

SpaceX Falcon 9 first stage Landing Prediction

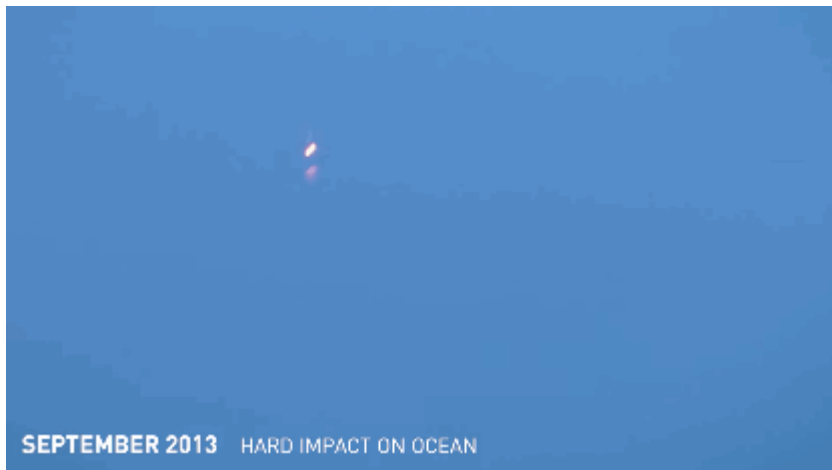
Lab 1: Collecting the data

Estimated time needed: **45** minutes

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



Several examples of an unsuccessful landing are shown here:



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

Objectives

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

- 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 [40]: # 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 d
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 columns 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 [41]: # 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 [42]: # 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 [43]: # 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 [44]: # 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 [45]: spacex_url="https://api.spacexdata.com/v4/launches/past"
```

```
In [46]: response = requests.get(spacex_url)
```

Check the content of the response

```
In [47]: print(response.content)
```

```
b'[{ "fairings": { "reused": false, "recovery_attempt": false, "recovered": false, "ships": [] }, "links": { "patch": { "small": "https://images2.imgbox.com/94/f2/NN6Ph45r_o.png", "large": "https://images2.imgbox.com/5b/02/QcxHUb5V_o.png" }, "reddit": { "campaign": null, "launch": null, "media": null, "recovery": null }, "flickr": { "small": [], "original": [] }, "presskit": null, "webcast": "https://www.youtube.com/watch?v=0a_00nJ_Y88", "youtube_id": "0a_00nJ_Y88", "article": "https://www.space.com/2196-spacex-inaugural-falcon-1-rocket-lost-launch.html", "wikipedia": "https://en.wikipedia.org/wiki/DemoSat", "static_fire_date_utc": "2006-03-17T00:00:00.000Z", "static_fire_date_unix": 1142553600, "net": false, "window": 0, "rocket": "5e9d0d95eda69955f709d1eb", "success": false, "failures": [ { "time": 33, "altitude": null, "reason": "merlin engine failure" } ], "details": "Engine failure at 33 seconds and loss of vehicle", "crew": [], "ships": [], "capsules": [], "payloads": [ 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```

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ding_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}, {"id":"5eb87ce1ffd86e000604b333"}, {"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]}, {"links":{"patch":{"small":"https://images2.imgbox.com/f8/27/XwZPEhTJ_o.png","large":"https://images2.imgbox.com/ae/62/D6SZleUG_o.png"},"reddit":{"campaign":null,"launch":"http://www.reddit.com/r/spacex/comments/1ndlay","media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":"https://spaceflightnow.com/falcon9/006/UpgradedF9DemoMission_PressKit.pdf","webcast":"https://www.youtube.com/watch?v=uFefasS6bhc","youtube_id":"uFefasS6bhc","article":"http://www.parabolicarc.com/2013/09/29/falcon-9-launch-payloads-orbit-vandenberg/","wikipedia":"https://en.wikipedia.org/wiki/CASSIOPE"},"static_fire_date_utc":"2013-09-19T00:00:00.000Z","static_fire_date_unix":1379548800,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Commercial mission and first Falcon 9 v1.1 flight, with improved 13-tonne to LEO capacity. Following second-stage separation from the first stage, an attempt was made to perform an ocean touchdown test of the discarded booster vehicle. The test provided good test data on the experiment-its primary objective-but as the booster neared the ocean, aerodynamic forces caused an uncontrollable roll. The center engine, depleted of fuel by centrifugal force, shut down resulting in the impact and destruction of the vehicle."},"crew":[],"ships":["5ea6ed2d080df4000697c903"],"capsules":[],"payloads":["5eb0e4bbb6c3bb0006eeb1ee"],"launchpad":"5e9e4502f509092b78566f87","flight_number":11,"name":"CASSIOPE","date_utc":"2013-09-29T16:00:00.000Z","date_unix":1380470400,"date_local":"2013-09-29T09:00:00-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e289ff359180ae23b262d","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":true,"landing_success":false,"landing_type":"Ocean","landpad":null}], {"id":"5eb87ce1ffd86e000604b334"}, {"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]}, {"links":{"patch":{"small":"https://images2.imgbox.com/4e/f8/rqu7XWMF_o.png","large":"https://images2.imgbox.com/41/b7/H6vprzuB_o.png"},"reddit":{"campaign":null,"launch":"http://www.reddit.com/r/spacex/comments/1ryy1n","media":null,"recovery":null},"flickr":{"small":[],"original":[]},"presskit":"http://www.spacex.com/sites/spacex/files/spacex_ses-8launch_presskit.pdf","webcast":"https://www.youtube.com/watch?v=aAj5xapImEs","youtube_id":"aAj5xapImEs","article":"https://www.nasaspaceflight.com/2013/12/spacex-falcon-9-v1-1-milestone-ses-8-launch/","wikipedia":"https://en.wikipedia.org/wiki/SES-8"},"static_fire_date_utc":"2013-11-22T06:26:00.000Z","static_fire_date_unix":1385101560,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"First GTO launch for Falcon 9","crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4bbb6c3bb0006eeb1ee"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":12,"name":"SES-8","date_utc":"2013-12-03T22:41:00.000Z","date_unix":1386110460,"date_local":"2013-12-03T18:41:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e289ff35918862c3b262e","flight":1,"gridfins":false,"legs":false,"reused":false,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}], {"id":"5eb87ce2ffd86e000604b335"}, {"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]}, {"links":{"patch":{"small":"https://images2.imgbox.com/5c/20/AsqTXJD C_o.png","large":"https://images2.imgbox.com/f5/fa/JvLWfNZz_o.png"},"reddit":{"campaign":null,"launch":"http://www.reddit.com/r/spacex/comments/1ujoc0","media":null,"recovery":null},"flickr":{"small":[],"original":["https://farm9.staticflickr.com/8617/16789019815_f99a165dc5_o.jpg","https://farm8.staticflickr.com/7619/16763151866_35a0a4d8e1_o.jpg","https://farm9.staticflickr.com/8569/16169086873_4d8829832e_o.png"]},"presskit":"http://www.spacex.com/sites/spacex/files/spacex_thaicom6_presskit.pdf","webcast":"https://www.youtube.com/watch?v=AnSNRzMEmCU","youtube_id":"AnSNRzMEmCU","article":"http://spacenews.com/38959spacex-delivers-thaicom-6-satellite-to-orbit/","wikipedia":"https://en.wikipedia.org/wiki/Thaicom_6"},"static_fire_date_utc":"2013-12-28T00:00:00.000Z","static_fire_date_unix":1388188800,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Second GTO launch for Falcon 9. The USAF evaluated launch data from this flight as part of a separate certification program for SpaceX to qualify

to fly U.S. military payloads and found that the Thaicom 6 launch had \\\"unacceptable fuel reserves at engine cutoff of the stage 2 second burnoff\\\"\", \"crew\": [], \"ships\": [], \"capsules\": [], \"payloads\": [\"5eb0e4bbb6c3bb0006eeb1f0\"], \"launchpad\": \"5e9e4501f509094ba4566f84\", \"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.imgbox.com/ae/3c/yVvE2vVh_o.png\", \"large\": \"https://images2.imgbox.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/8597/16856369125_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-lON4bTyQ\", \"youtube_id\": \"Od-lON4bTyQ\", \"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\": \"5e9d0d95eda69973a809d1ec\", \"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\": [\"5ea6ed2d080df4000697c902\"], \"capsules\": [\"5e9e2c5bf3591859a63b2668\"], \"payloads\": [\"5eb0e4bbb6c3bb0006eeb1f1\"], \"launchpad\": \"5e9e4501f509094ba4566f84\", \"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_d\": false, \"recovery_attempt\": false, \"recovered\": false, \"ships\": []}, \"links\": {\"patch\": {\"small\": \"https://images2.imgbox.com/a4/44/YWAUBkOe_o.png\", \"large\": \"https://images2.imgbox.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.png\", \"https://farm8.staticflickr.com/7285/16581736047_6fd536ab11_o.jpg\", \"https://farm8.staticflickr.com/7597/16789021675_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\": \"5e9d0d95eda69973a809d1ec\", \"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

ew":[],"ships":[],"capsules":[],"payloads":["5eb0e4bcb6c3bb0006eeb1f2"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":15,"name":"OG-2 Mission 1","date_utc":"2014-07-14T15:15:00.000Z","date_unix":1405350900,"date_local":"2014-07-14T11:15:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a0f3591870a63b2631","flight":1,"gridfins":false,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"Ocean","landpad":null}],{"aut o_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87ce4ffd86e000604b338"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/dd/4d/szidadu8_o.png","large":"https://images2.imgbox.com/60/3f/hwK01Qce_o.png"},"reddit":{"campaign":null,"launch":"http://www.reddit.com/r/spacex/comments/2fenrv","media":null,"recovery":null},"flickr":{"small":[],"original":["https://farm9.staticflickr.com/8638/16855192031_962f7b1113_o.jpg","https://farm8.staticflickr.com/7603/16648925347_769a6009c7_o.jpg","https://farm9.staticflickr.com/8687/16789027675_cde1bd098a_o.jpg","https://farm8.staticflickr.com/7629/16668638138_7acf13cfb5_o.jpg","https://farm8.staticflickr.com/7281/16668845950_7680146525_o.jpg","https://farm8.staticflickr.com/7626/16233865484_10d9925b5d_o.jpg"]},"presskit":"https://spaceflightnow.com/falcon9/011/presskit.pdf","webcast":"https://www.youtube.com/watch?v=essrkMGlw5s","youtube_id":"essrkMGlw5s","article":"http://spacenews.com/41497spacex-launches-first-of-two-satellites-for-asiasat/","wikipedia":"https://en.wikipedia.org/wiki/AsiaSat_8"},"static_fire_date_utc":"2014-07-31T23:35:15.000Z","static_fire_date_unix":1406849715,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4bcb6c3bb0006eeb1f3"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":16,"name":"AsiaSat 8","date_utc":"2014-08-05T08:00:00.000Z","date_unix":1407225600,"date_local":"2014-08-05T04:00:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a0f359186e2e3b2632","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":"5eb87ce5ffd86e000604b339"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/d4/ea/jdJqr6He_o.png","large":"https://images2.imgbox.com/5a/f0/b3TgnmVr_o.png"},"reddit":{"campaign":null,"launch":"http://www.reddit.com/r/spacex/comments/2fenrv","media":null,"recovery":null},"flickr":{"small":[],"original":["https://farm8.staticflickr.com/7604/16169087563_0e3559ab5b_o.jpg","https://farm9.staticflickr.com/8742/16233828644_96738200b2_o.jpg","https://farm8.staticflickr.com/7645/16601443698_e70315d1ed_o.jpg","https://farm9.staticflickr.com/8730/16830335046_5f017c17be_o.jpg","https://farm9.staticflickr.com/8637/16855040322_57671ab8eb_o.jpg"]},"presskit":"https://www.spaceflightnow.com/falcon9/012/presskit.pdf","webcast":"https://www.youtube.com/watch?v=39ninsyTRk8","youtube_id":"39ninsyTRk8","article":"https://www.space.com/27052-spacex-launches-asiasat6-satellite.html","wikipedia":"https://en.wikipedia.org/wiki/AsiaSat_6"},"static_fire_date_utc":"2014-08-22T23:51:18.000Z","static_fire_date_unix":1408751478,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":[],"ships":[],"capsules":[],"payloads":["5eb0e4bcb6c3bb0006eeb1f4"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":17,"name":"AsiaSat 6","date_utc":"2014-09-07T05:00:00.000Z","date_unix":1410066000,"date_local":"2014-09-07T01:00:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a0f35918b1bc3b2633","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":"5eb87ce6ffd86e000604b33a"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/7b/fb/Mm0LdwGY_o.png","large":"https://images2.imgbox.com/21/13/ps1yJZFD_o.png"},"reddit":{"campaign":null,"launch":"http://www.reddit.com/r/spacex/comments/2grxer","media":null,"recovery":null},"flickr":{"small":[],"original":["https://farm8.staticflickr.com/7608/16661753958_9f61f777e7_o.jpg","https://farm9.staticflickr.com/8593/16763199166_38ba2cafc8_o.jpg","https://farm9.staticflickr.com/8655/16789074175_ba03989359_o.png","https://farm9.staticflickr.com/8659/16166761954_ebc2a72b2a_o.jpg","https://farm9.staticflickr.com/8620/16642025217_a6852b9499_o.jpg"]},"presskit":"https://www.nasa.gov/sites/default/files/files/

SpaceX_NASA_CRS-4_PressKit.pdf", "webcast": "https://www.youtube.com/watch?v=7YkCh7uOw1Y", "youtube_id": "7YkCh7uOw1Y", "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": ["5ea6ed2d080df4000697c902"], "capsules": ["5e9e2c5bf3591880643b2669"], "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_bb5cbbdb71_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": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c", "5ea6ed2f080df4000697c90f", "5ea6ed30080df4000697c912"], "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/2vj9e", "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_1f0fab9b54_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

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The first stage made a test flight descent to an over-ocean landing within 10 m (33 ft) of its intended target.", "crew": [], "ships": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c"], "capsules": [], "payloads": ["5eb0e4bdb6c3bb0006eeb1f7"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 20, "name": "DSCOVr", "date_utc": "2015-02-11T23:03:00.000Z", "date_unix": 1423695780, "date_local": "2015-02-11T19:03:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a0f3591885be3b2636", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "Ocean", "landpad": null}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87ceaffd86e000604b33d"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/2b/65/8Hd65fHz_o.png", "large": "https://images2.imgbox.com/3f/c9/ZczpJ97M_o.png"}, "reddit": {"campaign": null, "launch": "http://www.reddit.com/r/spacex/comments/2x81fc", "media": "https://www.reddit.com/r/spacex/comments/2xumx", "recovery": null}, "flickr": {"small": [], "original": ["https://farm9.staticflickr.com/8749/16788442562_ed460c2d9e_o.jpg", "https://farm9.staticflickr.com/8586/16510243060_48d6a9b1f6_o.jpg", "https://farm9.staticflickr.com/8641/16490359747_c043b8c61a_o.jpg", "https://farm9.staticflickr.com/8636/16510241270_ca83157509_o.jpg", "https://farm8.staticflickr.com/7618/16601658850_13b826e705_o.jpg", "https://farm9.staticflickr.com/8617/16510041628_883af57512_o.jpg"]}}, "presskit": "http://www.spacex.com/sites/spacex/files/abs-eutelsatfactsheet.pdf", "webcast": "https://www.youtube.com/watch?v=mN7lyaCBzT8", "youtube_id": "mN7lyaCBzT8", "article": "http://www.space.com/28702-spacex-rocket-launches-satellites-video.html", "wikipedia": "https://en.wikipedia.org/wiki/ABS-3A"}, "static_fire_date_utc": "2015-02-25T19:10:00.000Z", "static_fire_date_unix": 1424891400, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "The launch was Boeing's first-ever conjoined launch of a lighter-weight dual-commsat stack that was specifically designed to take advantage of the lower-cost SpaceX Falcon 9 launch vehicle. Per satellite, launch costs were less than \$30 million. The ABS satellite reached its final destination ahead of schedule and started operations on September 10.", "crew": [], "ships": [], "capsules": [], "payloads": ["5eb0e4bdb6c3bb0006eeb1f8", "5eb0e4bdb6c3bb0006eeb1f9"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 21, "name": "ABS-3A / Eutelsat 115W B", "date_utc": "2015-03-02T03:50:00.000Z", "date_unix": 1425268200, "date_local": "2015-03-02T23:50:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a0f35918c0893b2637", "flight": 1, "gridfins": false, "legs": false, "reused": false, "landing_attempt": false, "landing_success": null, "landing_type": null, "landpad": null}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87ceaffd86e000604b33e"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/75/39/TJU6xWM5_o.png", "large": "https://images2.imgbox.com/c7/02/2XvCh1yD_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/32jnyd", "media": "https://www.reddit.com/r/spacex/comments/32lw5y", "recovery": null}, "flickr": {"small": [], "original": ["https://farm8.staticflickr.com/7624/17170624642_e5949d160e_o.jpg", "https://farm8.staticflickr.com/7708/17170624402_f6de506461_o.jpg", "https://farm8.staticflickr.com/7658/17170624462_2efc977fee_o.jpg", "https://farm8.staticflickr.com/7611/17171659711_42597fefed_o.jpg", "https://farm9.staticflickr.com/8774/17170624412_7091dbd04a_o.jpg"]}}, "presskit": "https://www.nasa.gov/sites/default/files/files/SpaceX_NASA_CRS-6_PressKit.pdf", "webcast": "https://www.youtube.com/watch?v=csVpa25iqH0", "youtube_id": "csVpa25iqH0", "article": "https://spaceflightnow.com/2015/04/14/falcon-9-successfully-launches-descends-to-off-balance-landing/", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_NASA_CRS-6_PressKit"}

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", "5ea6ed2f080df4000697c90f", "5ea6ed30080df4000697c912"], "capsules": ["5e9e2c5cf359188bfb3b266b"], "payloads": ["5eb0e4bdb6c3bb0006eeb1fa"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 22, "name": "CRS-6", "date_utc": "2015-04-14T20:10:00.000Z", "date_unix": 1429042200, "date_local": "2015-04-14T16:10:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a1f359186d533b2638", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": false, "landing_type": "ASDS", "landpad": "5e9e3032383ecb761634e7cb"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cecffd86e000604b33f"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/a6/9b/IzWT1pYC_o.png", "large": "https://images2.imgbox.com/a1/dc/grsyEfA5_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/33xqcj", "media": "https://www.reddit.com/r/spacex/comments/3439s3", "recovery": null}, "flickr": {"small": [], "original": ["https://farm8.staticflickr.com/7695/17138865668_18dcce7072_o.jpg", "https://farm8.staticflickr.com/7677/16706406093_61a8f9c2f8_o.jpg", "https://farm8.staticflickr.com/7691/17324793792_2dd13ea3f3_o.jpg", "https://farm8.staticflickr.com/7691/17139094400_b94ce1ff56_o.jpg", "https://farm9.staticflickr.com/8739/17140415959_38b5ee8bc6_o.jpg", "https://farm8.staticflickr.com/7735/16704192574_e3a0a6fac2_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/space_xthalesfactsheet_final.pdf", "webcast": "https://www.youtube.com/watch?v=nBwAYTogj4", "youtube_id": "nBwAYTogj4", "article": "https://spaceflightnow.com/2015/04/28/falcon-9-rocket-powers-into-space-with-satellite-for-turkmenistan/", "wikipedia": "https://en.wikipedia.org/wiki/T%C3%BCrkmen%C3%84lem_52%C2%B0E_/MonacoSAT"}, "static_fire_date_utc": "2015-04-22T11:11:00.000Z", "static_fire_date_unix": 1429701060, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": null, "crew": [], "ships": [], "capsules": [], "payloads": ["5eb0e4beb6c3bb0006eeb1fb"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 23, "name": "T\u00d7c3\u00d7bcrkmen\u00d7c3\u00d7x84lem 52\u00d7c2\u00d7xb0E / MonacoSAT", "date_utc": "2015-04-27T23:03:00.000Z", "date_unix": 1430175780, "date_local": "2015-04-27T19:03:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a1f35918233f3b2639", "flight": 1, "gridfins": false, "legs": false, "reused": false, "landing_attempt": false, "landing_success": null, "landing_type": null, "landpad": null}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cedffd86e000604b340"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/53/12/gFtcOQuX_o.png", "large": "https://images2.imgbox.com/7a/51/NfgiMpar_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/3b27hk", "media": "https://www.reddit.com/r/spacex/comments/3berj3", "recovery": null}, "flickr": {"small": [], "original": ["https://farm1.staticflickr.com/344/19045370790_f20f29cd8d_o.jpg", "https://farm1.staticflickr.com/287/18999110808_6e153fed64_o.jpg"]}, "presskit": "https://www.nasa.gov/sites/default/files/atoms/files/spacex_nasa_crs-7_presskit.pdf", "webcast": "https://www.youtube.com/watch?v=PuNymhcTtSQ", "youtube_id": "PuNymhcTtSQ", "article": "https://spaceflightnow.com/2015/06/28/falcon-9-rocket-destroyed-in-launch-mishap/", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_CRS-7"}, "static_fire_date_utc": "2015-06-26T05:00:00.000Z", "static_fire_date_unix": 1435294800, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": false, "failures": [{"time": 139, "altitude": 40, "reason": "helium tank overpressure led to the second stage LOX tank explosion"}], "details": "Launch performance was nominal until an overpressure incident in the second-stage LOX tank, leading to vehicle breakup at T+150 seconds. The Dragon capsule survived the explosion but was lost upon splashdown because its software did not contain provisions for parachute deployment on launch vehicle failure.", "crew": [], "ships": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c"], "capsules": ["5e9e2c5cf35918407d3b266c"], "payloads": ["5eb0e4beb6c3bb0006eeb1fc"], "launchpad": "5e9e4501f509094ba4566f84"}]

9094ba4566f84", "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": "5eb87cefffd86e000604b341"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/6a/7e/J7IQfBqg_o.png", "large": "https://images2.imgbox.com/99/d4/0aIlpFpw_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/3xgxh5", "media": "https://www.reddit.com/r/spacex/comments/3xm83h/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm2.staticflickr.com/1648/23827554109_837b21739e_o.jpg", "https://farm1.staticflickr.com/597/23802553412_d41e4dcc64_o.jpg", "https://farm6.staticflickr.com/5806/23802550622_9ff8c90098_o.jpg", "https://farm1.staticflickr.com/571/23604164970_2a1a2366e4_o.jpg", "https://farm6.staticflickr.com/5773/23271687254_5e64d726ba_o.jpg", "https://farm6.staticflickr.com/5766/23526044959_5bfe74bc88_o.jpg", "https://farm6.staticflickr.com/5723/23785609832_83038751d1_o.jpg", "https://farm1.staticflickr.com/715/23833499336_d3fde6a25a_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/spacex_orbcomm_press_kit_final2.pdf", "webcast": "https://www.youtube.com/watch?v=05bTbVbe4e4", "youtube_id": "05bTbVbe4e4", "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"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 25, "name": "OG-2 Mission 2", "date_utc": "2015-12-22T01:29:00.000Z", "date_unix": 1450747740, "date_local": "2015-12-22T21:29:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a1f3591867753b263b", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cefffd86e000604b342"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/8a/44/PSksEBjD_o.png", "large": "https://images2.imgbox.com/d9/c9/57iowDgW_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/417weg", "media": "https://www.reddit.com/r/spacex/comments/41cvdm", "recovery": null}, "flickr": {"small": [], "original": ["https://farm2.staticflickr.com/1460/24382360351_9b1f2fcabc_o.jpg", "https://farm2.staticflickr.com/1669/24423604506_27d3c4548b_o.jpg", "https://farm2.staticflickr.com/1618/24151425850_1cb6040569_o.jpg", "https://farm2.staticflickr.com/1622/24127012370_07edc62046_o.jpg", "https://farm2.staticflickr.com/1508/24127011190_92ef932c96_o.jpg", "https://farm2.staticflickr.com/1591/23778325594_08231286fc_o.jpg", "https://farm2.staticflickr.com/1542/24038722499_34c10216a3_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/spacex_jason3_press_kit.pdf", "webcast": "https://www.youtube.com/watch?v=ivdKRJzl6y0", "youtube_id": "ivdKRJzl6y0", "article": "https://spaceflightnow.com/2016/01/18/satellite-launched-to-measure-motions-of-the-oceans/", "wikipedia": "https://en.wikipedia.org/wiki/Jason-3"}, "static_fire_date_utc": "2016-01-11T18:42:00.000Z", "static_fire_date_unix": 1452537720, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "First launch of NASA and NOAA joint science mission under the NLS II launch contract (not related to NASA CRS or USAF OSP3 contracts). Last launch of the original Falcon 9 v1.1 launch vehicle. The Jason-3 satellite was successfully deployed to target orbit. SpaceX again attempted a recovery of the first stage booster by landing on an autonomous drone ship; this time located in the Atlantic Ocean."}]

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": "5e9e4502f509092b78566f87", "flight_number": 26, "name": "Jason 3", "date_utc": "2016-01-17T15:42:00.000Z", "date_unix": 1453045320, "date_local": "2016-01-17T08:42:00-07:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a1f3591842fa3b263c", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": false, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cf0ffd86e000604b343"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/7f/15/rjv54Es5_o.png", "large": "https://images2.imgbox.com/c9/7f/EQ1g4Iv2_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/48u4yq", "media": "https://www.reddit.com/r/spacex/comments/472k8c", "recovery": null}, "flickr": {"small": [], "original": ["https://farm2.staticflickr.com/1623/25395662282_942fd68ba3_o.jpg", "https://farm2.staticflickr.com/1458/25395661442_bfd783f18a_o.jpg", "https://farm2.staticflickr.com/1641/25421381351_38390bcb8e_o.jpg", "https://farm2.staticflickr.com/1616/25514167315_b19b0a4365_o.jpg", "https://farm2.staticflickr.com/1482/24883160354_b03cefd416_o.jpg", "https://farm2.staticflickr.com/1653/25420915781_8fc648b4a4_o.jpg", "https://farm2.staticflickr.com/1610/25486858116_9c06dfea59_o.jpg", "https://farm2.staticflickr.com/1617/25168697841_00dfff89bb_o.jpg", "https://farm2.staticflickr.com/1533/24631230904_83b1624807_o.jpg", "https://farm2.staticflickr.com/1627/25145624551_1b8743116f_o.jpg", "https://farm2.staticflickr.com/1622/25120540712_7fcla5ed72_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": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4beb6c3bb0006eeb1ff"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 27, "name": "SES-9", "date_utc": "2016-03-04T23:35:00.000Z", "date_unix": 1457134500, "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": "5eb87cf2ffd86e000604b344"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/72/1e/mA23xHqe_o.png", "large": "https://images2.imgbox.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/1650/26300505022_8b8b9035e8_o.jpg", "https://farm2.staticflickr.com/1486/25787998624_3ca213be1e_o.jpg", "https://farm2.staticflickr.com/1450/26326628031_e1b08ec0b3_o.jpg", "https://farm2.staticflickr.com/1670/26239020092_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/1"]}

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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": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c", "5ea6ed30080df4000697c912", "5ea6ed30080df4000697c913"], "capsules": ["5e9e2c5cf3591885d43b266d"], "payloads": ["5eb0e4bfb6c3bb0006eeb200"], "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": "5eb87cf3fffd86e000604b345"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false}, "ships": [], "links": {"patch": {"small": "https://images2.imgbox.com/7a/90/Zdo2mijx_o.png", "large": "https://images2.imgbox.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/7079/26778141661_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_d77bd31fd0_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 broadcasts 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": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c"], "capsules": [], "payloads": ["5eb0e4bfb6c3bb0006eeb201"], "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": "5eb87cf3fffd86e000604b346"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false}, "ships": [], "links": {"patch": {"small": "https://images2.imgbox.com/fa/f2/iR1eKXrX_o.png", "large": "https://images2.imgbox.com/84/d

c/Qp0wk7j1_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/4hjjz4k", "launch": "https://www.reddit.com/r/spacex/comments/4l9uou", "media": "https://www.reddit.com/r/spacex/comments/4l4af1", "recovery": "https://www.reddit.com/r/spacex/comments/4l2y6"}, "flickr": {"small": [], "original": ["https://farm8.staticflickr.com/7420/26814484893_13059e4b39_o.jpg", "https://farm8.staticflickr.com/7321/26812794884_bf91665325_o.jpg", "https://farm8.staticflickr.com/7337/26812792104_9323121f0b_o.jpg", "https://farm8.staticflickr.com/7376/27421461715_5640d2b87a_o.jpg", "https://farm8.staticflickr.com/7717/26812758364_74569b4327_o.jpg", "https://farm8.staticflickr.com/7742/27294263035_9b43bd141c_o.jpg", "https://farm8.staticflickr.com/7252/27294262435_c534cc4351_o.jpg", "https://farm8.staticflickr.com/7698/27294261525_82c4b7e604_o.jpg", "https://farm8.staticflickr.com/7045/27259828166_9e32061cc9_o.jpg", "https://farm8.staticflickr.com/7013/27259827316_c2f7507b3d_o.jpg", "https://farm8.staticflickr.com/7211/27182485331_ed2414a947_o.jpg", "https://farm8.staticflickr.com/7740/27182481921_0d7a759736_o.jpg", "https://farm8.staticflickr.com/7315/26645036414_39736db559_o.jpg"]}], "presskit": "http://www.spacex.com/sites/spacex/files/spacex_thaicom_8_press_kit.pdf", "webcast": "https://www.youtube.com/watch?v=zBYC4f79iXc", "youtube_id": "zBYC4f79iXc", "article": "https://spaceflightnow.com/2016/05/27/spacex-logs-successful-late-afternoon-launch-for-thaicom/", "wikipedia": "https://en.wikipedia.org/wiki/Thaicom_8", "static_fire_date_utc": "2016-05-25T00:00:00.000Z", "static_fire_date_unix": 1464134400, "net": false, "window": 7200, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Manufactured by Orbital ATK, the 3,100-kilogram (6,800 lb) Thaicom 8 communications satellite will serve Thailand, India and Africa from the 78.5° East geostationary location. It is equipped with 24 active Ku-band transponders.", "crew": [], "ships": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4bfb6c3bb0006eeb202"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 30, "name": "Thaicom 8", "date_utc": "2016-05-27T21:39:00.000Z", "date_unix": 1464385140, "date_local": "2016-05-27T17:39:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a2f3591845c73b2640", "flight": 1, "gridfins": true, "legs": true, "reuse": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "launchpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cf6ffd86e000604b347"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/36/a4/J5gJWxuC_o.png", "large": "https://images2.imgbox.com/c6/d2/MIC8sIE4_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/4ksdy3", "launch": "https://www.reddit.com/r/spacex/comments/4o5u6r", "media": "https://www.reddit.com/r/spacex/comments/4o5j6o", "recovery": "https://www.reddit.com/r/spacex/comments/4on75l"}, "flickr": {"small": [], "original": ["https://farm8.staticflickr.com/7088/27661326426_ce3c3f320d_o.jpg", "https://farm8.staticflickr.com/7698/27661325446_affb08be24_o.jpg", "https://farm8.staticflickr.com/7733/27661322976_073466e80c_o.jpg", "https://farm8.staticflickr.com/7218/27661320706_4c16f3b76b_o.jpg", "https://farm8.staticflickr.com/7340/27661315686_6dcb2ce6f9_o.jpg", "https://farm8.staticflickr.com/7656/27661313956_e1ac9650b9_o.jpg", "https://farm8.staticflickr.com/7616/27661312516_640764f8fd_o.jpg", "https://farm8.staticflickr.com/7413/27078893234_0142dd80f0_o.jpg", "https://farm8.staticflickr.com/7334/27078889924_8819fd55ea_o.jpg"]}], "presskit": "https://drive.google.com/open?id=0BwA3a65ef10vMGpJSlpDNHhjelu", "webcast": "https://www.youtube.com/watch?v=gLNmtUEvI5A", "youtube_id": "gLNmtUEvI5A", "article": "https://spaceflightnow.com/2016/06/15/spacex-successfully-fires-satellites-into-orbit-but-loses-booster-on-landing/", "wikipedia": "https://en.wikipedia.org/wiki/ABS_(satellite_operator)", "static_fire_date_utc": "2016-06-13T15:03:00.000Z", "static_fire_date_unix": 1465830180, "net": false, "window": 2700, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "One year after pioneering this technique on flight 16, Falcon again launched two Boeing 702SP gridded ion thruster satellites in a dual-stack configuration, with the two customers sharing the rocket and mission costs. First stage landing attempt on drone ship failed on landing due to low thrust on one of the three landing engines.", "crew": [], "ships": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4bfb6c3bb0006eeb203", "5eb0e4bfb6c3bb0006eeb204"], "launchpad": "5e9e4501f509094

ba4566f84","flight_number":31,"name":"ABS-2A / Eutelsat 117W B","date_utc":"2016-06-15T14:29:00.000Z","date_unix":1466000940,"date_local":"2016-06-15T10:29:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a2f359184f403b2641","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":false,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cf8ffd86e000604b348"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/bb/0d/aLsm9QDC_o.png","large":"https://images2.imgbox.com/56/af/b7fNzZGo_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/4ksed1","launch":"https://www.reddit.com/r/spacex/comments/4t2umd/","media":"https://www.reddit.com/r/spacex/comments/4tayth","recovery":"https://www.reddit.com/r/spacex/comments/4znsvo"},"flickr":{"small":[],"original":["https://farm9.staticflickr.com/8819/27776240293_fcbf8c4a0a_o.jpg","https://farm8.staticflickr.com/7720/27776237513_038971797c_o.jpg","https://farm8.staticflickr.com/7594/27776235133_d794ce01f4_o.jpg","https://farm8.staticflickr.com/7759/27776229243_a0674e590f_o.jpg","https://farm8.staticflickr.com/7512/27776228443_6652c6baea_o.jpg","https://farm9.staticflickr.com/8038/27776218453_34112abbc1_o.jpg","https://farm8.staticflickr.com/7636/27776215913_3f9f1b05df_o.jpg","https://farm8.staticflickr.com/7740/28358960896_9785456101_o.jpg","https://farm8.staticflickr.com/7488/27776206663_262526ba5f_o.jpg","https://farm8.staticflickr.com/7656/28358955546_ce55d65e16_o.jpg","https://farm8.staticflickr.com/7467/27776204693_68b4ed82c9_o.jpg","https://farm8.staticflickr.com/7693/28348649546_0a54b1aa44_o.jpg","https://farm8.staticflickr.com/7540/28291786662_5e2e874576_o.jpg"]},"presskit":"https://drive.google.com/open?id=0BwA3a65ef10vM0JpSXdDUUJMRVkJ","webcast":"https://www.youtube.com/watch?v=ThIdCuSsJh8","youtube_id":"ThIdCuSsJh8","article":"https://spaceflightnow.com/2016/07/18/spacex-sends-supplies-to-space-station-lands-another-falcon-rocket/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-9"},"static_fire_date_utc":"2016-07-16T02:31:47.000Z","static_fire_date_unix":1468636307,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Among other cargo, an International Docking Adapter (IDA-2) was carried to the ISS. This mission had a successful first-stage landing at Cape Canaveral.*Including the reusable Dragon Capsule, total payload to orbit was 6457 kg."},"crew":[],"ships":["5ea6ed2e080df4000697c906","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90c","5ea6ed380df4000697c912"],"capsules":["5e9e2c5cf359183bb73b266e"],"payloads":["5eb0e4c0b6c3bb0006eeb205"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":32,"name":"CRS-9","date_utc":"2016-07-18T04:45:00.000Z","date_unix":1468817100,"date_local":"2016-07-18T00:45:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a2f359187f273b2642","flight":1,"gridfins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":true,"landing_type":"RTLS","landpad":"5e9e3032383ecb267a34e7c7"}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87cf9ffd86e000604b349"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/22/cc/DjPcsMhb_o.png","large":"https://images2.imgbox.com/0b/3e/aQpLZQHT_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/4pv6ws","launch":"https://www.reddit.com/r/spacex/comments/4xi7uq","media":"https://www.reddit.com/r/spacex/comments/4xkdfj","recovery":"https://www.reddit.com/r/spacex/comments/4y5xd1"},"flickr":{"small":[],"original":["https://farm9.staticflickr.com/8699/28965678292_17533229f3_o.jpg","https://farm9.staticflickr.com/8173/28453337463_b9d11eeb4c_o.jpg","https://farm8.staticflickr.com/7793/28453335533_3f5a0a5760_o.jpg","https://farm9.staticflickr.com/8784/28938085496_74b3fd0527_o.jpg","https://farm9.staticflickr.com/8337/28969742675_15f78369a1_o.jpg","https://farm9.staticflickr.com/8691/28353012603_ab83b6f5aa_o.jpg","https://farm9.staticflickr.com/8078/28351782813_58ca783e51_o.jpg"]},"presskit":"https://drive.google.com/open?id=0BwA3a65ef10vb0FkYnE5dElZRLU","webcast":"https://www.youtube.com/watch?v=QZTCE00gvLo","youtube_id":"QZTCE00gvLo","article":"https://spaceflightnow.com/2016/08/14/falcon-9-rocket-launches-japanese-satellite-then-nails-bullseye-landing/","wikipedia":"https://en.wikipedia.org/wiki/JCSAT-16"},"static_fire_date_utc":"2016-08-11T04:01:00.000Z","static_fire_date_unix":1470888060,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"First attempt to touch down from a ballistic trajectory using a single-engine

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", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cfaffd86e000604b34a"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": [], "links": {"patch": {"small": "https://images2.imgbox.com/0d/5b/8X01C3ov_o.png", "large": "https://images2.imgbox.com/ff/19/KCI4DVla_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/4pv7jl", "launch": null, "media": null, "recovery": null}, "flickr": {"small": [], "original": []}, "presskit": null, "webcast": "https://www.youtube.com/watch?v=_BgJEXQkjNQ", "youtube_id": "_BgJEXQkjNQ", "article": "https://spaceflightnow.com/2016/09/01/spacex-rocket-and-israeli-satellite-destroyed-in-launch-pad-explosion/", "wikipedia": "https://en.wikipedia.org/wiki/Amos-6"}, "static_fire_date_utc": "2016-09-01T13:07:00.000Z", "static_fire_date_unix": 1472735220, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": false, "failures": [{"time": -165180, "altitude": 0, "reason": "buckled liner in several of the COPV tanks, causing perforations that allowed liquid and/or solid oxygen to accumulate underneath the lining, which was ignited by friction."}], "details": "The rocket and Amos-6 payload were lost in a launch pad explosion on September 1, 2016 during propellant fill prior to a static fire test. The pad was clear of personnel and there were no injuries.", "crew": [], "ships": [], "capsules": [], "payloads": ["5eb0e4c1b6c3bb0006eeb207"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 34, "name": "Amos-6", "date_utc": "2016-09-01T13:07:00.000Z", "date_unix": 1472735220, "date_local": "2016-09-01T09:07:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a2f359187ee83b2644", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": null, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cfbffd86e000604b34b"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": [], "links": {"patch": {"small": "https://images2.imgbox.com/89/2a/bkI6LN0R_o.png", "large": "https://images2.imgbox.com/24/c3/9MKjvOdD_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/5dii6z", "launch": "https://www.reddit.com/r/spacex/comments/5nsaqm", "media": "https://www.reddit.com/r/spacex/comments/5nsico", "recovery": "https://www.reddit.com/r/spacex/comments/5oe9kk"}, "flickr": {"small": [], "original": ["https://farm1.staticflickr.com/658/32394688795_55a9873ea7_o.jpg", "https://farm1.staticflickr.com/506/32394688095_a3339f3c6d_o.jpg", "https://farm1.staticflickr.com/745/32394687645_63ae2b4740_o.jpg", "https://farm1.staticflickr.com/318/31548291014_e3a30abca8_o.jpg", "https://farm1.staticflickr.com/670/32351549066_e9cffe8d2b_o.jpg", "https://farm6.staticflickr.com/5518/31579784413_83aeac560a_o.jpg", "https://farm6.staticflickr.com/5556/32312421135_22c197c156_o.jpg", "https://farm1.staticflickr.com/529/32312420015_5d2403a847_o.jpg", "https://farm1.staticflickr.com/435/32312417695_19c0e50c4b_o.jpg", "https://farm1.staticflickr.com/735/32312416415_b90892af0a_o.jpg", "https://farm1.staticflickr.com/293/32312415025_cae16d1994_o.jpg", "https://farm1.staticflickr.com/738/31467130724_92e02c9524_o.jpg", "https://farm1.staticflickr.com/464/31467130374_9f7a7d380e_o.jpg", "https://farm1.staticflickr.com/581/31467129424_bac77d594a_o.jpg", "https://farm1.staticflickr.com/380/32308163845_c1731a4b1f_o.jpg", "https://farm1.staticflickr.com/447/31450835954_72ed10a19e_o.jpg", "https://farm1.staticflickr.com/507/31450834974_b8a3f4aca5_o.jpg"]}, "presskit": "https://drive.google.com/open?id=0BwA3a65ef10vZC1aU3FuM1QzalE", "webcast": "https://www.youtube.com/watch?v=7WimRhydggg", "youtube_id": "7WimRhydggg", "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

c": "2017-01-05T19:40:00.000Z", "static_fire_date_unix": 1483645200, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Return-to-flight mission after the loss of Amos-6 in September 2016. Iridium NEXT will replace the original Iridium constellation, launched in the late 1990s. Each Falcon mission will carry 10 satellites, with a goal to complete deployment of the 66 plus 9 spare satellite constellation by mid 2018. The first two Iridium qualification units were supposed to ride a Dnepr rocket in April 2016 but were delayed, so Iridium decided to qualify the first batch of 10 satellites instead.", "crew": [], "ships": ["5ea6ed2f080df4000697c910", "5ea6ed30080df4000697c912", "5ea6ed30080df4000697c915"], "capsules": [], "payloads": ["5eb0e4c2b6c3bb0006eeb208"], "launchpad": "5e9e4502f509092b78566f87", "flight_number": 35, "name": "Iridium NEXT Mission 1", "date_utc": "2017-01-14T17:54:00.000Z", "date_unix": 1484416440, "date_local": "2017-01-14T10:54:00-07:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a3f359189e3a3b2645", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87cfdffd86e000604b34c"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/11/eb/qqrhHFhv_o.png", "large": "https://images2.imgbox.com/ea/43/D4tA0WaM_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/5n2eqx", "launch": "https://www.reddit.com/r/spacex/comments/5uw4bh", "media": "https://www.reddit.com/r/spacex/comments/5uoy8o", "recovery": "https://www.reddit.com/r/spacex/comments/609aq4"}, "flickr": {"small": [], "original": ["https://farm3.staticflickr.com/2815/32761844973_d2e8d76e9c_o.jpg", "https://farm4.staticflickr.com/3878/32761843663_8e366494f4_o.jpg", "https://farm3.staticflickr.com/2790/32852846842_6f1f7b26b9_o.jpg", "https://farm3.staticflickr.com/2295/32852845662_e7ae0daf4a_o.jpg", "https://farm4.staticflickr.com/3888/33000639155_2a6e2bb23d_o.jpg", "https://farm1.staticflickr.com/405/33000638185_b4ec7c7b93_o.jpg", "https://farm1.staticflickr.com/574/32874779241_9f463de901_o.jpg", "https://farm4.staticflickr.com/3710/32153433074_96337a54db_o.jpg", "https://farm1.staticflickr.com/327/32153432924_09dd1482d8_o.jpg", "https://farm3.staticflickr.com/2881/32183025803_36bf976b9e_o.jpg", "https://farm3.staticflickr.com/2362/32183025493_2a37b4e22c_o.jpg", "https://farm1.staticflickr.com/504/32178458813_ff47f61bb9_o.jpg", "https://farm1.staticflickr.com/265/32176806823_879ccc5da0_o.jpg", "https://farm1.staticflickr.com/401/32866357531_69c6d289ed_o.jpg", "https://farm3.staticflickr.com/2105/32945170805_553d45ca56_o.jpg", "https://farm4.staticflickr.com/3865/32945170225_58129f00dc_o.jpg"]}], "presskit": "http://www.spacex.com/sites/spacex/files/crs10presskitfinal.pdf", "webcast": "https://www.youtube.com/watch?v=giNhaEzv_PI", "youtube_id": "giNhaEzv_PI", "article": "https://spaceflightnow.com/2017/02/19/historic-launch-pad-back-in-service-with-thundering-blastoff-by-spacex/", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_CRS-10"}, {"static_fire_date_utc": "2017-02-12T21:30:00.000Z", "static_fire_date_unix": 1486935000, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "First Falcon 9 flight from the historic LC-39A launchpad at Kennedy Space Center, carrying supplies and materials to support dozens of science and research investigations scheduled during ISS Expeditions 50 and 51. The first stage returned to launch site and landed at LZ-1.", "crew": [], "ships": ["5ea6ed30080df4000697c912"], "capsules": ["5e9e2c5cf359185d753b266f"], "payloads": ["5eb0e4c3b6c3bb0006eeb209"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 36, "name": "CRS-10", "date_utc": "2017-02-19T14:39:00.000Z", "date_unix": 1487515140, "date_local": "2017-02-19T10:39:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a3f3591829dc3b2646", "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": "5eb87cfeffd86e000604b34d"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/56/9d/gvzAqLFg_o.png", "large": "https://images2.imgbox.com/52/a0/z8Dwflcz_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/5n2e10/echostar_23_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/5z8dkm/welcome_to_the_rspacex_echostar23_official_launch/", "media": "https://www.reddit.com/r/spacex/comments/5z8if6/rspacex_echostar_23_media_thread_videos_images/", "recovery": null}, "f

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Second-stage speed and altitude telemetry were omitted from the launch webcast, which displayed first-stage telemetry instead, with continuous tracking of the booster from liftoff to landing for the first time.", "crew": [], "ships": ["5ea6ed2f080df4000697c90c"], "capsules": [], "payloads": ["5eb0e4c3b6c3bb0006eeb20c"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 39, "name": "NROL-76", "date_utc": "2017-05-01T11:15:00.000Z", "date_unix": 1493637300, "date_local": "2017-05-01T07:15:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a3f3591811f83b2648", "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": "5eb87d01ffd86e000604b350"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/ab/8d/fUpriAbI_o.png", "large": "https://images2.imgbox.com/5b/f7/30l0xVXG_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/64kguj/", "launch": "https://www.reddit.com/r/spacex/comments/6b88hz/", "media": "https://www.reddit.com/r/spacex/comments/6bcf8j/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4174/33859521334_d75fa367d5_o.jpg", "https://farm5.staticflickr.com/4158/33859520764_5bb7a7daf6_o.jpg", "https://farm5.staticflickr.com/4182/33859520404_a9c78c971d_o.jpg", "https://farm5.staticflickr.com/4157/34556140711_f404943340_o.jpg", "https://farm5.staticflickr.com/4179/34556139821_b2d6255e07_o.jpg", "https://farm5.staticflickr.com/4187/34684981395_2f93965492_o.jpg", "https://farm5.staticflickr.com/4155/34684980875_77b745158a_o.jpg", "https://farm5.staticflickr.com/4183/34296430820_8d3a42c0d7_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/inmarsat5f4presskit_final.pdf", "webcast": "https://www.youtube.com/watch?v=ynMYE64IEKs", "youtube_id": "ynMYE64IEKs", "article": "https://www.space.com/36852-spacex-launches-inmarsat-5-f4-satellite.html", "wikipedia": "https://en.wikipedia.org/wiki/Inmarsat#Satellites"}, "static_fire_date_utc": "2017-05-11T16:45:00.000Z", "static_fire_date_unix": 1494521100, "net": false, "window": 2940, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "At 6,070 kg this was the heaviest payload launched to GTO by a Falcon 9 rocket. The launch was originally scheduled for the Falcon Heavy, but performance improvements allowed the mission to be carried

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.imgbox.com/54/45/VoihQAY3_o.png", "large": "https://images2.imgbox.com/2d/39/EAkUxxPk_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/68ul58/", "launch": "https://www.reddit.com/r/spacex/comments/6ektk/", "media": "https://www.reddit.com/r/spacex/comments/6emlzt/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4210/34696326760_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_f52e5bffff_o.jpg", "https://farm5.staticflickr.com/4219/34918571502_7cf66854f7_o.jpg", "https://farm5.staticflickr.com/4252/34918568732_4efe0885de_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/4280/34268361083_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/2017/06/03/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": ["5ea6ed30080df4000697c912"], "capsules": ["5e9e2c5bf3591880643b2669"], "payloads": ["5eb0e4c4b6c3bb0006eeb20e"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 41, "name": "CRS-11", "date_utc": "2017-06-03T21:07:00.000Z", "date_unix": 1496524020, "date_local": "2017-06-03T17:07:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a3f3591856803b264a", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "RTL S", "landpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d03ffd86e000604b352", {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/fa/1b/3vvXwAf9_o.png", "large": "https://images2.imgbox.com/e2/f3/RZJ7ET73_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/69hhkm/bulgariasat1_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/6isph2/welcome_to_the_rspacex_bulgariasat1_official/", "media": "https://www.reddit.com/r/spacex/comments/6iuj1z/rspacex_bulgariasat1_media_thread_videos_images/", "recovery": "https://www.reddit.com/r/spacex/comments/6k3kop/b10292_bulgariasat1_recovery_thread/"}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4216/35496028185_ac5456195f_o.jpg", "https://farm5.staticflickr.com/4278/35496027525_9ab9d90417_o.jpg", "https://farm5.staticflickr.com/4277/35496026875_fd25c46934_o.jpg", "https://farm5.staticflickr.com/4257/35496026065_02fe65754b_o.jpg", "https://farm5.staticflickr.com/4289/35491530485_5a4d0f39ae_o.jpg", "https://farm5.staticflickr.com/4279/35491529875_1e35ee0a1e_o.jpg", "https://farm5.staticflickr.com/4230/34681559323_53f05581ca_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/bulgariasat1presskit.pdf", "webcast": "https://www.youtube.com/watch?v=Y8mLi-rRTh8", "youtube_id": "Y8mLi-rRTh8", "article": "https://en.wikipedia.org/wiki/BulgariaSat-1", "wikipedia": "https://en.wikipedia.org/wiki/BulgariaSat-1"}, "static_fire_date_utc": "2017-06-15T22:25:00.000Z", "static_fire_date_unix": 1497384000, "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."}]

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The satellite has a mass of only 475 kg.", "crew": [], "ships": ["5ea6ed2e080df4000697c905", "5ea6ed2f080df4000697c910"], "capsules": [], "payloads": ["5eb0e4c4b6c3bb0006eeb213"], "launchpad": "5e9e4502f509092b78566f87", "flight_number": 46, "name": "FormoSat-5", "date_utc": "2017-08-24T18:50:00.000Z", "date_unix": 1503600600, "date_local": "2017-08-24T11:50:00-07:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a4f359182d843b264e", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d08ffd86e000604b357"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/12/7c/p8btH0CD_o.png", "large": "https://images2.imgbox.com/32/61/cX8Z1EJQ_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/6u6q1t/x37b_otv5_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/6ygmf1/rspacex_x37b_otv5_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/6yih4g/rspacex_x37b_otv5_media_thread_videos_images_gifs/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4411/37087809715_08a6d9904d_o.jpg", "https://farm5.staticflickr.com/4384/37087808315_4dc9575d1b_o.jpg", "https://farm5.staticflickr.com/4363/36251815974_8b996dbbfb_o.jpg", "https://farm5.staticflickr.com/4374/36251814644_1a469f63ee_o.jpg", "https://farm5.staticflickr.com/4388/36251812554_006501315f_o.jpg", "https://farm5.staticflickr.com/4355/36250895284_8c24cb4232_o.jpg", "https://farm5.staticflickr.com/4342/36689886890_99709e6934_o.jpg", "https://farm5.staticflickr.com/4364/36689885100_c3c427c6bf_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/otv5_presskit.pdf", "webcast": "https://www.youtube.com/watch?v=9M6Zvi-fFv4", "youtube_id": "9M6Zvi-fFv4", "article": "https://spaceflightnow.com/2017/09/07/spacex-beats-hurricane-with-smooth-launch-of-militarys-x-37b-spaceplane/", "wikipedia": "https://en.wikipedia.org/wiki/Boeing_X-37"}, {"static_fire_date_utc": "2017-08-31T20:30:00.000Z", "static_fire_date_unix": 1504211400, "net": false, "window": 18300, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Notable because Boeing is the primary contractor of the X-37B, which has until now been launched by ULA, a SpaceX competitor and Boeing partnership. Second flight of the Falcon 9 Block 4 upgrade.", "crew": [], "ships": ["5ea6ed2e080df4000697c906", "5ea6ed2f080df4000697c90b"], "capsules": [], "payloads": ["5eb0e4c5b6c3bb0006eeb214"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 47, "name": "Boeing X-37B OTV-5", "date_utc": "2017-09-07T13:50:00.000Z", "date_unix": 1504792200, "date_local": "2017-09-07T09:50:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a4f3591845123b264f", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d09ffd86e000604b358"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/fb/5b/LNVLRI_Tr_o.png", "large": "https://images2.imgbox.com/48/d4/MKsibD8N_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/6ygwxx/iridium_next_constellation_mission_3_launch/", "launch": "https://www.reddit.com/r/spacex/comments/753e0m/iridium_next_mission_3_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/755m2z/rspacex_iridium3_media_thread_videos_images_gifs/", "recovery": "https://www.reddit.com/r/spacex/comments/75z823/b10411_recovery_thread/"}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4509/37610550066_b56bc5d743_o.jpg", "https://farm5.staticflickr.com/4487/37610548356_1b7d30001e_o.jpg", "https://farm5.staticflickr.com/4514/37610547696_9114038d60_o.jpg", "https://farm5.staticflickr.com/4483/37610547226_01d19395a3_o.jpg", "https://farm5.staticflickr.com/4504/36984625383_d7707548ec_o.jpg", "https://farm5.staticflickr.com/4505/36984623903_7bb6643649_o.jpg", "https://farm5.staticflickr.com/4445/36984622463_6f9b21929c_o.jpg", "https://farm5.staticflickr.com/4471/36944884234_92ddc7fb39_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/iridium3presskit.pdf"}

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The satellite will be placed in GEO at 113° East Longitude, and will provide services ranging from broadband internet to broadcasting services and maritime communications.", "crew": [], "ships": ["5ea6ed2f080df4000697c90d", "5ea6ed2e080df4000697c908", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4c5b6c3bb0006e6eb217"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 50, "name": "KoreaSat 5A", "date_utc": "2017-10-30T19:34:00.000Z", "date_unix": 1509392040, "date_local": "2017-10-30T15:34:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a4f359185cc03b2651", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "launchpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d0dfffd86e000604b35b"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/84/42/Ejb9KhGR_o.png", "large": "https://images2.imgbox.com/54/4f/CeMcU6RG_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/7bxg5a/crs13_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/7j725w/rspacex_crs13_official_launch_discussion_updates/", "media": "https://www.reddit.com/r/spacex/comments/7j6oxz/rspacex_crs13_media_thread_videos_images_gifs/"}, "recovery": null, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4591/38372264594_8140bd943d_o.png", "https://farm5.staticflickr.com/4546/39051469552_13703e6b2e_o.jpg", "https://farm5.staticflickr.com/4682/39051469662_55c55150c0_o.jpg", "https://farm5.staticflickr.com/4565/25215551218_2597838c1a_o.jpg", "https://farm5.staticflickr.com/4680/39051469812_b6f802fc9d_o.jpg", "https://farm5.staticflickr.com/4517/27304331429_59b9d6c1d4_o.jpg"]}}, "presskit": "http://www.spacex.com/sites/spacex/files/crs13presskit12_11.pdf", "webcast": "https://www.youtube.com/watch?v=OPHbqY9LHCs", "youtube_id": "OPHbqY9LHCs", "article": "https://spaceflightnow.com/2017/12/15/spacexs-50th-falcon-rocket-launch-kicks-off-station-resupply-mission/", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_CRS-13"}, {"static_fire_date_utc": "2017-12-06T20:00:00.000Z", "static_fire_date_unix": 1512590400, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Will reuse the Dragon capsule previously flown on CRS-6 and will reuse the booster from CRS-11.", "crew": [], "ships": ["5ea6ed30080df4000697c912"], "capsules": ["5e9e2c5cf359188bfb3b266b"], "payloads": ["5eb0e4c5b6c3bb0006e6eb218"], "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", "launchpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d0efffd86e000604b35c"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/85/43/6VSgldk0_o.png", "large": "https://images2.imgbox.com/5f/d4/wAoAmyxK_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/7cgts7/iridium_next_constellation_mission_4_launch/", "launch": "https://www.reddit.com/r/spacex/comments/7li8y2/rspacex_iridium_next_4_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/7litv2/rspacex_iridium4_media_thread_videos_images_gifs/"}, "recovery": null, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4695/25557986177_2d315f4c11_o.jpg", "https://farm5.staticflickr.com/4735/25377631178_d28e0a9141_o.jpg", "https://farm5.staticflickr.com/4733/25377628928_a79bb43a31_o.jpg", "https://farm5.staticflickr.com/4732/25377628288_361f551d34_o.jpg", "https://farm5.staticflickr.com/4598/39244105581_eeb76c8ed2_o.jpg", "https://farm5.staticflickr.com/4728/24381830217_a49ae2100f_o.jpg"]}}, "presskit": "http://www.spacex.com/sites/spacex/files/iridium4presskit.pdf", "webcast": "https://www.youtube.com/watch?v=wtdjCwo6d3Q", "youtube_id": "wtdjCwo6d3Q"}]

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First-stage booster will attempt landing at LZ-1", "crew": [], "ships": [], "capsules": [], "payloads": ["5eb0e4c6b6c3bb0006eeb21a"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 53, "name": "ZUMA", "date_utc": "2018-01-08T01:00:00.000Z", "date_unix": 1515373200, "date_local": "2018-01-07T20:00:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a4f35918345e3b2652", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d10fffd86e000604b35e", {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/e0/b5/G8QLLURL_o.png", "large": "https://images2.imgbox.com/3b/6b/ovK7nExS_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/7olw86/govsat1_ses16_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/7tvbth/rspacex_govsat1_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/7tzzwy/rspacex_govsat1_media_thread_videos_images_gifs/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4721/40026315981_f16a7cd32a_o.jpg", "https://farm5.staticflickr.com/4708/40026316291_0b3aef9d8d_o.jpg", "https://farm5.staticflickr.com/4652/39128355655_3eefa0d583_o.jpg", "https://farm5.staticflickr.com/4741/39128355825_7c4166dbbe_o.jpg", "https://farm5.staticflickr.com/4609/39128355355_17381fc00e_o.jpg"]}, "presskit": "http://www.spacex.com/sites/spacex/files/govsat1presskit.pdf", "webcast": "https://www.youtube.com/watch?v=ScYUA51-POQ", "youtube_id": "ScYUA51-POQ", "article": "https://spaceflightnow.com/2018/01/31/spacex-rocket-flies-on-60th-anniversary-of-first-u-s-satellite-launch/", "wikipedia": "https://en.wikipedia.org/wiki/List_of_SES_satellites#SES_Fleet"}, "static_fire_date_utc": "2018-01-26T15:27:00.000Z", "static_fire_date_unix": 1516980420, "net": false, "window": 8460, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Reused booster f

rom the classified NROL-76 mission in May 2017. Following a successful experiment al ocean landing that used three engines, the booster unexpectedly remained intact; Elon Musk stated in a tweet that SpaceX will attempt to tow the booster to shore.", "crew": [], "ships": ["5ea6ed2f080df4000697c90b"], "capsules": [], "payloads": ["5eb0e4c6b6c3bb0006eeb21b"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 54, "name": "SES-16 / GovSat-1", "date_utc": "2018-01-31T21:25:00.000Z", "date_unix": 1517433900, "date_local": "2018-01-31T16:25:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a3f3591811f83b2648", "flight": 2, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "Ocean", "landpad": null}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d11ffd86e000604b35f"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/cd/48/NVrODg2G_o.png", "large": "https://images2.imgbox.com/97/11/mjn87zBs_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/7hj03/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/7vmtm/rspacex_falcon_heavy_test_flight_media_thread/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4745/40110304192_b0165b7785_o.jpg", "https://farm5.staticflickr.com/4676/40110297852_6173e5cae6_o.jpg", "https://farm5.staticflickr.com/4615/40143096241_0324643b5e_o.jpg", "https://farm5.staticflickr.com/4702/40110298232_4e9c412936_o.jpg", "https://farm5.staticflickr.com/4610/39337245575_41d760caef_o.jpg", "https://farm5.staticflickr.com/4654/25254688767_59603ff06c_o.jpg", "https://farm5.staticflickr.com/4627/40126462801_d54b4f00be_o.jpg", "https://farm5.staticflickr.com/4760/40126462231_cdf00ef431_o.jpg", "https://farm5.staticflickr.com/4655/40202121122_5d29cfe2ac_o.jpg", "https://farm5.staticflickr.com/4631/39337245145_5f5630a66a_o.jpg", "https://farm5.staticflickr.com/4650/40126461851_14b93ec9d7_o.jpg", "https://farm5.staticflickr.com/4711/40126461411_b1ed283d45_o.jpg", "https://farm5.staticflickr.com/4696/40126460511_7b5cc64871_o.jpg", "https://farm5.staticflickr.com/4589/38583831555_9ae89f5c10_o.jpg", "https://farm5.staticflickr.com/4682/38583829815_e01509d1a7_o.jpg", "https://farm5.staticflickr.com/4731/39225582801_80594d5d91_o.jpg", "https://farm5.staticflickr.com/4641/39225582421_7aa0c65851_o.jpg", "https://farm5.staticflickr.com/4643/27449864329_d2424bc280_o.jpg", "https://farm5.staticflickr.com/4681/39225582171_137a4c75e7_o.jpg", "https://farm5.staticflickr.com/4644/39225582351_ac6aba2533_o.jpg", "https://farm5.staticflickr.com/4587/27449863849_709e135a98_o.jpg"]}], "presskit": "http://www.spacex.com/sites/spacex/files/falconheavypresskit_v1.pdf", "webcast": "https://www.youtube.com/watch?v=wbSwFU6tY1c", "youtube_id": "wbSwFU6tY1c", "article": "https://spaceflightnow.com/2018/02/07/spacex-debuts-worlds-most-powerful-rocket-sends-tesla-toward-the-asteroid-belt/", "wikipedia": "https://en.wikipedia.org/wiki/Elon_Musk%27s_Tesla_Roadster"}, {"static_fire_date_utc": "2018-01-24T17:30:00.000Z", "static_fire_date_unix": 1516815000, "net": false, "window": 9000, "rocket": "5e9d0d95eda69974db09d1ed", "success": true, "failures": [], "details": "The launch was a success, and the side boosters landed simultaneously at adjacent ground pads. 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Final burn to heliocentric mars-earth orbit was successful after the second stage and payload passed through the Van Allen belts.", "crew": [], "ships": ["5ea6ed2f080df4000697c90c", "5ea6ed2f080df4000697c90d", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4c6b6c3bb0006eeb21c"], "launchpad": "5e9e4502f509094188566f88", "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": "5e9e28a5f359187f703b2653", "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", "landpad": "5e9e3032383ecb90a834e7c8"}, {"core": "5e9e28a2f3591845c73b2640", "flight": 2, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "RTL", "landpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d13ffd86e000604b360"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": false, "ship

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s performed, the booster was expended into the ocean. SpaceX planned a second rec  
overy attempt of one half of the fairing using the specially modified boat Mr. St  
even. However, the fairing's parafoil twisted during the recovery, which led to  
water impact at high speed", "crew": [], "ships": [ "5ea6ed2e080df4000697c908" ], "capsu  
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Iridium CEO Matt Desch disclosed in September 2017 that GRACE-FO would be launched on the sixth Iridium NEXT mission. The booster reuse turnaround was a record 4.5 months between flights."},"crew":[],"ships":["5ea6ed2e080df4000697c908"],"capsules":[],"payloads":["5eb0e4c7b6c3bb0006eeb224","5eb0e4c8b6c3bb0006eeb225"],"launchpad":"5e9e4502f509092b78566f87","flight_number":62,"name":"Iridium NEXT Mission 6","date_utc":"2018-05-22T19:47:58.000Z","date_unix":1527018478,"date_local":"2018-05-22T12:47:58-08:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f35918345e3b2652"},"flight":2,"gridfins":true,"legs":false,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d1affd86e000604b367"}},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[],"links":{"patch":{"small":"https://images2.imgbox.com/fa/c4/37mkd4wY_o.png","large":"https://images2.imgbox.com/9f/0c/0KIBJmFe_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8jv0ed/ses12_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/8o9woj/rspacex_ses12_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/8oa3k4/rspacex_ses12_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1752/41664024035_14c81a25e3_o.jpg","https://farm2.staticflickr.com/1731/27695627527_d9d5bca0ae_o.jpg","https://farm2.staticflickr.com/1735/27695627327_ed66c7282c_o.jpg","https://farm2.staticflickr.com/1752/27695627417_38ea7d7acf_o.jpg","https://farm2.staticflickr.com/1733/41664023935_e9e8120690_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/ses-12missionpress_kit_6.2.18.pdf","webcast":"https://www.youtube.com/watch?v=2hcM5hqQ45s","youtube_id":"2hcM5hqQ45s","article":"https://spaceflightnow.com/2018/06/04/multi-mission-telecom-craft-launched-by-spacex-for-ses/","wikipedia":"https://en.wikipedia.org/wiki/SES-12"},"static_fire_date_utc":"2018-05-25T01:48:00.000Z","static_fire_date_unix":1527212880,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec"},"success":true,"failures":[],"details":"SES-12, the replacement satellite for NSS-6, was successfully launched and deployed on June 4th, completing SpaceX's eleventh flight of 2018. According to SES Luxembourg, The SES-12 satellite will expand SES's capabilities to provide direct-to-home (DTH) broadcasting, VSAT, Mobility and High Throughput Satellite (HTS) data connectivity services in the Middle East and the Asia-Pacific region, including rapidly growing markets such as India and Indonesia. [SES-12] will be co-located with SES-8","crew":[],"ships":["5ea6ed2e080df4000697c90a"],"capsules":[],"payloads":["5eb0e4c8b6c3bb0006eeb226"],"launchpad":"5e9e4502f509092b78566f87","flight_number":63,"name":"SES-12 Mission","date_utc":"2018-06-04T00:00:00.000Z","date_unix":1527907200,"date_local":"2018-06-04T00:00:00-04:00","date_precision":"second","upcoming":true,"cores":[{"core":"5e9e4502f509092b78566f87"},"flight":3,"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":"5eb87d1bffd86e000604b368"}},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/0a/01/0a0a0a0a_o.png","large":"https://images2.imgbox.com/0a/01/0a0a0a0a_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8jv0ed/ses12_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/8o9woj/rspacex_ses12_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/8oa3k4/rspacex_ses12_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1752/41664024035_14c81a25e3_o.jpg","https://farm2.staticflickr.com/1731/27695627527_d9d5bca0ae_o.jpg","https://farm2.staticflickr.com/1735/27695627327_ed66c7282c_o.jpg","https://farm2.staticflickr.com/1752/27695627417_38ea7d7acf_o.jpg","https://farm2.staticflickr.com/1733/41664023935_e9e8120690_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/ses-12missionpress_kit_6.2.18.pdf","webcast":"https://www.youtube.com/watch?v=2hcM5hqQ45s","youtube_id":"2hcM5hqQ45s","article":"https://spaceflightnow.com/2018/06/04/multi-mission-telecom-craft-launched-by-spacex-for-ses/","wikipedia":"https://en.wikipedia.org/wiki/SES-12"},"static_fire_date_utc":"2018-05-25T01:48:00.000Z","static_fire_date_unix":1527212880,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec"},"success":true,"failures":[],"details":"SES-12, the replacement satellite for NSS-6, was successfully launched and deployed on June 4th, completing SpaceX's eleventh flight of 2018. According to SES Luxembourg, The SES-12 satellite will expand SES's capabilities to provide direct-to-home (DTH) broadcasting, VSAT, Mobility and High Throughput Satellite (HTS) data connectivity services in the Middle East and the Asia-Pacific region, including rapidly growing markets such as India and Indonesia. [SES-12] will be co-located with SES-8","crew":[],"ships":["5ea6ed2e080df4000697c90a"],"capsules":[],"payloads":["5eb0e4c8b6c3bb0006eeb226"],"launchpad":"5e9e4502f509092b78566f87","flight_number":64,"name":"SES-12 Mission","date_utc":"2018-06-04T00:00:00.000Z","date_unix":1527907200,"date_local":"2018-06-04T00:00:00-04:00","date_precision":"second","upcoming":true,"cores":[{"core":"5e9e4502f509092b78566f87"},"flight":4,"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":"5eb87d1cffd86e000604b369"}},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/0a/01/0a0a0a0a_o.png","large":"https://images2.imgbox.com/0a/01/0a0a0a0a_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8jv0ed/ses12_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/8o9woj/rspacex_ses12_official_launch_discussion_updates/","media":"https://www.reddit.com/r/spacex/comments/8oa3k4/rspacex_ses12_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1752/41664024035_14c81a25e3_o.jpg","https://farm2.staticflickr.com/1731/27695627527_d9d5bca0ae_o.jpg","https://farm2.staticflickr.com/1735/27695627327_ed66c7282c_o.jpg","https://farm2.staticflickr.com/1752/27695627417_38ea7d7acf_o.jpg","https://farm2.staticflickr.com/1733/41664023935_e9e8120690_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/ses-12missionpress_kit_6.2.18.pdf","webcast":"https://www.youtube.com/watch?v=2hcM5hqQ45s","youtube_id":"2hcM5hqQ45s","article":"https://spaceflightnow.com/2018/06/04/multi-mission-telecom-craft-launched-by-spacex-for-ses/","wikipedia":"https://en.wikipedia.org/wiki/SES-12"},"static_fire_date_utc":"2018-05-25T01:48:00.000Z","static_fire_date_unix":1527212880,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec"},"success":true,"failures":[],"details":"SES-12, the replacement satellite for NSS-6, was successfully launched and deployed on June 4th, completing SpaceX's eleventh flight of 2018. According to SES Luxembourg, The SES-12 satellite will expand SES's capabilities to provide direct-to-home (DTH) broadcasting, VSAT, Mobility and High Throughput Satellite (HTS) data connectivity services in the Middle East and the Asia-Pacific region, including rapidly growing markets such as India and Indonesia. [SES-12] will be co-located with SES-8","crew":[],"ships":["5ea6ed2e080df4000697c90a"],"capsules":[],"payloads":["5eb0e4c8b6c3bb0006eeb226"],"launchpad":"5e9e4502f509092b78566f87","flight_number":65,"name":"SES-12 Mission","date_utc":"2018-06-04T00:00:00.000Z","date_unix":1527907200,"date_local":"2018-06-04T00:00:00-04:00","date_precision":"second","upcoming":true,"cores":[{"core":"5e9e4502f509092b78566f87"},"flight":5,"gridfins":true,"legs":false,"
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d":"5e9e4501f509094ba4566f84","flight_number":63,"name":"SES-12","date_utc":"2018-06-04T04:45:00.000Z","date_unix":1528087500,"date_local":"2018-06-04T00:45:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a4f3591845123b264f","flight":2,"gridfins":false,"legs":false,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],{"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d1bffd86e000604b368"},{"fairings":null,"links":{"patch":{"small":"https://images2.imgbox.com/b3/12/t63UKas5_o.png","large":"https://images2.imgbox.com/15/3c/W0LEnrZx_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8pua1m/crs15_launch_campaign_thread/", "launch":"https://www.reddit.com/r/spacex/comments/8ugo3l/rspacex_crs15_official_launch_discussion_updates","media":"https://www.reddit.com/r/spacex/comments/8ujcwo/rspacex_crs15_media_thread_videos_images_gifs/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/836/42374725204_dae09db889_o.jpg","https://farm2.staticflickr.com/1781/41281636860_71dca92ab4_o.jpg","https://farm2.staticflickr.com/1829/42374725534_325e676d19_o.jpg","https://farm2.staticflickr.com/1810/42374724974_e50b050403_o.jpg","https://farm1.staticflickr.com/843/41281636620_437528bd1f_o.jpg","https://farm2.staticflickr.com/1790/41281637670_f6a6a2cf6c_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/crs15presskit.pdf","webcast":"https://www.youtube.com/watch?v=ycMagB1s8XM","youtube_id":"ycMagB1s8XM","article":"https://spaceflightnow.com/2018/06/29/spacex-launches-ai-enabled-robot-companion-vegetation-monitor-to-space-station/","wikipedia":"https://en.wikipedia.org/wiki/SpaceX_CRS-15"},"static_fire_date_utc":"2018-06-23T21:30:00.000Z","static_fire_date_unix":1529789400,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"Payload included MISSE-FF 2, ECOSTRESS, and a Latching End Effector. The refurbished booster featured a record 2.5 months period turnaround from its original launch of the TESS satellite \xe2\x80\x94 the fastest previous was 4.5 months. This was the last commercial flight of a Block 4 booster, which was expended into the Atlantic without landing legs and grid fins."},"crew":[],"ships":["5ea6ed30080df4000697c912"],"capsules":["5e9e2c5cf359183bb73b266e"],"payloads":["5eb0e4c8b6c3bb0006eeb227"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":64,"name":"CRS-15","date_utc":"2018-06-29T09:42:00.000Z","date_unix":1530265320,"date_local":"2018-06-29T05:42:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f35918863d3b2655","flight":2,"gridfins":false,"legs":false,"reused":true,"landing_attempt":false,"landing_success":null,"landing_type":null,"landpad":null}],{"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d1cffd86e000604b369"},{"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/2b/de/2CF8Q4Bq_o.png","large":"https://images2.imgbox.com/c0/d8/Jt7Es9az_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8w19yg/telstar_19v_launch_campaign_thread/", "launch":"https://www.reddit.com/r/spacex/comments/90p1a6/rspacex_telstar_19v_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/90oxrr/rspacex_telstar_19v_media_thread_videos_images/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/856/28684550147_49802752b3_o.jpg","https://farm1.staticflickr.com/927/28684552447_956a9744f1_o.jpg","https://farm2.staticflickr.com/1828/29700007298_8ac5891d2c_o.jpg","https://farm1.staticflickr.com/914/29700004918_31ed7b73ef_o.jpg","https://farm1.staticflickr.com/844/29700002748_3047e50a0a_o.jpg","https://farm2.staticflickr.com/1786/29700000688_2514cd3cbb_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/telstar19vantagepresskit.pdf","webcast":"https://www.youtube.com/watch?v=xybp6zLaGx4","youtube_id":"xybp6zLaGx4","article":"https://spaceflightnow.com/2018/07/22/spacex-delivers-for-telesat-with-successful-early-morning-launch/","wikipedia":"https://en.wikipedia.org/wiki/Telstar_19V"},"static_fire_date_utc":"2018-07-18T21:00:00.000Z","static_fire_date_unix":1531947600,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SSL-manufactured communications satellite intended to be placed at 63\xc2\xbd West over the Americas. At 7,075 kg, it became the heaviest commercial communications satellite ever launched."},"crew":[],"ships":["5ea6ed2e080df4000697c90a","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90d","5ea6ed30080df4000697c913"],"capsules":[],"payloads":["5eb0e4c8b6c3bb0006eeb228"],"launchpad":"5e9e4501f509094ba4566f84"}

4","flight_number":65,"name":"Telstar 19V","date_utc":"2018-07-22T05:50:00.000Z","date_unix":1532238600,"date_local":"2018-07-22T01:50:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f359181eed3b2657","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":"5eb87d1effd86e000604b36a"}, {"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/b4/96/LRfRepk0_o.png","large":"https://images2.imgbox.com/e6/10/oZPCNx0m_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/8v4wcm/iridium_next_constellation_mission_7_launch/","launch":"https://www.reddit.com/r/spacex/comments/91i1ru/rspacex_iridium_next_7_official_launch_discussion/","media":"https://www.reddit.com/r/spacex/comments/91gx44/rspacex_iridium_next_constellation_mission_7/","recovery":null},"flickr":{"small":[],"original":["https://farm1.staticflickr.com/934/41868222930_0a850d30dc_o.jpg","https://farm1.staticflickr.com/852/41868222500_2ff5f6e5f9_o.jpg","https://farm1.staticflickr.com/929/28787338307_7c0cfce99a_o.jpg","https://farm1.staticflickr.com/928/28787338507_3be74590d2_o.jpg"]},"presskit":"http://www.spacex.com/sites/spacex/files/iridium7_press_kit_7_24.pdf","webcast":"https://www.youtube.com/watch?v=vsDknmK30C0","youtube_id":"vsDknmK30C0","article":"https://spaceflightnow.com/2018/07/25/spacexs-second-launch-in-three-days-lofts-10-more-iridium-satellites/","wikipedia":"https://en.wikipedia.org/wiki/Iridium_satellite_constellation#Next-generation_constellation"},"static_fire_date_utc":"2018-07-20T21:08:00.000Z","static_fire_date_unix":1532120880,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX's fourteenth flight of 2018 and seventh of eight launches in a half-a-billion-dollar contract with Iridium. Will use a Block 5 first stage, to be recovered in the Pacific Ocean. Only one mission will be left for Iridium, with 10 more satellites. First attempt to recover a Fairing with the upgraded net. Fairing recovery was not successful."},"crew":[],"ships":["5ea6ed2f080df4000697c910","5ea6ed2e080df4000697c908","5ea6ed30080df4000697c912","5ea6ed30080df4000697c914"],"capsules":[],"payloads":["5eb0e4c9b6c3bb0006eeb229"],"launchpad":"5e9e4502f509092b78566f87","flight_number":66,"name":"Iridium NEXT Mission 7","date_utc":"2018-07-25T11:39:26.000Z","date_unix":1532518766,"date_local":"2018-07-25T04:39:26-07:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591809c03b2658","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":"5eb87d1fffd86e000604b36b"}, {"fairings":{"reused":false,"recovery_attempt":false,"recovered":false,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/46/b2/NUQmyHR4_o.png","large":"https://images2.imgbox.com/9e/eb/uGUYOYfZ_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/91gwfg/merah_putih_telkom4_launch_campaign_thread/","launch":"https://www.reddit.com/r/spacex/comments/9539nr/rspacex_merah_putih_telkom4_official_launch/","media":"https://www.reddit.com/r/spacex/comments/94zr0b/rspacex_merah_putih_media_thread_videos_images/","recovery":null},"flickr":{"small":[],"original":["https://farm2.staticflickr.com/1798/43862495212_8fe1688c4b_o.jpg","https://farm1.staticflickr.com/935/43006330655_f1623a3fa1_o.jpg","https://farm1.staticflickr.com/938/28974313177_d16381ff5f_o.jpg","https://farm2.staticflickr.com/1780/43006334045_fb7b4a8714_o.jpg","https://farm1.staticflickr.com/929/28974335747_ffd87ff274_o.jpg","https://farm1.staticflickr.com/930/30041972208_f735b9690b_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/merahputihpresskit.pdf","webcast":"https://www.youtube.com/watch?v=FjfQNBVv2IY","youtube_id":"FjfQNBVv2IY","article":"https://spaceflightnow.com/2018/08/07/indonesian-communications-satellite-deployed-in-orbit-by-spacex/","wikipedia":"https://en.wikipedia.org/wiki/Telkom_Indonesia"},"static_fire_date_utc":"2018-08-02T15:53:00.000Z","static_fire_date_unix":1533225180,"net":false,"window":7200,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX's fifteenth flight of 2018 launched the Merah Putih (also known as Telkom-4) geostationary communications satellite for Telkom Indonesia. It marked the first reuse of any Block 5 first stage; the booster B1046 had previously launched Bangabandhu-1. The stage was recovered and is expected to become the

first Falcon 9 booster to fly three missions.", "crew": [], "ships": ["5ea6ed2f080df4000697c90d", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22a"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 67, "name": "Merah Putih", "date_utc": "2018-08-07T05:18:00.000Z", "date_unix": 1533619080, "date_local": "2018-08-07T01:18:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f359182b023b2656", "flight": 2, "gridfins": true, "legs": true, "reuse": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d20ffd86e000604b36c", {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/55/54/73EXeMfo_o.png", "large": "https://images2.imgbox.com/fd/59/nv3Ih3Am_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/95cte4/telstar_18v_apstar_5c_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/9e7bmq/rspacex_telstar_18v_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/9ebkqw/rspacex_telstar_18v_media_thread_videos_images/", "recovery": "https://www.reddit.com/r/spacex/comments/9erx1h/telstar_18_vantage_recovery_thread/"}, "flickr": {"small": [], "original": ["https://farm2.staticflickr.com/1878/43690848045_492ef182dd_o.jpg", "https://farm2.staticflickr.com/1856/43881229604_6d42e838b6_o.jpg", "https://farm2.staticflickr.com/1852/43881223704_93777e34af_o.jpg", "https://farm2.staticflickr.com/1841/43881217094_558b7b214e_o.jpg", "https://farm2.staticflickr.com/1869/43881193934_423ef8c86_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/telstar18vantagepresskit.pdf", "webcast": "https://www.youtube.com/watch?v=Apw3xqwsG1U", "youtube_id": "Apw3xqwsG1U", "article": "https://spaceflightnow.com/2018/09/10/spacex-teleat-achieve-repeat-success-with-midnight-hour-launch/", "wikipedia": "https://en.wikipedia.org/wiki/Telstar_18V"}, "static_fire_date_utc": "2018-09-05T07:21:00.000Z", "static_fire_date_unix": 1536132060, "net": false, "window": 14400, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX's sixteenth flight of 2018 launched the Telstar 18v GEO communication satellite for Telesat, the second launch for the canadian company in a few months. The first stage was a new Falcon 9 V1.2 Block 5 which was successfully recovered on OCISLY.", "crew": [], "ships": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90d", "5ea6ed2f080df4000697c90b"], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22b"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 68, "name": "Telstar 18V", "date_utc": "2018-09-10T04:45:00.000Z", "date_unix": 1536554700, "date_local": "2018-09-10T00:45:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f3591833b13b2659", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d22ffd86e000604b36d", {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/cb/41/RQIY0BjQ_o.png", "large": "https://images2.imgbox.com/df/2c/DsfygPln_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/9fwj9o/saocom_1a_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/9lazvr/rspacex_saocom_1a_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/9m3ly5/rspacex_saocom_1a_media_thread_videos_images_gifs/", "recovery": null}, "flickr": {"small": [], "original": ["https://farm2.staticflickr.com/1940/44262177535_9582184d3f_o.jpg", "https://farm2.staticflickr.com/1917/30234800687_fd94fde151_o.jpg", "https://farm2.staticflickr.com/1951/30234801997_b5a65426ca_o.jpg", "https://farm2.staticflickr.com/1910/44262169525_e4c6b27299_o.jpg", "https://farm2.staticflickr.com/1923/44451125454_8d26929d0b_o.jpg", "https://farm2.staticflickr.com/1914/44262170545_22fe55d4bb_o.jpg", "https://farm2.staticflickr.com/1934/44262166295_3f84597f09_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/saocom1apresskit.pdf", "webcast": "https://www.youtube.com/watch?v=vr_C6LQ7mHc", "youtube_id": "vr_C6LQ7mHc", "article": "https://spaceflightnow.com/2018/10/08/spacex-aces-first-rocket-landing-in-california-after-launching-argentine-satellite/", "wikipedia": "https://en.wikipedia.org/wiki/SAOCOM"}, "static_fire_date_utc": "2018-10-02T21:00:00.000Z", "static_fire_date_unix": 1538514000, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX's seventeenth flight of 2018 was the first launch of the Saocom Earth observation sa

tellite constellation of the Argentine Space Agency CONAE. The second launch of SAOCOM 1B will happen in 2019. This flight marked the first RTLS launch out of Vandenberg, with a landing on the concrete pad at SLC-4W, very close to the launch pad.

"crew": [], "ships": [], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22c"], "launchpad": "5e9e4502f509092b78566f87", "flight_number": 69, "name": "SAOCOM 1A", "date_utc": "2018-10-08T02:22:00.000Z", "date_unix": 1538965320, "date_local": "2018-10-07T19:22:00-07:00", "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.imgbox.com/ad/40/oCtCFYf1_o.png", "large": "https://images2.imgbox.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/9xaa76/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_0ab571e7bc_o.jpg", "https://farm5.staticflickr.com/4899/32040173568_bb5c991565_o.jpg", "https://farm5.staticflickr.com/4875/32040173278_b5578ba6be_o.jpg", "https://farm5.staticflickr.com/4862/32040173928_afdfb09939_o.jpg", "https://farm5.staticflickr.com/4888/32040173048_b2b29c020f_o.jpg", "https://farm5.staticflickr.com/4808/32248947038_dd1cf9e8c3_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/Es%27hailSat"}, "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", "5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22d"], "launchpad": "5e9e4502f509094188566f88", "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": ["5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgbox.com/48/3b/Lg1Qc4uX_o.png", "large": "https://images2.imgbox.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/a0vjff/rspacex_ssoa_official_launch_discussion_updates/", "media": "https://old.reddit.com/r/spacex/comments/a0wylf/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/4869/45257570925_8eae9a0888_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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If this happens it will be the first time a Falcon 9 has flown more than two missions.", "crew": [], "ships": ["5ea6ed2f080df4000697c910", "5ea6ed30080df4000697c912", "5ea6ed30080df4000697c914", "5ea6ed2e080df4000697c908"], "capsules": [], "payloads": ["5eb0e4c9b6c3bb0006eeb22e"], "launchpad": "5e9e4502f509092b78566f87", "flight_number": 71, "name": "SSO-A", "date_utc": "2018-12-03T18:34:00.000Z", "date_unix": 1543861920, "date_local": "2018-12-03T10:34:00-08:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f359182b023b2656", "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": null, "id": "5eb87d25ffd86e000604b370"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/f0/a6/oNKZP5Hu_o.png", "large": "https://images2.imgbox.com/ee/c6/MkvXHhu1_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/9z7i4j/crs16_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/a2oubw/rspacex_crs16_official_launch_discussion_updates/", "media": "https://www.reddit.com/r/spacex/comments/a2uojp/rspacex_crs16_media_thread_videos_images_gifs/", "recovery": "https://www.reddit.com/r/spacex/comments/a3n3vm/crs16_emergency_recovery_thread/"}, "flickr": {"small": [], "original": ["https://farm5.staticflickr.com/4835/45473442624_69ee8bee45_o.jpg", "https://farm5.staticflickr.com/4903/45473443604_0d668c31da_o.jpg", "https://farm5.staticflickr.com/4858/45473444314_413a344dcb_o.jpg", "https://farm5.staticflickr.com/4856/45473445134_d9384878f8_o.jpg", "https://farm5.staticflickr.com/4840/45473446114_7d5e5d6fe2_o.jpg"]}}, "presskit": "https://www.spacex.com/sites/spacex/files/crs16_press_kit_12_4.pdf", "webcast": "https://www.youtube.com/watch?v=Esh1jHT9oTA", "youtube_id": "Esh1jHT9oTA", "article": "https://spaceflightnow.com/2018/12/05/spacex-falcon-9-boosts-dragon-cargo-ship-to-orbit-first-stage-misses-landing-target/", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_CRS-16", "static_fire_date_utc": "2018-11-30T19:57:00.000Z", "static_fire_date_unix": 1543607820, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX's 16th Crew Resupply Mission on behalf of NASA, with a total of 20 contracted flights. This will bring essential supplies to the International Space Station using SpaceX's reusable Dragon spacecraft. The Falcon 9 will launch from SLC-40 at Cape Canaveral Air Force Station. During the landing of the first stage, a grid fin hydraulic pump stalled, causing the core to enter an uncontrolled roll, and resulting in a (successful) water landing.", "crew": [], "ships": ["5ea6ed2f080df4000697c90b"], "capsules": ["5e9e2c5cf359185d753b266f"], "payloads": ["5eb0e4cab6c3bb0006eeb22f"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 72, "name": "CRS-16", "date_utc": "2018-12-05T18:16:00.000Z", "date_unix": 1544033760, "date_local": "2018-12-05T13:16:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f359185c603b265a", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": false, "landing_type": "RTLS", "landpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d26ffd86e000604b371"}, {"fairings": {"reused": false, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/3c/2f/tL7xDUD6_o.png", "large": "https://images2.imgbox.com/f9/31/MGTnAfur_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/a4516o/gps_iii2_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/a71wyn/rspacex_gps_iii2_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/a73kz5/rspacex_gps_iii2_media_thread_videos_images_gifs/", "recovery": null}, "flickr": {"small":

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er, likely carrying some cargo to the International Space Station. The booster is expected to land on OCISLY.", "crew": [], "ships": ["5ea6ed30080df4000697c913"], "capsules": ["5e9e2c5df35918b1063b2671"], "payloads": ["5eb0e4cbb6c3bb0006eeb235"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 76, "name": "CCTCap Demo Mission 1", "date_utc": "2019-03-02T07:45:00.000Z", "date_unix": 1551512700, "date_local": "2019-03-02T02:45:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f35918c0803b265c", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d2bffd86e000604b375"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2f080df4000697c90c"]}, "links": {"patch": {"small": "https://images2.imgbox.com/14/18/JxCyAHXk_o.png", "large": "https://images2.imgbox.com/9f/c3/GvLfwIfg_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/b0kscl/arabsat6a_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/basm9y/rspacex_arabsat6a_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/bbh9a/rspacex_arabsat6a_media_thread_videos_images_gifs/", "recovery": "https://www.reddit.com/r/spacex/comments/bcecao/fh_arabsat_6a_center_core_recovery_thread/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/7911/32652060737_4be1171d4a_o.jpg", "https://live.staticflickr.com/7807/40628442293_9643eaf670_o.jpg", "https://live.staticflickr.com/7804/40628440983_4da5d76cc7_o.jpg", "https://live.staticflickr.com/7856/40628439793_27927d11de_o.jpg", "https://live.staticflickr.com/7919/40628438523_c597eabff1_o.jpg", "https://live.staticflickr.com/7834/40628437283_84088aca75_o.jpg", "https://live.staticflickr.com/7856/40628435833_a1bcde59db_o.jpg", "https://live.staticflickr.com/7809/40628435153_17c05d3b5e_o.jpg", "https://live.staticflickr.com/7885/40628434483_3545598b82_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/arabsat-6a_press_kit.pdf", "webcast": "https://youtu.be/TXMGU2d8c8g", "youtube_id": "TXMGU2d8c8g", "article": "https://spaceflightnow.com/2019/04/11/spacexs-falcon-heavy-successful-in-commercial-debut/", "wikipedia": "https://en.wikipedia.org/wiki/Arabsat-6A"}, "static_fire_date_utc": "2019-04-05T09:57:00.000Z", "static_fire_date_unix": 1554458220, "net": false, "window": 7020, "rocket": "5e9d0d95eda69974db09d1ed", "success": true, "failures": [], "details": "SpaceX will launch Arabsat 6A to a geostationary transfer orbit from SLC-39A, KSC. The satellite is a geostationary telecommunications satellite built by Lockheed Martin for the Saudi Arabian company Arabsat. This will be the first operational flight of Falcon Heavy, and also the first Block 5 Falcon Heavy. All three cores will be new Block 5 cores. The side cores are expected to land at LZ-1 and LZ-2, and the center core is expected to land on OCISLY.", "crew": [], "ships": ["5ea6ed2f080df4000697c90e", "5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90b", "5ea6ed2e080df4000697c909", "5ea6ed2f080df4000697c90c"], "capsules": [], "payloads": ["5eb0e4cbb6c3bb0006eeb236"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 77, "name": "ArabSat 6A", "date_utc": "2019-04-11T22:35:00.000Z", "date_unix": 1555022100, "date_local": "2019-04-11T18:35:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f3591897453b265f", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}, {"core": "5e9e28a6f359183c413b265d", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb267a34e7c7"}, {"core": "5e9e28a6f359188fd53b265e", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb90a834e7c8"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d2dffd86e000604b376"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/97/8e/YbVKIUZB_o.png", "large": "https://images2.imgbox.com/0d/05/zH7YqLRe_o.png"}, "reddit": {"campaign": "https://new.reddit.com/r/spacex/comments/bd2l28/crs17_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/bjsn0v/rspacex_crs17_official_launch_discussion_updates", "media": "https://www.reddit.com/r/spacex/comments/bkc4d5/rspacex_crs17_media_thread_videos_images_gifs", "recovery": "https://www.reddit.com/r/spacex/comments/bjy7p5/rspacex_crs17_recovery_discussion_updates_thread"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/46856594435_206c773b5a_o.jpg", "https://live.staticflickr.com/65535/4

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The external payload for this mission is International Docking Adapter 3, replacing IDA-1 lost in SpaceX's CRS-7 launch failure. This mission will launch from SLC-40 at Cape Canaveral AFS on a Falcon 9, and the first-stage booster is expected to land back at CCAFS LZ-1.", "crew": [], "ships": [], "capsules": ["5e9e2c5cf359188bfb3b266b"], "payloads": ["5eb0e4ceb6c3bb0006eeb24a"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 82, "name": "CRS-18", "date_utc": "2019-07-25T22:01:00.000Z", "date_unix": 1564092060, "date_local": "2019-07-25T18:01:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591809313b2660", "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": "5eb87d36ffd86e000604b37b"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgbox.com/65/c2/MMGkhdcA_o.png", "large": "https://images2.imgbox.com/9e/6f/oaYZfAoF_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/cjaawx/amos17_launch_campaign_thread", "launch": "https://www.reddit.com/r/spacex/comments/cmcdgn/rspacex_amos17_official_launch_discussion_updates", "media": "https://www.reddit.com/r/spacex/comments/cmppne/rspacex_amos17_media_thread_videos_images_gifs", "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/48478269312_58dd3dc446_o.jpg", "https://live.staticflickr.com/65535/48478269747_353dcb2e62_o.jpg", "https://live.staticflickr.com/65535/48478119901_2de0441026_o.jpg", "https://live.staticflickr.com/65535/48478120646_ab72c2c6c3_o.jpg", "https://live.stati

cflickr.com/65535/48478120031_5aae1f6131_o.jpg", "https://live.staticflickr.com/65535/48478269442_08479bed36_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/amos-17_mission_press_kit_8_6_2019.pdf", "webcast": "https://youtu.be/fZh82-WcCuo", "youtube_id": "fZh82-WcCuo", "article": "https://spaceflightnow.com/2019/08/07/spacex-launches-israeli-owned-telecom-satellite/", "wikipedia": "https://en.wikipedia.org/wiki/Spacecom"}, "static_fire_date_utc": "2019-08-01T00:00:00.000Z", "static_fire_date_unix": 1564617600, "net": false, "window": 5280, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX will launch Boeing built Amos-17, a geostationary communications satellite for Israeli company Spacecom. The satellite will be delivered to GTO from KSC LC-39A or possibly CCAFS SLC-40, and will replace the defunct Amos-5 at 17\\xc2\\xb0 E. 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": "2019-08-06T22:52:00.000Z", "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": "5eb87d37ffd86e000604b37c"}, {"fairings": {"reused": true, "recovery_attempt": false, "recovered": false, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/61/a6/1MnnbXIF_o.png", "large": "https://images2.imgbox.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_starlink1_media_thread_videos_images", "recovery": "https://www.reddit.com/r/spacex/comments/du1duu/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": "2019-11-11T12:08:00.000Z", "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 AFS. They are expected to contribute to the 550 km x 53\\xc2\\xb0 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": "2019-11-11T14:56:00.000Z", "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.imgbox.com/5d/26/ZP75I11j_o.png", "large": "https://images2.imgbox.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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The external payloads for this mission include the Hyperspectral Imager Suite and a lithium-ion battery. Falcon 9 and Dragon will launch from SLC-40, Cape Canaveral AFS. The mission will be complete with return and recovery of the Dragon capsule and down cargo.", "crew": [], "ships": ["5ea6ed2f080df4000697c90d"], "capsules": ["5e9e2c5bf3591880643b2669"], "payloads": ["5eb0e4cfb6c3bb0006eeb24d"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 85, "name": "CRS-19", "date_utc": "2019-12-05T17:29:23.000Z", "date_unix": 1575566963, "date_local": "2019-12-05T12:29:23-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f359187afd3b2662", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d39ffd86e000604b37e"}, {"fairings": {"reuse": false, "recovery_attempt": true, "recovered": false, "ships": ["5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgbox.com/2c/03/fMLdgNQ4_o.png", "large": "https://images2.imgbox.com/73/e2/4I30s6n7_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/e5w6i8/jcsat18kacific1_launch_campaign_thread", "launch": "https://www.reddit.com/r/spacex/comments/ebfr9t/rspacex_jcsat18kacific1_official_launch", "media": "https://www.reddit.com/r/spacex/comments/ebn4g5/rspacex_jcsat18kacific1_media_thread_videos", "recovery": "https://www.reddit.com/r/spacex/comments/ec48p3/jcsat_18kacific1_recovery_discussion_and_updates"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/49235364922_e55ceb61be_o.jpg", "https://live.staticflickr.com/65535/49235136806_e5a3774904_o.jpg", "https://live.staticflickr.com/65535/49235137056_585dc050e7_o.jpg"]}, "presskit": "https://www.spacex.com/sites/spacex/files/jcsat18kacific1_mission_press_kit.pdf", "webcast": "https://youtu.be/sbXgZg9JmkI", "youtube_id": "sbXgZg9JmkI", "article": "https://spaceflightnow.com/2019/12/17/startup-launches-broadband-satellite-on-spacex-rocket-to-connect-pacific-islands", "wikipedia": "https://en.wikipedia.org/wiki/JSAT_(satellite_constellation)", "static_fire_date_utc": "2019-12-13T12:34:00.000Z", "static_fire_date_unix": 1576240440, "net": false, "window": 5280, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX will launch the Boeing built dual payload satellite to geostationary transfer orbit from XXXX. JCSat 18 is a mobile broadband communications payload built for Sky Perfect JSAT Corporation of Japan and will service Asia Pacific. Kacific 1 is a high throughput broadband internet payload built for Kacific Broadband Satellites and will service certain high demand areas of Southeast Asia and the Pacific. Both payloads share a single chassis. The booster for this mission is expected to land on OCISLY.", "crew": [], "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90d"], "capsules": [], "payloads": ["5eb0e4cfb6c3bb0006eeb24e"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 86, "name": "JCSat 18 / Kacific 1", "date_utc": "2019-12-17T00:10:00.000Z", "date_unix": 1576541400, "date_local": "2019-12-16T19:10:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591809313b2660", "flight": 3, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true}

e,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],{"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d3bffd86e000604b37f"},{"fairings":{"reused":false,"recovery_attempt":true,"recovered":false,"ships":["5ea6ed2e080df4000697c908"]},"links":{"patch":{"small":"https://images2.imgbox.com/36/f5/B08U2KHW_o.png","large":"https://images2.imgbox.com/69/c7/G444jTFk_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/efqnvq/starlink2_launch_campaign_thread","launch":"https://www.reddit.com/r/spacex/comments/eko0hr/rspacex_starlink2_official_launch_discussion","media":"https://www.reddit.com/r/spacex/comments/ekyzbz/rspacex_starlink2_media_thread_videos_images_gifs","recovery":"https://www.reddit.com/r/spacex/comments/elgp5k/rspacex_starlink_l2_recovery_discussion_updates"},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/49346907238_b27507e4d9_o.jpg","https://live.staticflickr.com/65535/49347368761_f4e45bd38a_o.jpg","https://live.staticflickr.com/65535/49347368406_8f9ac1fe2a_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/starlink_press_kit_jan2020.pdf","webcast":"https://youtu.be/HwyXo6T7jC4","youtube_id":"HwyXo6T7jC4","article":"https://spaceflightnow.com/2020/01/07/spacex-launches-more-starlink-satellites-tests-design-change-for-astronomers","wikipedia":"https://en.wikipedia.org/wiki/Starlink_(satellite_constellation)","static_fire_date_utc":"2020-01-04T11:45:00.000Z","static_fire_date_unix":1578138300,"net":false,"window":0,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"This mission will launch the second batch of Starlink version 1.0 satellites, from SLC-40, Cape Canaveral AFS. They are expected to contribute to the 550 km x 53\\xc2\\xb0 she ll. It is the third Starlink launch overall. Starlink is a low Earth orbit broadband and internet constellation developed and owned by SpaceX which will eventually consist of nearly 12 000 satellites and will provide low latency internet service to ground terminals around the world. The booster for this mission is expected to land on OCISLY."},"crew":[],"ships":["5ea6ed2e080df4000697c908","5ea6ed30080df4000697c913","5ea6ed2e080df4000697c909","5ea6ed2f080df4000697c90b","5ea6ed2f080df4000697c90d"],"capsules":[],"payloads":["5eb0e4cfb6c3bb0006eeb24f"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":87,"name":"Starlink-2","date_utc":"2020-01-07T02:19:00.000Z","date_unix":1578363540,"date_local":"2020-01-06T21:19:00-05:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a5f3591833b13b2659","flight":4,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3032383ecb6bb234e7ca"}],{"auto_update":true,"tbd":false,"launch_library_id":null,"id":"5eb87d3cffd86e000604b380"},{"fairings":{"reused":null,"recovery_attempt":null,"recovered":null,"ships":[],"links":{"patch":{"small":"https://images2.imgbox.com/c0/9d/SJYvC4hT_o.png","large":"https://images2.imgbox.com/19/df/IH0nVnSr_o.png"},"reddit":{"campaign":"https://www.reddit.com/r/spacex/comments/ek7eny/in_flight_abort_test_launch_campaign_thread","launch":"https://www.reddit.com/r/spacex/comments/eq24ap/rspacex_inflight_abort_test_official_launch","media":"https://www.reddit.com/r/spacex/comments/eq7pg4/rspacex_inflight_abort_test_media_thread_videos/","recovery":null},"flickr":{"small":[],"original":["https://live.staticflickr.com/65535/49421605028_b7ba890f0e_o.jpg","https://live.staticflickr.com/65535/49422067976_cda2b8f021_o.jpg","https://live.staticflickr.com/65535/49422067876_13ed519fe6_o.jpg","https://live.staticflickr.com/65535/49421604803_0093a5d2cb_o.jpg","https://live.staticflickr.com/65535/49422294602_0d5e7d8e82_o.jpg","https://live.staticflickr.com/65535/49422068111_2ed613b19b_o.jpg"]},"presskit":"https://www.spacex.com/sites/spacex/files/in-flight_abort_test_press_kit.pdf","webcast":"https://youtu.be/mhrkdHshb3E","youtube_id":"mhrkdHshb3E","article":"https://spaceflightnow.com/2020/01/19/spacex-aces-final-major-test-before-first-crew-mission","wikipedia":"https://en.wikipedia.org/wiki/Commercial_Crew_Development"},"static_fire_date_utc":"2020-01-11T09:42:00.000Z","static_fire_date_unix":1578735720,"net":false,"window":14400,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":"SpaceX will launch a Crew Dragon capsule from LC-39A, KSC on a fully fueled Falcon 9 rocket and then trigger the launch escape system during the period of maximum dynamic pressure. As part of NASA's Commercial Crew Integrated Capability program (CCiCap) this test will contribute valuable data to help validate Crew Dragon and its launch abort system. The Crew Dragon will be recovered by GO Searcher after splashdown in the Atlantic Ocean. This flight does not go to orbit. The booster an

d upper stage are expected to break up following capsule separation and there will be no landing attempt.", "crew": [], "ships": ["5ea6ed2f080df4000697c90c"], "capsules": ["5e9e2c5df359184c9a3b2672"], "payloads": ["5eb0e4d0b6c3bb0006eeb250"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 88, "name": "Crew Dragon In Flight Abort Test", "date_utc": "2020-01-19T14:00:00.000Z", "date_unix": 1579442400, "date_local": "2020-01-19T09:00:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f359182b023b2656", "flight": 4, "gridfins": false, "legs": false, "reused": true, "landing_attempt": false, "landing_success": null, "landing_type": null, "landpad": null}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d3dff86e000604b381", {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgbox.com/3a/c6/ueu9Acdh_o.png", "large": "https://images2.imgbox.com/1c/55/xNcIOR8Z_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/eof5pr/starlink3_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/eudve3/rspacex_starlink_3_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/evjdw3/rspacex_starlink3_media_thread_videos_images_gifs/", "recovery": "https://www.reddit.com/r/spacex/comments/evnyi3/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/65535/49461673707_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-boosts-60-more-starlink-satellites-into-orbit-after-weather-delays/", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_Starlink"}, "static_fire_date_utc": "2020-01-20T13:17:00.000Z", "static_fire_date_unix": 1579526220, "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 their operational altitude of 550 km. The booster for this mission is expected to land on OCISLY.", "crew": [], "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90d"], "capsules": [], "payloads": ["5eb0e4d0b6c3bb0006eeb251"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 89, "name": "Starlink-3", "date_utc": "2020-01-29T14:06:00.000Z", "date_unix": 1580306760, "date_local": "2020-01-29T09:06:00-05:00", "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": "5eb87d3fffd86e000604b382", {"fairings": {"reused": false, "recovery_attempt": true, "recovered": false, "ships": ["5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgbox.com/4f/07/GJWgTmKM_o.png", "large": "https://images2.imgbox.com/90/7c/MlD6s04z_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/ex0il1m/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/f56mb4/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/65535/49549022017_18738a2552_o.jpg", "https://live.staticflickr.com/65535/49548795221_edd6dc7ef6_o.jpg", "https://live.staticflickr.com/65535/49548795401_93ef80caf5_o.jpg", "https://live.staticflickr.com/65535/49549022057_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 launch the fifth 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 OCISLY."}]

launch 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 OCISLY.

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c": "2020-03-13T18:37:00.000Z", "static_fire_date_unix": 1584124620, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "The sixth Starlink launch overall and the fifth operational batch of Starlink satellites will launch into orbit aboard a Falcon 9 rocket. This mission is expected to deploy all sixty satellites into an elliptical orbit about fifteen minutes into flight. In the weeks following launch the satellites are expected to utilize their onboard ion thrusters to raise their orbits to 550 km in three groups of 20, making use of precession rates to separate themselves into three planes. The booster will land on a drone ship approximately 628 km downrange.", "crew": [], "ships": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90d"], "capsules": [], "payloads": ["5eb0e4d0b6c3bb0006eeb254"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 92, "name": "Starlink-5", "date_utc": "2020-03-18T12:16:00.000Z", "date_unix": 1584533760, "date_local": "2020-03-18T08:16:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f3591809c03b2658", "flight": 5, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": false, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d43ffd86e000604b385"}, {"fairings": {"reused": true, "recovery_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_l6_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/65535/49672551303_564ce21658_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/wSgeOI7pwFI", "youtube_id": "wSgeOI7pwFI", "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": ["5eb0e4d1b6c3bb0006eeb255"], "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/fjff6rr/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/gp1gf5/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_b43cd4c44_o.jpg", "https://live.staticflickr.com/65535/49927519588_8a39a3994f_o.jpg", "https://live.staticflickr.com/65535/49928343022_6fb33cbd9c_o.jpg", "https://li

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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": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90c", "5ea6ed2e080df4000697c909", "5ea6ed2f080df4000697c90d"], "capsules": ["5e9e2c5df359188aba3b2676"], "payloads": ["5eb0e4d1b6c3bb0006eeb257"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 94, "name": "CCTCap Demo Mission 2", "date_utc": "2020-05-30T19:22:00.000Z", "date_unix": 1590866520, "date_local": "2020-05-30T15:22:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591817f23b2663", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d46ffd86e000604b388"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": null, "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907"]}, "links": {"patch": {"small": "https://images2.imgbox.com/14/8a/x2EqeeM4_o.png", "large": "https://images2.imgbox.com/f4/9a/sUj3vEI3_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/gamcbr/starlink7_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/gkfe30/rspacex_starlink_7_official_launch_discussion/", "media": null, "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/49971196871_a0462d0084_o.jpg", "https://live.staticflickr.com/65535/49970682603_e6333945ee_o.jpg"]}, "presskit": "https://spacetime 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": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ee68c683c228f36bd5809b5"], "capsules": [], "payloads": ["5eb0e4d1b6c3bb0006eeb256"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 95, "name": "Starlink-7", "date_utc": "2020-06-04T01:25:00.000Z", "date_unix": 1591233900, "date_local": "2020-06-03T21:25:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f3591833b13b2659", "flight": 5, "gridfins": true, "legs": true, "reuse

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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": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ea6ed2f080df4000697c90b"], "capsules": [], "payloads": ["5eb0e4d2b6c3bb0006eeb25b"], "launchpad": "5e9e4501f509094ba4566f84", "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": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}, {"auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d50ffd86e000604b394"}, {"fairings": {"reused": null, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907"]}, "links": {"patch": {"small": "https://images2.imgbox.com/ac/ad/FhIfqkTq_o.png", "large": "https://images2.imgbox.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", "https://live.staticflickr.com/65535/50199715777_eca6f41d25_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/KU6KogxG5BE", "youtube_id": "KU6KogxG5BE", "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": "2020-06-24T18:18:00.000Z", "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-39A, 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 on an ASDS.", "crew": [], "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ea6ed30080df4000697c913", "5ee68c683c228f36bd5809b5"], "capsules": [], "payloads": ["5ed9858b1f30554030d45c3e", "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": ["5ea6ed2e080df4000697c907"], "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": "5e9e28a7f359187afd3b2662", "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": ["5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgbox.com/38/09/yStzn5Er_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/ij8mxf/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": ["5ea6ed2e080df4000697c908", "5ea6ed2f080df4000697c90b", "5ee68c683c228f36bd5809b5"], "capsules": [], "payloads": ["5ef6a4600059c33cee4a829e"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 102, "name": "Starlink-11 (v1.0)", "date_utc": "2020-09-03T12:46:00.000Z", "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": ["5ea6ed2e080df4000697c907", "5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgbox.com/3b/c3/kd7H9FTQ_o.png", "large": "https://images2.imgbox.com/79/1f/hBdiixIW_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/65535/50428228397_6151927733_o.jpg", "https://live.staticflickr.com/65535/50427359318_67b3397892_o.jpg", "https://live.staticflickr.com/65535/50428050591_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": ["5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c910", "5ea6ed2e080df4000697c907", "5ea6ed2e080df4000697c908", "5ea6ed30080df4000697c913"], "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

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It is the fourteenth 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": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90b", "5ee68c683c228f36bd5809b5", "5ea6ed2e080df4000697c907", "5ea6ed2e080df4000697c908"], "capsules": [], "payloads": ["5ef6a4d50059c33cee4a82a1"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 104, "name": "Starlink-13 (v1.0)", "date_utc": "2020-10-18T12:25:00.000Z", "date_unix": 1603023900, "date_local": "2020-10-18T08:25:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f35918c0803b265c", "flight": 6, "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": "5ef6a2bf0059c33cee4a828c"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": null, "ships": ["5ea6ed2e080df4000697c907", "5ea6ed2e080df4000697c908"]}, "links": {"patch": {"small": "https://images2.imgbox.com/65/e5/GS6w5gPI_o.png", "large": "https://images2.imgbox.com/21/50/iOx9Tpuy_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/jetth8/rspacex_starlink14_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/jhchwun/rspacex_starlink14_media_thread_photographer/", "recovery": null}, "flickr": {"small": [], "original": []}, "presskit": null, "webcast": "https://youtu.be/2gbVgTxLgN0", "youtube_id": "2gbVgTxLgN0", "article": "https://spaceflightnow.com/2020/10/24/spacex-adds-another-60-satellites-to-starlink-network/", "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, {"static_fire_date_utc": "2020-10-21T12:55:00.000Z", "static_fire_date_unix": 1603284900, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission will launch the fourteenth batch of operational Starlink satellites, which are expected to be version 1.0, from SLC-40, Kennedy Space Center. It is the fifteenth 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.", "crew": [], "ships": ["5ea6ed2f080df4000697c910", "5ea6ed2f080df4000697c90b", "5ea6ed2e080df4000697c907", "5ea6ed2e080df4000697c908"], "capsules": [], "payloads": ["5ef6a4ea0059c33cee4a82a2"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 105, "name": "Starlink-14 (v1.0)", "date_utc": "2020-10-24T15:31:00.000Z", "date_unix": 1603553460, "date_local": "2020-10-24T11:31:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5ef670f10059c33cee4a826c", "flight": 3, "gridfins": true, "legs": true, "reuse

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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.

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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": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90c", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90d", "5ea6ed2e080df4000697c907"], "capsules": [], "payloads": ["5fb95c263a88ae63c9546044"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 109, "name": "Starlink-15 (v1.0)", "date_utc": "2020-11-25T02:13:00.000Z", "date_unix": 1606270380, "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": "5fb95b3f3a88ae63c954603c"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/a2/a0/CHJWyFCo_o.png", "large": "https://images2.imgbox.com/dd/53/Wl0Rog1y_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/65535/50689254512_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": "5e9d0d95eda69973a809d1ec", "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": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90b", "5ea6ed2f080df4000697c90d"], "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": {"reuse": true, "recovery_attempt": true, "recovered": null, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/a9/be/43FhrPoq_o.png", "large": "https://images2.imgbox.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/65535/50715254423_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/65535/50716071167_100d6f7092_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/COrAGXFb1lo", "youtube_id": "COrAGXFb1lo", "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": "2020-12-07T23:00:00.000

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SXM-7 will replace XM-3 in geostationary orbit.", "crew": [], "ships": ["5ea6ed2f080df4000697c910", "5ee68c683c228f36bd5809b5", "5ea6ed2f080df4000697c90c"], "capsules": [], "payloads": ["5eb0e4d2b6c3bb0006eeb25d"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 111, "name": "SXM-7", "date_utc": "2020-12-13T17:30:00.000Z", "date_unix": 1607880600, "date_local": "2020-12-13T12:30:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f35918c0803b265c", "flight": 7, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d4bffd86e000604b38c", {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2f080df4000697c90c"]}}, {"links": {"patch": {"small": "https://images2.imgbox.com/25/01/sBErN07T_o.jpg", "large": "https://images2.imgbox.com/be/b5/tGnEI6rY_o.jpg"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/j7qqbg/nrol108_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/ke9pmg/rspacex_nrol108_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/65535/50740257483_0f550f6a25_o.jpg", "https://live.staticflickr.com/65535/50740993291_57ef3f881b_o.jpg", "https://live.staticflickr.com/65535/50740257263_b41b843e85_o.jpg", "https://live.staticflickr.com/65535/50740993211_dc00af6dbb_o.jpg", "https://live.staticflickr.com/65535/50740257078_e46a6462df_o.jpg", "https://live.staticflickr.com/65535/50741096702_2a152bdf13_o.jpg", "https://live.staticflickr.com/65535/50740257323_e3e49fa2c6_o.jpg"]}}, "presskit": null, "webcast": "https://youtu.be/90eVwaFBkFE", "youtube_id": "90eVwaFBkFE", "article": "https://spaceflightnow.com/2020/12/19/spacex-closes-out-record-year-of-launches-from-floridas-space-coast/", "wikipedia": "https://en.wikipedia.org/wiki/National_Reconnaissance_Office"}], "static_fire_date_utc": null, "static_fire_date_unix": null, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX will launch NROL-108 for the National Reconnaissance Office aboard a Falcon 9 from SLC-40, Cape Canaveral Air Force Station. The booster for this mission is expected to land at LZ-1.", "crew": [], "ships": ["5ea6ed2f080df4000697c90c", "5ea6ed2e080df4000697c908"], "capsules": [], "payloads": ["5f839ac7818d8b59f5740d48"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 112, "name": "NROL-108", "date_utc": "2020-12-19T14:00:00.000Z", "date_unix": 1608386400, "date_local": "2020-12-19T09:00:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f359187afd3b2662", "flight": 5, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5f8399fb818d8b59f5740d43", {"fairings": {"reused": true, "recovery_attempt": true, "recovered": null, "ships": ["5ea6ed2e080df4000697c907", "5ea6ed2e080df4000697c908"]}}, {"links": {"patch": {"small": "https://images2.imgbox.com/a4/9a/8KhFejXx_o.png", "large": "https://images2.imgbox.com/aa/a6/hE0kWqix_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/kawyby4/t%C3%BCrksat_5a_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/ksagr9/rspacex_t%C3%BCrksat_5a_official_launch_discussion/", "media": null, "recovery": "https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/50814482042_476d87b020_o.jpg", "https://live.staticflickr.com/65535/50813630408_d98c2215f8_o.jpg", "https://live.staticflickr.com/65535/50814379121_8834b5362d_o.jpg", "https://live.staticflickr.com/65535/50814379056_f032a23955_o.jpg"]}}, "presskit": null, "webcast": "https://youtu.be/9I0UYXVqIn8", "youtube_id": "9I0UYXVqIn8", "article": "https://spaceflightnow.com/2021/01/08/spacex-deploys-turkish-satellite-in-first-launch-of-2021/", "wikipedia": "https://en.wikipedia.org/wiki/T%C3%BCrksat_5A"}], "static_fire_date_utc": null, "static_fire_date_unix": null, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX will launch the first of two next generation high power S-band broadcast satellites for SiriusXM. The spacecraft will be delivered into a geostationary transfer orbit and the booster will be recovered downrange. The spacecraft is built by Space Systems Loral (SSL) on the SSL 1300 platform and includes two solar arrays producing 20kW, and an unfurlable antenna dish. SXM-7 will replace XM-3 in geostationary orbit.", "crew": [], "ships": ["5ea6ed2f080df4000697c910", "5ee68c683c228f36bd5809b5", "5ea6ed2f080df4000697c90c"], "capsules": [], "payloads": ["5eb0e4d2b6c3bb0006eeb25d"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 111, "name": "SXM-7", "date_utc": "2020-12-13T17:30:00.000Z", "date_unix": 1607880600, "date_local": "2020-12-13T12:30:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f35918c0803b265c", "flight": 7, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5eb87d4bffd86e000604b38c", {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2f080df4000697c90c"]}}, {"links": {"patch": {"small": "https://images2.imgbox.com/25/01/sBErN07T_o.jpg", "large": "https://images2.imgbox.com/be/b5/tGnEI6rY_o.jpg"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/j7qqbg/nrol108_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/ke9pmg/rspacex_nrol108_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/65535/50740257483_0f550f6a25_o.jpg", "https://live.staticflickr.com/65535/50740993291_57ef3f881b_o.jpg", "https://live.staticflickr.com/65535/50740257263_b41b843e85_o.jpg", "https://live.staticflickr.com/65535/50740993211_dc00af6dbb_o.jpg", "https://live.staticflickr.com/65535/50740257078_e46a6462df_o.jpg", "https://live.staticflickr.com/65535/50741096702_2a152bdf13_o.jpg", "https://live.staticflickr.com/65535/50740257323_e3e49fa2c6_o.jpg"]}}, "presskit": null, "webcast": "https://youtu.be/90eVwaFBkFE", "youtube_id": "90eVwaFBkFE", "article": "https://spaceflightnow.com/2020/12/19/spacex-closes-out-record-year-of-launches-from-floridas-space-coast/", "wikipedia": "https://en.wikipedia.org/wiki/National_Reconnaissance_Office"}], "static_fire_date_utc": null, "static_fire_date_unix": null, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX will launch NROL-108 for the National Reconnaissance Office aboard a Falcon 9 from SLC-40, Cape Canaveral Air Force Station. The booster for this mission is expected to land at LZ-1.", "crew": [], "ships": ["5ea6ed2f080df4000697c90c", "5ea6ed2e080df4000697c908"], "capsules": [], "payloads": ["5f839ac7818d8b59f5740d48"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 112, "name": "NROL-108", "date_utc": "2020-12-19T14:00:00.000Z", "date_unix": 1608386400, "date_local": "2020-12-19T09:00:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f359187afd3b2662", "flight": 5, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "landpad": "5e9e3032383ecb267a34e7c7"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "5f8399fb818d8b59f5740d43", {"fairings": {"reused": true, "recovery_attempt": true, "recovered": null, "ships": ["5ea6ed2e080df4000697c907", "5ea6ed2e080df4000697c908"]}}, {"links": {"patch": {"small": "https://images2.imgbox.com/a4/9a/8KhFejXx_o.png", "large": "https://images2.imgbox.com/aa/a6/hE0kWqix_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/kawyby4/t%C3%BCrksat_5a_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/ksagr9/rspacex_t%C3%BCrksat_5a_official_launch_discussion/", "media": null, "recovery": "https
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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": ["5ea6ed30080df4000697c913", "601742b20c87b90be7bb7e86", "5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907", "5ea6ed2f080df4000697c90b"], "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": "f31702e8-6353-4c9a-932c-5bd104717500", "id": "5ff6554f9257f579ee3a6c5f", {"fairings": {"reused": null, "recovery_attempt": true, "recovered": true, "ships": ["5ea6ed2e080df4000697c908", "5ea6ed2e080df4000697c907"]}, "links": {"patch": {"small": "https://images2.imgbox.com/fa/01/EAdaKWgq_o.png", "large": "https://images2.imgbox.com/ec/c1/ex40h2Xp_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/ljkh7l/rspacex_starlink19_official_launch_discussion/", "media": "https://www.reddit.com/r/spacex/comments/lkwl1g/starlink19_media_thread_photo_grapher_contest/", "recovery": "https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/50949943433_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": "5e9d0d95eda69973a80

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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": [{"5ea6ed2f080df4000697c90d"}, {"5ea6ed30080df4000697c913"}], "capsules": [], "payloads": [{"5fbfedc654ceb10a5664c814"}], "launchpad": {"5e9e4502f509094188566f88"}, "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"}, "flight": 8, "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": "dfd4f0e0-0ab4-494d-bd88-1b93b934b269", "id": {"5fbfecfe54ceb10a5664c80b"}}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": true, "ships": [{"5ea6ed2e080df4000697c909"}, {"5ea6ed2f080df4000697c90c"}]}, "links": {"patch": {"small": "https://images2.imgbox.com/df/ea/lre39tFr_o.png", "large": "https://images2.imgbox.com/38/db/moPRrpCB_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/jhu37i/starlink_general_discussion_and_deployment_thread/", "launch": "https://www.reddit.com/r/spacex/comments/m0yww5/rspacex_starlink20_official_launch_discussion/", "media": null, "recovery": "https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/51027544097_799f5baccc_o.jpg", "https://live.staticflickr.com/65535/51027443336_3e7486be6f_o.jpg", "https://live.staticflickr.com/65535/51027443321_9a59458d39_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/U4sWbTfrzj8", "youtube_id": "U4sWbTfrzj8", "article": "https://spaceflightnow.com/2021/03/11/spacex-adds-more-satellites-to-starlink-internet-fleet/", "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc": "2021-03-09T23:00:00.000Z", "static_fire_date_unix": 1615330800, "net": false, "window": null, "rocket": {"5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission launches the 20th batch of operational Starlink satellites, which are version 1.0, from LC-39A or SLC-40. It is the 21st Starlink launch overall. The satellites will be delivered to low Earth orbit and will spend a few weeks maneuvering to their operational altitude. The booster is expected to land on an


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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. 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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": ["5ee68c683c228f36bd5809b5", "5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90b", "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": "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": "896d876d-e834-4810-8a5e-44d6b6a42630", "id": "600f9a8d8f798e2a4d5f979e"}, {"fairings": {"reused": null, "recovery_attempt": true, "recovered": true, "ships": ["6059166413f40e27e8af34b6", "5ea6ed2f080df4000697c90b"]}, "links": {"patch": {"small": "https://images2.imgbox.com/f3/0d/E2I1NJs2_o.png", "large": "https://images2.imgbox.com/68/e1/XpScXejQ_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/jhu37i/starlink_general_discussion_and_deployment_thread/", "launch": "https://www.reddit.com/r/spacex/comments/maqmd0/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 or 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."}]
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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.", "crew": [], "ships": ["5ea6ed30080df4000697c913", "5ee68c683c228f36bd5809b5", "5ea6ed2f080df4000697c90b"], "capsules": [], "payloads": ["60428b02c041c16716f73cde"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 122, "name": "Starlink-23 (v1.0)", "date_utc": "2021-04-07T16:34:00.000Z", "date_unix": 1617813240, "date_local": "2021-04-07T12:34:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591817f23b2663", "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": "385455f4-067e-4c24-9937-ca8283ed3307", "id": "60428ac4c041c16716f73cd8"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/c4/ee/2m9k8HLW_o.png", "large": "https://images2.imgbox.com/cf/e3/b0i2QZU1_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/lrx7ez/crew2_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/mvcst9/rspacex_crew2_launch_discussion_updates_thread/", "media": null, "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/51136761295_edb4d3ba1d_o.jpg", "https://live.staticflickr.com/65535/51135652706_3e8448193d_o.jpg", "https://live.staticflickr.com/65535/51135865043_3ee9818a56_o.jpg", "https://live.staticflickr.com/65535/51136428854_4723547f5a_o.jpg", "https://live.staticflickr.com/65535/51134975562_ca678d7e2f_o.jpg", "https://live.staticflickr.com/65535/51135650561_0bd04e5a56_o.jpg", "https://live.staticflickr.com/65535/51135650711_f65e45739d_o.jpg", "https://live.staticflickr.com/65535/51136428874_30a1912bc6_o.jpg", "https://live.staticflickr.com/65535/51135650696_80bb4d0047_o.jpg", "https://live.staticflickr.com/65535/51135650641_f8c77b5420_o.jpg", "https://live.staticflickr.com/65535/51136428829_2b995a79bc_o.jpg", "https://live.staticflickr.com/65535/51135650621_187bc9fa5b_o.jpg", "https://live.staticflickr.com/65535/51135324597_816d0bc217_o.jpg", "https://live.staticflickr.com/65535/51135997286_1b5a4452f0_o.jpg", "https://live.staticflickr.com/65535/51136428899_eb329865d1_o.jpg", "https://live.staticflickr.com/65535/51136428909_d4d6cf76ae_o.jpg", "https://live.staticflickr.com/65535/51136761220_9a2e6dbaf6_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/lW07SN3YoLI", "youtube_id": "lW07SN3YoLI", "article": "https://spaceflightnow.com/2021/04/23/spacex-launches-astronauts-on-refurbished-capsule-and-flight-proven-rocket/", "wikipedia": "https://en.wikipedia.org/wiki/SpaceX_Crew-2"}, "static_fire_date_utc": "2021-04-17T11:01:00.000Z", "static_fire_date_unix": 1618657260, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "SpaceX launches the second operational mission of its Crew Dragon vehicle as part of NASA's Commercial Crew Program, carrying NASA astronauts Shane Kimbrough, Megan McArthur, Thomas Pesquet, and Akihiko H

oshide to the International Space Station. The Falcon 9 and Crew Dragon lift off from LC-39A, Kennedy Space Center. Both the booster and the capsule have flown previously, each a first for a commercial crew flight. The booster for this mission is expected to land on an ASDS. The mission will be complete with the safe return of the astronauts to Earth.", "crew": ["5fe3ba5fb3467846b3242188", "5fe3bb01b3467846b3242189", "5fe3bc3db3467846b324218b", "5fe3bc8ab3467846b324218c"], "ships": ["5ea6ed2e080df4000697c909", "5ea6ed30080df4000697c913"], "capsules": ["5e9e2c5df359188aba3b2676"], "payloads": ["5fe3b3adb3467846b3242173"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 123, "name": "Crew-2", "date_utc": "2021-04-23T09:49:00.000Z", "date_unix": 1619171340, "date_local": "2021-04-23T05:49:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5f57c53d0622a6330279009f", "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": "32dcb5ad-7609-4fc0-8094-768ee5c2ebe0", "id": "5fe3af58b3467846b324215f"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true, "ships": ["6059166413f40e27e8af34b6"]}, "links": {"patch": {"small": "https://images2.imgbox.com/cd/30/UYfjAmuT_o.png", "large": "https://images2.imgbox.com/2e/a8/bvzKCiwf_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/mzol0k/rspacex_starlink24_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/65535/51146838376_4667d78231_o.jpg", "https://live.staticflickr.com/65535/51147622479_d027e09727_o.jpg", "https://live.staticflickr.com/65535/51147949685_975bd6b4ee_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/RBxkRKZ34yo", "youtube_id": "RBxkRKZ34yo", "article": "https://spaceflightnow.com/2021/04/29/spacex-launches-60-more-starlink-spacecraft-fcc-clears-spacex-to-fly-satellites-at-lower-altitudes/", "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 24th batch of operational Starlink satellites, which are version 1.0, from LC-39A or SLC-40. It is the 25th Starlink launch overall. The satellites will be delivered to low Earth orbit and will spend a few weeks maneuvering to their operational altitude. The booster is expected to land on an ASDS.", "crew": [], "ships": ["5ea6ed2f080df4000697c910", "5ea6ed2f080df4000697c90d", "5ee68c683c228f36bd5809b5", "6059166413f40e27e8af34b6"], "capsules": [], "payloads": ["605b4be3aa5433645e37d046"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 124, "name": "Starlink-24 (v1.0)", "date_utc": "2021-04-29T03:44:00.000Z", "date_unix": 1619667840, "date_local": "2021-04-28T23:44:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5ef670f10059c33cee4a826c", "flight": 7, "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": "fbd23c86-89d0-4d3f-b5fb-5d7165d05cca", "id": "605b4b6aaa5433645e37d03f"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": true, "ships": ["6059166413f40e27e8af34b6"]}, "links": {"patch": {"small": "https://images2.imgbox.com/33/03/aHKx9cu1_o.png", "large": "https://images2.imgbox.com/8e/e0/wOt6ZecV_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/n3z0aa/rspacex_starlink25_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/xpl_JnG7rcg", "youtube_id": "xpl_JnG7rcg", "article": null, "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc": "2021-05-03T05:00:00.000Z", "static_fire_date_unix": 1620018000, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "This mission launches the 25th batch of operational Starlink satellites, which are version 1.0, from LC-39A. It is the 26th 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 OCISLY.", "crew": [], "ships": ["608c1a06cf7f3d6152666ad4", "5ea6ed30080df4000697c913", "6059166413f"]

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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": ["5ea6ed30080df4000697c913", "5ee68c683c228f36bd5809b5", "6059166413f40e27e8af34b6"], "capsules": [], "payloads": ["6079bd5e9a06446e8c61bf7c"], "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-fd4bd9df90e7", "id": "6079bd1c9a06446e8c61bf76"}, {"fairings": {"reused": true, "recovery_attempt": true, "recovered": null, "ships": ["6059166413f40e27e8af34b6"]}], "links": {"patch": {"small": "https://images2.imgbox.com/b5/8a/KeiGEz4f_o.png", "large": "https://images2.imgbox.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_6a3f0e08b9_o.jpg", "https://live.staticflickr.com/65535/51170251791_9b36fba5b7_o.jpg", "https://live.staticflickr.com/65535/51185653708_86840b1672_o.jpg", "https://live.staticflickr.com/65535/51185653723_7bd9ecab87_o.jpg", "https://live.staticflickr.com/65535/51186506630_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": ["5ea6ed30080df4000697c913", "6059166413f40e27e8af34b6", "608c1a06cf7f3d6152666ad4", "5ea6ed2f080df4000697c90b"], "capsules": [], "payloads": ["605b4bfbcaa5433645e37d048", "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": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697c90c", "5ee68c683c228f36bd5809b5", "5ea6ed2f080df4000697c90b", "5ea6ed2e080df4000697c909"], "capsules": [], "payloads": ["6079bd679a06446e8c61bf7d"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 128, "name": "Starlink-28 (v1.0)", "date_utc": "2021-05-26T18:59:00.000Z", "date_unix": 1622055540, "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", "landpad": "5e9e3033383ecbb9e534e7cc"}], "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/16/32/9Z7btrQF_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/nhztq5/crs22_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/nqjojc/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/65535/51226340205_9c3ac87b8e_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/65535/51225482053_1fe7157f74_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-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", "608c1a06cf7f3d6152666ad4", "5ea6ed30080df4000697c913"], "capsules": ["60b803421f83cc1e59f1644d"], "payloads": ["5fe3b642b3467846b324217b"], "launchpad": "5e9e4502f509094188566f88", "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", "5ea6ed2f080df4000697c910", "5ea6ed2f080df4000697c90b", "5ea6ed2e080df4000697c909"], "capsules": [], "payloads": ["5fe3b57db3467846b324217a"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 130, "name": "SXM-8", "date_utc": "2021-06-06T04:26:00.000Z", "date_unix": 1622953560, "date_local": "2021-06-06T00:26:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5f57c53d0622a6330279009f", "flight": 3, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}], "auto_update": true, "tbd": false, "launch_library_id": "edaf9a8d-d67c-4e0e-8452-a37b111581d5", "id": "5fe3af6db3467846b3242160"}, {"fairings": {"reused": false, "recovery_attempt": true, "recovered": true, "ships": ["60c8c7a45d4819007ea69871"]}], "links": {"patch": {"small": "https://images2.imgbox.com/d0/66/bCRsHNSZ_o.png", "large": "https://images2.imgbox.com/2f/6f/ebF59FDJ_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/nuud0l/gps_iii_sv05_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/o0gcq/rspacex_gps_iii_sv05_launch_discussion_and/", "media": null, "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/51254829184_e6e1d0d79c_o.jpg", "https://live.staticflickr.com/65535/51253353892_de82b01e23_o.jpg", "https://live.staticflickr.com/65535/51254285968_288383ce6e_o.jpg", "https://live.staticflickr.com/65535/51254829154_3c5980c086_o.jpg", "https://live.staticflickr.com/65535/51253353882_e59ea4df4f_o.jpg", "https://live.staticflickr.com/65535/51254829139_ca68c19689_o.jpg", "https://live.staticflickr.com/65535/51262926489_9fbce20e9c_o.jpg", "https://live.staticflickr.com/65535/51262926469_974292477d_o.jpg", "https://live.staticflickr.com/65535/51262179176_e4302db116_o.jpg", "https://live.staticflickr.com/65535/51263224735_3210fb7499_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/QJXxVtp3KqI", "youtube_id": "QJXxVtp3KqI", "article": null, "wikipedia": "https://en.wikipedia.org/wiki/GPS_Block_II_I"}, "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", "5ea6ed2f080df4000697c910"], "capsules": [], "payloads": ["5eb0e4d2b6c3bb0006eeb261"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 13

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1-08-29T03:14:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5f57c53d0622a6330279009f", "flight": 4, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecb075134e7cd"}], "auto_update": true, "tbd": false, "launch_library_id": "13386512-85bb-4c93-a9b0-f5eac05f5be4f", "id": "5fe3b11eb3467846b324216c"}, {"fairings": {"reused": true, "recovery_attempt": null, "recovered": null, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/cb/ef/u7G01bj4_o.png", "large": "https://images2.imgbox.com/a3/55/7K6zE0T2_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/jhu37i/starlink_general_discussion_and_deployment_thread/", "launch": "https://www.reddit.com/r/spacex/comments/pmn0xm/rspacex_starlink21_launch_discussion_and_updates/", "media": null, "recovery": "https://www.reddit.com/r/spacex/comments/k2ts1q/rspacex_fleet_updates_discussion_thread/"}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/51474853666_be4615e186_o.jpg", "https://live.staticflickr.com/65535/51475097383_dcf9002e9c_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/4372QYiPZB4", "youtube_id": "4372QYiPZB4", "article": "https://spaceflightnow.com/2021/09/14/spacex-launches-first-full-batch-of-laser-equipped-starlink-satellites/", "wikipedia": "https://en.wikipedia.org/wiki/Starlink"}, "static_fire_date_utc": "2021-09-02T17:29:00.000Z", "static_fire_date_unix": 1630603740, "net": false, "window": 0, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": null, "crew": [], "ships": ["5ea6ed30080df4000697c913"], "capsules": [], "payloads": ["60e3bf3373359e1e20335c3c"], "launchpad": "5e9e4502f509092b78566f87", "flight_number": 134, "name": "Starlink 2-1 (v1.5)", "date_utc": "2021-09-14T03:55:00.000Z", "date_unix": 1631591700, "date_local": "2021-09-13T20:55:00-07:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a5f3591833b13b2659", "flight": 10, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3032383ecb6bb234e7ca"}], "auto_update": true, "tbd": false, "launch_library_id": "6b9f9fe6-7f94-498b-a664-7c9e42dbe76d", "id": "60e3bf0d73359e1e20335c37"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/bb/2f/jMnSSQHM_o.png", "large": "https://images2.imgbox.com/eb/36/ZJnCO6hc_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/pc1fq7/inspiration4_launch_campaign_thread/", "launch": "https://www.reddit.com/r/spacex/comments/po651k/rspacex_inspiration4_launch_discussion_updates/", "media": null, "recovery": null}, "flickr": {"small": [], "original": []}, "presskit": null, "webcast": "https://youtu.be/3pv01sSq44w", "youtube_id": "3pv01sSq44w", "article": null, "wikipedia": "https://en.wikipedia.org/wiki/Inspiration4"}, "static_fire_date_utc": "2021-09-13T07:07:00.000Z", "static_fire_date_unix": 1631516820, "net": false, "window": 18000, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": "Inspiration4 is the world's first all-civilian mission to space. The mission will be commanded by Jared Isaacman, the 37-year-old founder and Chief Executive Officer of Shift4 Payments and an accomplished pilot and adventurer. Inspiration4 will leave Earth from Kennedy Space Center's historic Launch Complex 39A, the embarkation point for Apollo and Space Shuttle missions, and travel across a low earth orbit on a multi-day journey that will continually eclipse more than 90% of the earth's population. Named in recognition of the four-person crew that will raise awareness and funds for St. Jude Children's Research Hospital, this milestone represents a new era for human spaceflight and exploration.", "crew": ["607a3a5f5a906a44023e0870", "607a3ab45a906a44023e0872", "607b48375a906a44023e08b8", "607b48da5a906a44023e08b9"], "ships": ["5ea6ed2f080df4000697c910", "5ee68c683c228f36bd5809b5", "614251b711a64135defb3654"], "capsules": ["5f6f99fddcfdf403df379709"], "payloads": ["607a382f5a906a44023e0867"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 135, "name": "Inspiration4", "date_utc": "2021-09-16T00:02:00.000Z", "date_unix": 1631750520, "date_local": "2021-09-15T20:02:00-04:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5f57c5440622a633027900a0", "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": "621d64e6-0513-45dc-8ffa-c9fd56518398", "id": "607a37565a906a44023e0866"}, {"fairings": null, "links": {"patch": {"small": "https://images2.imgbox.com/5a/2f/w3woVyro_o.png", "large": "https://images2.imgbox.com/80/34/J7ROsgsi_o.png"}, "reddit": {"campaign": "https://www.reddit.com/r/spacex/comments/q8r52a/crew_1
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This mission will fly on a new capsule and a once used booster. The booster will land downrange on a drone ship. The Crew-2 mission returns from the space station in November.", "crew": ["5fe3c587b3467846b3242198", "5fe3c5beb3467846b3242199", "5fe3c5f6b3467846b324219a", "60c4b5ad4e041c0b356db393"], "ships": ["5ea6ed2d080df4000697c904", "5ee68c683c228f36bd5809b5", "614251b711a64135defb3654", "5ea6ed2f080df4000697c90c", "5ea6ed2e080df4000697c909"], "capsules": ["617c05591bad2c661a6e2909"], "payloads": ["5fe3b3bab3467846b3242174"], "launchpad": "5e9e4502f509094188566f88", "flight_number": 136, "name": "Crew-3", "date_utc": "2021-11-11T02:03:00.000Z", "date_unix": 1636596180, "date_local": "2021-11-10T21:03:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "60b800111f83cc1e59f16438", "flight": 2, "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": "0d779392-1a36-4c1e-b0b8-ec11e3031ee6", "id": "5fe3b15eb3467846b324216d"}, {"fairings": {"reused": null, "recovery_attempt": true, "recovered": true, "ships": ["618fad7e563d69573ed8caa9"]}, "links": {"patch": {"small": "https://images2.imgbox.com/f1/38/HYBzPrio_o.png", "large": "https://images2.imgbox.com/c9/b7/R0e1MkGD_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/qro60o/rspacex_starlink_41_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/65535/51676939646_1a12780e54_o.jpg", "https://live.staticflickr.com/65535/51677186188_e03e87ae8e_o.jpg", "https://live.staticflickr.com/65535/51676136297_0bbb893f44_o.jpg", "https://live.staticflickr.com/65535/51677822295_87c2ee94b1_o.jpg", "https://live.staticflickr.com/65535/51677186098_12c8f54593_o.jpg", "https://live.staticflickr.com/65535/51676136282_5118fa42ef_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/AtmtP4vouSY", "youtube_id": "AtmtP4vouSY", "article": "https://spaceflightnow.com/2021/11/13/spacex-launch-starts-deployment-of-new-starlink-orbital-shell/", "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": ["5ea6ed2f080df4000697c910", "618fad7e563d69573ed8caa9"], "capsules": [], "payloads": ["618fabf0563d69573ed8caa6"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 137, "name": "Starlink 4-1 (v1.5)", "date_utc": "2021-11-13T12:40:00.000Z", "date_unix": 1636807200, "date_local": "2021-11-13T07:40:00-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a7f3591817f23b2663", "flight": 9, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "ASDS", "landpad": "5e9e3033383ecbb9e534e7cc"}], "auto_update": true, "tbd": false, "launch_library_id": null, "id": "618faad2563d69573ed8ca9d"}, {"fairings": {"reused": null, "recovery_attempt": true, "recovered": null, "ships": ["5ea6ed30080df4000697c912"]}, "links": {"patch": {"small": "https://images2.imgbox.com/5a/fa/fhZj1ebN_o.png", "large": "https://images2.imgbox.com/57/b8/7pGrT5cb_o.png"}, "reddit": {"campaign": "https://www.r

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9973a809d1ec", "success": true, "failures": [], "details": "NASA's Double Asteroid Red
irect Test (DART) will demonstrate the use of a kinetic impactor to alter an aste
roid's trajectory, an intervention that could be used in the future to prevent d
evastating Earth impacts. The target system consists of Didymos, 780 meters in di
ameter, and its moonlet Dimorphos, 160 meters. The DART spacecraft will intercept
the double asteroid, using autonomous guidance to crash into the smaller one. Mov
ing at about 6 km/s, the transferred momentum should alter Dimorphos's 12 hour o
rbital period around its companion by several minutes. The mission tests several
technologies, including the Small-body Maneuvering Autonomous Real-Time Navigatio
n (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 Commercial (NEXT) ion
engine will also be demonstrated, although the spacecraft's primary propulsion i
s 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 e
jecta with its two cameras. Earth-based telescopes will be used to measure the al
tered orbit.", "crew": [], "ships": ["5ea6ed30080df4000697c913", "5ea6ed2f080df4000697
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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, Türksat 5B will be launched into an orbital slot at 42 degrees East. With 12 kW power, Türksat 5B will provide TV broadcasting and data communication services over a wide coverage area that reaches the entire Middle East, the Persian Gulf, the Red Sea, the Mediterranean, North Africa, East Africa, South Africa and Nigeria. Apart 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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The mission lifts off from SLC-40, Cape Canaveral on a southward azimuth and performs a dogleg maneuver. The booster for this mission is expected to return to LZ-1 based on FCC communications filings", "crew": [], "ships": [], "capsules": [], "payloads": ["6161d3a06db1a92bfb8535a"], "launchpad": "5e9e4501f509094ba4566f84", "flight_number": 147, "name": "CSG-2", "date_utc": "2022-01-31T23:11:12.000Z", "date_unix": 1643670672, "date_local": "2022-01-31T18:11:12-05:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "5e9e28a6f359183c413b265d", "flight": 3, "gridfins": true, "legs": true, "reused": true, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "launch_library_id": "5e9e3032383ecb267a34e7c7"}], "auto_update": false, "tbd": false, "launch_library_id": "23229c2b-abb7-4b94-b624-981a9adc88d2", "id": "6161d32d6db1a92bfb85359", {"fairings": {"reused": null, "recovery_attempt": null, "recovered": null, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/a8/17/lVuBZTIF_o.png", "large": "https://images2.imgbox.com/4c/7a/USlZa8r3_o.png"}, "reddit": {"campaign": null, "launch": "https://www.reddit.com/r/spacex/comments/si3o0y/rspacex_nrol87_launch_discussion_and_updates/", "media": null, "recovery": null}, "flickr": {"small": [], "original": ["https://live.staticflickr.com/65535/51860158413_2ebc4d47a4_o.jpg", "https://live.staticflickr.com/65535/51860412009_2e15b59fbf_o.jpg", "https://live.staticflickr.com/65535/51860158508_793bf779eb_o.jpg", "https://live.staticflickr.com/65535/51860411994_584cab0598_o.jpg", "https://live.staticflickr.com/65535/51859123422_603c610574_o.jpg", "https://live.staticflickr.com/65535/51859122897_637e67a312_o.jpg", "https://live.staticflickr.com/65535/51860730685_c8c7f0561e_o.jpg", "https://live.staticflickr.com/65535/51859123052_cc5640ef1a_o.jpg", "https://live.staticflickr.com/65535/51860412119_8926453a27_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/bVk8XyjhTKo", "youtube_id": "bVk8XyjhTKo", "article": "https://spaceflightnow.com/2022/02/02/spacex-launches-classified-nro-satellite-from-vandenberg-space-force-base/", "wikipedia": null, "static_fire_date_utc": null, "static_fire_date_unix": null, "net": false, "window": null, "rocket": "5e9d0d95eda69973a809d1ec", "success": true, "failures": [], "details": null, "crew": [], "ships": [], "capsules": [], "payloads": ["6175aaacefa4314085aa9c56"], "launchpad": "5e9e4502f509092b78566f87", "flight_number": 148, "name": "NROL-87", "date_utc": "2022-02-02T20:18:00.000Z", "date_unix": 1643833080, "date_local": "2022-02-02T12:18:00-08:00", "date_precision": "hour", "upcoming": false, "cores": [{"core": "61fae5947aa67176fe3e0e1e", "flight": 1, "gridfins": true, "legs": true, "reused": false, "landing_attempt": true, "landing_success": true, "landing_type": "RTLS", "launch_library_id": "5e9e3032383ecb554034e7c9"}], "auto_update": true, "tbd": false, "launch_library_id": "2e650790-ff3e-434a-b028-a6a1a13cfc94", "id": "607a34e35a906a44023e085e", {"fairings": {"reused": null, "recovery_attempt": null, "recovered": null, "ships": []}, "links": {"patch": {"small": "https://images2.imgbox.com/1c/c9/KfwNHab1_o.png", "large": "https://images2.imgbox.com/fa/2d/9bZKP4Lb_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/sfr8l0/rspacex_starlink_47_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/65535/51869166852_83ed7030ff_o.jpg", "https://live.staticflickr.com/65535/51870446979_a7af58c55a_o.jpg", "https://live.staticflickr.com/65535/51870446669_f94575721f_o.jpg"]}, "presskit": null, "webcast": "https://youtu.be/UY3fZ6PwuUY", "youtube_id": "UY3fZ6PwuUY", "article": "https://spaceflightnow.com/2022/02/03/spacex-launches-third-falcon-9-rocket"}}

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```



```
used":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecb075134e7cd"}],{"auto_update":true,"tbd":false,"launch_library_id":"4a114237-e8c5-4248-8d30-7a9026b86430","id":"62f3b5200f55c50e192a4e6c"},{"fairings":{"reused":null,"recovery_attempt":null,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/12/42/5T8I9wZL_o.png","large":"https://images2.imgbox.com/f4/bc/5iJ5j1Ju_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":[]},"presskit":null,"webcast":"https://youtu.be/07RGJ04HRns","youtube_id":"07RGJ04HRns","article":null,"wikipedia":null},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":null,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":[],"ships":[],"capsules":[],"payloads":["631614d7ffc78f3b85670716"],"launchpad":"5e9e4502f509094188566f88","flight_number":181,"name":"Starlink 4-23 (v1.5)","date_utc":"2022-08-28T02:22:00.000Z","date_unix":1661653320,"date_local":"2022-08-27T22:22:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"61c1ef45a4a2462678cbf45d","flight":2,"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":"67158b3c-201d-4450-be8a-990010c05b40","id":"62f3b5290f55c50e192a4e6d"},{"fairings":{"reused":null,"recovery_attempt":null,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/72/07/PtgYfiFT_o.png","large":"https://images2.imgbox.com/fc/18/97AKS1XR_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/x1t7gd/rspacex_starlink_34_launch_discussion_and_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/zSJWK_pmXVw","youtube_id":"zSJWK_pmXVw","article":null,"wikipedia":null},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":null,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":[],"ships":[],"capsules":[],"payloads":["630f63bf18702d4844fb5391"],"launchpad":"5e9e4502f509092b78566f87","flight_number":182,"name":"Starlink 3-4 (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-0da4138d192d","id":"62f3b53a0f55c50e192a4e6f"},{"fairings":{"reused":null,"recovery_attempt":null,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/dc/a0/erKL6HGq_o.png","large":"https://images2.imgbox.com/57/42/trORYoRc_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":[]},"presskit":null,"webcast":"https://youtu.be/NONM-xsKMSs","youtube_id":"NONM-xsKMSs","article":null,"wikipedia":null},"static_fire_date_utc":null,"static_fire_date_unix":null,"net":false,"window":null,"rocket":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":[],"ships":[],"capsules":[],"payloads":["631614e9ffc78f3b85670717","631617fbffc78f3b8567071d"],"launchpad":"5e9e4501f509094ba4566f84","flight_number":183,"name":"Starlink 4-20 (v1.5) & Sherpa LTC-2/Varuna-TDM","date_utc":"2022-09-05T02:09:00.000Z","date_unix":1662343740,"date_local":"2022-09-04T22:09:00-04:00","date_precision":"hour","upcoming":false,"cores":[{"core":"5e9e28a6f359183c413b265d","flight":7,"gridfins":true,"legs":true,"reused":true,"landing_attempt":true,"landing_success":true,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],{"auto_update":true,"tbd":false,"launch_library_id":null,"id":"62f3b5330f55c50e192a4e6e"},{"fairings":{"reused":null,"recovery_attempt":null,"recovered":null,"ships":[]},"links":{"patch":{"small":"https://images2.imgbox.com/a9/9a/NXVKtZCE_o.png","large":"https://images2.imgbox.com/e3/cc/hN96PMST_o.png"},"red
```

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```

```
t":"5e9d0d95eda69973a809d1ec","success":true,"failures":[],"details":null,"crew":
["62dd7196202306255024d13c","62dd71c9202306255024d13d","62dd7210202306255024d13
e","62dd7253202306255024d13f"],"ships":[],"capsules":["617c05591bad2c661a6e290
9"],"payloads":["62dd73ed202306255024d145"],"launchpad":"5e9e4502f509094188566f8
8","flight_number":187,"name":"Crew-5","date_utc":"2022-10-05T16:00:00.000Z","dat
e_unix":1664985600,"date_local":"2022-10-05T12:00:00-04:00","date_precision":"hou
r","upcoming":false,"cores":[{"core":"633d9da635a71d1d9c66797b","flight":1,"gridf
ins":true,"legs":true,"reused":false,"landing_attempt":true,"landing_success":tru
e,"landing_type":"ASDS","landpad":"5e9e3033383ecbb9e534e7cc"}],"auto_update":tru
e,"tbd":false,"launch_library_id":"f33d5ece-e825-4cd8-809f-1d4c72a2e0d3","id":"62
dd70d5202306255024d139"}]'
```

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

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

```
In [49]: response.status_code
```

```
Out[49]: 200
```

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

```
In [55]: # Use json_normalize meethod to convert the json result into a dataframe
data = pd.json_normalize(response.json())
```

Using the dataframe `data` print the first 5 rows

```
In [56]: # Get the head of the dataframe
data.head()
```

Out[56]:

	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
---	--------------------------	--------------	-------	-----	--------------------------

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

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

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

	static_fire_date_utc	static_fire_date_unix	net	window	rocket

4	None	NaN	False	0.0	5e9d0d95eda69955f709d1eb
---	------	-----	-------	-----	--------------------------

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

# 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 version of cores, the number of times this specific core has been reused, and the serial of the core.

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

```
In [75]: #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 look at `BoosterVersion` variable. Before we apply `getBoosterVersion` the list is empty:

```
In [76]: BoosterVersion
```

```
Out[76]: []
```

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

```
In [77]: # Call getBoosterVersion
getBoosterVersion(data)
```

the list has now been update

```
In [78]: BoosterVersion[0:5]
```

```
Out[78]: ['Falcon 1', 'Falcon 1', 'Falcon 1', 'Falcon 1', 'Falcon 9']
```

we can apply the rest of the functions here:

```
In [79]: # Call getLaunchSite
getLaunchSite(data)
```

```
In [80]: # Call getPayloadData
getPayloadData(data)
```

```
In [81]: # Call getCoreData
getCoreData(data)
```

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

```
In [84]: 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 [85]: # Create a data from launch_dict
launch_data = pd.DataFrame(launch_dict)
```

Show the summary of the dataframe

```
In [86]: # Show the head of the dataframe
launch_data.head()
```

```
Out[86]:
```

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

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 [87]: # Hint data['BoosterVersion']!='Falcon 1'
data_falcon9 = launch_data[launch_data['BoosterVersion']!='Falcon 1']
data_falcon9.head()
```

Out[87]:

	FlightNumber	Date	BoosterVersion	PayloadMass	Orbit	LaunchSite	Outcome	Fli
4	6	2010-06-04	Falcon 9	NaN	LEO	CCSFS SLC 40	None	None
5	8	2012-05-22	Falcon 9	525.0	LEO	CCSFS SLC 40	None	None
6	10	2013-03-01	Falcon 9	677.0	ISS	CCSFS SLC 40	None	None
7	11	2013-09-29	Falcon 9	500.0	PO	VAFB SLC 4E	False	Ocean
8	12	2013-12-03	Falcon 9	3170.0	GTO	CCSFS SLC 40	None	None



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

```
In [88]: data_falcon9.loc[:, 'FlightNumber'] = list(range(1, data_falcon9.shape[0]+1))
data_falcon9
```

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

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
self._setitem_single_column(ilocs[0], value, pi)
```


Out[88]:

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

Data Wrangling

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

In [89]: `data_falcon9.isnull().sum()`

```
Out[89]: FlightNumber    0
         Date            0
         BoosterVersion  0
         PayloadMass     5
         Orbit           0
         LaunchSite      0
         Outcome         0
         Flights         0
         GridFins        0
         Reused          0
         Legs            0
         LandingPad      26
         Block           0
         ReusedCount     0
         Serial          0
         Longitude       0
         Latitude        0
         dtype: int64
```

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 [91]: # Calculate the mean value of PayloadMass column

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

data_falcon9.isnull().sum()
```

```
Out[91]: FlightNumber    0
         Date            0
         BoosterVersion  0
         PayloadMass     0
         Orbit           0
         LaunchSite      0
         Outcome         0
         Flights         0
         GridFins        0
         Reused          0
         Legs            0
         LandingPad      26
         Block           0
         ReusedCount     0
         Serial          0
         Longitude       0
         Latitude        0
         dtype: int64
```

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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