



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 landing.



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
# import requests
# Pandas is a software library written for the Python programming Language for a
# import pandas as pd
# NumPy is a library for the Python programming Language, adding support for Lar
# 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 da
def getBoosterVersion(data):
```

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

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

```
In [3]: # Takes the dataset and uses the Launchpad column to call the API and append the
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 [4]: # Takes the dataset and uses the payloads column to call the API and append the
def getPayloadData(data):
    for load in data['payloads']:
        if load:
            response = requests.get("https://api.spacexdata.com/v4/payloads/" + load)
            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, whether the core is reused, whether legs were used, the landing pad used, the block of the core which is a number used to separate version of cores, the number of times this specific core has been reused, and the serial of the core.

```
In [5]: # Takes the dataset and uses the cores column to call the API and append the data
def getCoreData(data):
    for core in data['cores']:
        if core['core'] != None:
            response = requests.get("https://api.spacexdata.com/v4/cores/" + core['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 [6]: spacex_url="https://api.spacexdata.com/v4/launches/past"
```

```
In [7]: response = requests.get(spacex_url)
```

Check the content of the response

```
In [8]: C
```

```
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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 burnoff\\\", \"crew\": [], \"ships\": [], \"capsules\": [], \"payloads\": [\"5eb0e4bbb6c3bb0006eeb1f0\"], \"launchpad\": \"5e9e4501f500094ba4566f84\", \"flight_number\": 13, \"name\": \"Thaicom 6\", \"date_utc\": \"2014-01-06T18:06:00.000Z\", \"date_unix\": 1389031560, \"date_local\": \"2014-01-06T14:06:00-04:00\", \"date_precision\": \"hour\", \"upcoming\": false, \"cores\": [{\"core\": \"5e9e289ff3591878603b262f\"}, {\"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\": \"5eb87ce3ffd86e000604b336\"}, {\"fairings\": null, \"links\": {\"patch\": {\"small\": \"https://images2.imgur.com/ae/3c/yVvE2wWh_o.png\", \"large\": \"https://images2.imgur.com/82/c7/bbs0gt88_o.png\"}, \"reddit\": {\"campaign\": null, \"launch\": \"http://www.reddit.com/r/spacex/comments/22zo8c\", \"media\": null, \"recovery\": null}, \"flickr\": {\"small\": [], \"original\": [\"https://farm8.staticflickr.com/7615/16670240949_8d43db0e36_o.jpg\", \"https://farm9.staticflickr.com/8597/16856389125_e97cd30ef7_o.jpg\", \"https://farm8.staticflickr.com/7586/16166732954_9338dc859c_o.jpg\", \"https://farm8.staticflickr.com/7603/16855223522_462da54e84_o.jpg\", \"https://farm8.staticflickr.com/7618/16234010894_e1210ec300_o.jpg\", \"https://farm8.staticflickr.com/7617/16855338881_69542a2fa9_o.jpg\"]}, \"presskit\": \"http://www.spacex.com/sites/spacex/files/spacexcrs-3_presskit_042014.pdf\", \"webcast\": \"https://www.youtube.com/watch?v=Od-10N4bTyQ\", \"youtube_id\": \"Od-10N4bTyQ\", \"article\": \"https://newatlas.com/crs-3-launch-spacex/31671\", \"wikipedia\": \"https://en.wikipedia.org/wiki/SpaceX CRS-3\"}, \"static_fire_date_utc\": \"2014-03-08T00:00:00.000Z\", \"static_fire_date_unix\": 1394236800, \"net\": false, \"window\": 0, \"rocket\": \"5e9d0d95eda69973a809diec\", \"success\": true, \"failures\": [], \"details\": \"Following second-stage separation, SpaceX conducted a second controlled-descent test of the discarded booster vehicle and achieved the first successful controlled ocean touchdown of a liquid-rocket-engine orbital booster. Following touchdown the first stage tipped over as expected 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 vehicle.\", \"crew\": [], \"ships\": [\"5ea6ed2d080df40000697c982\"], \"capsules\": [\"5e9e2c5bf3591859a63b2668\"], \"payloads\": [\"5eb0e4bbb6c3bb0006eeb1f1\"], \"launchpad\": \"5e9e4501f500094ba4566f84\", \"flight_number\": 14, \"name\": \"CRS-3\", \"date_utc\": \"2014-04-18T19:25:00.000Z\", \"date_unix\": 1397849100, \"date_local\": \"2014-04-18T15:25:00-04:00\", \"date_precision\": \"hour\", \"upcoming\": false, \"cores\": [{\"core\": \"5e9e289ff3591829343b2630\"}, {\"flight\": 1, \"gridfins\": false, \"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\": \"5eb87ce4ffd86e000604b337\"}, {\"fairings\": {\"reuse\": false, \"recovery_attempt\": false, \"recovered\": false, \"ships\": []}, \"links\": {\"patch\": {\"small\": \"https://images2.imgur.com/a4/44/YWAUBkOe_o.png\", \"large\": \"https://images2.imgur.com/fd/41/FUnfqHHH_o.png\"}, \"reddit\": {\"campaign\": null, \"launch\": \"http://www.reddit.com/r/spacex/comments/2aany2\", \"media\": null, \"recovery\": null}, \"flickr\": {\"small\": [], \"original\": [\"https://farm8.staticflickr.com/7585/16602893909_1181317089_o.jpg\", \"https://farm9.staticflickr.com/8747/16581738577_83e0690136_o.jpg\", \"https://farm8.staticflickr.com/7285/16581736847_6fd536ab11_o.jpg\", \"https://farm8.staticflickr.com/7597/16789821675_35f0148f78_o.jpg\", \"https://farm8.staticflickr.com/7631/16236321533_829ae07b42_o.jpg\", \"https://farm9.staticflickr.com/8726/16830422056_26c2265bbc_o.jpg\", \"https://farm9.staticflickr.com/8591/16670149079_33d6cc3631_o.jpg\"]}, \"presskit\": \"http://www.spacex.com/sites/spacex/files/spacex_orbcomm_presskit_final.pdf\", \"webcast\": \"https://www.youtube.com/watch?v=lbHnSu-DLR4\", \"youtube_id\": \"lbHnSu-DLR4\", \"article\": \"https://www.orbcomm.com/en/networks/satellite/orbcomm-og2\", \"wikipedia\": \"https://en.wikipedia.org/wiki/Falcon_9_flight_10\"}, \"static_fire_date_utc\": \"2015-12-19T04:57:00.000Z\", \"static_fire_date_unix\": 1450501020, \"net\": false, \"window\": 0, \"rocket\": \"5e9d0d95eda69973a809diec\", \"success\": true, \"failures\": [], \"details\": \"Total payload mass was 1,316 kg (2,901 lb) : 6 satellites weighing 172 kg each, plus two 142-kg mass simulators. This was the second Falcon 9 booster equipped with landing legs. Following second-stage separation, SpaceX conducted a controlled-descent test of the first stage, which successfully decelerated from \\xc2\\xa0hypersonic velocity in the upper atmosphere, made reentry and landing burns, deployed its legs and touched down on the ocean surface. As with the previous mission, the first stage then tipped over as expected and was not recovered.\", \"cr

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SpaceX_NASA CRS-4_PressKit.pdf", "webcast": "https://www.youtube.com/watch?v=7YkCh7u0w1Y", "youtube_id": "7YkCh7u0w1Y", "article": "https://www.nasa.gov/press/2014/september/nasa-cargo-launches-to-space-station-aboard-spacex-resupply-mission-0", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX CRS-4"}, "static_fire_date_utc": "2014-09-17T00:00:00.000Z", "static_fire_date_unix": 1410912000, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": null, "crew": [], "ships": ["Sea6ed2d080df4000697c902"], "capsules": ["5e9e2c5bf3591888643b2669"], "payloads": ["5eb0e4bcb6c3bb0006eeb1f5"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 18, "name": "CRS-4", "date_utc": "2014-09-21T05:52:00.000Z", "date_unix": 1411278720, "date_local": "2014-09-21T01:52:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a0f359184a683b2634", "flight": 1, "gridfins": false, "legs": false, "reused": false, "landing_attempt": true, "landing_success": false, "landing_type": "Ocean", "landpad": null}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87ce7ffd86e000604b33b"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/df/53/3Ik1KR20_o.png", "large": "https://images2.imgbox.com/ed/f3/MdEzr8rE_o.png"}, "reddit": {"campaign": null, "launch": "http://www.reddit.com/r/spacex/comments/2rrdha", "media": null, "recovery": null}, "flickr": {"small": [], "original": ["https://farm9.staticflickr.com/8666/16511391418_bb5cdbbd71_o.jpg", "https://farm9.staticflickr.com/8612/16848173281_035bdc6009_o.jpg", "https://farm9.staticflickr.com/8571/16699496805_bf39747618_o.jpg", "https://farm9.staticflickr.com/8650/16699496705_187e4e53fd_o.jpg", "https://farm9.staticflickr.com/8663/16077174554_370937efbe_o.jpg", "https://farm9.staticflickr.com/8638/16512101410_83763eb9ea_o.jpg", "https://farm9.staticflickr.com/8653/16077173984_17885d4bea_o.jpg", "https://farm8.staticflickr.com/7635/16848159582_40c0f9d25f_o.jpg"]}], "presskit": "http://www.spacex.com/sites/spacex/files/spacex_nasa_crs-5_presskit.pdf", "webcast": "https://www.youtube.com/watch?v=p7x-SumbynI", "youtube_id": "p7x-SumbynI", "article": "https://spaceflightnow.com/2015/01/10/dragon-successfully-launched-rocket-recovery-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": 1418947200, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Following second stage separation, SpaceX performed a test flight which attempted to return the first stage of the Falcon 9 through the atmosphere and land it on an approximately 90-by-50-meter (300 ft x 160 ft) floating 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 data was obtained from the first use of grid fin control surfaces used for more precise reentry positioning. The grid fin control system ran out of hydraulic fluid a minute before landing and the landing itself resulted in a crash.", "crew": [], "ships": ["Sea6ed2e080df4000697c906", "Sea6ed2f080df4000697c90b", "Sea6ed2f080df4000697c90c", "Sea6ed2f080df4000697c90f", "Sea6ed300080df4000697c912"], "capsules": ["5e9e2c5bf35918165f3b266a"], "payloads": ["5eb0e4bdb6c3bb0006eeb1f6"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 19, "name": "CRS-5", "date_utc": "2015-01-10T09:47:00.000Z", "date_unix": 1420883220, "date_local": "2015-01-10T05:47:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a0f359187a3c3b2635", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": false, "landing_type": "ASDS", "landpad": "5e9e3032383ecb761634e7cb"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87ce8ffd86e000604b33c"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false}, "ships": [], "links": {"patch": {"small": "https://images2.imgbox.com/bc/a6/uDYvXvql_o.png", "large": "https://images2.imgbox.com/30/47/WmtGcjW8_o.png"}, "reddit": {"campaign": null, "launch": "http://www.reddit.com/r/spacex/comments/2vjm9e", "media": null, "recovery": null}, "flickr": {"small": [], "original": ["https://farm9.staticflickr.com/8619/16511407538_9a25c5d8c6_o.jpg", "https://farm9.staticflickr.com/8665/16697946612_1284e952b0_o.jpg", "https://farm9.staticflickr.com/8570/16698990475_16524a93de_o.jpg", "https://farm9.staticflickr.com/8681/16512864259_e849e496b1_o.jpg", "https://farm9.staticflickr.com/8637/16079045013_1f0fa b9b54_o.jpg", "https://farm9.staticflickr.com/8601/16512864369_2bb896c344_o.jpg", "https://farm9.staticflickr.com/8646/16697693861_a038331e0a_o.jpg", "https://farm9.staticflickr.com/8680/16511407248_093635a243_o.jpg", "https://farm9.staticflic

kr.com/8654/16511594820_451f194d53_o.jpg", "https://farm9.staticflickr.com/8683/16673054016_472fb42a20_o.jpg"]}, "presskit": "http://www.spacex.com/press/2015/02/11/dscovr-launch-update", "webcast": "https://www.youtube.com/watch?v=OvHJSIKP0Hg", "youtube_id": "OvHJSIKP0Hg", "article": "https://spaceflightnow.com/2015/02/12/space-weather-observatory-blasts-off-after-17-year-wait/", "wikipedia": "https://en.wikipedia.org/wiki/Deep_Space_Climate_Observatory"}, "static_fire_date_utc": "2015-01-31T00:00:00.000Z", "static_fire_date_unix": 1422662400, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "First launch under USAF's OSP 3 launch contract. First SpaceX launch to put 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": [], "ships": ["5ea6ed2e080df4800697c906", "5ea6ed2f080df4800697c90b", "5ea6ed2f080df4800697c90c"], "capsules": [], "payloads": ["5eb0e4bdb6c3bb0006eeb1f7"], "launchpad": "5e9e4501f589094ba4566f84", "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.imgur.com/2b/65/8Hd65fHz_o.png", "large": "https://images2.imgur.com/3f/c9/ZcpJ97M_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/8636/16510241278_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.imgur.com/75/39/T3U6xWM5_o.png", "large": "https://images2.imgur.com/c7/02/2XvCh1y0_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/7624/17170624462_e5949d160e_o.jpg", "https://farm8.staticflickr.com/7708/17170624462_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=csVpa2SiqH0", "youtube_id": "csVpa2SiqH0", "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"}]

ia.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"], "capsules": ["5e9e2c5cf359188bfb3b266b"], "payloads": ["5eb0e4bdb6c3bb0006eeb1fa"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 22, "name": "CRS-6", "date_utc": "2015-04-14T20:10:00.000Z", "date_unix": 1429842200, "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", "landpad": "5e9e3032383ecb761634e7cb"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cecfd86e000604b33f"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}}, "links": {"patch": {"small": "https://images2.imgur.com/a6/9b/IzWT1pYC_o.png", "large": "https://images2.imgur.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/8739/17140415959_38b5ee8bc6_o.jpg", "https://farm8.staticflickr.com/7735/16704192574_e3a0a6fac2_o.jpg"]]}, "presskit": {"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%93C3%BCrkmen%C3%84lem_52%C2%BBE/_MonacoSAT"}, "static_fire_date_utc": "2015-04-22T11:11:00.000Z", "static_fire_date_unix": 1429781060, "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.imgur.com/53/12/gFtc0QuX_o.png", "large": "https://images2.imgur.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/287/18999110888_6e153fed64_o.jpg"]]}, "presskit": {"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": "5e9e4501f506"}]

9894ba4566f84", "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.imgur.com/6a/7e/J7IQfBqq_o.png", "large": "https://images2.imgur.com/99/d4/0a1lpPw_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/597/23882553412_d41e4dcc64_o.jpg", "https://farm6.staticflickr.com/5806/23882550622_9ff8c90098_o.jpg", "https://farm1.staticflickr.com/571/23604164970_2a1a2366e4_o.jpg", "https://farm6.staticflickr.com/5773/23271687254_5e64d726ba_o.jpg", "https://farm6.staticflickr.com/5766/23526044959_5bfe74bc88_o.jpg", "https://farm6.staticflickr.com/5723/23785689832_83038751d1_o.jpg", "https://farm1.staticflickr.com/715/23833499336_d3fde6a25a_o.jpg"]}, "presskit": "https://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-space-x-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"], "landpad": "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": "5eb87ceeffd86e000604b342"}, {""fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgur.com/Ba/44/PSksE8jD_o.png", "large": "https://images2.imgur.com/d9/c9/57ioWDgW_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/41cvdm/", "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/1622/24127812378_87edc62046_o.jpg", "https://farm2.staticflickr.com/1508/24127811198_92ef932c96_o.jpg", "https://farm2.staticflickr.com/1591/23778325594_08231286fc_o.jpg", "https://farm2.staticflickr.com/1542/24038722499_34c10216a3_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/spacex_jason3_press_kit.pdf", "webcast": "https://www.youtube.com/watch?v=ivdKRJz16y0", "youtube_id": "ivdKRJz16y0", "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"}]

n 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": "5e9e4582f509092b78566f87", "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": "5eb87cf0ffd86e008604b343"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false}, "ships": [], "links": {"patch": {"small": "https://images2.imgur.com/7f/15/rjv54Es5_o.png", "large": "https://images2.imgur.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_bfd783f18a_o.jpg", "https://farm2.staticflickr.com/1641/25421381351_38390bcb8e_o.jpg", "https://farm2.staticflickr.com/1616/25514167315_b19b8a4365_o.jpg", "https://farm2.staticflickr.com/1482/24883160354_b03cef416_o.jpg", "https://farm2.staticflickr.com/1653/25420915781_8fc648b4a4_o.jpg", "https://farm2.staticflickr.com/1610/25486858116_9c06dfa59_o.jpg", "https://farm2.staticflickr.com/1617/25168697841_00ffff89bb_o.jpg", "https://farm2.staticflickr.com/1533/24631230984_83b1624807_o.jpg", "https://farm2.staticflickr.com/1627/25145624551_1b8743116f_o.jpg", "https://farm2.staticflickr.com/1622/25120540712_7fc1a5ed72_o.jpg", "https://farm2.staticflickr.com/1550/24585667074_aa712b13a8_o.jpg"]]}, "presskit": "http://www.spacex.com/sites/spacex/files/spacex_ses9_press_kit_final.pdf", "webcast": "https://www.youtube.com/watch?v=muDPSy07-A0", "youtube_id": "muDPSy07-A0", "article": "https://spaceflightnow.com/2016/03/05/tv-broadcasting-satellite-finally-launched-on-falcon-9/", "wikipedia": "https://en.wikipedia.org/wiki/SES-9"}, {"static_fire_date_utc": "2016-10-02T14:11:00.000Z", "static_fire_date_unix": 1475417460, "net": false, "window": 5400, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Second launch of the enhanced Falcon 9 Full Thrust launch vehicle. Following the launch, SpaceX attempted an experimental landing test to a drone ship, although a successful landing was not expected because launch mass exceeded previously indicated limit for a GTO there was little fuel left. As predicted, booster recovery failed: the spent first stage \\"landed hard\\", but the controlled-descent, atmospheric re-entry and navigation to the drone ship were successful and returned significant test data on bringing back high-energy Falcon 9s."}, {"crew": [], "ships": ["5ea6ed2f080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4beb6c3bb0006eeb1ff"], "launchpad": "5e9e4581f509094ba4566f84", "flight_number": 27, "name": "SES-9", "date_utc": "2016-03-04T23:35:00.000Z", "date_unix": 1457134580, "date_local": "2016-03-04T19:35:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a1f359188def3b263d", "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": "5eb87cf2ffd86e008604b344"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgur.com/72/1e/mA23xHqe_o.png", "large": "https://images2.imgur.com/36/d8/RyPKsTpC_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/4dtoly", "media": "https://www.reddit.com/r/spacex/comments/4dtpxn/", "recovery": "https://www.reddit.com/r/spacex/comments/4ee2zy"}, "flickr": {"small": [], "original": ["https://farm2.staticflickr.com/1633/25788014884_6a3f9ae183_o.jpg", "https://farm2.staticflickr.com/1650/26300505822_8b8b9035e8_o.jpg", "https://farm2.staticflickr.com/1486/25787998624_3ca213be1e_o.jpg", "https://farm2.staticflickr.com/1450/26326628831_e1b08ec0b3_o.jpg", "https://farm2.staticflickr.com/1670/26239028092_05e5e4c538_o.jpg", "https://farm2.staticflickr.com/1709/26305479266_76b4d01caf_o.jpg", "https://farm2.staticflickr.com/1645/26239017922_28c7ac50e0_o.jpg", "https://farm2.staticflickr.com/1559/26288402056_6c5997ce66_o.jpg", "https://farm2.staticflickr.com/1449/25709481274_60f8c77358_o.jpg", "https://farm2.staticflickr.com/1449/25709481274_60f8c77358_o.jpg"]]}}, {"static_fire_date_utc": "2016-10-02T14:11:00.000Z", "static_fire_date_unix": 1475417460, "net": false, "window": 5400, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Second launch of the enhanced Falcon 9 Full Thrust launch vehicle. Following the launch, SpaceX attempted an experimental landing test to a drone ship, although a successful landing was not expected because launch mass exceeded previously indicated limit for a GTO there was little fuel left. As predicted, booster recovery failed: the spent first stage \\"landed hard\\", but the controlled-descent, atmospheric re-entry and navigation to the drone ship were successful and returned significant test data on bringing back high-energy Falcon 9s."}]}

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The rocket's first stage landed smoothly on SpaceX's autonomous spaceport drone 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 B1021 was later also the first orbital booster to be used again, when launching SES-10 on March 30, 2017.", "crew": [], "ships": ["Sea6ed2e0880df4888697c986", "Sea6ed2f0880df4888697c98b", "Sea6ed2f0880df4888697c98c", "Sea6ed308880df4888697c912", "Sea6ed308880df4888697c913"], "capsules": ["5e9e2c5cf3591885d43b266d"], "payloads": ["5eb8e4bf6c3bb0006eeb200"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 28, "name": "CRS-8", "date_utc": "2016-04-08T20:43:00.000Z", "date_unix": 1460148180, "date_local": "2016-04-08T16:43:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a2f359182d0b3b263e", "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": "5eb87cf3ffd86e000604b345"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false}, "ships": []}, "links": {"patch": {"small": "https://images2.imgur.com/7a/98/zdo2mijx_o.png", "large": "https://images2.imgur.com/2a/47/az2sxGIB_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/4gyh8z", "launch": "https://www.reddit.com/r/spacex/comments/4htenu", "media": "https://www.reddit.com/r/spacex/comments/4htg2g"}, "recovery": "https://www.reddit.com/r/spacex/comments/4ihp1p"}, "flickr": {"small": [], "original": ["https://farm8.staticflickr.com/7340/27044931232_7b755276ec_o.jpg", "https://farm8.staticflickr.com/7444/27028105566_1d3413daa7_o.jpg", "https://farm8.staticflickr.com/7597/26778141961_e3bd237942_o.jpg", "https://farm8.staticflickr.com/7679/26778141661_559b48ac80_o.jpg", "https://farm8.staticflickr.com/7682/26778141401_c437b04b74_o.jpg", "https://farm8.staticflickr.com/7706/26751237322_ceb6d56235_o.jpg", "https://farm8.staticflickr.com/7677/26809210466_fc55835f3c_o.jpg", "https://farm8.staticflickr.com/7085/26809208046_d77bd31fd8_o.jpg", "https://farm8.staticflickr.com/7103/26809207316_cdc7d582e6_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/spacex_jcsat_press_kit_final.pdf", "webcast": "https://www.youtube.com/watch?v=L0bMeDj76ig", "youtube_id": "L0bMeDj76ig", "article": "https://spaceflightnow.com/2016/05/06/falcon-9-succeeds-in-middle-of-the-night-launch/", "wikipedia": "https://en.wikipedia.org/wiki/JCSAT-2B"}, "static_fire_date_utc": "2016-05-01T21:32:00.000Z", "static_fire_date_unix": 1462138320, "net": false, "window": 7200, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Launched the JCSAT 14 communications satellite for Tokyo-based SKY Perfect JSAT Corp. JCSAT 14 will support data networks, television broadcasters and mobile communications users in Japan, East Asia, Russia, Oceania, Hawaii and other Pacific islands. This was the first time a booster successfully landed after a GTO mission."}, "crew": [], "ships": ["5ea6ed2e0880df4888697c986", "5ea6ed2f0880df4888697c98b", "5ea6ed2f0880df4888697c98c"], "capsules": [], "payloads": ["5eb8e4bf6c3bb0006eeb201"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 29, "name": "JCSAT-2B", "date_utc": "2016-05-06T05:21:00.000Z", "date_unix": 1462512060, "date_local": "2016-05-06T01:21:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a2f35918077b3b263f", "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": "5eb87cf3ffd86e000604b346"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false}, "ships": []}, "links": {"patch": {"small": "https://images2.imgur.com/fa/f2/iRleKXRX_o.png", "large": "https://images2.imgur.com/84/d"}]

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e 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"}, {"core": "5eb87cfbf86e000604b34a"}], {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}}, {"links": {"patch": {"small": "https://images2.imgur.com/0d/Sb/8X01C3ov_o.png", "large": "https://images2.imgur.com/ff/19/KCI4DVla_o.png"}}, {"reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/4pv7jl1", "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": "5e9d0d95eda69973a809d1e"}, {"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": "5e9e28a2f35918ee83b2644"}, {"core": "5eb87cfbf86e000604b34b"}], {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}}, {"links": {"patch": {"small": "https://images2.imgur.com/89/2a/bkI6LN8R_o.png", "large": "https://images2.imgur.com/24/c3/9MKjv0dD_o.png"}}, {"reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/5nsaqm", "launch": "https://www.reddit.com/r/spacex/comments/5nsico"}, {"media": "https://www.reddit.com/r/spacex/comments/5oe9kk"}, {"recovery": "https://www.reddit.com/r/spacex/comments/5oe9kk"}, {"flickr": {"small": [], "original": [{"url": "https://farm1.staticflickr.com/658/32394688795_55a9873ea7_o.jpg", "url": "https://farm1.staticflickr.com/506/32394688095_a3339f3c6d_o.jpg", "url": "https://farm1.staticflickr.com/745/32394687645_63ae2b4740_o.jpg", "url": "https://farm1.staticflickr.com/318/31548291014_e3a30abca8_o.jpg", "url": "https://farm1.staticflickr.com/670/32351549066_e9cfffe8d2b_o.jpg", "url": "https://farm6.staticflickr.com/5556/32312421135_22c197c156_o.jpg", "url": "https://farm1.staticflickr.com/435/32312417695_19c0e50c4b_o.jpg", "url": "https://farm1.staticflickr.com/735/32312416415_b90892af0a_o.jpg", "url": "https://farm1.staticflickr.com/293/32312415025_cae16d1994_o.jpg", "url": "https://farm1.staticflickr.com/738/31467130724_92e02c9524_o.jpg", "url": "https://farm1.staticflickr.com/464/31467130374_9f7a7d380e_o.jpg", "url": "https://farm1.staticflickr.com/581/31467129424_bac77d594a_o.jpg", "url": "https://farm1.staticflickr.com/380/32308163845_c1731a4b1f_o.jpg", "url": "https://farm1.staticflickr.com/447/31450835954_72ed10a19e_o.jpg", "url": "https://farm1.staticflickr.com/507/31450834974_b8a3f4aca5_o.jpg"}]}, {"presskit": "https://drive.google.com/open?id=0BwA3a65ef10vZC1aU3FuMlQzalE"}, {"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_ut

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out by an expendable Falcon 9 instead.", "crew": [], "ships": [], "capsules": [], "payloads": ["5eb0e4c3b6c3bb0006eeb20d"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 40, "name": "Inmarsat-5 F4", "date_utc": "2017-05-15T23:21:00.000Z", "date_unix": 1494890460, "date_local": "2017-05-15T19:21:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a3f359186f3f3b2649", "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": "5eb87d01ffd86e000604b351"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgur.com/54/45/VoihQAY3_o.png", "large": "https://image.s2.imgur.com/2d/39/EAkUxxPk_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/6ektkt/", "launch": "https://www.reddit.com/r/spacex/comments/6emlzs/"}, "media": "https://www.reddit.com/r/spacex/comments/6emlzs/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4210/34696326768_cee662ef1f_o.jpg", "https://farm5.staticflickr.com/4279/34239858024_64795724c9_o.jpg", "https://farm5.staticflickr.com/4250/35043398436_3ceaa0098a_o.jpg", "https://farm5.staticflickr.com/4223/34272083563_f52e5bfff_o.jpg", "https://farm5.staticflickr.com/4219/34918571502_7cf66854f7_o.jpg", "https://farm5.staticflickr.com/4252/34918568732_4efe8885de_o.jpg", "https://farm5.staticflickr.com/4264/34272065153_cfd8899f3e_o.jpg", "https://farm5.staticflickr.com/4284/34948230531_e76b7560c9_o.jpg", "https://farm5.staticflickr.com/4280/35078830875_afbd41c675_o.jpg", "https://farm5.staticflickr.com/4280/34268361883_71fc70ff1a_o.jpg", "https://farm5.staticflickr.com/4199/35038651646_93d0339269_o.jpg", "https://farm5.staticflickr.com/4227/34223076793_4abe7e74d6_o.jpg"]]}, "presskit": "http://www.spacex.com/sites/spacex/files/crs11presskit.pdf", "webcast": "https://www.youtube.com/watch?v=JuZBOUMsYws", "youtube_id": "JuZBOUMsYws", "article": "https://spaceflightnow.com/2017/05/03/reused-dragon-cargo-capsule-launched-on-journey-to-space-station/", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX CRS-11"}, {"static_fire_date_utc": "2017-05-28T16:00:00.000Z", "static_fire_date_unix": 1495987200, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission delivered the Neutron Star Interior Composition Explorer (NICER) to the ISS, along with the MUSES Earth imaging platform and ROSA solar 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": ["5ea6ed300880df4000697c912"], "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": "RTL"}, {"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.imgur.com/fa/1b/3vvXwAf9_o.png", "large": "https://image.s2.imgur.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_rspace_x_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_9ab9d98417_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": 1497600000}

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The satellite has a mass of only 475 kg.", "crew": [], "ships": ["Sealed2e080df4000697c905", "5ea6ed2f080df4000697c910"], "capsules": [], "payloads": ["5eb0e4c4b6c3bb0006eeb213"], "launchpad": "5e9e4582f509092b78566f87", "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/cX8Z1EJQ_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/6u6qlt/x37b_otv5_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/6ygmfl/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/4384/37887808315_4dc9575d1b_o.jpg", "https://farm5.staticflickr.com/4363/36251815974_8b996dbbf_o.jpg", "https://farm5.staticflickr.com/4374/36251814644_1a469f63ee_o.jpg", "https://farm5.staticflickr.com/4388/36251812554_086581315f_o.jpg", "https://farm5.staticflickr.com/4355/36250895284_8c24cb4232_o.jpg", "https://farm5.staticflickr.com/4342/36689886898_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 upgrade.", "crew": [], "ships": ["Sealed2e080df4000697c906", "5ea6ed2f080df4000697c90b"], "capsules": [], "payloads": ["5eb0e4c5b6c3bb0006eeb214"], "launchpad": "5e9e4582f509094188566f88", "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": "5eb87d08ffd86e000604b358"}, {"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/MK5ibD8N_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/4509/37610548356_1b7d30001e_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_f9b21929c_o.jpg", "https://farm5.staticflickr.com/4471/36944884234_92ddc7fb39_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/iridium3presskit.pdf"}, {"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/cX8Z1EJQ_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/6u6qlt/x37b_otv5_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/6ygmfl/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/4384/37887808315_4dc9575d1b_o.jpg", "https://farm5.staticflickr.com/4363/36251815974_8b996dbbf_o.jpg", "https://farm5.staticflickr.com/4374/36251814644_1a469f63ee_o.jpg", "https://farm5.staticflickr.com/4388/36251812554_086581315f_o.jpg", "https://farm5.staticflickr.com/4355/36250895284_8c24cb4232_o.jpg", "https://farm5.staticflickr.com/4342/36689886898_99709e6934_o.jpg", "https://farm5.staticflickr.com/4364/36689885100_c3c427c6bf_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/iridium3presskit.pdf"}]

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Third time a first stage booster will be reused.", "crew": [], "ships": ["5ea6ed2f080df4000697c906", "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": "ASD S", "landpad": "5e9e3032383ecb6bb234e7ca"}]}, {"auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d0cffd86e000684b35a"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": false}, "ships": ["5ea6ed2e080df4000697c908"], "links": {"patch": {"small": "https://images2.imgur.com/bb/fa/vNIBtlSn_o.png", "large": "https://images2.imgur.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/koreasat5apr

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The satellite will be placed in GEO at 113°E East longitude, and will provide services ranging from broadband internet to broadcasting services and maritime communications.", "crew": [], "ships": ["5ea6ed2f080df4000697c90d", "5ea6ed2e880df4000697c908", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4c5b6c3bb0006e"], "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": "AS05", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d0dff86e0000604b35b"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgur.com/84/42/Ejb9KhGR_o.png", "large": "https://images2.imgur.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/7j60xz/rspacex_crs13_media_thread_videos_images_gifs/"}, "recovery": null}, "flickr": {"small": ["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"], "launchpad": "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": "5eb87d0eff86e0000604b35c"}, {"fairings": {"reused": false, "recover_y_attempt": false, "recovered": false}, "links": {"patch": {"small": "https://images2.imgur.com/85/43/6V5gldk0_o.png", "large": "https://images2.imgur.com/Sf/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_d2315f4c11_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": "wtdjCwo6

d3Q", "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": "5e9d8d95eda69973a809d1ec", "success": true, "failures": [], "details": "Reusing the booster first used on Iridium-2, but will be flying expendable.", "crew": [], "ships": ["5ea6ed2e080df48000697c908"], "capsules": [], "payloads": ["5eb0e4c6b6c3bb0006eeb219"], "launchpad": "5e9e450f509092b78566f87", "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": "5eb87d0ffd86e000684b35d"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgur.com/dc/7b/8HuZoJQU_o.png", "large": "https://images2.imgur.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_f66c7be98d_o.jpg", "https://farm5.staticflickr.com/4687/39585580001_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=0PWu3B8Rxn60", "youtube_id": "0PWu3B8Rxn60", "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": "5e9d8d95eda69973a809d1ec", "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": "5e9e450f509094ba4566f84", "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.imgur.com/e0/b5/G8QLLURl_o.png", "large": "https://images2.imgur.com/3b/6b/ovK7nEx5_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/7olw86/govsatl_ses16_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/7tvtbh/rspacex_govsatl_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/7tzzwy/rspacex_govsatl_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=5cYUAS1-POQ", "youtube_id": "5cYUAS1-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": "5e9d8d95eda69973a809d1ec", "success": true, "failures": [], "details": "Reused booster f

rom 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": ["Sea6ed2f080df4800697c98b"], "capsules": [], "payloads": ["Seb0e4c6b6c3bb0006eeb21b"], "launchpad": "5e9e4581f509094ba4566f84", "flight_number": 54, "name": "STS-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": "5eb87d13ffd86e000604b35f"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgur.com/cd/48/NVr0Dg2G_o.png", "large": "https://images2.imgur.com/97/11/mjn87zB5_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/7hjp83/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/4745/48110304192_b0165b7785_o.jpg", "https://farm5.staticflickr.com/4676/48110297852_6173e5cae6_o.jpg", "https://farm5.staticflickr.com/4615/48143096241_0324643b5e_o.jpg", "https://farm5.staticflickr.com/4782/48110298232_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/4627/48126462801_d54b4f00be_o.jpg", "https://farm5.staticflickr.com/4760/48126462231_cdf00ef431_o.jpg", "https://farm5.staticflickr.com/4655/48202121122_5d29cfe2ac_o.jpg", "https://farm5.staticflickr.com/4631/39337245145_5f5630a66a_o.jpg", "https://farm5.staticflickr.com/4650/48126461851_14b93ec9d7_o.jpg", "https://farm5.staticflickr.com/4711/48126461411_b1ed283d45_o.jpg", "https://farm5.staticflickr.com/4696/48126460511_7b5cc64871_o.jpg", "https://farm5.staticflickr.com/4589/38583831555_9ae89f5c18_o.jpg", "https://farm5.staticflickr.com/4682/38583829815_e01509d1a7_o.jpg", "https://farm5.staticflickr.com/4731/39225582881_88594d5d91_o.jpg", "https://farm5.staticflickr.com/4641/39225582421_7aa0c65851_o.jpg", "https://farm5.staticflickr.com/4681/39225582171_137a4c75e7_o.jpg", "https://farm5.staticflickr.com/4644/39225582351_ac6aba2533_o.jpg", "https://farm5.staticflickr.com/4587/27449864329_d2424bc280_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=wbSwFU6tYic", "youtube_id": "wbSwFU6tYic", "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 boosters landed simultaneously at adjacent ground pads. Drone ship landing of the central core failed. Final burn to heliocentric mars-earth orbit was successful after the second stage and payload passed through the Van Allen belts."}, {"crew": [], "ships": ["Sea6ed2f080df4800697c98c", "Sea6ed2f080df4800697c98d", "Sea6ed30000df4800697c913"], "capsules": [], "payloads": ["Seb0e4c6b6c3bb0006eeb21c"], "launchpad": "5e9e4582f509094188566f88", "flight_number": 55, "name": "Falcon Heavy Test Flight", "date_utc": "2018-02-06T20:45:00.000Z", "date_unix": 1517949900, "date_local": "2018-02-06T15:45:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a2f359187f703b2653", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": false, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}, {"core": "5e9e28a2f359187f273b2642", "flight": 2, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "RTL S", "landpad": "5e9e3032383ecb90a834e7c8"}, {"core": "5e9e28a2f3591845c73b2640", "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": "5eb87d13ffd86e000604b360"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": false, "ship": null}]}]

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Will also carry two SpaceX test satellites for the upcoming Starlink constellation.", "crew": [], "ships": ["5ea6ed2e0880df4000697c908"], "capsules": [], "payloads": ["5eb0e4c6b6c3bb0006eeb21d", "5eb0e4c6b6c3bb0006eeb21e"], "launchpad": "5e9e4502f5090992b78566f87", "flight_number": 56, "name": "Paz / Starlink Demo", "date_utc": "2018-02-22T14:17:00.000Z", "date_unix": 1519309020, "date_local": "2018-02-22T06:17:00-08:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a4f359182d843b264e", "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": "5eb87d14ffd86e000604b361"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false}, "ships": []}, "link": {"patch": {"small": "https://images2.imgbox.com/53/b7/HHAy8Wkp_o.png", "large": "https://images2.imgbox.com/66/4e/eQQ5QrXp_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/7r5pyn/hispasat_30w6_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/7r5pyn/hispasat_30w6_launch_campaign_thread/", "media": "https://www.reddit.com/r/spacex/comments/825asx/rspacex_hispasat_30w6_media_thread_videos_images/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4753/25798223907_36e7b59efa_o.jpg", "https://farm5.staticflickr.com/4666/38850799080_e17426795c_o.jpg", "https://farm5.staticflickr.com/4758/40660917561_daa8feea04_o.jpg", "https://farm5.staticflickr.com/4622/39951085264_b5deeed6c9_o.jpg", "https://farm5.staticflickr.com/4772/39951085474_77be77c227_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/hispasat30w6_presskit.pdf", "webcast": "https://www.youtube.com/watch?v=Kpfrp-GMKKM", "youtube_id": "Kpfrp-GMKKM", "article": "https://spaceflightnow.com/2018/03/06/hefty-hispasat-satellite-rides-spacex-rocket-into-orbit/"}, "wikipedia": "https://en.wikipedia.org/wiki/Hispasat_30W-6"}, "static_fire_date_utc": "2018-02-21T03:46:00.000Z", "static_fire_date_unix": 1519184760, "net": false, "window": 7200, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Launched 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": ["5ea6ed2e0880df4000697c908"]}], "links": {"patch": {"small": "https://images2.imgbox.com/55/c6/8sNQh2b6_o.png", "large": "https://images2.imgbox.com/23/bc/mq59502o_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/88114"}]

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first Falcon 9 booster to fly three missions.", "crew": [], "ships": ["5ea6ed2f0880df4000697c90d", "5ea6ed300080df4000697c913"], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22a"], "launchpad": "5e9e4501f50994ba4566f84", "flight_number": 67, "name": "Merah Putih", "date_utc": "2018-08-07T05:18:00.000Z", "date_unix": 1533619880, "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.imgur.com/55/54/73ExeMfo_o.png", "large": "https://images2.imgur.com/fd/59/nv3lh3Am_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/comment/s9erxlh/telstar_18_vantage_recovery_thread/"}, "flickr": {"small": [], "original": ["https://farm2.staticflickr.com/1878/43698848845_492ef182dd_o.jpg", "https://farm2.staticflickr.com/1856/43881229684_6d42e838b6_o.jpg", "https://farm2.staticflickr.com/1852/43881223784_93777e34af_o.jpg", "https://farm2.staticflickr.com/1841/43881217094_558b7b214e_o.jpg", "https://farm2.staticflickr.com/1869/43881193934_423ef8c86_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/telstar18vantagewpresskit.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": ["5ea6ed300080df4000697c913", "5ea6ed2f0880df4000697c90d", "5ea6ed2f0880df4000697c90b"], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22b"], "launchpad": "5e9e4501f50994ba4566f84", "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.imgur.com/cb/41/RQIV8BjQ_o.png", "large": "https://images2.imgur.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/1948/44262177535_9582184d3f_o.jpg", "https://farm2.staticflickr.com/1917/30234800687_fd94fd151_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-first-rocket-landing-in-california-after-launching-argentine-satellite/", "wikipedia": "https://en.wikipedia.org/wiki/SAOCOM"}, "static_fire_date_utc": "2018-10-08T21:00:00.000Z", "static_fire_date_unix": 1538514000, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX's sixteenth flight of 2018 was the first launch of the Saocom Earth observation saocom1a"}]

tellite constellation of the Argentine Space Agency CONAE. The second launch of 5 aocom 1B will happen in 2019. This flight marked the first RTLS launch out of Van denberg, with a landing on the concrete pad at SLC-4W, very close to the launch pad.", "crew": [], "ships": [], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22c"], "launchpad": "5e9e4582f509092b78566f87", "flight_number": 69, "name": "SAOCOM 1A", "date_utc": "2018-10-08T02:22:00.000Z", "date_unix": 1538965320, "date_local": "2018-10-08T19:22:00-07:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f3591809c03b2658", "flight": 2, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb554034e7c9"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d23ffd86e000604b36e"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false}, "ships": [], "links": {"patch": {"small": "https://images2.imgur.com/ad/40/oCtCFYfl_o.png", "large": "https://images2.imgur.com/7c/8a/j6Hu3TqR_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/9p82jt/eshail_2_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/9x9w9v/rspacex_eshail_2_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/9xaat76/rspacex_eshail_2_media_thread_videos_images_gifs/", "recovery": "https://www.reddit.com/r/spacex/comments/9xmpa7/eshail_2_recovery_thread/"}, "flickr": {"small": [], "original": [{"https://farm5.staticflickr.com/4834/32040174268_b71d703417_o.jpg", "https://farm5.staticflickr.com/4810/32040174058_a65fa64e85_o.jpg", "https://farm5.staticflickr.com/4814/32040173268_8ab571e7bc_o.jpg", "https://farm5.staticflickr.com/4899/32040173568_bb5c991565_o.jpg", "https://farm5.staticflickr.com/4875/32040173278_b5578ba6be_o.jpg", "https://farm5.staticflickr.com/4888/32040173928_afdfb09939_o.jpg", "https://farm5.staticflickr.com/4888/32040173048_b2b29c020f_o.jpg", "https://farm5.staticflickr.com/4887/31180979107_da6a935c20_o.jpg"}]}, "presskit": "https://www.spacex.com/sites/spacex/files/eshail-2_mission_press_kit_11_14_2018.pdf", "webcast": "https://www.youtube.com/watch?v=PhTbzc-BqKs&feature=youtu.be", "youtube_id": "PhTbzc-BqKs", "article": "https://spaceflightnow.com/2018/11/15/spacex-launches-qatars-eshail-2-communications-satellite/", "wikipedia": "https://en.wikipedia.org/wiki/EshailSat"}, "static_fire_date_utc": "2018-11-12T18:13:00.000Z", "static_fire_date_unix": 1542046380, "net": false, "window": 6180, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX's eighteenth flight of 2018 was its first for Es'hailSat. Es'hail-2 is a communications satellite delivering television and internet 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 OCISLY.", "crew": [], "ships": ["5ea6ed2f080df4000697c90d", "5ea6ed300080df4000697c913"], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22d"], "launchpad": "5e9e4582f509094188566f88", "flight_number": 70, "name": "Es'hail-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", "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": "5eb87d24ffd86e000604b36f"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": false}, "ships": ["5ea6ed2e0800df4000697c908"], "links": {"patch": {"small": "https://images2.imgur.com/48/3b/Lg1Qc4uX_o.png", "large": "https://images2.imgur.com/3e/87/xYszAJQc_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/9raysi/ssoa_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/a0wyif/rspacex_ssoa_official_launch_discussion_updates/", "media": "https://old.reddit.com/r/spacex/comments/a0wyif/rspacex_ssoa_media_thread_videos_images_gifs/"}, "recovery": "https://www.reddit.com/r/spacex/comments/a2tjoe/ssoa_recovery_thread/"}, "flickr": {"small": [], "original": [{"https://farm5.staticflickr.com/4875/45257565145_d53757e0b2_o.jpg", "https://farm5.staticflickr.com/4839/45257565835_4fd6f3e895_o.jpg", "https://farm5.staticflickr.com/4822/45257566865_9c9d34a7ca_o.jpg", "https://farm5.staticflickr.com/4821/45257568225_186c8431cf_o.jpg", "https://farm5.staticflickr.com/4885/45257569445_1d74a601df_o.jpg", "https://farm5.staticflickr.com/4869/45257578925_Beae9a0888_o.jpg", "https://farm5.staticflickr.com/4842/31338804427_2e4dcda6e7_o.jpg", "https://farm5.staticflickr.com/4894/46227271292_2eee9af3eb_o.jpg", "https://farm5.stat"}]}]

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er, likely carrying some cargo to the International Space Station. The booster is expected to land on OCISLY.", "crew": [], "ships": ["5ea6ed300880df4000697c913"], "capsules": ["5e9e2c5df35918b1063b2671"], "payloads": ["5eb0e4ccb6c3bb0006eeb235"], "landpad": "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": "5e9e28a6f35918c0003b265c", "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": ["5ea6ed2f0880df4000697c90c"]}, {"links": {"patch": {"small": "https://images2.imgur.com/14/18/JxCyAHXk_o.png", "large": "https://images2.imgur.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/7884/40628440983_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/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/spacex-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": 155445820, "net": false, "window": 7020}, {"rocket": "5e9d0d9Seda69974db09d1ed", "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": ["5ea6ed2f0880df4000697c90e", "5ea6ed300880df4000697c913", "5ea6ed2f0880df4000697c90b", "5ea6ed2e0880df4000697c909", "5ea6ed2f0880df4000697c90c"]}, {"capsules": [], "payloads": ["5eb0e4ccb6c3bb0006eeb236"]}, {"landpad": "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": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}, {"core": "5e9e28a6f359188fd53b265e", "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": "5eb87d2bffd86e000604b376"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgur.com/97/8e/YbVKIUZB_o.png", "large": "https://images2.imgur.com/0d/05/zH7YqlRe_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/bd2128/crs17_launch_campaign_thread/"}}, {"launch": "https://www.reddit.com/r/spacex/comments/bjsm0v/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/65535/46856594435_206c773b5a_o.jpg"]}], "links": {"patch": {"small": "https://images2.imgur.com/97/8e/YbVKIUZB_o.png", "large": "https://images2.imgur.com/0d/05/zH7YqlRe_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/bd2128/crs17_launch_campaign_thread/"}}, {"launch": "https://www.reddit.com/r/spacex/comments/bjsm0v/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/65535/46856594435_206c773b5a_o.jpg"]]}]

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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", "5ea6ed2f0880df4000697c908e", "5ea6ed2f0880df4000697c90b"], "capsules": ["5e9e2c5cf3591869b63b2678"], "payloads": ["5eb0e4ccb6c3bb0006eeb237"], "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": ["5ea6ed2f0880df4000697c90c"]}], "links": {"patch": {"small": "https://images2.imgbox.com/79/ec/T0E2PB3q_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/65535/47926137017_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": "5e9d0d95eda69973a889d1ec", "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", "5ea6ed2f0880df4000697c90c", "5ea6ed2f0880df4000697c90e", "5ea6ed2f0880df4000697c90b", "5ea6ed2e0880df4000697c909"], "capsules": [], "payloads": ["5eb0e4ccb6c3bb0006eeb238"], "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": "5eb87d30fffd86e000604b378"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2f0880df4000697c90c"]]}]

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contracted flights for NASA, this launch will deliver essential supplies to the I
nternational Space Station using the reusable Dragon 1 cargo spacecraft. The exte
rnal payload for this mission is International Docking Adapter 3, replacing IDA-1
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back at CCAFS LZ-1.", "crew": [], "ships": [], "capsules": ["5e9e2c5cf359188fbf3b266
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Amos-17 carries multi-band high throughput and regional beams servicing Africa, Europe and the Middle 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 expected.", "crew": [], "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c909"], "capsules": [], "payloads": ["5eb0e4cfb6c3bb0006eeb24b"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 83, "name": "Amos-17", "date_utc": "2019-08-06T22:52:00Z", "date_unix": 1565131920, "date_local": "2019-08-06T18:52:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f359181eed3b2657", "flight": 3, "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": "5eb87d37ffd86e000684b37c"}, {"fairings": {"reused": true, "recovery_attempt": false, "recovered": false, "ships": []}}, "links": {"patch": {"small": "https://images2.imgur.com/61/a6/1MnnbXIF_o.png", "large": "https://images2.imgur.com/3a/d1/R1MaGiiV_o.png"}}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/dgqcb6/2nd_starlink_mission_launch_campaign_thread", "launch": "https://www.reddit.com/r/spacex/comments/du07rt/rspacex_starlink1_official_launch_discussion", "media": "https://www.reddit.com/r/spacex/comments/durx53/rspacex_starlink_1_media_thread_videos_images"}, "recovery": "https://www.reddit.com/r/spacex/comments/du1uu/starlink1_booster_and_fairing_recovery_discussion"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/49051988851_0b422e1603_o.jpg", "https://live.staticflickr.com/65535/49051988746_1a97e38ca8_o.jpg", "https://live.staticflickr.com/65535/49052201452_c3b01e37f0_o.jpg", "https://live.staticflickr.com/65535/49051988636_3714a78787_o.jpg", "https://live.staticflickr.com/65535/49051477088_d86104481d_o.jpg"]]}, "presskit": "https://www.spacex.com/sites/spacex/files/starlink_press_kit_nov2019.pdf", "webcast": "https://youtu.be/pIDuv0Ta0XQ", "youtube_id": "pIDuv0Ta0XQ", "article": "https://spaceflightnow.com/2019/11/11/Successful-launch-continues-deployment-of-spacexs-starlink-network"}, "wikipedia": "https://en.wikipedia.org/wiki/Starlink_(satellite_constellation)"}, "static_fire_date_utc": "2019-11-11T12:08:00Z", "static_fire_date_unix": 1573474080, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission will launch the first batch of Starlink version 1.0 satellites, from SLC-40, Cape Canaveral AF5. They are expected to contribute to the 550 km x 53°E shell. It is the second 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", "5ea6ed2f080df4000697c90d"], "capsules": [], "payloads": ["5eb0e4cfb6c3bb0006eeb24c"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 84, "name": "Starlink-1", "date_utc": "2019-11-11T14:56:00Z", "date_unix": 1573484160, "date_local": "2019-11-11T09:56:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f3591809c03b2658", "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": "5eb87d39ffd86e000604b37d"}, {"fairings": null}, "links": {"patch": {"small": "https://images2.imgur.com/5d/26/zP75I11j_o.png", "large": "https://images2.imgur.com/6e/76/jVcSQg0K_o.png"}}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/e0upb3/crs19_launch_campaign_thread", "launch": "https://www.reddit.com/r/spacex/comments/e5r8hj/rspacex_crs19_of"}]

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d upper stage are expected to break up following capsule separation and there will be no landing attempt.", "crew": [], "ships": ["5ea6ed2f880df4000697c90c"], "capsules": ["5e9e2c5df359184c9a3b2672"], "payloads": ["5eb0e4d0b6c3bb0006eeb250"], "launchpad": "5e9e4502f500094188566f88", "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": "5eb87d3dff86e000604b381"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true}, "ships": ["5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgur.com/3a/c6/ueu9Acjh_o.png", "large": "https://images2.imgur.com/1c/55/xNcIOR8Z_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/contests/eofSpr/starlink3_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/eudve3/rspacex_starlink_3_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/evjdws/rspacex_starlink3_media_thread_videos_images_gifs/", "recovery": "https://www.reddit.com/r/spacex/comments/evnyij/rspacex_starlink3_recovery_discussion_updates/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/49461673512_f4e01c8b27_o.jpg", "https://live.staticflickr.com/65535/49461673792_b1804c2a2b_o.jpg", "https://live.staticflickr.com/65535/49461673787_cb7fc4a3a8_o.jpg", "https://live.staticflickr.com/65535/49461673552_65cc294f82_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/starlink_press_kit_jan272020.pdf", "webcast": "https://youtu.be/1KmBDCil7MU", "youtube_id": "1KmBDCil7MU", "article": "https://spaceflightnow.com/2020/01/29/spacex-boasts-60-more-starlink-satellites-into-orbit-after-weather-delays/"}, "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_Starlink"}, "static_fire_date_utc": "2020-01-28T13:17:00.000Z", "static_fire_date_unix": 1580526220, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission will launch the third batch of Starlink version 1.0 satellites, from SLC-40, Cape Canaveral AFS. It is the fourth Starlink launch overall. The satellites will be delivered to low Earth orbit and will spend a few weeks maneuvering to the final operational altitude of 550 km. The booster for this mission is expected to land on OCISLY."}, {"crew": [], "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ea6ed30080df4000697c913"], "payloads": ["5eb0e4d0b6c3bb0006eeb251"], "launchpad": "5e9e4501f500094ba4566f84", "flight_number": 89, "name": "Starlink-3", "date_utc": "2020-01-29T14:00:00.000Z", "date_unix": 1580306760, "date_local": "2020-01-29T09:00:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f35918c0803b265c", "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": "5eb87d3fff86e000604b382"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": false}, "ships": ["5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgur.com/4f/07/GJWgTmKM_o.png", "large": "https://images2.imgur.com/98/7c/MlD6s04z_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/ex0ilm/starlink4_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/f4d8sg/rspacex_starlink4_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/f56ab4/rspacex_starlink4_media_thread_videos_images_gifs/"}, "recovery": "https://www.reddit.com/r/spacex/comments/f5es7j/rspacex_starlink4_recovery_discussion_updates/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/49549822817_18738a2552_o.jpg", "https://live.staticflickr.com/65535/49548795221_edd6dc7ef6_o.jpg", "https://live.staticflickr.com/65535/49549822857_d4dbd6a492_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/fifth_starlink_press_kit.pdf", "webcast": "https://youtu.be/8xeX62mLcf8", "youtube_id": "8xeX62mLcf8", "article": "https://spaceflightnow.com/2020/02/17/spacex-delivers-more-starlink-satellites-to-orbit-booster-misses-drone-ship-landing/"}, "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_Starlink"}, "static_fire_date_utc": "2020-02-14T08:31:00.000Z", "static_fire_date_unix": 1581669060, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": []}, {"details": "This mission will 1"}]

aunch the fourth batch of Starlink version 1.0 satellites, from SLC-40, Cape Canaveral AFS. It is the fifth 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 OCISL Y.", "crew": [], "ships": ["Sea6ed2e0880df4800697c988", "5ea6ed2e080df4000697c907", "Sea6ed2f0880df4000697c90b", "Sea6ed30080df4800697c913", "5ea6ed2f080df4000697c90d"], "capsules": [], "payloads": ["5eb0e4d0b6c3bb0006eeb252"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 90, "name": "Starlink-4", "date_utc": "2020-02-17T15:05:55.000Z", "date_unix": 1581951955, "date_local": "2020-02-17T10:05:55-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591809313b2660", "flight": 4, "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": "5eb87d41ffd86e000604b383"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgur.com/9b/93/k1hCBIG8_o.png", "large": "https://images2.imgur.com/dd/58/KsiuGQL4_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/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/65535/49636202572_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": 15830556631, "date_local": "2020-03-06T23:50:31-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f359187af3b2662", "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": ["Sea6ed2e080df4000697c908"], "links": {"patch": {"small": "https://images2.imgur.com/dc/14/DllaYbf_o.png", "large": "https://images2.imgur.com/e4/fd/2NP1Cwzs_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-satellite-s/", "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_ut

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The booster will land on a drone ship approximately 628 km downrange.", "crew": [], "ships": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90d"], "capsules": [], "payloads": ["5eb8e4d0b6c3bb0006eeb254"], "launchpad": "5e9e4502f509094188566fa8", "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_attempt": false, "recovered": null}, "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2f080df4000697c90d"]}], "links": {"patch": {"small": "https://images2.imgbox.com/ef/36/h10Ds3kT_o.png", "large": "https://images2.imgbox.com/ab/12/2cQPNTCZ_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/fxkc7k/starlink6_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/g5jmx0/rspacex_starlink_6_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/g5fqka/rspacex_starlink6_media_thread_photographer/", "recovery": "https://www.reddit.com/r/spacex/comments/g6kztd/rspacex_starlink_v1_16_recovery_discussion/"}, "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/65535/49806771628_fef13c852d_o.jpg", "https://live.staticflickr.com/65535/49807633862_e5abcb41a6_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/seventh_starlink_mission_overview.pdf", "webcast": "https://youtu.be/w5ge0I7pwFI", "youtube_id": "w5ge0I7pwFI", "article": "https://spaceflightnow.com/2020/04/22/spacexs-starlink-network-surpasses-400-satellite-mark-after-successful-launch/", "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc": "2020-04-17T11:48:00.000Z", "static_fire_date_unix": 1587687810, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission will launch the sixth batch of operational Starlink satellites, which are expected to be version 1.0, from SLC-40, Cape Canaveral AFS. It is the seventh 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 OCISLY.", "crew": [], "ships": ["5ea6ed30080df4000697c913", "5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ee68c683c228f36bd5809b5"], "capsules": [], "payloads": ["5eb8edd1b6c3bb0006eeb255"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 93, "name": "Starlink-6", "date_utc": "2020-04-22T19:30:00.000Z", "date_unix": 1587583800, "date_local": "2020-04-22T15:30:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f35918c0803b265c", "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": "5eb87d44ffd86e000604b386"}, {"fairings": null}, "links": {"patch": {"small": "https://images2.imgbox.com/48/a8/LTqq80rE_o.png", "large": "https://images2.imgbox.com/e3/b7/DeT7QTkx_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/fjf6rr/dm2_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/glwz6n/rspacex_cctcap_demonstration_mission_2_general/", "media": "https://www.reddit.com/r/spacex/comments/gplgf5/rspacex_dm2_media_thread_photographer_contest/"}, "recovery": "https://www.reddit.com/r/spacex/comments/gu5gkd/cctcap_demonstration_mission_2_stage_1_recovery/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/49927519643_b43c6d4c44_o.jpg", "https://live.staticflickr.com/65535/49927519588_8a39a3994f_o.jpg", "https://live.staticflickr.com/65535/49928343022_6fb33cbd9c_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/seventh_starlink_mission_overview.pdf", "webcast": "https://youtu.be/w5ge0I7pwFI", "youtube_id": "w5ge0I7pwFI", "article": "https://spaceflightnow.com/2020/04/22/spacexs-starlink-network-surpasses-400-satellite-mark-after-successful-launch/", "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc": "2020-04-22T19:30:00.000Z", "static_fire_date_unix": 1587583800, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission will launch the sixth batch of operational Starlink satellites, which are expected to be version 1.0, from SLC-40, Cape Canaveral AFS. It is the seventh 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 OCISLY.", "crew": [], "ships": ["5ea6ed30080df4000697c913", "5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ee68c683c228f36bd5809b5"], "capsules": [], "payloads": ["5eb8edd1b6c3bb0006eeb255"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 93, "name": "Starlink-6", "date_utc": "2020-04-22T19:30:00.000Z", "date_unix": 1587583800, "date_local": "2020-04-22T15:30:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f35918c0803b265c", "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": "5eb87d44ffd86e000604b386"}, {"fairings": null}, "links": {"patch": {"small": "https://images2.imgbox.com/48/a8/LTqq80rE_o.png", "large": "https://images2.imgbox.com/e3/b7/DeT7QTkx_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/fjf6rr/dm2_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/glwz6n/rspacex_cctcap_demonstration_mission_2_general/", "media": "https://www.reddit.com/r/spacex/comments/gplgf5/rspacex_dm2_media_thread_photographer_contest/"}, "recovery": "https://www.reddit.com/r/spacex/comments/gu5gkd/cctcap_demonstration_mission_2_stage_1_recovery/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/49927519643_b43c6d4c44_o.jpg", "https://live.staticflickr.com/65535/49927519588_8a39a3994f_o.jpg", "https://live.staticflickr.com/65535/49928343022_6fb33cbd9c_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/seventh_starlink_mission_overview.pdf", "webcast": "https://youtu.be/w5ge0I7pwFI", "youtube_id": "w5ge0I7pwFI", "article": "https://spaceflightnow.com/2020/04/22/spacexs-starlink-network-surpasses-400-satellite-mark-after-successful-launch/", "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc": "2020-04-22T19:30:00.000Z", "static_fire_date_unix": 1587583800, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission will launch the sixth batch of operational Starlink satellites, which are expected to be version 1.0, from SLC-40, Cape Canaveral AFS. 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Barring unexpected developments, this mission will be the first crewed flight to launch from the United States since the end of the Space Shuttle program in 2011. DM-2 demonstrates the Falcon 9 and 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": ["5ea6ed30080df40000697c913", "5ea6ed2f0800df40000697c98b", "5ea6ed2f0800df40000697c98c", "5ea6ed2e0800df40000697c989", "5ea6ed2f0800df40000697c98d"], "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": ["5ea6ed2e0800df40000697c988", "5ea6ed2e0800df40000697c987"]}, "links": {"patch": {"small": "https://images2.imgbox.com/14/8a/x2EgeeM4_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/rspace_x_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/65535/49970682683_e6333945ee_o.jpg"]}], "presskit": "https://spacextime.machine.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": ["5ea6ed2e0800df40000697c988", "5ea6ed2e0800df40000697c987", "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, "reuse": true}]}]

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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":"5eb87d4affd86e000604b38b"}, {"fairings":{"reused":null,"recovery_attempt":true,"recovered":true,"ships":["Sea6ed2e880df4000697c908","Sea6ed2e080df4000697c907"]}, "links":{"patch":{"small":"https://images2.imgur.com/c3/19/YmxxZMLw_o.png","large":"https://images2.imgur.com/d4/0b/QdfjLsV3_o.png"}, "reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/hkbhqo/anasisii_launch_campaign_thread","launch":"https://www.reddit.com/r/spacex/comments/hu6sci/rspacex_anasisii_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/hundpv/rspacex_anasisii_media_thread_photographer_contest/","recovery":"https://www.reddit.com/r/spacex/comments/hvgjk9/anasisii_recovery_thread/"}, "flickr":{"small":[],"original":["https://live.staticflickr.com/65535/50136967628_eda99b6353_o.jpg","https://live.staticflickr.com/65535/50137510881_4618ba6c84_o.jpg"], "presskit":null,"webcast":"https://youtu.be/TshvZlQ7le8","youtube_id":"TshvZlQ7le8"}, "article":"https://spaceflightnow.com/2020/07/20/spacex-delivers-south-korea-first-military-satellite-into-on-target-orbit/","wikipedia":null}, "static_fire_date_utc":"2020-07-11T17:58:00.000Z","static_fire_date_unix":1594490280,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch ANASIS-II, a South Korean geostationary military communication satellite from LC-39A, Kennedy Space Center. It will be South Korea's first dedicated military communications satellite. Falcon 9 will deliver the satellite to a geostationary transfer orbit. The booster is expected to land downrange on an ASDS."}, "crew":[],"ships":["Sea6ed2e880df4000697c908","Sea6ed2e080df4000697c907"], "capsules":[],"payloads":["5eb0e4d2b6c3bb8006eeb25b"]}, "launchpad":"5e9e4501f589094ba4566f84","flight_number":98,"name":"ANASIS-II","date_utc":"2020-07-20T21:30:00.000Z","date_unix":1595280600,"date_local":"2020-07-20T17:30:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a7f3591817f23b2663","flight":2,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASD S","landpad":"5e9e3033383ecbb9e534e7cc"}]}, "auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d50ffd86e000604b394"}, {"fairings":{"reused":null,"recovery_attempt":true,"recovered":true,"ships":["Sea6ed2e080df4000697c908","Sea6ed2e080df4000697c907"]}, "links":{"patch":{"small":"https://images2.imgur.com/ac/ad/FhIfqkTq_o.png","large":"https://images2.imgur.com/2f/4f/Mk46ah9f_o.png"}, "reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/h8mold/starlink9_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/i4ozw3/rspacex_starlink9_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/hg499n/rspacex_starlink9_media_thread_photographer/","recovery":"https://www.reddit.com/r/spacex/comments/i5smhk/starlink_9blacksky_recovery_thread/"}, "flickr":{"small":[],"original":["https://live.staticflickr.com/65535/50198901143_0bb53a499e_o.jpg","https://live.staticflickr.com/65535/50199448011_35d0e9c8bf_o.jpg"], "presskit":null,"webcast":"https://youtu.be/KU6KogxG58E","youtube_id":"KU6KogxG58E"}, "article":"https://spaceflightnow.com/2020/08/07/spacex-closes-out-busy-week-with-launch-of-more-starlink-satellites/","wikipedia":"https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc":"2020-08-24T18:18:00.000Z","static_fire_date_unix":1593022680,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"This mission will launch the ninth batch of operational Starlink satellites, which are expected to be version 1.0, from LC-39 A, Kennedy Space Center. It is the tenth 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 includes a rideshare of two BlackSky satellites on top of the Starlink stack. The booster for this mission is expected to land an ASDS."}, "crew":[],"ships":["Sea6ed2e080df4000697c907","Sea6ed300880df4000697c913","See68c683c228f36bd5809b5"], "capsules":[],"payloads":["5ed9858b1f30554830d45c3e","5ee522e32f1f3d474c758123"]}, "launchpad":"5e9e4502f509094188566f88","flight_number":99,"name":"Starlink-9 (v1.0) & BlackSky Global 5-6","date_utc":"2020-08-07T05:12:00.000Z","date_unix":159677712}

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ds Sequoia, and GNOMES-1. This will be the first polar launch from the Space Coast in 60 years. The launch azimuth will be southward and the booster will land at LZ-1.", "crew": [], "ships": ["5ea6ed2e880df4800697c907"], "capsules": [], "payloads": ["5eb0e4d1b6c3bb0006eeb259"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 101, "name": "SAOCOM 1B, GNOMES-1, Tyvak-0172", "date_utc": "2020-08-30T23:18:00.000Z", "date_unix": 1598829480, "date_local": "2020-08-30T19:18:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f359187af3b2662", "flight": 4, "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": "5eb87d47ffd86e000604b38a"}, {"fairings": {"reused": null, "recovery_attempt": true, "recovered": null, "ships": ["5ea6ed2e880df4800697c908"]}], "links": {"patch": {"small": "https://images2.imgbox.com/38/09/y5tzn5Er_o.png", "large": "https://images2.imgbox.com/83/11/smudwRMI_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/i63bst/starlink_general_discussion_and_deployment_thread/", "launch": "https://www.reddit.com/r/spacex/comments/iip8h3/rspacex_starlink11_launch_discussion_updates/", "media": "https://www.reddit.com/r/spacex/comments/ij8mxr/rspacex_starlink11_saocom_1b_media_thread/", "recovery": null}, "flickr": {"small": [], "original": []}, "presskit": null, "webcast": "https://youtu.be/_j4xR7LMCGY", "youtube_id": "_j4xR7LMCGY", "article": null, ".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 will launch the eleventh batch of operational Starlink satellites, which are expected to be version 1.0, from SLC-40, Cape Canaveral Air Force Station. It is the twelfth 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 an ASDS."}, {"crew": [], "ships": ["5ea6ed2e880df4800697c908", "5ea6ed2f0880df4800697c90b"], "capsules": [], "payloads": ["5ef6a4680059c33cee4a829e"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 102, "name": "Starlink-11 (v1.0)", "date_utc": "2020-09-03T08:46:00-04:00", "date_unix": 1599137160, "date_local": "2020-09-03T08:46:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5ef670f10059c33cee4a826c", "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": "5ef6a1e90059c33cee4a828a"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2e080df4800697c907", "5ea6ed2e080df4800697c908"]}], "links": {"patch": {"small": "https://images2.imgbox.com/3b/c3/kd7H9FTQ_o.png", "large": "https://images2.imgbox.com/79/1f/h8diixIW_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/i63bst/starlink_general_discussion_and_deployment_thread/", "launch": "https://www.reddit.com/r/spacex/comments/iu0vtg/rspacex_starlink12_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/iudifm/rspacex_starlink12_media_thread_photographer/", "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/58428228397_6151927733_o.jpg", "https://live.staticflickr.com/65535/58427359318_67b3397892_o.jpg", "https://live.staticflickr.com/65535/58428050591_36defbe958_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/UZkaE_9zwQQ", "youtube_id": "UZkaE_9zwQQ", "article": null, ".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 twelfth batch of operational Starlink satellites, which are expected to be version 1.0, from SLC-40, Cape Canaveral Air 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 operational altitude of 550 km. The booster for this mission is expected to land on an ASDS."}, {"crew": [], "ships": ["5ea6ed2f0880df4800697c90b", "5ea6ed2f0880df4800697c910", "5ea6ed2e080df4800697c907", "5ea6ed2e080df4800697c908", "5ea6ed30080df4800697c913"], "capsules": [], "payloads": ["5ef6a48e0059c33cee4a829f"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 103, "name": "Starlink-12 (v1.0)", "date_utc": "2020-10-06T11:29:00.000Z", "date_unix": 1601983740, "date_local": "2020-10-06T07:29:00-04:00", "date_precision": "hour", "upcoming": false, "core": "5e9e28a7f359187af3b2662"}]

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carrying 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 the end of the Space Shuttle program in 2011.", "crew": ["5f7f1543bf32c864a529b23e", "5f7f158bbf32c864a529b23f", "5f7f15d5bf32c864a529b240", "5f7f1614bf32c864a529b241"], "ships": ["5ea6ed2f0880df40000697c910", "5ee68c683c228f36bd5809b5", "5ea6ed2f0880df40000697c909", "5ea6ed2f0880df40000697c90b"], "capsules": ["5f6f99fddcfdf403df379789"], "payloads": ["5eb0e4d2b6c3bb0086eeb25f"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 107, "name": "Crew-1", "date_utc": "2020-11-16T00:27:00.000Z", "date_unix": 1605486420, "date_local": "2020-11-15T19:27:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5f57c53d0622a6338279809f", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e", "launch_library_id": null, "id": "5eb87d4dff86e000604b38e"}], {"fairings": {"reused": null, "recovery_attempt": null, "recovered": null, "ships": []}}, "links": {"patch": {"small": "https://images2.imgbox.com/96/40/667Hx07w_o.png", "large": "https://images2.imgbox.com/26/73/pypH8lGD_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/jkk93v/sentinel6_michael_freiblich_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/jxsche/rspacex_sentinel6_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/jyd67q/rspacex_sentinel6_media_thread_photographer/", "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/50631642722_3af8131c6f_o.jpg", "https://live.staticflickr.com/65535/50631544171_66bd43eaa9_o.jpg", "https://live.staticflickr.com/65535/50631543966_e8035d5cca_o.jpg", "https://live.staticflickr.com/65535/50631643917_cb7db291d0_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/aVFPzTDCihQ", "youtube_id": "aVFPzTDCihQ", "article": "https://spaceflightnow.com/2020/11/21/international-satellite-launches-to-extend-measurements-of-sea-level-rise/"}, "wikipedia": "https://en.wikipedia.org/wiki/Copernicus_Sentinel-6"}, "static_fire_date_utc": "2020-11-17T13:17:00.000Z", "static_fire_date_unix": 1605619020, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX will launch Sentinel-6 Michael Freilich into low Earth orbit for NASA, NOAA, ESA, and the European Organization for the Exploitation of Meteorological Satellites aboard a Falcon 9 from SLC-4E, Vandenberg Air Force Station. Sentinel-6(A) is an ocean observation satellite providing radar ocean surface altimetry data and also atmospheric temperature profiles as a secondary mission. The booster for this mission is will land at LZ-4.", "crew": [], "ships": [], "capsules": [], "payloads": ["5ed9867c1f30554030d45c40"], "launchpad": "5e9e4502f509092b78566f87", "flight_number": 108, "name": "Sentinel-6 Michael Freilich", "date_utc": "2020-11-21T17:17:00.000Z", "date_unix": 1605979020, "date_local": "2020-11-21T09:17:00-08:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5f57c54a8622a633027980a1", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb554034e7c9"}]}, {"auto_update": true, "tbd": false, "launch_library_id": null, "id": "5ed983aa1f30554030d45c31"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": null, "ships": ["5ea6ed2e0880df40000697c907"]}], "links": {"patch": {"small": "https://images2.imgbox.com/54/00/20goVF1S_o.png", "large": "https://images2.imgbox.com/4a/e7/h403ivFa_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/jxyodz/rspacex_starlink15_official_launch_discussion/"}, "media": "https://www.reddit.com/r/spacex/comments/k0mom0/starlink15_media_thread_photographer_contest/", "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/50644831893_bb48b68827_o.jpg", "https://live.staticflickr.com/65535/506445588736_44af27257f_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/j442-ti-Dhg", "youtube_id": "j442-ti-Dhg", "article": "https://spaceflightnow.com/2020/11/25/spacex-launches-60-more-starlink-satellites-on-100th-falcon-9-flight/"}, "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc": "2020-11-21T16:31:00.000Z", "static_fire_date_unix": 1605976260, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission will launch the fifteenth batch of operational Starlink satellites, which are version 1.0,

from SLC-40, Cape 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 maneuvering to their operational altitude of 550 km. The booster for this mission is expected to land on an ASDS.", "crew": [], "ships": ["5ea6ed300000df40000697c913", "5ea6ed2f0800df40000697c90c", "5ea6ed2f0800df40000697c90b", "5ea6ed2f0800df40000697c90d", "5ea6ed2e0800df40000697c907"], "capsules": [], "payloads": ["5fb95c263a88ae63c9546844"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 109, "name": "Starlink-15 (v1.0)", "date_utc": "2020-11-25T02:13:00.000Z", "date_unix": 1600627000, "date_local": "2020-11-24T21:13:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f3591833b13b2659", "flight": 7, "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": "5fb95b3f3a88ae63c954683c"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgur.com/a2/a0/cH0WyFCo_o.png", "large": "https://images2.imgur.com/dd/53/W10Rogly_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/jw8bfe/crs21_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/k6my16/rspacex_crs21_official_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/65535/50689254612_db8bc87d2c_o.jpg", "https://live.staticflickr.com/65535/50689254712_98ef758c81_o.jpg", "https://live.staticflickr.com/65535/50689254512_bb44826694_o.jpg", "https://live.staticflickr.com/65535/50689254642_ba6b08d142_o.jpg", "https://live.staticflickr.com/65535/50689254552_1d9f91a963_o.jpg"}]}, "presskit": "https://www.nasa.gov/sites/default/files/atoms/files/spacex_crs-21_mision_overview_high_res.pdf", "webcast": "https://youtu.be/4xJAGFR_N-c", "youtube_id": "4xJAGFR_N-c", "article": "https://spaceflightnow.com/2020/12/06/spacex-launches-first-in-new-line-of-upgraded-space-station-cargo-ships/", ".wikipedia": "https://en.wikipedia.org/wiki/SpaceX CRS-21"}, "static_fire_date_utc": "2020-12-03T13:45:00.000Z", "static_fire_date_unix": 1607003100, "net": false, "window": null, "rocket": "5e9d8d95eda69973a809d1ec", "success": 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 supplies 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 expected to land on an ASDS. The mission will be complete with return and recovery of the Dragon capsule and down cargo.", "crew": [], "ships": ["5ea6ed300000df40000697c913", "5ea6ed2f0800df40000697c90b", "5ea6ed2f0800df40000697c90d"], "capsules": ["5fbb0f8fec55b34eb9f35c14"], "payloads": ["5eb0e4d3b6c3bb0006eeb262"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 110, "name": "CRS-21", "date_utc": "2020-12-06T16:17:00.000Z", "date_unix": 1607271420, "date_local": "2020-12-06T11:17:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591817f23b2663", "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": "5eb87d4effd86e000604b391"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": null, "ships": []}, "links": {"patch": {"small": "https://images2.imgur.com/a9/be/43FhrPoq_o.png", "large": "https://images2.imgur.com/17/34/WgRl7YFh_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/k51p7b/sxm7_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/kaizok/rspacex_sxm7_official_launch_discussion_updates/"}, "media": "https://www.reddit.com/r/spacex/comments/kcev8p/sxm7_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/65535/50715992426_3cb2a8ff9c_o.jpg", "https://live.staticflickr.com/65535/50715992426_bf43a8f872_o.jpg", "https://live.staticflickr.com/65535/50716071077_5a5bc00af9_o.jpg", "https://live.staticflickr.com/65535/50716071116_7_186d6f7093_o.jpg"}]}, "presskit": null, "webcast": "https://youtu.be/C0raGXFBilo", "youtube_id": "C0raGXFBilo", "article": "https://spaceflightnow.com/2020/12/13/siriusxm-satellite-rides-spacex-rocket-into-orbit/", ".wikipedia": "https://en.wikipedia.org/wiki/Sirius_XM_Satellites"}, "static_fire_date_utc": "2020-12-07T23:00:00.000Z", "static_fire_date_unix": 1607321600, "net": false, "window": null, "rocket": "5e9d8d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX's 22nd ISS resupply mission on behalf of NASA and the second under the CRS-2 contract, this mission brings 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 Nanoracks Bishop Airlock. 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 return and recovery of the Dragon capsule and down cargo."}]}

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w":17820,"rocket":"5e9d0d95eda69973a889d1ec","success":true,"failures":[],"details":"SpaceX will launch the first of two next generation satellites on contract for T\xc3\xbcrcrsat. T\xc3\xbcrcrsat 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":["Sea6ed2f0880df4000697c90d","5e9ed2f0880df4000697c910","5e9ed2e0880df4000697c907","5e9ed2e0880df4000697c908"],"capsules":[],"payloads":["5eb0e4d3b6c3bb0006eeb264"],"launchpad":"5e9e4581f509094ba4566f84","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":"5ef670f10859c33cee4a826c"}, {"core":"5ef670f10859c33cee4a826c"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d4ffffd88e000604b393"}, {"fairings":{"reused":true,"recovery_attempt":true,"recovered":null,"ships":["5e9ed2e0880df4000697c907","5e9ed2e0880df4000697c908"]}], "links":{"patch":{"small":"https://images2.imgur.com/a6/d3/bPczm8gQ_o.png","large":"https://images2.imgur.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":[{"url": "https://live.staticflickr.com/65535/50855737933_bcc65bdf8b_o.jpg", "size": "5d05cd"}, {"url": "https://live.staticflickr.com/65535/50855737933_bcc65bdf8b_o.jpg", "size": "5d05cd"}, {"url": "https://live.staticflickr.com/65535/50856551642_5190c59ec1_o.jpg", "size": "5d05cd"}]}, "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":"5e9d0d95eda69973a889d1ec","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 maneuvering to their operational altitude. The booster is expected to land on an ASDS.", "crew":[],"ships":["5e9ed2e0880df4000697c907","5e9ed2e0880df4000697c908","5e9ed2f0880df4000697c910","5e9ed2f0880df4000697c90d","5e9ed2f0880df4000697c90b"],"capsules":[],"payloads":["5fbfedba54ceb10a5664c813"]}], "launchpad":"5e9e4582f509094188566f88","flight_number":114,"name":"Starlink-16 (v1.0)","date_utc":"2021-01-20T13:02:00.000Z","date_unix":1611147720,"date_local":"2021-01-20T08:02:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a6f35918c0803b265c"}, {"core":"5e9e28a6f35918c0803b265c"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5fbfecce54ceb10a5664c80a"}, {"fairings":{"reused":false,"recovery_attempt":true,"recovered":true,"ships":["5e9ed2e0880df4000697c908","5e9ed2e0880df4000697c907"]}], "links":{"patch":{"small":"https://images2.imgur.com/58/70/eapAog9v_o.png","large":"https://images2.imgur.com/82/9a/fzsUst0u_o.png"}, "reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/kt5gds/transporter1_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/l210i3/rspacex_transporter1_official_launch_discussion/","media":null,"recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr":{"small":[],"original":[{"url": "https://live.staticflickr.com/65535/50870343533_e815eb30c4_o.jpg", "size": "5d05cd"}, {"url": "https://live.staticflickr.com/65535/50871151292_af114a3f9e_o.jpg", "size": "5d05cd"}, {"url": "https://live.staticflickr.com/65535/50871053741_59a1dbb6cc_o.jpg", "size": "5d05cd"}, {"url": "https://live.staticflickr.com/65535/50871053696_cd01a7e892_o.jpg", "size": "5d05cd"}, {"url": "https://live.staticflickr.com/65535/50870343763_1b1ac55eae_o.jpg", "size": "5d05cd"}]}, "presskit":null}, "webcast":"https://youtu.be/ScHIIcbkUv4","y

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The booster for this mission is expected to land on an ASDS.", "crew": [], "ships": ["Sea6ed30080df4000697c913", "Sea6ed2f0800df4000697c900c", "Sea6ed2e0800df4000697c9008", "Sea6ed2e0800df4000697c9007"], "capsules": [], "payloads": ["5fd3871a7faea57d297c86c6"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 115, "name": "Transporter-1", "date_utc": "2021-01-24T15:00:00.000Z", "date_unix": 1611500400, "date_local": "2021-01-24T10:00:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591817f23b2663"}, {"flight": 5, "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": "5fd386aa7faea57d297c86c1"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": null}, "ships": ["5e6ed2e0800df4000697c9008", "5e6ed2e0800df4000697c9007"]}], "links": {"patch": {"small": "https://images2.imgur.com/81/af/UT6KOE53_o.png", "large": "https://images2.imgur.com/6b/53/ZqAxQPhS_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/lbjuok/rspacex_starlink18_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/65535/58908787351_5733229c09_o.jpg", "https://live.staticflickr.com/65535/589088092893_d254477be0_o.jpg", "https://live.staticflickr.com/65535/58908892833_4cb5833fb9_o.jpg", "https://live.staticflickr.com/65535/589088787221_9cf383a2b4_o.jpg", "https://live.staticflickr.com/65535/589088787166_8dde2e29bd_o.jpg"}]}, "presskit": null, "webcast": "https://youtu.be/fe6HBw1y6bA", "youtube_id": "fe6HBw1y6bA", "article": null, "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 eighteenth batch of operational Starlink satellites, which are version 1.0, from SLC-40. It is the nineteenth 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": ["5e6ed30080df4000697c913", "601742b20c87b90bc7bb7e86", "5e6ed2e0800df4000697c9008", "5e6ed2e0800df4000697c9007", "5e6ed2f0800df4000697c900b"], "capsules": [], "payloads": ["5ff655769257f579ee3a6c64"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 116, "name": "Starlink-18 (v1.0)", "date_utc": "2021-02-04T06:19:00.000Z", "date_unix": 1612419540, "date_local": "2021-02-04T01:19:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5ef670f10059c33cee4a826c"}, {"flight": 5, "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": "f31782e8-6353-4c9a-932c-5bd104717500", "id": "5ff6554f9257f579ee3a6c5f"}, {"fairings": {"reused": null, "recovery_attempt": true, "recovered": true}, "ships": ["5e6ed2e0800df4000697c9008", "5e6ed2e0800df4000697c9007"]], "links": {"patch": {"small": "https://images2.imgur.com/fa/01/EAdaKWgq_o.png", "large": "https://images2.imgur.com/ec/c1/ex48h2Xp_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/ljhk7l/rspacex_starlink19_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/lkwllg/starlink19_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/65535/58949943433_87e3002307_o.jpg"}]}, "presskit": null, "webcast": "https://youtu.be/L0dkyV09zso", "youtube_id": "L0dkyV09zso", "article": "https://spaceflightnow.com/2021/02/16/spacex-successfully-deploys-60-more-starlink-satellites-but-loses-booster-on-descent/", "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc": "2021-02-13T18:17:00.000Z", "static_fire_date_unix": 1613240220, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec"}]

9d1ec", "success":true, "failures":[], "details":"This mission launches the eighteenth batch of operational Starlink satellites, which are version 1.0, from SLC-40. It is the nineteenth 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":["5ea6ed300000df4000697c913"], "capsules":[], "payloads":["600f9bc08f798e2a4d5f97a4"], "launchpad":"Se9e4581f500094ba4566f84", "flight_number":117, "name":"Starlink-19 (v1.0)", "date_utc":"2021-02-16T03:59:00.000Z", "date_unix":1613447940, "date_local":"2021-02-15T22:59:00-05:00", "date_precision":"hour", "upcoming":false, "cores":[{"core":"5e9e28a7f359187af3b2662"}, {"core":"5e9e3032383ecb6bb234e7ca"}], "auto_update":true, "tbd":false, "launch_library_id":985f1cc1-82c1-4a89-b2cc-e9dc91829a0e, "id":600f9a5e8f798e2a4d5f979c}, {"fairings":{"reused":null, "recovery_attempt":null, "recovered":null, "ships":[]}, "links":{"patch": {"small":"https://images2.imgur.com/ba/a9/Q6APoEBC_o.png", "large":"https://images2.imgur.com/29/6c/mQwxR0KQ_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/l8qsx3/rspacex_starlink17_official_launch_discussion/"}, {"media":null, "recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr":{"small":[], "original": [{"url": "https://live.staticflickr.com/65535/51004598286_9779f08338_o.jpg"}, {"url": "https://live.staticflickr.com/65535/51004598196_b2059799f4_o.jpg"}]}, "presskit":null, "webcast":"https://youtu.be/d5DzoKuhdNk", "youtube_id":d5DzoKuhdNk, "article":"https://spaceflightnow.com/2021/03/04/spacex-adds-more-satellites-to-starlink-internet-fleet/", "wikipedia":"https://en.wikipedia.org/wiki/Starlink"}, {"static_fire_date_utc":"2021-02-24T12:25:00.000Z", "static_fire_date_unix":1614169500, "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 LC-39A. It is the eighteenth 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":["5ea6ed2f00000df4000697c90d", "5ea6ed300000df4000697c913"], "capsules":[], "payloads":["5fbfedc654ceb10a5664c814"], "launchpad":"Se9e4582f500094188566f88", "flight_number":118, "name":"Starlink-17 (v1.0)", "date_utc":"2021-03-04T08:24:00.000Z", "date_unix":1614846240, "date_local":"2021-03-04T03:24:00-05:00", "date_precision":"hour", "upcoming":false, "cores":[{"core":"5e9e28a5f3591833b13b2659"}, {"core":"5e9e3032383ecb6bb234e7ca"}], "auto_update":true, "tbd":false, "launch_library_id":dfd4f0e0-0ab4-494d-bd88-1b93b934b269, "id":5fbfecfe54ceb10a5664c80b}, {"fairings":{"reused":true, "recovery_attempt":true, "recovered":true, "ships":[]}, "links":{"patch": {"small":"https://images2.imgur.com/df/ea/1re39tFr_o.png", "large":"https://images2.imgur.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": [{"url": "https://live.staticflickr.com/65535/51027544097_799f5baccc_o.jpg"}, {"url": "https://live.staticflickr.com/65535/51027443336_3e7486be6f_o.jpg"}, {"url": "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": ["5ea6ed2f0880df4000697c910", "5ee68c683c228f36bd5889b5", "5ea6ed2e0880df4000697c909", "5ea6ed2f0880df4000697c90c"], "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-c9fdb0a11efc", "id": "600f9a718f798e2a4d5f979d"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": true}, "ships": ["5ea6ed2e0880df4000697c909", "5ea6ed2f0880df4000697c90c"]], "links": {"patch": {"small": "https://images2.imgur.com/a0/1a/BLRGLyNe_o.png", "large": "https://images2.imgur.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": ["5ea6ed2e0880df4000697c909", "5ea6ed2f0880df4000697c90c", "5ea6ed2f0880df4000697c90d", "5ea6ed300880df4000697c913"], "capsules": [], "payloads": ["600f9bcb8f798e2a4d5f97a6"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 120, "name": "Starlink-21 (v1.0)", "date_utc": "2021-03-14T10:01:00.000Z", "date_unix": 1615716860, "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": "5e9e3032383ecbb6bb234e7ca"}], "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", "5ea6ed2f0880df4000697c90b"]], "links": {"patch": {"small": "https://images2.imgur.com/f3/0d/E2I1Mjs2_o.png", "large": "https://images2.imgur.com/68/e1/XpScXejQ_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/maqd0/rspacex_starlink22_launch_discussion_updates/", "media": null, "recovery": "https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr": {"small": [], "original": []}, "presskit": null, "webcast": "https://youtu.be/a15czI9B91c", "youtube_id": "a15czI9B91c", "article": "https://spaceflightnow.com/2021/03/24/spacex-launches-25th-mission-to-build-out-starlink-internet-network/", "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 22nd batch of operational Starlink satellites, which are version 1.0, from SLC-40. It is the 23rd 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": ["5ee68c683c228f36bd5889b5", "5ea6ed300880df4000697c913", "5ea6ed2f0880df4000697c90b", "6059166413f40e27e8af34b6"], "capsules": [], "payloads": ["60428afbc041c16716f73cdd"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 121, "name": "Starlink-22 (v1.0)", "date_utc": "2021-03-24T08:28:00.000Z", "date_unix": 1616574480, "date_local": "2021-03-24T04:28:00-04:00", "date_precision": "second", "upcoming": true, "cores": [{"core": "5e9e28a7f3591817f23b2663", "flight": 7, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecbb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": "134eb787-244e-4131-8b03-c9fdb0a11efc", "id": "600f9a8d8f798e2a4d5f979d"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": true}, "ships": ["5ea6ed2e0880df4000697c909", "5ea6ed2f0880df4000697c90c"]], "links": {"patch": {"small": "https://images2.imgur.com/0d/0d/E2I1Mjs2_o.png", "large": "https://images2.imgur.com/68/e1/XpScXejQ_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/maqd0/rspacex_starlink22_launch_discussion_updates/", "media": null, "recovery": "https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr": {"small": [], "original": []}, "presskit": null, "webcast": "https://youtu.be/a15czI9B91c", "youtube_id": "a15czI9B91c", "article": "https://spaceflightnow.com/2021/03/24/spacex-launches-25th-mission-to-build-out-starlink-internet-network/", "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 23rd batch of operational Starlink satellites, which are version 1.0, from SLC-40. It is the 24th 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."}]}

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It is the 27th 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": ["5ea6ed300880df4000697c913", "5ee68c683c228f36bd5809b5", "6059166413f40e27e8af34b6"], "capsules": [], "payloads": ["6079bd5e9a086446e8c61bf7c"]}, {"launchpad": "5e9e4501f509094ba4566f84", "flight_number": 126, "name": "Starlink-27 (v1.0)", "date_utc": "2021-05-09T06:42:00.000Z", "date_unix": 1620542520, "date_local": "2021-05-09T02:42:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f35918c0803b265c", "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": "e5085f22-208b-4b28-b66c-fd4bd9df98e7", "id": "6079bd1c9a06446e8c61bf76"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": null}, "ships": ["6059166413f40e27e8af34b6"]}, {"links": {"patch": {"small": "https://images2.imgur.com/b5/8a/KeiGEz4f_o.png", "large": "https://images2.imgur.com/f6/28/amlU5JWP_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/ncfexu/rspacex_starlink26_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/65535/51171344450_6a3f0e88b9_o.jpg", "https://live.staticflickr.com/65535/51170251791_9b36fba5b7_o.jpg", "https://live.staticflickr.com/65535/51185653723_7bd9ecab87_o.jpg", "https://live.staticflickr.com/65535/51186586630_1a47a43787_o.jpg"]]}, "presskit": null, "webcast": "https://youtu.be/tdgg_qwj-hI", "youtube_id": "tdgg_qwj-hI", "article": null, "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 launches the 27th batch of operational Starlink satellites, which are version 1.0, from LC-39A or SLC-40. It is the 28th 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": ["5ea6ed300880df4000697c913", "6059166413f40e27e8af34b6", "608c1a06cf7f3d6152666ad4", "5ea6ed2f0880df4000697c98b"]}, {"capsules": [], "payloads": ["605b4bfcaa5433645e37d048", "609f48374a12e4692eae4667", "609f49c64a12e4692eae4668"]}, {"launchpad": "5e9e4502f509094188566f88", "flight_number": 127, "name": "Starlink-26 (v1.0) + Capella-6 + Tyvak-0130", "date_utc": "2021-05-15T22:54:00.000Z", "date_unix": 1621119240, "date_local": "2021-05-15T18:54:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591817f23b2663", "flight": 8, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASD"}]

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It was the 29th Starlink launch overall. The satellites plan to be delivered to low Earth orbit and will spend a few weeks maneuvering to their operational altitude. The booster is expected to land on ASDS JRTI.", "crew": [], "ships": ["5ea6ed30000df4000697c913", "5ea6ed2f080df4000697c90c", "5ee68c683c228f36bd5809b5", "5ea6ed2f080df4000697c90b", "5ea6ed2e080df4000697c909"], "capsules": [], "payloads": ["6879bd679a06446e8c61bf7d"], "launchpad": "5e9e4501f5090094ba4566f84", "flight_number": 128, "name": "Starlink-28 (v1.0)", "date_utc": "2021-05-26T18:59:00.000Z", "date_unix": 1622055548, "date_local": "2021-05-26T14:59:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5f57c54a0622a633027900a1", "flight": 2, "grid_fins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS"}, {"core": "5e9e3033383ecbb9e534e7cc", "flight": 1, "grid_fins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS"}], "auto_update": true, "tbd": false, "launch_library_id": "fb25ecf0-fb51-4b5e-b678-105f6ba4c06e", "id": "6079bd399a06446e8c61bf77"}, {"fairings": null, "links": { "patch": { "small": "https://images2.imgbox.com/aa/a8/HhwYIXoB_o.png", "large": "https://images2.imgbox.com/16/32/927btrQF_o.png" }, "reddit": { "campaign": "https://www.reddit.com/r/spacex/comments/nhztq5/crs22_launch_campaign_thread/" }, "launch": "https://www.reddit.com/r/spacex/comments/nqquojc/rspacex_crs22_launch_docking_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/65535/51225482033_086576f2cd_o.jpg", "https://live.staticflickr.com/65535/51224563112_61d493b775_o.jpg", "https://live.staticflickr.com/65535/51224563062_95bf029b80_o.jpg", "https://live.staticflickr.com/65535/51225271661_49315dc688_o.jpg", "https://live.staticflickr.com/65535/51226340225_27df994080_o.jpg", "https://live.staticflickr.com/65535/51224563102_d07c630ef5_o.jpg", "https://live.staticflickr.com/65535/51226038164_304c347347_o.jpg"] }, "presskit": null, "webcast": "https://youtu.be/QXF9mRwbXDM", "youtube_id": "QXF9mRwbXDM", "article": "https://spaceflightnow.com/2021/06/03/spacex-supply-ship-1-launches-on-mission-to-begin-upgrading-space-station-electrical-grid/", "wikipedia": "https://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", "608cia06cf7f3d6152666ad4", "5ea6ed30000df4000697c913"], "capsules": ["60b803421f83cc1e59f1644d"], "payloads": ["5fe3b642b3467846b324217b"], "launchpad": "5e9e4502f5090094188566f88", "flight_number": 129, "name": "CRS-22 & IROSA", "date_utc": "2021-06-03T17:29:00"}

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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", "Sea6ed2f0880df4800697c910", "Sea6ed2f0880df4800697c90b", "5ea6ed2e0880df4800697c909"], "capsules":[], "payloads":["5fe3b57db3467846b324217a"], "launchpad":"5e9e4501f509094ba4566f84", "flight_number":138, "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.imgur.com/d0/66/bCRsHNSZ_o.png", "large":"https://images2.imgur.com/2f/6f/ebFS9FDJ_o.png"}, "reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/muud01/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_e6e1d8d79c_o.jpg", "https://live.staticflickr.com/65535/51253353892_de82b01e23_o.jpg", "https://live.staticflickr.com/65535/51254285968_288383ce6e_o.jpg", "https://live.staticflickr.com/65535/51253353882_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/65535/51262179176_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_II"}, "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 time 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", "Sea6ed2f0880df4800697c910"], "capsules":[], "payloads":["5eb0e4d2b6c3bb0006eeb261"]}, "launchpad":"5e9e4501f509094ba4566f84", "flight_number":139, "name":"GPS III-4", "date_utc":"2021-06-13T19:30:00.000Z", "date_unix":1623612600, "date_local":"2021-06-13T19:30:00-04:00", "date_precision":"second", "upcoming":true, "cores": [{"core": "5e9d0d95eda69973a809d1ec", "flight": 4, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}]}]

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eddit.com/r/spacex/comments/qu8s5a/dart_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/r0dn3a/rspacex_dart_launch_discussion_and_updates_thread/", "media": null, "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/51702654584_13a4b39655_o.jpg", "https://live.staticflickr.com/65535/51702261963_ec86519bce_o.jpg", "https://live.staticflickr.com/65535/51702654544_c4b8a727c3_o.jpg", "https://live.staticflickr.com/65535/51702654339_7c48563d73_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/XKRF6-NcMqI", "youtube_id": "XKRF6-NcMqI", "article": null, "wikipedia": "https://en.wikipedia.org/wiki/Double_Asteroid_Redirection_Test"}, "static_fire_date_utc": "2021-11-19T20:20:00.000Z", "static_fire_date_unix": 1637353200, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "NASA's Double Asteroid Redirect Test (DART) will demonstrate the use of a kinetic impactor to alter an asteroid's trajectory, an intervention that could be used in the future to prevent devastating Earth impacts. The target system consists of Didymos, 780 meters in diameter, and its moonlet Dimorphos, 160 meters. The DART spacecraft will intercept the double asteroid, using autonomous guidance to crash into the smaller one. Moving at about 6 km/s, the transferred momentum should alter Dimorphos's 12 hour orbital period around its companion by several minutes. The mission tests several technologies, including the Small-body Maneuvering Autonomous Real-Time Navigation (SMART Nav) used to differentiate and steer toward the target body and Roll-Out Solar Arrays (ROSA) with Transformational Solar Array concentrators. NASA's Evolutionary Xenon Thruster (NEXT) Commercial ion engine will also be demonstrated, although the spacecraft's primary propulsion is hydrazine thrusters. DART should arrive at Didymos in late September 2022, when it is about 11 million kilometers from Earth. Ten days before impact, the Italian Space Agency's cubesat LICIACube will be deployed to observe the collision and ejecta with its two cameras. Earth-based telescopes will be used to measure the altered orbit.", "crew": [], "ships": ["5ea6ed30080df4000697c913", "5ea6ed2f0880df4000697c90b", "5ea6ed30080df4000697c912"], "capsules": [], "payloads": ["5fe3c4a6b3467846b3242192"], "launchpad": "5e9e4502f589092b78566f87", "flight_number": 138, "name": "DART", "date_utc": "2021-11-24T06:20:00.000Z", "date_unix": 1637734800, "date_local": "2021-11-23T22:20:00-08:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5f57c54a0622a633027900a1", "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": "c4b2f90e-3385-4cbe-a89f-fc5f57da1fbfb", "id": "5fe3b107b3467846b324216b"}, {"fairings": {"reused": null, "recovery_attempt": true, "recovered": null, "ships": ["618fad7e563d69573ed8caa9"]}, "links": {"patch": {"small": "https://images2.imgur.com/fc/e7/esvHlHwA_o.png", "large": "https://images2.imgur.com/91/15/2LRaHihk_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/r79osa/spacex_starlink_43_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/65535/51732172914_4efa7d5210_o.jpg", "https://live.staticflickr.com/65535/51732172879_4ce91546ed_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/594TbXriaAk", "youtube_id": "594TbXriaAk", "article": null, "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": null, "crew": [], "ships": ["5ea6ed2d0880df4000697c904", "618fad7e563d69573ed8caa9", "5ee68c683c228f36bd5809b5"], "capsules": [], "payloads": ["6161d0f26db1a92bfba85355"], "launchpad": "5e9e4501f589094ba4566f84", "flight_number": 139, "name": "Starlink 4-3 (v1.5)", "date_utc": "2021-12-01T23:20:00.000Z", "date_unix": 1638400800, "date_local": "2021-12-01T18:20:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5ef670f10059c33cee4a826c", "flight": 9, "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": "56db9abd-41b8-41a3-9d6d-88e52460682b", "id": "6161c94c6db1a92bfba85349"}, {"fairings": {"reused": null, "recovery_attempt": true, "recovered": null, "ships": ["6161c94c6db1a92bfba85349"]}, "links": {"patch": {"small": "https://images2.imgur.com/fc/e7/esvHlHwA_o.png", "large": "https://images2.imgur.com/91/15/2LRaHihk_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/r79osa/spacex_starlink_43_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/65535/51732172914_4efa7d5210_o.jpg", "https://live.staticflickr.com/65535/51732172879_4ce91546ed_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/594TbXriaAk", "youtube_id": "594TbXriaAk", "article": null, "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": null, "crew": [], "ships": ["5ea6ed2d0880df4000697c904", "618fad7e563d69573ed8caa9", "5ee68c683c228f36bd5809b5"], "payloads": ["6161d0f26db1a92bfba85355"], "launchpad": "5e9e4501f589094ba4566f84", "flight_number": 139, "name": "Starlink 4-3 (v1.5)", "date_utc": "2021-12-01T23:20:00.000Z", "date_unix": 1638400800, "date_local": "2021-12-01T18:20:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5ef670f10059c33cee4a826c", "flight": 9, "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": "56db9abd-41b8-41a3-9d6d-88e52460682b", "id": "6161c94c6db1a92bfba85349"}]}}, {"fai

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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 pre-launch preparations. With an estimated in-orbit lifetime of 30 years and the aim of securing Turkey's orbital and frequency rights, Telstar 58 will be launched into an orbital slot at 42 degrees east. With 12 kW power, Telstar 58 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 from that, the satellite will also provide customized services for airlines and commercial ship operators around the world thanks to the fact that it operates in Ka-Band.

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(v1.5)","date_utc":"2022-08-31T05:40:00.000Z","date_unix":1661924400,"date_local":"2022-08-30T22:40:00-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5f57c54a0622a633027900a1","flight":7,"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":"576b04d6-1962-4bda-b43f-8da4138d192d","id":"62f3b53a0f55c50e192a4e6f"}, {"fairings":{"reused":null,"recovery_attempt":null,"recovered":null,"ships":[]}, "links":{"patch":{"small":"https://images2.imgur.com/dc/a0/erKL6HGq_o.png","large":"https://images2.imgur.com/57/42/tr0RYoRc_o.png"}, "reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/jhu37i/starlink_general_discussion_and_deployment_thread/","launch":null,"media":null,"recovery":"https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr":{"small":[],"original":[]}, 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```

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"Starlink 4-35 (v1.5)", "date_utc": "2022-09-24T23:30:00.000Z", "date_unix": 1664062280, "date_local": "2022-09-24T19:30:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "627843d657b51b752c5c5a53", "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": "1c903b65-6667-4fd5-944d-296c5f13e01f", "id": "63161339ffc78f3b8567070c"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgur.com/e8/d8/D1Yywp0w_o.png", "large": "https://images2.imgur.com/33/2e/k6VE4iYl_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/xvm76j/rspacex_crew5_launchcoast_docking_discussion_and/", "media": null, "recovery": null}, "flickr": {"small": [], "original": []}, "presskit": null, "webcast": "https://youtu.be/SEwW8ZkArI4", "youtube_id": "SEwW8ZkArI4", 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```
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```

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.cl
```

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

```
In [11]: response.status_code
```

```
Out[11]: 200
```

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

```
In [12]: # Use json_normalize meethod to convert the json result into a dataframe
respjson = response.json()
data = pd.json_normalize(respjson)
```

Using the dataframe `data` print the first 5 rows

```
In [13]: # Get the head of the dataframe
data.head()
```

```
Out[13]: static_fire_date_utc static_fire_date_unix net window rocket
```

0	2006-03-17T00:00:00.000Z	1.142554e+09	False	0.0	5e9d0d95eda69955f709d1eb	rocket
---	--------------------------	--------------	-------	-----	--------------------------	--------

1	None	NaN	False	0.0	5e9d0d95eda69955f709d1eb	rocket
---	------	-----	-------	-----	--------------------------	--------

2	None	NaN	False	0.0	5e9d0d95eda69955f709d1eb	rocket
---	------	-----	-------	-----	--------------------------	--------

3	2008-09-20T00:00:00.000Z	1.221869e+09	False	0.0	5e9d0d95eda69955f709d1eb	rocket
---	--------------------------	--------------	-------	-----	--------------------------	--------

	static_fire_date_utc	static_fire_date_unix	net	window	rocket
4	None	NaN False	0.0	Se9d0d95eda69955f709d1eb	

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 [15]: # Lets take a subset of our dataframe keeping only the features we want and the
data = data[['rocket', 'payloads', 'launchpad', 'cores', 'flight_number', 'date_UTC']

# We will remove rows with multiple cores because those are falcon rockets with
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 v
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 extractin
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 separate versions 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 [16]: #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 [14]: BoosterVersion
```

```
Out[14]: []
```

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

```
In [15]: # Call getBoosterVersion
getBoosterVersion(data)
```

```
-----
NameError                                 Traceback (most recent call last)
/tmp/ipykernel_77/4276343484.py in <module>
      1 # Call getBoosterVersion
----> 2 getBoosterVersion(data)

NameError: name 'data' is not defined
```

the list has now been update

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

we can apply the rest of the functions here:

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

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

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

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

```
In [ ]: 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 [ ]: # Create a data from Launch_dict
```

Show the summary of the dataframe

```
In [ ]: # Show the head of the dataframe
```

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 [ ]: # Hint data['BoosterVersion']!='Falcon 1'
```

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

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

Data Wrangling

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

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

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 [ ]: # Calculate the mean value of PayloadMass column  
# Replace the np.nan values with its mean value
```

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

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