



# Hubble and James Webb Space Telescopes

The Latest Spectacular Images from the Cosmos

# 2024

## Cover

Stars Forming in Rho Ophiuchi

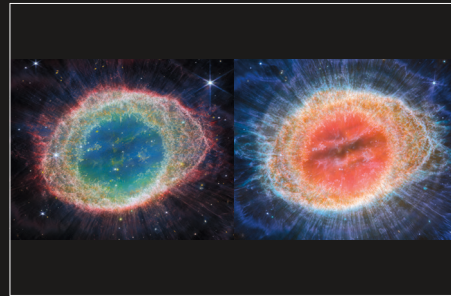


The subject of the first anniversary image from the NASA/ESA/CSA James Webb Space Telescope is the Rho Ophiuchi cloud complex, the closest star-forming region to Earth. Jets bursting from young stars crisscross the image, impacting the surrounding interstellar gas and lighting up molecular hydrogen.

Credit: NASA, ESA, CSA, STScI, K. Pontoppidan (STScI), A. Pagan (STScI)

## January

The Ring Nebula's Beauty



Formed by a star throwing off its outer layers as it runs out of fuel, the Ring Nebula is an archetypal planetary nebula. The near-infrared image (left) makes the ring's intricate detail visible, while the mid-infrared image (right) reveals concentric features in the outer regions of the nebula's ring.

Credit: NASA, ESA, CSA, M. Barlow, N. Cox, R. Wesson

## February

Jellyfish Galaxies

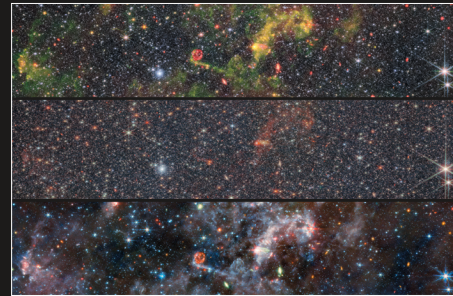


In 2023 several images from Hubble of 'jellyfish' galaxies, named for their beautiful trailing tentacles, were released. These jellyfish are all travelling through galaxy clusters, ploughing through the diffuse gas that pervades such clusters. The resulting 'ram pressure' strips gas from the galaxies and creates these trailing streamers, where new stars form.

Credit: NASA, ESA, M. Gullieuszik and the GASP team

## March

Dust-Filled Galaxy NGC 6822

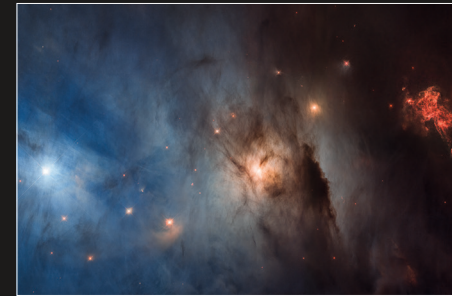


These three images give radically different views of the galaxy NGC 6822. At the bottom, in Webb's mid-infrared image, the emission of light by galactic dust is prominent, obscuring the galaxy's stars. In the middle, the near-infrared image shows the galaxy's countless stars in incredible detail. The two views are combined in the top image.

Credit: NASA, ESA, CSA, M. Meixner

## April

Stars Forming in NGC 1333



This image, released to celebrate Hubble's 33rd anniversary in April 2023, features the star-forming nebula NGC 1333 in the Perseus molecular cloud. Hubble's colourful view, showcasing its unique ability to obtain images in light from ultraviolet to near-infrared, unveils an effervescent cauldron of gases and dust stirred up by newly forming stars within the dark cloud.

Credit: NASA, ESA, STScI

## May

A Gargantuan Gravitational Lens



A massive galaxy cluster, SPT-CL J0019-2026, dominates the centre of this image from Hubble. The view is populated with a serene collection of elliptical and spiral galaxies, but galaxies surrounding the central cluster appear stretched into bright arcs, an amazing example of gravitational lensing.

Credit: NASA, ESA, H. Ebeling

## June

Gas and Light Collide



This is Webb's view of the Orion Bar region, a part of the Orion Nebula that hosts intense star formation activity and active astrochemistry. Harsh ultraviolet light from the stars of the Trapezium Cluster carves out a rich tapestry of cavities and filaments.

Credit: NASA, ESA, CSA, M. Zamani (ESA/Webb), the PDRs4All ERS Team

## July

Clash of the Titans



This distorted galaxy, NGC 3256, is the result of an ancient clash between two galaxies. The left image, from Webb (in 2023), captures infrared light from dust grains, irradiated by young stars that were formed from the collision. The right image from Hubble (in 2018) highlights hot, massive stars in the two galactic cores, shrouded by dark dust that blocks visible light.

Credit (left): NASA, ESA, CSA, L. Armus, A. Evans  
Credit (right): NASA, ESA

## August

Cosmic Smokescreen

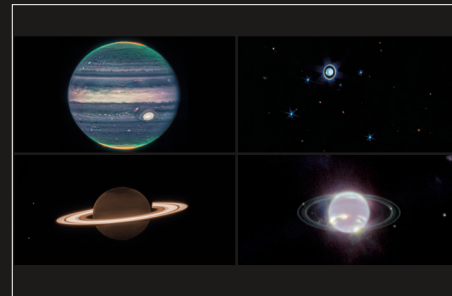


A portion of the open cluster NGC 6530 appears as a roiling wall of smoke studded with stars in this image from Hubble. The cluster is set within the larger Lagoon Nebula, a gigantic interstellar cloud of gas and dust; it is the nebula that gives this image its distinctly smokey appearance.

Credit: NASA, ESA, CSA, ESO, O. De Marco

## September

Outer Planets and Moons

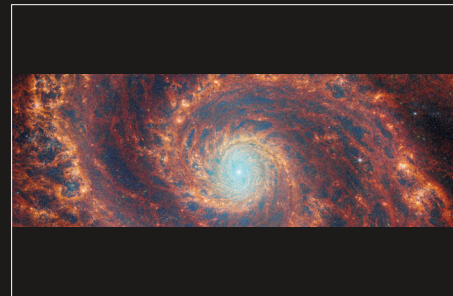


In its first year the James Webb Space Telescope has returned stunning infrared images of the Solar System's outer planets and some of their moons. Featured here are Jupiter (top left), Saturn (bottom left), Uranus (top right) and Neptune (bottom right).

Credit (top left): NASA, ESA, Jupiter ERS Team, J. Schmidt  
Credit (bottom left): NASA, ESA, CSA, STScI, M. Tiscareno, M. Showalter, M. Hedman, M. El Moutamid, L. Fletcher, H. Hammel, J. DePasquale (STScI)  
Credit (top right): NASA, ESA, CSA, STScI, J. DePasquale (STScI)  
Credit (bottom right): NASA, ESA, CSA, STScI

## October

A Spiral of Gas and Dust



The graceful winding arms of the grand-design spiral galaxy M51 stretch across this Webb image. This galactic portrait is a composite image that integrates both near-infrared and mid-infrared data. Red colours trace out dust grains, while orange and yellow reveal regions of gas ionised by recently formed star clusters.

Credit: NASA, ESA, CSA, A. Adamo and the FEAST JWST team

## November

A Glittering Globular Cluster

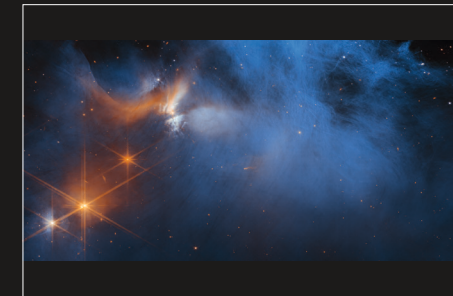


This star-filled view from the Hubble Space Telescope is of Terzan 12, a globular cluster embedded in our Milky Way galaxy. Creeping tendrils of galactic gas and dust blanket large portions of Terzan 12, giving some stars a sinister red hue. Relatively unobscured stars shine brightly in white and blue.

Credit: NASA, ESA, R. Cohen

## December

Ices in a Dark Molecular Cloud



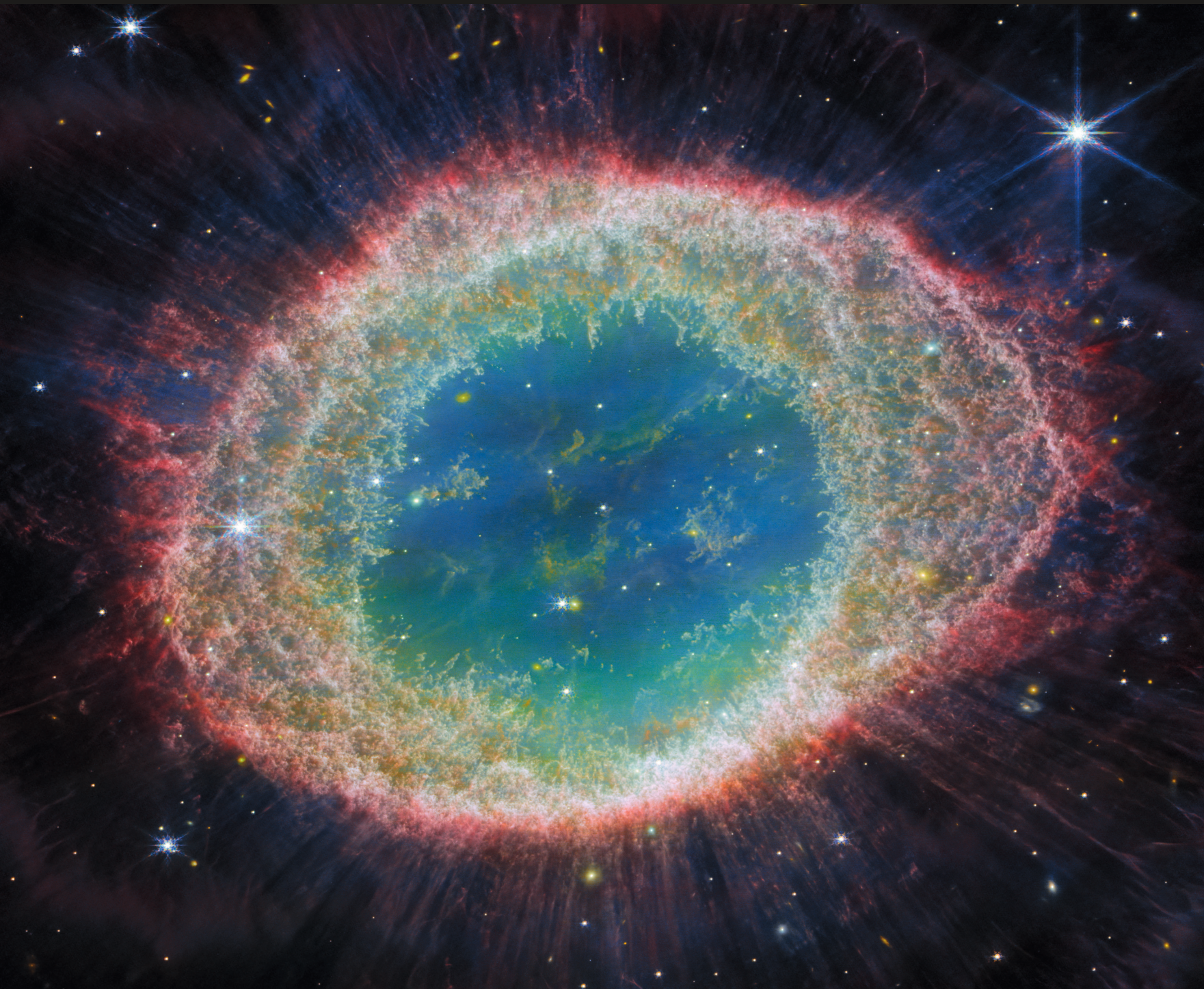
This image from Webb features the central region of the Chameleon I dark cloud. Cold, wispy cloud material is illuminated in the infrared by the glow of a young, shrouded protostar. Its study points at icy molecules forming in clouds of gas and dust that will one day form stars and planets.

Credit: NASA, ESA, CSA, M. Zamani (ESA/Webb), F. Sun, Z. Smith, and the Ice Age ERS Team

# 2024



Moon phases are indicated in Universal Time.



# January 2024

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 Ring Nebula's Beauty (Webb)





February 2024

Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday							
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	1	2



Jellyfish Galaxies  
(Hubble)





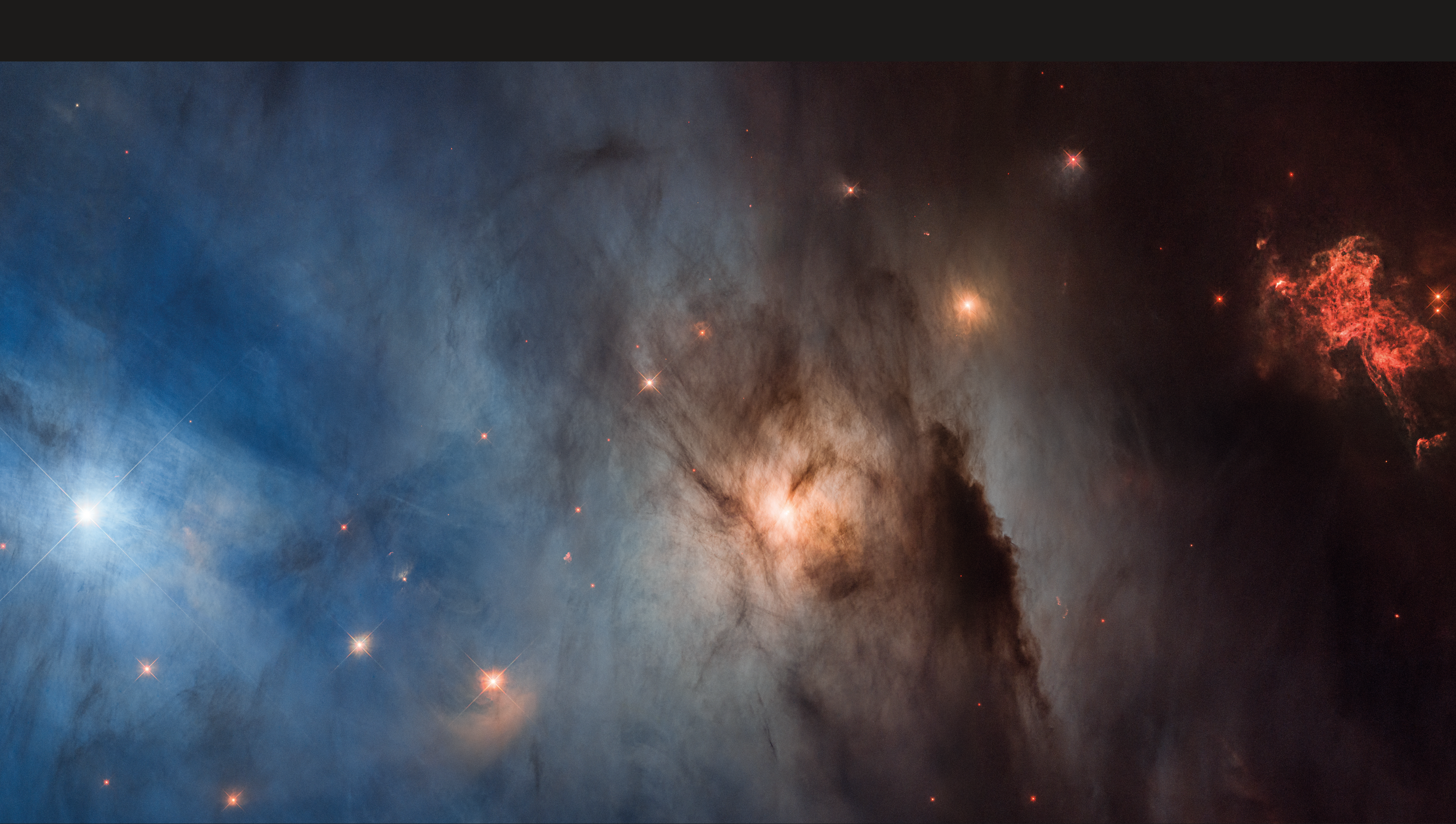
Dust-Filled Galaxy NGC 6822  
(Webb)

March 2024

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





# April 2024

Stars Forming in NGC 1333  
(Hubble)

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	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	1





May 2024

A Gargantuan Gravitational Lens  
(Hubble)

Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday Saturday Sunday Monday Tuesday Wednesday Thursday Friday  
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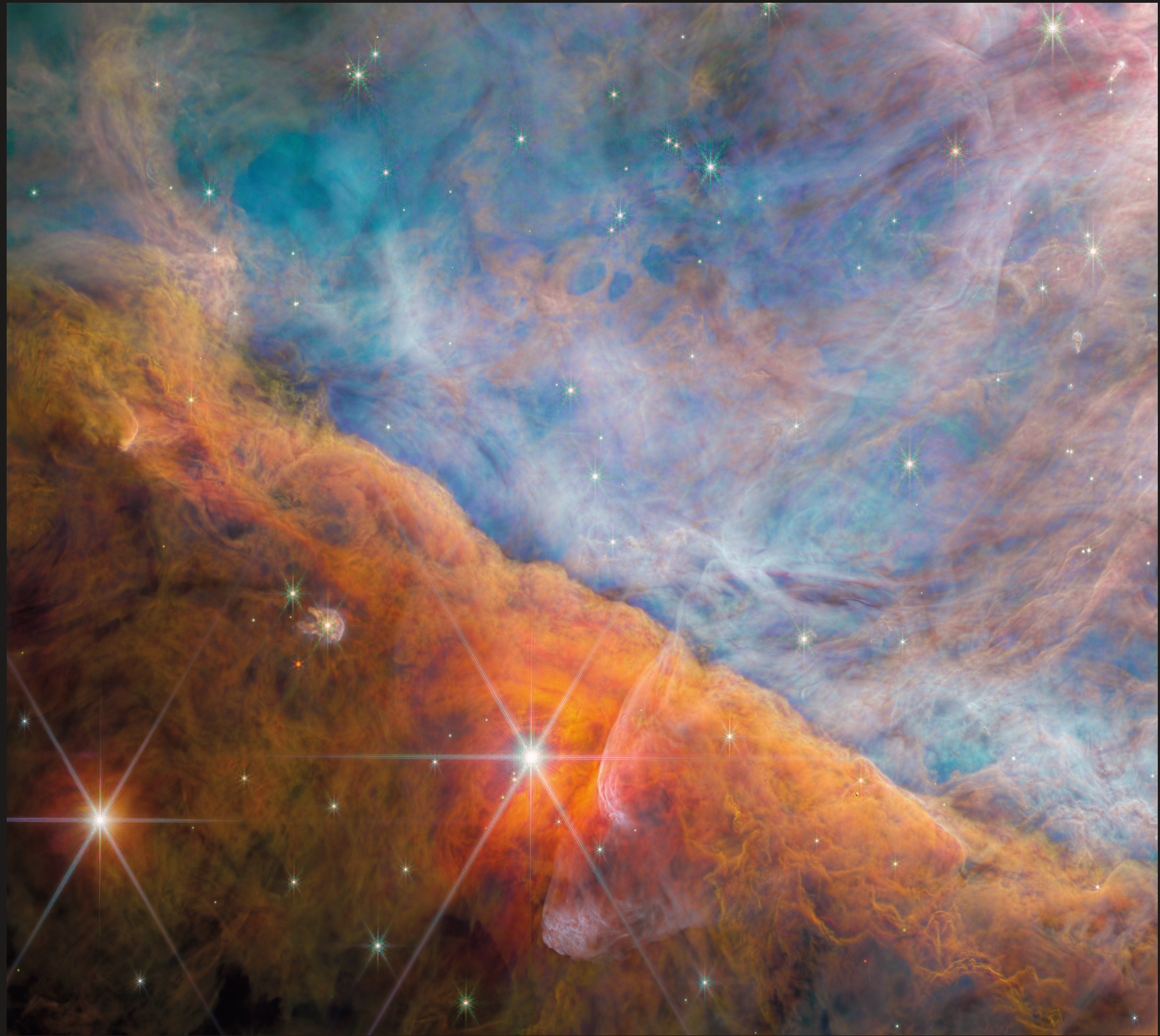
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June 2024

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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	

Gas and Light Collide  
(Webb)







# July 2024

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

27 28 29 30 31

Clash of the Titans  
(Left: Webb; Right: Hubble)





# August 2024

Cosmic Smokescreen  
(Hubble)

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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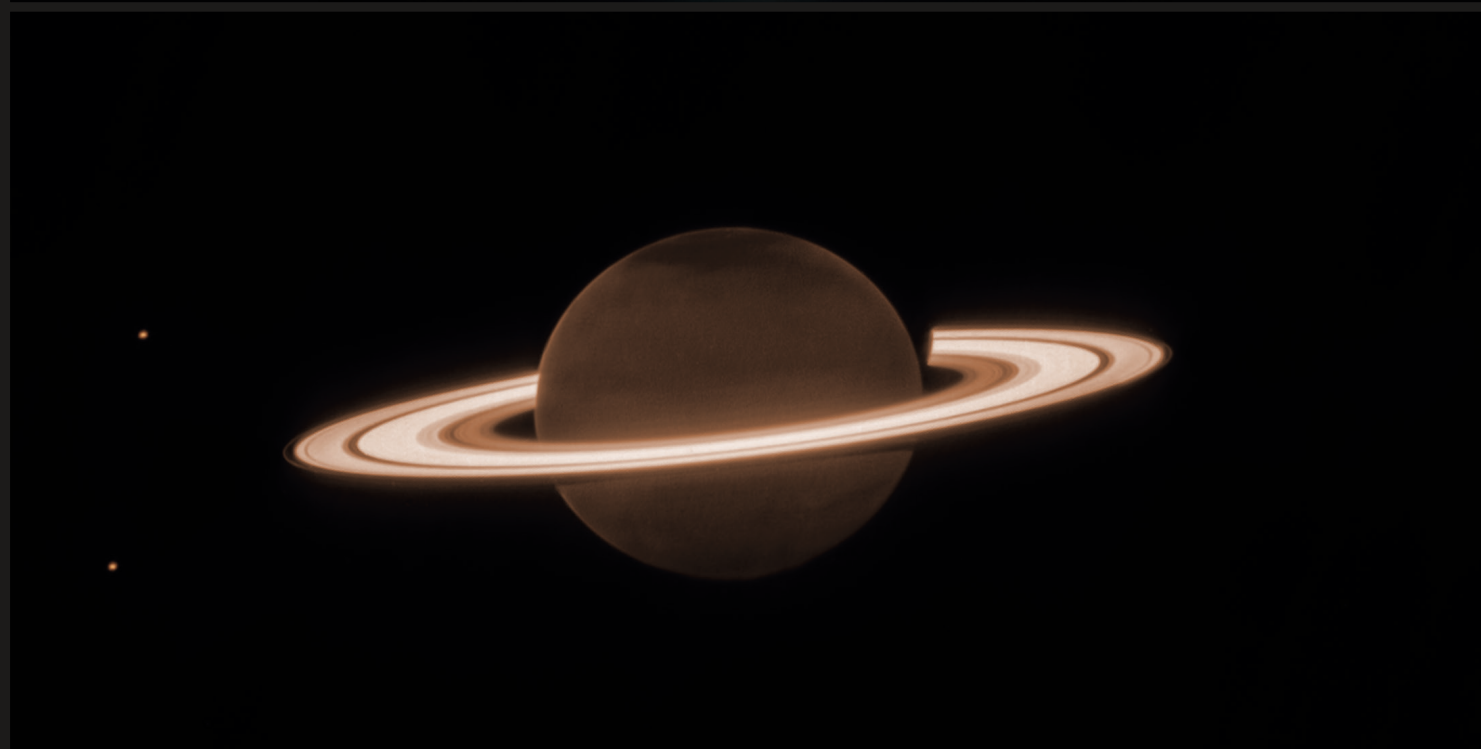
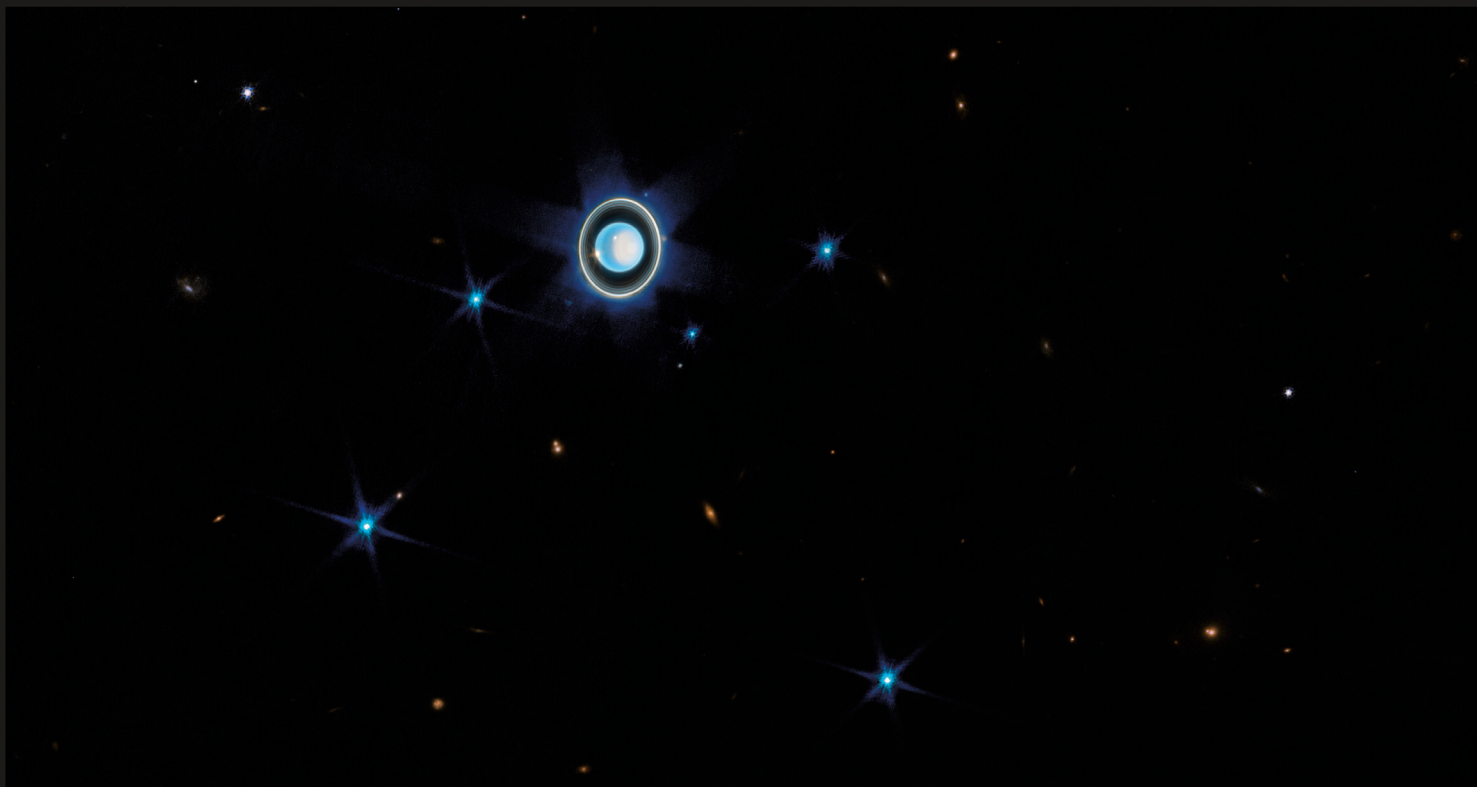
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# September 2024

Outer Planets and Moons  
(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							
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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October 2024

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

41

42

43

44



A Spiral of Gas and Dust  
(Webb)





# November 2024

Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday							
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45

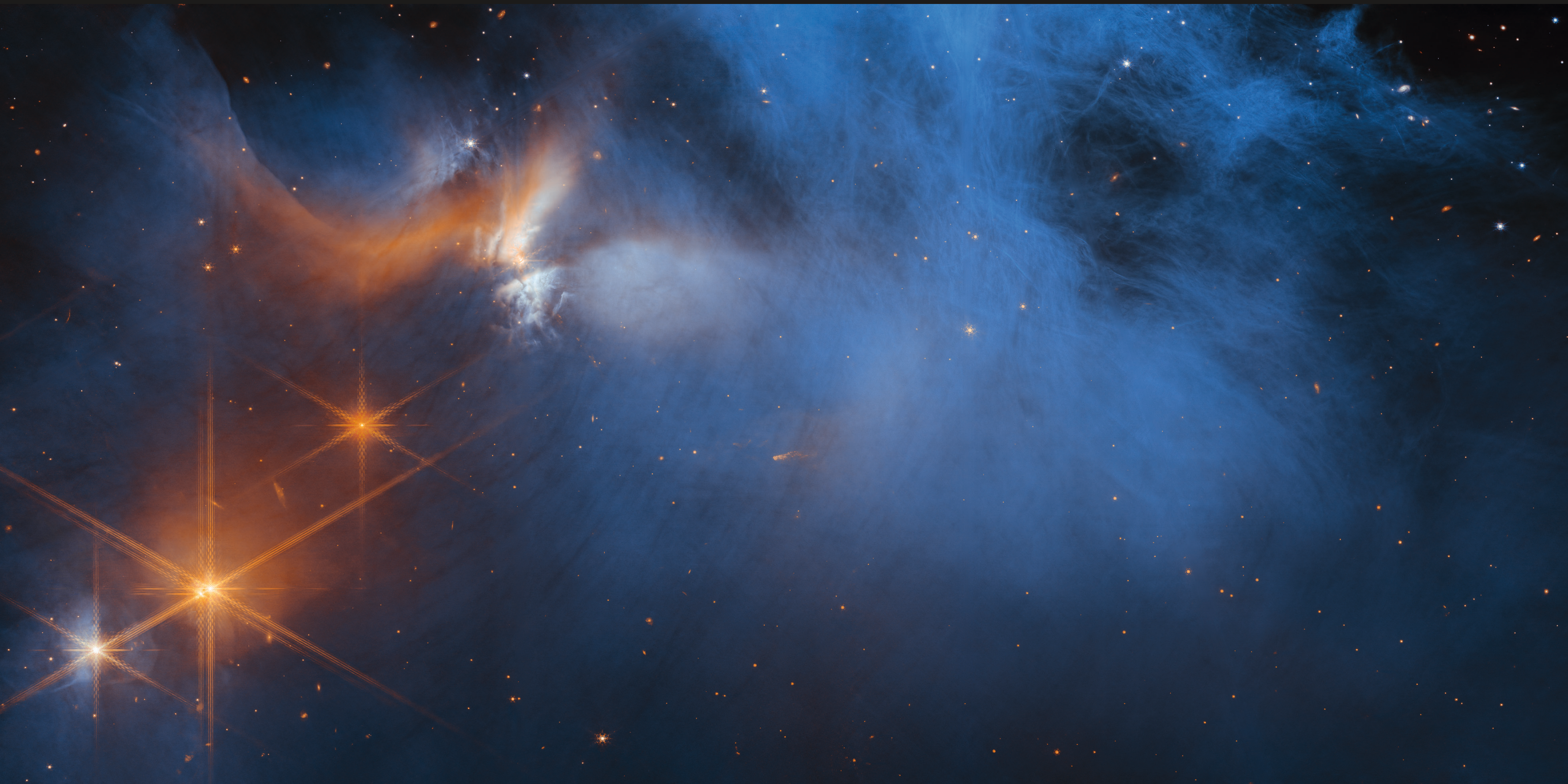
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A Glittering Globular Cluster  
(Hubble)



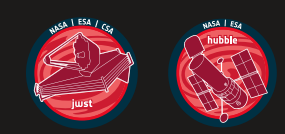
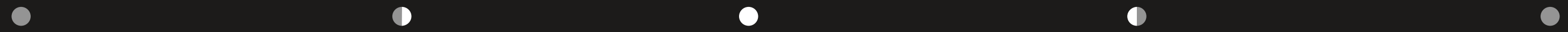


# December 2024

Ices in a Dark Molecular Cloud  
(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							
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

49 50 51 52 1





The GOODS-South field (Webb image)  
Credit: NASA, ESA, CSA, B. Robertson, B. Johnson, S. Tacchella, M. Rieke, D. Eisenstein, A. Pagan (STScI)





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 2023.