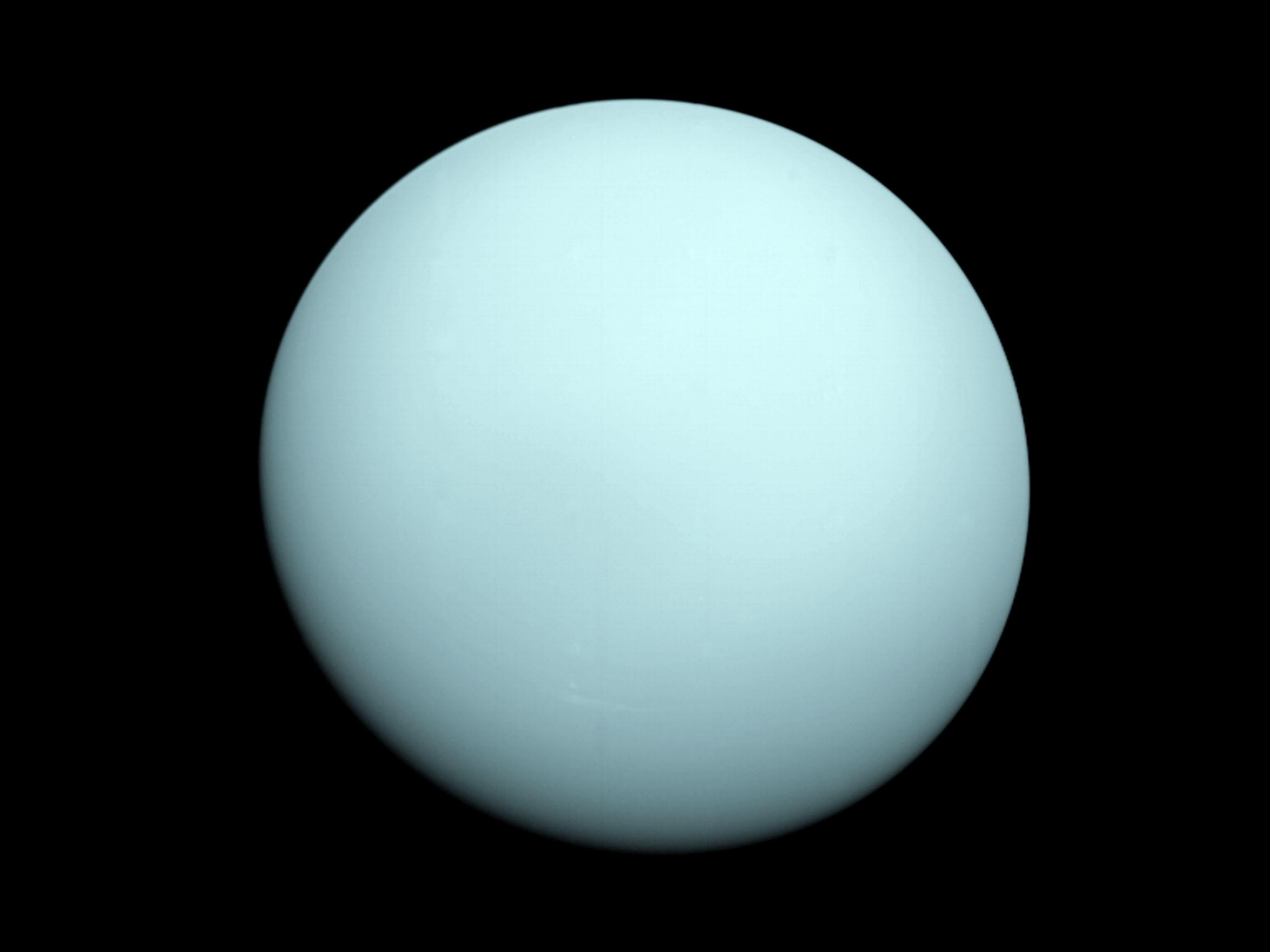
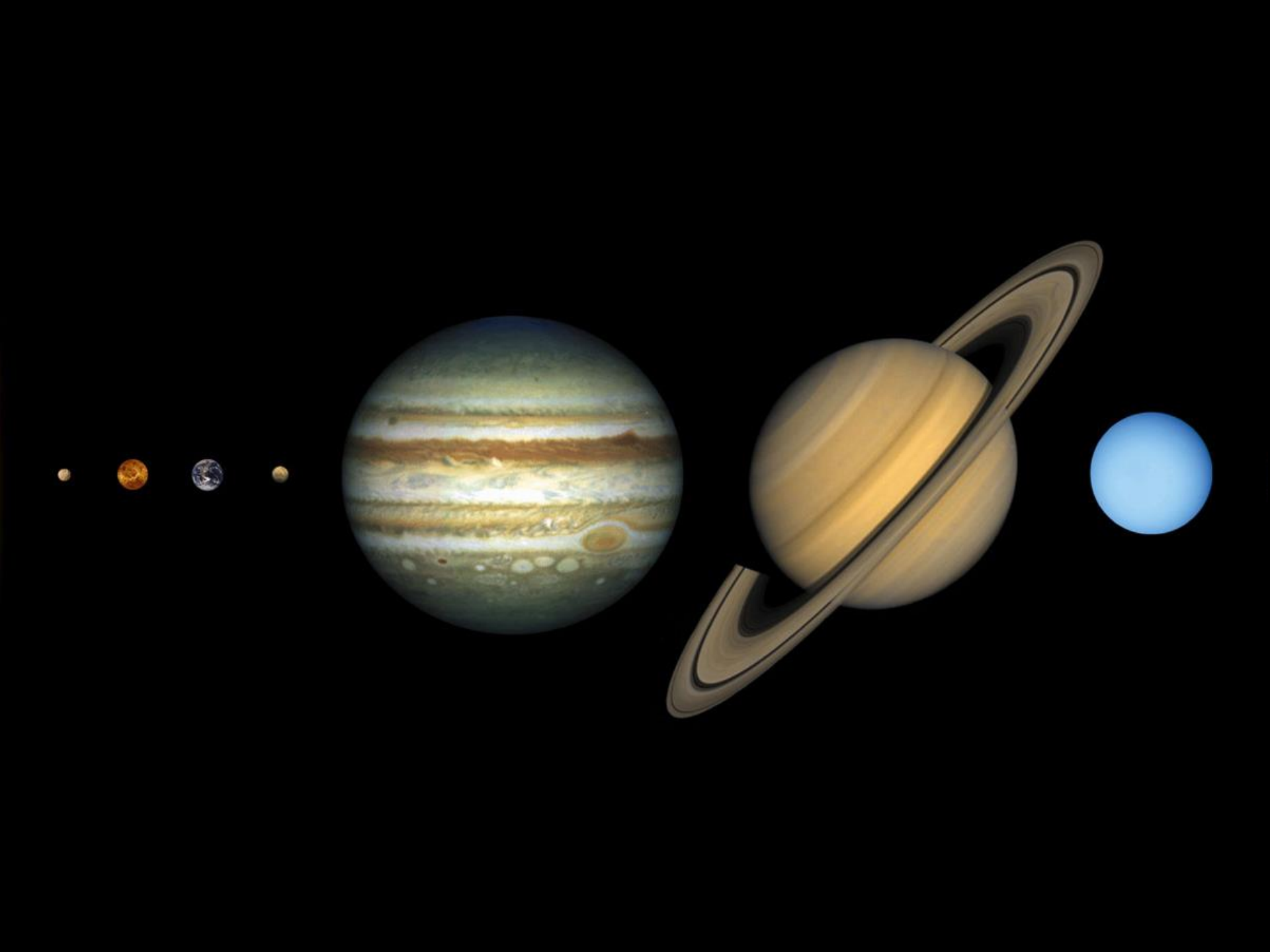
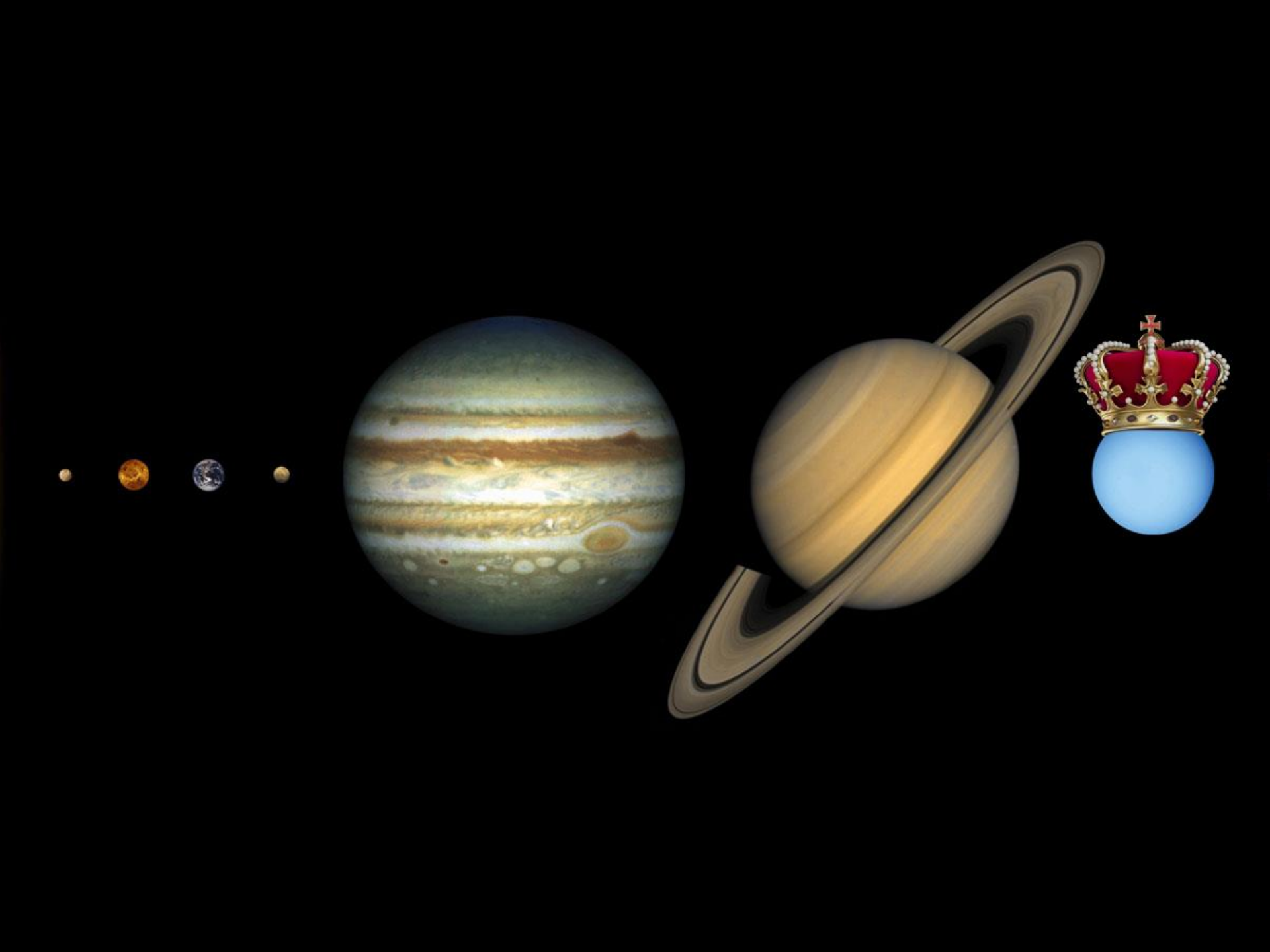
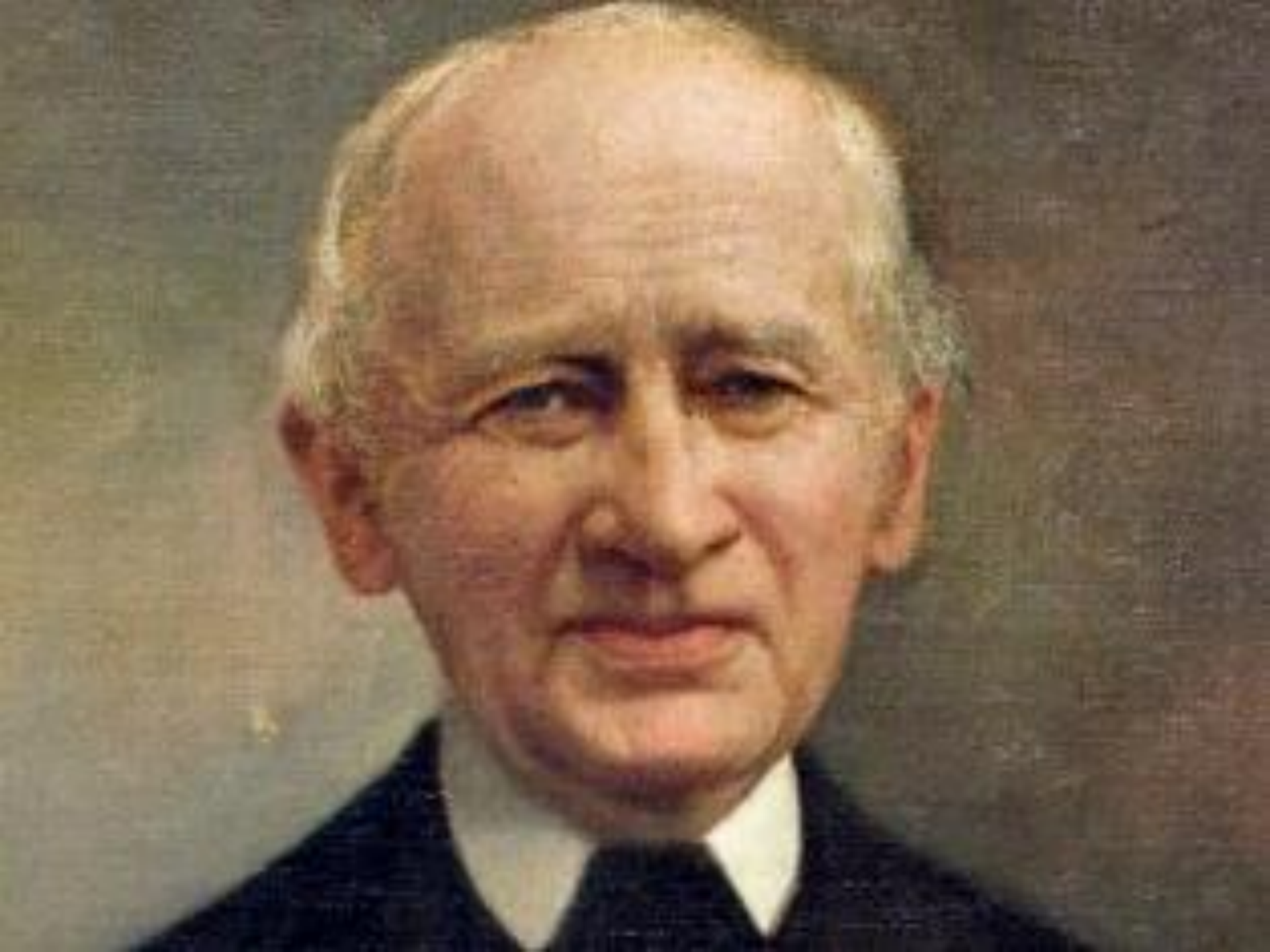
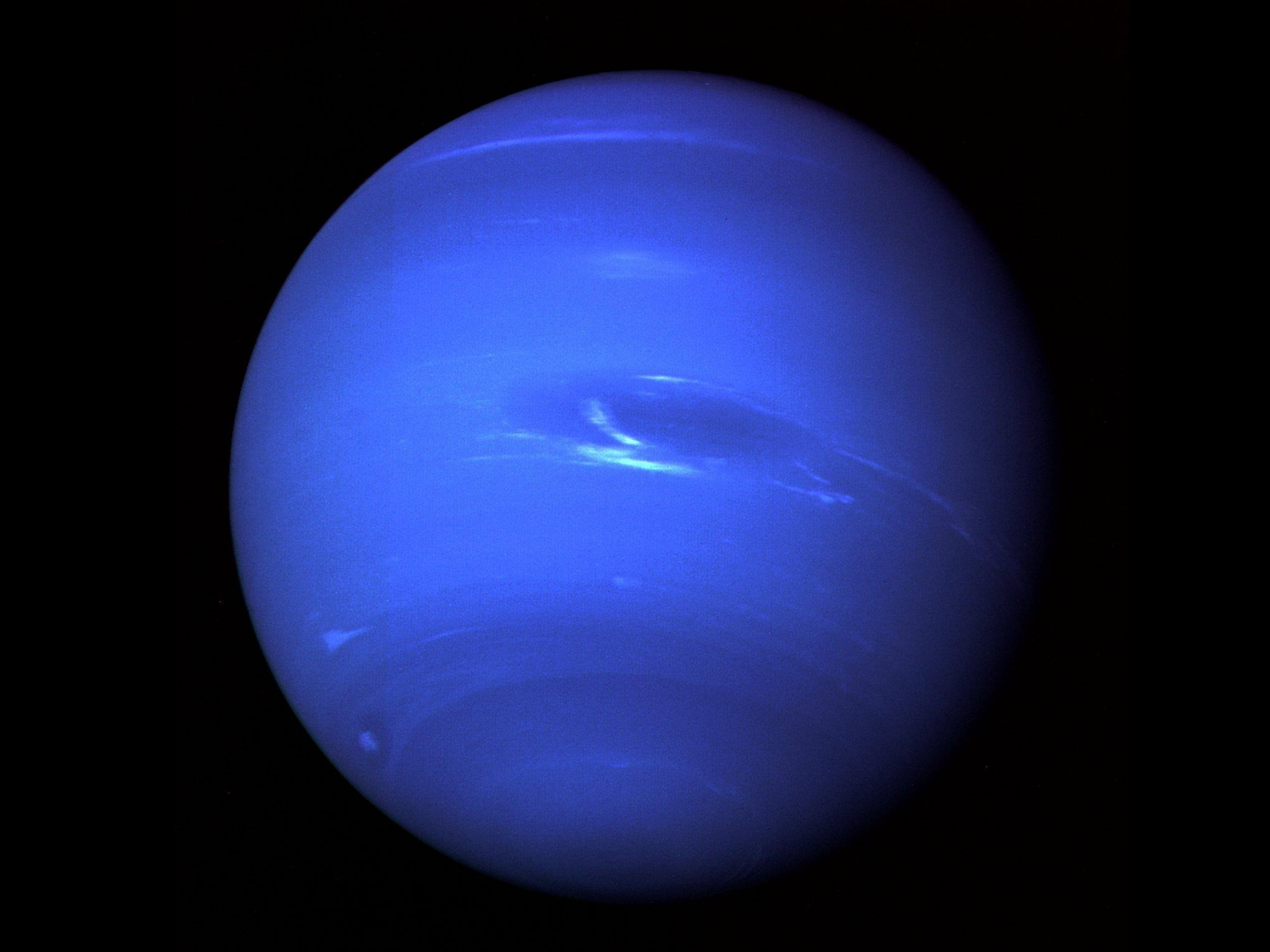
João Paulo Monteiro Cruvinel da Costa - Centro de Divulagação da Astronomia - USP

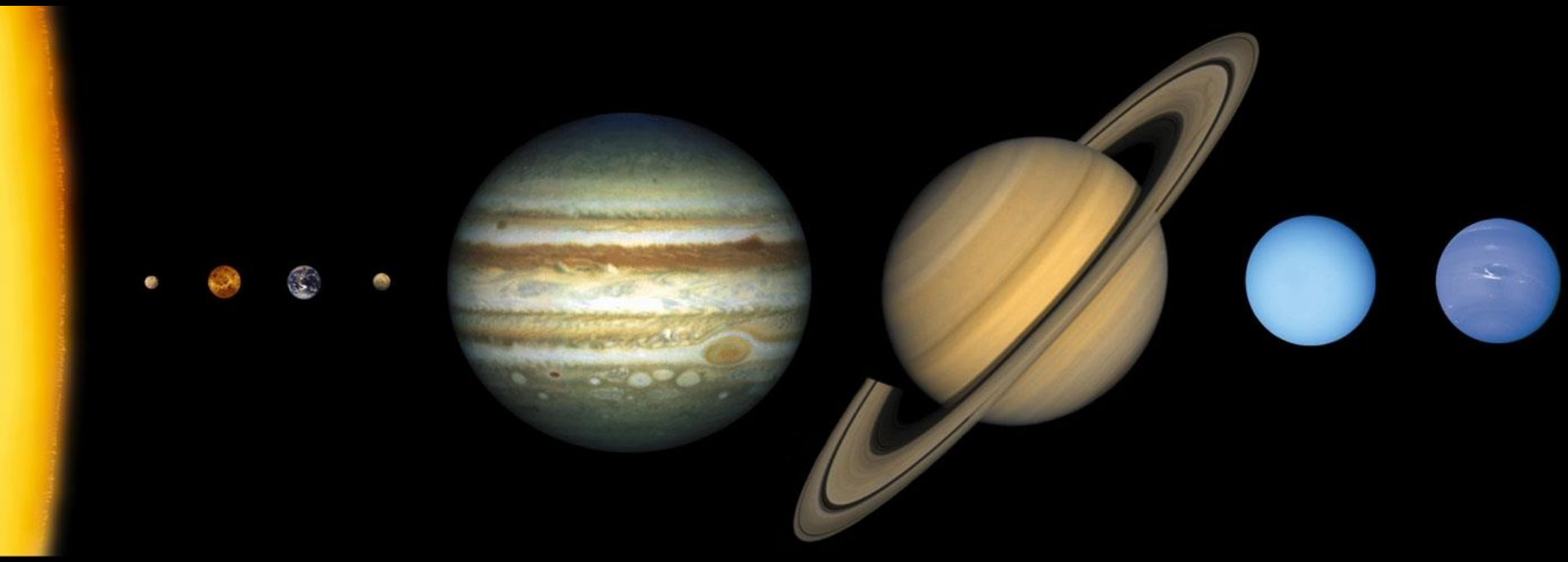


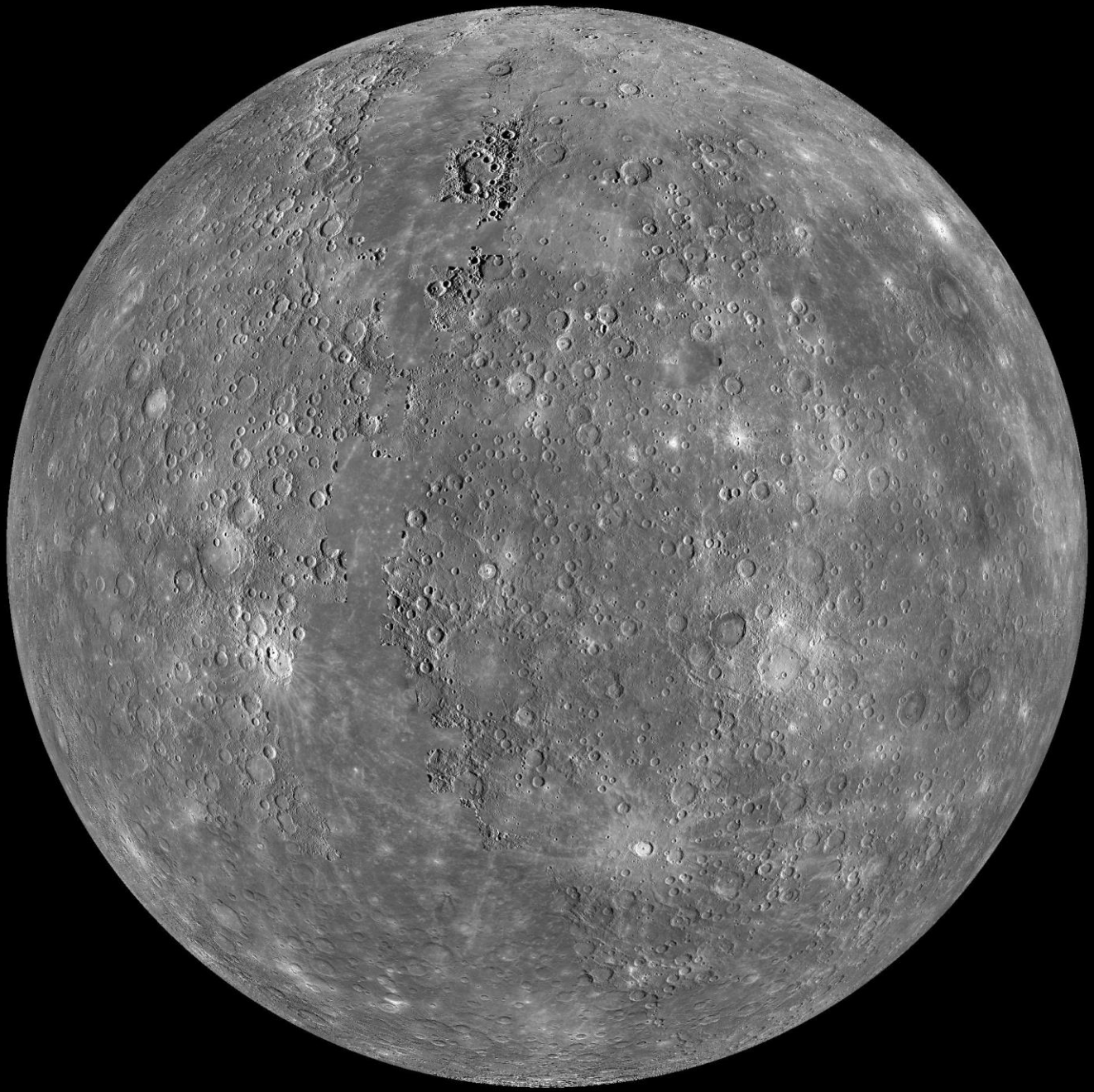


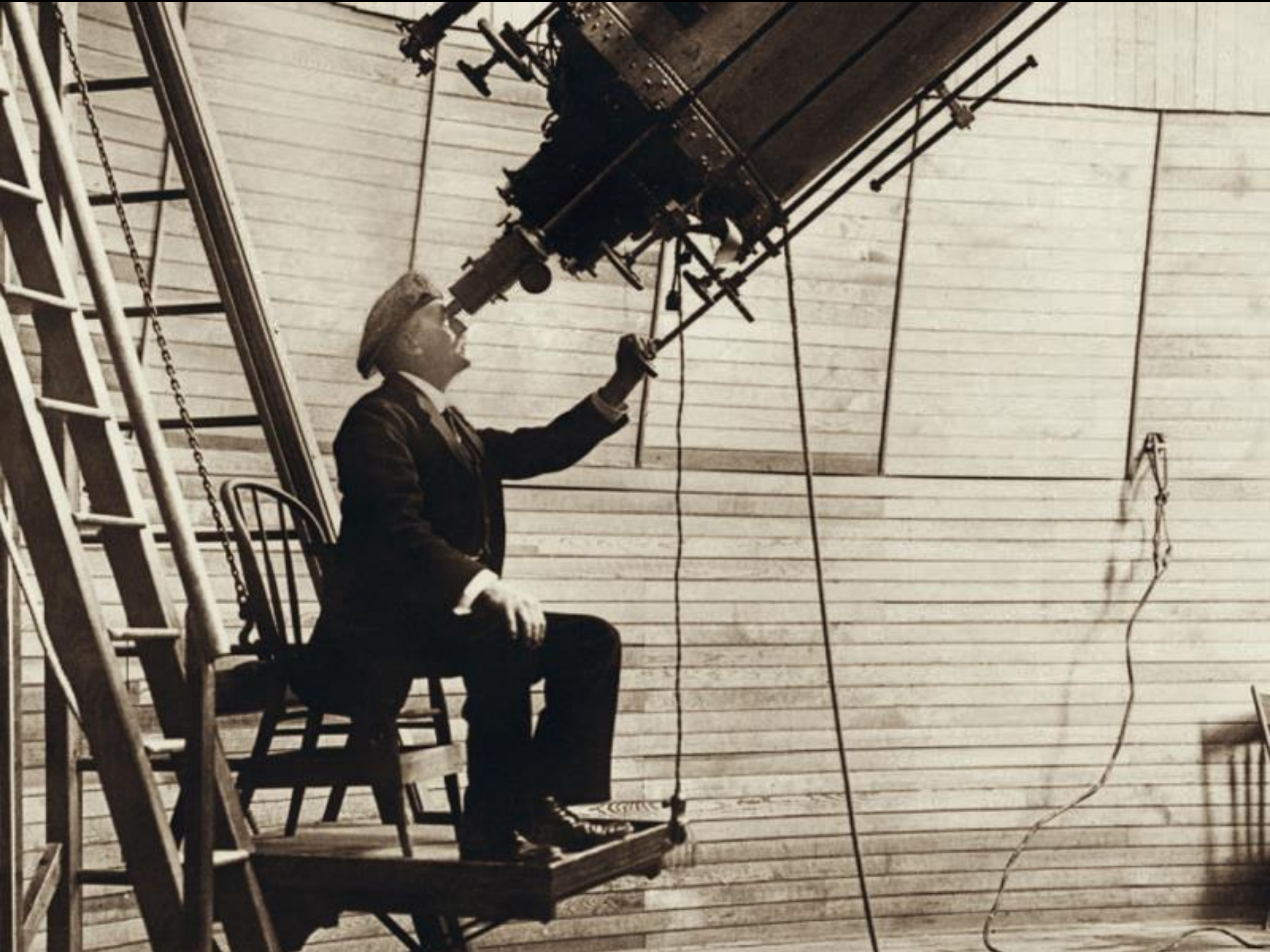


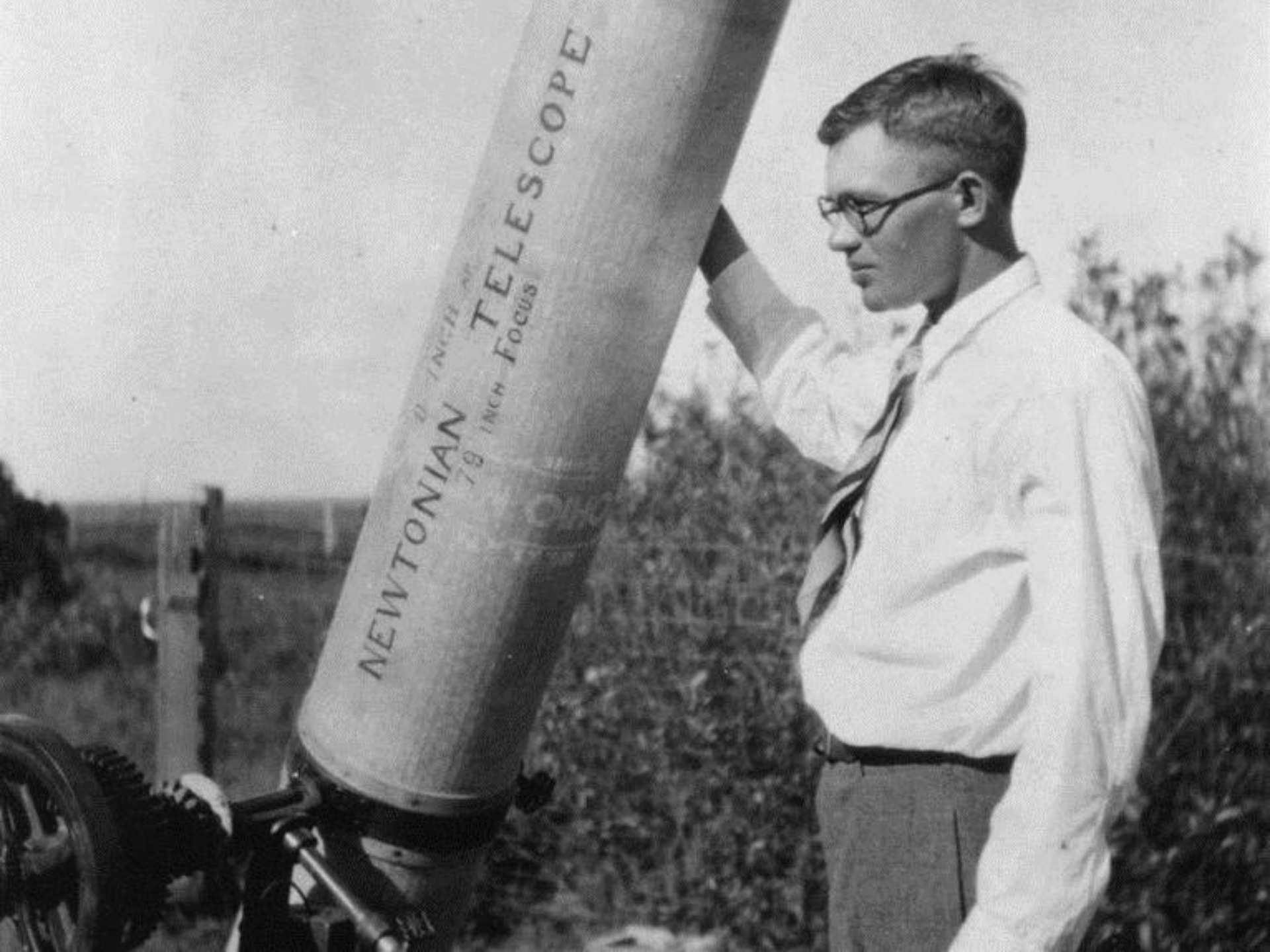








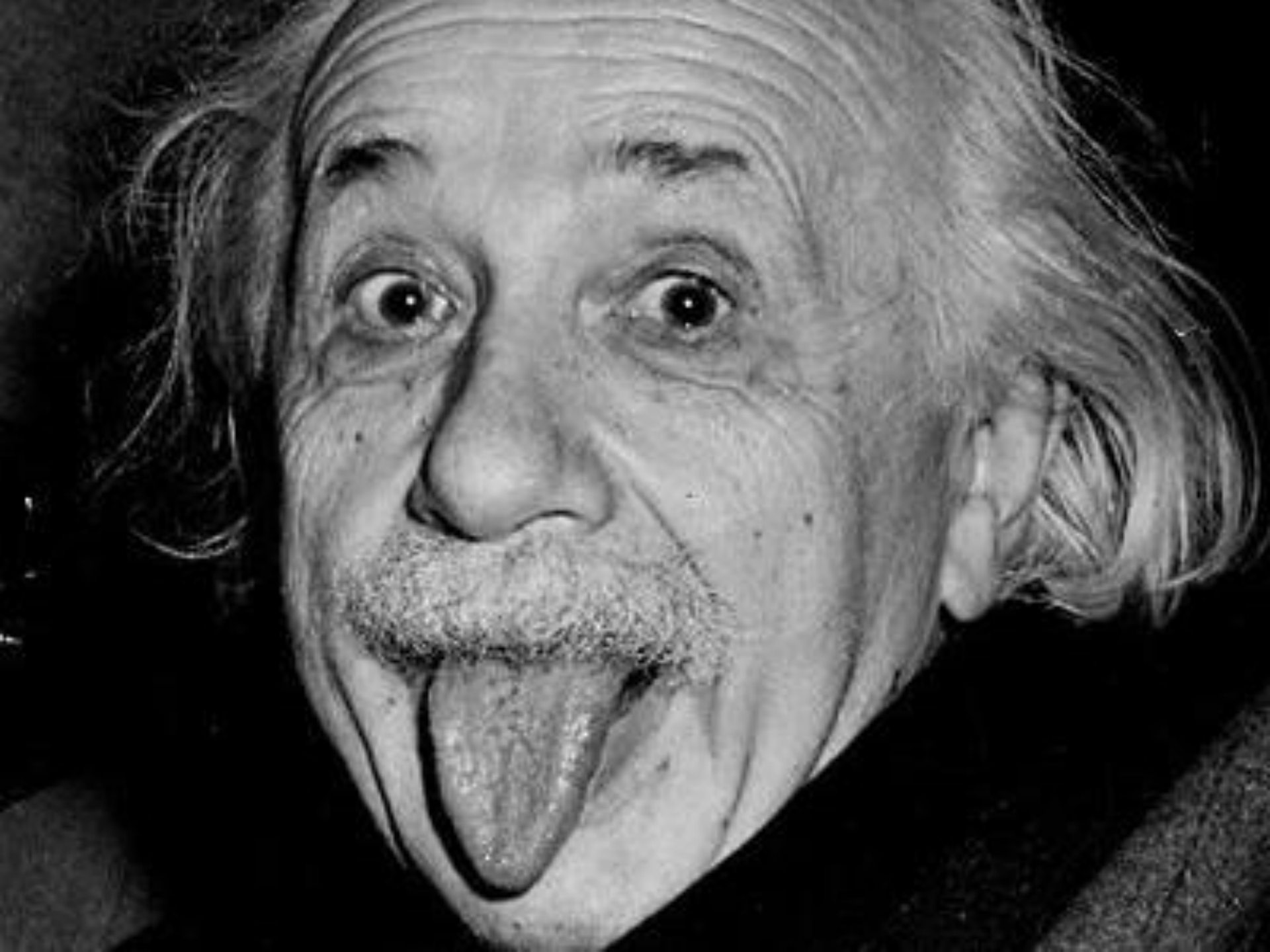



NEWTONIAN TELESCOPE
79 INCH FOCUS

DISCOVERY OF THE PLANET PLUTO

January 23, 1930

January 29, 1930



$$F = G \frac{m_1 m_2}{r^2}$$

$$E = mc^2$$

$$G_{\mu\nu} \equiv R_{\mu\nu} - \frac{1}{2} R g_{\mu\nu} = \frac{8\pi G}{c^4} T\mu_{\nu}$$

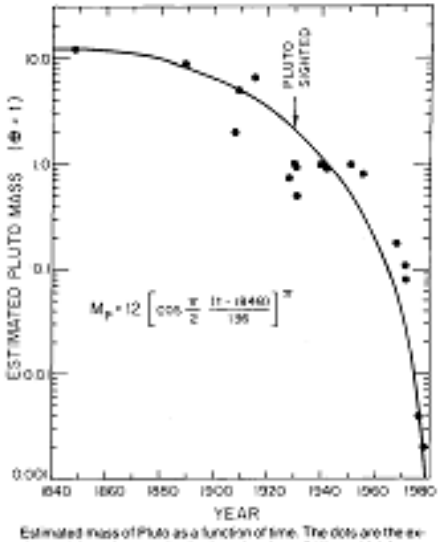
Forum

From the Ridiculous to the Sublime: The Pending Disappearance of Pluto

Pluto is so distant that it is difficult to learn much about it from direct observation. For example, starting more than 100 years ago, astronomers first postulated its existence and began estimating its mass by assuming it was responsible for observed perturbations of the orbits of Neptune and Uranus. Succeeding estimates of mass were made by the most eminent astronomers of the time; for example, estimates were made by astronomers such as Pickering, Lowell, Nicholson, Mayall, Eckert, Brouwer, and Clemence, with the latest estimate being made in 1978 by Christy and Harrington. At the recent meeting of the 50th Anniversary of the Discovery of Pluto, R. L. Duncombe and P. K. Seidelmann assembled these earlier estimates of the mass of Pluto. We have plotted these (see figure), starting with the estimate by J. Babinet in 1848 which gave Pluto a mass 12 times that of Earth. The graph clearly illustrates that while Pluto was sighted in 1930, it was sighted in the 1970's.

Let us argue that these mass estimates should be taken seriously; it is difficult to ignore those many careful analyses made by so many eminent astronomers. We argue that they are not wildly in error; notice that the points are not scattered but follow a definite systematic trend. We are only prudent when we conclude that these earlier mass estimates are largely correct; we treat these data with the respect that the effort that went into obtaining them warrants.

The consequence of following this chain of logic is to reach a most spectacular conclusion. The plot of mass versus time clearly indicates the impending disappearance of Pluto! The mass of Pluto as a function of time is fit by a cosine function raised to the pi power. It shows that Pluto's mass was first estimated when it was near its heaviest, and its mass has been dropping alarmingly during the past few years. As one might have guessed, it is scheduled to disappear in 1984, a year in which other ominous things are supposed to take place. This event may be welcomed by those of us who have been yearning for the 'good old (pre-Pluto) days' when planetary orbits were more circular; we will no longer have to tolerate Pluto's eccentricities. On the other hand, those of you interested in observing Pluto should hurry.



Estimated mass of Pluto as a function of time. The dots are the experimental data; the equation is plotted as the solid line, which is the best fit curve on which the theory is developed.

If we use our equation to extrapolate forward past 1984, we see that more interesting things are in store. After 1984, the cosine function is negative, and we all know that a negative number raised to an irrational power is Complex! That is, Pluto reappears, but with a complex mass. The real part of this complex number is negative. While this idea may seem repellant to some, Pluto will be repellant to everything at this point. The mass also has an imaginary part, but we can't imagine what effect this might have. Pluto will reappear as a real planet in 2256; this is a fortuitous time, for by then, the space shuttle will have become operational, and we will have the opportunity to institute a new planetary observation program by launching the Space Telescope. Pluto's mass will then be increasing rapidly until it once again reaches 12 Earth masses in the year 2392.

One can push mathematical extrapolations too far. Perhaps Pluto will not go negative; perhaps there is a physical explanation for this disappearing act. Velikovsky postulated that Venus was once a comet. (Despite claims to the contrary by reputable scientists, we can't prove Velikovsky wrong. While spacecraft have visited Venus, they have never visited a comet.) Pluto may be a comet also—a fresh one, since it was sighted for the first time only in 1930. We know fresh comets ablate as they approach the sun, for that is how cometary tails are born. Pluto has also been approaching the sun. It is now inside the orbit of Neptune, merrily evaporating away.

The National Aeronautics and Space Administration (NASA) is presently contemplating (which is a lot cheaper than planning, which in turn is much cheaper than building) a Halley Intercept Mission (Him). The rationale for going to Halley now despite the backlog of missions developing in the pipeline because of NASA's inability to get new missions approved (BMDPBNMGNMA) is that Halley will not return for 76 years. However, Pluto may never return! Even if we believe our conservative mathematical estimate (which conserves Pluto), Pluto will not become real again for 272 years, and who knows where it will reappear after being repellant for so long. NASA should redirect its priorities immediately and develop mission Ploto (Positively Last Opportunity to Observe) to Pluto. (We note that this name gets us off the hook if someone discovers a way to negatively observe Pluto. In the present environment, keeping off the hook has a certain intrinsic appeal to mission planners.)

In closing, we should emphasize that a few years ago astronomers would have said these early mass estimates were ridiculous. However, the present evidence suggests that Pluto is simply evaporating with time. Clearly, theories about Pluto have gone from the ridiculous to the sublime.

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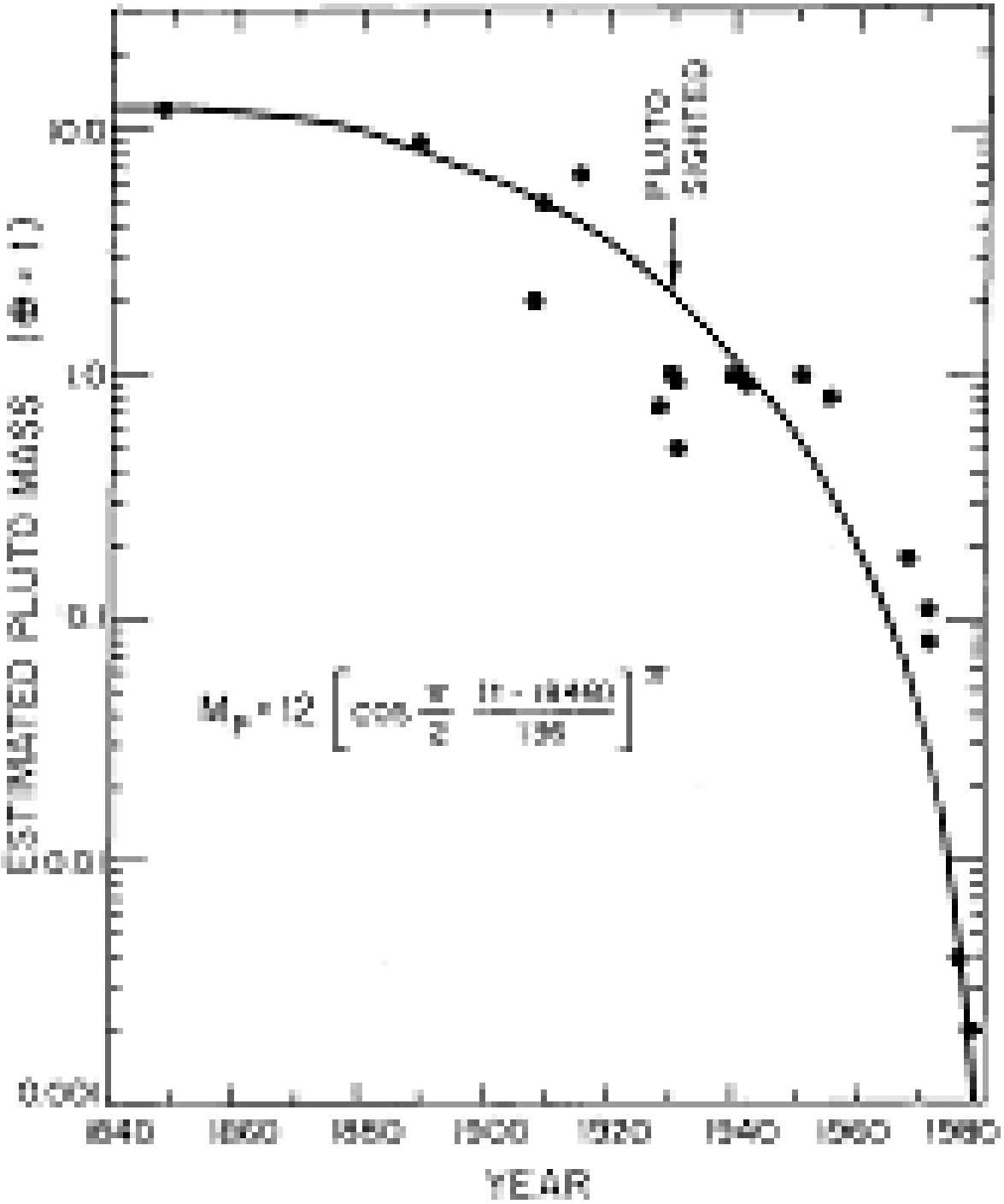
PLUTO SIGHTED
ESTIMATED PLUTO MASS (⊕ = 1)
10.0
1.0
0.1
0.01
0.001
1840
1860
1880
1900
1920
1940
1960
1980
YEAR


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