



# **GY4051 Earth Science and Society**



**On successful completion of this module, you will be able to:**

1. Explain the process of plate tectonics, and the formation of rocks in different tectonic settings and environments
2. Describe and identify various geological materials, using standard Earth science techniques and terminology, and interpret their origins
3. Use the principles of stratigraphy, the geologic time scale, and information from geological maps and other sources to describe the geological history of an area
4. Relate patterns in human geography to causal geological processes and features
5. Integrate information from disparate sources in earth science and human geography

1. Why is Ireland a major supplier of lead and zinc, with some gold, and previously copper, but not the rare earth elements used in modern electronics?
2. Why were Game of Thrones, Harry Potter, and Star Wars filmed (partially) in Ireland?
3. Why is the A2 Coast Road in Co. Antrim arguably the most repaired road in Ireland?
4. Why was Co. Down considered as a location for the disposal of spent nuclear fuel?
5. Oliver Cromwell famously said “To hell or to Connacht”. Why Connacht?
6. Why did the Industrial Revolution start in England?
7. Why is Scotland far less dependant on imported energy than Ireland?
8. Modern humans have existed for around 300,000 years. Why is the oldest evidence for humans in Ireland only 12,500 years ago?

## **Exam (100%)**

The Exam will comprise a mixture of short answer and essay questions.

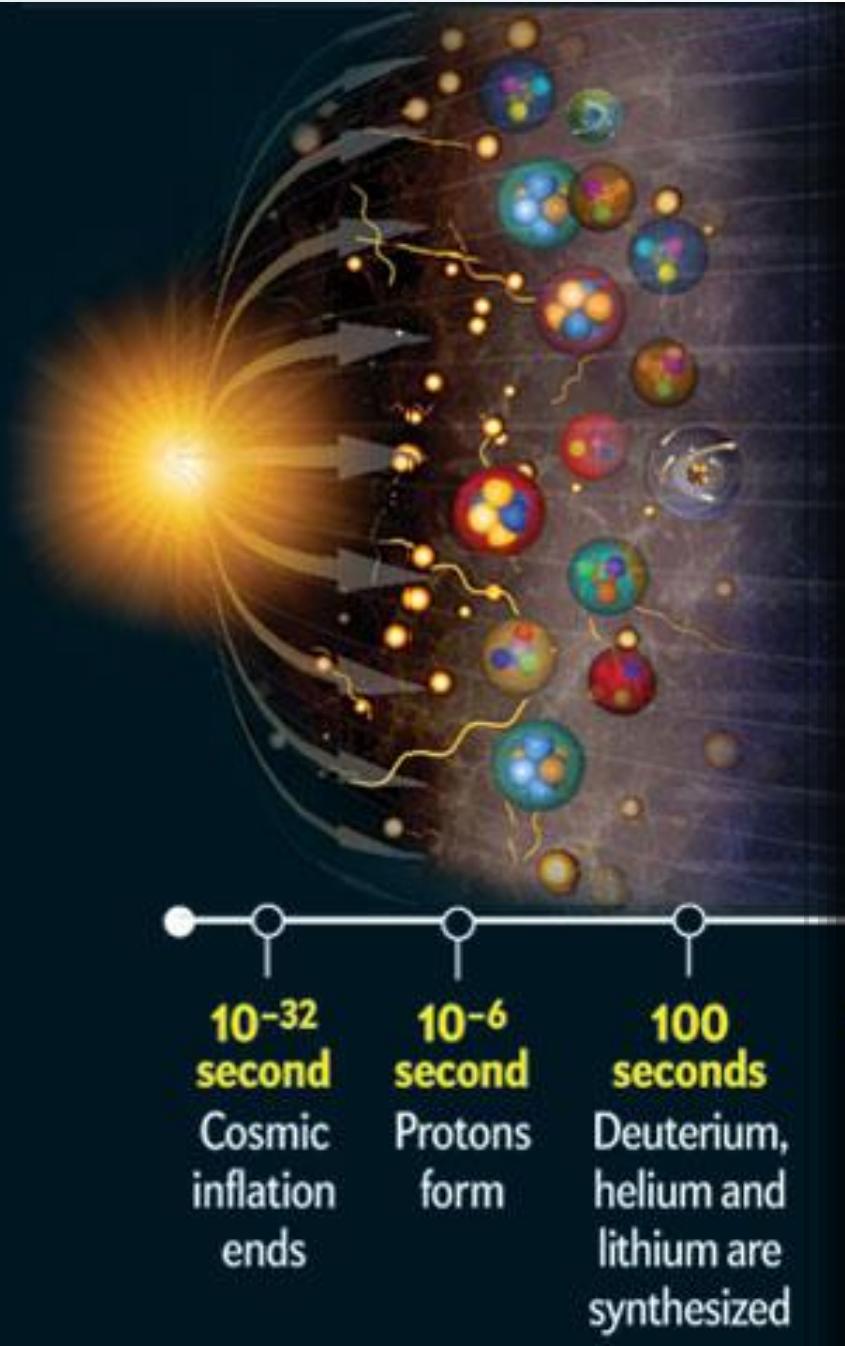
An example paper will be provided in the second half of the module; the exam will take place in Weeks 14-15.

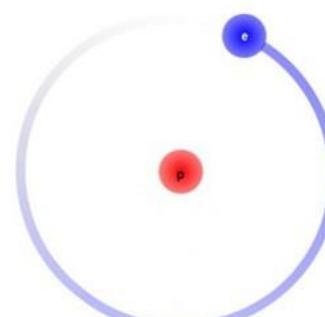
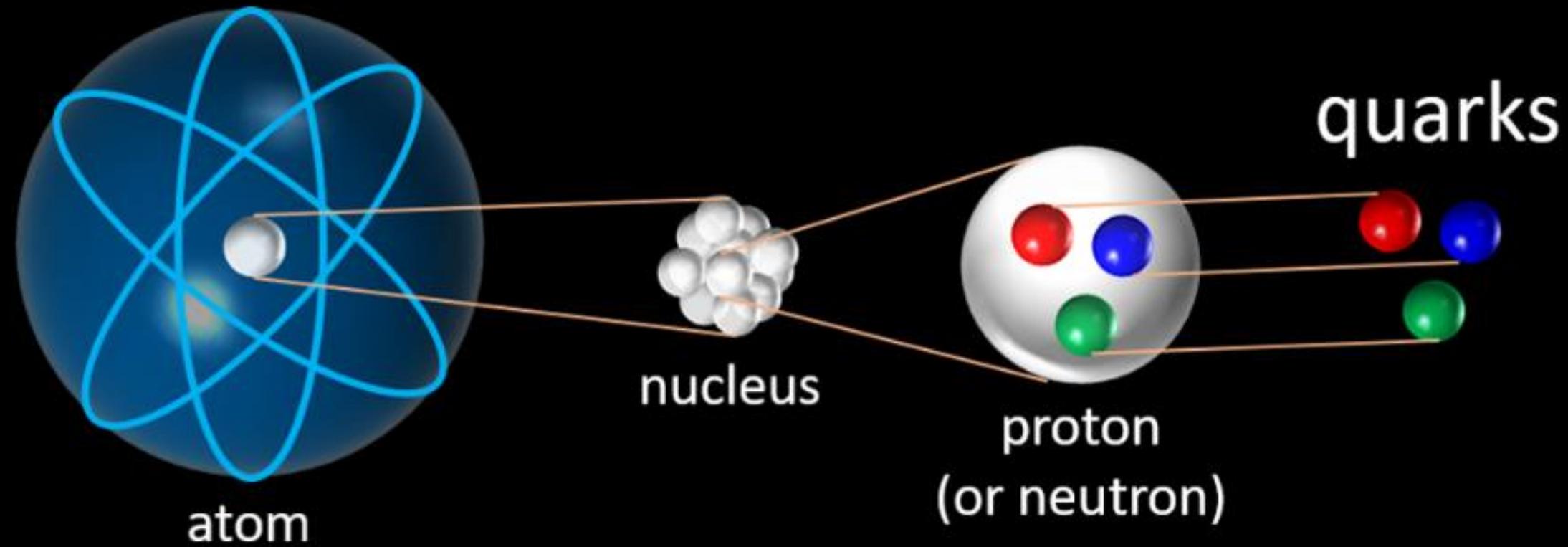
Grade	QPV	Threshold	Classification	Criteria
A1	4.00	80%	First Class	Exceptional work which comprehensively addresses the task. Demonstrates ability to synthesize and analyse information well beyond that delivered in the module content.
A2	3.60	70%		Excellent work which comprehensively addresses the task. Demonstrates ability to interpret and evaluate information or concepts in depth with strong critical reasoning. Evidence of reading academic sources considerably beyond the module content. Well structured, with a high standard of writing. As good as can reasonably be expected.
B1	3.20	65%	Upper Second Class (II.1)	Superior, but not exceptional, work with plenty of relevant material, based on the reading of academic sources exceeding the module content. Well written and structured but does not demonstrate quite as deep interpretation or evaluation of information or concepts, or critical reasoning, as students in the A range. Does not "make the material their own".
B2	3.00	60%		Very good work with a lot of relevant material. More evidence of reading academic sources beyond the module content than a B3 student; but arguments not as well constructed as B1 work.
B3	2.80	55%	Lower Second Class (II.2)	Competently addresses the task. Demonstrates a good grasp of concepts, with clear evidence of some independent reading from academic sources beyond material covered in module content.
C1	2.60	50%	Pass	Competently addresses the task. Demonstrates a good grasp of concepts. Includes all or most relevant points delivered in the module, but is based mainly on material covered in lectures/tutorials/laboratory classes; demonstrates little or no evidence of independent reading from academic sources.
C2	2.40	45%		Addresses the task, but does not include all relevant points delivered in the module, or has some errors in understanding. Little or no evidence of any independent reading from academic sources.
C3	2.00	40%		Addresses the task, but fails to include significant amounts of relevant points delivered in the module; or some good points are undermined by many inaccuracies or confusion on key concepts.
D1	1.60	35%	Compensating Fail	Weak submission failing to reach the pass threshold. This will often be because of a failure to adequately address the task, i.e., insufficient relevant material.
D2	1.20	30%		Very 'thin' submission. Student typically includes very little relevant content. Little or no evidence of more than general knowledge of the topic.
F	0		Fail	Answer reveals little evidence of engagement with the module content, and therefore does not merit the award of any modular credit.
NG	0		No Grade	No engagement evident; student has not submitted any assignments for grading.

Schedule GY4051

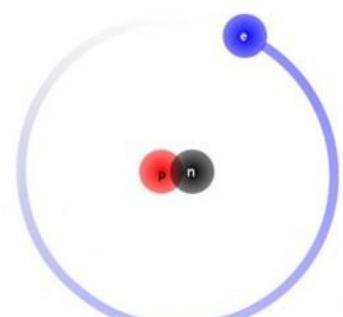
Week	Lecture	Lab Groups A, B, C	Lab Groups D, E, F
1	Origin of the Earth		
2	Plate Tectonics	Volcanic and Igneous Rocks	No labs
3	Volcanoes	No labs	Volcanic and Igneous Rocks
4	Metamorphism	Metamorphic Rocks	No labs
5	Erosion, Transport, and Deposition	No labs	Metamorphic Rocks
6	GEOGRAPHY READING WEEK	Virtual Field Trip I	Virtual Field Trip I
7	Carbonates	Clastic Sediments and Rocks	No labs
8	OCTOBER BANK HOLIDAY	No labs	Clastic Sediments and Rocks
9	Geological History of Ireland I	Carbonate Sediments and Rocks	No labs
10	Geological History of Ireland II	No labs	Carbonate Sediments and Rocks
11	Geological History of Ireland III	No labs	No labs
12	Geological History of Ireland IV	No labs	No labs
13	READING WEEK	Virtual Field Trip II	Virtual Field Trip II
14	EXAM PERIOD		
15	EXAM PERIOD		



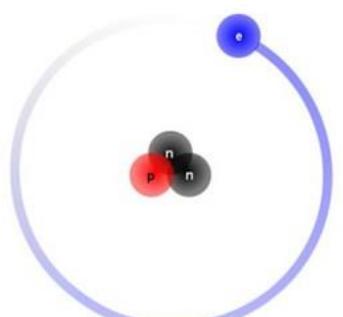




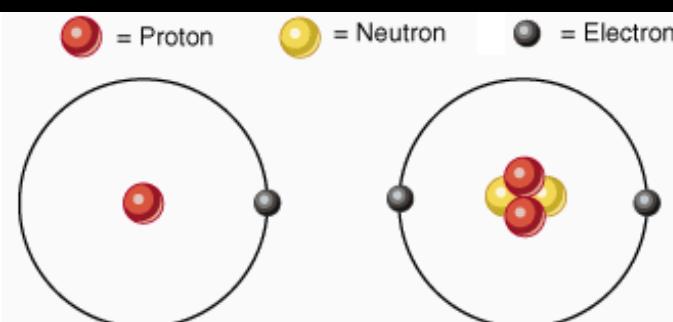
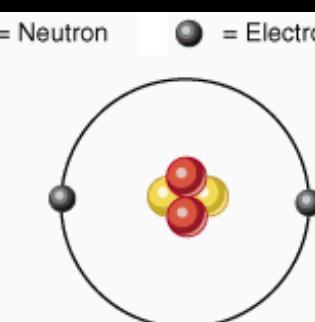
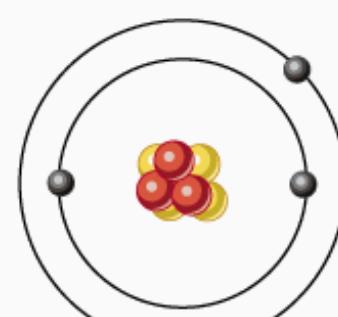
Hydrogen

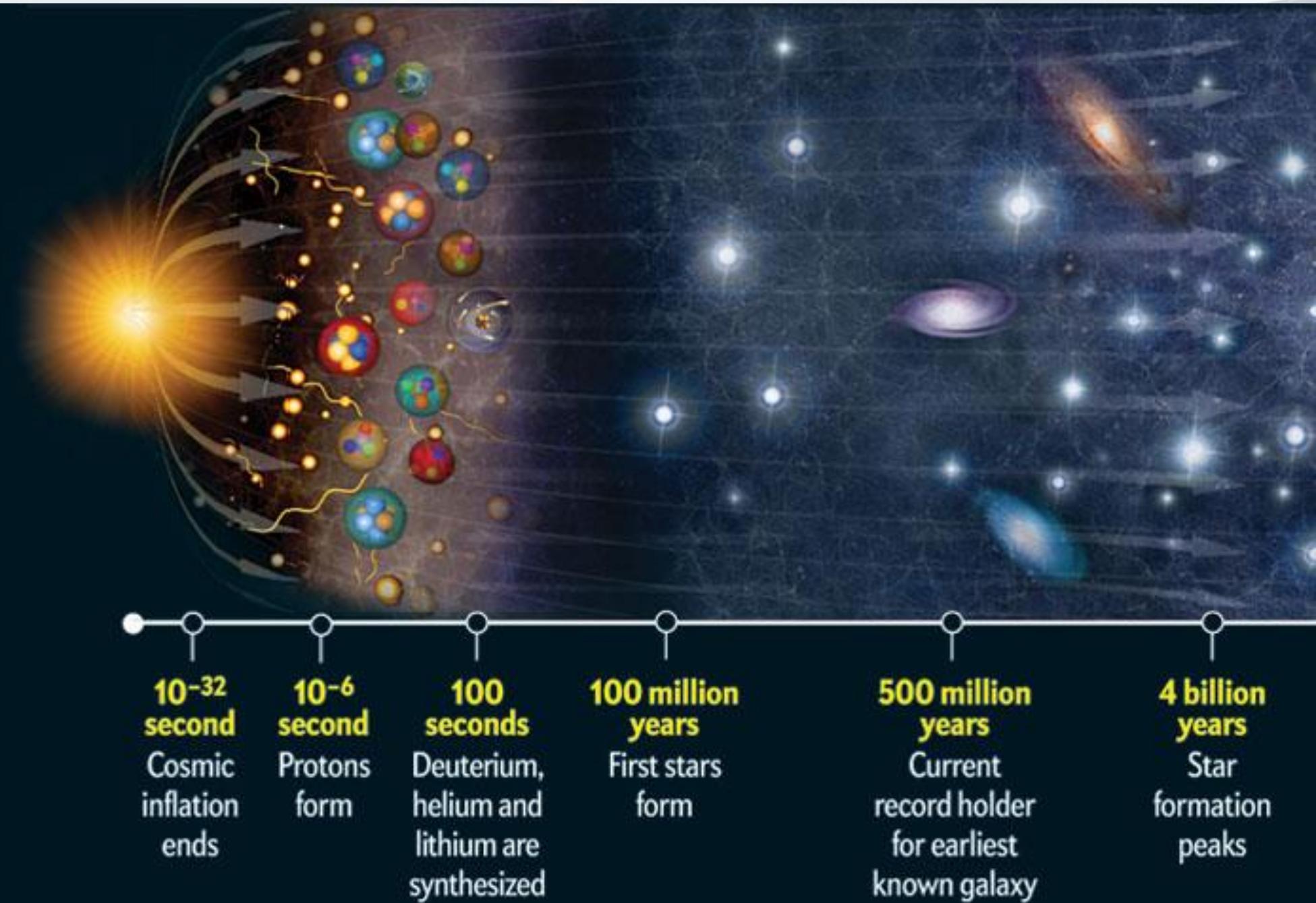


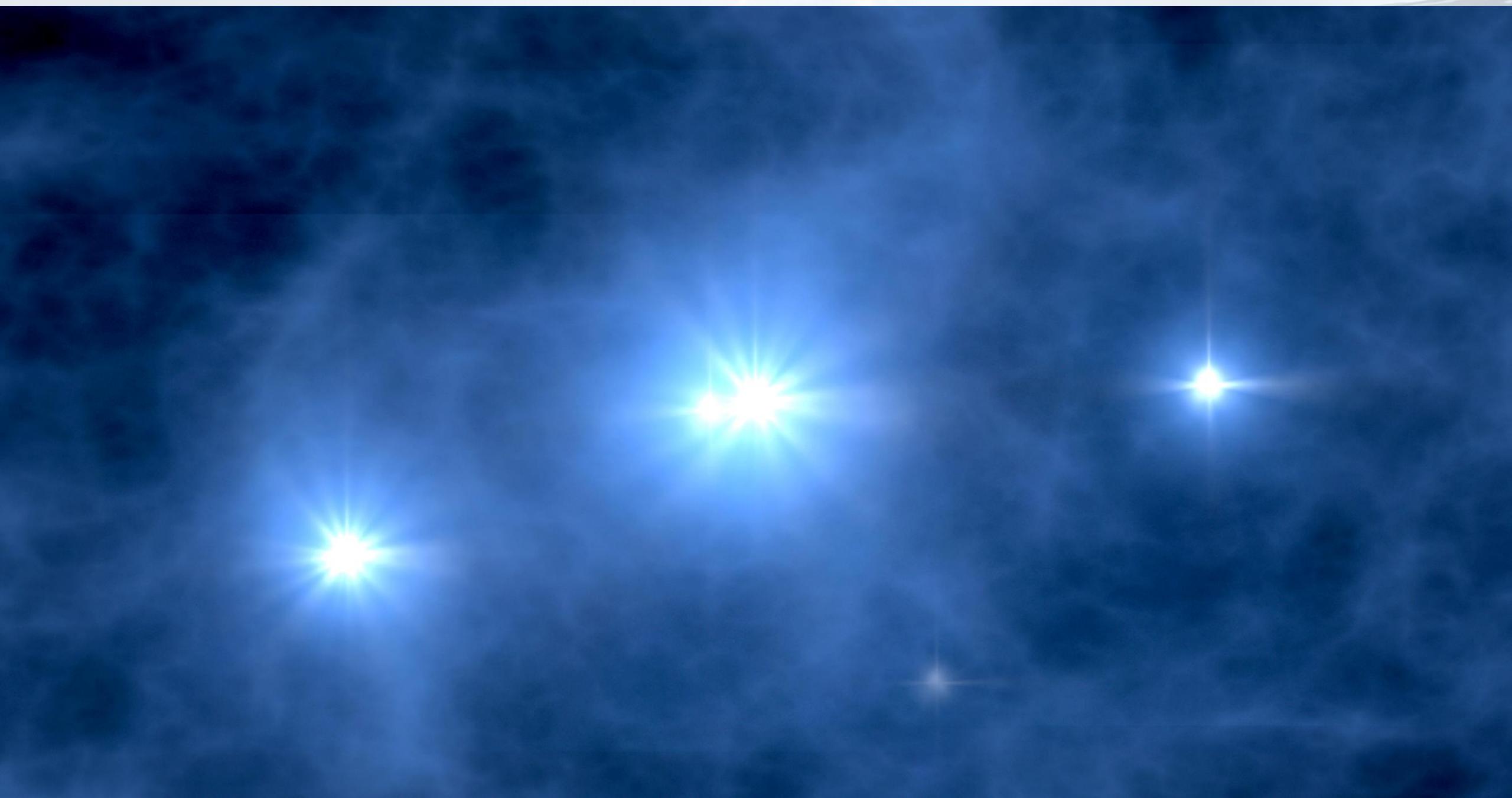
Deuterium



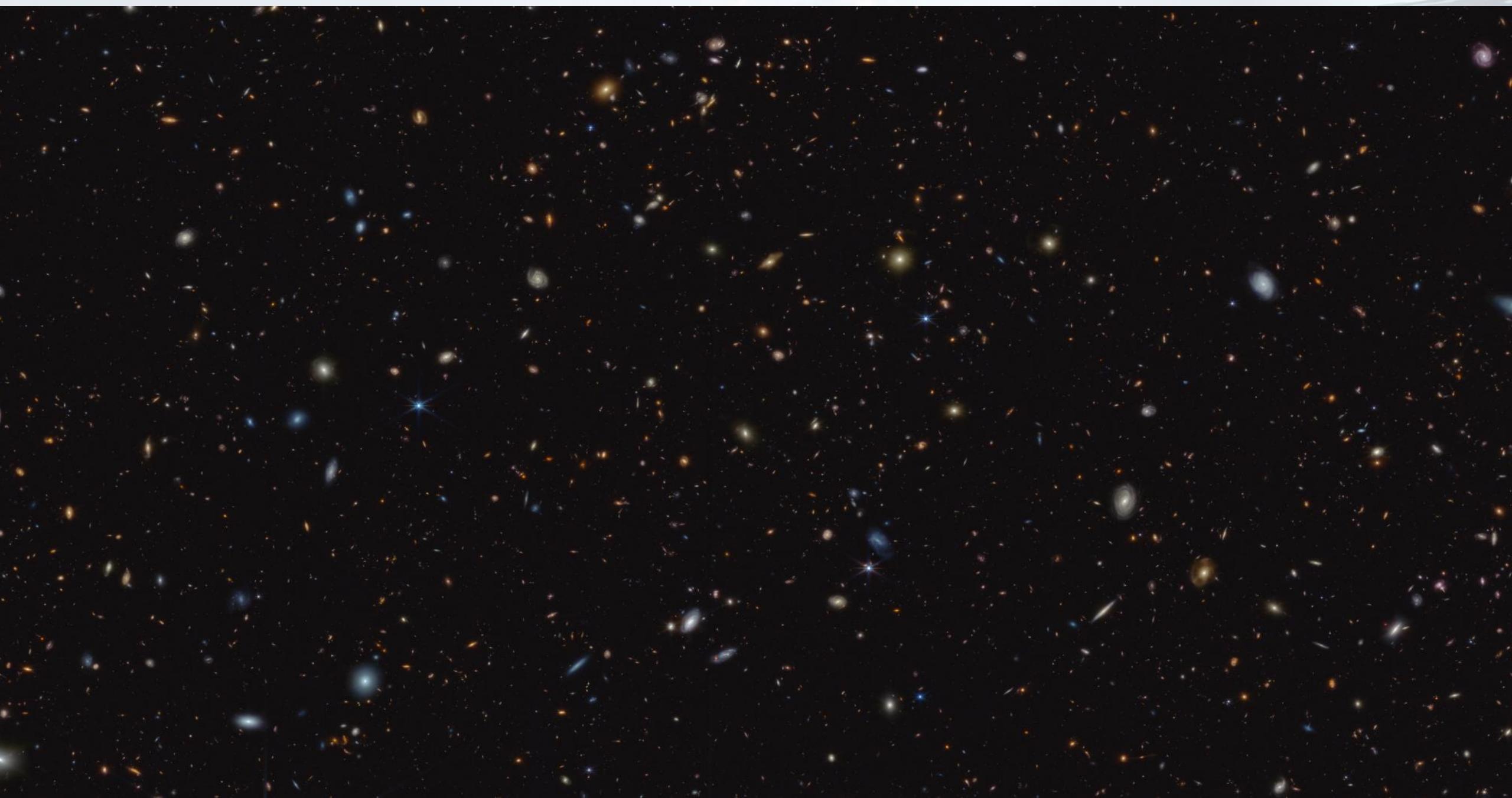
Tritium

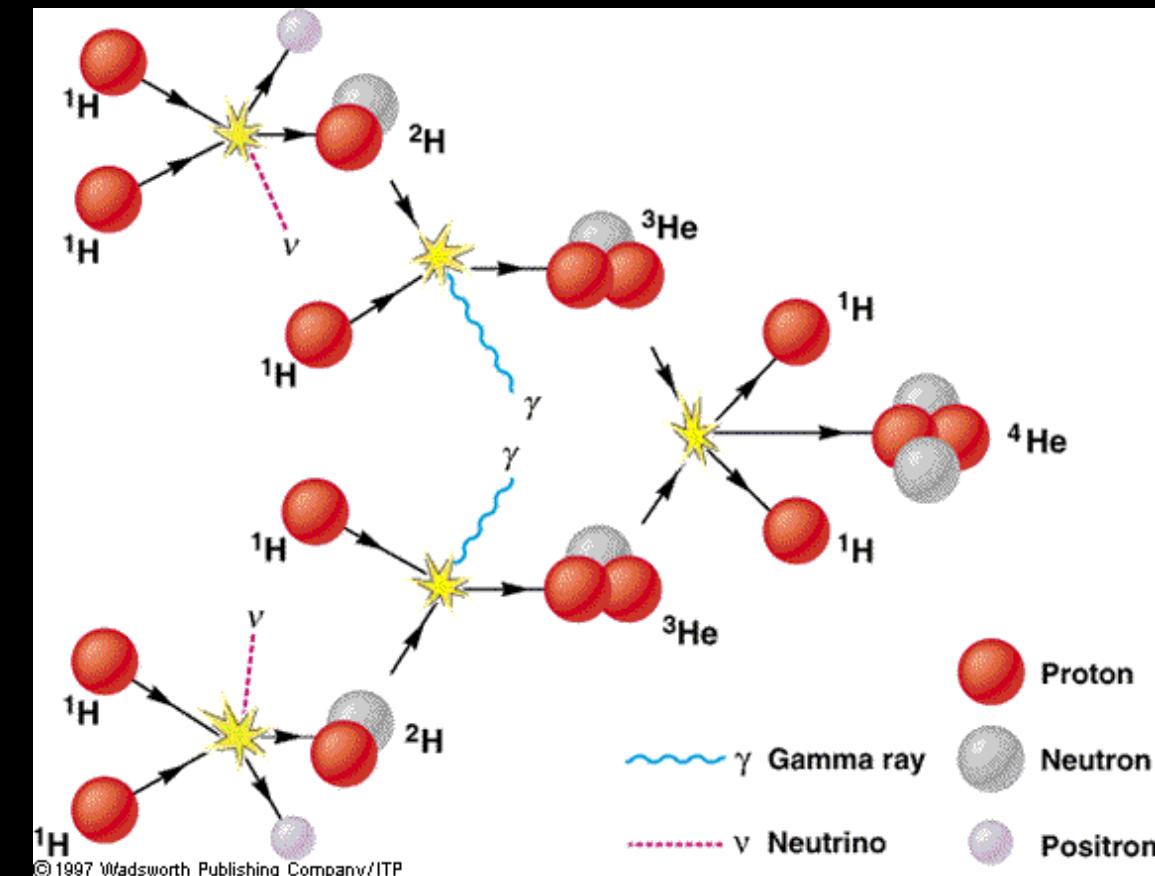
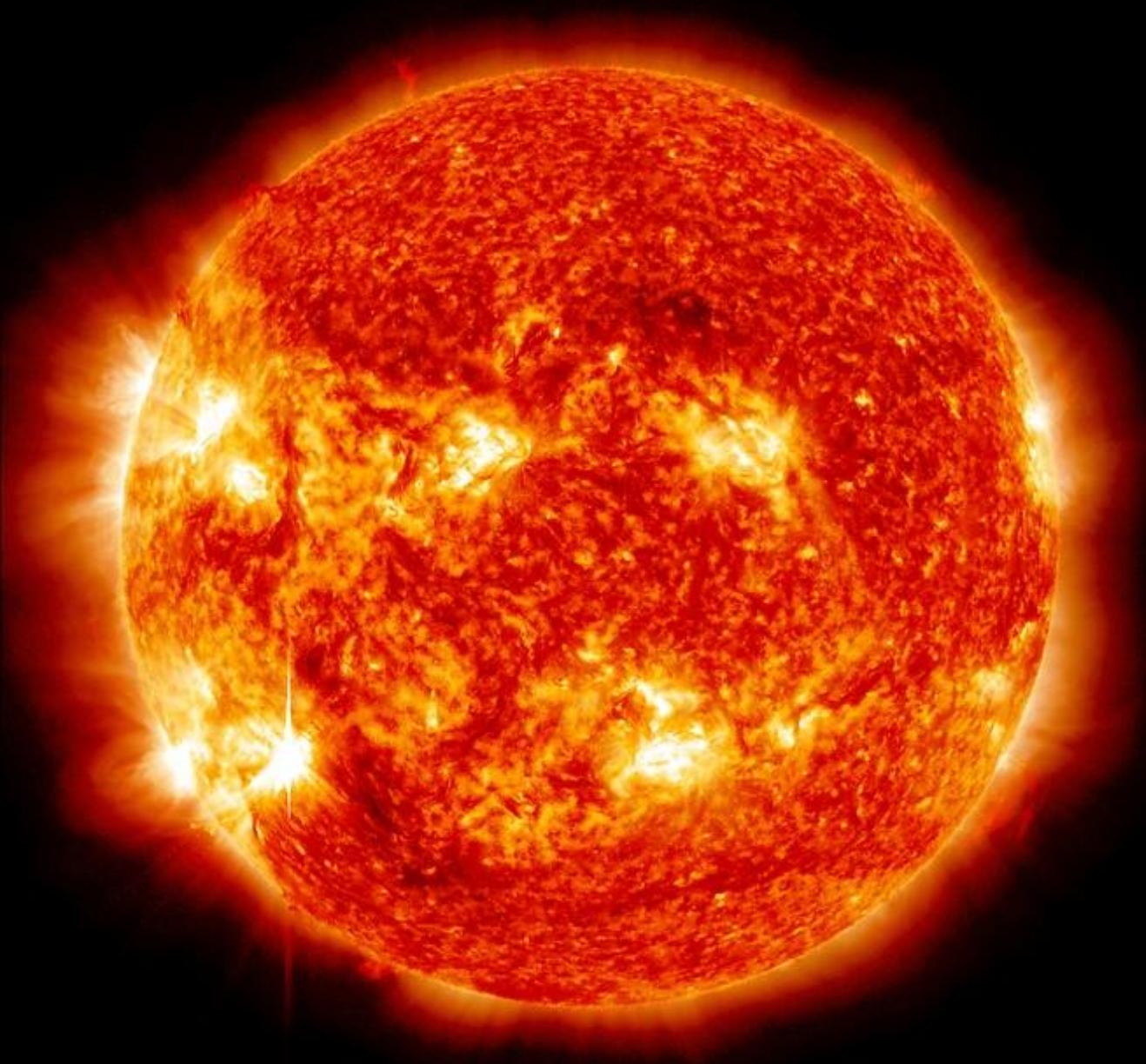
Hydrogen (H)  
(1p<sup>+</sup>; 0n<sup>0</sup>; 1e<sup>-</sup>)Helium (He)  
(2p<sup>+</sup>; 2n<sup>0</sup>; 2e<sup>-</sup>)Lithium (Li)  
(3p<sup>+</sup>; 4n<sup>0</sup>; 3e<sup>-</sup>)

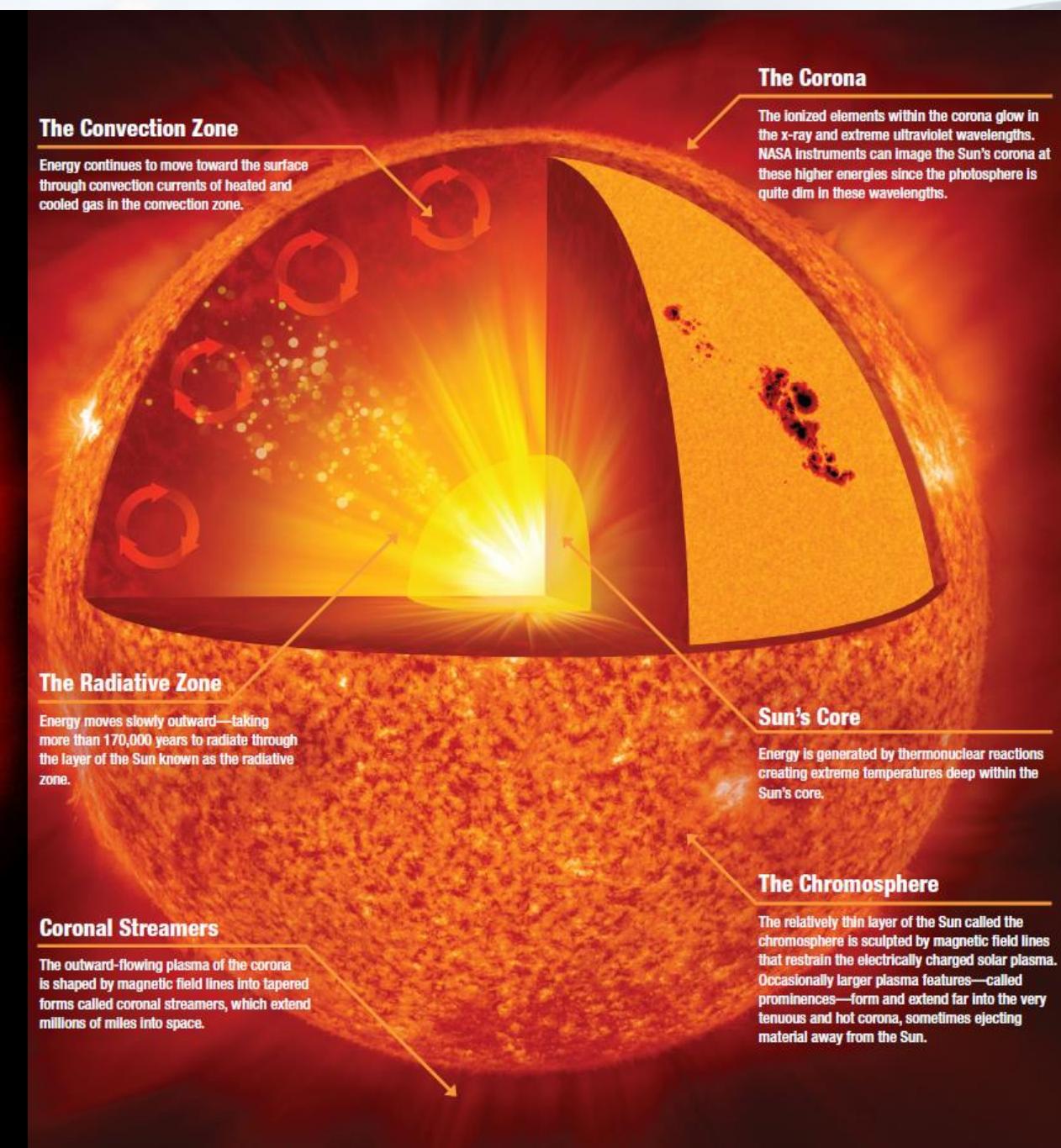
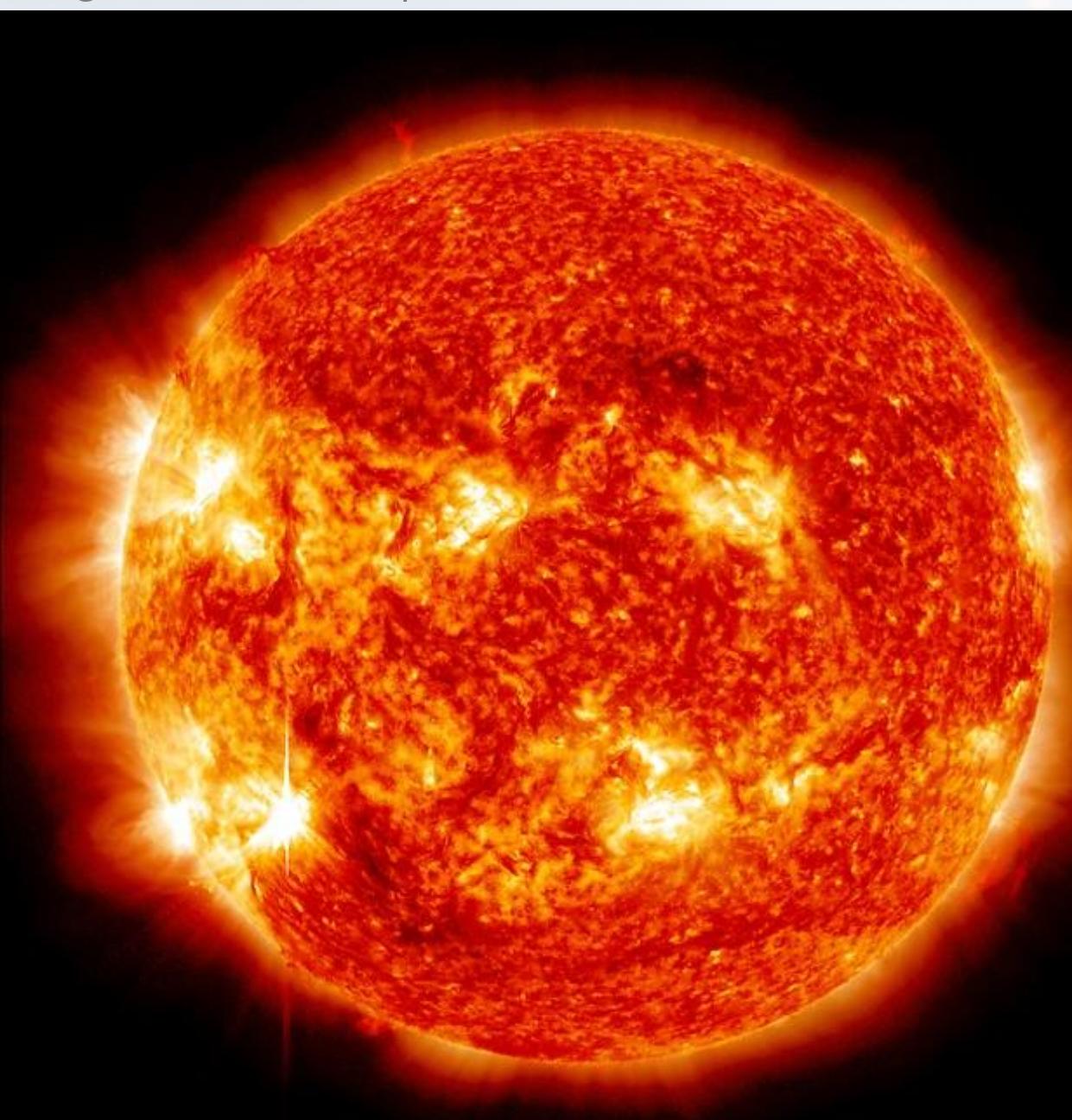


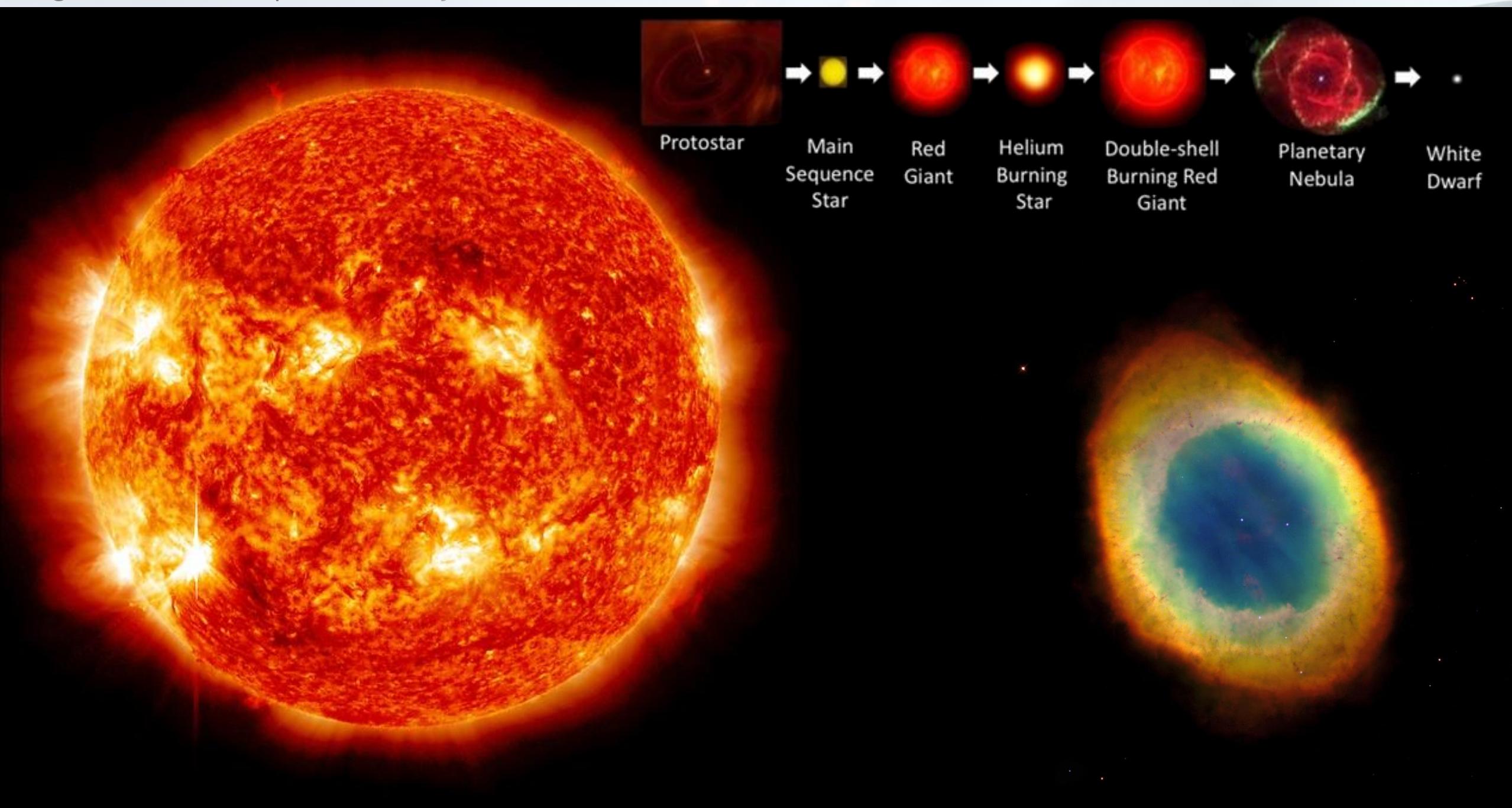


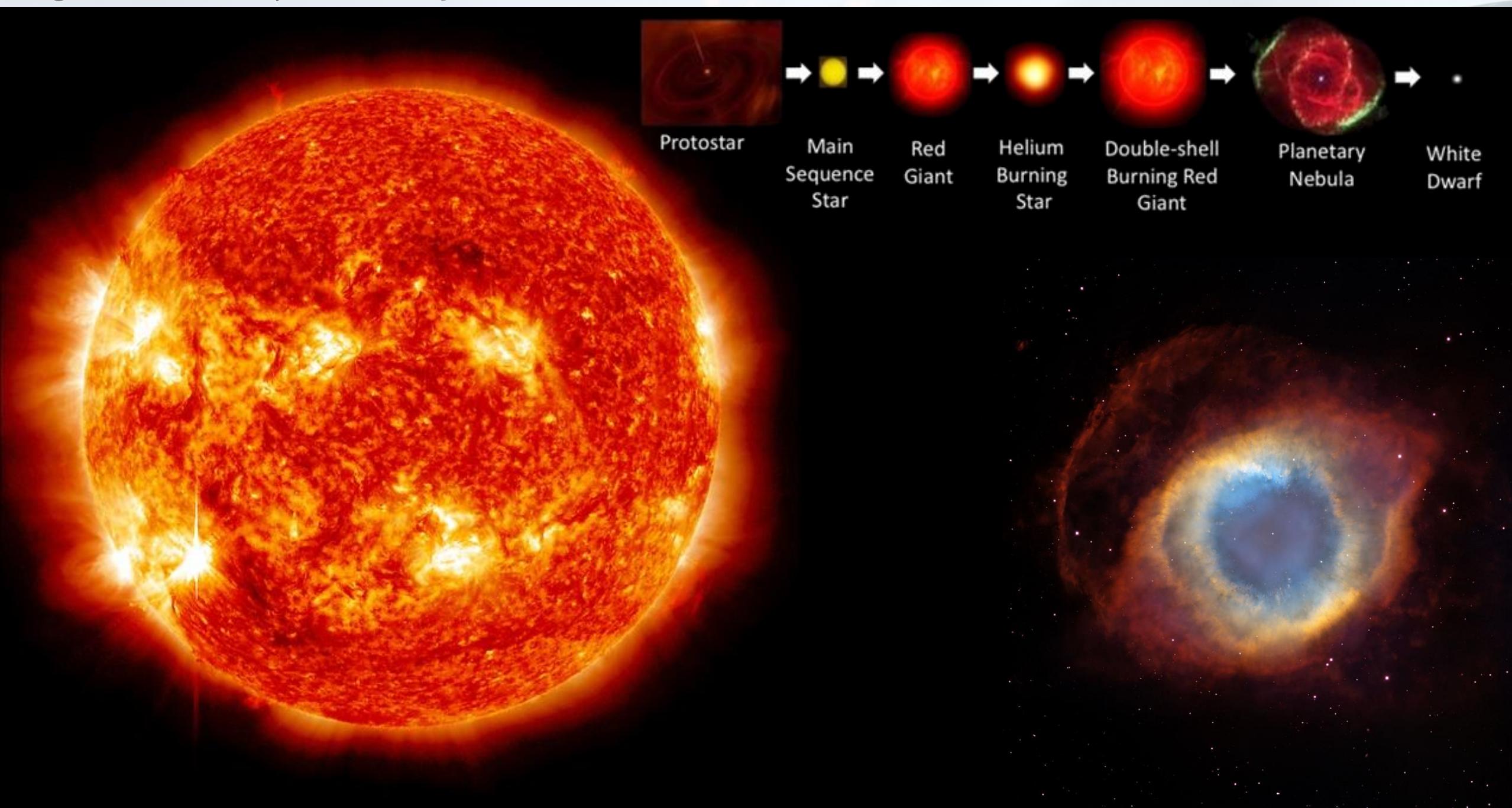


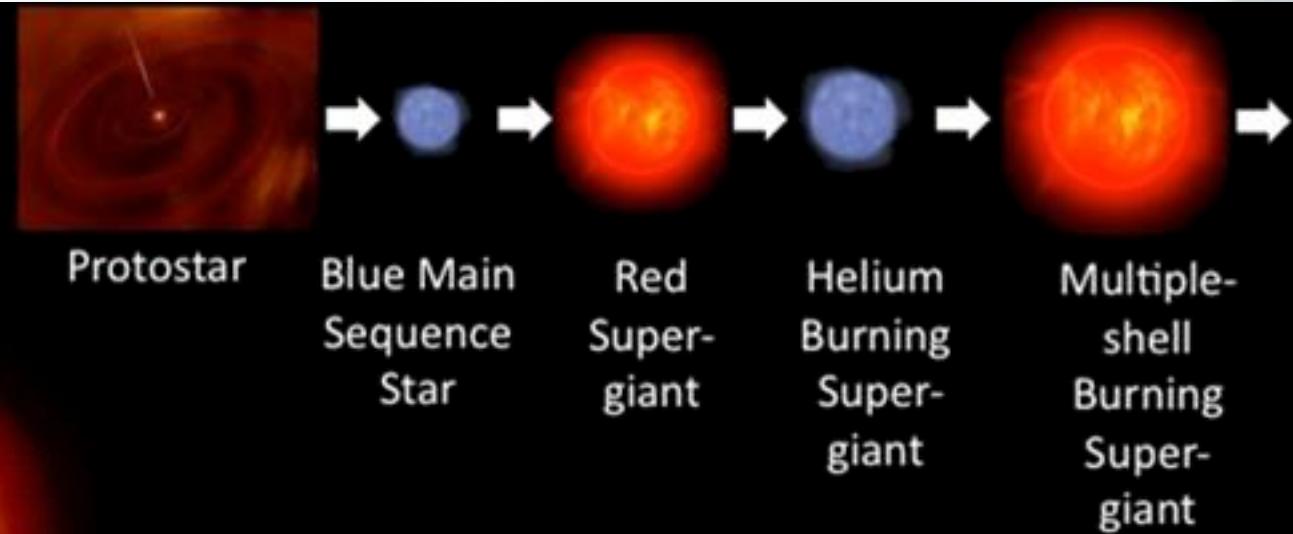
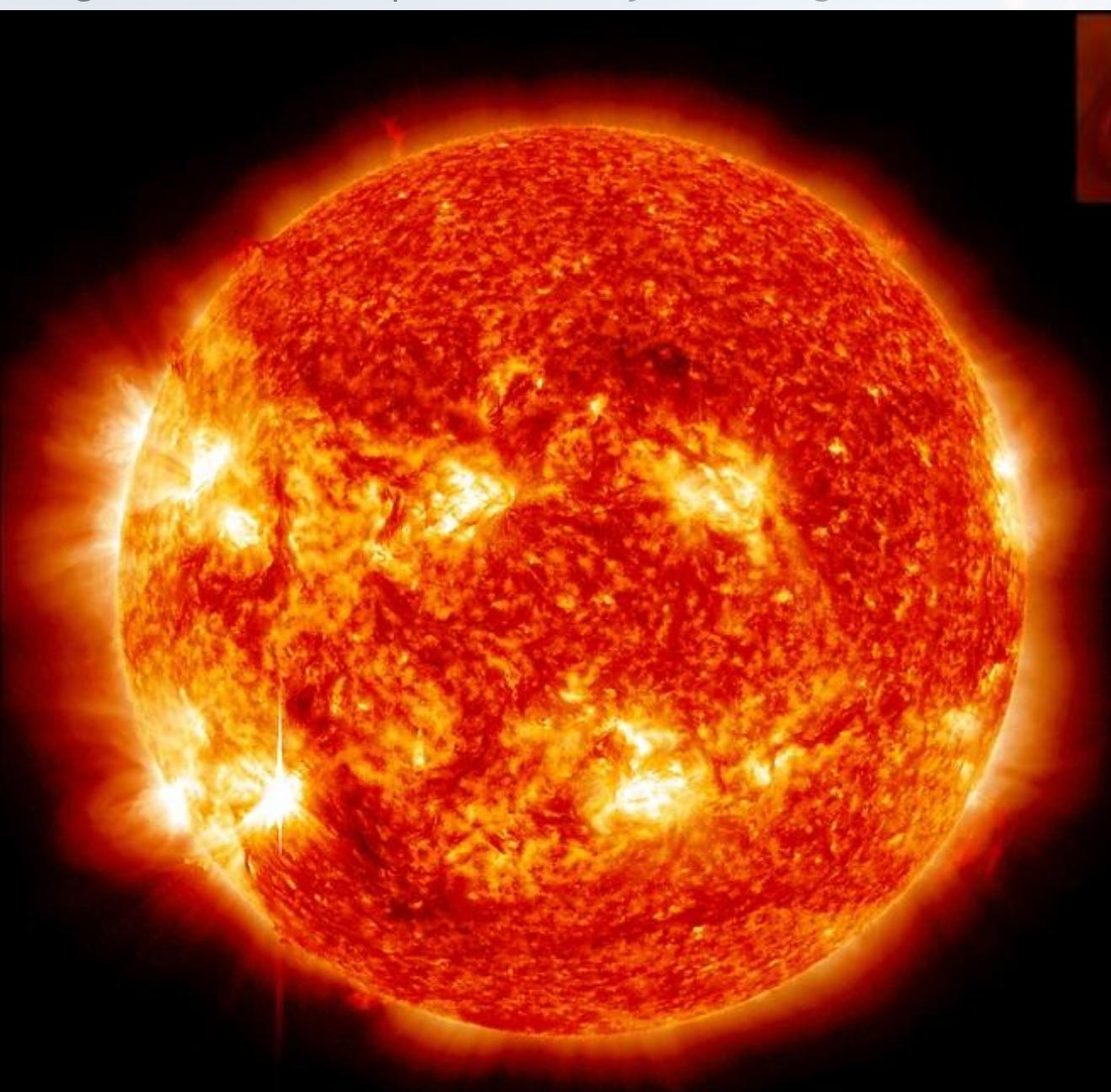


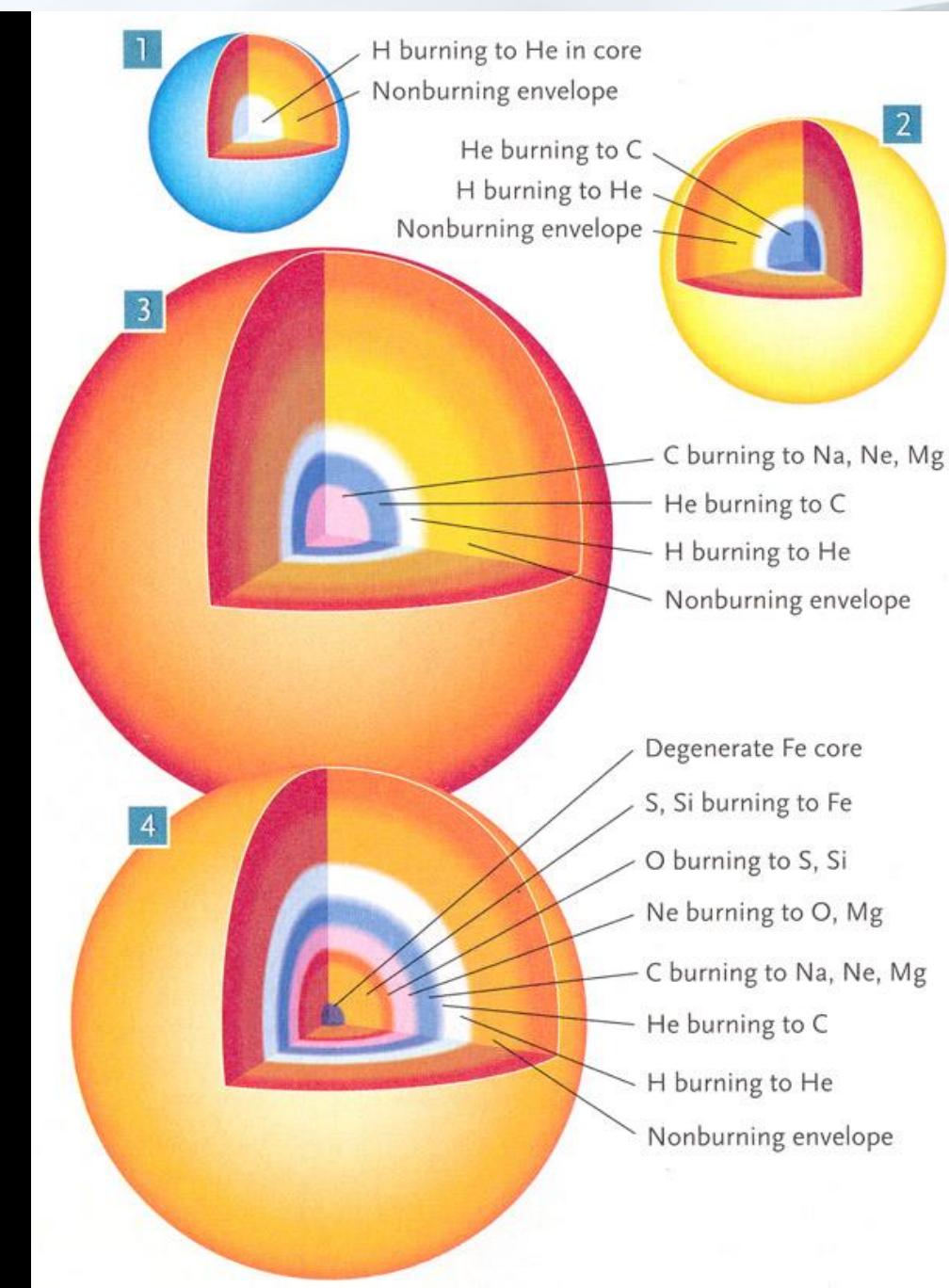
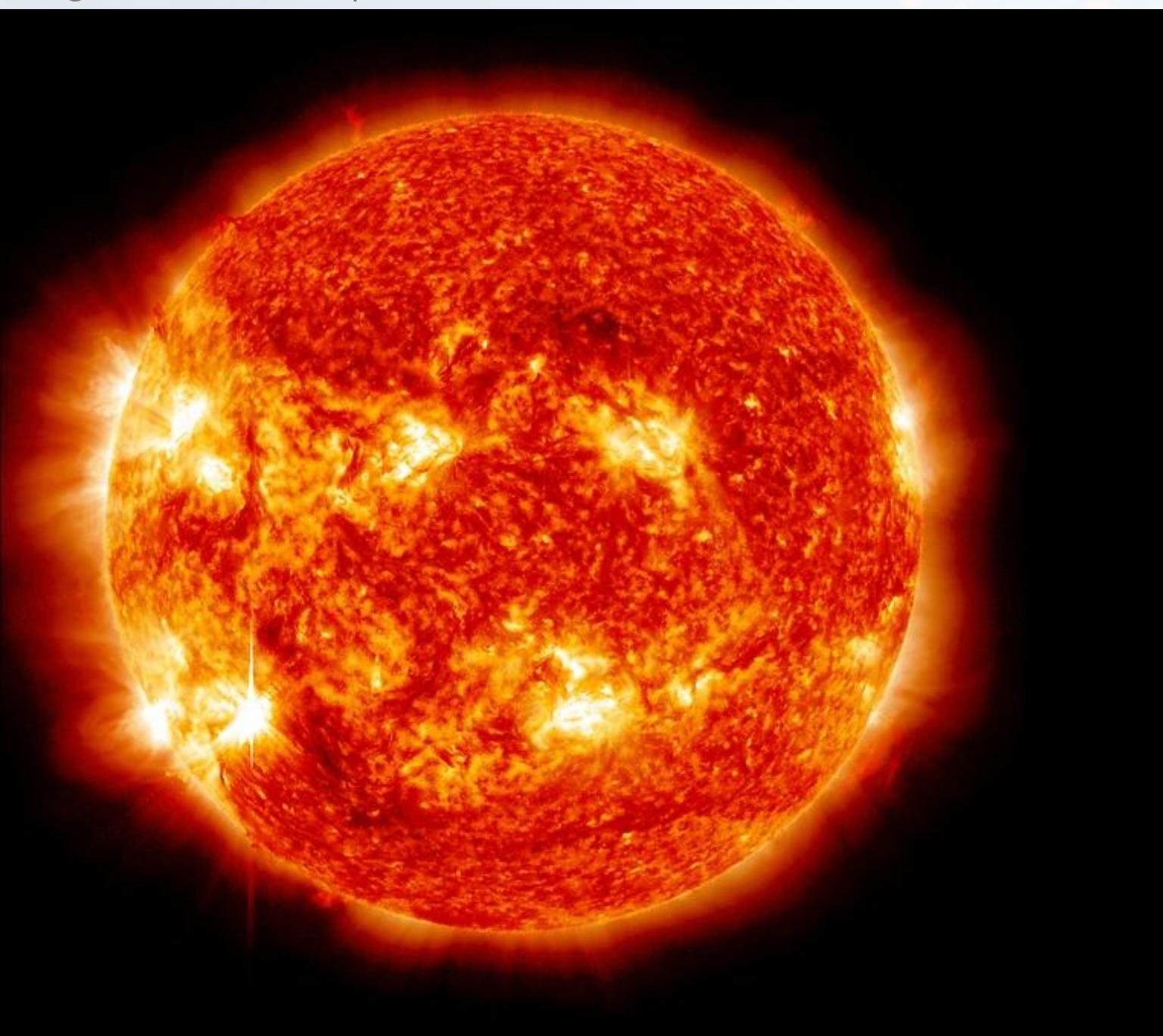


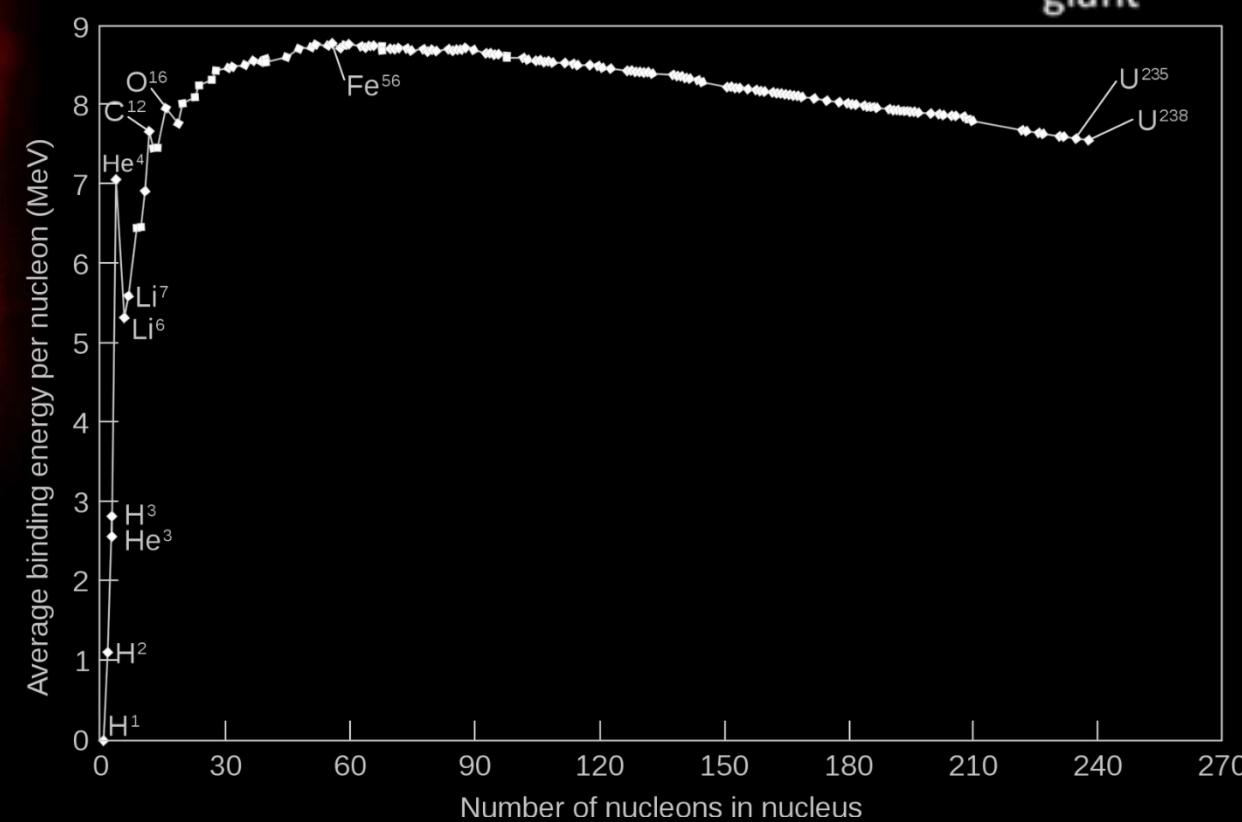
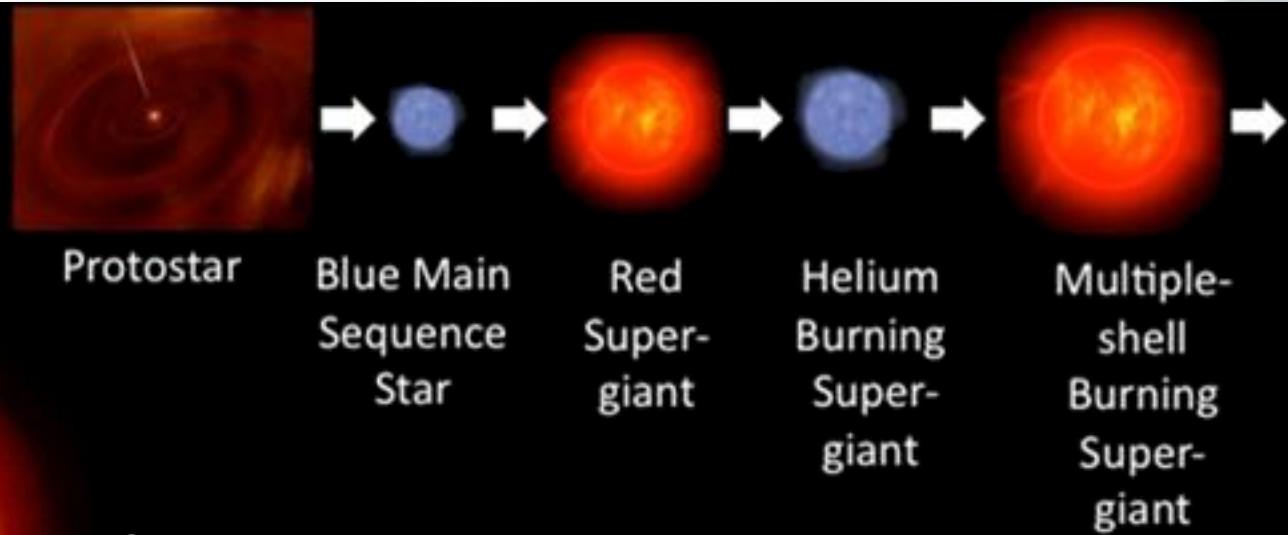
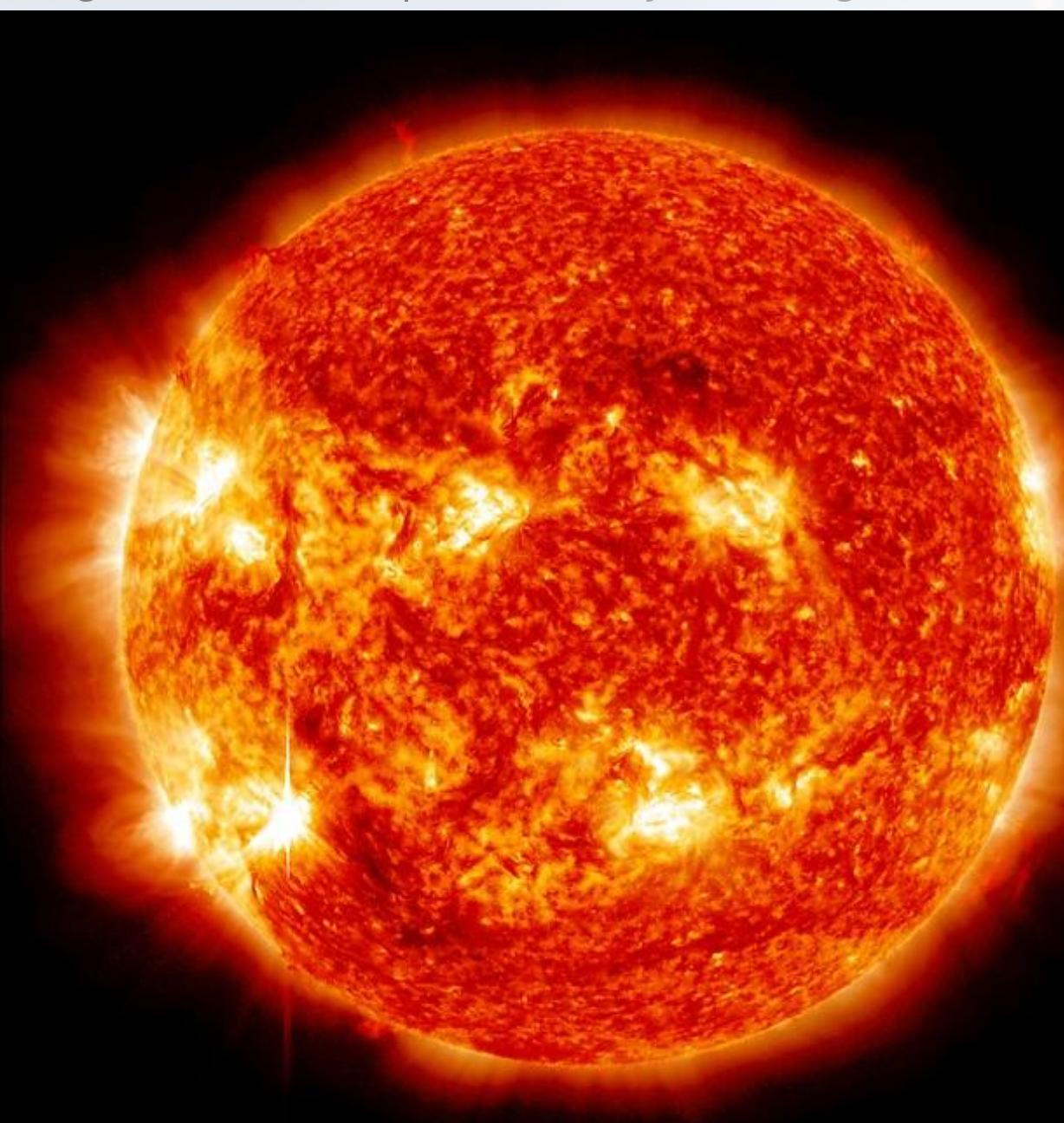










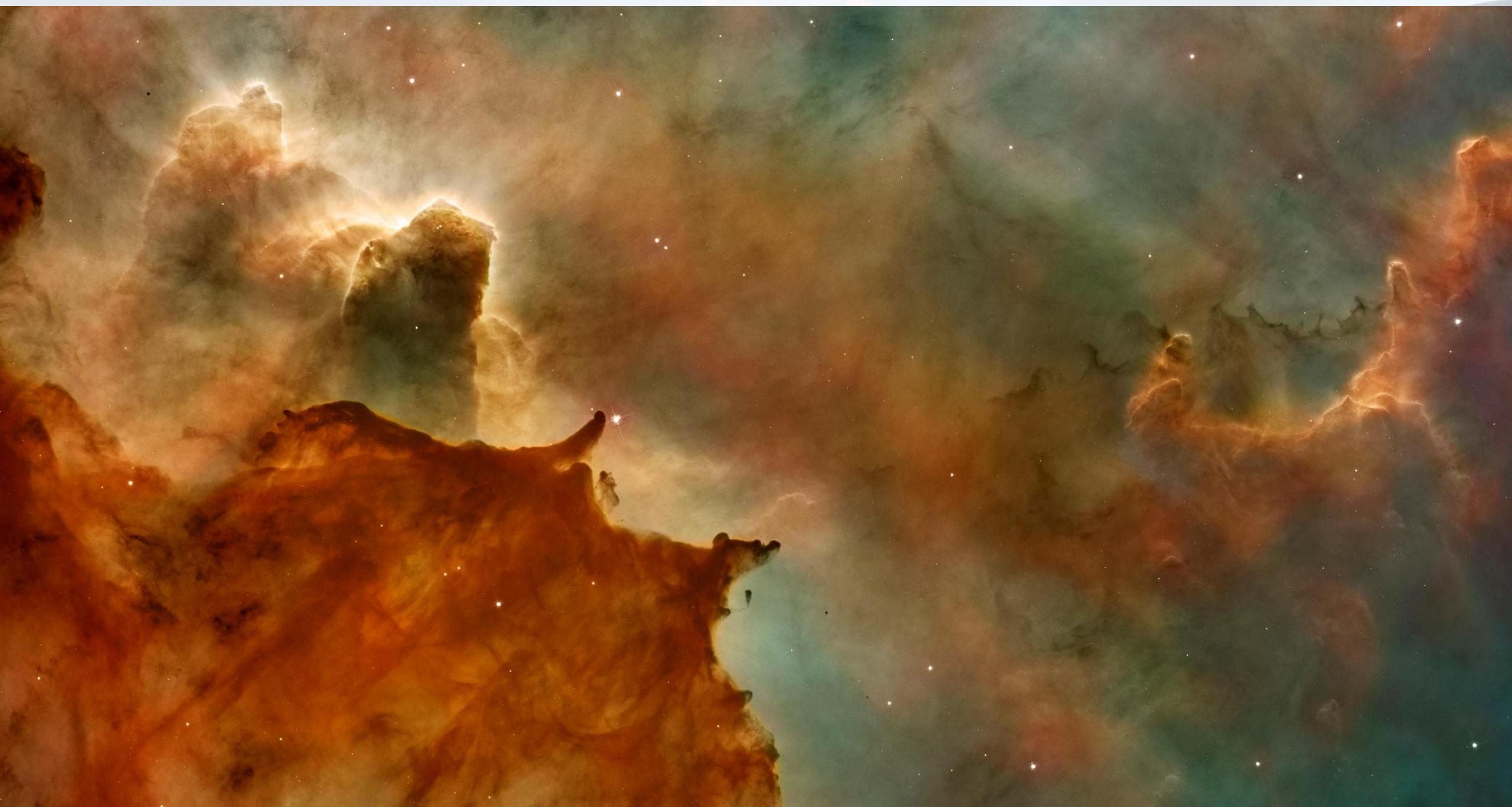


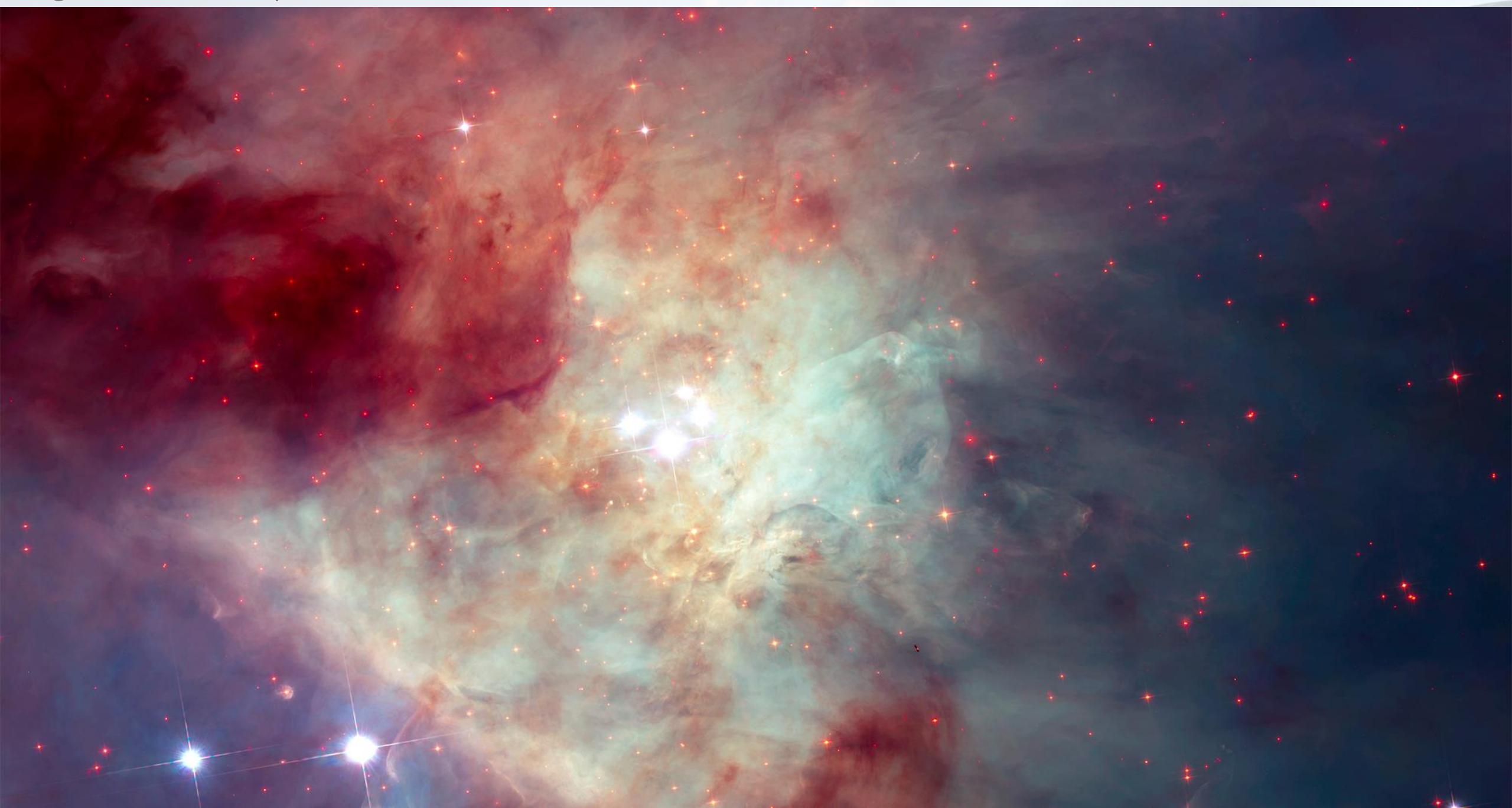


# Origin of the Earth | Supernovae

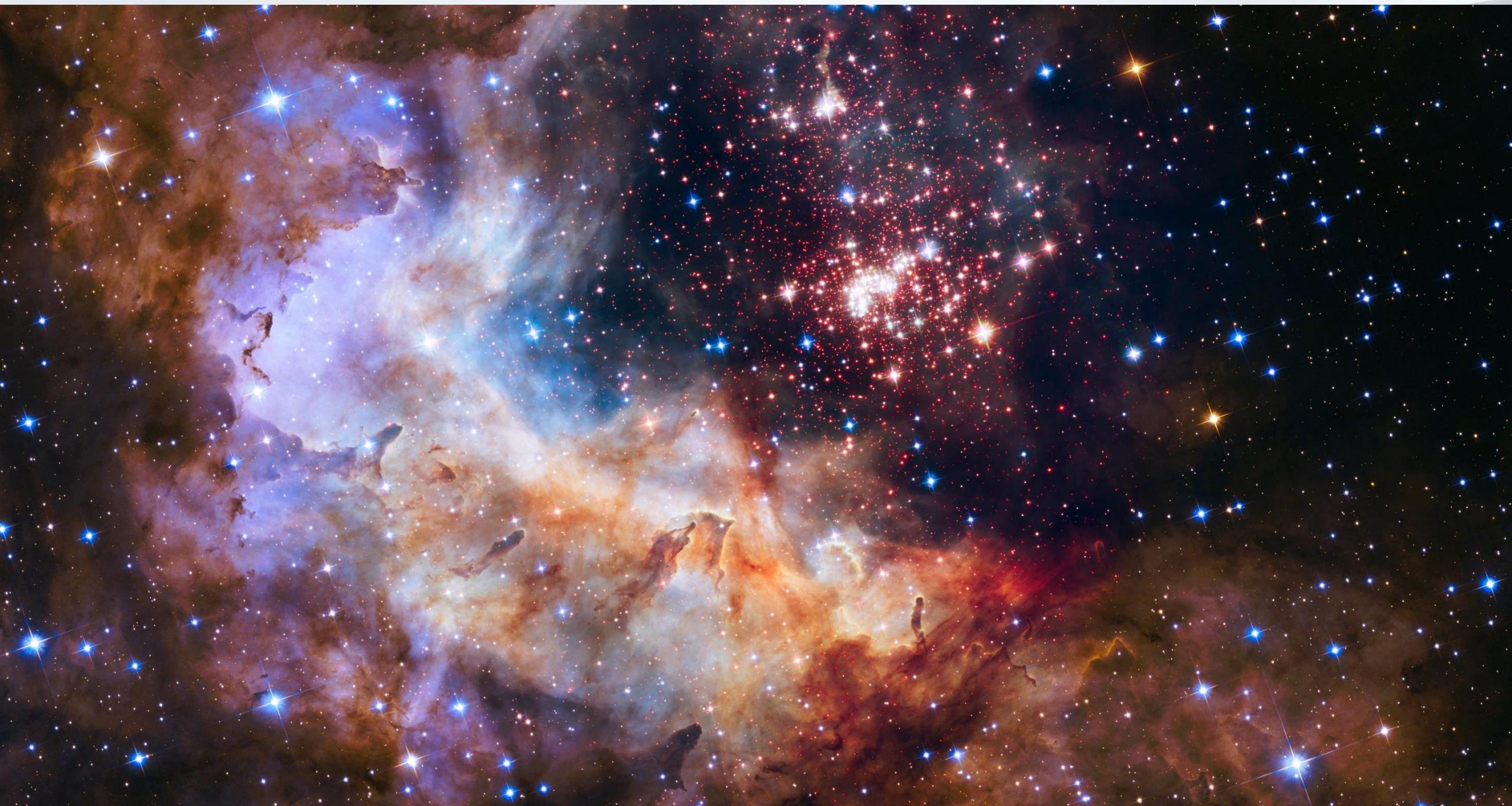
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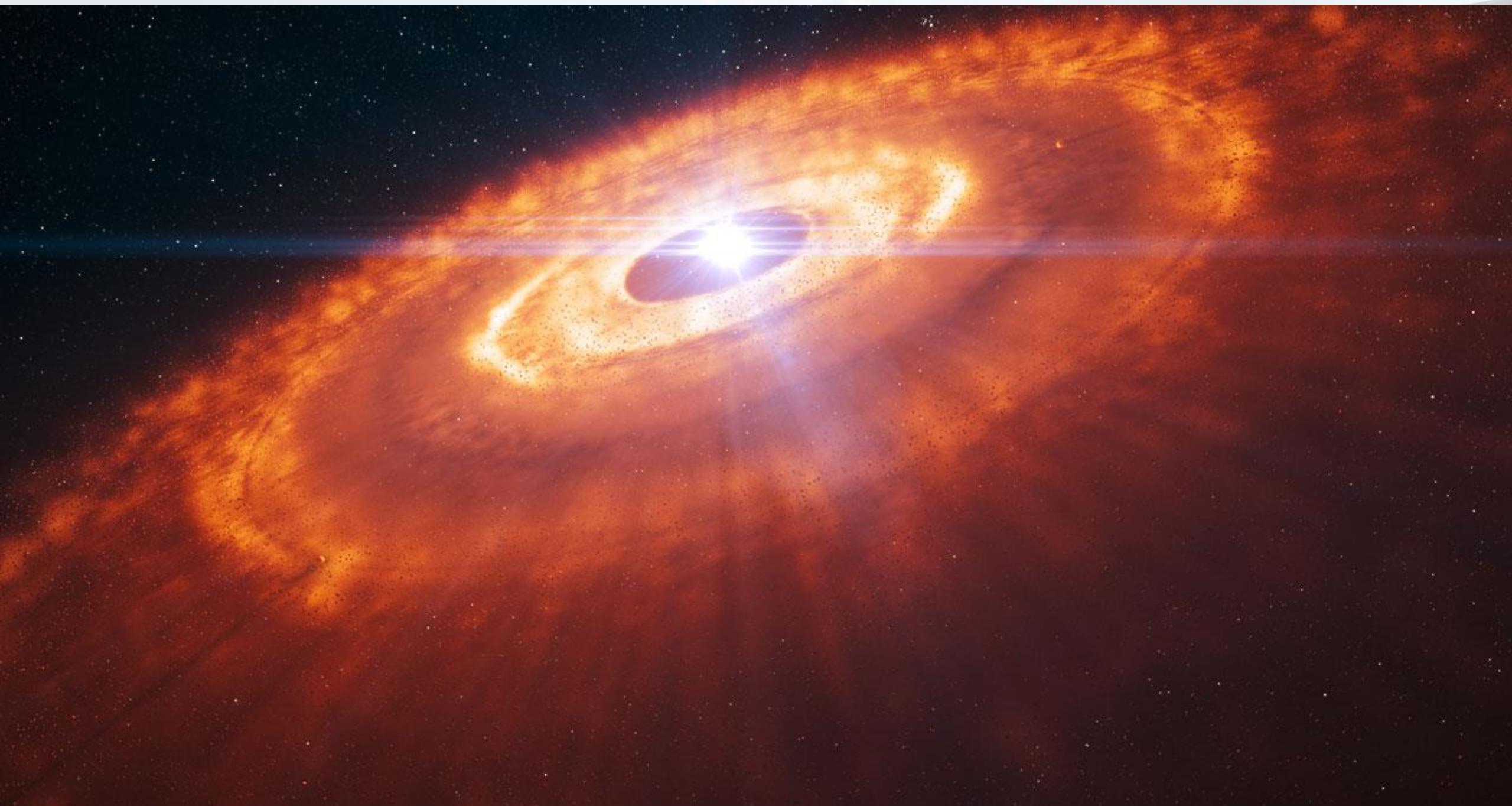


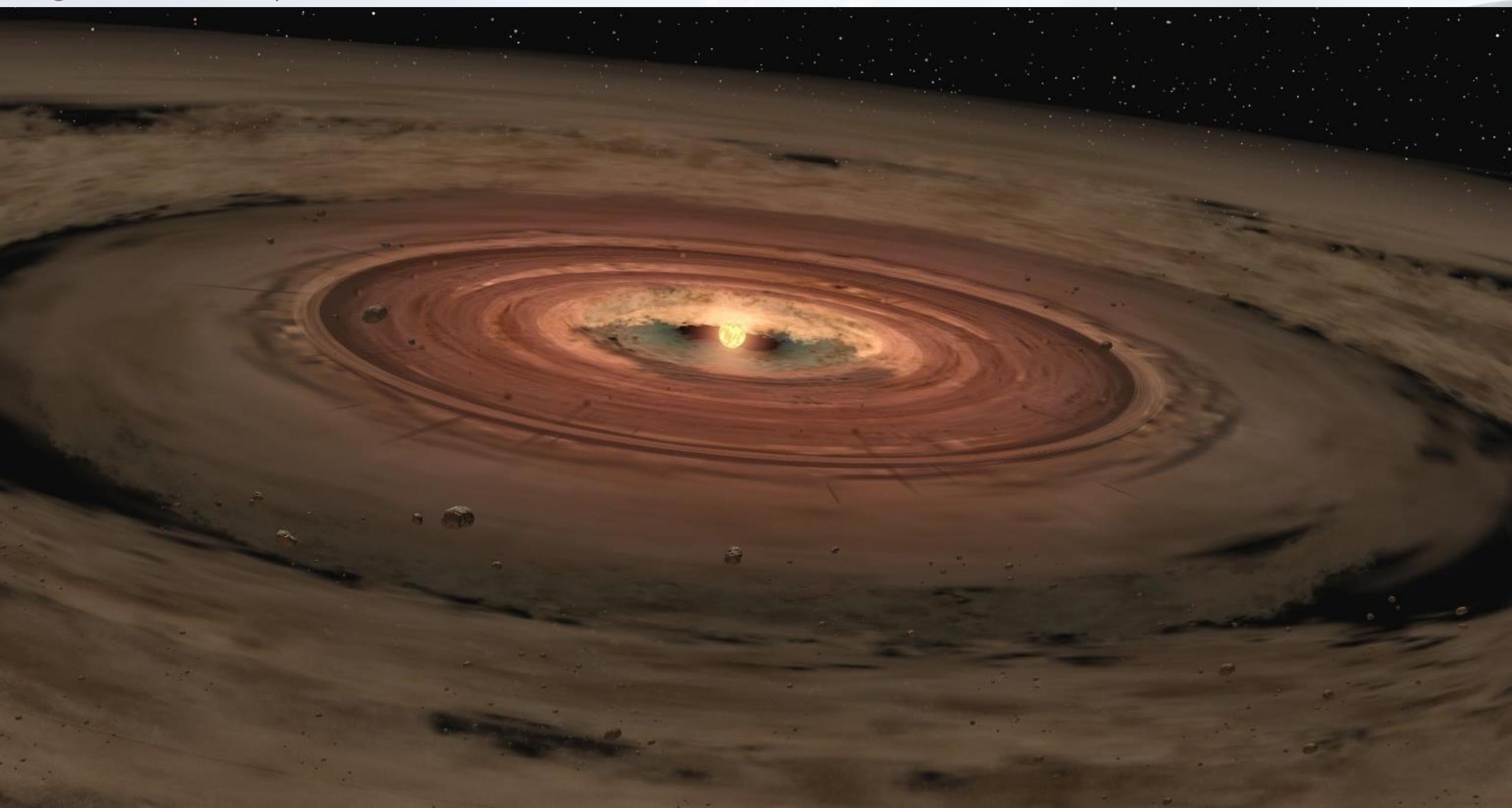


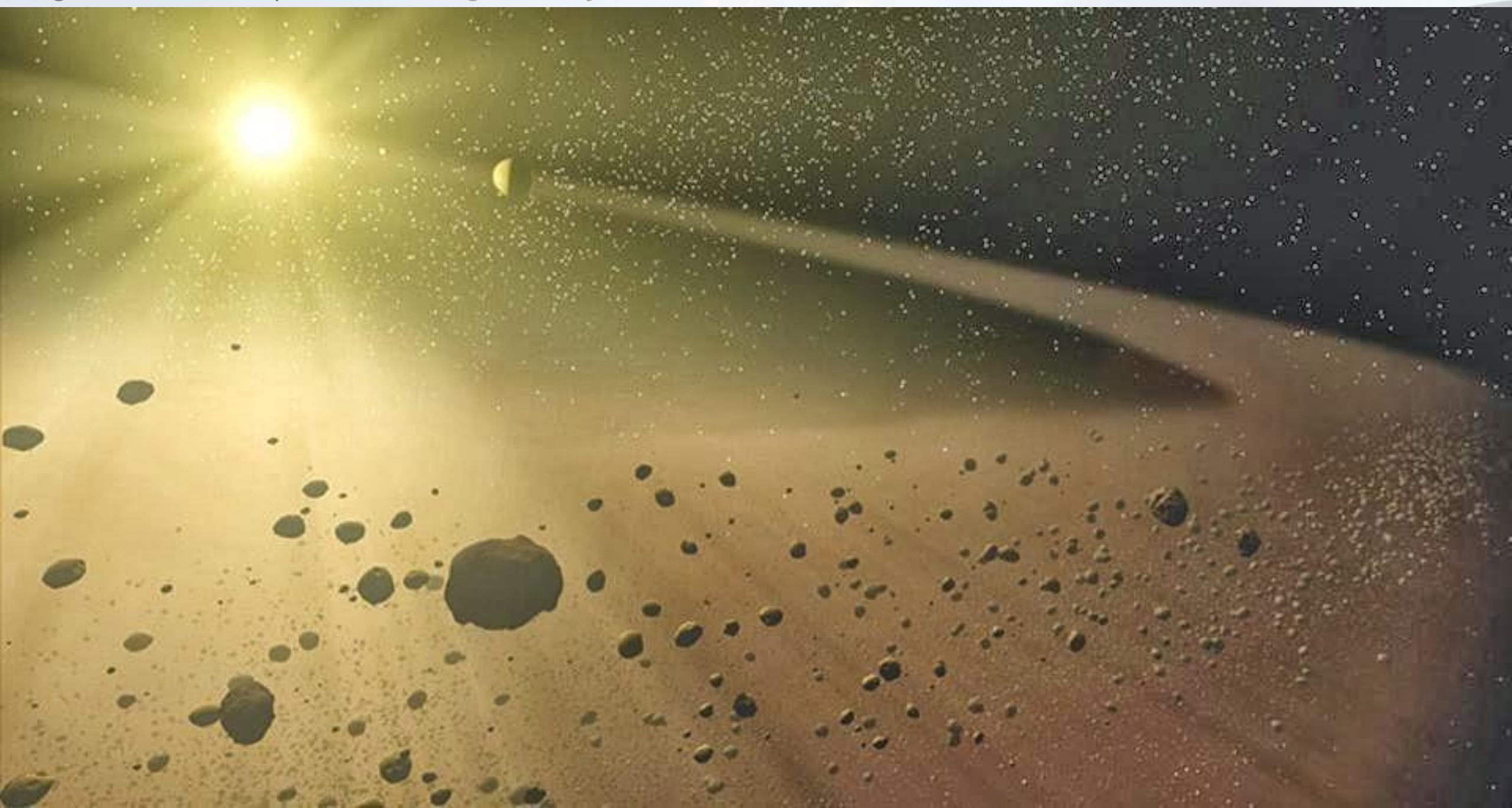


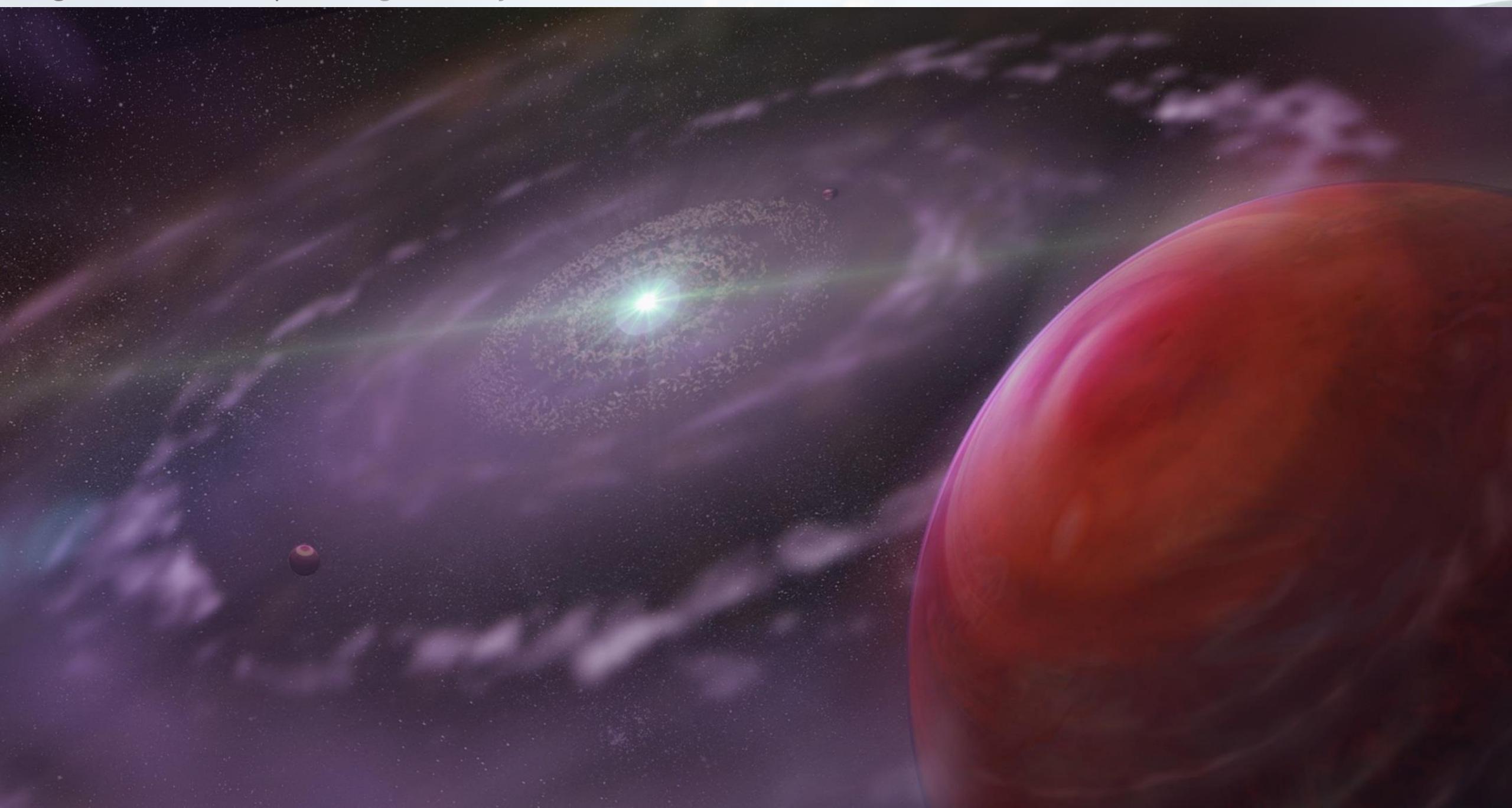


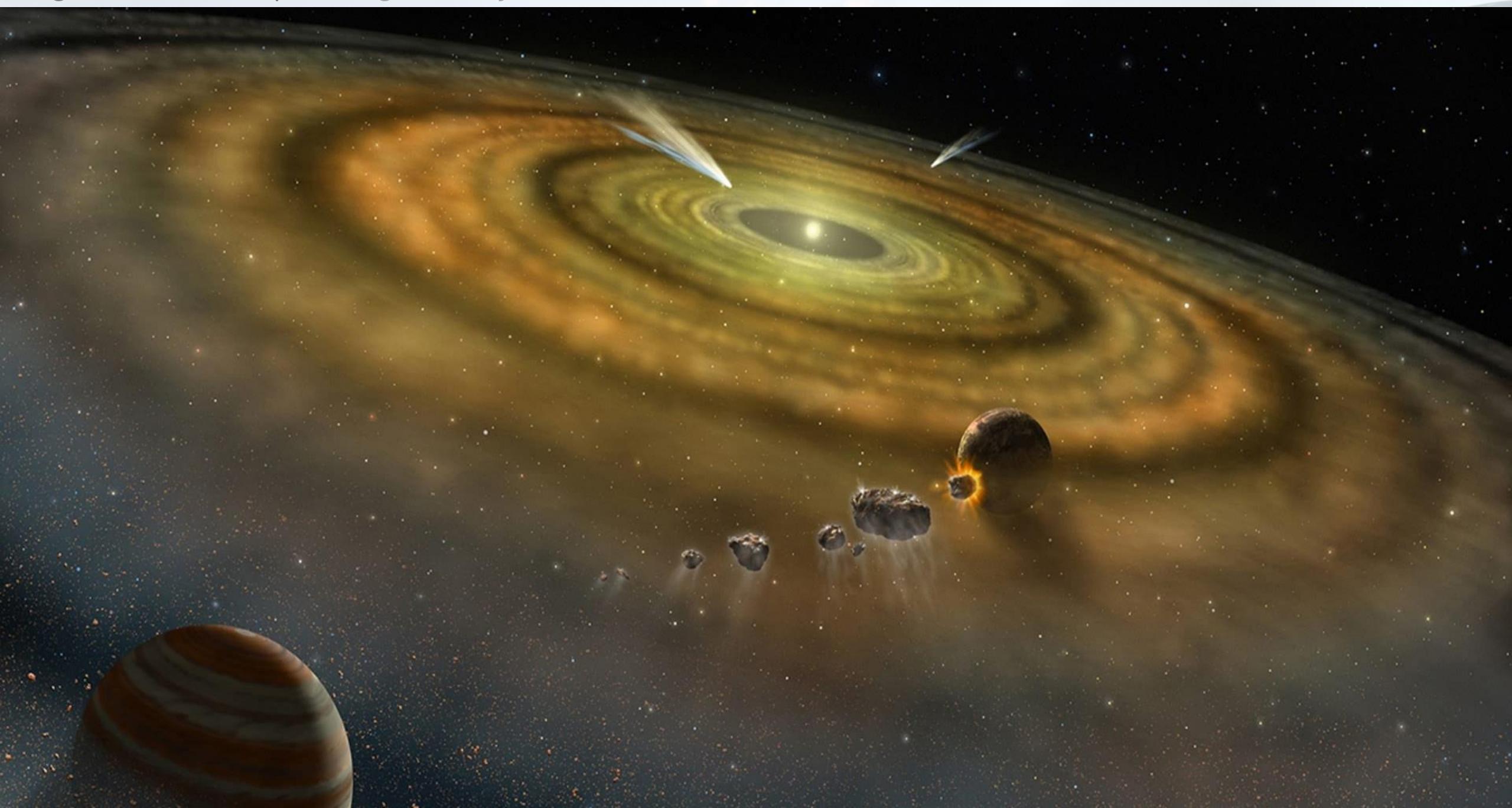


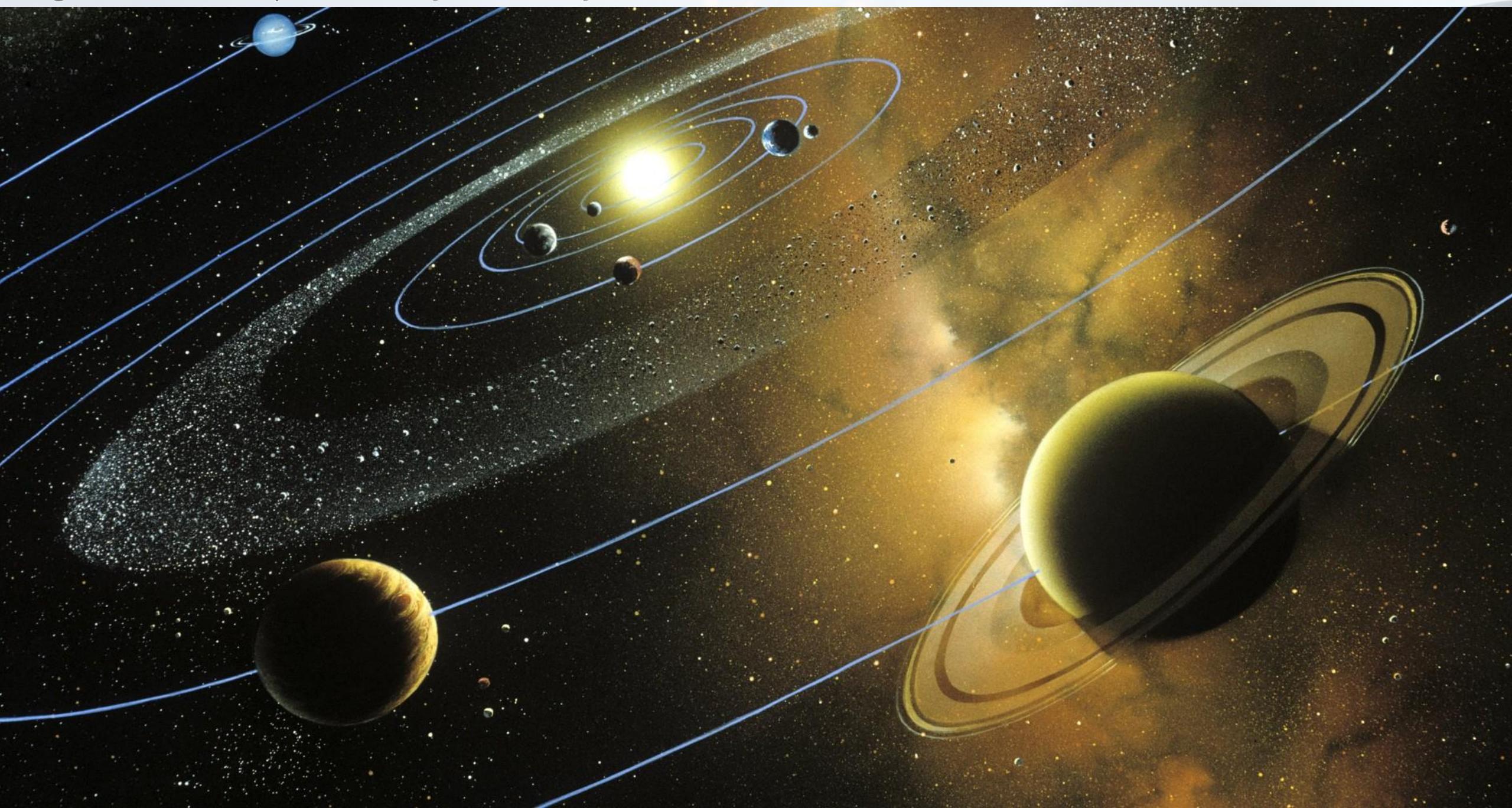


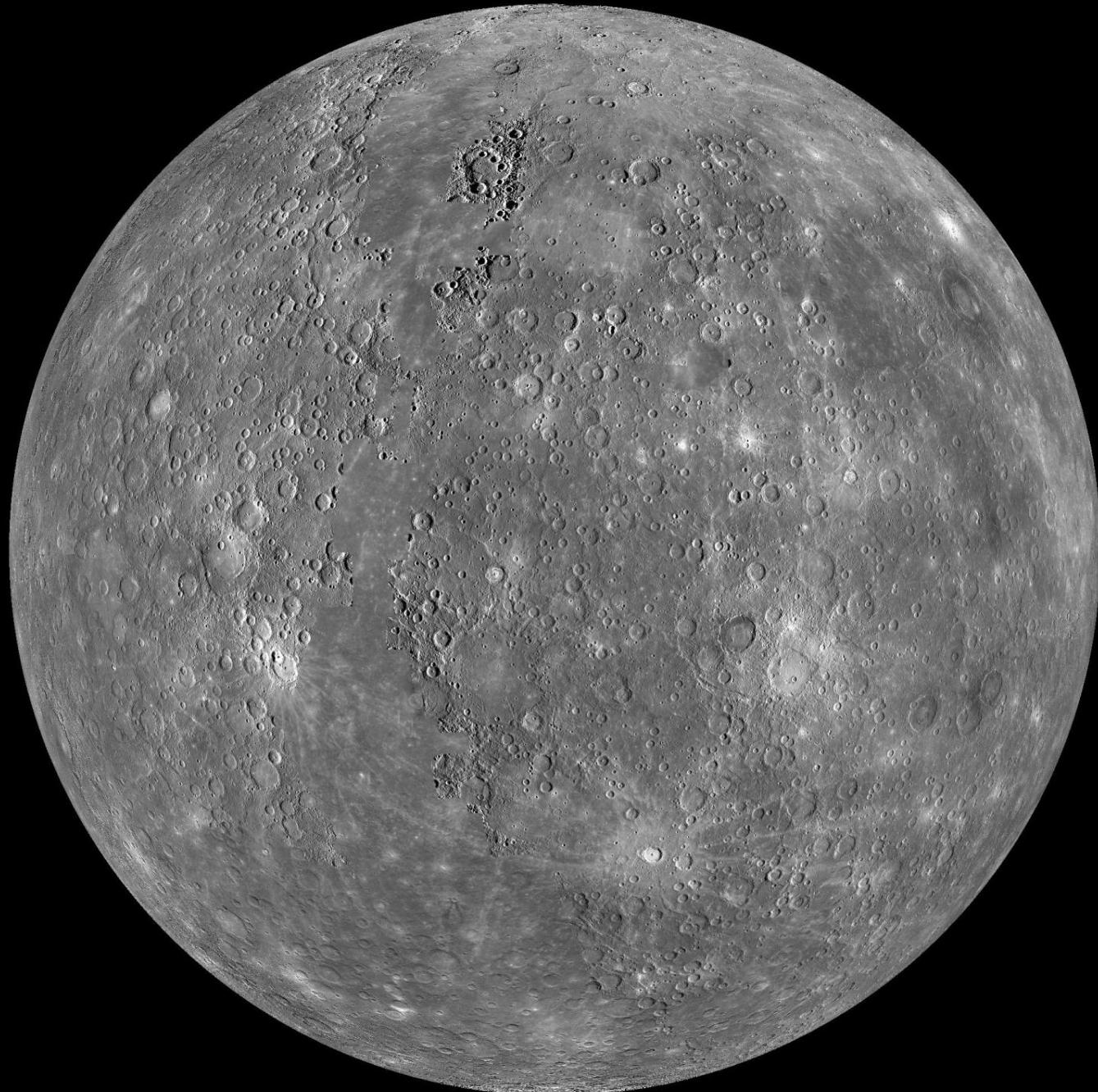


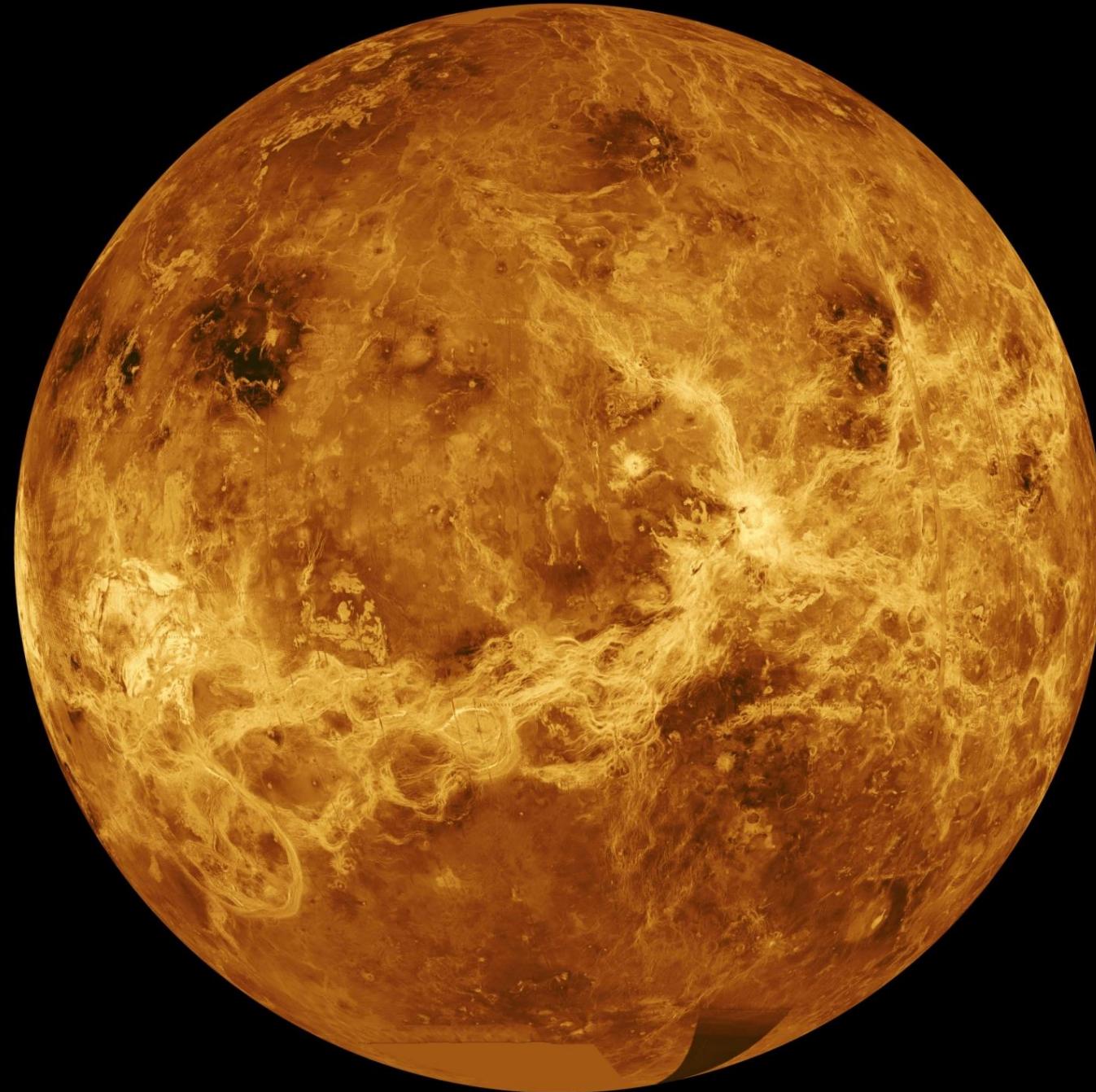




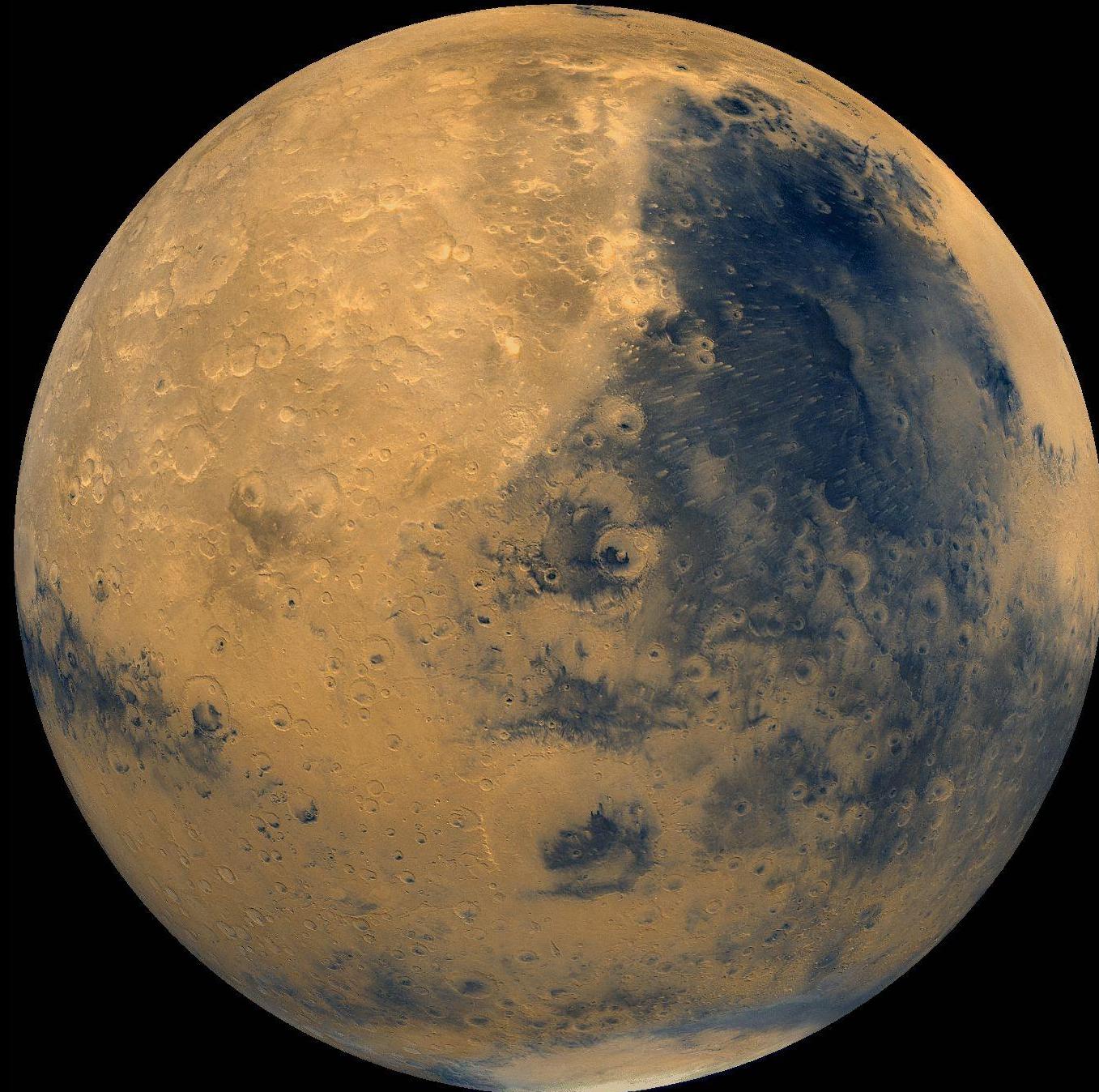


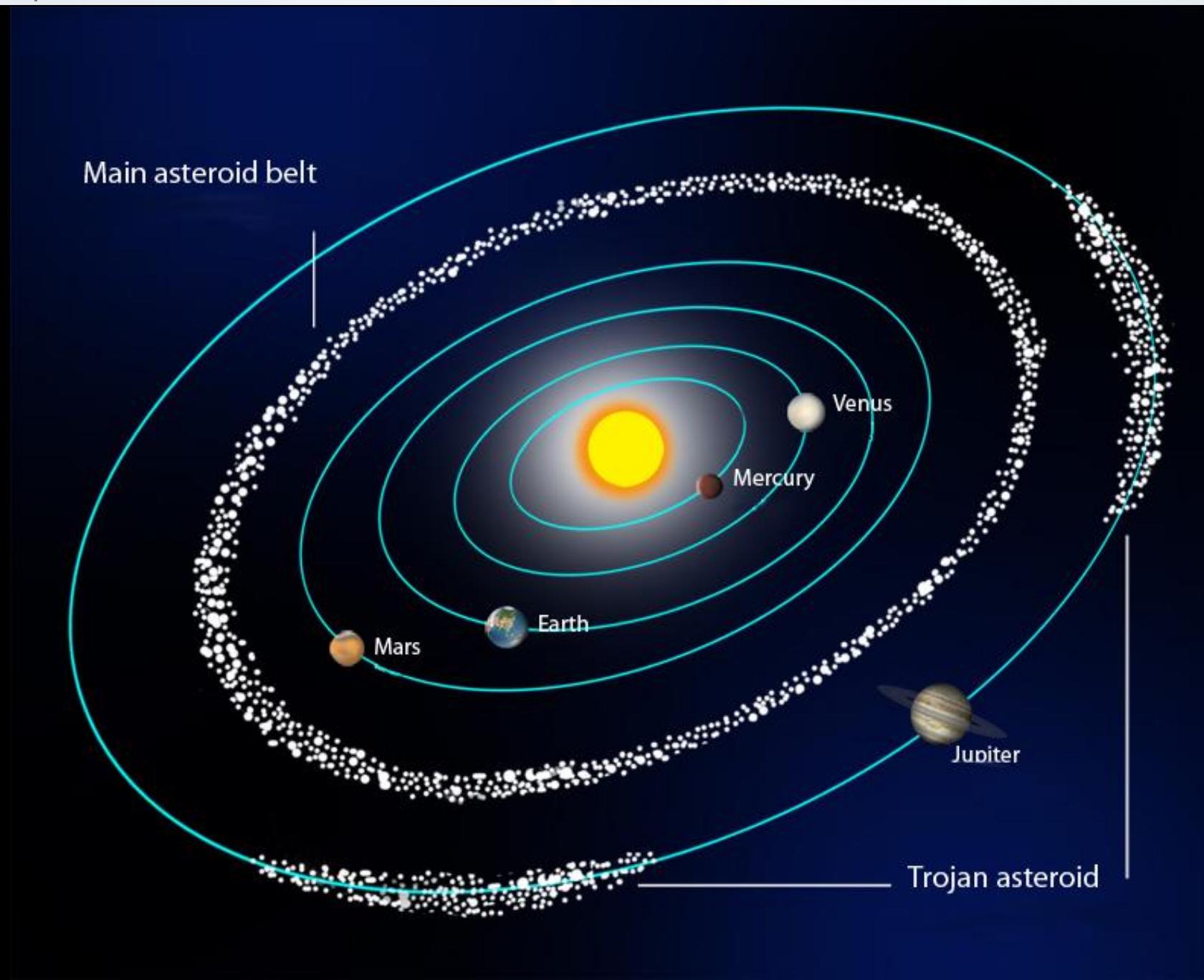




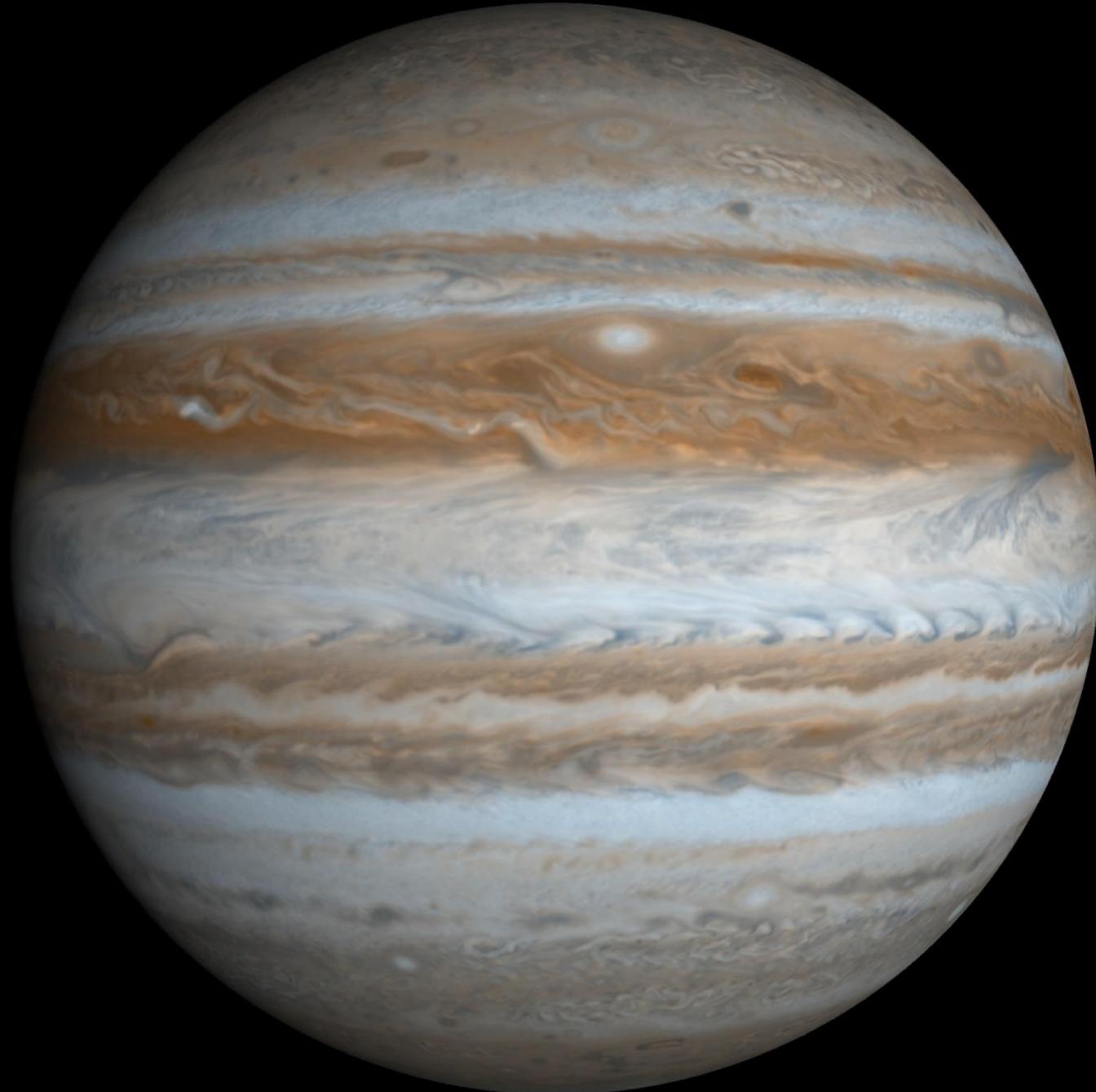


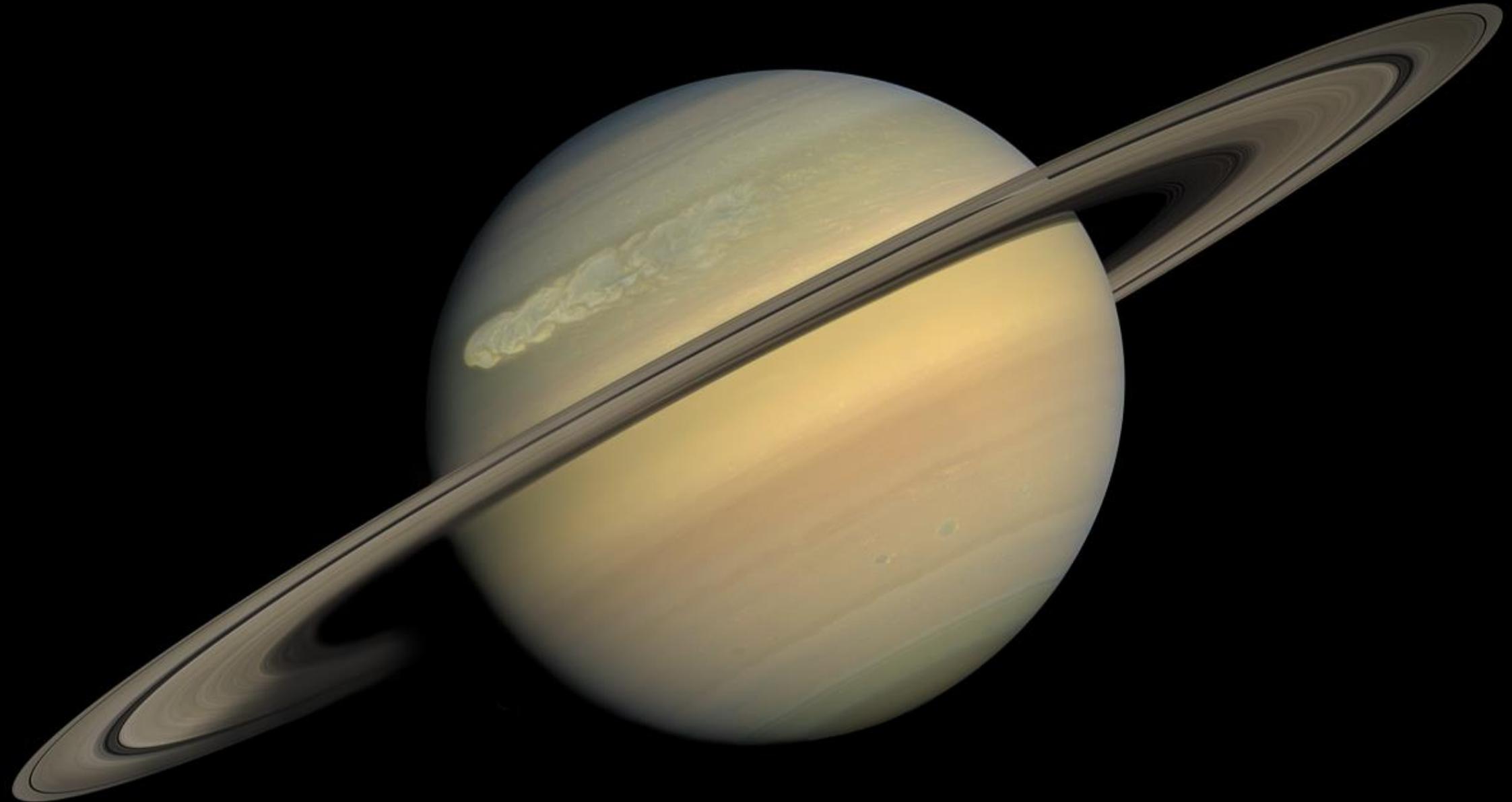




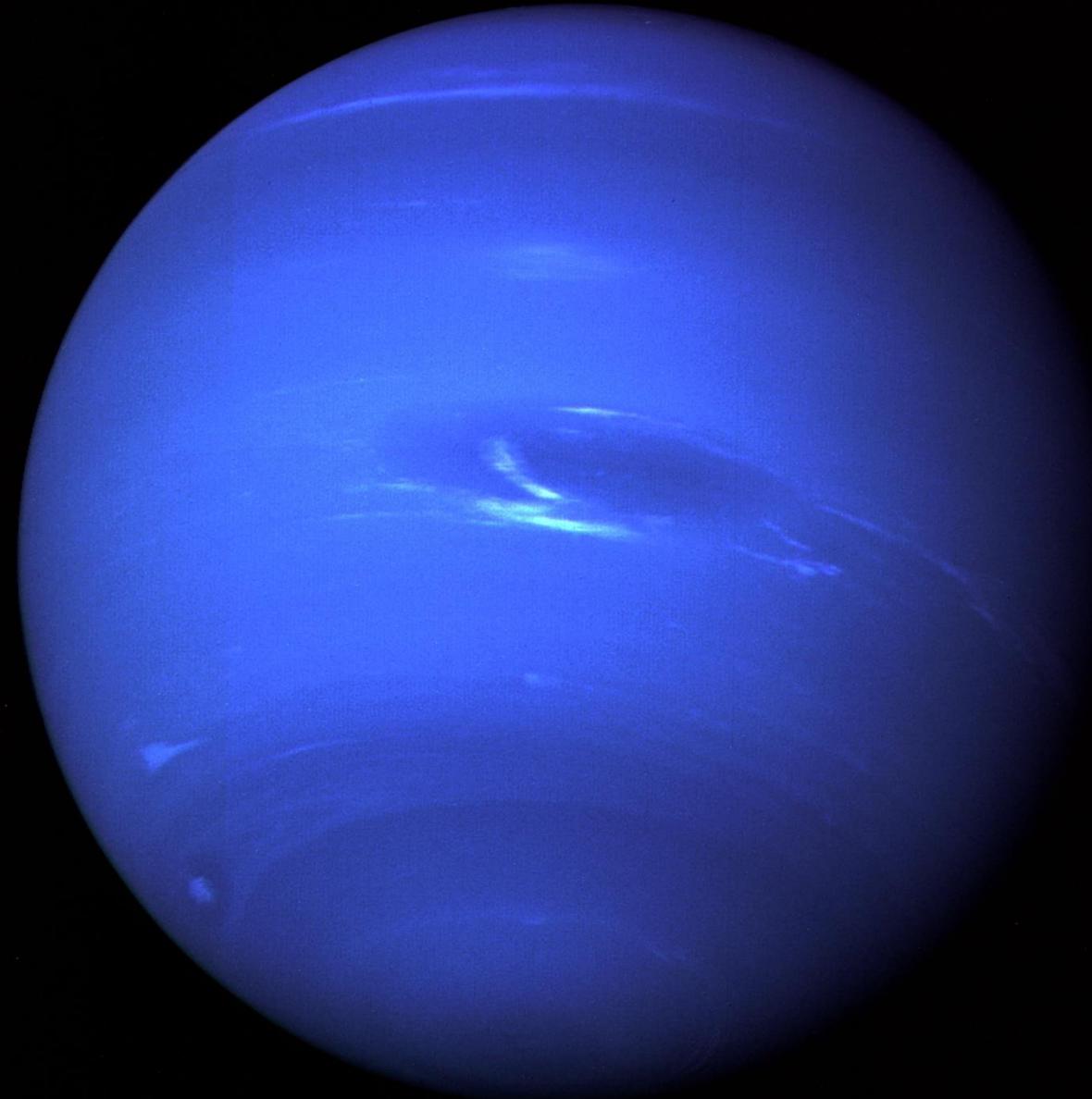


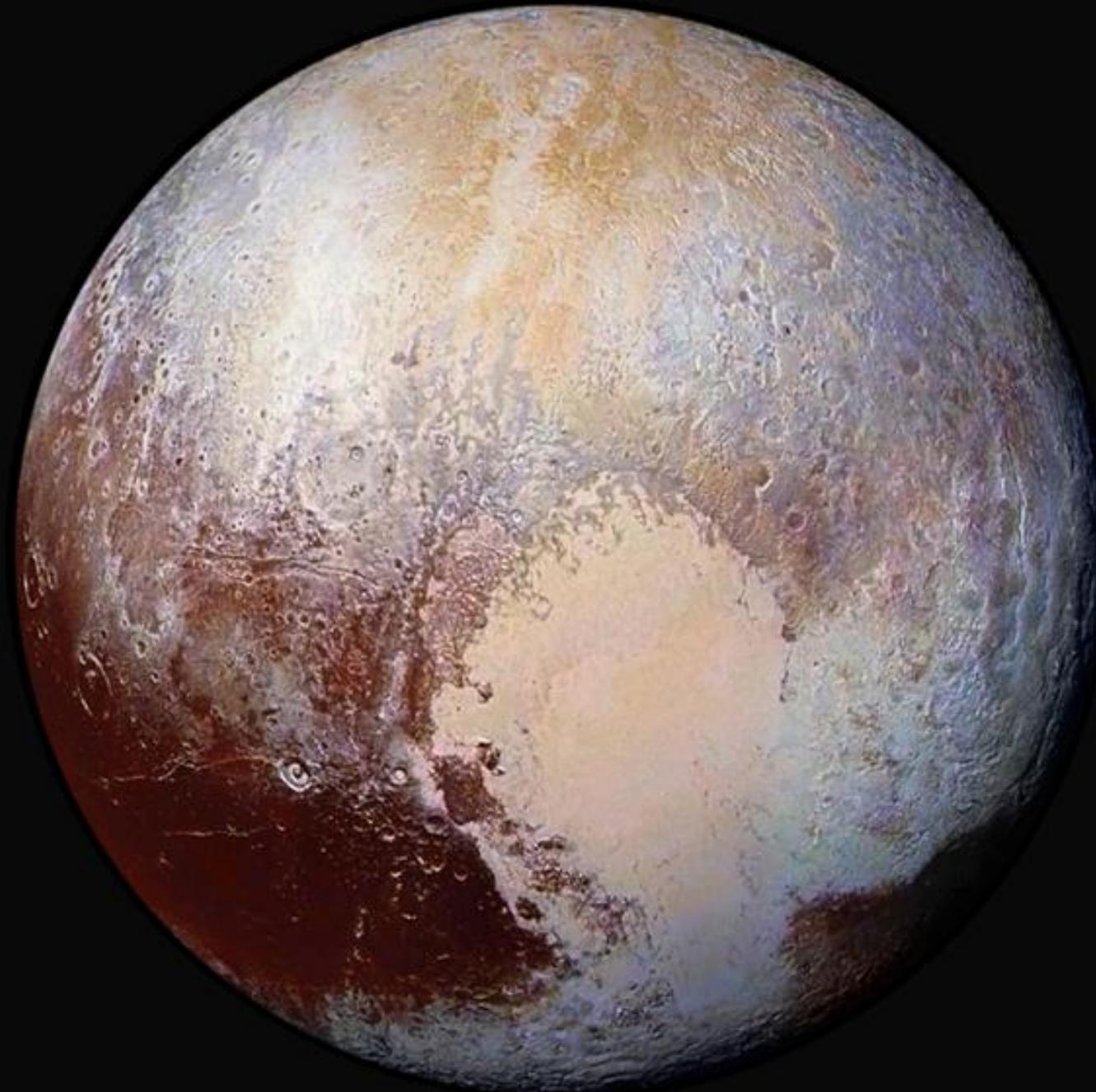


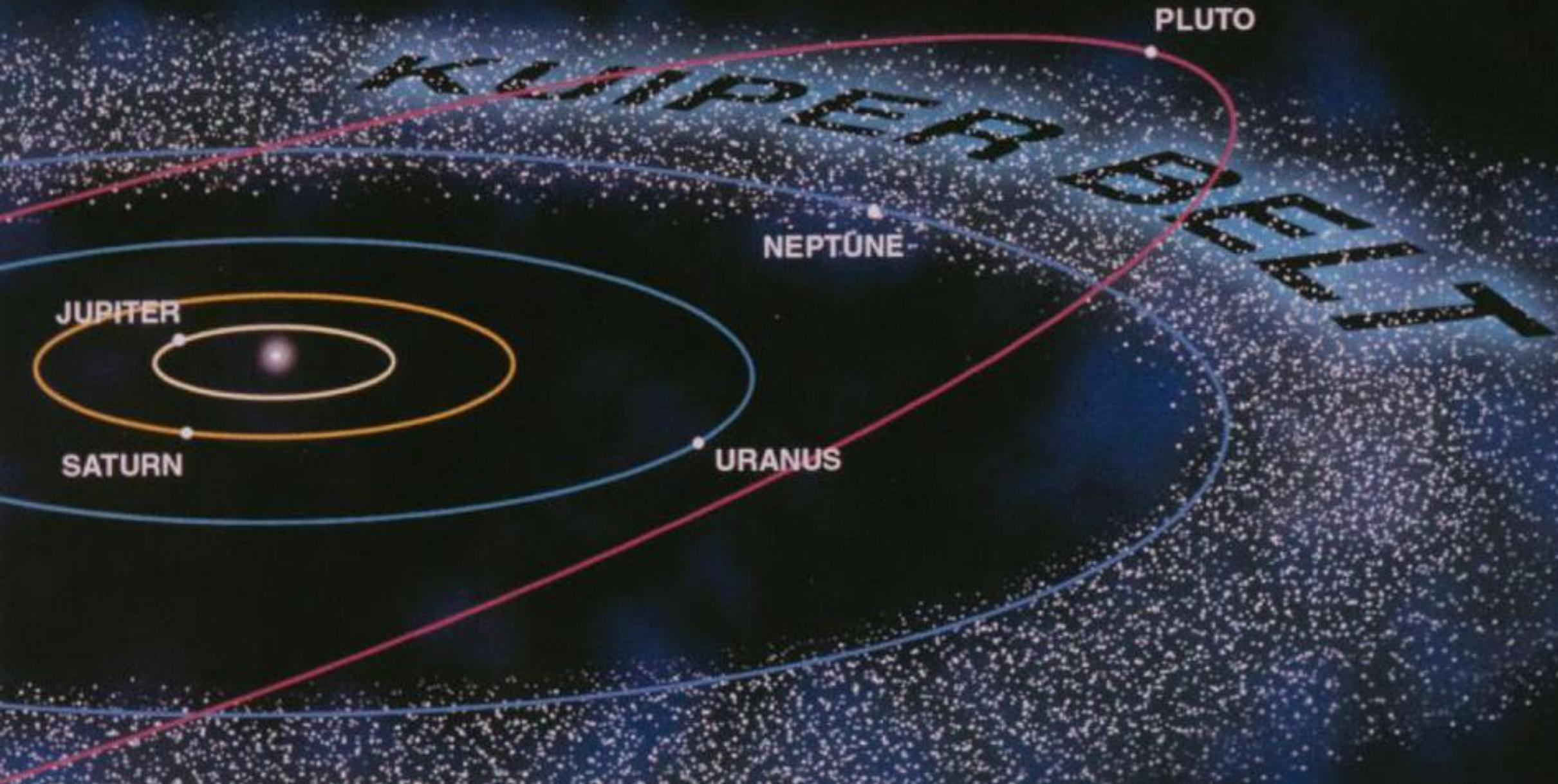


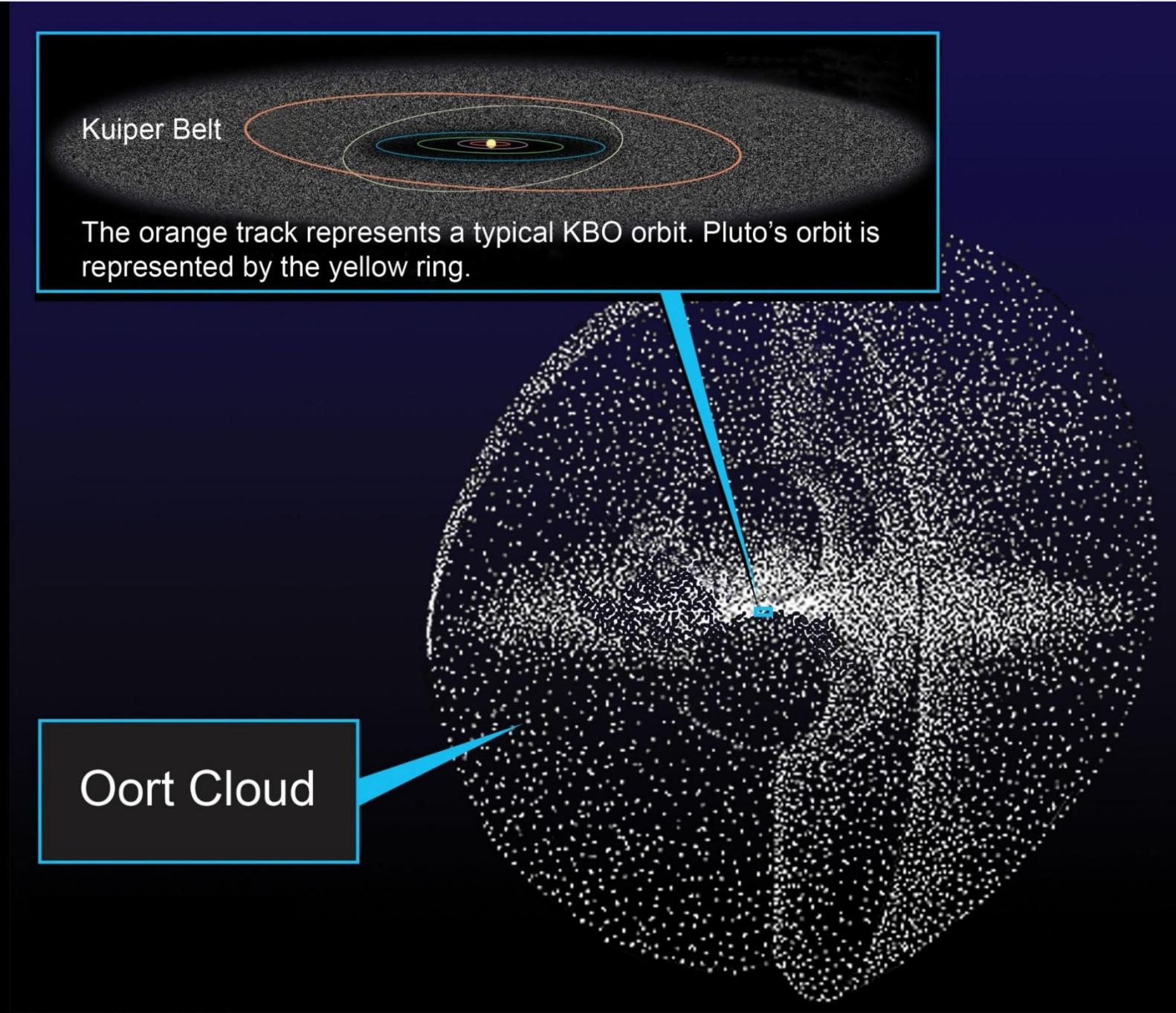




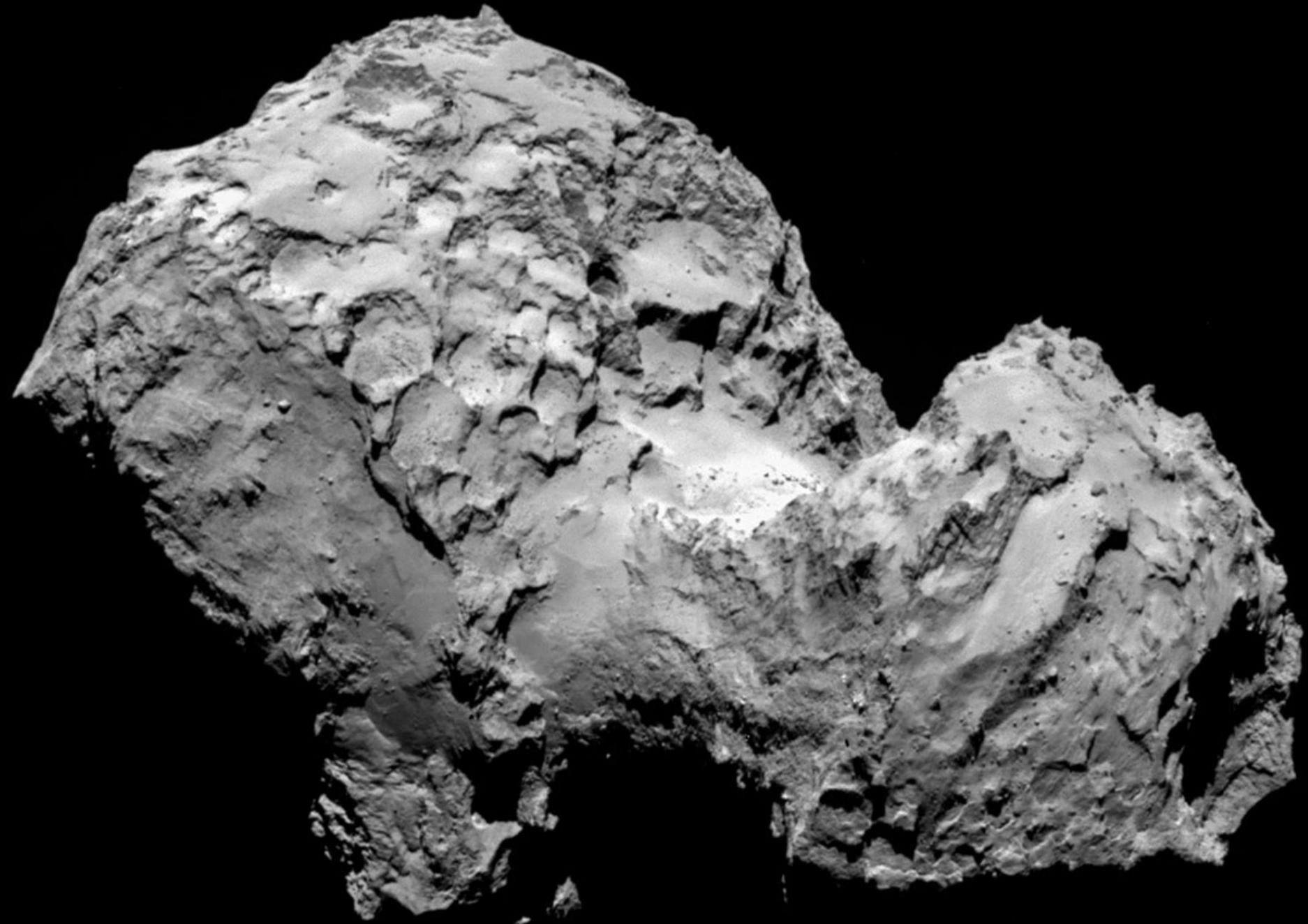


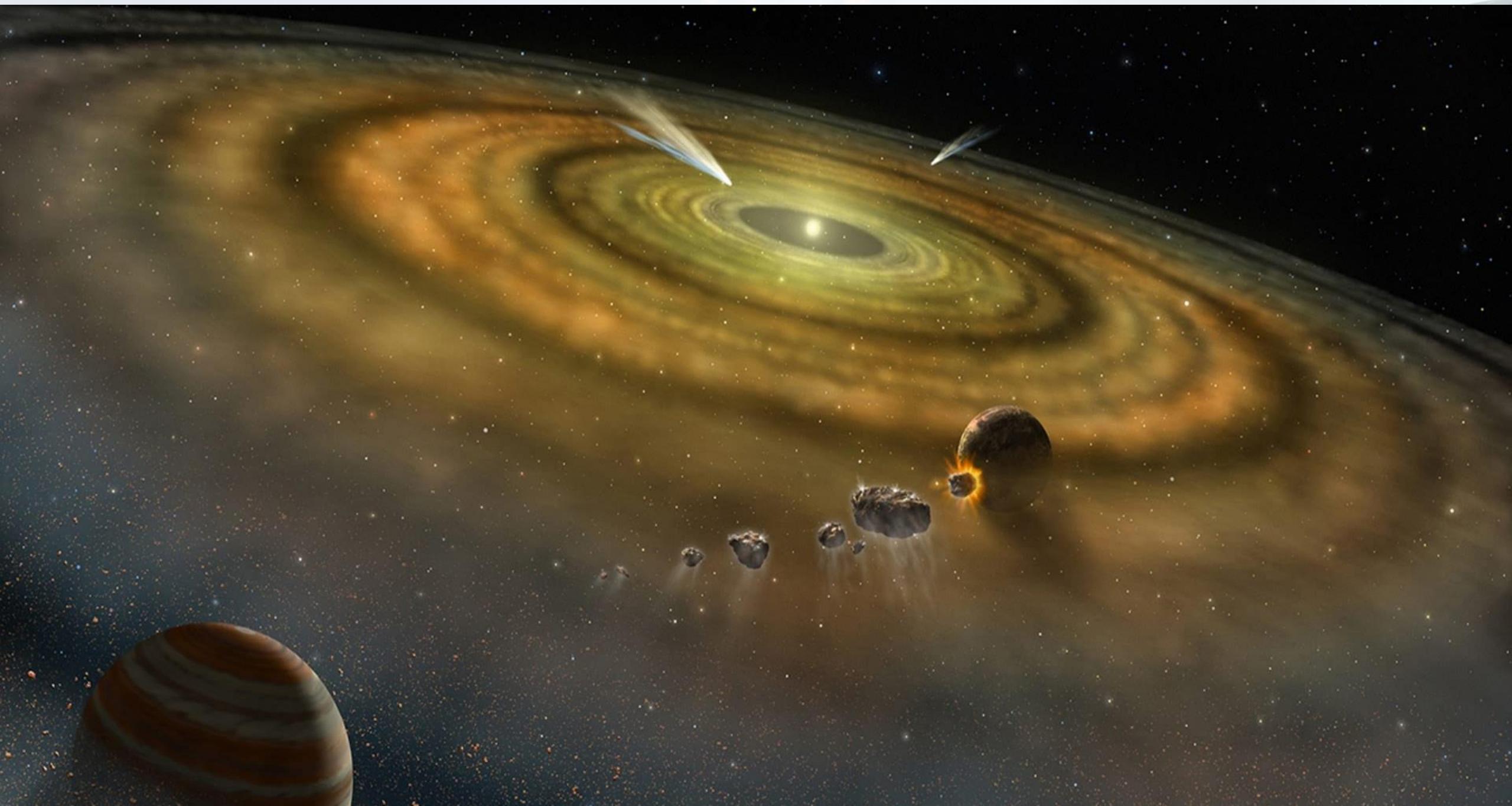






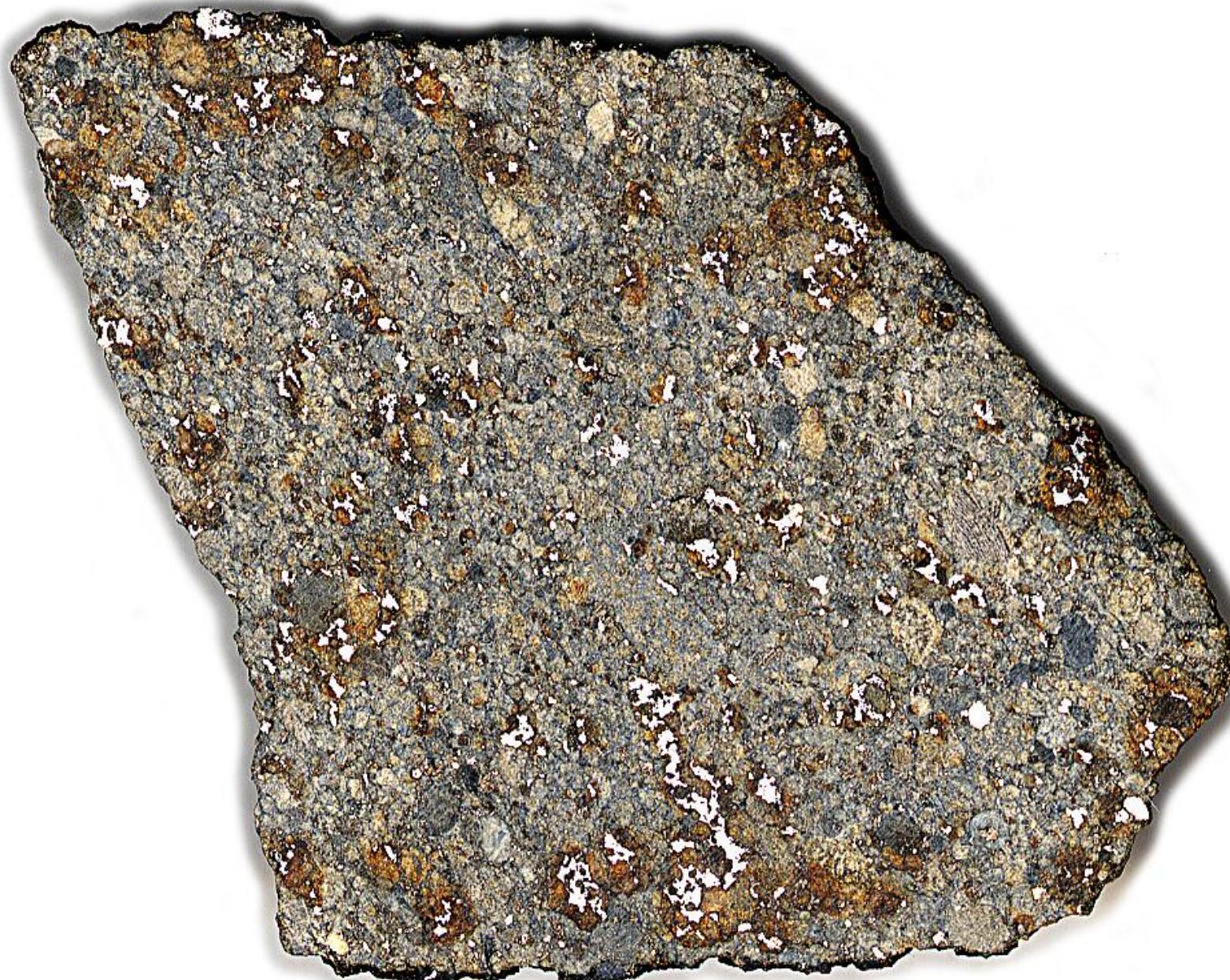




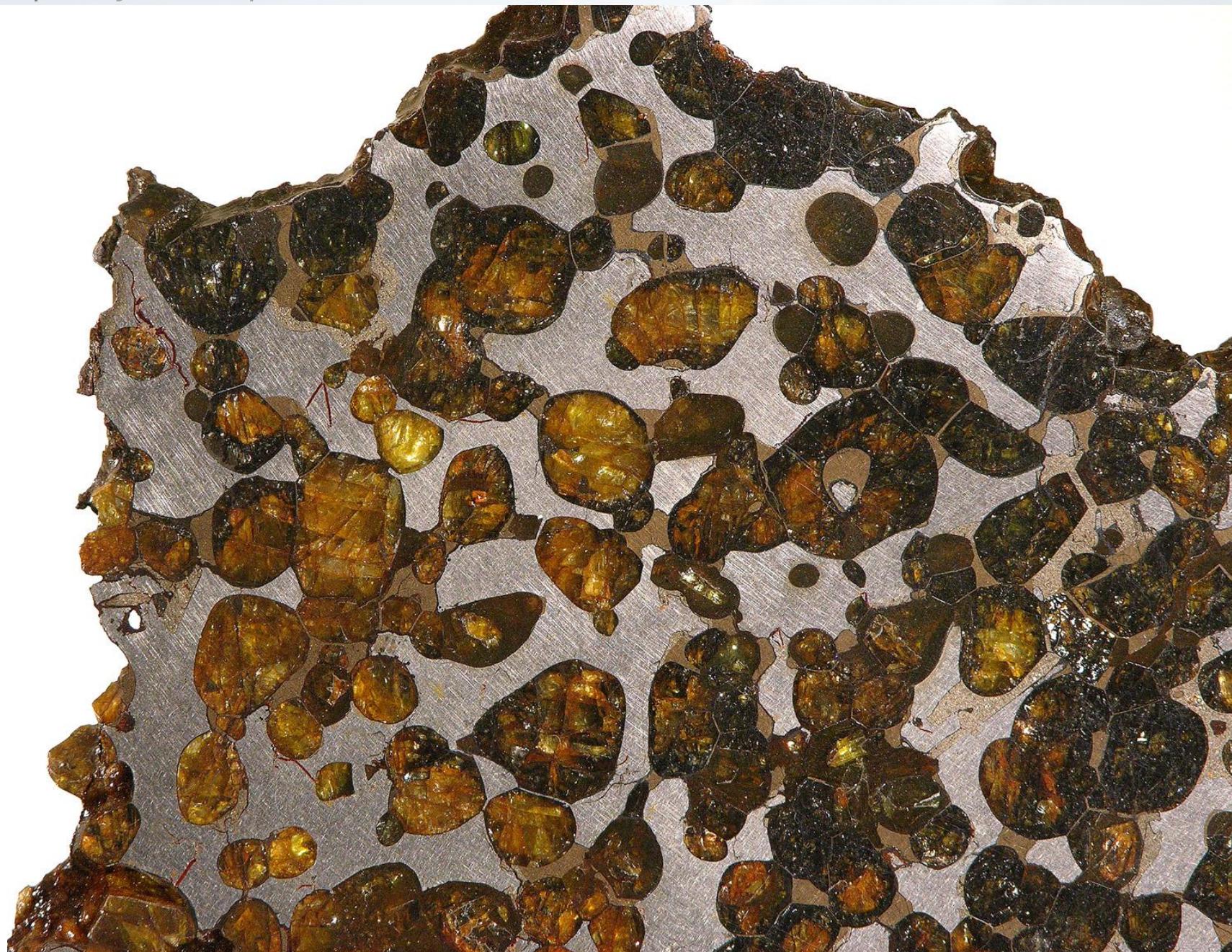




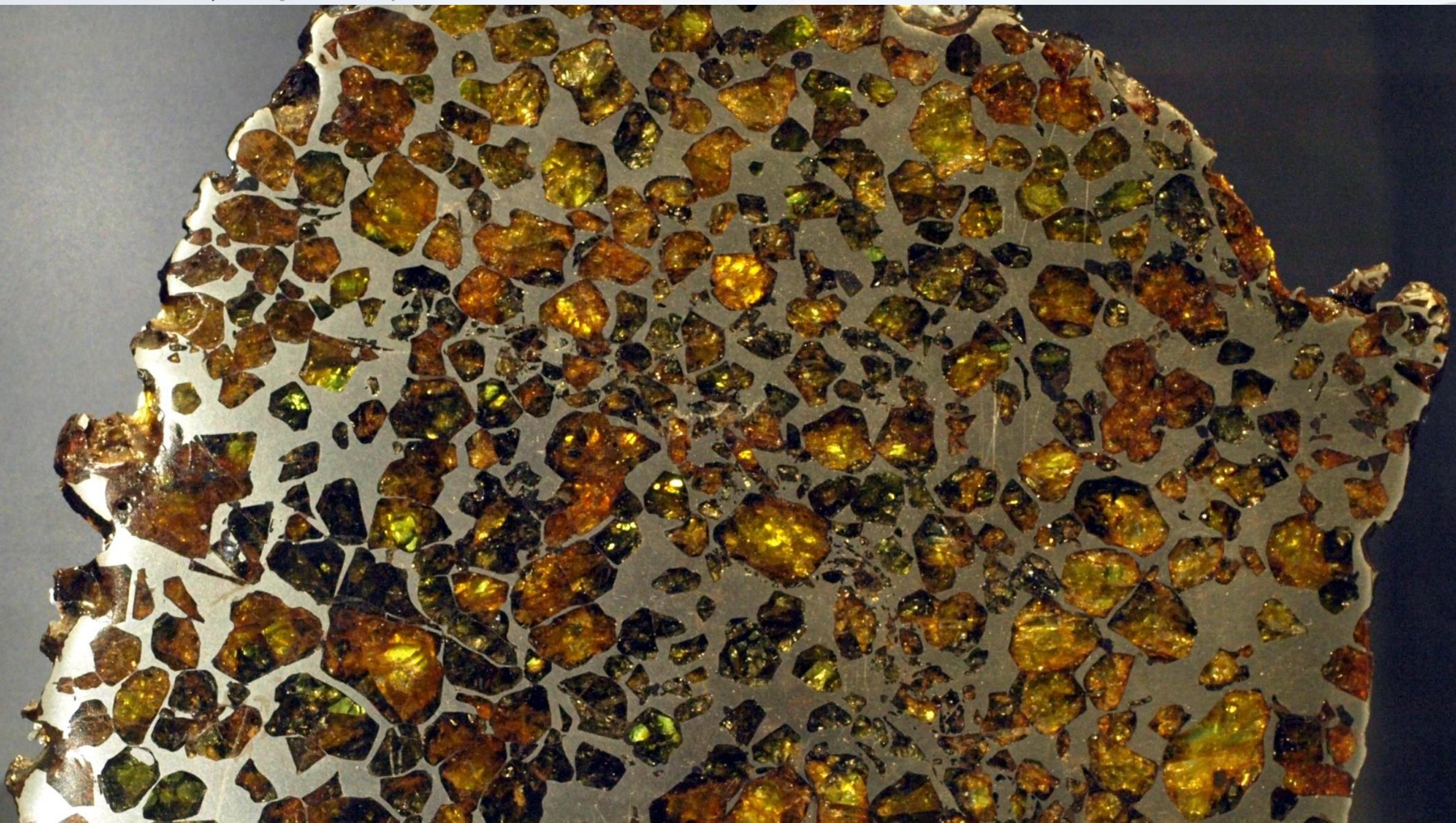




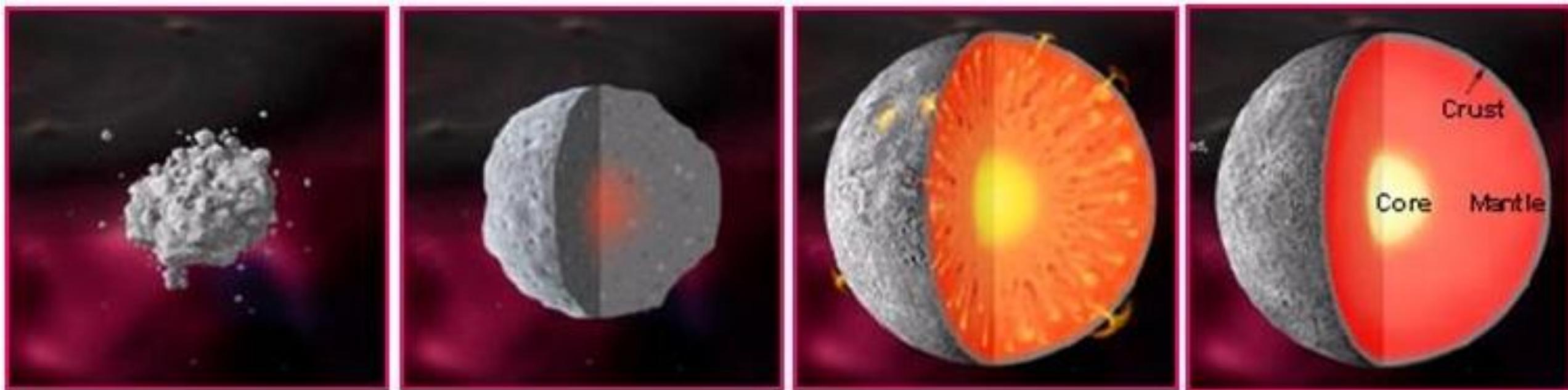




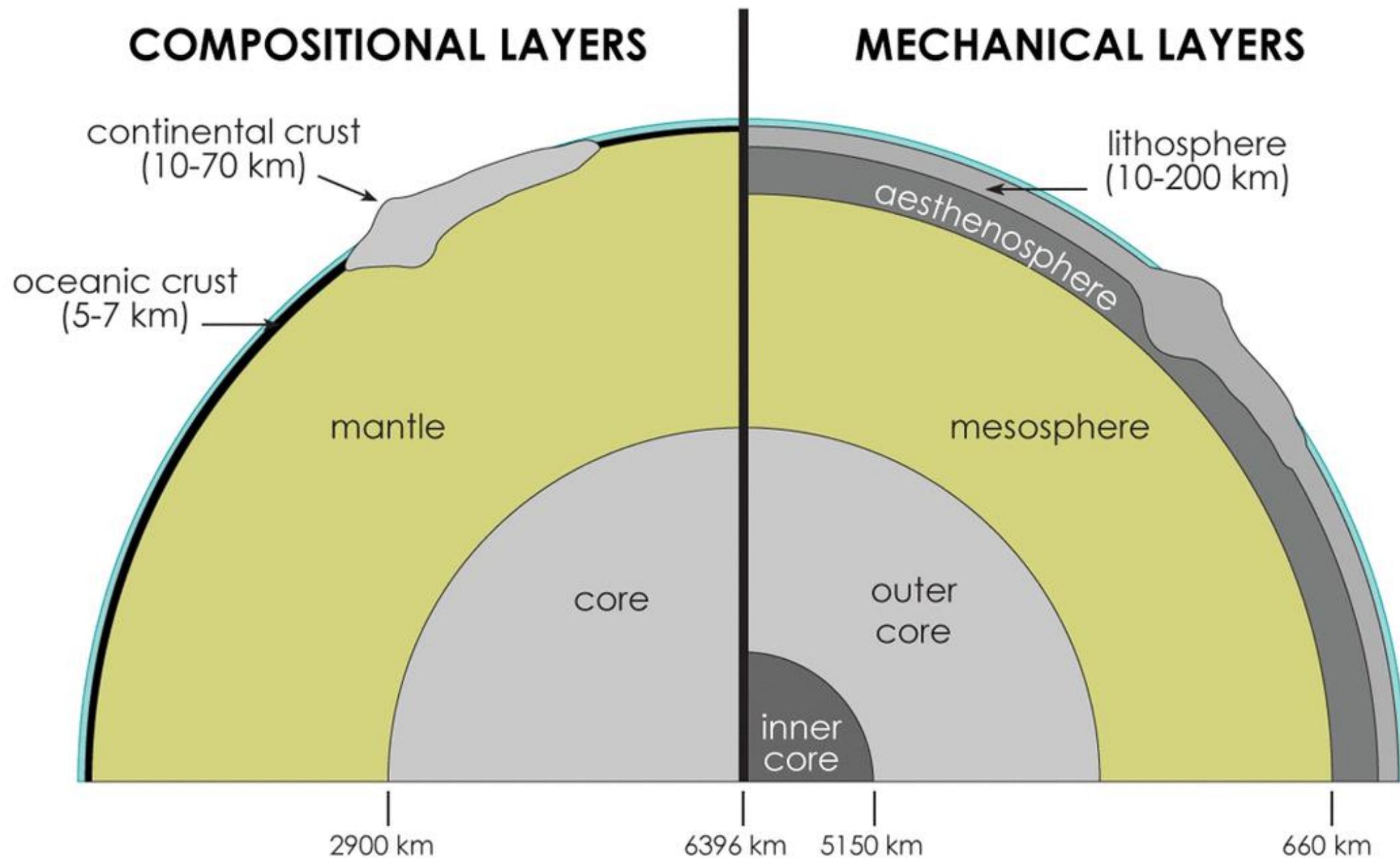
*Brenham Pallasite. Photograph by Geoffrey Notkin © Aerolite Meteorites; Monnig Meteorite Gallery.*

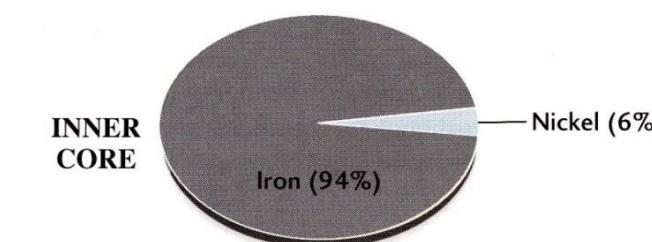
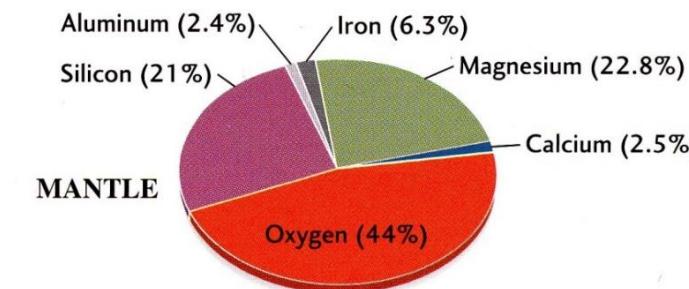
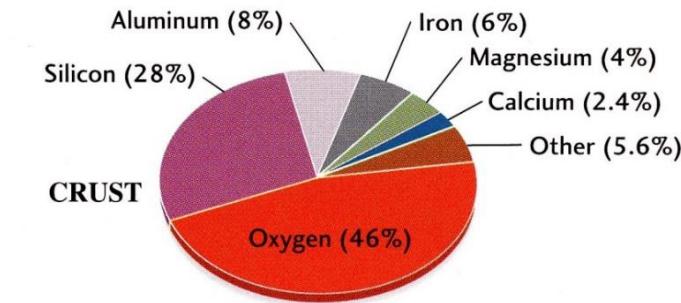
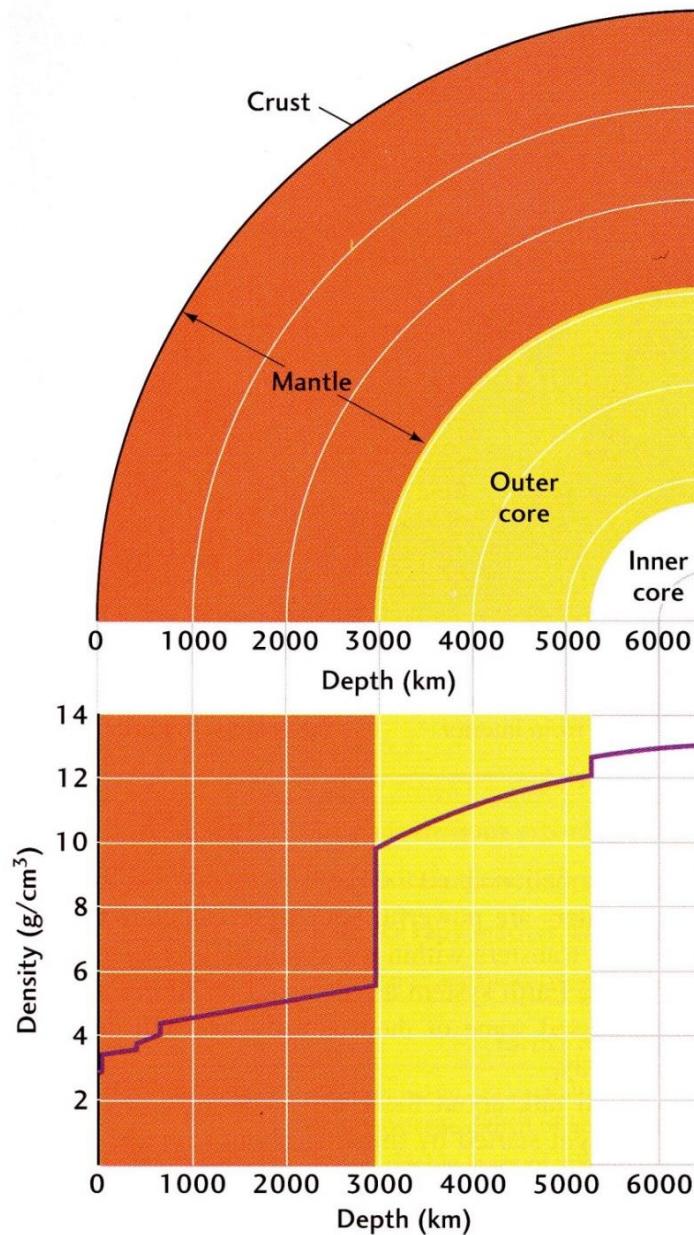












Grotzinger et al. 2007



