



# Hubble and James Webb Space Telescopes

The Latest Spectacular Images from the Cosmos

# 2023

## Cover

The Cosmic Cliffs



This landscape of mountains and valleys speckled with glittering stars is actually the edge of a nearby, young, star-forming region called NGC 3324 in the Carina Nebula. Captured in infrared light by the James Webb Space Telescope, this image reveals for the first time previously invisible regions of star birth.

Credit: NASA, ESA, CSA, and STScI

## January

A Fiery Hourglass



The protostar L1527, shown in this image from the James Webb Space Telescope, is embedded within a cloud of material that is feeding its growth. Material ejected from the star has cleared out cavities on either side, whose boundaries glow orange and blue in this infrared view.

Credit: NASA, ESA, CSA, and STScI, J. DePasquale (STScI)

## February

Deep Fields of View



The image on the left is the first deep-field image from the James Webb Space Telescope, showcasing thousands of galaxies of the galaxy cluster SMACS 0723 in the near-infrared. The image on the right from the Hubble Space Telescope features the galaxy cluster Abell 611, located roughly 3.2 billion light-years from Earth.

Credit (left): NASA, ESA, CSA, and STScI  
Credit (right): ESA/Hubble, NASA, P. Kelly, M. Postman, J. Richard, S. Allen

## March

The Tarantula Nebula



In this mosaic image stretching 340 light-years across, the James Webb Space Telescope showcases the Tarantula Nebula star-forming region in infrared light, including tens of thousands of previously unseen young stars that are obscured by cosmic dust in visible-light images.

Credit: NASA, ESA, CSA, and STScI

## April

Mesmerizing Galaxy Mergers



This month features four galaxy mergers. The objects are IC 1623 (top left, as seen by Webb), Arp 248 (bottom left, as seen by Hubble), Arp 282 (top right, as seen by Hubble), and IC 2431 (bottom right, as seen by Hubble).

Credit (top left): ESA/Webb, NASA & CSA, L. Armus & A. Evans  
Credit (bottom left): ESA/Hubble & NASA, Dark Energy Survey/DOE/FNAL/DECam/CTIO/NOIRLab/NSF/AURA, J. Dalcanton  
Credit (top right): ESA/Hubble & NASA, J. Dalcanton, Dark Energy Survey, DOE, FNAL/DECam, CTIO/NOIRLab/NSF/AURA, SDSS  
Credit (bottom right): ESA/Hubble & NASA, W. Keel, Dark Energy Survey, DOE, FNAL, DECam, CTIO, NOIRLab/NSF/AURA, SDSS

## May

The Southern Ring Nebula

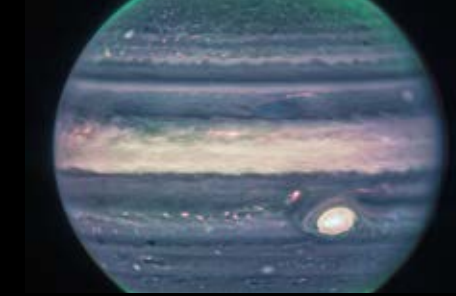


Two views from the James Webb Space Telescope reveal the planetary nebula NGC 3132, also known as the Southern Ring. The left image is a sharp near-infrared view of the nebula, while the view on the right is in mid-infrared wavelengths, and captures the dust shrouding one of the white dwarf stars at the nebula's centre.

Credit: NASA, ESA, CSA, STScI

## June

Jovian Aurora



Jupiter, the largest planet in our Solar System, is featured here in near-infrared wavelengths as seen by the James Webb Space Telescope. Different colours mark the light from the planet's aurorae, and the clouds and hazes at different depths in the atmosphere. The Great Red Spot shines brightly with reflected near-infrared light from the Sun.

Credit: NASA, ESA, Jupiter ERS Team; image processing by J. Schmidt

## July

Glittering Globular Clusters



This montage displays four globular star clusters as seen by the Hubble Space Telescope. Shown here are Liller 1 (top left), Terzan 9 (bottom left), Terzan 4 (top right) and NGC 6569 (bottom right). Each is filled with both redder, older stars and bluer, younger ones.

Credit (top left): ESA/Hubble & NASA, F. Ferraro  
Credit (bottom left): ESA/Hubble & NASA, R. Cohen  
Credit (top right): ESA/Hubble & NASA, R. Cohen  
Credit (bottom right): ESA/Hubble & NASA, R. Cohen

## August

Scattered Galaxy Groupings



These images show unusual, densely packed groupings of entire galaxies. The left image, in visible light from the Hubble Space Telescope, is of the soon-to-merge galaxies of HCG 40. The right image, taken by the James Webb Space Telescope in infrared light, is of the interacting galaxies of HCG 92 — also known as Stephan's Quintet.

Credit (left): NASA, ESA, and STScI  
Credit (right): NASA, ESA, CSA, and STScI

## September

Rainbow Colours in the Orion Nebula



This celestial cloudscape from the Hubble Space Telescope captures the colourful region surrounding the Herbig-Haro object HH 505. The Orion Nebula is awash in intense ultraviolet radiation from bright young stars. Outflows from such stars collide with gas and dust, creating the shockwaves known as Herbig-Haro objects that are brightly visible to Hubble.

Credit: ESA/Hubble & NASA, J. Bally

## October

The Phantom Galaxy



This montage features three views of M74, also known as the Phantom Galaxy. The left section of this image is a visible-light image from the Hubble Space Telescope, while the right section, in mid-infrared wavelengths, comes from the James Webb Space Telescope. In the centre, data from both telescopes are combined for a truly unique view into the heart of the object.

Credit: ESA/Webb, NASA, CSA, J. Lee and the PHANGS-JWST Team, R. Chandar

## November

Pillars of Creation



Two views of the famous Pillars of Creation, part of the Eagle Nebula, are revealed here by the James Webb Space Telescope. The left, mid-infrared, image details the spread of interstellar dust. On the right, the near-infrared image highlights bright, newly-formed stars.

Credit (left): NASA, ESA, CSA, STScI, J. DePasquale (STScI), A. Pagan (STScI)  
Credit (right): NASA, ESA, CSA, STScI, J. DePasquale, A. Koekemoer, A. Pagan (STScI)

## December

A Made-to-Measure Galaxy



NGC 7038 is displayed in glorious detail here by the Hubble Space Telescope. The image is remarkably detailed, combining over 15 hours of observations to expose distant stars and galaxies in the background. The spiral galaxy filling the frame here contains celestial objects that can be used to measure distances on cosmic scales.

Credit: ESA/Hubble & NASA, D. Jones

# 2023

Moon phases are indicated in Universal Time.

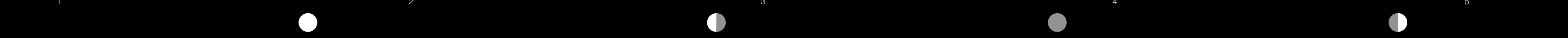


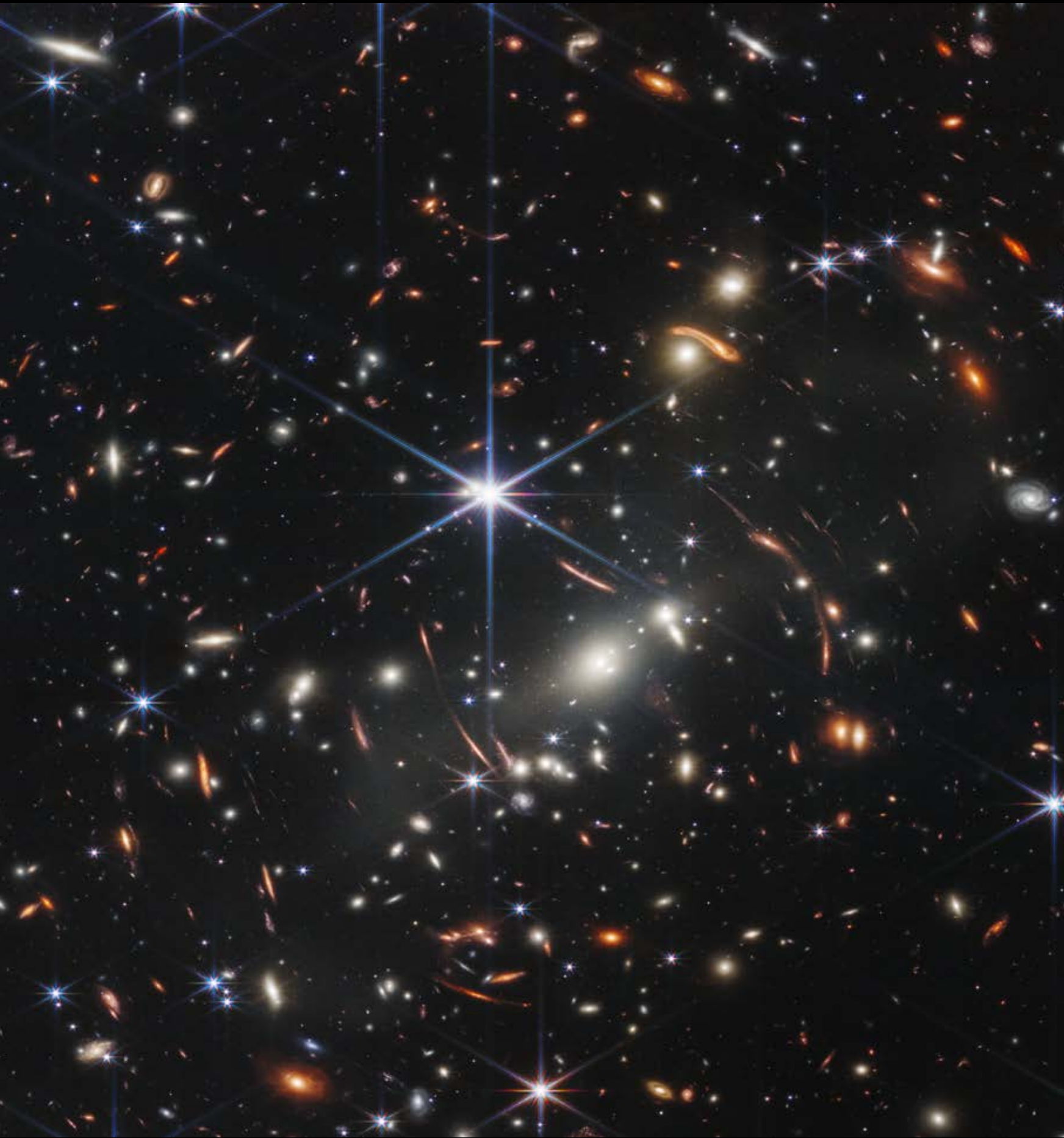


# January 2023

A Fiery Hourglass  
(Webb)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31



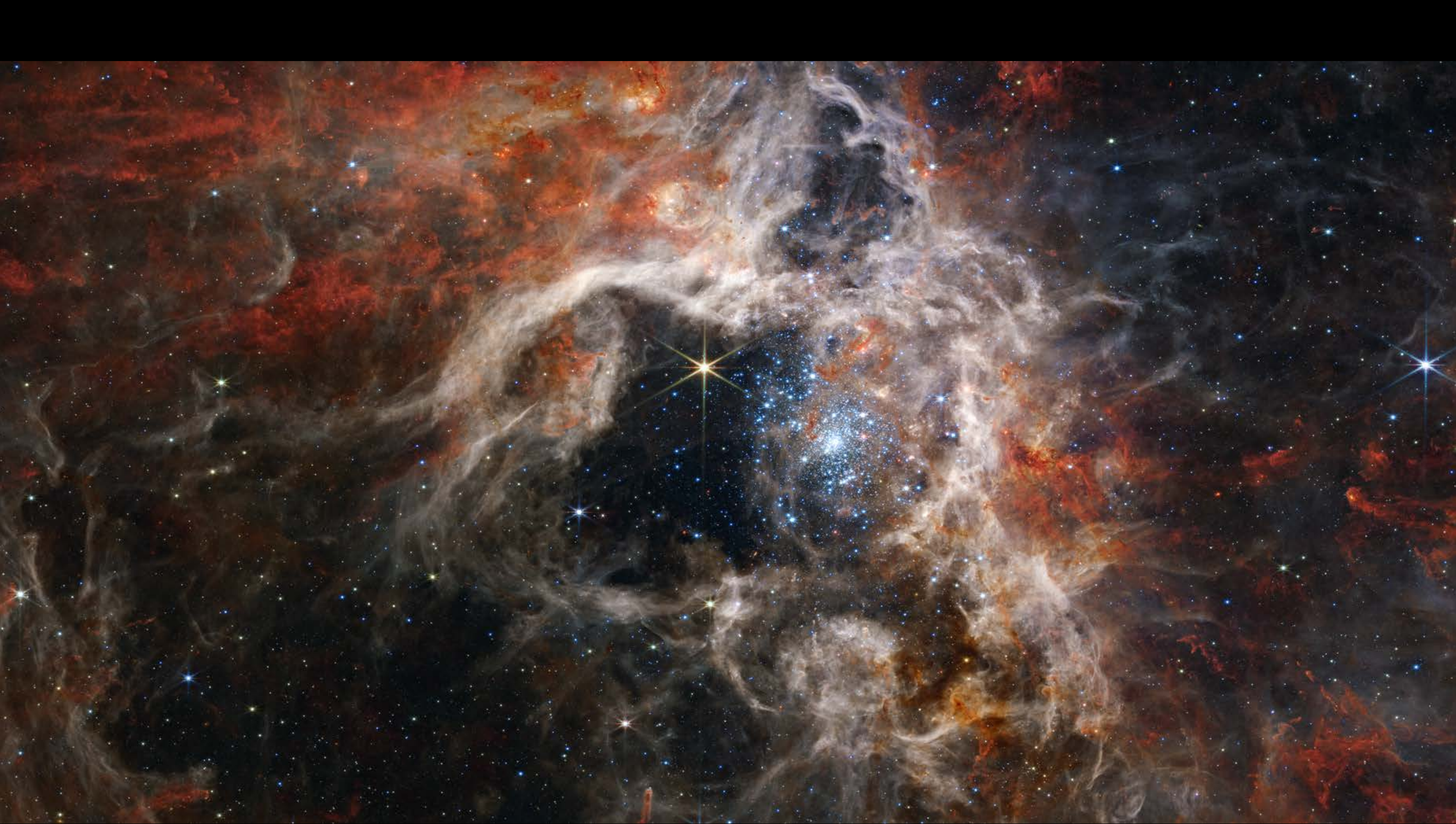


# February 2023

Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 1 2 3

Deep Fields of View  
(Left: Webb; Right: Hubble)





March 2023

Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday  
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

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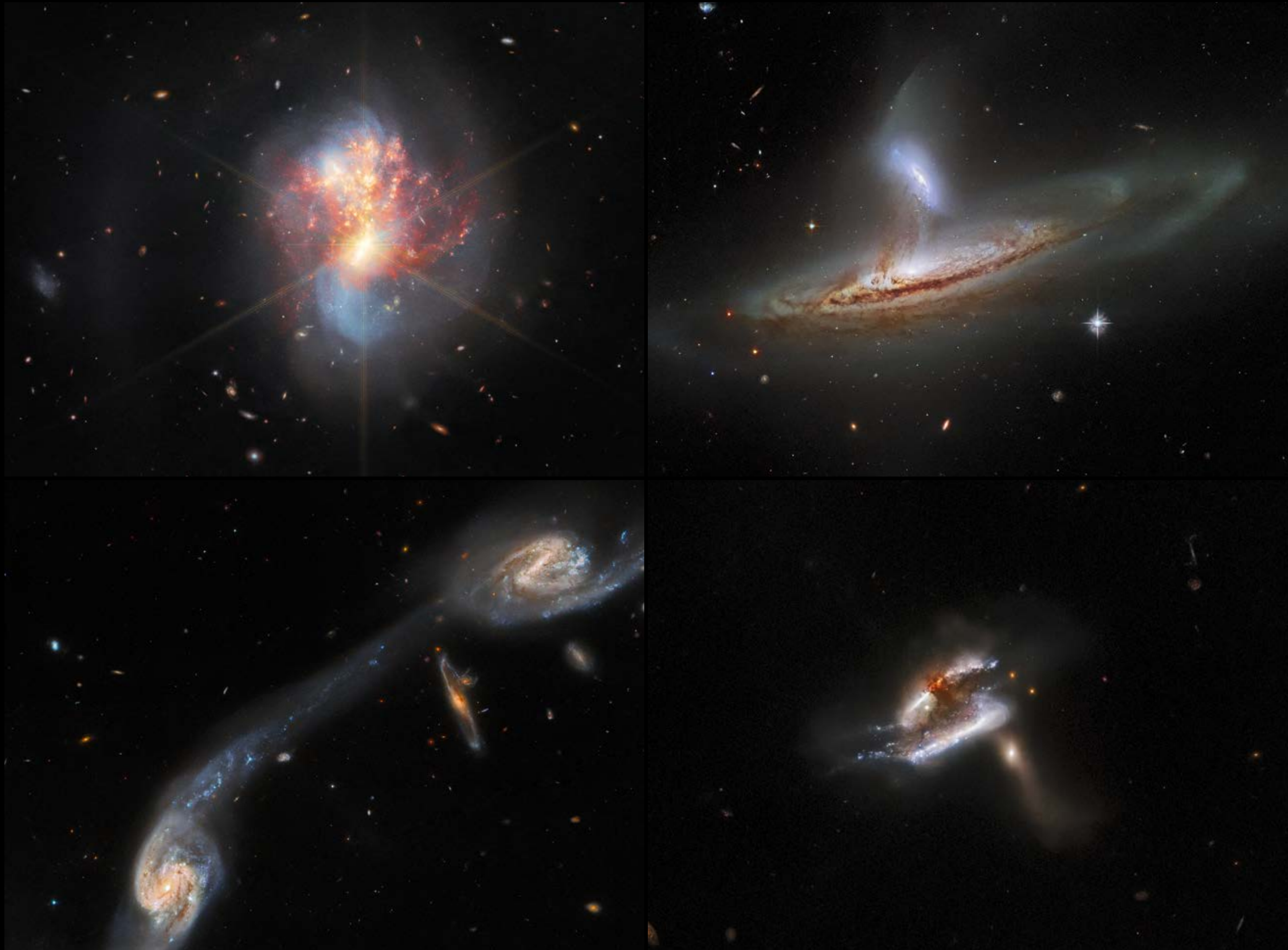
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The Tarantula Nebula  
(Webb)





April 2023

Mesmerizing Galaxy Mergers  
 (Top left: Webb; Bottom left, top right, and bottom right: Hubble)

Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1

14 15 16 17





May 2023

Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday

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

The Southern Ring Nebula  
(Webb)



18 19 20 21 22





# June 2023

Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday							
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Jovian Aurora  
(Webb)







July 2023

Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday

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

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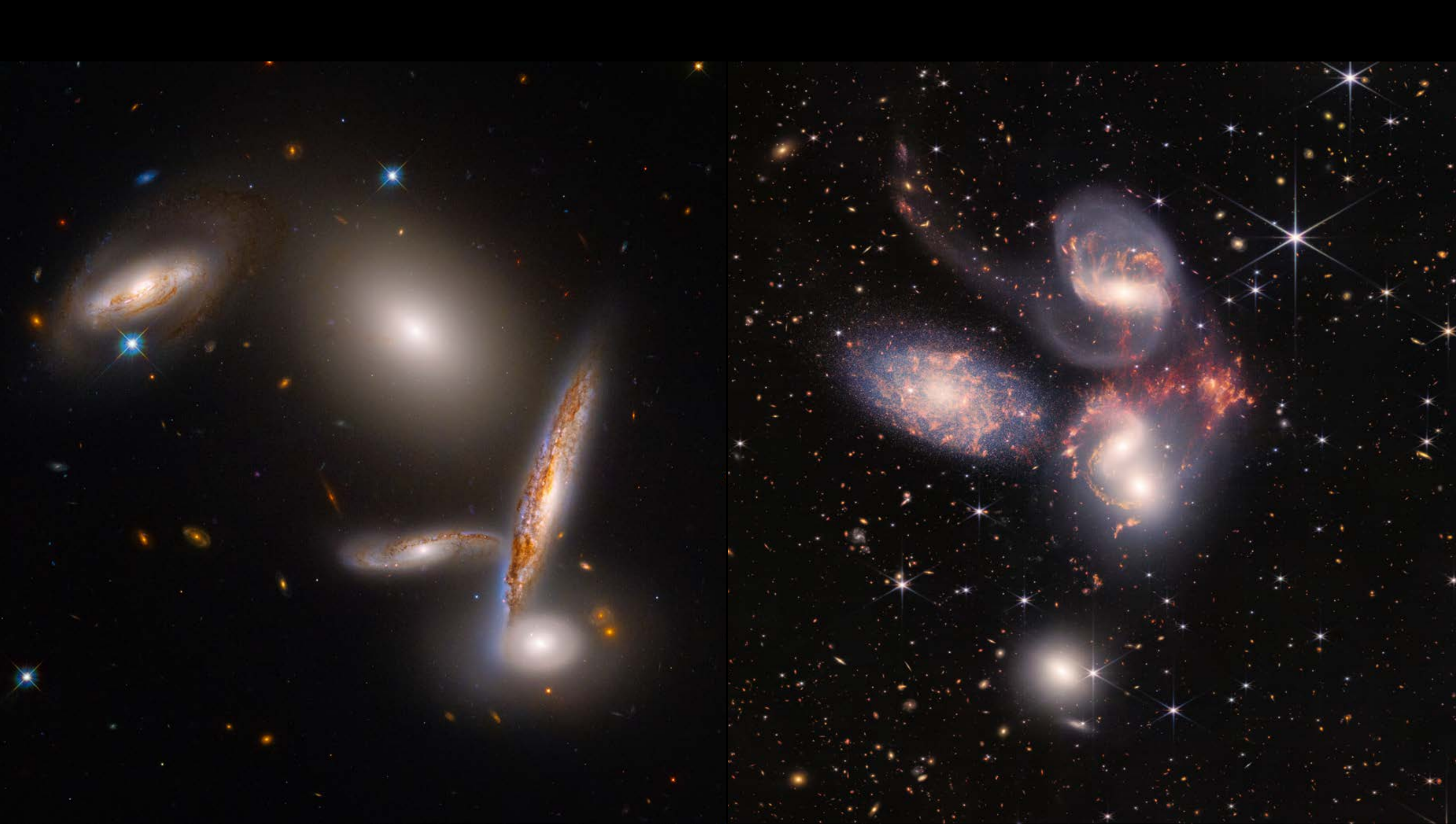
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Glittering Globular Clusters  
(Hubble)





# August 2023

Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday

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

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Scattered Galaxy Groupings  
(Left: Hubble, Right: Webb)





# September 2023

Rainbow Colours in the Orion Nebula  
(Hubble)

Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1

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Hubble / Optical



Hubble & Webb



Webb / Infrared

# October 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
40							41						42								43							44			

The Phantom Galaxy (Webb)





# November 2023

Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1

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Pillars of Creation  
(Webb)





# December 2023

Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

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A Made-to-Measure Galaxy  
(Hubble)





Liftoff of the James Webb Space Telescope  
Credit: ESA/CNES/Arianespace/  
Optique Vidéo du CSG - JM Guillon





The images featured in this calendar were taken by the NASA/ESA Hubble Space Telescope and the NASA/ESA/CSA James Webb Space Telescope and were publicly released throughout 2022.