staticflickr.com/2876/33994851620_fabd14770f_o.jpg","https://farm3.staticflickr.com/2832/33973172140_b370b79c51_o.jpg","https://farm3.staticflickr.com/2874/34357262105_11b417bea2_o.jpg","https://farm5.staticflickr.com/4158/34357260545_16870a94ba_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/nrol76presskit.pdf","webcast":"https://www.youtube.com/watch?v=EzQpkQ1etdA","youtube_id":"EzQpkQ1etdA","article":"https://techcrunch.com/2017/05/01/spacex-successfully-launches-nrol-76-u-s-military-satellite/","wikipedia":"https://en.wikipedia.org/wiki/List_of_NRO_launches"},"static_fire_date_utc":"2017-04-25T19:02:00.000Z","static_fire_date_unix":1493146920,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"First launch under SpaceX\'s certification for national security space missions, which allows SpaceX to contract launch services for classified payloads. Second-stage speed and

altitude telemetry were omitted from the launch webcast, which displayed first-st
age telemetry instead, with continuous tracking of the booster from liftoff to lan
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ellite.html","wikipedia":"https://en.wikipedia.org/wiki/Inmarsat#Satellites"},"sta
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a Falcon 9 rocket. The launch was originally scheduled for the Falcon Heavy, but p
erformance improvements allowed the mission to be carried out by an expendable Fal
con 9 instead.","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4c3b6c3bb0006
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ps://spaceflightnow.com/2017/06/03/reused-dragon-cargo-capsule-launched-on-journey
-to-space-station/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-11"},"st
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plorer (NICER) to the ISS, along with the MUSES Earth imaging platform and ROSA so

lar array. For the first time, this mission launched a refurbished Dragon capsule, serial number C106 which first flew in September 2014 on the CRS-4 mission. Originally scheduled to launch on June 1, but was scrubbed due to inclement weather.","crew":[],"ships":["5ea6ed30080df4000697c912"],"capsules":["5e9e2c5bf3591880643b2669"],"payloads":["5eb0e4c4b6c3bb0006eeb20e"],"launchpad":"5e9e4502f509094188566f88","flight_number":41,"name":"CRS-11","date_utc":"2017-06-03T21:07:00.000Z","date_unix":1496524020,"date_local":"2017-06-03T17:07:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a3f3591856803b264a","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d03ffd86e000604b352"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/fa/1b/3vvXwAf9_o.png","large":"https://images2.imgbox.com/e2/f3/RZJ7ET73_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/69hhkm/bulgariasat1_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/6isph2/welcome_to_the_rspacex_bulgariasat1_official/","media":"https://www.reddit.com/r/spacex/comments/6iuj1z/rspacex_bulgariasat1_media_thread_videos_images/","recovery":"https://www.reddit.com/r/spacex/comments/6k3kop/b10292_bulgariasat_1_recovery_thread/"},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4216/35496028185_ac5456195f_o.jpg","https://farm5.staticflickr.com/4278/35496027525_9ab9d90417_o.jpg","https://farm5.staticflickr.com/4277/35496026875_fd25c46934_o.jpg","https://farm5.staticflickr.com/4257/35496026065_02fe65754b_o.jpg","https://farm5.staticflickr.com/4289/35491530485_5a4d0f39ae_o.jpg","https://farm5.staticflickr.com/4279/35491529875_1e35ee0a1e_o.jpg","https://farm5.staticflickr.com/4230/34681559323_53f05581ca_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/bulgariasat1presskit.pdf","webcast":"https://www.youtube.com/watch?v=Y8mLi-rRTh8","youtube_id":"Y8mLi-rRTh8","article":"https://en.wikipedia.org/wiki/BulgariaSat-1","wikipedia":"https://en.wikipedia.org/wiki/BulgariaSat-1"},"static_fire_date_utc":"2017-06-15T22:25:00.000Z","static_fire_date_unix":1497565500,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Second time a booster will be reused: Second flight of B1029 after the Iridium mission of January 2017. The satellite will be the first commercial Bulgarian-owned communications satellite and it will provide television broadcasts and other communications services over southeast Europe.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4c4b6c3bb0006eeb20f"],"launchpad":"5e9e4502f509094188566f88","flight_number":42,"name":"BulgariaSat-1","date_utc":"2017-06-23T19:10:00.000Z","date_unix":1498245000,"date_local":"2017-06-23T15:10:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a3f359189e3a3b2645","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d04ffd86e000604b353"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/dc/51/LrdAbm5y_o.png","large":"https://images2.imgbox.com/84/18/ahmKQNIj_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/6bp4fj/","launch":"https://www.reddit.com/r/spacex/comments/6j67ti/","media":"https://www.reddit.com/r/spacex/comments/6j7va6/","recovery":"https://www.reddit.com/r/spacex/comments/6k16ho/"},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4162/34868729603_c75aa126b5_o.jpg","https://farm5.staticflickr.com/4256/35618496935_5049a27240_o.jpg","https://farm5.staticflickr.com/4138/35231792310_377477e626_o.jpg","https://farm5.staticflickr.com/4005/35231791780_dd15335d5e_o.jpg","https://farm5.staticflickr.com/4289/35371450262_bb9c682ace_o.jpg","https://farm5.staticflickr.com/4263/35499710806_f9179bea0e_o.jpg","https://farm5.staticflickr.com/4256/35533873795_eb04895a60_o.jpg","https://farm5.staticflickr.com/4217/35533872755_900b3e8977_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/iridium2presskit.pdf","webcast":"https://www.youtube.com/watch?v=7tIwZg8F9b8","youtube_id":"7tIwZg8F9b8","article":"https://www.space.com/37304-liftoff-spacex-second-launch-three-days.html","wikipedia":"https://en.wikipedia.org/wiki/Iridium_satellite_constellation"},"static_fire_date_utc":"2017-06-20T22:10:00.000Z","static_fire_date_unix":1497996600,"net":false,"window":0,"rocket":"5e9d0d95ed

a69973a809d1ec","success":true,"failures":[],"details":"First flight with titanium grid fins to improve control authority and better cope with heat during re-entr y.","crew":[],"ships":["5ea6ed2f080df4000697c910","5ea6ed2f080df4000697c911","5ea6ed30080df4000697c912"],"capsules":[],"payloads":["5eb0e4c4b6c3bb0006eeb210"],"launchpad":"5e9e4502f509092b78566f87","flight_number":43,"name":"Iridium NEXT Mission 2","date_utc":"2017-06-25T20:25:00.000Z","date_unix":1498422300,"date_local":"2017-06-25T13:25:00-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a3f3591801cf3b264b","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d05ffd86e000604b354"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/8f/a2/46UURVaD_o.png","large":"https://images2.imgbox.com/14/bd/jSZymxYh_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/6fw4yy/","launch":"https://www.reddit.com/r/spacex/comments/6kt2re/","media":"https://www.reddit.com/r/spacex/comments/6kt3fe/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4063/35758875505_a8559a6226_o.jpg","https://farm5.staticflickr.com/4025/35758874355_5075298440_o.jpg","https://farm5.staticflickr.com/4235/35359372730_df7c79797b_o.jpg","https://farm5.staticflickr.com/4014/35359371840_239a658872_o.jpg","https://farm5.staticflickr.com/4002/35577536822_679c68862d_o.jpg","https://farm5.staticflickr.com/4259/34868730393_b778d81a71_o.jpg","https://farm5.staticflickr.com/4162/34868729603_c75aa126b5_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/intelsat35epresskit.pdf","webcast":"https://www.youtube.com/watch?v=MIHVPCj25Z0","youtube_id":"MIHVPCj25Z0","article":"https://spaceflightnow.com/2017/07/06/spacex-delivers-for-intelsat-on-heavyweight-falcon-9-mission/","wikipedia":"https://en.wikipedia.org/wiki/Intelsat_35e"},"static_fire_date_utc":"2017-06-29T00:30:00.000Z","static_fire_date_unix":1498696200,"net":false,"window":3480,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Due to the constraints of sending a heavy satellite (~6,000 kg) to GTO, the rocket will fly in its expendable configuration and the first-stage booster will not be recovered.","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4c4b6c3bb0006eeb211"],"launchpad":"5e9e4502f509094188566f88","flight_number":44,"name":"Intelsat 35e","date_utc":"2017-07-05T23:35:00.000Z","date_unix":1499297700,"date_local":"2017-07-05T19:35:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f3591850cc3b264c","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d06ffd86e000604b355"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/ee/85/dtsbOs0E_o.png","large":"https://images2.imgbox.com/9c/f7/BNIV5kBE_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/6mrga2/crs12_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/6tfcio/welcome_to_the_rspacex_crs12_official_launch/","media":"https://www.reddit.com/r/spacex/comments/6th2nf/rspacex_crs12_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4352/36438808381_733603843d_o.jpg","https://farm5.staticflickr.com/4434/35760634184_f75457493b_o.jpg","https://farm5.staticflickr.com/4418/35741466074_327e9d0a80_o.jpg","https://farm5.staticflickr.com/4414/35741465934_db82541cf3_o.jpg","https://farm5.staticflickr.com/4384/35741465854_e264864537_o.jpg","https://farm5.staticflickr.com/4333/35741465714_d0a8800533_o.jpg","https://farm5.staticflickr.com/4397/35741465464_1d49cc1cae_o.jpg","https://farm5.staticflickr.com/4354/35762350653_d94b2b5b07_o.jpg","https://farm5.staticflickr.com/4353/36571921725_2a0be4ec58_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/crs12presskit.pdf","webcast":"https://www.youtube.com/watch?v=vLxWsYx8dbo","youtube_id":"vLxWsYx8dbo","article":"https://spaceflightnow.com/2017/08/17/photos-falcon-9-rocket-soars-into-space-lands-back-at-cape-canaveral/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-12"},"static_fire_date_utc":"2017-08-10T13:10:00.000Z","static_fire_date_unix":1502370600,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Dragon is expected to carry 2,349 kg (5,179 lb) of pressurized mass and 961 kg (2,119 lb) unpressurized. The external payload manifested for this flight is the CREAM cosmic-ray detector. First flight of the Falcon 9 Block 4 upgrade. Last flight of a newly-built Dragon capsule; further missions will u

se refurbished spacecraft.","crew":[],"ships":["5ea6ed30080df4000697c912"],"capsules":["5e9e2c5cf3591869b63b2670"],"payloads":["5eb0e4c4b6c3bb0006eeb212"],"launchpad":"5e9e4502f509094188566f88","flight_number":45,"name":"CRS-12","date_utc":"2017-08-14T16:31:00.000Z","date_unix":1502728260,"date_local":"2017-08-14T12:31:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f3591884ee3b264d","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d07ffd86e00604b356"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/fd/09/Z1wlUv4U_o.png","large":"https://images2.imgbox.com/5e/95/HLIEaJlQ_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/6o98st","launch":"https://www.reddit.com/r/spacex/comments/6vihsl/welcome_to_the_rspacex_formosat5_official_launch/","media":"https://www.reddit.com/r/spacex/comments/6vhwi1/rspacex_formosat5_media_thread_videos_images_gifs/","recovery":"https://www.reddit.com/r/spacex/comments/6wk653/b1038_recovery_thread/"},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4434/36075361533_54b3b937dd_o.jpg","https://farm5.staticflickr.com/4428/36884090115_ced8a80f14_o.jpg","https://farm5.staticflickr.com/4393/36073897213_6746d2a8b2_o.jpg","https://farm5.staticflickr.com/4341/36073878143_45c3ef0b93_o.jpg","https://farm5.staticflickr.com/4369/35978284213_e12e5743ab_o.jpg","https://farm5.staticflickr.com/4394/35978283413_145ba2ca2f_o.jpg","https://farm5.staticflickr.com/4340/35978282703_5dff70fb19_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/formosat5presskit.pdf","webcast":"https://www.youtube.com/watch?v=J4u3ZN2g_MI","youtube_id":"J4u3ZN2g_MI","article":"https://spaceflightnow.com/2017/08/25/taiwanese-satellite-rides-spacex-rocket-into-orbit/","wikipedia":"https://en.wikipedia.org/wiki/Formosat-5"},"static_fire_date_utc":"2017-08-24T18:50:00.000Z","static_fire_date_unix":1503600600,"net":false,"window":2520,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Formosat-5 is an Earth observation satellite of the Taiwanese space agency. The SHERPA space tug by Spaceflight Industries was removed from the cargo manifest of this mission. The satellite has a mass of only 475 kg.","crew":[],"ships":["5ea6ed2e080df4000697c905","5ea6ed2f080df4000697c910"],"capsules":[],"payloads":["5eb0e4c4b6c3bb0006eeb213"],"launchpad":"5e9e4502f509092b78566f87","flight_number":46,"name":"FormoSat-5","date_utc":"2017-08-24T18:50:00.000Z","date_unix":1503600600,"date_local":"2017-08-24T11:50:00-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f359182d843b264e","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d08ffd86e000604b357"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/12/7c/p8btH0CD_o.png","large":"https://images2.imgbox.com/32/61/cX8ZlEJQ_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/6u6q1t/x37b_otv5_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/6ygmf1/rspacex_x37b_otv5_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/6yih4g/rspacex_x37b_otv5_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4411/37087809715_08a6d9904d_o.jpg","https://farm5.staticflickr.com/4384/37087808315_4dc9575d1b_o.jpg","https://farm5.staticflickr.com/4363/36251815974_8b996dbbfb_o.jpg","https://farm5.staticflickr.com/4374/36251814644_1a469f63ee_o.jpg","https://farm5.staticflickr.com/4388/36251812554_006501315f_o.jpg","https://farm5.staticflickr.com/4355/36250895284_8c24cb4232_o.jpg","https://farm5.staticflickr.com/4342/36689886890_99709e6934_o.jpg","https://farm5.staticflickr.com/4364/36689885100_c3c427c6bf_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/otv5_presskit.pdf","webcast":"https://www.youtube.com/watch?v=9M6Zvi-fFv4","youtube_id":"9M6Zvi-fFv4","article":"https://spaceflightnow.com/2017/09/07/spacex-beats-hurricane-with-smooth-launch-of-militarys-x-37b-spaceplane/","wikipedia":"https://en.wikipedia.org/wiki/Boeing_X-37"},"static_fire_date_utc":"2017-08-31T20:30:00.000Z","static_fire_date_unix":1504211400,"net":false,"window":18300,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Notable because Boeing is the primary contractor of the X-37B, which has until now been launched by ULA, a SpaceX competitor and Boeing partnership. Second flight of the Falcon 9 Block 4 upgrad

e.","crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b"],"capsules":[],"payloads":["5eb0e4c5b6c3bb0006eeb214"],"launchpad":"5e9e4502f509094188566f88","flight_number":47,"name":"Boeing X-37B OTV-5","date_utc":"2017-09-07T13:50:00.000Z","date_unix":1504792200,"date_local":"2017-09-07T09:50:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f3591845123b264f","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d09ffd86e000604b358"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/fb/5b/LNVLRITr_o.png","large":"https://images2.imgbox.com/48/d4/MKsibD8N_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/6ygwxw/iridium_next_constellation_mission_3_launch/","launch":"https://www.reddit.com/r/spacex/comments/753e0m/iridium_next_mission_3_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/755m2z/rspacex_iridium3_media_thread_videos_images_gifs/","recovery":"https://www.reddit.com/r/spacex/comments/75z823/b10411_recovery_thread/"},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4509/37610550066_b56bc5d743_o.jpg","https://farm5.staticflickr.com/4487/37610548356_1b7d30001e_o.jpg","https://farm5.staticflickr.com/4514/37610547696_9114038d60_o.jpg","https://farm5.staticflickr.com/4483/37610547226_01d19395a3_o.jpg","https://farm5.staticflickr.com/4504/36984625383_d7707548ec_o.jpg","https://farm5.staticflickr.com/4505/36984623903_7bb6643649_o.jpg","https://farm5.staticflickr.com/4445/36984622463_6f9b21929c_o.jpg","https://farm5.staticflickr.com/4471/36944884234_92ddc7fb39_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/iridium3presskit.pdf","webcast":"https://www.youtube.com/watch?v=SB4N4xF2B2w&feature=youtu.be","youtube_id":"SB4N4xF2B2w","article":"https://spaceflightnow.com/2017/10/09/spacex-launch-adds-another-10-satellites-to-iridium-next-fleet/","wikipedia":"https://en.wikipedia.org/wiki/Iridium_satellite_constellation#Next-generation_constellation"},"static_fire_date_utc":"2017-10-05T13:31:00.000Z","static_fire_date_unix":1507210260,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Third of eight missions to launch Iridium\'s second generation constellation from VAFB","crew":[],"ships":["5ea6ed2e080df4000697c905","5ea6ed2f080df4000697c910"],"capsules":[],"payloads":["5eb0e4c5b6c3bb0006eeb215"],"launchpad":"5e9e4502f509092b78566f87","flight_number":48,"name":"Iridium NEXT Mission 3","date_utc":"2017-10-09T12:37:00.000Z","date_unix":1507552620,"date_local":"2017-10-09T05:37:00-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f3591843103b2650","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d0affd86e000604b359"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/bc/d3/Yd5qpPd9_o.png","large":"https://images2.imgbox.com/dd/c6/Qns2WYDQ_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/6yvn64/ses11echostar_105_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/75bw7p/ses11echostar105_official_launch_discussions/","media":"https://www.reddit.com/r/spacex/comments/75pgu5/rspacex_ses11_media_thread_videos_images_gifs/","recovery":"https://www.reddit.com/r/spacex/comments/76fqz1/b10312_recovery_thread/"},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4471/37388002420_b86680c3af_o.jpg","https://farm5.staticflickr.com/4497/37388002170_a267280534_o.jpg","https://farm5.staticflickr.com/4455/37388001730_0869279a8d_o.jpg","https://farm5.staticflickr.com/4465/36975195443_b98ed0fb24_o.jpg","https://farm5.staticflickr.com/4499/36975194993_8548a53c60_o.jpg","https://farm5.staticflickr.com/4482/36975194613_15bb109059_o.jpg","https://farm5.staticflickr.com/4453/36975194233_5f8f45c686_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/echostar105ses11presskit.pdf","webcast":"https://www.youtube.com/watch?v=iv1zeGSvhIw","youtube_id":"iv1zeGSvhIw","article":"https://spaceflightnow.com/2017/10/12/video-falcon-9-rocket-lifts-off-with-joint-satellite-for-ses-echostar/","wikipedia":"https://en.wikipedia.org/wiki/List_of_SES_satellites"},"static_fire_date_utc":"2017-10-02T20:30:00.000Z","static_fire_date_unix":1506976200,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Nineteenth comsat to GTO, also the fourth satellite launched for SES and second for Echostar. Third time a first

stage booster will be reused.","crew":[],"ships":["5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90d","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4c5b6c3bb0006eeb216"],"launchpad":"5e9e4502f509094188566f88","flight_number":49,"name":"SES-11 / Echostar 105","date_utc":"2017-10-11T22:53:00.000Z","date_unix":1507762380,"date_local":"2017-10-11T18:53:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a3f3591829dc3b2646","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d0cffd86e000604b35a"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/bb/fa/vNIBtlSn_o.png","large":"https://images2.imgbox.com/d6/8d/iv3VDTkX_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/73ttkd/koreasat_5a_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/79iuvb/rspacex_koreasat_5a_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/79lmdu/rspacex_koreasat5a_media_thread_videos_images/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4477/38056454431_a5f40f9fd7_o.jpg","https://farm5.staticflickr.com/4455/26280153979_b8016a829f_o.jpg","https://farm5.staticflickr.com/4459/38056455051_79ef2b949a_o.jpg","https://farm5.staticflickr.com/4466/26280153539_ecbc2b3fa9_o.jpg","https://farm5.staticflickr.com/4482/26280154209_bf08d76361_o.jpg","https://farm5.staticflickr.com/4493/38056455211_a4565a9cee_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/koreasat5apresskit.pdf","webcast":"https://www.youtube.com/watch?v=RUjH14vhLxA","youtube_id":"RUjH14vhLxA","article":"https://spaceflightnow.com/2017/10/30/spacex-launches-and-lands-third-rocket-in-three-weeks/","wikipedia":"https://en.wikipedia.org/wiki/Koreasat_5A"},"static_fire_date_utc":"2017-10-26T16:00:00.000Z","static_fire_date_unix":1509033600,"net":false,"window":8640,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"KoreaSat 5A is a Ku-band satellite capable of providing communication services from East Africa and Central Asia to southern India, Southeast Asia, the Philippines, Guam, Korea, and Japan. The satellite will be placed in GEO at 113\xc3\x82\xc2\xb0 East Longitude, and will provide services ranging from broadband internet to broadcasting services and maritime communications.","crew":[],"ships":["5ea6ed2f080df4000697c90d","5ea6ed2e080df4000697c908","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4c5b6c3bb0006eeb217"],"launchpad":"5e9e4502f509094188566f88","flight_number":50,"name":"KoreaSat 5A","date_utc":"2017-10-30T19:34:00.000Z","date_unix":1509392040,"date_local":"2017-10-30T15:34:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f359185cc03b2651","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d0dffd86e000604b35b"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/84/42/Ejb9KhGR_o.png","large":"https://images2.imgbox.com/54/4f/CeMcU6RG_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/7bxg5a/crs13_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/7j725w/rspacex_crs13_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/7j6oxz/rspacex_crs13_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4591/38372264594_8140bd943d_o.png","https://farm5.staticflickr.com/4546/39051469552_13703e6b2e_o.jpg","https://farm5.staticflickr.com/4682/39051469662_55c55150c0_o.jpg","https://farm5.staticflickr.com/4565/25215551218_2597838c1a_o.jpg","https://farm5.staticflickr.com/4680/39051469812_b6f802fc9d_o.jpg","https://farm5.staticflickr.com/4517/27304331429_59b9d6c1d4_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/crs13presskit12_11.pdf","webcast":"https://www.youtube.com/watch?v=OPHbqY9LHCs","youtube_id":"OPHbqY9LHCs","article":"https://spaceflightnow.com/2017/12/15/spacexs-50th-falcon-rocket-launch-kicks-off-station-resupply-mission/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-13"},"static_fire_date_utc":"2017-12-06T20:00:00.000Z","static_fire_date_unix":1512590400,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Will reuse the Dragon capsule previously flown on CRS-6 and will reuse the booster from CRS-11.","crew":[],"ships":["5ea6ed30080df4000697c912"],"capsules":["5e9e2c5cf359188bfb3b266b"],"payloads":["5eb0e4c5b6c3bb0006eeb218"],"launchpa

d":"5e9e4501f509094ba4566f84","flight_number":51,"name":"CRS-13","date_utc":"2017-12-15T15:36:00.000Z","date_unix":1513352160,"date_local":"2017-12-15T10:36:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a3f3591856803b264a","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d0effd86e000604b35c"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/85/43/6VSgldkO_o.png","large":"https://images2.imgbox.com/5f/d4/wAoAmyxK_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/7cgts7/iridium_next_constellation_mission_4_launch/","launch":"https://www.reddit.com/r/spacex/comments/7li8y2/rspacex_iridium_next_4_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/7litv2/rspacex_iridium4_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4695/25557986177_2d315f4c11_o.jpg","https://farm5.staticflickr.com/4735/25377631178_d28e0a9141_o.jpg","https://farm5.staticflickr.com/4733/25377628928_a79bb43a31_o.jpg","https://farm5.staticflickr.com/4732/25377628288_361f551d34_o.jpg","https://farm5.staticflickr.com/4598/39244105581_eeb76c8ed2_o.jpg","https://farm5.staticflickr.com/4728/24381830217_a49ae2100f_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/iridium4presskit.pdf","webcast":"https://www.youtube.com/watch?v=wtdjCwo6d3Q","youtube_id":"wtdjCwo6d3Q","article":"https://spaceflightnow.com/2017/12/23/spacex-launch-dazzles-delivering-10-more-satellites-for-iridium/","wikipedia":"https://en.wikipedia.org/wiki/Iridium_satellite_constellation#Next-generation_constellation"},"static_fire_date_utc":"2017-12-17T21:00:00.000Z","static_fire_date_unix":1513544400,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Reusing the booster first used on Iridium-2, but will be flying expendable.","crew":[],"ships":["5ea6ed2e080df4000697c908"],"capsules":[],"payloads":["5eb0e4c6b6c3bb0006eeb219"],"launchpad":"5e9e4502f509092b78566f87","flight_number":52,"name":"Iridium NEXT Mission 4","date_utc":"2017-12-23T01:27:23.000Z","date_unix":1513992443,"date_local":"2017-12-22T17:27:23-08:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a3f3591801cf3b264b","flight":2,"gridfins":true,"legs":false,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"Ocean","landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d0fffd86e000604b35d"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/dc/7b/8HuZoJQU_o.png","large":"https://images2.imgbox.com/4f/0d/UudW8zZK_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/7895bo/zuma_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/7oqjf0/rspacex_zuma_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/7orksl/rspacex_zuma_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4751/39557026242_384d287045_o.jpg","https://farm5.staticflickr.com/4674/39556549372_810396618d_o.jpg","https://farm5.staticflickr.com/4661/39556548902_f66c7be90d_o.jpg","https://farm5.staticflickr.com/4607/39585580001_8b21846eab_o.jpg","https://farm5.staticflickr.com/4754/39585578201_a67ab9b9a8_o.jpg","https://farm5.staticflickr.com/4603/39585575631_216cc035f4_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/zumapresskit.pdf","webcast":"https://www.youtube.com/watch?v=0PWu3BRxn60","youtube_id":"0PWu3BRxn60","article":"https://spaceflightnow.com/2018/01/08/spacex-kicks-off-ambitious-2018-schedule-with-launch-for-u-s-government/","wikipedia":"https://en.wikipedia.org/wiki/Zuma_(satellite)"},"static_fire_date_utc":"2017-11-11T23:00:00.000Z","static_fire_date_unix":1510441200,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Originally planned for mid-November 2017, the mission was delayed due to test results from the fairing of another customer. First-stage booster will attempt landing at LZ-1","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4c6b6c3bb0006eeb21a"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":53,"name":"ZUMA","date_utc":"2018-01-08T01:00:00.000Z","date_unix":1515373200,"date_local":"2018-01-07T20:00:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f35918345e3b2652","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_

library_id":null,"id":"5eb87d10ffd86e000604b35e"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/e0/b5/G8QLLURl_o.png","large":"https://images2.imgbox.com/3b/6b/ovK7nExS_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/7olw86/govsat1_ses16_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/7tvtbh/rspacex_govsat1_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/7tzzwy/rspacex_govsat1_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4721/40026315981_f16a7cd32a_o.jpg","https://farm5.staticflickr.com/4708/40026316291_0b3aef9d8d_o.jpg","https://farm5.staticflickr.com/4652/39128355655_3eefa0d583_o.jpg","https://farm5.staticflickr.com/4741/39128355825_7c4166dbbe_o.jpg","https://farm5.staticflickr.com/4609/39128355355_17381fc00e_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/govsat1presskit.pdf","webcast":"https://www.youtube.com/watch?v=ScYUA51-POQ","youtube_id":"ScYUA51-POQ","article":"https://spaceflightnow.com/2018/01/31/spacex-rocket-flies-on-60th-anniversary-of-first-u-s-satellite-launch/","wikipedia":"https://en.wikipedia.org/wiki/List_of_SES_satellites#SES_Fleet"},"static_fire_date_utc":"2018-01-26T15:27:00.000Z","static_fire_date_unix":1516980420,"net":false,"window":8460,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Reused booster from the classified NROL-76 mission in May 2017. Following a successful experimental ocean landing that used three engines, the booster unexpectedly remained intact; Elon Musk stated in a tweet that SpaceX will attempt to tow the booster to shore.","crew":[],"ships":["5ea6ed2f080df4000697c90b"],"capsules":[],"payloads":["5eb0e4c6b6c3bb0006eeb21b"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":54,"name":"SES-16 / GovSat-1","date_utc":"2018-01-31T21:25:00.000Z","date_unix":1517433900,"date_local":"2018-01-31T16:25:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a3f3591811f83b2648","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"Ocean","landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d11ffd86e000604b35f"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/cd/48/NVrODg2G_o.png","large":"https://images2.imgbox.com/97/11/mjn87zBs_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/7hjp03/falcon_heavy_demo_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/7vg63x/rspacex_falcon_heavy_test_flight_official_launch/","media":"https://www.reddit.com/r/spacex/comments/7vimtm/rspacex_falcon_heavy_test_flight_media_thread/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4745/40110304192_b0165b7785_o.jpg","https://farm5.staticflickr.com/4676/40110297852_6173e5cae6_o.jpg","https://farm5.staticflickr.com/4615/40143096241_0324643b5e_o.jpg","https://farm5.staticflickr.com/4702/40110298232_4e9c412936_o.jpg","https://farm5.staticflickr.com/4610/39337245575_41d760caef_o.jpg","https://farm5.staticflickr.com/4654/25254688767_59603ff06c_o.jpg","https://farm5.staticflickr.com/4627/40126462801_d54b4f00be_o.jpg","https://farm5.staticflickr.com/4760/40126462231_cdf00ef431_o.jpg","https://farm5.staticflickr.com/4655/40202121122_5d29cfe2ac_o.jpg","https://farm5.staticflickr.com/4631/39337245145_5f5630a66a_o.jpg","https://farm5.staticflickr.com/4650/40126461851_14b93ec9d7_o.jpg","https://farm5.staticflickr.com/4711/40126461411_b1ed283d45_o.jpg","https://farm5.staticflickr.com/4696/40126460511_7b5cc64871_o.jpg","https://farm5.staticflickr.com/4589/38583831555_9ae89f5c10_o.jpg","https://farm5.staticflickr.com/4682/38583829815_e01509d1a7_o.jpg","https://farm5.staticflickr.com/4731/39225582801_80594d5d91_o.jpg","https://farm5.staticflickr.com/4641/39225582421_7aa0c65851_o.jpg","https://farm5.staticflickr.com/4643/27449864329_d2424bc280_o.jpg","https://farm5.staticflickr.com/4681/39225582171_137a4c75e7_o.jpg","https://farm5.staticflickr.com/4644/39225582351_ac6aba2533_o.jpg","https://farm5.staticflickr.com/4587/27449863849_709e135a98_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/falconheavypresskit_v1.pdf","webcast":"https://www.youtube.com/watch?v=wbSwFU6tY1c","youtube_id":"wbSwFU6tY1c","article":"https://spaceflightnow.com/2018/02/07/spacex-debuts-worlds-most-powerful-rocket-sends-tesla-toward-the-asteroid-belt/","wikipedia":"https://en.wikipedia.org/wiki/Elon_Musk%27s_Tesla_Roadster"},"static_fire_date_utc":"2018-01-24T17:30:00.000Z","static_fire_date_unix":1516815000,"net":false,"window":9000,"rocket":"5e9d0d95eda69974db09d1ed","success":true,"failures":[],"details":"The launch was a success, and the side boost

ers landed simultaneously at adjacent ground pads. Drone ship landing of the centr
al core failed. Final burn to heliocentric mars-earth orbit was successful after t
he second stage and payload passed through the Van Allen belts.","crew":[],"ship
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om/2018/02/22/recycled-spacex-rocket-boosts-paz-radar-satellite-first-starlink-tes
tbeds-into-orbit/","wikipedia":"https://en.wikipedia.org/wiki/Paz_(satellite)"},"s
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om/sites/spacex/files/hispasat30w6_presskit.pdf","webcast":"https://www.youtube.co
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w.com/2018/03/06/hefty-hispasat-satellite-rides-spacex-rocket-into-orbit/","wikipe
dia":"https://en.wikipedia.org/wiki/Hispasat_30W-6"},"static_fire_date_utc":"2018-
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ched with landing legs and titanium grid fins. Did not attempt a landing due to \'unfavorable weather conditions in the recovery area\'.","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4c7b6c3bb0006eeb21f"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":57,"name":"Hispasat 30W-6","date_utc":"2018-03-06T05:33:00.000Z","date_unix":1520314380,"date_local":"2018-03-06T00:33:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f359186cb73b2654","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d15ffd86e000604b362"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/55/c6/8sNQh2b6_o.png","large":"https://images2.imgbox.com/23/bc/mq595O2o_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/82njj5/iridium_next_constellation_mission_5_launch/","launch":"https://www.reddit.com/r/spacex/comments/88184i/rspacex_iridium_next_5_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/88114l/rspacex_iridium5_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/791/40227113515_da97986607_o.jpg","https://farm1.staticflickr.com/788/27248936158_2eaf1a98b3_o.jpg","https://farm1.staticflickr.com/864/40227112595_c34a1cf8d1_o.jpg","https://farm1.staticflickr.com/806/41121608121_8f0b886f9d_o.jpg","https://farm1.staticflickr.com/809/41121608541_cdfec6a849_o.jpg","https://farm1.staticflickr.com/822/40227112875_ec3c5df585_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/iridium-5_press_kit_2018.pdf","webcast":"https://www.youtube.com/watch?v=mp0TW8vkCLg","youtube_id":"mp0TW8vkCLg","article":"https://spaceflightnow.com/2018/03/30/iridium-messaging-network-gets-another-boost-from-spacex/","wikipedia":"https://en.wikipedia.org/wiki/Iridium_satellite_constellation#Next-generation_constellation"},"static_fire_date_utc":"2018-03-25T12:23:00.000Z","static_fire_date_unix":1521980580,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Fifth Iridium NEXT mission to deploy ten Iridium NEXT satellites. Reused booster from third Iridium flight, and although controlled descent was performed, the booster was expended into the ocean. SpaceX planned a second recovery attempt of one half of the fairing using the specially modified boat Mr. Steven. However, the fairing\'s parafoil twisted during the recovery, which led to water impact at high speed","crew":[],"ships":["5ea6ed2e080df4000697c908"],"capsules":[],"payloads":["5eb0e4c7b6c3bb0006eeb220"],"launchpad":"5e9e4502f509092b78566f87","flight_number":58,"name":"Iridium NEXT Mission 5","date_utc":"2018-03-30T14:13:51.000Z","date_unix":1522419231,"date_local":"2018-03-30T07:13:51-08:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f3591843103b2650","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d16ffd86e000604b363"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/49/e8/6Tmdhwlq_o.png","large":"https://images2.imgbox.com/28/c4/dc3rQbGy_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/82op7a/crs14_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/88s8a7/rspacex_crs14_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/88l52i/rspacex_crs14_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/819/26326005987_c3aec29db5_o.jpg","https://farm1.staticflickr.com/791/40303273215_4926c917c4_o.jpg","https://farm1.staticflickr.com/867/26326007227_39e71e6775_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/crs-14presskit2018.pdf","webcast":"https://www.youtube.com/watch?v=BPQHG-LevZM","youtube_id":"BPQHG-LevZM","article":"https://spaceflightnow.com/2018/04/02/spacex-supply-ship-departs-cape-canaveral-for-space-station/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-14"},"static_fire_date_utc":"2018-03-28T15:52:00.000Z","static_fire_date_unix":1522252320,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"The launch used a refurbished booster (from CRS-12) for the 11th time, and a refurbished capsule (C110 from CRS-8) for the third time. External payloads include a materials research platform MISSE-FF phase 3 of the Robotic Refueling Mission TSIS, heliophysics sensor several crystallization experiments, and the RemoveDebris spacecraft aimed at space junk removal. The booster was expended in order to test a new

landing profile.","crew":[],"ships":["5ea6ed30080df4000697c912"],"capsules":["5e9e2c5cf3591885d43b266d"],"payloads":["5eb0e4c7b6c3bb0006eeb221"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":59,"name":"CRS-14","date_utc":"2018-04-02T20:30:41.000Z","date_unix":1522701041,"date_local":"2018-04-02T16:30:41-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f3591884ee3b264d","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d16ffd86e000604b364"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/4d/55/TQjhUrc7_o.png","large":"https://images2.imgbox.com/22/84/wfppRwXb_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/88l46q/tess_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/8cm61o/rspacex_tess_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/8cmzop/rspacex_tess_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/799/27684194488_0d9a703c1c_o.jpg","https://farm1.staticflickr.com/854/41512967372_0c37360126_o.jpg","https://farm1.staticflickr.com/832/41512968122_20c2e31de3_o.jpg","https://farm1.staticflickr.com/803/27684194678_c1ccd0680b_o.jpg","https://farm1.staticflickr.com/902/41512967962_74913ef5b0_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/tesspresskitfinal417.pdf","webcast":"https://www.youtube.com/watch?v=aY-0uBIYYKk","youtube_id":"aY-0uBIYYKk","article":"https://spaceflightnow.com/2018/04/19/all-sky-surveyor-launched-from-cape-canaveral-on-the-hunt-for-exoplanets/","wikipedia":"https://en.wikipedia.org/wiki/Transiting_Exoplanet_Survey_Satellite"},"static_fire_date_utc":"2018-04-11T18:30:00.000Z","static_fire_date_unix":1523471400,"net":false,"window":30,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Part of the Explorers program, this space telescope is intended for wide-field search of exoplanets transiting nearby stars. It is the first NASA high priority science mission launched by SpaceX. It was the first time SpaceX launched a scientific satellite not primarily intended for Earth observations. The second stage placed it into a high-Earth elliptical orbit, after which the satellite\'s own booster will perform complex maneuvers including a lunar flyby, and over the course of two months, reach a stable, 2:1 resonant orbit with the Moon. In January 2018, SpaceX received NASA\'s Launch Services Program Category 2 certification of its Falcon 9 \'Full Thrust\', certification which is required for launching medium risk missions like TESS. It was the last launch of a new Block 4 booster, and marked the 24th successful recovery of the booster. An experimental water landing was performed in order to attempt fairing recovery.","crew":[],"ships":["5ea6ed2e080df4000697c90a","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90d","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4c7b6c3bb0006eeb222"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":60,"name":"TESS","date_utc":"2018-04-18T22:51:00.000Z","date_unix":1524091860,"date_local":"2018-04-18T18:51:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f35918863d3b2655","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d18ffd86e000604b365"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/97/bf/G9sPBnrg_o.png","large":"https://images2.imgbox.com/8e/80/QIE1XB30_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8624iq/bangabandhu1_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/8ia091/rspacex_bangabandhu1_official_launch_discussion","media":"https://www.reddit.com/r/spacex/comments/8ia5bu/rspacex_bangabandhu1_media_thread_videos_images/","recovery":"https://www.reddit.com/r/spacex/comments/8j6moa/bangabandhu1_block_5_recovery_thread/"},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/903/28197547888_dd697d8147_o.jpg","https://farm1.staticflickr.com/823/42025498712_8ec531950f_o.jpg","https://farm1.staticflickr.com/975/28197546158_880e466fb6_o.jpg","https://farm1.staticflickr.com/823/27200014957_940f3720bb_o.jpg","https://farm1.staticflickr.com/945/42025498442_0b7b91d561_o.jpg","https://farm1.staticflickr.com/967/42025498972_8720104d8a_o.jpg","https://farm1.staticflickr.com/954/42025499162_8a0ef7feaa_o.jpg","https://farm1.staticflickr.com/911/42025499722_47d3433d65_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/file

s/bangabandhupresskit51118.pdf","webcast":"https://www.youtube.com/watch?v=rQEqKZ7CJlk","youtube_id":"rQEqKZ7CJlk","article":"https://spaceflightnow.com/2018/05/11/spacex-debuts-an-improved-human-rated-model-of-the-falcon-9-rocket/","wikipedia":"https://en.wikipedia.org/wiki/Bangabandhu-1"},"static_fire_date_utc":"2018-05-04T23:25:00.000Z","static_fire_date_unix":1525476300,"net":false,"window":7620,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"First launch of a Block V first stage.","crew":[],"ships":["5ea6ed2e080df4000697c90a","5ea6ed2f080df4000697c90b","5ea6ed30080df4000697c913","5ea6ed30080df4000697c916"],"capsules":[],"payloads":["5eb0e4c7b6c3bb0006eeb223"],"launchpad":"5e9e4502f509094188566f88","flight_number":61,"name":"Bangabandhu-1","date_utc":"2018-05-11T20:14:00.000Z","date_unix":1526069640,"date_local":"2018-05-11T16:14:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f359182b023b2656","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d19ffd86e000604b366"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/c8/01/ijWT6oSs_o.png","large":"https://images2.imgbox.com/e9/61/9dF2ELMJ_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8ffsgl/iridium6_gracefo_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/8kyk5a/rspacex_iridium_next_6_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/8l9tfz/rspacex_iridium6gracefo_media_thread_videos/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/897/42290934301_4c6ac431c8_o.jpg","https://farm1.staticflickr.com/831/42290933051_510176c9da_o.jpg","https://farm1.staticflickr.com/882/42290932011_a522b43015_o.jpg","https://farm1.staticflickr.com/947/42290930761_4bf7b607b1_o.jpg","https://farm1.staticflickr.com/982/42290930181_0117ab0dfb_o.jpg","https://farm1.staticflickr.com/955/42244412292_e787538fc5_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/iridium6presskit2018521.pdf","webcast":"https://www.youtube.com/watch?v=I_0GgKfwCSk","youtube_id":"I_0GgKfwCSk","article":"https://spaceflightnow.com/2018/05/22/rideshare-launch-by-spacex-serves-commercial-and-scientific-customers/","wikipedia":"https://en.wikipedia.org/wiki/Gravity_Recovery_and_Climate_Experiment"},"static_fire_date_utc":"2018-05-18T20:16:00.000Z","static_fire_date_unix":1526674560,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"GFZ arranged a rideshare of GRACE-FO on a Falcon 9 with Iridium following the cancellation of their Dnepr launch contract in 2015. Iridium CEO Matt Desch disclosed in September 2017 that GRACE-FO would be launched on the sixth Iridium NEXT mission. The booster reuse turnaround was a record 4.5 months between flights.","crew":[],"ships":["5ea6ed2e080df4000697c908"],"capsules":[],"payloads":["5eb0e4c7b6c3bb0006eeb224","5eb0e4c8b6c3bb0006eeb225"],"launchpad":"5e9e4502f509092b78566f87","flight_number":62,"name":"Iridium NEXT Mission 6","date_utc":"2018-05-22T19:47:58.000Z","date_unix":1527018478,"date_local":"2018-05-22T12:47:58-08:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f35918345e3b2652","flight":2,"gridfins":true,"legs":false,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d1affd86e000604b367"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/fa/c4/37mkd4wY_o.png","large":"https://images2.imgbox.com/9f/0c/0KIBjMfe_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8jv0ed/ses12_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/8o9woj/rspacex_ses12_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/8oa3k4/rspacex_ses12_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1752/41664024035_14c81a25e3_o.jpg","https://farm2.staticflickr.com/1731/27695627527_d9d5bca0ae_o.jpg","https://farm2.staticflickr.com/1735/27695627327_ed66c7282c_o.jpg","https://farm2.staticflickr.com/1752/27695627417_38ea7d7acf_o.jpg","https://farm2.staticflickr.com/1733/41664023935_e9e8120690_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/ses-12missionpress_kit_6.2.18.pdf","webcast":"https://www.youtube.com/watch?v=2hcM5hqQ45s","youtube_id":"2hcM5hqQ45s","article":"https://spaceflightnow.com/2018/06/04/multi-mission-telecom-craft-launched-by-spacex-for-ses/","wikipedia":"https://en.wikipedia.org/

wiki/SES-12"},"static_fire_date_utc":"2018-05-25T01:48:00.000Z","static_fire_date_unix":1527212880,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SES-12, the replacement satellite for NSS-6, was successfully launched and deployed on June 4th, completing SpaceX\'s eleventh flight of 2018. According to SES Luxembourg, The SES-12 satellite will expand SES \xe2\x80\x99s capabilities to provide direct-to-home (DTH) broadcasting, VSAT, Mobility and High Throughput Satellite (HTS) data connectivity services in the Middle East and the Asia-Pacific region, including rapidly growing markets such as India and Indonesia. [SES-12] will be co-located with SES-8","crew":[],"ships":["5ea6ed2e080df4000697c90a"],"capsules":[],"payloads":["5eb0e4c8b6c3bb0006eeb226"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":63,"name":"SES-12","date_utc":"2018-06-04T04:45:00.000Z","date_unix":1528087500,"date_local":"2018-06-04T00:45:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f3591845123b264f","flight":2,"gridfins":false,"legs":false,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d1bffd86e000604b368"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/b3/12/t63UKas5_o.png","large":"https://images2.imgbox.com/15/3c/W0LEnrZx_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8pua1m/crs15_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/8ugo3l/rspacex_crs15_official_launch_discussion_updates","media":"https://www.reddit.com/r/spacex/comments/8ujcwo/rspacex_crs15_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/836/42374725204_dae09db889_o.jpg","https://farm2.staticflickr.com/1781/41281636860_71dca92ab4_o.jpg","https://farm2.staticflickr.com/1829/42374725534_325e676d19_o.jpg","https://farm2.staticflickr.com/1810/42374724974_e50b050403_o.jpg","https://farm1.staticflickr.com/843/41281636620_437528bd1f_o.jpg","https://farm2.staticflickr.com/1790/41281637670_f6a6a2cf6c_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/crs15presskit.pdf","webcast":"https://www.youtube.com/watch?v=ycMagB1s8XM","youtube_id":"ycMagB1s8XM","article":"https://spaceflightnow.com/2018/06/29/spacex-launches-ai-enabled-robot-companion-vegetation-monitor-to-space-station/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-15"},"static_fire_date_utc":"2018-06-23T21:30:00.000Z","static_fire_date_unix":1529789400,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Payload included MISSE-FF 2, ECOSTRESS, and a Latching End Effector. The refurbished booster featured a record 2.5 months period turnaround from its original launch of the TESS satellite \xe2\x80\x94 the fastest previous was 4.5 months. This was the last commercial flight of a Block 4 booster, which was expended into the Atlantic without landing legs and grid fins.","crew":[],"ships":["5ea6ed30080df4000697c912"],"capsules":["5e9e2c5cf359183bb73b266e"],"payloads":["5eb0e4c8b6c3bb0006eeb227"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":64,"name":"CRS-15","date_utc":"2018-06-29T09:42:00.000Z","date_unix":1530265320,"date_local":"2018-06-29T05:42:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f35918863d3b2655","flight":2,"gridfins":false,"legs":false,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d1cffd86e000604b369"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/2b/de/2CF8Q4Bq_o.png","large":"https://images2.imgbox.com/c0/d8/Jt7Es9az_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8w19yg/telstar_19v_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/90p1a6/rspacex_telstar_19v_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/90oxrr/rspacex_telstar_19v_media_thread_videos_images/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/856/28684550147_49802752b3_o.jpg","https://farm1.staticflickr.com/927/28684552447_956a9744f1_o.jpg","https://farm2.staticflickr.com/1828/29700007298_8ac5891d2c_o.jpg","https://farm1.staticflickr.com/914/29700004918_31ed7b73ef_o.jpg","https://farm1.staticflickr.com/844/29700002748_3047e50a0a_o.jpg","https://farm2.staticflickr.com/1786/29700000688_2514cd3cbb_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/telstar19vantagepresskit.pdf","webcast":"https://www.youtube.com/watch?v=xybp6zLaGx4","youtube_id":"xybp6zLaGx4","article":"https://spaceflightnow.com/2018/07/22/spacex-delivers-for-telesat-with-successful-ea

rly-morning-launch/","wikipedia":"https://en.wikipedia.org/wiki/Telstar_19V"},"sta
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ilures":[],"details":"SSL-manufactured communications satellite intended to be pla
ced at 63\xc2\xb0 West over the Americas. At 7,075 kg, it became the heaviest comm
ercial communications satellite ever launched.","crew":[],"ships":["5ea6ed2e080df4
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e4501f509094ba4566f84","flight_number":65,"name":"Telstar 19V","date_utc":"2018-07
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pacex/comments/91i1ru/rspacex_iridium_next_7_official_launch_discussion/","medi
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tion_mission_7/","recovery":null},"flickr":{"small":[],"original":["https://farm1.
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mK30C0","article":"https://spaceflightnow.com/2018/07/25/spacexs-second-launch-in-
three-days-lofts-10-more-iridium-satellites/","wikipedia":"https://en.wikipedia.or
g/wiki/Iridium_satellite_constellation#Next-generation_constellation"},"static_fir
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lse,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"d
etails":"SpaceX\'s fourteenth flight of 2018 and seventh of eight launches in a ha
lf-a-billion-dollar contract with Iridium. Will use a Block 5 first stage, to be r
ecovered in the Pacific Ocean. Only one mission will be left for Iridium, with 10
 more satellites. First attempt to recover a Fairing with the upgraded net. Fairin
g recovery was not successful.","crew":[],"ships":["5ea6ed2f080df4000697c910","5ea
6ed2e080df4000697c908","5ea6ed30080df4000697c912","5ea6ed30080df4000697c914"],"cap
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tube_id":"FjfQNBYv2IY","article":"https://spaceflightnow.com/2018/08/07/indonesian
-communications-satellite-deployed-in-orbit-by-spacex/","wikipedia":"https://en.wi

kipedia.org/wiki/Telkom_Indonesia"},"static_fire_date_utc":"2018-08-02T15:53:00.000Z","static_fire_date_unix":1533225180,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s fifteenth flight of 2018 launched the Merah Putih (also known as Telkom-4) geostationary communications satellite for Telkom Indonesia. It marked the first reuse of any Block 5 first stage; the booster B1046 had previously launched Bangabandhu-1. The stage was recovered and is expected to become the first Falcon 9 booster to fly three missions.","crew":[],"ships":["5ea6ed2f080df4000697c90d","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4c9b6c3bb0006eeb22a"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":67,"name":"Merah Putih","date_utc":"2018-08-07T05:18:00.000Z","date_unix":1533619080,"date_local":"2018-08-07T01:18:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f359182b023b2656","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d20ffd86e000604b36c"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/55/54/73EXeMfo_o.png","large":"https://images2.imgbox.com/fd/59/nv3Ih3Am_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/95cte4/telstar_18v_apstar_5c_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/9e7bmq/rspacex_telstar_18v_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/9ebkqw/rspacex_telstar_18v_media_thread_videos_images/","recovery":"https://www.reddit.com/r/spacex/comments/9erxlh/telstar_18_vantage_recovery_thread/"},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1878/43690848045_492ef182dd_o.jpg","https://farm2.staticflickr.com/1856/43881229604_6d42e838b6_o.jpg","https://farm2.staticflickr.com/1852/43881223704_93777e34af_o.jpg","https://farm2.staticflickr.com/1841/43881217094_558b7b214e_o.jpg","https://farm2.staticflickr.com/1869/43881193934_423eff8c86_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/telstar18vantagepresskit.pdf","webcast":"https://www.youtube.com/watch?v=Apw3xqwsG1U","youtube_id":"Apw3xqwsG1U","article":"https://spaceflightnow.com/2018/09/10/spacex-telesat-achieve-repeat-success-with-midnight-hour-launch/","wikipedia":"https://en.wikipedia.org/wiki/Telstar_18V"},"static_fire_date_utc":"2018-09-05T07:21:00.000Z","static_fire_date_unix":1536132060,"net":false,"window":14400,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s sixteenth flight of 2018 launched the Telstar 18v GEO communication satellite for Telesat, the second launch for the canadian company in a few months. The first stage was a new Falcon 9 V1.2 Block 5 which was successfully recovered on OCISLY.","crew":[],"ships":["5ea6ed30080df4000697c913","5ea6ed2f080df4000697c90d","5ea6ed2f080df4000697c90b"],"capsules":[],"payloads":["5eb0e4c9b6c3bb0006eeb22b"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":68,"name":"Telstar 18V","date_utc":"2018-09-10T04:45:00.000Z","date_unix":1536554700,"date_local":"2018-09-10T00:45:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591833b13b2659","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d22ffd86e000604b36d"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/cb/41/RQIY0BjQ_o.png","large":"https://images2.imgbox.com/df/2c/DsfygPln_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/9fwj9o/saocom_1a_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/9lazvr/rspacex_saocom_1a_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/9m3ly5/rspacex_saocom_1a_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1940/44262177535_9582184d3f_o.jpg","https://farm2.staticflickr.com/1917/30234800687_fd94fde151_o.jpg","https://farm2.staticflickr.com/1951/30234801997_b5a65426ca_o.jpg","https://farm2.staticflickr.com/1910/44262169525_e4c6b27299_o.jpg","https://farm2.staticflickr.com/1923/44451125454_8d26929d0b_o.jpg","https://farm2.staticflickr.com/1914/44262170545_22fe55d4bb_o.jpg","https://farm2.staticflickr.com/1934/44262166295_3f84597f09_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/saocom1apresskit.pdf","webcast":"https://www.youtube.com/watch?v=vr_C6LQ7mHc","youtube_id":"vr_C6LQ7mHc","article":"https://spaceflightnow.com/2018/10/08/spacex-aces-firs

t-rocket-landing-in-california-after-launching-argentine-satellite/","wikipedi
a":"https://en.wikipedia.org/wiki/SAOCOM"},"static_fire_date_utc":"2018-10-02T21:0
0:00.000Z","static_fire_date_unix":1538514000,"net":false,"window":0,"rocket":"5e9
d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s seventeen
th flight of 2018 was the first launch of the Saocom Earth observation satellite c
onstellation of the Argentine Space Agency CONAE. The second launch of Saocom 1B w
ill happen in 2019. This flight marked the first RTLS launch out of Vandenberg, wi
th a landing on the concrete pad at SLC-4W, very close to the launch pad.","crew":
[],"ships":[],"capsules":[],"payloads":["5eb0e4c9b6c3bb0006eeb22c"],"launchpad":"5
e9e4502f509092b78566f87","flight_number":69,"name":"SAOCOM 1A","date_utc":"2018-10
-08T02:22:00.000Z","date_unix":1538965320,"date_local":"2018-10-07T19:22:00-07:0
0","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591809c03b
2658","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":tru
e,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb554034e7c
9"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d23ffd86e0
00604b36e"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":fals
e,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/ad/40/oCtCFYfl
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read/","launch":"https://www.reddit.com/r/spacex/comments/9x9w9v/rspacex_eshail_2_
official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/9xa
a76/rspacex_eshail_2_media_thread_videos_images_gifs/","recovery":"https://www.red
dit.com/r/spacex/comments/9xmpa7/eshail_2_recovery_thread/"},"flickr":{"small":
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r.com/4899/32040173568_bb5c991565_o.jpg","https://farm5.staticflickr.com/4875/3204
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ps://farm5.staticflickr.com/4808/32248947038_dd1cf9e8c3_o.jpg","https://farm5.stat
icflickr.com/4887/31180979107_da6a935c20_o.jpg"]},"presskit":"https://www.spacex.c
om/sites/spacex/files/eshail-2_mission_press_kit_11_14_2018.pdf","webcast":"http
s://www.youtube.com/watch?v=PhTbzc-BqKs&feature=youtu.be","youtube_id":"PhTbzc-BqK
s","article":"https://spaceflightnow.com/2018/11/15/spacex-launches-qatars-eshail-
2-communications-satellite/","wikipedia":"https://en.wikipedia.org/wiki/Es%27hailS
at"},"static_fire_date_utc":"2018-11-12T18:13:00.000Z","static_fire_date_unix":154
2046380,"net":false,"window":6180,"rocket":"5e9d0d95eda69973a809d1ec","success":tr
ue,"failures":[],"details":"SpaceX\'s eighteenth flight of 2018 was its first for
 Es\'hailSat. Es\'hail-2 is a communications satellite delivering television and i
nternet to Qatar and the surrounding region. It was launched into a geostationary
 transfer orbit from LC-39A at Kennedy Space Center. The booster landed on OCISL
Y.","crew":[],"ships":["5ea6ed2f080df4000697c90d","5ea6ed30080df4000697c913"],"cap
sules":[],"payloads":["5eb0e4c9b6c3bb0006eeb22d"],"launchpad":"5e9e4502f5090941885
66f88","flight_number":70,"name":"Es\xe2\x80\x99hail 2","date_utc":"2018-11-15T20:
46:00.000Z","date_unix":1542314760,"date_local":"2018-11-15T15:46:00-05:00","date_
precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f359181eed3b2657","fl
ight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_
success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_u
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mpaign_thread","launch":"https://www.reddit.com/r/spacex/comments/a0vjff/rspacex_s
soa_official_launch_discussion_updates/","media":"https://old.reddit.com/r/spacex/
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s://www.reddit.com/r/spacex/comments/a2tjoe/ssoa_recovery_thread/"},"flickr":{"sma
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pg","https://farm5.staticflickr.com/4839/45257565835_4fd6f3e895_o.jpg","https://fa
rm5.staticflickr.com/4822/45257566865_9c9d34a7ca_o.jpg","https://farm5.staticflick
r.com/4821/45257568225_186c8431cf_o.jpg","https://farm5.staticflickr.com/4885/4525

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dit.com/r/spacex/comments/a73kz5/rspacex_gps_iii2_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4864/45715171884_f1dd88c058_o.jpg","https://farm8.staticflickr.com/7926/45525648155_32fdab17a5_o.jpg","https://farm8.staticflickr.com/7876/45525649035_ba60162fe0_o.jpg","https://farm8.staticflickr.com/7853/45525649825_e6d35415e1_o.jpg","https://farm5.staticflickr.com/4893/45525650685_02b408c385_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/gps_iii_press_kit.pdf","webcast":"https://youtu.be/yRiLPoy_Mzc","youtube_id":"yRiLPoy_Mzc","article":"https://spaceflightnow.com/2018/12/23/spacex-closes-out-year-with-successful-gps-satellite-launch/","wikipedia":"https://en.wikipedia.org/wiki/GPS_Block_IIIA"},"static_fire_date_utc":"2018-12-13T21:24:00.000Z","static_fire_date_unix":1544736240,"net":false,"window":1560,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s twenty-first flight of 2018 launched the first of the new GPS III satellites (Block IIIA) for the United States Air Force and was SpaceX\'s first EELV mission. The spacecraft was delivered to a MEO transfer orbit from SLC-40 at Cape Canaveral Air Force Station. This mission was the first to fly with the redesigned COPV on the first stage (B1054) as well as the second. The booster was expended.","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4cab6c3bb0006eeb230"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":73,"name":"GPS III SV01","date_utc":"2018-12-23T13:51:00.000Z","date_unix":1545573060,"date_local":"2018-12-23T08:51:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a6f35918513b3b265b","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d27ffd86e000604b372"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/75/cb/DMVc5j8b_o.png","large":"https://images2.imgbox.com/d7/f9/861bfh4Q_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/a699fh/iridium_next_constellation_mission_8_launch/","launch":"https://www.reddit.com/r/spacex/comments/aemq2i/rspacex_iridium_next_8_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/aeoxve/rspacex_iridium_next_8_media_thread_videos_images/","recovery":"https://www.reddit.com/r/spacex/comments/aewp4r/iridium_8_recovery_thread/"},"flickr":{"small":[],"original":["https://farm5.staticflickr.com/4866/39745612523_14270b4b9d_o.jpg","https://farm8.staticflickr.com/7833/39745612923_21aa442350_o.jpg","https://farm5.staticflickr.com/4881/39745613173_e99b09c000_o.jpg","https://farm8.staticflickr.com/7882/39745613513_6cdd4581af_o.jpg","https://farm8.staticflickr.com/7807/39745613733_1a7b70e54a_o.jpg","https://farm5.staticflickr.com/4891/39745614053_43855205bc_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/iridium8presskit.pdf","webcast":"https://youtu.be/VshdafZvwrg","youtube_id":"VshdafZvwrg","article":"https://spaceflightnow.com/2019/01/11/spacex-begins-2019-with-eighth-and-final-for-upgraded-iridium-network/","wikipedia":"https://en.wikipedia.org/wiki/Iridium_satellite_constellation#Next-generation_constellation"},"static_fire_date_utc":"2019-01-06T13:51:00.000Z","static_fire_date_unix":1546782660,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s first flight of 2019 will be the eighth and final launch of its planned Iridium flights. Delivering 10 satellites to low earth orbit, this brings the total up to 75 and completes the Iridium NEXT constellation. This mission launches from SLC-4E at Vandenberg AFB. The booster is expected to land on JRTI.","crew":[],"ships":["5ea6ed2f080df4000697c910","5ea6ed30080df4000697c912","5ea6ed30080df4000697c914"],"capsules":[],"payloads":["5eb0e4cab6c3bb0006eeb231"],"launchpad":"5e9e4502f509092b78566f87","flight_number":74,"name":"Iridium NEXT Mission 8","date_utc":"2019-01-11T15:31:00.000Z","date_unix":1547220660,"date_local":"2019-01-11T07:31:00-08:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591833b13b2659","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d28ffd86e000604b373"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/06/bc/5KvLN0mH_o.png","large":"https://images2.imgbox.com/4d/63/oBLNSPkL_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/afxyrd/nusantara_satu_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/assxjz/rspacex_psn

vi_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/at5mu8/rspacex_psn6_media_thread_videos_images_gifs/","recovery":"https://www.reddit.com/r/spacex/comments/atbmp3/psnvi_recovery_discussion_updates_thread/"},"flickr":{"small":[],"original":["https://farm8.staticflickr.com/7800/47173936271_b8ddb5bc5b_o.jpg","https://farm8.staticflickr.com/7821/47121969172_37428a280e_o.jpg","https://farm8.staticflickr.com/7923/47173936181_c0bf7a22a6_o.jpg","https://farm8.staticflickr.com/7829/46259779115_8982c2c8c2_o.jpg","https://farm8.staticflickr.com/7889/46259778995_68130be69d_o.jpg","https://farm8.staticflickr.com/7895/47130341432_3772641a68_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/nusantara_satu_press_kit.pdf","webcast":"https://www.youtube.com/watch?v=XS0E35aYJcU","youtube_id":"XS0E35aYJcU","article":"https://spaceflightnow.com/2019/02/22/israeli-moon-lander-hitches-ride-on-spacex-launch-with-indonesian-comsat/","wikipedia":"https://en.wikipedia.org/wiki/PT_Pasifik_Satelit_Nusantara"},"static_fire_date_utc":"2019-02-18T17:03:00.000Z","static_fire_date_unix":1550509380,"net":false,"window":1920,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch this rideshare to GTO for Space Systems Loral (SSL). The primary payload for this mission is Nusantara Satu, a communications satellite built by SSL for the private Indonesian company PT Pasifik Satelit Nusantara (PSN). Spaceflight Industries\' GTO-1 mission consists of two secondary payloads. One of those is Beresheet, the lunar lander built by the Israeli non-profit organization, SpaceIL. Beresheet will make its own way to the moon from GTO. The other secondary is Air Force Research Lab\'s (Space Situational Awareness) S5 mission, which hitches a ride to GEO aboard Nusantara Satu. This mission launches from SLC-40 at Cape Canaveral AFS. The booster is expected to land on OCISLY.","crew":[],"ships":["5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4cab6c3bb0006eeb232","5eb0e4cab6c3bb0006eeb233","5eb0e4cab6c3bb0006eeb234"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":75,"name":"Nusantara Satu (PSN-6) / S5 / Bereshee t","date_utc":"2019-02-22T01:45:00.000Z","date_unix":1550799900,"date_local":"2019-02-21T20:45:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591809c03b2658","flight":3,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d2affd86e000604b374"},{"fairings":{"reused":null,"recovery_attempt":null,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/59/a8/q5IEqsOJ_o.png","large":"https://images2.imgbox.com/ee/a6/x4AyUIc3_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/a65clm/dm1_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/av1asz/rspacex_cctcap_demo_mission_1_official_launch/","media":"https://www.reddit.com/r/spacex/comments/aw6g7j/rspacex_cctcap_demo_mission_1_media_thread_videos/","recovery":"https://www.reddit.com/r/spacex/comments/awo5lf/cctcap_demo_mission_1_official_booster_recovery/"},"flickr":{"small":[],"original":["https://farm8.staticflickr.com/7899/39684491043_f0289164bd_o.jpg","https://farm8.staticflickr.com/7804/39684490433_70337aa4e5_o.jpg","https://farm8.staticflickr.com/7826/32774791628_e2234480db_o.jpg","https://farm5.staticflickr.com/4882/39684490143_7df3838d2c_o.jpg","https://farm8.staticflickr.com/7851/46535572784_7eb295968e_o.jpg","https://farm8.staticflickr.com/7826/46535572564_a022f9c43a_o.jpg","https://farm8.staticflickr.com/7889/40294395933_f429c12e83_o.jpg","https://farm8.staticflickr.com/7914/40294395873_0a328f2d87_o.jpg","https://farm8.staticflickr.com/7866/46535572294_22499c1223_o.jpg","https://farm8.staticflickr.com/7850/46535573034_03da10f899_o.jpg","https://farm8.staticflickr.com/7848/46535572664_316c466742_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/crew_demo-1_press_kit.pdf","webcast":"https://youtu.be/2ZL0tbOZYhE","youtube_id":"2ZL0tbOZYhE","article":"https://spaceflightnow.com/2019/03/02/spacex-launches-first-crew-dragon-ferry-ship/","wikipedia":"https://en.wikipedia.org/wiki/SpX-DM1"},"static_fire_date_utc":"2019-01-24T19:03:00.000Z","static_fire_date_unix":1548356580,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Demonstration Mission 1 (DM-1) will launch Dragon 2 as part of NASA\'s Commercial Crew Transportation Capability program. This mission will demonstrate Dragon 2, and Falcon 9 in its configuration for crewed missions. DM-1 will launch from LC-39A at Kennedy Space Center, likely carrying some cargo to the International Space Station. The booster is expected to land on OCISLY.","crew":[],"ships":["5ea6ed30080df4000697c913"],"capsules":["5e9e2c5

df35918b1063b2671"],"payloads":["5eb0e4cbb6c3bb0006eeb235"],"launchpad":"5e9e4502f509094188566f88","flight_number":76,"name":"CCtCap Demo Mission 1","date_utc":"2019-03-02T07:45:00.000Z","date_unix":1551512700,"date_local":"2019-03-02T02:45:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a6f35918c0803b265c","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d2bffd86e000604b375"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":true,"ships":["5ea6ed2f080df4000697c90c"]},"links":{"patch":{"small":"https://images2.imgbox.com/14/18/JxCyAHXk_o.png","large":"https://images2.imgbox.com/9f/c3/GvLfwIfg_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/b0kscl/arabsat6a_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/basm9y/rspacex_arabsat6a_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/bbhz9a/rspacex_arabsat6a_media_thread_videos_images_gifs/","recovery":"https://www.reddit.com/r/spacex/comments/bcecao/fh_arabsat_6a_center_core_recovery_thread/"},"flickr":{"small":[],"original":["https://live.staticflickr.com/7911/32652060737_4be1171d4a_o.jpg","https://live.staticflickr.com/7807/40628442293_9643eaf670_o.jpg","https://live.staticflickr.com/7804/40628440983_4da5d76cc7_o.jpg","https://live.staticflickr.com/7856/40628439793_27927d11de_o.jpg","https://live.staticflickr.com/7919/40628438523_c597eabff1_o.jpg","https://live.staticflickr.com/7834/40628437283_84088aca75_o.jpg","https://live.staticflickr.com/7856/40628435833_a1bcde59db_o.jpg","https://live.staticflickr.com/7809/40628435153_17c05d3b5e_o.jpg","https://live.staticflickr.com/7885/40628434483_3545598b82_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/arabsat-6a_press_kit.pdf","webcast":"https://youtu.be/TXMGu2d8c8g","youtube_id":"TXMGu2d8c8g","article":"https://spaceflightnow.com/2019/04/11/spacexs-falcon-heavy-successful-in-commercial-debut/","wikipedia":"https://en.wikipedia.org/wiki/Arabsat-6A"},"static_fire_date_utc":"2019-04-05T09:57:00.000Z","static_fire_date_unix":1554458220,"net":false,"window":7020,"rocket":"5e9d0d95eda69974db09d1ed","success":true,"failures":[],"details":"SpaceX will launch Arabsat 6A to a geostationary transfer orbit from SLC-39A, KSC. The satellite is a geostationary telecommunications satellite built by Lockheed Martin for the Saudi Arabian company Arabsat. This will be the first operational flight of Falcon Heavy, and also the first Block 5 Falcon Heavy. All three cores will be new Block 5 cores. The side cores are expected to land at LZ-1 and LZ-2, and the center core is expected to land on OCISLY.","crew":[],"ships":["5ea6ed2f080df4000697c90e","5ea6ed30080df4000697c913","5ea6ed2f080df4000697c90b","5ea6ed2e080df4000697c909","5ea6ed2f080df4000697c90c"],"capsules":[],"payloads":["5eb0e4cbb6c3bb0006eeb236"],"launchpad":"5e9e4502f509094188566f88","flight_number":77,"name":"ArabSat 6A","date_utc":"2019-04-11T22:35:00.000Z","date_unix":1555022100,"date_local":"2019-04-11T18:35:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a6f3591897453b265f","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"},{"core":"5e9e28a6f359183c413b265d","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"},{"core":"5e9e28a6f359188fd53b265e","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb90a834e7c8"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d2dffd86e000604b376"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/97/8e/YbVKIUZB_o.png","large":"https://images2.imgbox.com/0d/05/zH7YqLRe_o.png"},"reddit":{"campaign":"https://new.reddit.com/r/spacex/comments/bd2l28/crs17_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/bjsn0v/rspacex_crs17_official_launch_discussion_updates","media":"https://www.reddit.com/r/spacex/comments/bkc4d5/rspacex_crs17_media_thread_videos_images_gifs","recovery":"https://www.reddit.com/r/spacex/comments/bjy7p5/rspacex_crs17_recovery_discussion_updates_thread"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/46856594435_206c773b5a_o.jpg","https://live.staticflickr.com/65535/47720639872_284e49381d_o.jpg","https://live.staticflickr.com/65535/46856594755_88f1b22e50_o.jpg","https://live.staticflickr.com/65535/47720639542_1b7c1a71b0_o.jpg","https://live.staticflickr.com/65535/47720639732_e04b2a9ed7_o.jpg","https://live.staticflickr.com/65535/32829382467_087d024428_o.jpg"]},"presski

t":"https://www.spacex.com/sites/spacex/files/crs-17_press_kit.pdf","webcast":"https://youtu.be/AQFhX5TvP0M","youtube_id":"AQFhX5TvP0M","article":"https://spaceflightnow.com/2019/05/04/spacex-launches-space-station-resupply-mission-lands-rocket-on-drone-ship/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-17"},"static_fire_date_utc":"2019-04-27T07:23:00.000Z","static_fire_date_unix":1556349780,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s 17th Commercial Resupply Services mission for NASA out of a total of 20 contracted flights, this mission brings essential supplies to the International Space Station using SpaceX\'s reusable Dragon 1 spacecraft. The external payloads for this mission include Orbital Carbon Observatory 3 and Space Test Program-Houston 6. The Falcon 9 launches from SLC-40 at Cape Canaveral AFS. The booster was expected to land at LZ-1, however, due to the ongoing investigation and clean-up following the Crew Dragon testing incident, it is likely to land on OCISLY instead.\\n   ","crew":[],"ships":["5ea6ed30080df4000697c913","5ea6ed2f080df4000697c90e","5ea6ed2f080df4000697c90b"],"capsules":["5e9e2c5cf3591869b63b2670"],"payloads":["5eb0e4cbb6c3bb0006eeb237"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":78,"name":"CRS-17","date_utc":"2019-05-04T06:48:00.000Z","date_unix":1556952480,"date_local":"2019-05-04T02:48:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f3591809313b2660","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d2effd86e000604b377"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":true,"ships":["5ea6ed2f080df4000697c90c"]},"links":{"patch":{"small":"https://images2.imgbox.com/79/ec/TOE2PBJq_o.png","large":"https://images2.imgbox.com/39/aa/5of7buxK_o.png"},"reddit":{"campaign":"https://www.reddit.com/comments/bjybrl","launch":"https://www.reddit.com/r/spacex/comments/brfbic/rspacex_starlink_official_launch_discussion","media":"https://www.reddit.com/r/spacex/comments/bp0479/rspacex_starlink_media_thread_videos_images_gifs","recovery":"https://www.reddit.com/r/spacex/comments/bsaljm/rspacex_starlink_b10493_recovery_discussion_and"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/47926143711_4a0b2680bf_o.jpg","https://live.staticflickr.com/65535/47926136902_d8ce35223d_o.jpg","https://live.staticflickr.com/65535/47926144123_2a828b66d5_o.jpg","https://live.staticflickr.com/65535/47926137127_ef58152b6b_o.jpg","https://live.staticflickr.com/65535/47926137017_e6d86fa820_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/starlink_press_kit.pdf","webcast":"https://www.youtube.com/watch?v=riBaVeDTEWI","youtube_id":"riBaVeDTEWI","article":"https://spaceflightnow.com/2019/05/24/spacexs-first-60-starlink-broadband-satellites-deployed-in-orbit","wikipedia":"https://en.wikipedia.org/wiki/Starlink_(satellite_constellation)"},"static_fire_date_utc":"2019-05-13T20:06:00.000Z","static_fire_date_unix":1557777960,"net":false,"window":9000,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch dozens of Starlink demonstration satellites from SLC-40, Cape Canaveral AFS. Starlink is a low Earth orbit broadband internet constellation developed and owned by SpaceX which will eventually consist of nearly 12 000 satellites and will provide low latency internet service to ground terminals around the world. Two prototype satellites, Microsats 2a and 2b, were launched from Vandenberg AFB in February 2018. The booster for this mission will land on OCISLY.","crew":[],"ships":["5ea6ed30080df4000697c913","5ea6ed2f080df4000697c90c","5ea6ed2f080df4000697c90e","5ea6ed2f080df4000697c90b","5ea6ed2e080df4000697c909"],"capsules":[],"payloads":["5eb0e4cbb6c3bb0006eeb238"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":79,"name":"Starlink v0.9","date_utc":"2019-05-24T02:30:00.000Z","date_unix":1558665000,"date_local":"2019-05-23T22:30:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591833b13b2659","flight":3,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d30ffd86e000604b378"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/39/af/ygmjLYhv_o.png","large":"https://images2.imgbox.com/03/18/xlkSHLy1_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/buq487/radarsat_constellation_launch_campaign_thread","launch":"https://www.reddit.com/r/spacex/comments/byp69f/rspacex_radarsat_constellation_official_launch","media":null,"re

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s/spacex/files/radarsat_constellation_mission_press_kit.pdf","webcast":"https://yo
utu.be/8A2nJd9Urk8","youtube_id":"8A2nJd9Urk8","article":"https://spaceflightnow.c
om/2019/06/12/three-canadian-radar-surveillance-satellites-ride-spacex-rocket-into
-orbit/","wikipedia":"https://en.wikipedia.org/wiki/RADARSAT_Constellation"},"stat
ic_fire_date_utc":"2019-06-08T08:39:00.000Z","static_fire_date_unix":1559983140,"n
et":false,"window":780,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failure
s":[],"details":"SpaceX is launching the three satellite RADARSAT Constellation Mi
ssion into Sun Synchronous orbit from SLC-4E, VAFB. The RCM spacecraft are synthet
ic aperture radar (SAR) Earth observation satellites built by the Canadian space c
ompany, MDA, for the Canadian Space Agency. This mission was delayed when the orig
inally slated booster failed to land after CRS-16. The booster is expected to retu
rn to LZ-4.","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4ccb6c3bb0006eeb
239"],"launchpad":"5e9e4502f509092b78566f87","flight_number":80,"name":"RADARSAT C
onstellation","date_utc":"2019-06-12T14:17:00.000Z","date_unix":1560349020,"date_l
ocal":"2019-06-12T07:17:00-07:00","date_precision":"hour","upcoming":false,"core
s":[{"core":"5e9e28a6f35918c0803b265c","flight":2,"gridfins":true,"legs":true,"reu
sed":true,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","lan
dpad":"5e9e3032383ecb554034e7c9"}],"auto_update":true,"tbd":false,"launch_library_
id":null,"id":"5eb87d31ffd86e000604b379"},{"fairings":{"reused":false,"recovery_at
tempt":true,"recovered":true,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patc
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ges2.imgbox.com/81/9e/p6AaiJwj_o.png"},"reddit":{"campaign":"https://www.reddit.co
m/r/spacex/comments/bw6aa8/stp2_launch_campaign_thread/","launch":"https://www.red
dit.com/r/spacex/comments/c40a29/rspacex_stp2_official_launch_discussion_update
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pacex.com/sites/spacex/files/stp-2_press_kit.pdf","webcast":"https://youtu.be/WxH4
CAlhtiQ","youtube_id":"WxH4CAlhtiQ","article":"https://spaceflightnow.com/2019/06/
25/falcon-heavy-launches-on-military-led-rideshare-mission-boat-catches-fairin
g","wikipedia":"https://en.wikipedia.org/wiki/Space_Test_Program"},"static_fire_da
te_utc":"2019-06-19T21:52:00.000Z","static_fire_date_unix":1560981120,"net":fals
e,"window":14400,"rocket":"5e9d0d95eda69974db09d1ed","success":true,"failures":
[],"details":"Space Test Program 2 is a rideshare managed by the U.S. Air Force Sp
ace and Missile Systems Center (SMC), launching from LC-39A, KSC. Most of the spac
ecraft will be delivered into low Earth orbit (LEO) in two deployment sequences se
parated by a second stage burn. These LEO payloads include the six Taiwan and Unit
ed States owned COSMIC-2 microsatellites, the Planetary Society\'s LightSail-B dem
onstrator cubesat, and others. The third and final deployment will be the Air Forc
e Research Lab\'s DSX spacecraft, which will be delivered to a medium Earth orbit
 (MEO). This mission will reuse the side cores from Arabsat 6A, which will return
 to LZ-1, and LZ-2. The new center core will boost back to land on OCISLY less tha
n 40 km from the launch site.","crew":[],"ships":["5ea6ed30080df4000697c913","5ea6
ed2f080df4000697c90b","5ea6ed2e080df4000697c909","5ea6ed2e080df4000697c908","5ea6e
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6-25T03:30:00.000Z","date_unix":1561433400,"date_local":"2019-06-24T23:30:00-04:0
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e,"landing_success":false,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7c
a"},{"core":"5e9e28a6f359183c413b265d","flight":2,"gridfins":true,"legs":true,"reu
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l_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/ch
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d":"S1grxVuP5jk","article":"https://spaceflightnow.com/2019/07/25/new-docking-port
-spacesuit-and-supplies-en-route-to-space-station/","wikipedia":"https://en.wikipe
dia.org/wiki/SpaceX_CRS-18"},"static_fire_date_utc":"2019-07-19T15:31:00.000Z","st
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y Services mission out of a total of 20 such contracted flights for NASA, this lau
nch will deliver essential supplies to the International Space Station using the r
eusable Dragon 1 cargo spacecraft. The external payload for this mission is Intern
ational Docking Adapter 3, replacing IDA-1 lost in SpaceX\'s CRS-7 launch failure.
This mission will launch from SLC-40 at Cape Canaveral AFS on a Falcon 9, and the
 first-stage booster is expected to land back at CCAFS LZ-1.","crew":[],"ships":
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icflickr.com/65535/48478269442_08479bed36_o.jpg"]},"presskit":"https://www.spacex.
com/sites/spacex/files/amos-17_mission_press_kit_8_6_2019.pdf","webcast":"https://
youtu.be/fZh82-WcCuo","youtube_id":"fZh82-WcCuo","article":"https://spaceflightno
w.com/2019/08/07/spacex-launches-israeli-owned-telecom-satellite/","wikipedia":"ht
tps://en.wikipedia.org/wiki/Spacecom"},"static_fire_date_utc":"2019-08-01T00:00:0
0.000Z","static_fire_date_unix":1564617600,"net":false,"window":5280,"rocket":"5e9
d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch
 Boeing built Amos-17, a geostationary communications satellite for Israeli compan

y Spacecom. The satellite will be delivered to GTO from KSC LC-39A or possibly CCA
FS SLC-40, and will replace the defunct Amos-5 at 17\xc2\xb0 E. Amos-17 carries mu
lti-band high throughput and regional beams servicing Africa, Europe and the Middl
e East. The cost of this launch is covered for Spacecom by SpaceX credit following
the Amos-6 incident. A recovery of the booster for this mission is not expecte
d.","crew":[],"ships":["5ea6ed2e080df4000697c908","5ea6ed2e080df4000697c909"],"cap
sules":[],"payloads":["5eb0e4cfb6c3bb0006eeb24b"],"launchpad":"5e9e4501f509094ba45
66f84","flight_number":83,"name":"Amos-17","date_utc":"2019-08-06T22:52:00.000
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n","media":"https://www.reddit.com/r/spacex/comments/durx53/rspacex_starlink_1_med
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051988636_3714a78787_o.jpg","https://live.staticflickr.com/65535/49051477088_d8610
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s_kit_nov2019.pdf","webcast":"https://youtu.be/pIDuv0Ta0XQ","youtube_id":"pIDuv0Ta
0XQ","article":"https://spaceflightnow.com/2019/11/11/successful-launch-continues-
deployment-of-spacexs-starlink-network","wikipedia":"https://en.wikipedia.org/wik
i/Starlink_(satellite_constellation)"},"static_fire_date_utc":"2019-11-11T12:08:0
0.000Z","static_fire_date_unix":1573474080,"net":false,"window":0,"rocket":"5e9d0d
95eda69973a809d1ec","success":true,"failures":[],"details":"This mission will laun
ch the first batch of Starlink version 1.0 satellites, from SLC-40, Cape Canaveral
AFS. They are expected to contribute to the 550 km x 53\xc2\xb0 shell. It is the s
econd Starlink launch overall. Starlink is a low Earth orbit broadband internet co
nstellation developed and owned by SpaceX which will eventually consist of nearly
 12 000 satellites and will provide low latency internet service to ground termina
ls around the world. The booster for this mission is expected to land on OCISL
Y.","crew":[],"ships":["5ea6ed2e080df4000697c908","5ea6ed30080df4000697c913","5ea6
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eused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","l
andpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_librar
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ex_crs19_booster_recovery_discussion_updates"},"flickr":{"small":[],"original":["h
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st":"https://youtu.be/-aoAGdYXp_4","youtube_id":"-aoAGdYXp_4","article":"https://s

paceflightnow.com/2019/12/05/dragon-soars-on-research-and-resupply-flight-to-international-space-station","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-19"},"static_fire_date_utc":"2019-11-26T17:04:00.000Z","static_fire_date_unix":1574787840,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s 19th Crew Resupply Mission on behalf of NASA with a total of 20 contracted flights, this mission brings essential supplies to the International Space Station using SpaceX\'s reusable Dragon spacecraft. The external payloads for this mission include the Hyperspectral Imager Suite and a lithium-ion battery. Falcon 9 and Dragon will launch from SLC-40, Cape Canaveral AFS. The mission will be complete with return and recovery of the Dragon capsule and down cargo.","crew":[],"ships":["5ea6ed2f080df4000697c90d"],"capsules":["5e9e2c5bf3591880643b2669"],"payloads":["5eb0e4cfb6c3bb0006eeb24d"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":85,"name":"CRS-19","date_utc":"2019-12-05T17:29:23.000Z","date_unix":1575566963,"date_local":"2019-12-05T12:29:23-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f359187afd3b2662","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d39ffd86e000604b37e"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/2c/03/fMLdgNQ4_o.png","large":"https://images2.imgbox.com/73/e2/4I3Os6n7_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/e5w6i8/jcsat18kacific1_launch_campaign_thread","launch":"https://www.reddit.com/r/spacex/comments/ebfr9t/rspacex_jcsat18kacific1_official_launch","media":"https://www.reddit.com/r/spacex/comments/ebn4g5/rspacex_jcsat18kacific1_media_thread_videos","recovery":"https://www.reddit.com/r/spacex/comments/ec48p3/jscat_18kacific1_recovery_discussion_and_updates"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/49235364922_e55ceb61be_o.jpg","https://live.staticflickr.com/65535/49235136806_e5a3774904_o.jpg","https://live.staticflickr.com/65535/49235137056_585dc050e7_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/jcsat18kacific1_mission_press_kit.pdf","webcast":"https://youtu.be/sbXgZg9JmkI","youtube_id":"sbXgZg9JmkI","article":"https://spaceflightnow.com/2019/12/17/startup-launches-broadband-satellite-on-spacex-rocket-to-connect-pacific-islands","wikipedia":"https://en.wikipedia.org/wiki/JSAT_(satellite_constellation)"},"static_fire_date_utc":"2019-12-13T12:34:00.000Z","static_fire_date_unix":1576240440,"net":false,"window":5280,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch the Boeing built dual payload satellite to geostationary transfer orbit from XXXX. JCSat 18 is a mobile broadband communications payload built for Sky Perfect JSAT Corporation of Japan and will service Asia Pacific. Kacific 1 is a high throughput broadband internet payload built for Kacific Broadband Satellites and will service certain high demand areas of Southeast Asia and the Pacific. Both payloads share a single chassis. The booster for this mission is expected to land on OCISLY.","crew":[],"ships":["5ea6ed2e080df4000697c908","5ea6ed2e080df4000697c907","5ea6ed30080df4000697c913","5ea6ed2f080df4000697c90d"],"capsules":[],"payloads":["5eb0e4cfb6c3bb0006eeb24e"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":86,"name":"JCSat 18 / Kacific 1","date_utc":"2019-12-17T00:10:00.000Z","date_unix":1576541400,"date_local":"2019-12-16T19:10:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f3591809313b2660","flight":3,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d3bffd86e000604b37f"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/36/f5/B08U2KHW_o.png","large":"https://images2.imgbox.com/69/c7/G444jTFk_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/efqnvg/starlink2_launch_campaign_thread","launch":"https://www.reddit.com/r/spacex/comments/eko0hr/rspacex_starlink_2_official_launch_discussion","media":"https://www.reddit.com/r/spacex/comments/ekybzb/rspacex_starlink2_media_thread_videos_images_gifs","recovery":"https://www.reddit.com/r/spacex/comments/elgp5k/rspacex_starlink_l2_recovery_discussion_updates"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/49346907238_b27507e4d9_o.jpg","https://live.staticflickr.com/65535/49347368761_f4e45bd38a_o.jpg","https://liv

e.staticflickr.com/65535/49347368406_8f9acf1e2a_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/starlink_press_kit_jan2020.pdf","webcast":"https://youtu.be/HwyXo6T7jC4","youtube_id":"HwyXo6T7jC4","article":"https://spaceflightnow.com/2020/01/07/spacex-launches-more-starlink-satellites-tests-design-change-for-astronomers","wikipedia":"https://en.wikipedia.org/wiki/Starlink_(satellite_constellation)"},"static_fire_date_utc":"2020-01-04T11:45:00.000Z","static_fire_date_unix":1578138300,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"This mission will launch the second batch of Starlink version 1.0 satellites, from SLC-40, Cape Canaveral AFS. They are expected to contribute to the 550 km x 53\xc2\xb0 shell. It is the third Starlink launch overall. Starlink is a low Earth orbit broadband internet constellation developed and owned by SpaceX which will eventually consist of nearly 12 000 satellites and will provide low latency internet service to ground terminals around the world. The booster for this mission is expected to land on OCISLY.","crew":[],"ships":["5ea6ed2e080df4000697c908","5ea6ed30080df4000697c913","5ea6ed2e080df4000697c909","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90d"],"capsules":[],"payloads":["5eb0e4cfb6c3bb0006eeb24f"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":87,"name":"Starlink-2","date_utc":"2020-01-07T02:19:00.000Z","date_unix":1578363540,"date_local":"2020-01-06T21:19:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591833b13b2659","flight":4,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d3cffd86e000604b380"},{"fairings":{"reused":null,"recovery_attempt":null,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/c0/9d/SJYvC4hT_o.png","large":"https://images2.imgbox.com/19/df/IH0nVnSr_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/ek7eny/in_flight_abort_test_launch_campaign_thread","launch":"https://www.reddit.com/r/spacex/comments/eq24ap/rspacex_inflight_abort_test_official_launch","media":"https://www.reddit.com/r/spacex/comments/eq7pg4/rspacex_inflight_abort_test_media_thread_videos/","recovery":null},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/49421605028_b7ba890f0e_o.jpg","https://live.staticflickr.com/65535/49422067976_cda2b8f021_o.jpg","https://live.staticflickr.com/65535/49422067876_13ed519fe6_o.jpg","https://live.staticflickr.com/65535/49421604803_0093a5d2cb_o.jpg","https://live.staticflickr.com/65535/49422294602_0d5e7d8e82_o.jpg","https://live.staticflickr.com/65535/49422068111_2ed613b19b_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/in-flight_abort_test_press_kit.pdf","webcast":"https://youtu.be/mhrkdHshb3E","youtube_id":"mhrkdHshb3E","article":"https://spaceflightnow.com/2020/01/19/spacex-aces-final-major-test-before-first-crew-mission","wikipedia":"https://en.wikipedia.org/wiki/Commercial_Crew_Development"},"static_fire_date_utc":"2020-01-11T09:42:00.000Z","static_fire_date_unix":1578735720,"net":false,"window":14400,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch a Crew Dragon capsule from LC-39A, KSC on a fully fueled Falcon 9 rocket and then trigger the launch escape system during the period of maximum dynamic pressure. As part of NASA\'a Commercial Crew Integrated Capability program (CCiCap) this test will contribute valuable data to help validate Crew Dragon and its launch abort system. The Crew Dragon will be recovered by GO Searcher after splashdown in the Atlantic Ocean. This flight does not go to orbit. The booster and upper stage are expected to break up following capsule separation and there will be no landing attempt.","crew":[],"ships":["5ea6ed2f080df4000697c90c"],"capsules":["5e9e2c5df359184c9a3b2672"],"payloads":["5eb0e4d0b6c3bb0006eeb250"],"launchpad":"5e9e4502f509094188566f88","flight_number":88,"name":"Crew Dragon In Flight Abort Test","date_utc":"2020-01-19T14:00:00.000Z","date_unix":1579442400,"date_local":"2020-01-19T09:00:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f359182b023b2656","flight":4,"gridfins":false,"legs":false,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d3dffd86e000604b381"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":true,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/3a/c6/ueu9Acdh_o.png","large":"https://images2.imgbox.com/1c/55/xNcIOR8Z_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/eof5pr/starlink3_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/com

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x/comments/ezn6n0/crs20_launch_campaign_thread","launch":"https://www.reddit.com/r/spacex/comments/fe8pcj/rspacex_crs20_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/fes64p/rspacex_crs20_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/49635401403_96f9c322dc_o.jpg","https://live.staticflickr.com/65535/49636202657_e81210a3ca_o.jpg","https://live.staticflickr.com/65535/49636202572_8831c5a917_o.jpg","https://live.staticflickr.com/65535/49635401423_e0bef3e82f_o.jpg","https://live.staticflickr.com/65535/49635985086_660be7062f_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/crs-20_mission_press_kit.pdf","webcast":"https://youtu.be/1MkcWK2PnsU","youtube_id":"1MkcWK2PnsU","article":"https://spaceflightnow.com/2020/03/07/late-night-launch-of-spacex-cargo-ship-marks-end-of-an-era/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-20"},"static_fire_date_utc":"2020-03-01T10:20:00.000Z","static_fire_date_unix":1583058000,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s 20th and final Crew Resupply Mission under the original NASA CRS contract, this mission brings essential supplies to the International Space Station using SpaceX\'s reusable Dragon spacecraft. It is the last scheduled flight of a Dragon 1 capsule. (CRS-21 and up under the new Commercial Resupply Services 2 contract will use Dragon 2.) The external payload for this mission is the Bartolomeo ISS external payload hosting platform. Falcon 9 and Dragon will launch from SLC-40, Cape Canaveral Air Force Station and the booster will land at LZ-1. The mission will be complete with return and recovery of the Dragon capsule and down cargo.","crew":[],"ships":[],"capsules":["5e9e2c5cf359185d753b266f"],"payloads":["5eb0e4d0b6c3bb0006eeb253"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":91,"name":"CRS-20","date_utc":"2020-03-07T04:50:31.000Z","date_unix":1583556631,"date_local":"2020-03-06T23:50:31-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f359187afd3b2662","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d42ffd86e000604b384"},{"fairings":{"reused":true,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/dc/14/DLlaYbmf_o.png","large":"https://images2.imgbox.com/e4/fd/2NPlCwzs_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/f8awv0/starlink5_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/fhymy3/rspacex_starlink_5_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/fizrn1/rspacex_starlink5_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/49673373182_93a517e140_o.jpg","https://live.staticflickr.com/65535/49672551378_fabc17ef6f_o.jpg","https://live.staticflickr.com/65535/49672551303_564ce21658_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/sixth_starlink_press_kit.pdf","webcast":"https://youtu.be/I4sMhHbHYXM","youtube_id":"I4sMhHbHYXM","article":"https://spaceflightnow.com/2020/03/18/falcon-9-rocket-overcomes-engine-failure-to-deploy-starlink-satellites/","wikipedia":"https://en.wikipedia.org/wiki/Starlink"},"static_fire_date_utc":"2020-03-13T18:37:00.000Z","static_fire_date_unix":1584124620,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"The sixth Starlink launch overall and the fifth operational batch of Starlink satellites will launch into orbit aboard a Falcon 9 rocket. This mission is expected to deploy all sixty satellites into an elliptical orbit about fifteen minutes into flight. In the weeks following launch the satellites are expected to utilize their onboard ion thrusters to raise their orbits to 550 km in three groups of 20, making use of precession rates to separate themselves into three planes. The booster will land on a drone ship approximately 628 km downrange.","crew":[],"ships":["5ea6ed30080df4000697c913","5ea6ed2f080df4000697c90d"],"capsules":[],"payloads":["5eb0e4d0b6c3bb0006eeb254"],"launchpad":"5e9e4502f509094188566f88","flight_number":92,"name":"Starlink-5","date_utc":"2020-03-18T12:16:00.000Z","date_unix":1584533760,"date_local":"2020-03-18T08:16:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591809c03b2658","flight":5,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":false,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d43ffd86e000604b385"},{"fairings":{"reused":true,"recovery_atte

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Crew Dragon\'s ability to safely transport crew to the space station and back to Earth and it is the last major milestone for certification of Crew Dragon. Initially the mission duration was planned to be no longer than two weeks, however NASA has been considering an extension to as much as six weeks or three months. The astronauts have been undergoing additional training for the possible longer mission.","crew":["5ebf1a6e23a9a60006e03a7a","5ebf1b7323a9a60006e03a7b"],"ships":["5ea6ed30080df4000697c913","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed2e080df4000697c909","5ea6ed2f080df4000697c90d"],"capsules":["5e9e2c5df359188aba3b2676"],"payloads":["5eb0e4d1b6c3bb0006eeb257"],"launchpad":"5e9e4502f509094188566f88","flight_number":94,"name":"CCtCap Demo Mission 2","date_utc":"2020-05-30T19:22:00.000Z","date_unix":1590866520,"date_local":"2020-05-30T15:22:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f3591817f23b2663","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d46ffd86e000604b388"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":null,"ships":["5ea6ed2e080df4000697c908","5ea6ed2e080df4000697c907"]},"links":{"patch":{"small":"https://images2.imgbox.com/14/8a/x2EqeeM4_o.png","large":"https://images2.imgbox.com/f4/9a/sUj3vEI3_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/gamcbr/starlink7_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/gkfe30/rspacex_starlink_7_official_launch_discussion/","media":null,"recovery":null},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/49971196871_a0462d0084_o.jpg","https://live.staticflickr.com/65535/49970682603_e6333945ee_o.jpg"]},"presskit":"https://spacextimemachine.com/assets/press_kits/185.pdf","webcast":"https://youtu.be/y4xBFHjkUvw","youtube_id":"y4xBFHjkUvw","article":"https://spaceflightnow.com/2020/06/04/spacex-sets-new-mark-in-rocket-reuse-10-years-after-first-falcon-9-launch/","wikipedia":"https://en.wikipedia.org/wiki/Starlink"},"static_fire_date_utc":"2020-05-13T11:11:00.000Z","static_fire_date_unix":1589368260,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"This mission will launch the seventh batch of operational Starlink satellites, which are expected to be version 1.0, from SLC-40, Cape Canaveral AFS. It is the eighth Starlink launch overall. The satellites will be delivered to low Earth orbit and will spend a few weeks maneuvering to their operational altitude of 550 km. The booster for this mission is expected to land on JRTI on its first mission since arriving at Port Canaveral.","crew":[],"ships":["5ea6ed2e080df4000697c908","5ea6ed2e080df4000697c907","5ee68c683c228f36bd5809b5"],"capsules":[],"payloads":["5eb0e4d1b6c3bb0006eeb256"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":95,"name":"Starlink-7","date_utc":"2020-06-04T01:25:00.000Z","date_unix":1591233900,"date_local":"2020-06-03T21:25:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591833b13b2659","flight":5,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d45ffd86e000604b387"},{"fairings":{"reused":true,"recovery_attempt":true,"recovered":null,"ships":["5ea6ed2e080df4000697c908","5ea6ed2e080df4000697c907"]},"links":{"patch":{"small":"https://images2.imgbox.com/f2/ab/jxHngBd5_o.png","large":"https://images2.imgbox.com/ba/aa/6rusTkQw_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/gwbr4t/starlink8_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/h7gqlc/rspacex_starlink_8_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/h842qk/rspacex_starlink8_media_thread_photographer/","recovery":"https://www.reddit.com/r/spacex/comments/h8sx6q/starlink8_recovery_thread/"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/50009748327_93e52a451f_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/8riKQXChPGg","youtube_id":"8riKQXChPGg","article":"https://spaceflightnow.com/2020/06/13/starlink-satellite-deployments-continue-with-successful-falcon-9-launch/","wikipedia":"https://en.wikipedia.org/wiki/Starlink"},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"This mission will launch the eighth batch of operational Starlink satellites, which are expected to be version 1.0, from SLC-40, Cape Canaveral AFS. It is the ninth Starlink launch overall. The satellites will be delivered to low Earth orbit and will spend a few weeks maneuvering to

their operational altitude of 550 km. This mission is includes rideshare payload
s, SkySats 16-18, on top of the Starlink stack. The booster for this mission is ex
pected to land an ASDS.","crew":[],"ships":["5ea6ed2e080df4000697c908","5ea6ed2e08
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m/2020/06/30/spacex-launches-its-first-mission-for-u-s-space-force/","wikipedi
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launch GPS Block III Space Vehicle 03 from SLC-40, Cape Canaveral AFS aboard a Fa
lcon 9. GPS III is owned and operated by the US Air Force and produced by Lockheed
Martin. This is the third GPS III satellite and the second launched by SpaceX. The
satellite will be delivered into a MEO transfer orbit. The booster for this missio
n is expected to land on an ASDS.","crew":[],"ships":[],"capsules":[],"payloads":
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ttps://spaceflightnow.com/2020/07/20/spacex-delivers-south-koreas-first-military-s
atellite-into-on-target-orbit/","wikipedia":null},"static_fire_date_utc":"2020-07-
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launch ANASIS-II, a South Korean geostationary military communication satellite f
rom LC-39A, Kennedy Space Center. It will be South Korea\'s first dedicated milita

ry communications satellite. Falcon 9 will deliver the satellite to a geostationar
y transfer orbit. The booster is expected to land downrange on an ASDS.","crew":
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07/spacex-closes-out-busy-week-with-launch-of-more-starlink-satellites/","wikipedi
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will launch the ninth batch of operational Starlink satellites, which are expected
to be version 1.0, from LC-39A, Kennedy Space Center. It is the tenth Starlink lau
nch overall. The satellites will be delivered to low Earth orbit and will spend a
 few weeks maneuvering to their operational altitude of 550 km. This mission is in
cludes a rideshare of two BlackSky satellites on top of the Starlink stack. The bo
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acex-adds-more-satellites-to-ever-growing-starlink-network/","wikipedia":"https://
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e tenth batch of operational Starlink satellites, which are expected to be version

1.0, from LC-39A, Kennedy Space Center. It is the eleventh Starlink launch overal
l. The satellites will be delivered to low Earth orbit and will spend a few weeks
 maneuvering to their operational altitude of 550 km. This mission is includes rid
eshare payloads, SkySats 19-21, on top of the Starlink stack. The booster for this
mission is expected to land on an ASDS.","crew":[],"ships":["5ea6ed2e080df4000697c
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OCOM 1 satellites into a sun-synchronous polar orbit from SLC-40, Cape Canaveral A
FS. SAOCOM 1B is a synthetic aperture radar Earth observation satellite to support
disaster management. The SAOCOM spacecraft are operated by CONAE, the Argentinian
 National Space Activities Commission, and are built by INVAP. This mission is als
o expected to include rideshare payloads Sequoia, and GNOMES-1. This will be the f
irst polar launch from the Space Coast in 60 years. The launch azimuth will be sou
thward and the booster will land at LZ-1.","crew":[],"ships":["5ea6ed2e080df400069
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version 1.0, from SLC-40, Cape Canaveral Air Force Station. It is the twelfth Star
link launch overall. The satellites will be delivered to low Earth orbit and will
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r for this mission is expected to land on an ASDS.","crew":[],"ships":["5ea6ed2e08
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r Force Station. It is the thirteenth Starlink launch overall. The satellites will
be delivered to low Earth orbit and will spend a few weeks maneuvering to their op
erational altitude of 550 km. The booster for this mission is expected to land on
 an ASDS.","crew":[],"ships":["5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c91
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 to be version 1.0, from LC-39A, Kennedy Space Center. It is the fourteenth Starli
nk launch overall. The satellites will be delivered to low Earth orbit and will sp
end a few weeks maneuvering to their operational altitude of 550 km. The booster f
or this mission is expected to land on an ASDS.","crew":[],"ships":["5ea6ed30080df
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t/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_Crew-1"},"static_fire_date_u
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s":"SpaceX will launch the first operational mission of its Crew Dragon vehicle as
part of NASA\'s Commercial Crew Transportation Capability Program (CCtCap), carryi
ng 3 NASA astronauts and 1 JAXA astronaut to the International Space Station. This
mission will be the second crewed flight to launch from the United States since th
e end of the Space Shuttle program in 2011.","crew":["5f7f1543bf32c864a529b23e","5
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ntinel6_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comm
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nal-satellite-launches-to-extend-measurements-of-sea-level-rise/","wikipedia":"htt
ps://en.wikipedia.org/wiki/Copernicus_Sentinel-6"},"static_fire_date_utc":"2020-11
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ill launch Sentinel-6 Michael Freilich into low Earth orbit for NASA, NOAA, ESA, a
nd the European Organization for the Exploitation of Meteorological Satellites abo
ard a Falcon 9 from SLC-4E, Vandenberg Air Force Station. Sentinel-6(A) is an ocea
n observation satellite providing radar ocean surface altimetry data and also atmo
spheric temperature profiles as a secondary mission. The booster for this mission
 is will land at LZ-4.","crew":[],"ships":[],"capsules":[],"payloads":["5ed9867c1f
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a.org/wiki/Starlink"},"static_fire_date_utc":"2020-11-21T16:31:00.000Z","static_fi
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h batch of operational Starlink satellites, which are version 1.0, from SLC-40, Ca
pe Canaveral Air Force Station. It will be the sixteenth Starlink launch overall.
 The satellites will be delivered to low Earth orbit and will spend a few weeks ma
neuvering to their operational altitude of 550 km. The booster for this mission is
expected to land on an ASDS.","crew":[],"ships":["5ea6ed30080df4000697c913","5ea6e
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raded-space-station-cargo-ships/","wikipedia":"https://en.wikipedia.org/wiki/Space
X_CRS-21"},"static_fire_date_utc":"2020-12-03T13:45:00.000Z","static_fire_date_uni
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ss":true,"failures":[],"details":"SpaceX\'s 21st ISS resupply mission on behalf of
NASA and the first under the CRS-2 contract, this mission brings essential supplie
s to the International Space Station using the cargo variant of SpaceX\'s Dragon 2

spacecraft. The external payload for this mission is the Nanoracks Bishop Airlock. Falcon 9 and Dragon launch from LC-39A, Kennedy Space Center and the booster is ex pected to land on an ASDS. The mission will be complete with return and recovery o f the Dragon capsule and down cargo.","crew":[],"ships":["5ea6ed30080df4000697c91 3","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90d"],"capsules":["5fbb0f8fec5 5b34eb9f35c14"],"payloads":["5eb0e4d3b6c3bb0006eeb262"],"launchpad":"5e9e4502f5090 94188566f88","flight_number":110,"name":"CRS-21","date_utc":"2020-12-06T16:17:00.0 00Z","date_unix":1607271420,"date_local":"2020-12-06T11:17:00-05:00","date_precisi on":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f3591817f23b2663","flight": 4,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_succes s":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_updat e":true,"tbd":false,"launch_library_id":null,"id":"5eb87d4effd86e000604b391"},{"fa irings":{"reused":true,"recovery_attempt":true,"recovered":null,"ships":[]},"link s":{"patch":{"small":"https://images2.imgbox.com/a9/be/43FhrPoq_o.png","large":"ht tps://images2.imgbox.com/17/34/WgRl7YFh_o.png"},"reddit":{"campaign":"https://www. reddit.com/r/spacex/comments/k51p7b/sxm7_launch_campaign_thread/","launch":"http s://www.reddit.com/r/spacex/comments/kaizok/rspacex_sxm7_official_launch_discussio n_updates/","media":"https://www.reddit.com/r/spacex/comments/kcev8p/sxm7_media_th read_photographer_contest/","recovery":"https://www.reddit.com/r/spacex/comments/k 2ts1q/rspacex_fleet_updates_discussion_thread/"},"flickr":{"small":[],"original": ["https://live.staticflickr.com/65535/50715254423_3cb2a8ff9c_o.jpg","https://live. staticflickr.com/65535/50715992426_bf43a8f872_o.jpg","https://live.staticflickr.co m/65535/50716071077_5a5bc00af9_o.jpg","https://live.staticflickr.com/65535/5071607 1167_100d6f7092_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/COraGXFb1l o","youtube_id":"COraGXFb1lo","article":"https://spaceflightnow.com/2020/12/13/sir iusxm-satellite-rides-spacex-rocket-into-orbit/","wikipedia":"https://en.wikipedi a.org/wiki/Sirius_XM#Satellites"},"static_fire_date_utc":"2020-12-07T23:00:00.000 Z","static_fire_date_unix":1607382000,"net":false,"window":null,"rocket":"5e9d0d95 eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch the f irst of two next generation high power S-band broadcast satellites for SiriusXM. T he spacecraft will be delivered into a geostationary transfer orbit and the booste r will be recovered downrange. The spacecraft is built by Space Systems Loral (SS L) on the SSL 1300 platform and includes two solar arrays producing 20kW, and an u nfurlable antenna dish. SXM-7 will replace XM-3 in geostationary orbit.","crew": [],"ships":["5ea6ed2f080df4000697c910","5ee68c683c228f36bd5809b5","5ea6ed2f080df40 00697c90c"],"capsules":[],"payloads":["5eb0e4d2b6c3bb0006eeb25d"],"launchpad":"5e9 e4501f509094ba4566f84","flight_number":111,"name":"SXM-7","date_utc":"2020-12-13T1 7:30:00.000Z","date_unix":1607880600,"date_local":"2020-12-13T12:30:00-05:00","dat e_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a6f35918c0803b265 c","flight":7,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"la nding_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7c c"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d4bffd86e0 00604b38c"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":tru e,"ships":["5ea6ed2e080df4000697c908","5ea6ed2f080df4000697c90c"]},"links":{"patc h":{"small":"https://images2.imgbox.com/25/01/sBErNO7T_o.jpg","large":"https://ima ges2.imgbox.com/be/b5/tGnEI6rY_o.jpg"},"reddit":{"campaign":"https://www.reddit.co m/r/spacex/comments/j7qqbg/nrol108_launch_campaign_thread/","launch":"https://www. reddit.com/r/spacex/comments/ke9pmg/rspacex_nrol108_official_launch_discussio n/","media":null,"recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspac ex_fleet_updates_discussion_thread/"},"flickr":{"small":[],"original":["https://li ve.staticflickr.com/65535/50740257483_0f550f6a25_o.jpg","https://live.staticflick r.com/65535/50740993291_57ef3f881b_o.jpg","https://live.staticflickr.com/65535/507 40257263_b41b843e85_o.jpg","https://live.staticflickr.com/65535/50740993211_dc00af 6dbb_o.jpg","https://live.staticflickr.com/65535/50740257078_e46a6462df_o.jpg","ht tps://live.staticflickr.com/65535/50741096702_2a152bdf13_o.jpg","https://live.stat icflickr.com/65535/50740257323_e3e49fa2c6_o.jpg"]},"presskit":null,"webcast":"http s://youtu.be/9OeVwaFBkfE","youtube_id":"9OeVwaFBkfE","article":"https://spacefligh tnow.com/2020/12/19/spacex-closes-out-record-year-of-launches-from-floridas-space- coast/","wikipedia":"https://en.wikipedia.org/wiki/National_Reconnaissance_Offic e"},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window": null,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"S

paceX will launch NROL-108 for the National Reconnaissance Office aboard a Falcon 9 from SLC-40, Cape Canaveral Air Force Station. The booster for this mission is expected to land at LZ-1.","crew":[],"ships":["5ea6ed2f080df4000697c90c","5ea6ed2e080df4000697c908"],"capsules":[],"payloads":["5f839ac7818d8b59f5740d48"],"launchpad":"5e9e4502f509094188566f88","flight_number":112,"name":"NROL-108","date_utc":"2020-12-19T14:00:00.000Z","date_unix":1608386400,"date_local":"2020-12-19T09:00:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f359187afd3b2662","flight":5,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5f8399fb818d8b59f5740d43"},{"fairings":{"reused":true,"recovery_attempt":true,"recovered":null,"ships":["5ea6ed2e080df4000697c907","5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/a4/9a/8KhFejXx_o.png","large":"https://images2.imgbox.com/aa/a6/hE0kWqix_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/kawyb4/t%C3%BCrksat_5a_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/ksagr9/rspacex_t%C3%BCrksat_5a_official_launch_discussion/","media":null,"recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/50814482042_476d87b020_o.jpg","https://live.staticflickr.com/65535/50813630408_d98c2215f8_o.jpg","https://live.staticflickr.com/65535/50814379121_8834b5362d_o.jpg","https://live.staticflickr.com/65535/50814379056_f032a23955_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/9I0UYXVqIn8","youtube_id":"9I0UYXVqIn8","article":"https://spaceflightnow.com/2021/01/08/spacex-deploys-turkish-satellite-in-first-launch-of-2021/","wikipedia":"https://en.wikipedia.org/wiki/T%C3%BCrksat_5A"},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":17820,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch the first of two next generation satellites on contract for T\xc3\xbcrksat. T\xc3\xbcrksat 5A is a Ku-band broadcast satellite built by Airbus Defense and Space and based on the Electric Orbit Raising version of the Eurostar E3000 platform. This spacecraft will be delivered into a transfer orbit and will then raise itself to its operational 31\xc2\xb0 East geostationary orbit to serve Turkey, the Middle East, Europe, North Africa and South Africa. The booster for this mission will be recovered downrange via ASDS.","crew":[],"ships":["5ea6ed2f080df4000697c90d","5ea6ed2f080df4000697c910","5ea6ed2e080df4000697c907","5ea6ed2e080df4000697c908"],"capsules":[],"payloads":["5eb0e4d3b6c3bb0006eeb264"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":113,"name":"Turksat 5A","date_utc":"2021-01-08T02:15:00.000Z","date_unix":1610072100,"date_local":"2021-01-07T21:15:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5ef670f10059c33cee4a826c","flight":4,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d4fffd86e000604b393"},{"fairings":{"reused":true,"recovery_attempt":true,"recovered":null,"ships":["5ea6ed2e080df4000697c907","5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/a6/d3/bPczm8gQ_o.png","large":"https://images2.imgbox.com/2b/28/fZnNbGqX_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/jhu37i/starlink_general_discussion_and_deployment_thread/","launch":"https://www.reddit.com/r/spacex/comments/kz969o/rspacex_starlink16_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/l1b5q8/starlink16_media_thread_photographer_contest/","recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/50855737853_4d290519b4_o.jpg","https://live.staticflickr.com/65535/50856457401_5fd05cddd1_o.jpg","https://live.staticflickr.com/65535/50855737933_bcc65bdf8b_o.jpg","https://live.staticflickr.com/65535/50856551642_5190c59ec1_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/84Nct_Q9Lqw","youtube_id":"84Nct_Q9Lqw","article":"https://spaceflightnow.com/2021/01/20/spacex-sets-new-rocket-reuse-records-with-successful-starlink-launch/","wikipedia":"https://en.wikipedia.org/wiki/Starlink"},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":null,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"This mission launches the sixteenth batch of operational Starlink satellites, which are version 1.0, from SLC-40 or LC-39A. It is the seventeenth Starlink launch overall. The

satellites will be delivered to low Earth orbit and will spend a few weeks maneuve
ring to their operational altitude. The booster is expected to land on an ASD
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 rideshare mission from SLC-40 or LC-39A. The spacecraft will be delivered into a
 sun-synchronous orbit. The booster for this mission is expected to land on an ASD
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perational Starlink satellites, which are version 1.0, from SLC-40. It is the nine
teenth Starlink launch overall. The satellites will be delivered to low Earth orbi
t and will spend a few weeks maneuvering to their operational altitude. The booste
r is expected to land on an ASDS.","crew":[],"ships":["5ea6ed30080df4000697c91
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9","id":"5fbfecfe54ceb10a5664c80b"},{"fairings":{"reused":true,"recovery_attempt":true,"recovered":true,"ships":["5ea6ed2e080df4000697c909","5ea6ed2f080df4000697c90c"]},"links":{"patch":{"small":"https://images2.imgbox.com/df/ea/lre39tFr_o.png","large":"https://images2.imgbox.com/38/db/moPRrpCB_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/jhu37i/starlink_general_discussion_and_deployment_thread/","launch":"https://www.reddit.com/r/spacex/comments/m0yww5/rspacex_starlink20_official_launch_discussion/","media":null,"recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/51027544097_799f5baccc_o.jpg","https://live.staticflickr.com/65535/51027443336_3e7486be6f_o.jpg","https://live.staticflickr.com/65535/51027443321_9a59458d39_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/U4sWbTfrzj8","youtube_id":"U4sWbTfrzj8","article":"https://spaceflightnow.com/2021/03/11/spacex-adds-more-satellites-to-starlink-internet-fleet/","wikipedia":"https://en.wikipedia.org/wiki/Starlink"},"static_fire_date_utc":"2021-03-09T23:00:00.000Z","static_fire_date_unix":1615330800,"net":false,"window":null,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"This mission launches the 20th batch of operational Starlink satellites, which are version 1.0, from LC-39A or SLC-40. It is the 21st Starlink launch overall. The satellites will be delivered to low Earth orbit and will spend a few weeks maneuvering to their operational altitude. The booster is expected to land on an ASDS.","crew":[],"ships":["5ea6ed2f080df4000697c910","5ee68c683c228f36bd5809b5","5ea6ed2e080df4000697c909","5ea6ed2f080df4000697c90c"],"capsules":[],"payloads":["600f9bcb8f798e2a4d5f97a5"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":119,"name":"Starlink-20 (v1.0)","date_utc":"2021-03-11T08:13:00.000Z","date_unix":1615450380,"date_local":"2021-03-11T03:13:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f3591817f23b2663","flight":6,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":"134eb787-244e-4131-8b03-c9fbd0a11efc","id":"600f9a718f798e2a4d5f979d"},{"fairings":{"reused":true,"recovery_attempt":true,"recovered":true,"ships":["5ea6ed2e080df4000697c909","5ea6ed2f080df4000697c90c"]},"links":{"patch":{"small":"https://images2.imgbox.com/a0/1a/BLRGLyNe_o.png","large":"https://images2.imgbox.com/a0/db/7LwA6xV9_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/jhu37i/starlink_general_discussion_and_deployment_thread/","launch":"https://www.reddit.com/r/spacex/comments/m4e377/rspacex_starlink21_launch_discussion_updates/","media":null,"recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/51036945097_9fc94fa9a9_o.jpg","https://live.staticflickr.com/65535/51036945067_ce0d5b3c0b_o.jpg","https://live.staticflickr.com/65535/51036945027_47c96d71d1_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/JKf45ATgATc","youtube_id":"JKf45ATgATc","article":"https://spaceflightnow.com/2021/03/14/spacex-extends-its-own-rocket-reuse-record-on-starlink-launch/","wikipedia":"https://en.wikipedia.org/wiki/Starlink"},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":null,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"This mission launches the 21st batch of operational Starlink satellites, which are version 1.0, from LC-39A or SLC-40. It is the 22nd Starlink launch overall. The satellites will be delivered to low Earth orbit and will spend a few weeks maneuvering to their operational altitude. The booster is expected to land on an ASDS.","crew":[],"ships":["5ea6ed2e080df4000697c909","5ea6ed2f080df4000697c90c","5ea6ed2f080df4000697c90d","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["600f9bd88f798e2a4d5f97a6"],"launchpad":"5e9e4502f509094188566f88","flight_number":120,"name":"Starlink-21 (v1.0)","date_utc":"2021-03-14T10:01:00.000Z","date_unix":1615716060,"date_local":"2021-03-14T06:01:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a6f35918c0803b265c","flight":9,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":"896d876d-e834-4810-8a5e-44d6b6a42630","id":"600f9a8d8f798e2a4d5f979e"},{"fairings":{"reused":null,"recovery_attempt":true,"recovered":true,"ships":["6059166413f40e27e8af34b6","5ea6ed2f080df4000697c90b"]},"links":{"patch":{"small":"https://images2.imgbox.com/f3/0d/E2I1NJs2_o.png","large":"https://images2.imgbox.com/68/e1/XpScXejQ_o.png"},"r

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23/spacex-launches-astronauts-on-refurbished-capsule-and-flight-proven-rocket/","w
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0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Spac
eX launches the second operational mission of its Crew Dragon vehicle as part of N
ASA\'s Commercial Crew Program, carrying NASA astronauts Shane Kimbrough, Megan Mc
Arthur, Thomas Pesquet, and Akihiko Hoshide to the International Space Station. Th
e Falcon 9 and Crew Dragon lift off from LC-39A, Kennedy Space Center. Both the bo
oster and the capsule have flown previously, each a first for a commercial crew fl
ight. The booster for this mission is expected to land on an ASDS. The mission wil
l be complete with the safe return of the astronauts to Earth.","crew":["5fe3ba5fb
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raft-fcc-clears-spacex-to-fly-satellites-at-lower-altitudes/","wikipedia":"http
s://en.wikipedia.org/wiki/Starlink"},"static_fire_date_utc":null,"static_fire_date
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al Starlink satellites, which are version 1.0, from LC-39A or SLC-40. It is the 25
th Starlink launch overall. The satellites will be delivered to low Earth orbit an
d will spend a few weeks maneuvering to their operational altitude. The booster is
expected to land on an ASDS.","crew":[],"ships":["5ea6ed2f080df4000697c910","5ea6e
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d will spend a few weeks maneuvering to their operational altitude. The booster is
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tails":"This mission launches the 28th batch of operational Starlink satellites, w
hich were version 1.0, from SLC-40. It was the 29th Starlink launch overall. The s
atellites plan to be delivered to low Earth orbit and will spend a few weeks maneu
vering to their operational altitude. The booster is expected to land on ASDS JRT
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es-on-mission-to-begin-upgrading-space-station-electrical-grid/","wikipedia":"http

s://en.wikipedia.org/wiki/SpaceX_CRS-22"},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s 22nd ISS resupply mission on behalf of NASA, this mission sends essential supplies to the International Space Station using the cargo variant of SpaceX\'s Dragon 2 spacecraft. The external payload for this mission is the first pair of ISS Roll Out Solar Arrays. Falcon 9 and Dragon launch from LC-39A, Kennedy Space Center and the booster is expected to land on an ASDS. The mission will be complete with splashdown and recovery of the capsule and down cargo.","crew":[],"ships":["5ea6ed2f080df4000697c90b","608c1a06cf7f3d6152666ad4","5ea6ed30080df4000697c913"],"capsules":["60b803421f83cc1e59f1644d"],"payloads":["5fe3b642b3467846b324217b"],"launchpad":"5e9e4502f509094188566f88","flight_number":129,"name":"CRS-22 & IROSA","date_utc":"2021-06-03T17:29:00.000Z","date_unix":1622741340,"date_local":"2021-06-03T13:29:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"60b800111f83cc1e59f16438","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":"89a150ea-6e4b-489f-853c-3603ae684611","id":"5fe3af84b3467846b3242161"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":true,"ships":["5ea6ed2f080df4000697c90b","5ea6ed2e080df4000697c909"]},"links":{"patch":{"small":"https://images2.imgbox.com/9a/f0/UVl6cZ6e_o.png","large":"https://images2.imgbox.com/98/c3/8McdwgVu_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/n9llxw/sxm8_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/nss9br/rspacex_sxm8_launch_discussion_and_updates_thread/","media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":null,"webcast":"https://youtu.be/bgtDRR2F2wA","youtube_id":"bgtDRR2F2wA","article":null,"wikipedia":"https://en.wikipedia.org/wiki/Sirius_XM#Satellites"},"static_fire_date_utc":"2021-06-03T06:32:00.000Z","static_fire_date_unix":1622701920,"net":false,"window":5940,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX launches the second of two next generation satellites for SiriusXM from SLC-40, Cape Canaveral Space Force Station. The spacecraft will be delivered into a sub-synchronous geostationary transfer orbit and will replace XM-4 in geostationary orbit. The booster for this mission will land on an ASDS.","crew":[],"ships":["5ee68c683c228f36bd5809b5","5ea6ed2f080df4000697c910","5ea6ed2f080df4000697c90b","5ea6ed2e080df4000697c909"],"capsules":[],"payloads":["5fe3b57db3467846b324217a"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":130,"name":"SXM-8","date_utc":"2021-06-06T04:26:00.000Z","date_unix":1622953560,"date_local":"2021-06-06T00:26:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5f57c53d0622a6330279009f","flight":3,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":"edaf9a8d-d67c-4e0e-8452-a37b111581d5","id":"5fe3af6db3467846b3242160"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":true,"ships":["60c8c7a45d4819007ea69871"]},"links":{"patch":{"small":"https://images2.imgbox.com/d0/66/bCRsHNSZ_o.png","large":"https://images2.imgbox.com/2f/6f/ebFS9FDJ_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/nuud0l/gps_iii_sv05_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/o0gcnq/rspacex_gps_iii_sv05_launch_discussion_and/","media":null,"recovery":null},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/51254829184_e6e1d0d79c_o.jpg","https://live.staticflickr.com/65535/51253353892_de82b01e23_o.jpg","https://live.staticflickr.com/65535/51254285968_288383ce6e_o.jpg","https://live.staticflickr.com/65535/51254829154_3c5980c086_o.jpg","https://live.staticflickr.com/65535/51253353882_e59ea4df4f_o.jpg","https://live.staticflickr.com/65535/51254829139_ca68c19689_o.jpg","https://live.staticflickr.com/65535/51262926489_9fbce20e9c_o.jpg","https://live.staticflickr.com/65535/51262926469_974292477d_o.jpg","https://live.staticflickr.com/65535/51262179176_e4302db116_o.jpg","https://live.staticflickr.com/65535/51263224735_3210fb7499_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/QJXxVtp3KqI","youtube_id":"QJXxVtp3KqI","article":null,"wikipedia":"https://en.wikipedia.org/wiki/GPS_Block_III"},"static_fire_date_utc":"2021-06-13T19:30:00.000Z","static_fire_date_unix":1623612600,"net":false,"window":900,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX\'s fourth GPS III launch will use the first stage from the previous GPS mission. This will be the first ti

me a National Security Space Launch has flown on a flight proven booster. Falcon 9 will launch from SLC-40, Cape Canaveral and the booster will land downrange on a drone ship. GPS III is the third generation of the U.S. Space Force\'s NAVSTAR Global Positioning System satellites, developed by Lockheed Martin. The GPS III constellation will feature a cross-linked command and control architecture, allowing the entire GPS constellation to be updated simultaneously from a single ground station. A new spot beam capability for enhanced military coverage and increased resistance to hostile jamming will be incorporated.","crew":[],"ships":["60c8c7a45d4819007ea69871","5ee68c683c228f36bd5809b5","5ea6ed2f080df4000697c910"],"capsules":[],"payloads":["5eb0e4d2b6c3bb0006eeb261"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":131,"name":"GPS III SV05","date_utc":"2021-06-17T16:09:00.000Z","date_unix":1623946140,"date_local":"2021-06-17T12:09:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5f57c5440622a633027900a0","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_library_id":"110c808a-a091-47ab-8532-4fa058c1de7a","id":"5eb87d4effd86e000604b390"},{"fairings":{"reused":true,"recovery_attempt":true,"recovered":true,"ships":["60c8c7a45d4819007ea69871"]},"links":{"patch":{"small":"https://images2.imgbox.com/a9/3e/L2EqHznO_o.png","large":"https://images2.imgbox.com/96/8c/4HOqLFoZ_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/nz7rai/transporter2_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/o9ki7u/rspacex_transporter2_launch_discussion_and/","media":null,"recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/51283430951_a9e5a41141_o.jpg","https://live.staticflickr.com/65535/51283430936_3852120bbe_o.jpg","https://live.staticflickr.com/65535/51283604493_d1a088b7c9_o.jpg","https://live.staticflickr.com/65535/51284454795_591717faee_o.jpg","https://live.staticflickr.com/65535/51284454810_9fdd0e8db4_o.jpg","https://live.staticflickr.com/65535/51283604443_6d92fe1231_o.jpg","https://live.staticflickr.com/65535/51283604428_b24ebf1b5f_o.jpg","https://live.staticflickr.com/65535/51283604438_7202e2a388_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/sSiuW1HcGjA","youtube_id":"sSiuW1HcGjA","article":null,"wikipedia":null},"static_fire_date_utc":"2021-06-22T15:24:00.000Z","static_fire_date_unix":1624375440,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Falcon 9 launches to sun-synchronous polar orbit from Florida as part of SpaceX\'s Rideshare program dedicated to smallsat customers. The mission lifts off from SLC-40, Cape Canaveral on a southward azimuth and performs a dogleg maneuver. The booster for this mission is expected to return to LZ-1 based on FCC communications filings. This rideshare takes approximately 90 satellites and hosted payloads into orbit on a variety of deployers including three free-flying spacecraft which dispense their customers\' satellites after separation from the SpaceX stack.","crew":[],"ships":["60c8c7a45d4819007ea69871"],"capsules":[],"payloads":["608ac397eb3e50044e3630e7"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":132,"name":"Transporter-2","date_utc":"2021-06-30T19:31:00.000Z","date_unix":1625081460,"date_local":"2021-06-30T15:31:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5ef670f10059c33cee4a826c","flight":8,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":"5d248abe-17ef-43ce-9c04-aef33af40520","id":"600f9b6d8f798e2a4d5f979f"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/23/8a/eyj3lHJk_o.png","large":"https://images2.imgbox.com/fd/60/g7jacgTb_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/p67i27/crs23_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/pcj0ao/rspacex_crs23_launch_docking_discussion_updates/","media":null,"recovery":null},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/51411435986_82d7088b61_o.jpg","https://live.staticflickr.com/65535/51411702583_fe67991413_o.jpg","https://live.staticflickr.com/65535/51411702573_de10cdbc06_o.jpg","https://live.staticflickr.com/65535/51411435116_ac7b3cc3d1_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/x-KiDqxAMU0","youtube_id":"x-KiDqxAMU0","article":null,"wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-23"},"static_fire_date_utc":"2021-08-26T02:49:00.000Z","static_fire_date_unix":1629946140,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1e

c","success":true,"failures":[],"details":"SpaceX\'s 23rd ISS resupply mission on behalf of NASA, this mission brings essential supplies to the International Space Station using the cargo variant of SpaceX\'s Dragon 2 spacecraft. Cargo includes several science experiments. The booster for this mission is expected to land on an ASDS. The mission will be complete with return and recovery of the Dragon capsule and down cargo.","crew":[],"ships":["5ea6ed2d080df4000697c904"],"capsules":[],"payloads":["5fe3c4f2b3467846b3242193"],"launchpad":"5e9e4502f509094188566f88","flight_number":133,"name":"CRS-23","date_utc":"2021-08-29T07:14:00.000Z","date_unix":1630221240,"date_local":"2021-08-29T03:14:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5f57c53d0622a6330279009f","flight":4,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecb075134e7cd"}],"auto_update":true,"tbd":false,"launch_library_id":"13386512-85bb-4c93-a9b0-f5eac05fbe4f","id":"5fe3b11eb3467846b324216c"},{"fairings":{"reused":true,"recovery_attempt":null,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/cb/ef/u7GOlbj4_o.png","large":"https://images2.imgbox.com/a3/55/7K6zEOT2_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/jhu37i/starlink_general_discussion_and_deployment_thread/","launch":"https://www.reddit.com/r/spacex/comments/pmn0xm/rspacex_starlink21_launch_discussion_and_updates/","media":null,"recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/51474853666_be4615e186_o.jpg","https://live.staticflickr.com/65535/51475097383_dcf9002e9c_o.jpg"]},"presskit":null,"webcast":"https://youtu.be/4372QYiPZB4","youtube_id":"4372QYiPZB4","article":"https://spaceflightnow.com/2021/09/14/spacex-launches-first-full-batch-of-laser-equipped-starlink-satellites/","wikipedia":"https://en.wikipedia.org/wiki/Starlink"},"static_fire_date_utc":"2021-09-02T17:29:00.000Z","static_fire_date_unix":1630603740,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":[],"ships":["5ea6ed30080df4000697c913"],"capsules":[],"payloads":["60e3bf3373359e1e20335c3c"],"launchpad":"5e9e4502f509092b78566f87","flight_number":134,"name":"Starlink 2-1 (v1.5)","date_utc":"2021-09-14T03:55:00.000Z","date_unix":1631591700,"date_local":"2021-09-13T20:55:00-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591833b13b2659","flight":10,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":"6b9f9fe6-7f94-498b-a664-7c9e42dbe76d","id":"60e3bf0d73359e1e20335c37"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/bb/2f/jMnSSQHM_o.png","large":"https://images2.imgbox.com/eb/36/ZJnCO6hc_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/pc1fq7/inspiration4_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/po651k/rspacex_inspiration4_launch_discussion_updates/","media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":null,"webcast":"https://youtu.be/3pv01sSq44w","youtube_id":"3pv01sSq44w","article":null,"wikipedia":"https://en.wikipedia.org/wiki/Inspiration4"},"static_fire_date_utc":"2021-09-13T07:07:00.000Z","static_fire_date_unix":1631516820,"net":false,"window":18000,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Inspiration4 is the world\xe2\x80\x99s first all-civilian mission to space. The mission will be commanded by Jared Isaacman, the 37-year-old founder and Chief Executive Officer of Shift4 Payments and an accomplished pilot and adventurer. Inspiration4 will leave Earth from Kennedy Space Center\xe2\x80\x99s historic Launch Complex 39A, the embarkation point for Apollo and Space Shuttle missions, and travel across a low earth orbit on a multi-day journey that will continually eclipse more than 90% of the earth\xe2\x80\x99s population. Named in recognition of the four-person crew that will raise awareness and funds for St. Jude Children\xe2\x80\x99s Research Hospital, this milestone represents a new era for human spaceflight and exploration.","crew":["607a3a5f5a906a44023e0870","607a3ab45a906a44023e0872","607b48375a906a44023e08b8","607b48da5a906a44023e08b9"],"ships":["5ea6ed2f080df4000697c910","5ee68c683c228f36bd5809b5","614251b711a64135defb3654"],"capsules":["5f6f99fddcfdf403df379709"],"payloads":["607a382f5a906a44023e0867"],"launchpad":"5e9e4502f509094188566f88","flight_number":135,"name":"Inspiration4","date_utc":"2021-09-16T00:02:00.000Z","date_unix":1631750520,"date_local":"2021-09-15T20:02:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5f57c5440622a6330279

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11/spacex-debuts-new-dragon-capsule-in-launch-to-the-international-space-statio
n/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_Crew-3"},"static_fire_date_u
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s":"SpaceX will launch the third operational mission of its Crew Dragon vehicle as
part of NASA\'s Commercial Crew Program, carrying four astronauts to the Internati
onal Space Station, including 1 international partner This mission will fly on a n
ew capsule and a once used booster. The booster will land downrange on a drone shi
p. The Crew-2 mission returns from the space station in November.","crew":["5fe3c5
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13/spacex-launch-starts-deployment-of-new-starlink-orbital-shell/","wikipedia":"ht
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s":"The T\xc3\xbcrksat 5B communication satellite, which its construction work con
tinues at Airbus Defense and Space\'s facilities in Toulouse, France, will soon be
sent to the Cape Canaveral Space Launch Station located in Florida, United States.
The satellite will be launched into space onboard the Falcon 9 rocket following pr
e-launch preparations. With an estimated in-orbit lifetime of 30 years and the aim
of securing Turkey\xe2\x80\x99s orbital and frequency rights, T\xc3\xbcrksat 5B wi
ll be launched into an orbital slot at 42 degrees East. With 12 kW power, T\xc3\xb
crksat 5B will provide TV broadcasting and data communication services over a wide
coverage area that reaches the entire Middle East, the Persian Gulf, the Red Sea,
 the Mediterranean, North Africa, East Africa, South Africa and Nigeria. Apart fro
m that, the satellite will also provide customized services for airlines and comme
rcial ship operators around the world thanks to the fact that it operates in Ka-Ba
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 behalf of NASA, this mission brings essential supplies to the International Space
Station using the cargo variant of SpaceX\'s Dragon 2 spacecraft. Cargo includes s
everal science experiments. The booster for this mission is expected to land on an
ASDS. The mission will be complete with return and recovery of the Dragon capsule
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le":null,"wikipedia":"https://en.wikipedia.org/wiki/SpaceX_Crew-5"},"static_fire_d
ate_utc":null,"static_fire_date_unix":null,"net":false,"window":null,"rocket":"5e9
d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":["62dd71
96202306255024d13c","62dd71c9202306255024d13d","62dd7210202306255024d13e","62dd725
3202306255024d13f"],"ships":[],"capsules":["617c05591bad2c661a6e2909"],"payloads":
["62dd73ed202306255024d145"],"launchpad":"5e9e4502f509094188566f88","flight_numbe
r":187,"name":"Crew-5","date_utc":"2022-10-05T16:00:00.000Z","date_unix":166498560
0,"date_local":"2022-10-05T12:00:00-04:00","date_precision":"hour","upcoming":fals
e,"cores":[{"core":"633d9da635a71d1d9c66797b","flight":1,"gridfins":true,"legs":tr
ue,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"AS
DS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":true,"tbd":false,"launch_
library_id":"f33d5ece-e825-4cd8-809f-1d4c72a2e0d3","id":"62dd70d5202306255024d13
9"}]'

You should see the response contains massive information about SpaceX launches. Next, let's try to discover some more relevant information for this project.

Task 1: Request and parse the SpaceX launch data using the GET request

To make the requested JSON results more consistent, we will use the following static response object for this project:

In [8]:
```
static_json_url='https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud
```

We should see that the request was successfull with the 200 status response code

In [9]:
```
response.status_code
```

Out[9]:
```
200
```

Now we decode the response content as a Json using `.json()` and turn it into a Pandas dataframe using `.json_normalize()`

In [10]:
```
# Use json_normalize meethod to convert the json result into a dataframe
response=requests.get(static_json_url).json()
data=pd.json_normalize(response)
```

Using the dataframe `data` print the first 5 rows

In [12]:
```
# Get the head of the dataframe
data.head(1)
```

Out[12]:

	static_fire_date_utc	static_fire_date_unix	tbd	net	window	rocket	succ
0	2006-03-17T00:00:00.000Z	1.142554e+09	False	False	0.0	5e9d0d95eda69955f709d1eb	Fa

You will notice that a lot of the data are IDs. For example the rocket column has no information about the rocket just an identification number.

We will now use the API again to get information about the launches using the IDs given for each launch. Specifically we will be using columns `rocket`, `payloads`, `launchpad`, and `cores`.

In [13]:
```
# Lets take a subset of our dataframe keeping only the features we want and the fli
data = data[['rocket', 'payloads', 'launchpad', 'cores', 'flight_number', 'date_utc

# We will remove rows with multiple cores because those are falcon rockets with 2 e
data = data[data['cores'].map(len)==1]
data = data[data['payloads'].map(len)==1]

# Since payloads and cores are lists of size 1 we will also extract the single valu
data['cores'] = data['cores'].map(lambda x : x[0])
data['payloads'] = data['payloads'].map(lambda x : x[0])

# We also want to convert the date_utc to a datetime datatype and then extracting t
data['date'] = pd.to_datetime(data['date_utc']).dt.date

# Using the date we will restrict the dates of the launches
data = data[data['date'] <= datetime.date(2020, 11, 13)]
```

- From the `rocket` we would like to learn the booster name

- From the `payload` we would like to learn the mass of the payload and the orbit that it is going to
- From the `launchpad` we would like to know the name of the launch site being used, the longitude, and the latitude.
- From `cores` we would like to learn the outcome of the landing, the type of the landing, number of flights with that core, whether gridfins were used, whether the core is reused, whether legs were used, the landing pad used, the block of the core which is a number used to seperate version of cores, the number of times this specific core has been reused, and the serial of the core.

The data from these requests will be stored in lists and will be used to create a new dataframe.

In [14]:
```
#Global variables
BoosterVersion = []
PayloadMass = []
Orbit = []
LaunchSite = []
Outcome = []
Flights = []
GridFins = []
Reused = []
Legs = []
LandingPad = []
Block = []
ReusedCount = []
Serial = []
Longitude = []
Latitude = []
```

These functions will apply the outputs globally to the above variables. Let's take a looks at `BoosterVersion` variable. Before we apply `getBoosterVersion` the list is empty:

In [15]:
```
BoosterVersion
```

Out[15]:
```
[]
```

Now, let's apply `getBoosterVersion` function method to get the booster version

In [16]:
```
# Call getBoosterVersion
getBoosterVersion(data)
```

the list has now been update

In [17]:
```
BoosterVersion[0:5]
```

Out[17]:
```
['Falcon 1', 'Falcon 1', 'Falcon 1', 'Falcon 1', 'Falcon 9']
```

we can apply the rest of the functions here:

In [22]:
```
# Call getLaunchSite
getLaunchSite(data)
```

In [19]:
```
# Call getPayloadData
getPayloadData(data)
```

In [20]:
```
# Call getCoreData
getCoreData(data)
```

Finally lets construct our dataset using the data we have obtained. We we combine the columns into a dictionary.

In [23]:
```
launch_dict = {'FlightNumber': list(data['flight_number']),
'Date': list(data['date']),
'BoosterVersion':BoosterVersion,
'PayloadMass':PayloadMass,
'Orbit':Orbit,
'LaunchSite':LaunchSite,
'Outcome':Outcome,
'Flights':Flights,
'GridFins':GridFins,
'Reused':Reused,
'Legs':Legs,
'LandingPad':LandingPad,
'Block':Block,
'ReusedCount':ReusedCount,
'Serial':Serial,
'Longitude': Longitude,
'Latitude': Latitude}
```

Then, we need to create a Pandas data frame from the dictionary launch_dict.

In [25]:
```
# Create a data from launch_dict
data=pd.DataFrame(launch_dict)
data.head()
```

Out[25]:

	FlightNumber	Date	BoosterVersion	PayloadMass	Orbit	LaunchSite	Outcome	Flights	Grid
0	1	2006-03-24	Falcon 1	20.0	LEO	Kwajalein Atoll	None None	1	
1	2	2007-03-21	Falcon 1	NaN	LEO	Kwajalein Atoll	None None	1	
2	4	2008-09-28	Falcon 1	165.0	LEO	Kwajalein Atoll	None None	1	
3	5	2009-07-13	Falcon 1	200.0	LEO	Kwajalein Atoll	None None	1	
4	6	2010-06-04	Falcon 9	NaN	LEO	CCSFS SLC 40	None None	1	

Show the summary of the dataframe

In [26]:
```
# Show the head of the dataframe
data.head()
```

Out[26]:

	FlightNumber	Date	BoosterVersion	PayloadMass	Orbit	LaunchSite	Outcome	Flights	Grid
0	1	2006-03-24	Falcon 1	20.0	LEO	Kwajalein Atoll	None None	1	
1	2	2007-03-21	Falcon 1	NaN	LEO	Kwajalein Atoll	None None	1	
2	4	2008-09-28	Falcon 1	165.0	LEO	Kwajalein Atoll	None None	1	
3	5	2009-07-13	Falcon 1	200.0	LEO	Kwajalein Atoll	None None	1	
4	6	2010-06-04	Falcon 9	NaN	LEO	CCSFS SLC 40	None None	1	

Task 2: Filter the dataframe to only include `Falcon 9` launches

Finally we will remove the Falcon 1 launches keeping only the Falcon 9 launches. Filter the data dataframe using the `BoosterVersion` column to only keep the Falcon 9 launches. Save the filtered data to a new dataframe called `data_falcon9`.

In [41]:
```
# Hint data['BoosterVersion']!='Falcon 1'
data_falcon9=data[data.BoosterVersion=="Falcon 9"]
```

Out[41]:

	FlightNumber	Date	BoosterVersion	PayloadMass	Orbit	LaunchSite	Outcome	Flights	Grid
4	6	2010-06-04	Falcon 9	NaN	LEO	CCSFS SLC 40	None None	1	

Now that we have removed some values we should reset the FlgihtNumber column

In [42]:
```
data_falcon9.loc[:,'FlightNumber'] = list(range(1, data_falcon9.shape[0]+1))
data_falcon9
```

```
/home/jupyterlab/conda/envs/python/lib/python3.7/site-packages/pandas/core/indexin
g.py:1773: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stabl
e/user_guide/indexing.html#returning-a-view-versus-a-copy
  self._setitem_single_column(ilocs[0], value, pi)
```

Out[42]:

	FlightNumber	Date	BoosterVersion	PayloadMass	Orbit	LaunchSite	Outcome	Flights	Gri
4	1	2010-06-04	Falcon 9	NaN	LEO	CCSFS SLC 40	None None	1	
5	2	2012-05-22	Falcon 9	525.0	LEO	CCSFS SLC 40	None None	1	
6	3	2013-03-01	Falcon 9	677.0	ISS	CCSFS SLC 40	None None	1	
7	4	2013-09-29	Falcon 9	500.0	PO	VAFB SLC 4E	False Ocean	1	
8	5	2013-12-03	Falcon 9	3170.0	GTO	CCSFS SLC 40	None None	1	
...	...	...	...	...	...	...	...	...	
89	86	2020-09-03	Falcon 9	15600.0	VLEO	KSC LC 39A	True ASDS	2	
90	87	2020-10-06	Falcon 9	15600.0	VLEO	KSC LC 39A	True ASDS	3	
91	88	2020-10-18	Falcon 9	15600.0	VLEO	KSC LC 39A	True ASDS	6	
92	89	2020-10-24	Falcon 9	15600.0	VLEO	CCSFS SLC 40	True ASDS	3	
93	90	2020-11-05	Falcon 9	3681.0	MEO	CCSFS SLC 40	True ASDS	1	

90 rows × 17 columns

Data Wrangling

We can see below that some of the rows are missing values in our dataset.

In [43]:
```
data_falcon9.isnull().sum()
```

Out[43]:
```
FlightNumber       0
Date               0
BoosterVersion     0
PayloadMass        5
Orbit              0
LaunchSite         0
Outcome            0
Flights            0
GridFins           0
Reused             0
Legs               0
LandingPad        26
Block              0
ReusedCount        0
Serial             0
Longitude          0
Latitude           0
dtype: int64
```

In [ ]:

Before we can continue we must deal with these missing values. The `LandingPad` column will retain None values to represent when landing pads were not used.

Task 3: Dealing with Missing Values

Calculate below the mean for the `PayloadMass` using the `.mean()`. Then use the mean and the `.replace()` function to replace `np.nan` values in the data with the mean you calculated.

In [61]:
```
# Calculate the mean value of PayloadMass column
mean=data_falcon9["PayloadMass"].mean()

# Replace the np.nan values with its mean value
data_falcon9["PayloadMass"].replace(np.nan, mean,inplace=True)
data_falcon9.head()
```

Out[61]:

	FlightNumber	Date	BoosterVersion	PayloadMass	Orbit	LaunchSite	Outcome	Flights	Grid
4	1	2010-06-04	Falcon 9	6123.547647	LEO	CCSFS SLC 40	None None	1	
5	2	2012-05-22	Falcon 9	525.000000	LEO	CCSFS SLC 40	None None	1	
6	3	2013-03-01	Falcon 9	677.000000	ISS	CCSFS SLC 40	None None	1	
7	4	2013-09-29	Falcon 9	500.000000	PO	VAFB SLC 4E	False Ocean	1	
8	5	2013-12-03	Falcon 9	3170.000000	GTO	CCSFS SLC 40	None None	1	

In [62]:
```
data_falcon9.isnull().sum()
```

Out[62]:
```
FlightNumber       0
Date               0
BoosterVersion     0
PayloadMass        0
Orbit              0
LaunchSite         0
Outcome            0
Flights            0
GridFins           0
Reused             0
Legs               0
LandingPad        26
Block              0
ReusedCount        0
Serial             0
Longitude          0
Latitude           0
dtype: int64
```

In [64]:
```
data_falcon9.to_csv('dataset_part_1.csv', index=False)
```

You should see the number of missing values of the `PayLoadMass` change to zero.

Now we should have no missing values in our dataset except for in `LandingPad`.

We can now export it to a **CSV** for the next section,but to make the answers consistent, in the next lab we will provide data in a pre-selected date range.

```
data_falcon9.to_csv('dataset_part_1.csv', index=False)
```

Authors

Joseph Santarcangelo has a PhD in Electrical Engineering, his research focused on using machine learning, signal processing, and computer vision to determine how videos impact human cognition. Joseph has been working for IBM since he completed his PhD.

Change Log

Date (YYYY-MM-DD)	Version	Changed By	Change Description
2020-09-20	1.1	Joseph	get result each time you run
2020-09-20	1.1	Azim	Created Part 1 Lab using SpaceX API
2020-09-20	1.0	Joseph	Modified Multiple Areas