# COMETS

## CAROLIN CRAWFORD
## GRESHAM PROFESSOR IN ASTRONOMY

Dave Curtis

ISTI MIRANT STELLA

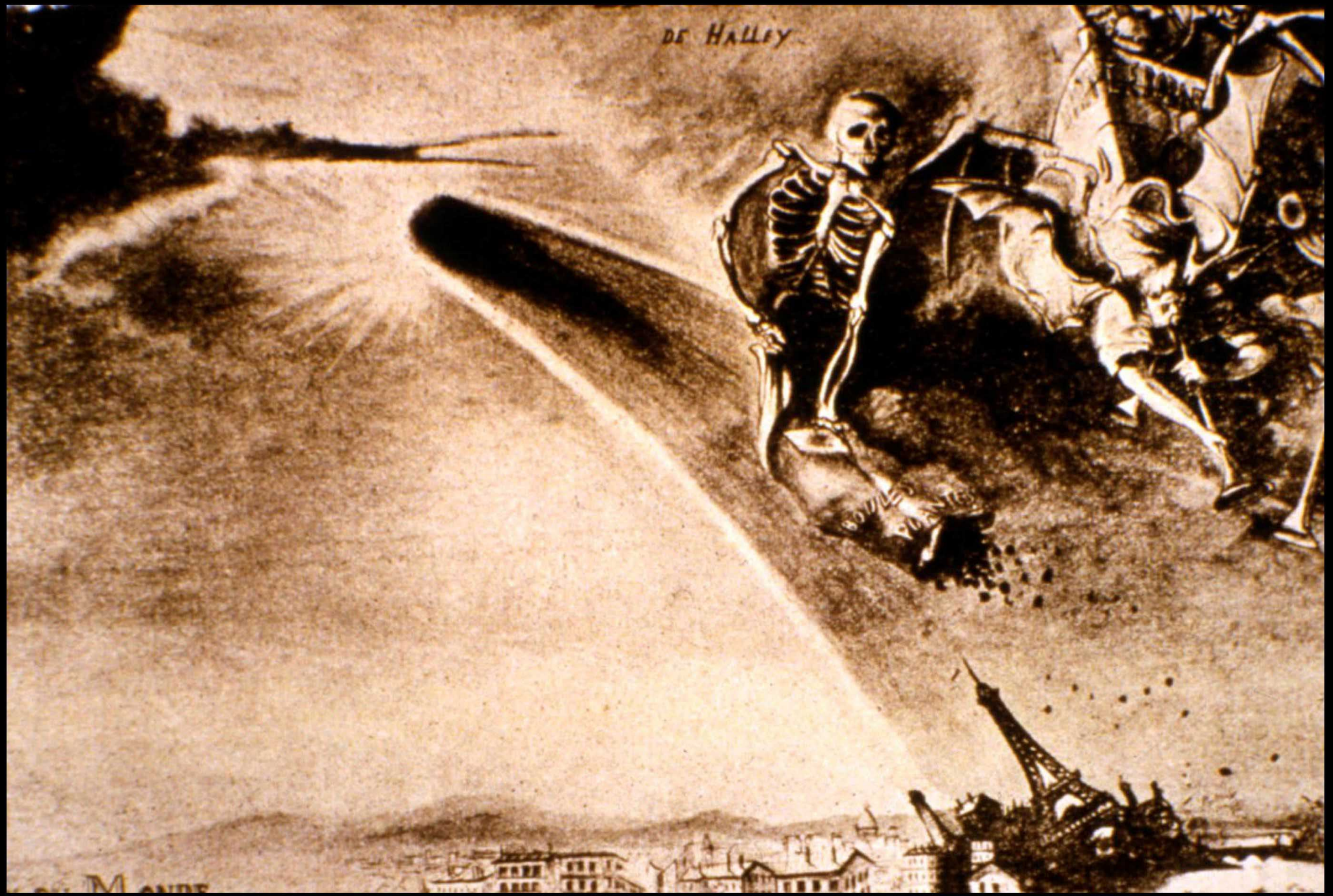
HAROLD

1066

Actualités Astrologiques

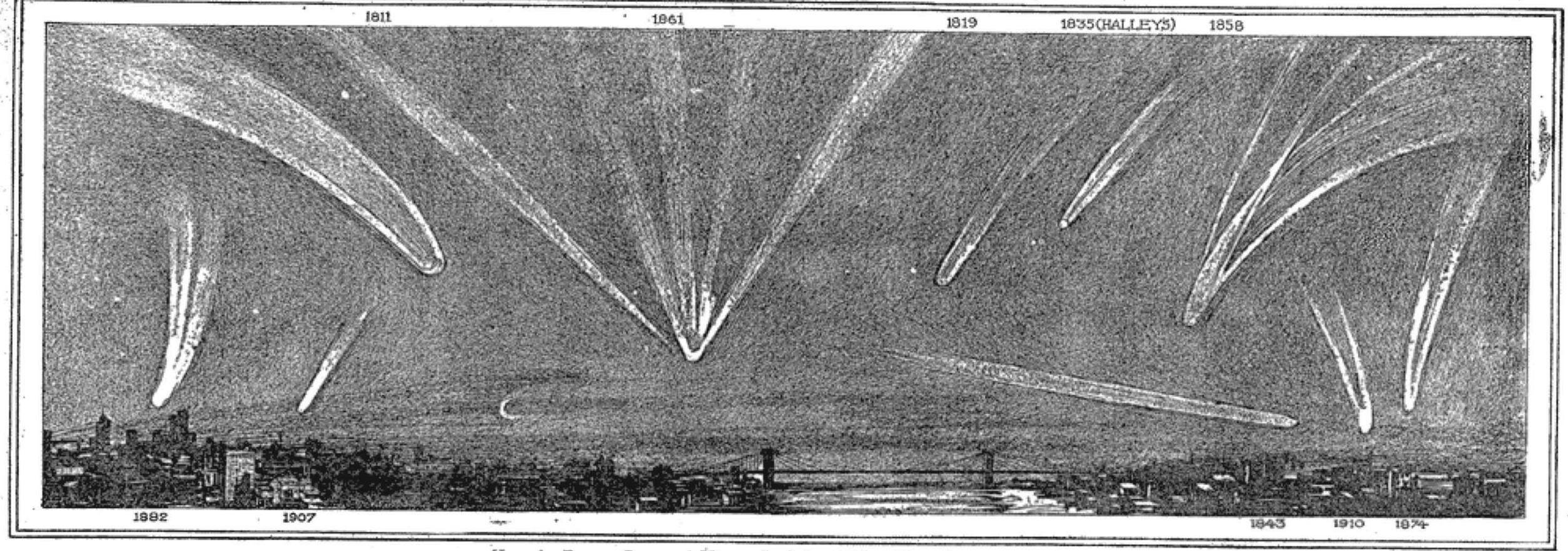
L'Apparition Foudroyante et Désastreuse de la Comète du 13 Juin 1857

1857




HALLEY'S COMET 191

# FEARS OF THE COMET ARE FOOLISH AND UNGROUNDED




How the Famous Comets of History Looked and How They Compare in Size.

## Mary Proctor Tells of Similar Scares in the Past, Occurring Every Time These Blazing Visitors Were Expected, and All Proved Groundless.

By MARY PROCTOR.

A DISMAL report is circulating to the effect that Halley's comet is about to cause the destruction of our planet, and as we draw nearer the fateful date of May 18, a grave feeling of apprehension is excited in the minds of those who are very naturally afraid of something they cannot understand.

Here is a gigantic monster in the sky with a head over two hundred thousand miles in width, (according to measures recently made by Prof. Barnard of the Yerkes Observatory,) and a train two million miles in length, rushing through space at the alarming rate of a thousand miles a minute.

On May 18 the earth will be plunged in this white hot mass of glowing gas, and, according to the report of the ignorant and superstitious, the world will be set on fire.

These sensation makers further say that the oceans on the side facing the comet will be boiled by the intense heat, and the land scorched and blistered as the dread wanderer passes by on its baneful way.

How the report started, and by whom it is difficult to trace, but the harm is done. We hear daily of people overcome with terror, one committing suicide, preferring to choose his own manner of death rather than await the coming of the final destruction of the earth. Another has gone insane, and numberless other cases, if known, might be added, showing the harm which has been done by the sensational articles which have been published accompanied by lurid illustrations showing the combination of good and evil influences attributed to one and the same comet on this momentous occasion.

It would be well if our own times were free from these idle fears concerning cometary influence, for it would prove that men were unaffected by the debasing effects of ignorance and superstition.

Why should bodies traveling uniformly in definite paths under the influence of the law of gravity be regarded as special messengers warning men either of good or evil approaching them?

Good and evil prevail in the world, comet or no comet, but the broad shoulders, or rather head, of Halley's comet must bear the blame of every disaster likely to occur on or before the fateful May 18.

A man who could believe that Halley's comet, whose return was predicted within four weeks in 1759, and within three days, (so greatly has our knowledge of the planets and their disturbing influence on the planets increased,) in 1910, was a messenger specially sent from heaven on these occasions, or on the other occasions during which it has visited our neighborhood during the past 2,000 years, would believe anything. In such a case reasoning is almost hopeless.

Astronomers are being suspected as conspiring together to keep the uninitiated in ignorance of the true fate awaiting our planet. They are besieged with letters and inquiries as to the threatened end of the world, and when Sir David Gill stated at a lecture given a few weeks ago in London that we knew little or nothing about comets, a lady was heard to remark:

"It is his business to find out. He ought to be ashamed of himself, inviting us to come to a lecture on comets, at 4 shillings a seat, and then telling us he does not know anything about them."

Where do the comets come from? Where are they going? Are they going to hit the earth? Will it really be destroyed by fire? These are some of the endless questions asked, and answered to the best of an astronomer's knowledge, through the comet and we will all burn up? Tell me if it is true, also when shall we be able to see the comet! Please excuse this letter, but I don't want to die."

So alarmed are certain ignorant and superstitious Chinese, on account of the announcement that the earth will pass through the train of the comet, with a possible bombardment of cometary material laden with the poisonous gas cyanogen, directed toward Japan, China, and India, that it has been found necessary, by the Chinese Literature Society to issue posters giving reproductions of Halley's comet as delineated on the famous Bayeux tapestry, by Matilda of Flanders in 1066.

Queen Matilda had drawn all the most memorable events in the eventful career of her husband, William the Conqueror, and the comet which was considered responsible for his defeat of Harold at the Battle of Hastings is represented in one of the corners with the inscription, "Isti Mirantur Stellam," which proves that it was considered a veritable marvel.

It is said even to be traditionally reported that one of the jewels of the British crown was taken from the tail of this comet!

William the Conqueror looked upon the comet as a good omen in his favor, stating that it was a sign from heaven that a kingdom wanted a King.

However, it was viewed with special alarm by the English, who attributed the downfall and death of Harold to its' baneful influence. The woe-begone look on Harold's face, as he received the tidings of William the Conquerer's arrival at Hastings, is also faithfully depicted by Queen Matilda on the Bayeux tapestry, yet the fearful go away shaking their heads, dreading they know not what, and reminding one of the numerous victims of comet scares in days gone by.

As recently as November, 1872, such a comet scare prevailed, causing people almost to die of fright, and the following is an extract from a letter which was published in an Atlanta newspaper at that time:

"The fear which took possession of many citizens has not yet abated. The general expectation hereabouts was that the comet would be heard from on Saturday night. As one result, the confessionals of the two Catholic churches were both crowded yesterday evening.

"As the night advanced there were many who insisted that they could detect a change in the atmosphere. The air they said, was stifling. It was wonderful to see how many persons gathered from different sections of the city around the newspaper offices with substantially the same statement.

"As a consequence many families of the better class kept watch all night, in order that if the worst came they might be awake to meet it. To-night all the churches are full, and sermons suited to the terrible occasion are being delivered."

In 1858 Donati's comet was seen by Mr. Willis Barnes at Latrobe, Penn., and he relates the following as giving an instance of the fear inspired by this comet. He said that there was a German woman who entertained young and old by telling them marvelous stories of the marching armies she could see in the sky, following in the train of the comet, and she prophesied that a great war was at hand. When the civil war of 1861 broke out. It was considered that her prophecy had come true.

This was the old idea, that comets bring in their wake war, pestilence, and death, and apparently from the present feeling of alarm which has been exhibited, it would seem that the old ideas still prevail.

Only a few days ago a report came from Vienna that the peasants in a small Hungarian village were in momentary expectation that the world would be smashed to atoms by coming in contact with Halley's comet.

They expected the encounter, and as a result one of their watchmen, seeing a blaze in an adjoining village, immediately arrived at the conclusion that the end of the world had come.

He went through the village blowing a horn, so as to awaken every one, and making the terrible announcement to those who hastened out of doors to learn the cause of the alarm, that the end of the world was at hand.

The women and children screamed with fright, and the men, overcome with terror, hastened into their homes and procured all the eatables obtainable. These were taken to a square in front of the church, where a great fire was lighted, and every one feasted. In between mouthfuls, we are told, the villagers prayed.

And this took place in the present enlightened days, when the appearance of a comet in the sky should be welcomed with delight, though, of course, in this instance, there was some excuse for the ignorance of the peasants.

But there are people nearly as bad living in cities within reach of all the advantages of education, and with numberless opportunities provided to hear the best authorities lecture on Halley's comet and allay their fears by a clear, rational explanation of the peculiarities of these celestial wanderers.

How can these objects which are made of material so filmey that we can see stars right through their trains, as easily as the light of a candle can be seen through a gauze veil, do us any harm?

Even though we "plunge through it," as some writers describe it, at a rate exceeding that of a cannon ball fifty times, or about 1,000 miles a minute, no more harm can come to us, as Sir Robert Ball stated recently at a lecture, than if a rhinoceros plunged through a spider's web.

In fact, the earth plunged through the train of a comet which appeared in the year 1861 without any harmful results. On that occasion an observer records that "the sky had a yellow, aurorral, glare-like look." The comet was plainly visible during sunshine at 7:45 P. M.

In confirmation of the statement that there was something unusual and indescribable happening, E. J. Lowe, the well-known meteorologist, states that in his parish church the vicar had the pulpit candles lighted at 7 o'clock, which proves that some sensation of darkness was felt even while the sun was shining.

Though unaware at the time that the comet's tail was enveloping the earth, he was so struck by the singularity of what he saw that he made the following entry in his day-book:

"A singular yellow phosphorescent glare, very like diffused Aurora Borealis, appeared, yet, being daylight, such Aurora could scarcely be noticeable. The comet itself," he states, "had a much more hazy appearance than on any subsequent evening."

In the accompanying illustration, the comet of 1861, is the one of fan-like structure, with some six or seven tails. The fact that the earth passed through the train of this comet was known to comparatively few, until after the event was over.

Next to it and in the upper left-hand corner of the same illustration ,is a drawing of the magnificent comet which appeared in the year 1811.

It had a train 100,000,000 miles in length, or long enough to reach from the earth to the sun and about 6,000,000 miles beyond.

The width of the train at the end was about 15,000,000 miles. No wonder this flaming object in the sky excited the utmost fear and a dread that it was a messenger announcing the end of the world. Even the so-called Daylight comet, better known as Comet 1910A, and shown in the lower right-hand corner of the illustration, excited a comet scare on a small scale.

The peasants in Portugal prayed when they saw it in the evening sky. The French thought it was the cause of the disastrous floods which occurred during the month of January, and in England some feared that it might have something to do with the downfall of the House of Lords.

To return to Halley's comet, there is absolutely no reason why any alarm should be felt on its account. Even when at its nearest, it will be some 14,000,000 miles distant from our planet, and unless its train increases from its present length of 2,000,000 miles there will not even be the possibility of our planet being immersed in cometary débris on the night of May 18 at 11:30, as announced.

Like a huge moth the comet hovered near the sun, that is, comparatively near, on April 20, for the distance in actual miles was about 100,000,000.

It then passed rapidly on its way, but not unscathed. Like the moth which ventures too near the flame of the lamp, the comet has been singed by the fierce glare of sunlight beating upon the particles of which it is composed.

These have been driven away from its head in consequence, and spread out like a mighty fan millions of miles in width.

As it recedes from the neighborhood of the sun the train will gradually diminish in size, until finally the comet disappears in space in the undecomposed condition in which it first made its appearance.

The poisonous cyanogen gas, which has been detected in the composition of the train, should in no way cause unnecessary alarm.

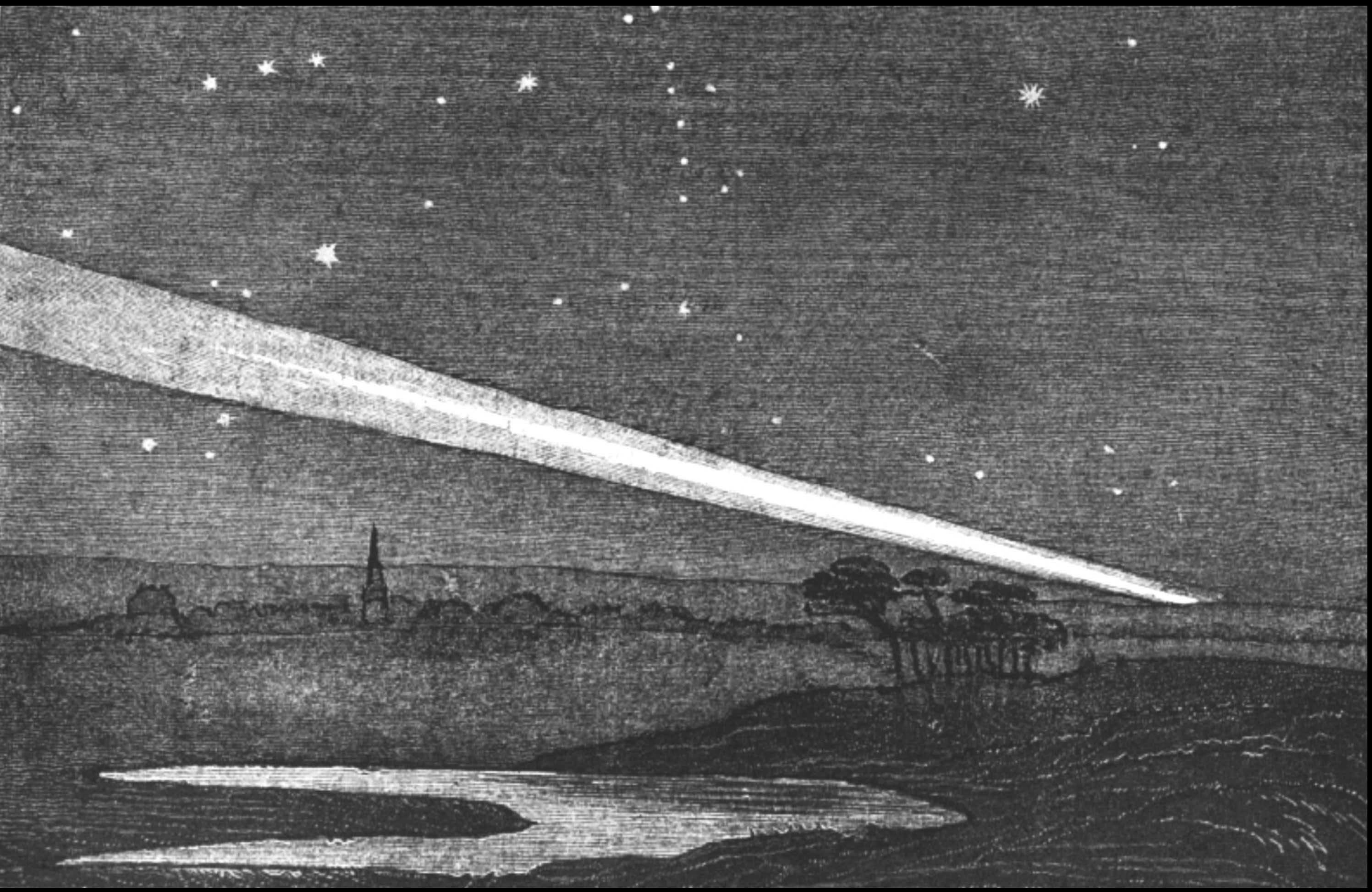
Though the size of the comet is enormous, the particles of which it is made are excessively minute.

"As a result," according to Prof. Mitchell of Columbia University, "the number of particles per cubic mile in the comet's tail is vanishingly small. Hence, though there may be cyanogen gas in the tail, it is there in such small quantities that could we have a cubic mile of the tail concentrated into a glass beaker in the laboratory it would probably take the

# THE GREAT COMET OF 1860

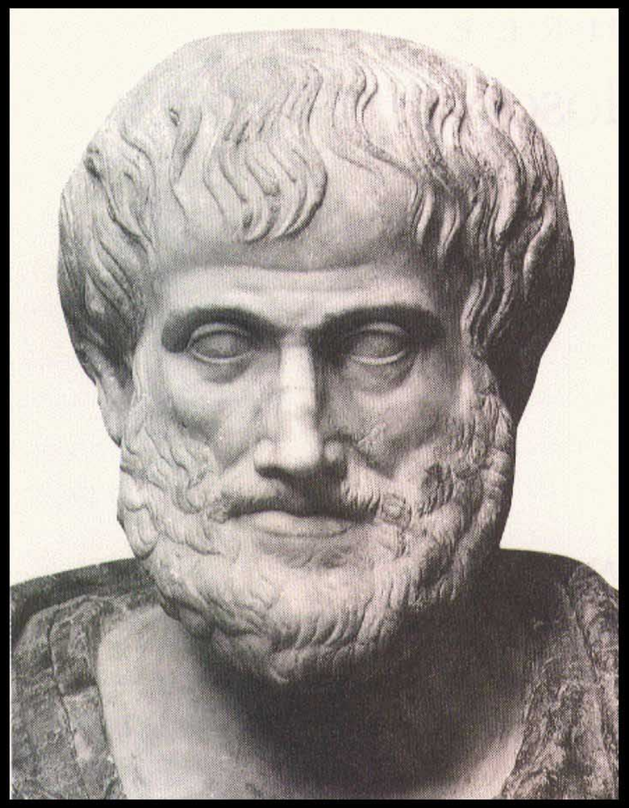
Lieve Verschuier

# THE GREAT COMET OF 1843



~300BC

NASA/JPL



# ARISTOTLE ( 4th century BC)

1577

# TYCHO BRAHE (1546-1601)

EDMUND HALLE
(1656-1742)

1682

1607

1531

1456

1910

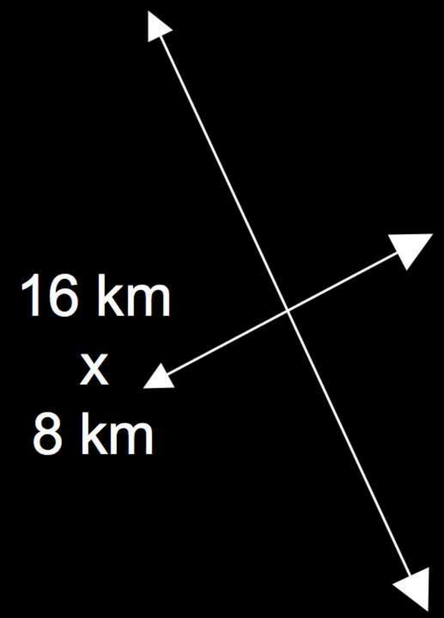
# HALLEY'S COMET 1986

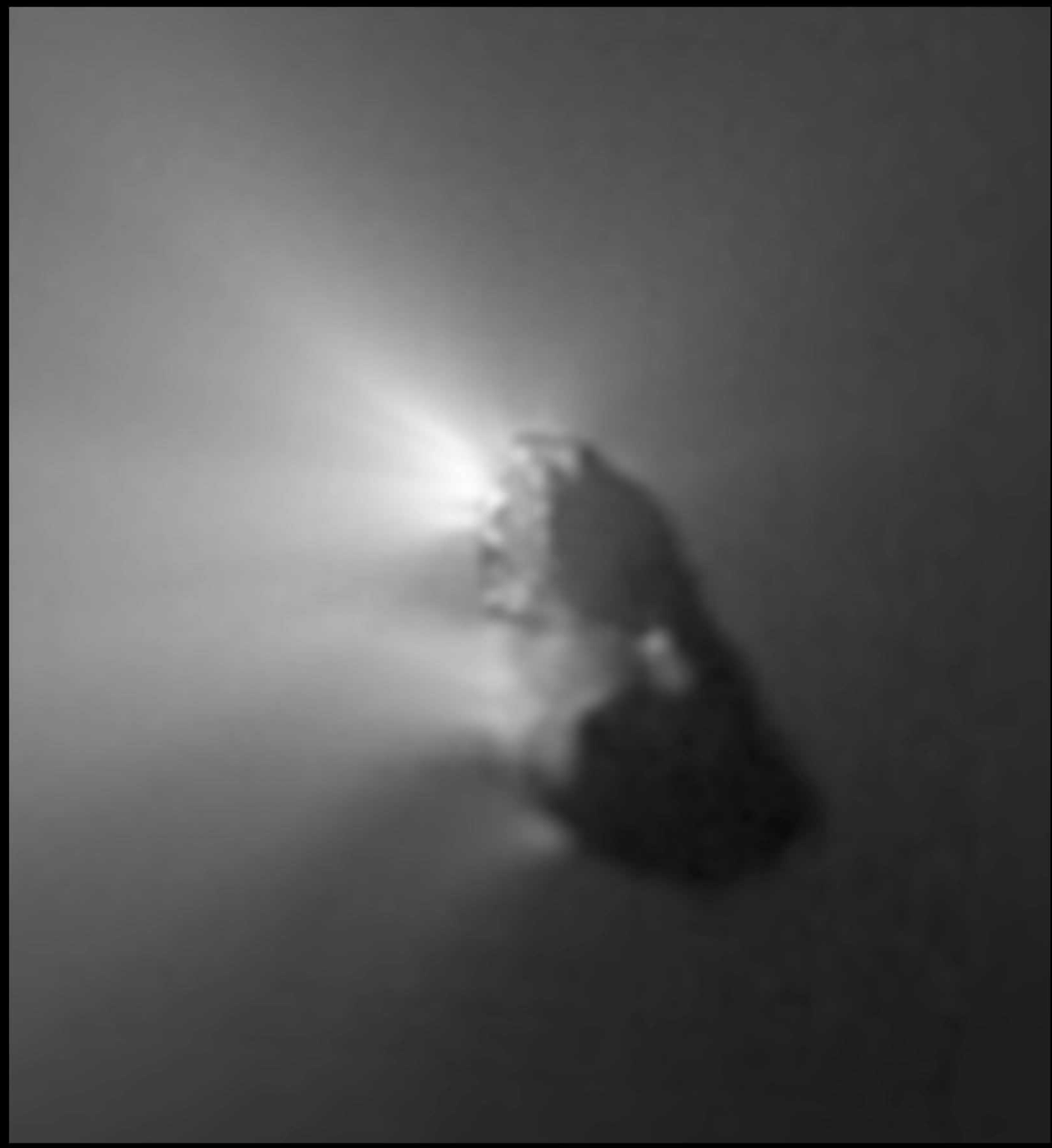
W Liller

# COMET ISON

Michael Jager

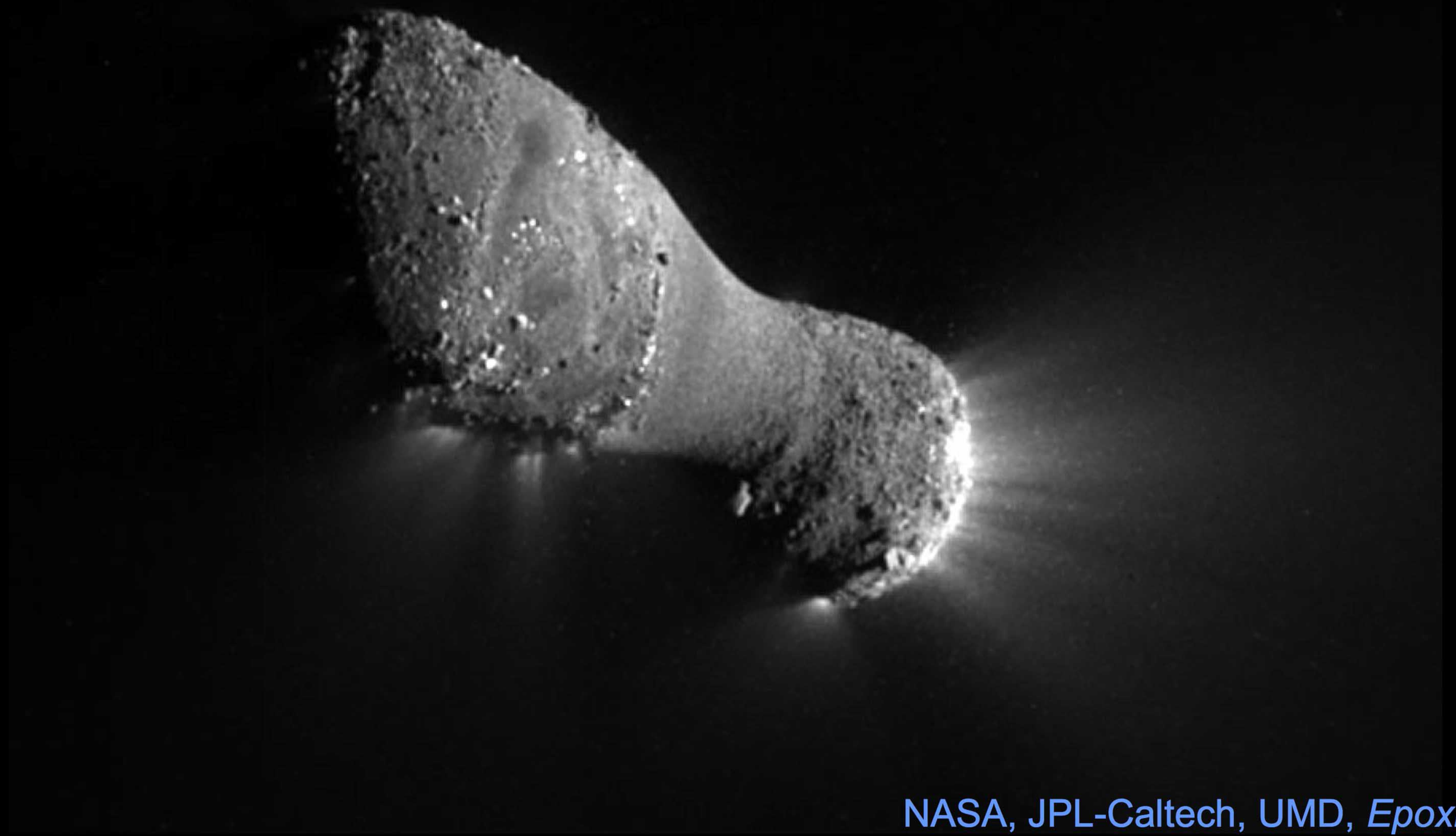
# HALLEY'S COMET 1986



*Giotto* project,ESA

# COMET HARTLEY 2 2010



NASA, JPL-Caltech, UMD, *Epoxi*

# HALLEY'S COMET 1986

*Giotto* project,ESA

# COMET HOLMES 2007

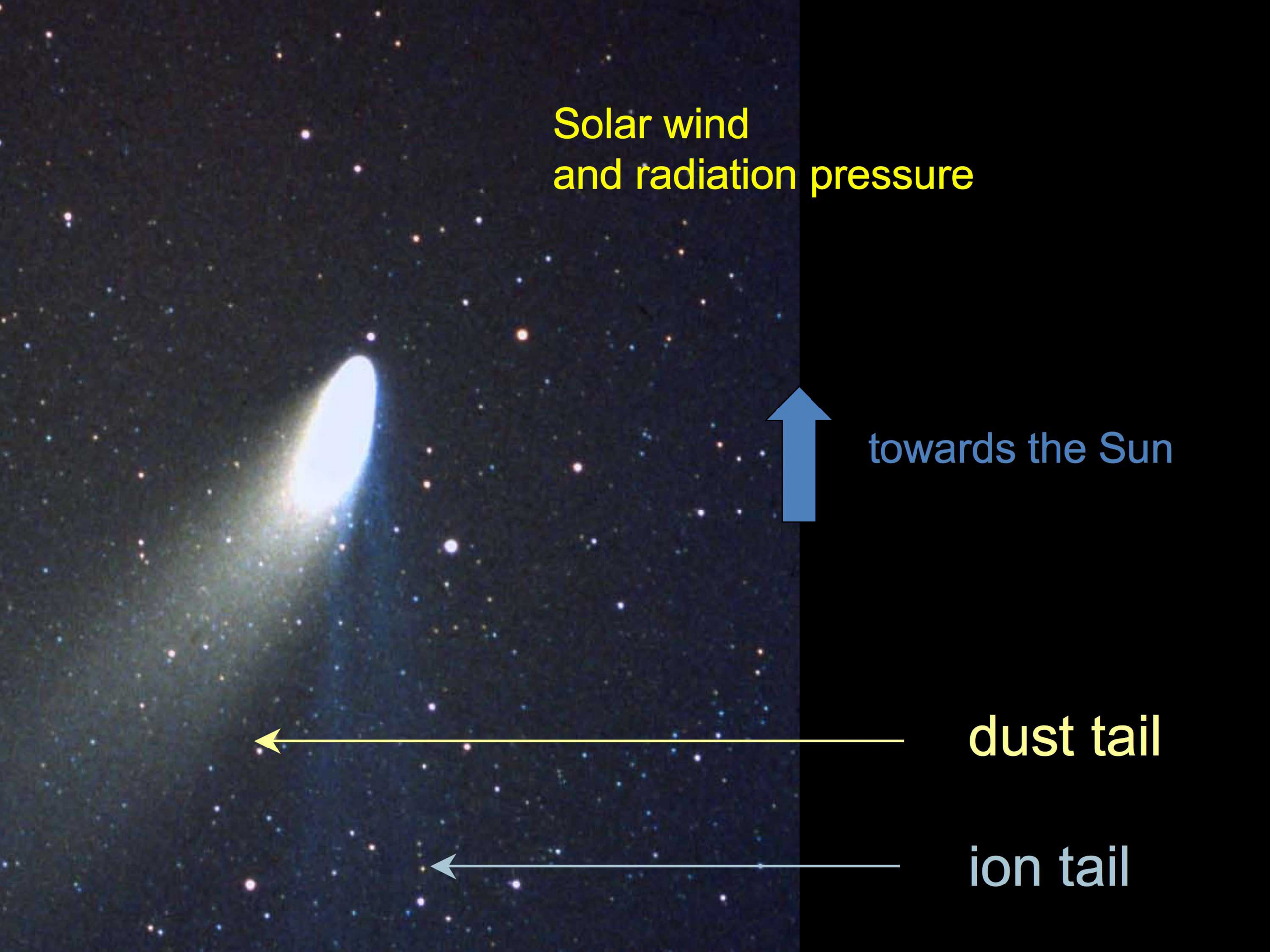
Tamas Ladanyi

# COMET MCNAUGHT 2007

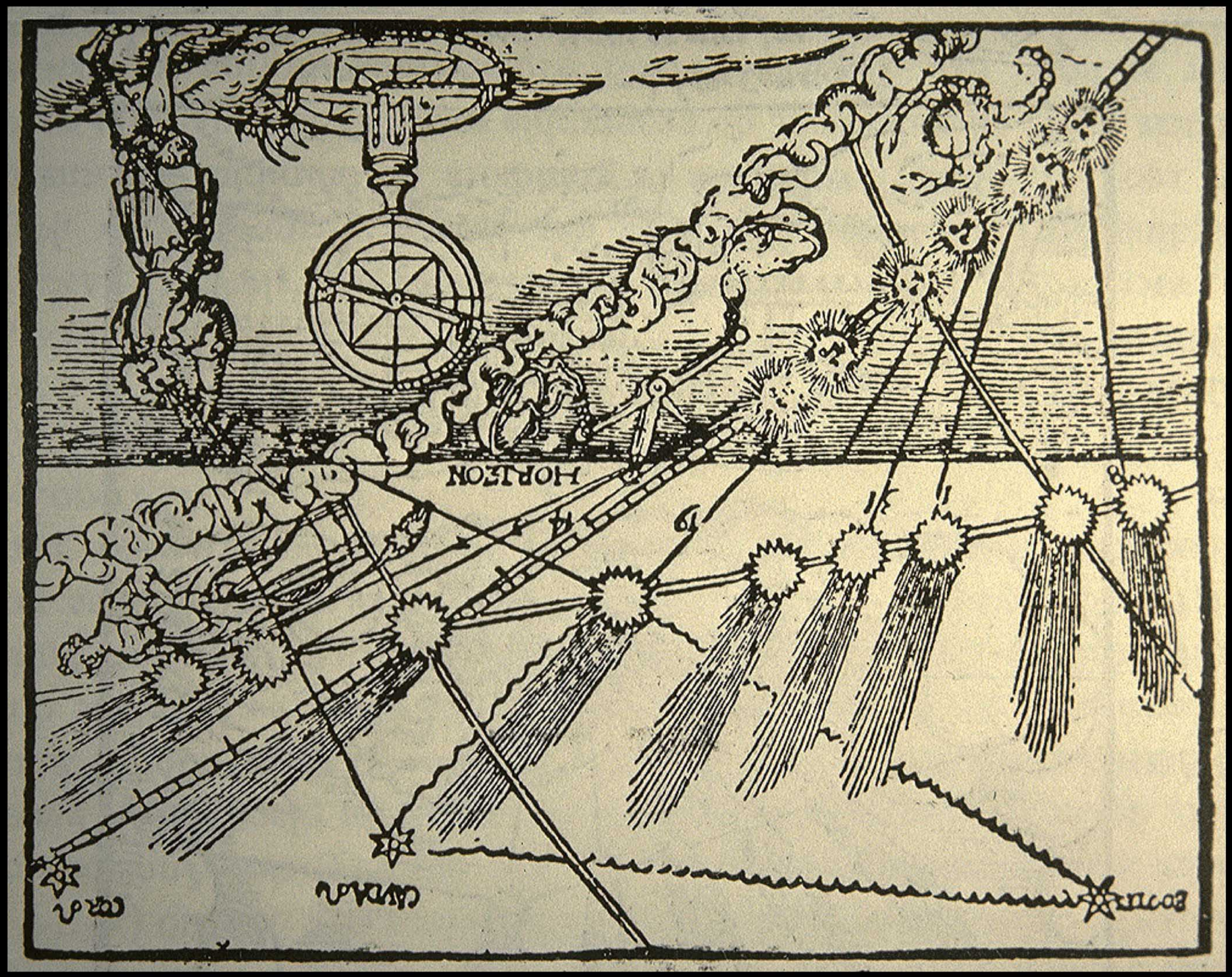
ESO

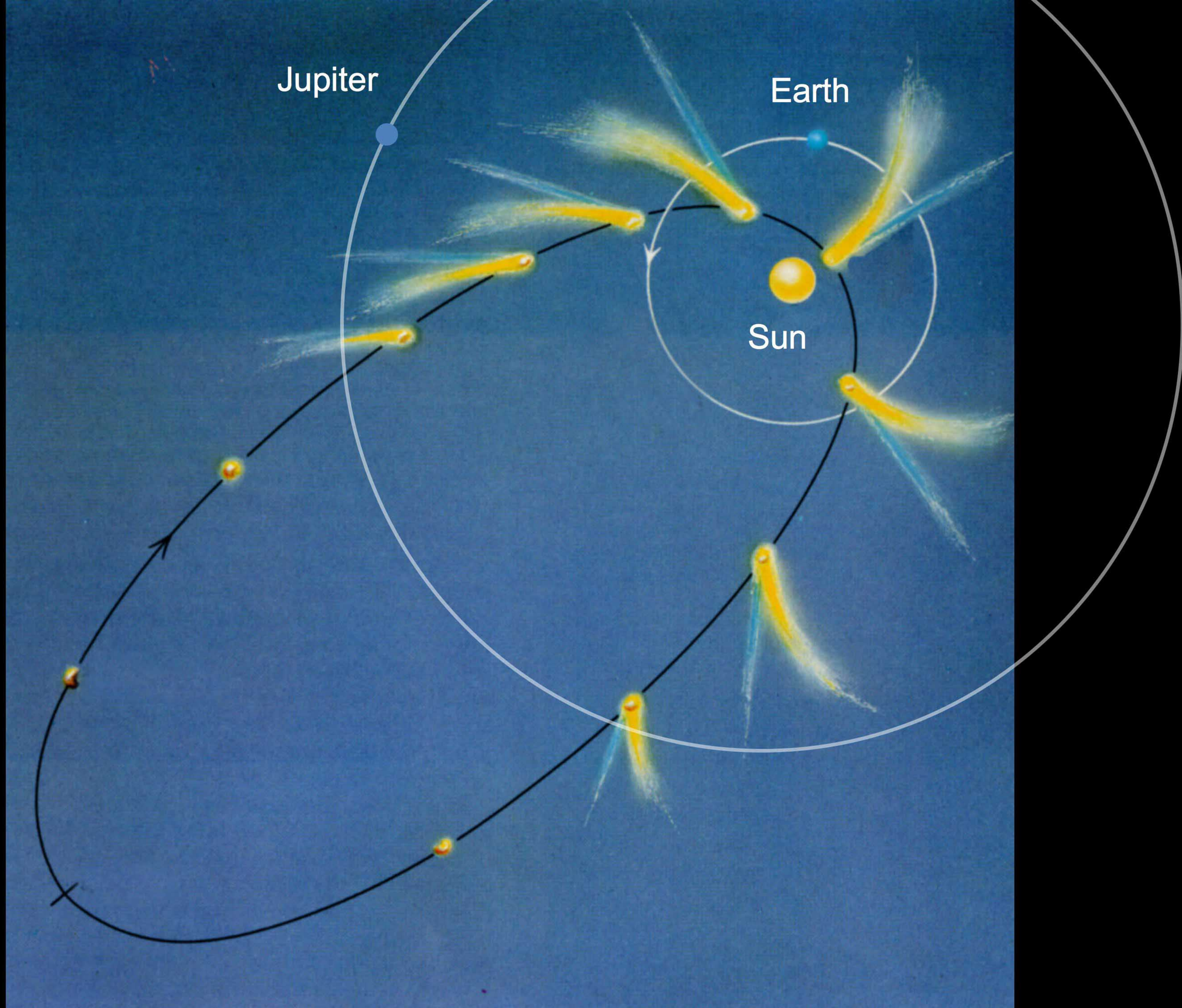
# COMET WEST 1975

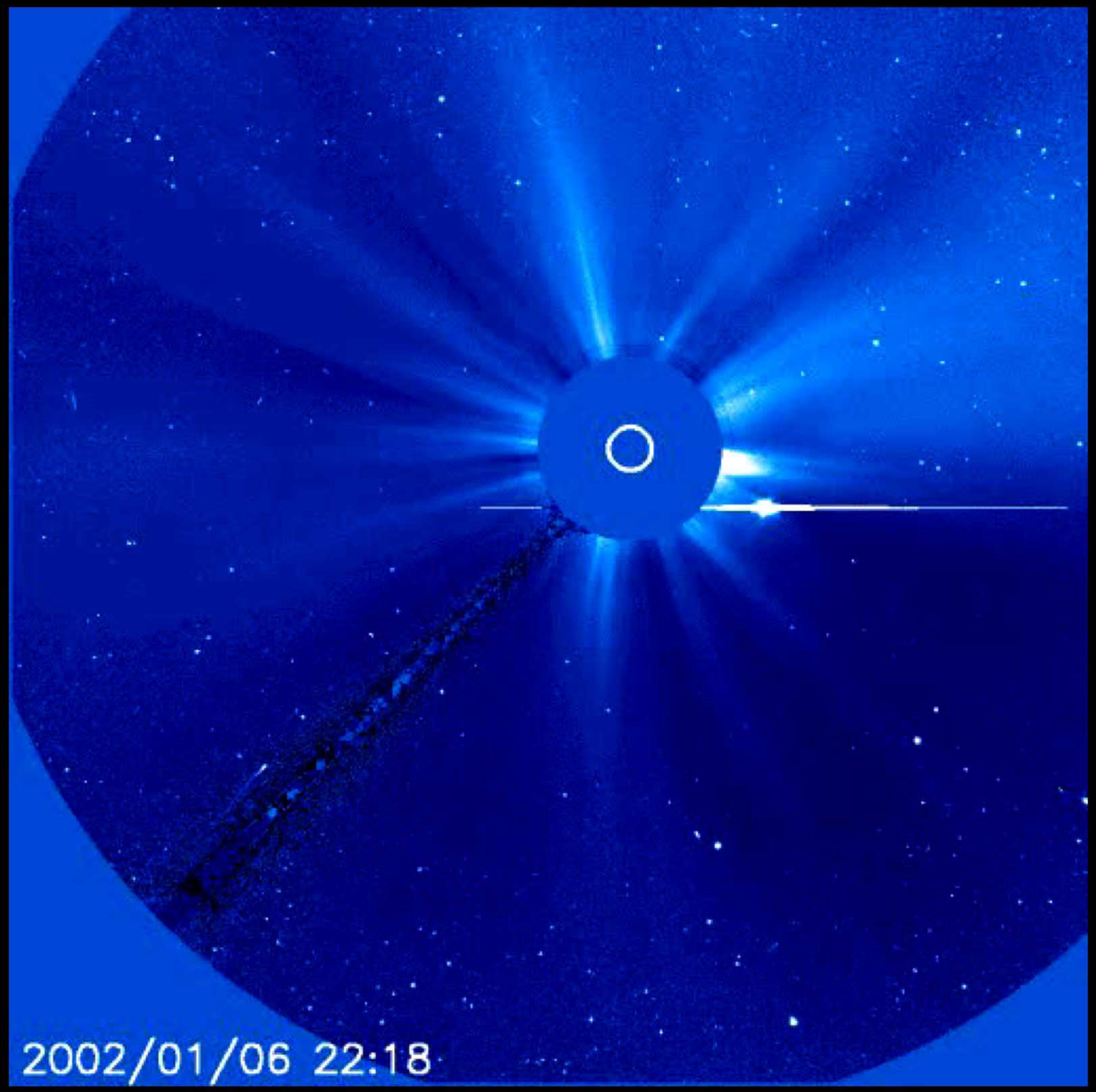
John Laborde


Solar wind
and radiation pressure
towards the Sun
dust tail
ion tail

1532



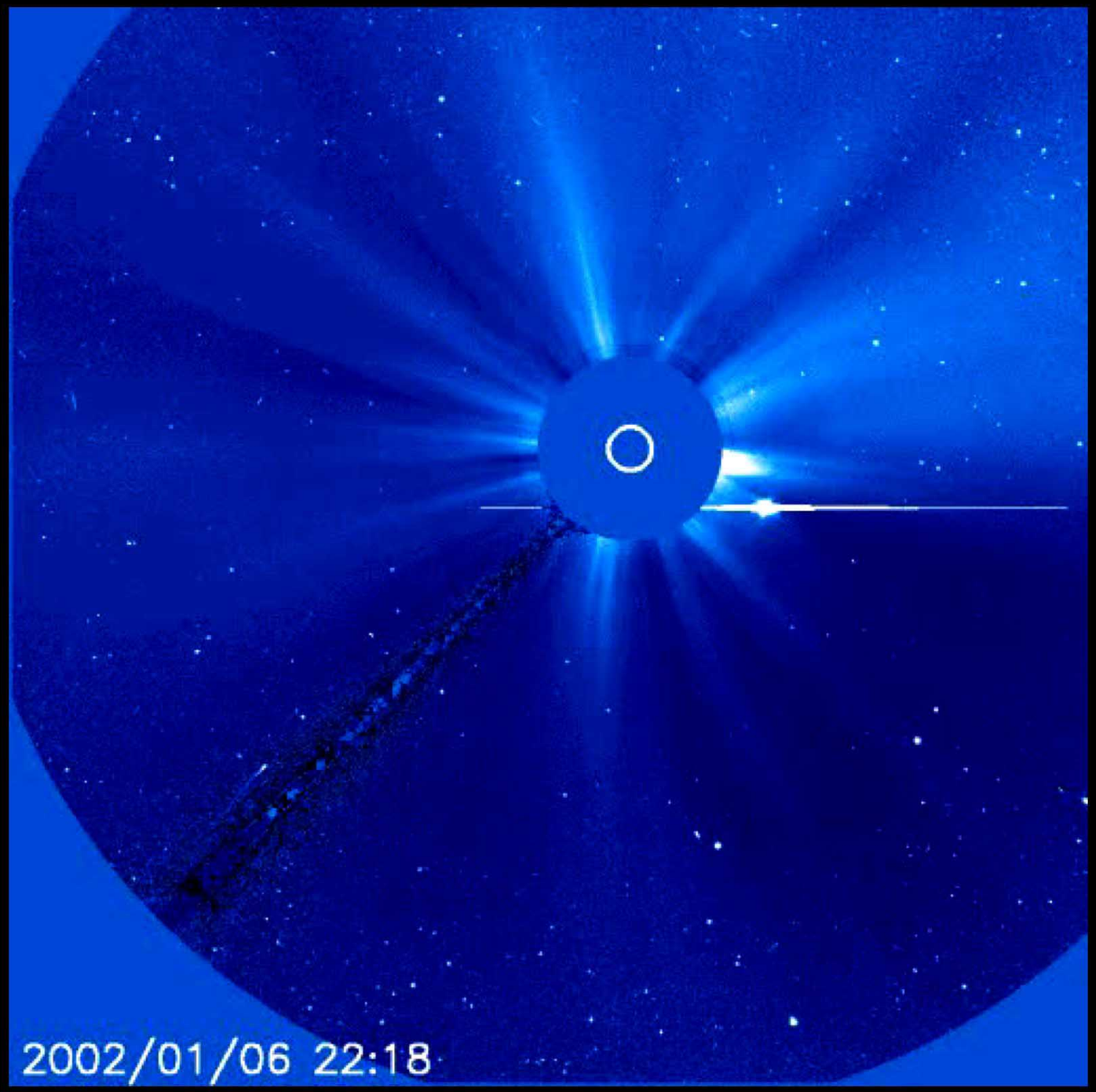

Jupiter
Earth
Sun




NASA/ESA/SOHO

# COMET MCNAUGHT 2007

Stephane Guisard




NASA/ESA/SOHO

# COMET LEMMON

Gerald Rheman

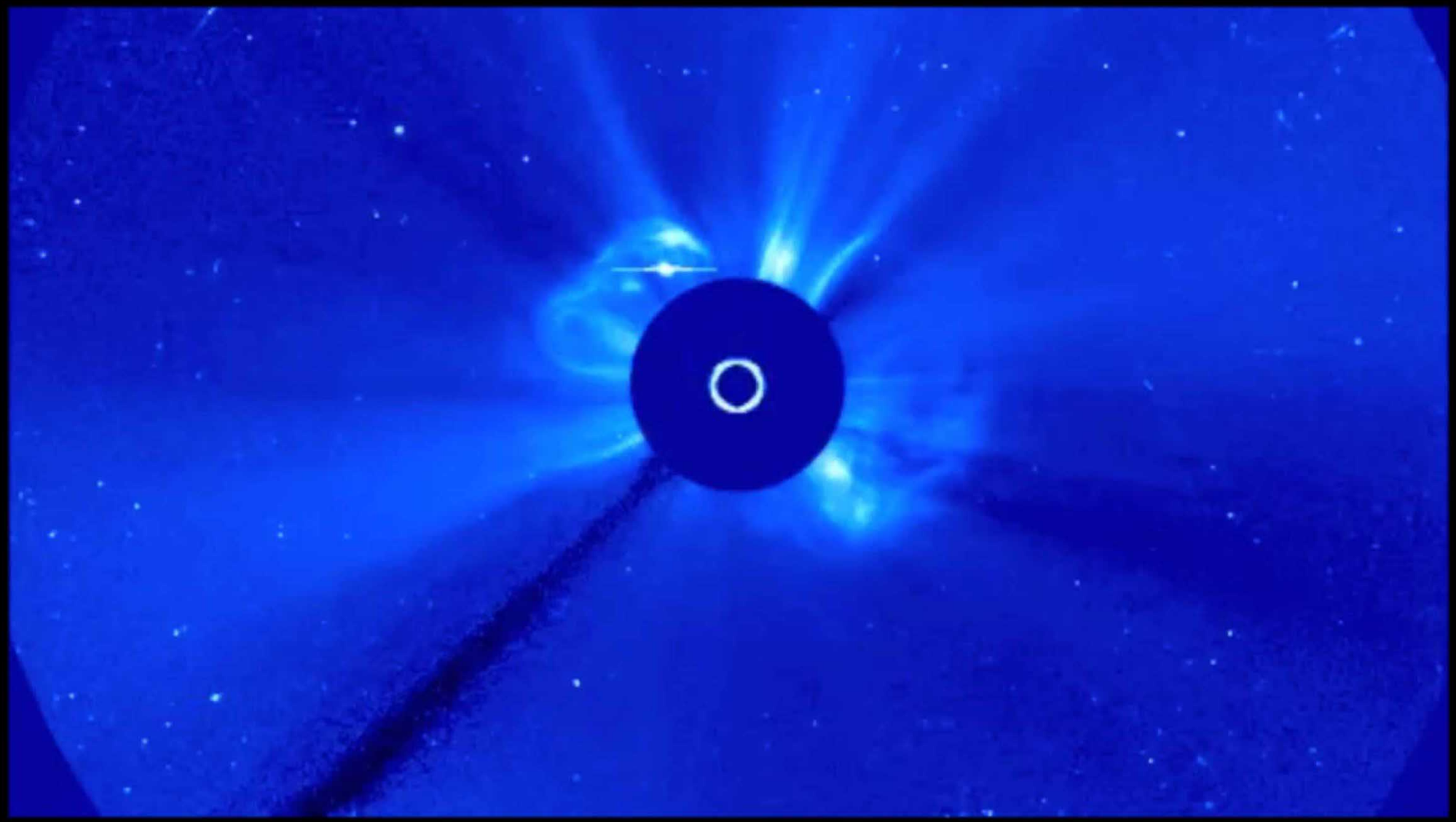
# COMET HALE-BOPP

C van Rijsdijk

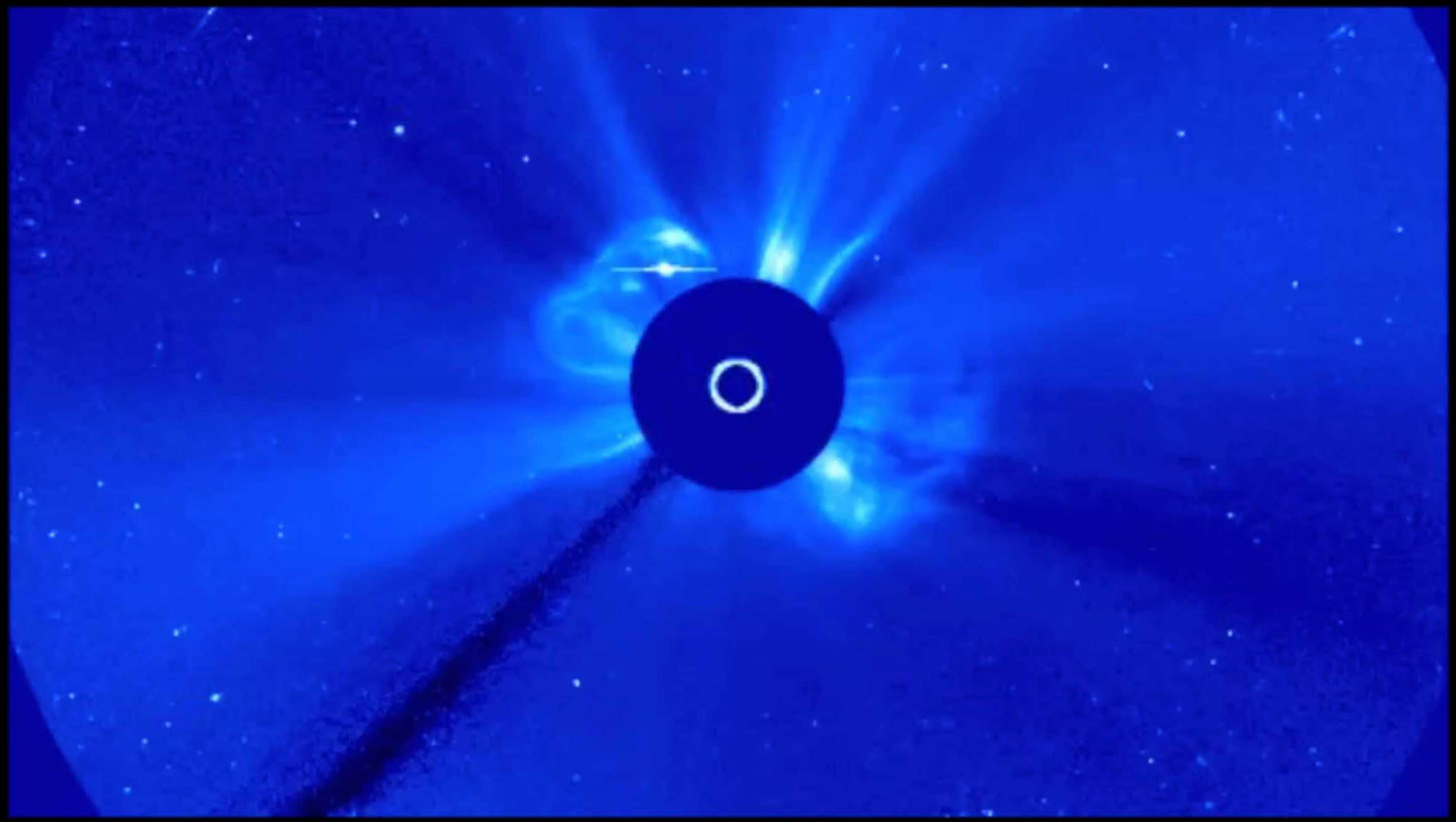
# COMET GARRADD 2012

Olivier Sedan (Sirene Observatory)

NASA/ESA/SOHO



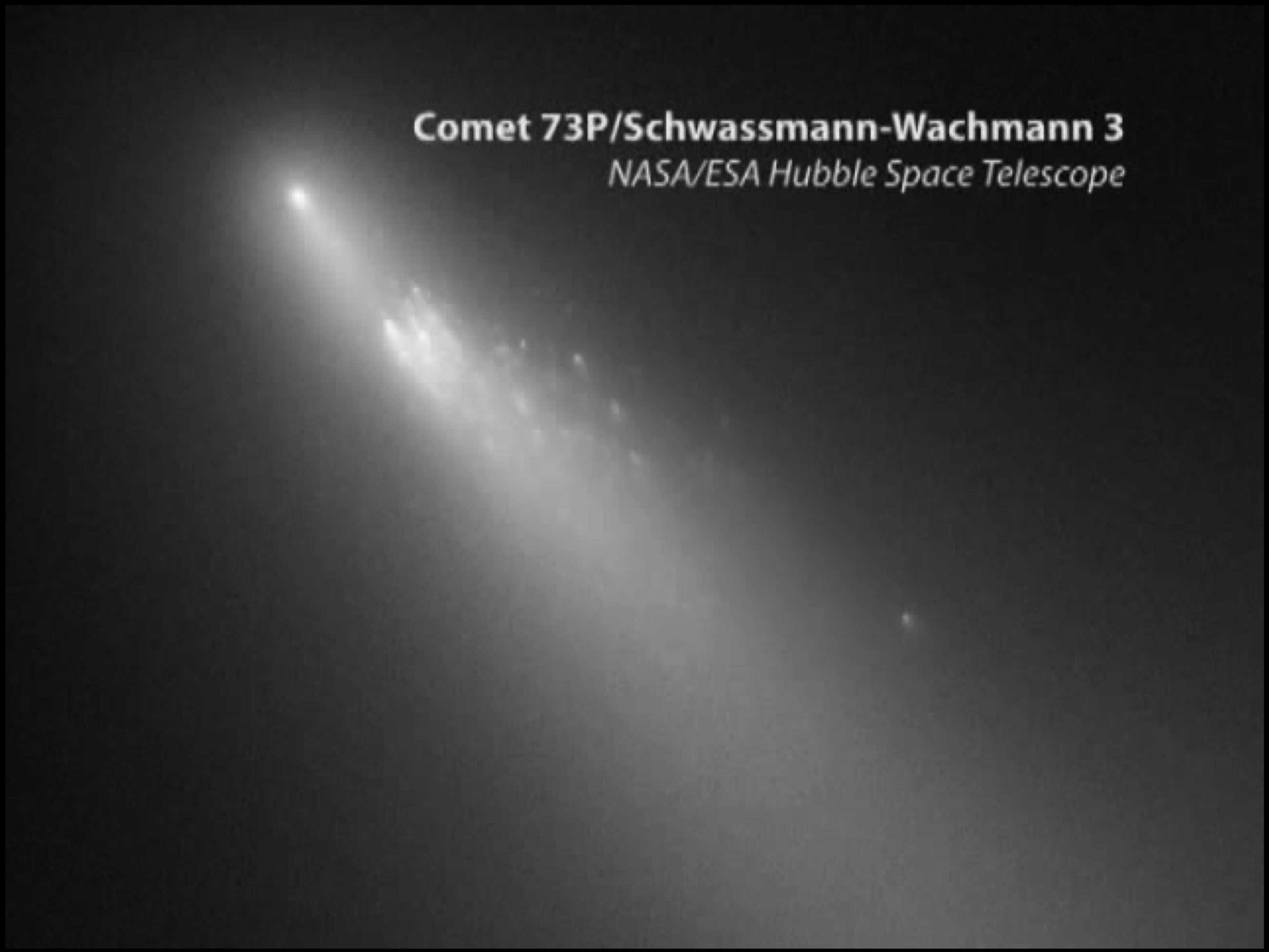
NASA/ESA/SOHO



NASA/ESA/SOHO

# COMET 73P/SCHWASSMANN-WACHMANN 3

NASA, ESA and G Bacon (STScI)




NASA, ESA, H. Weaver (APL/JHU), M. Mutchler and Z. Levay (STSc

# COMET BORRELLY

NASA *Deep Space 1*

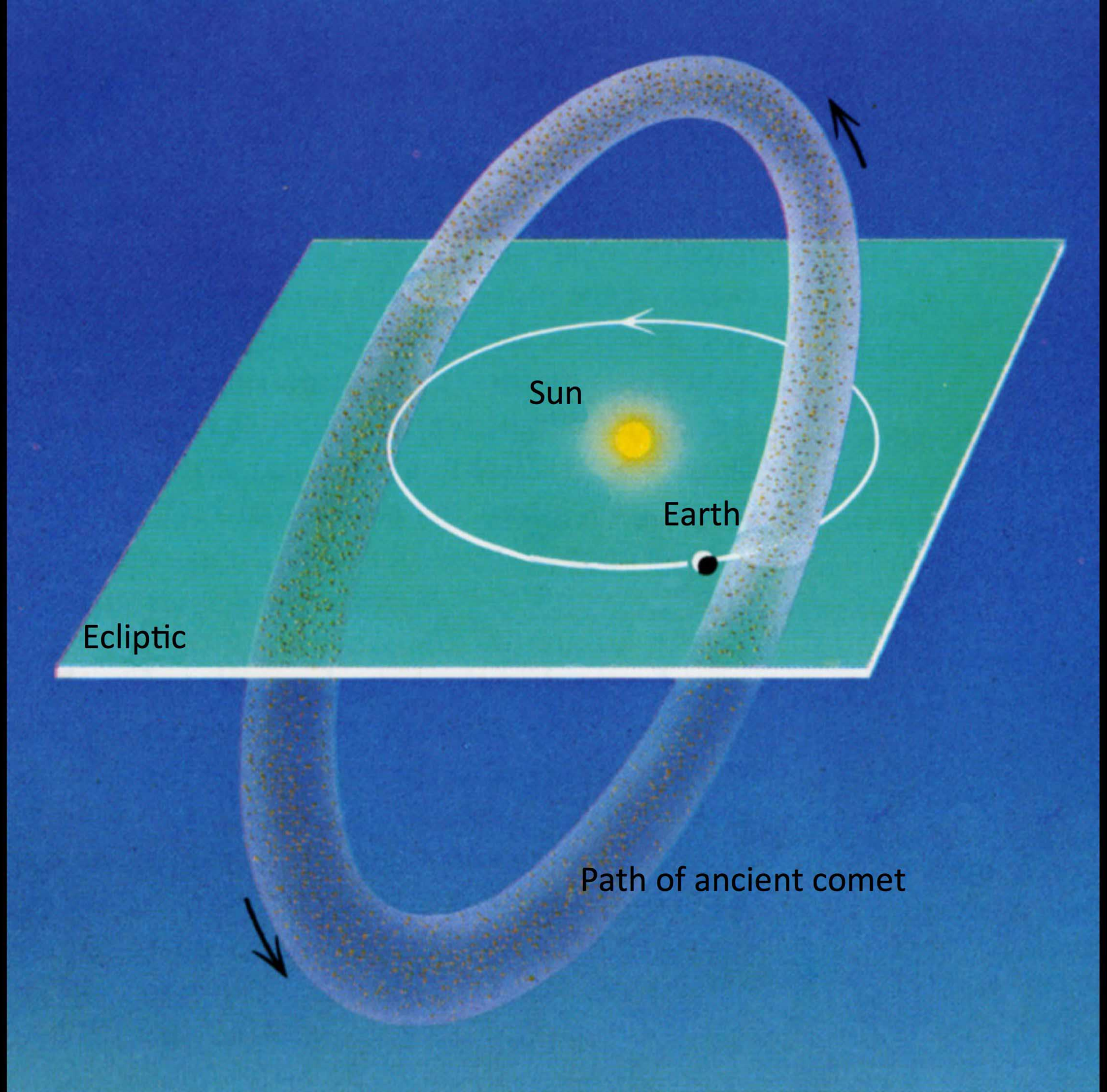
HALLEY'S COME

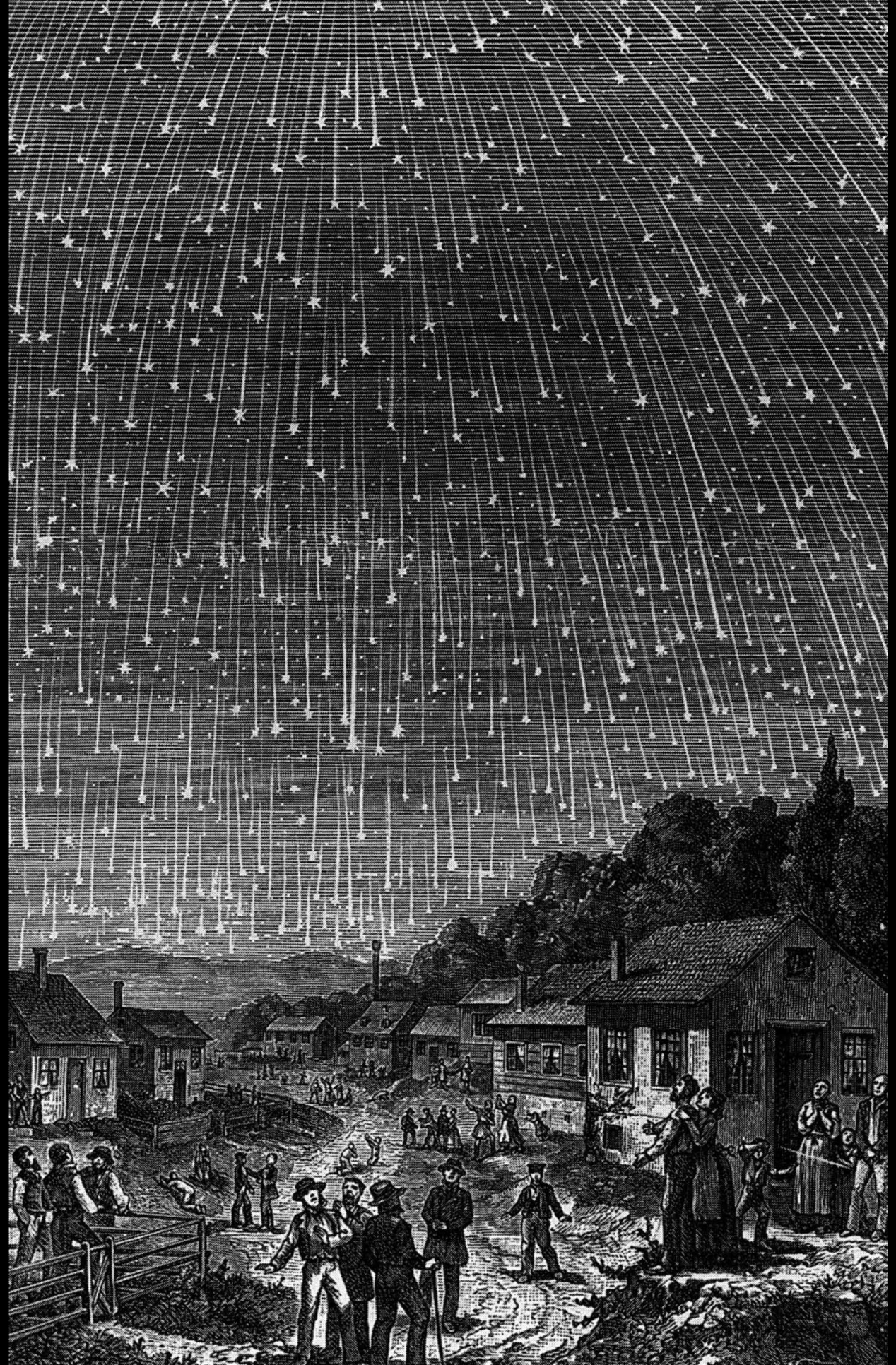
*Giotto* project,ESA

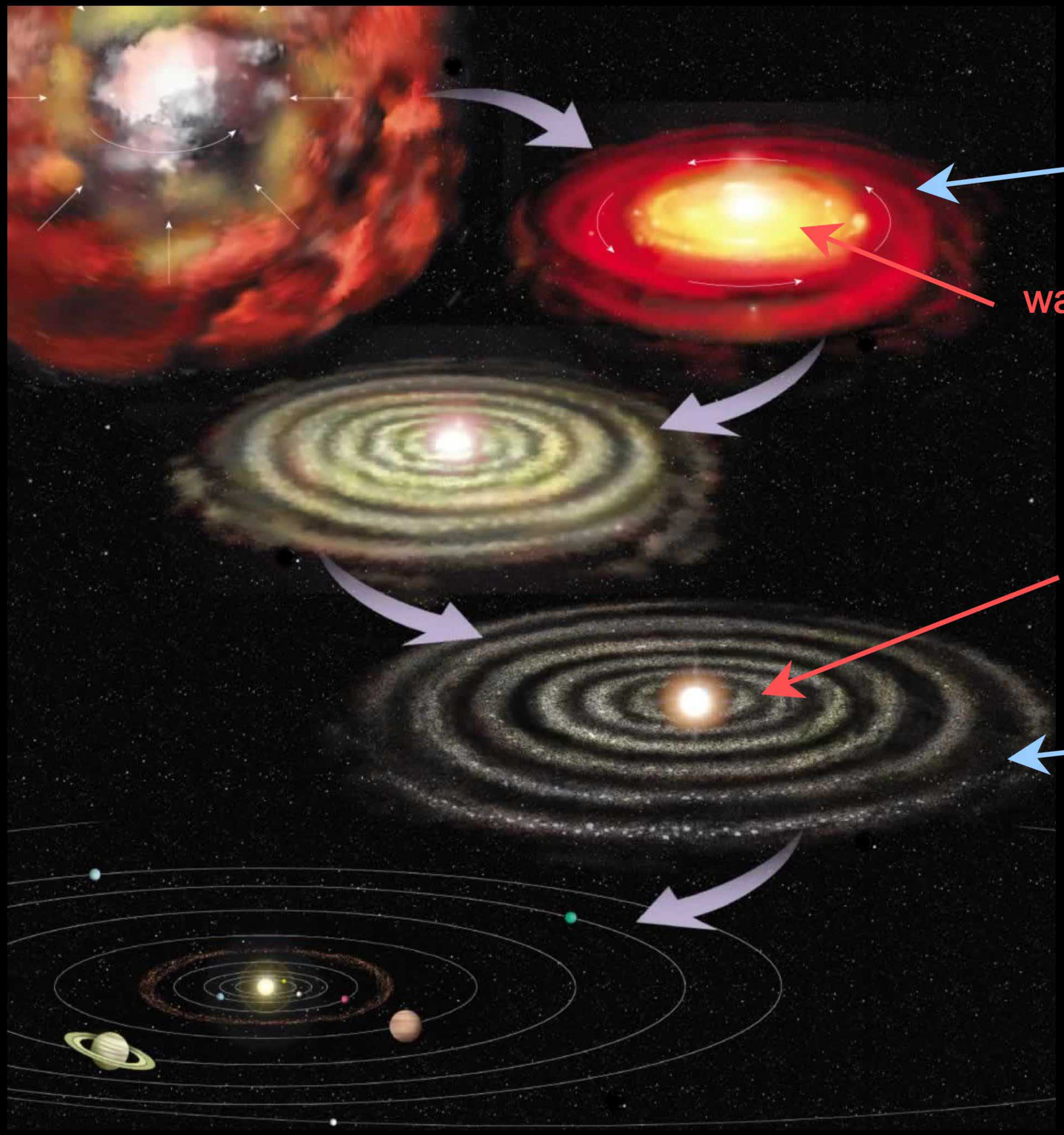
GIOTTO
(1305)

# COMET MCNAUGHT 2007

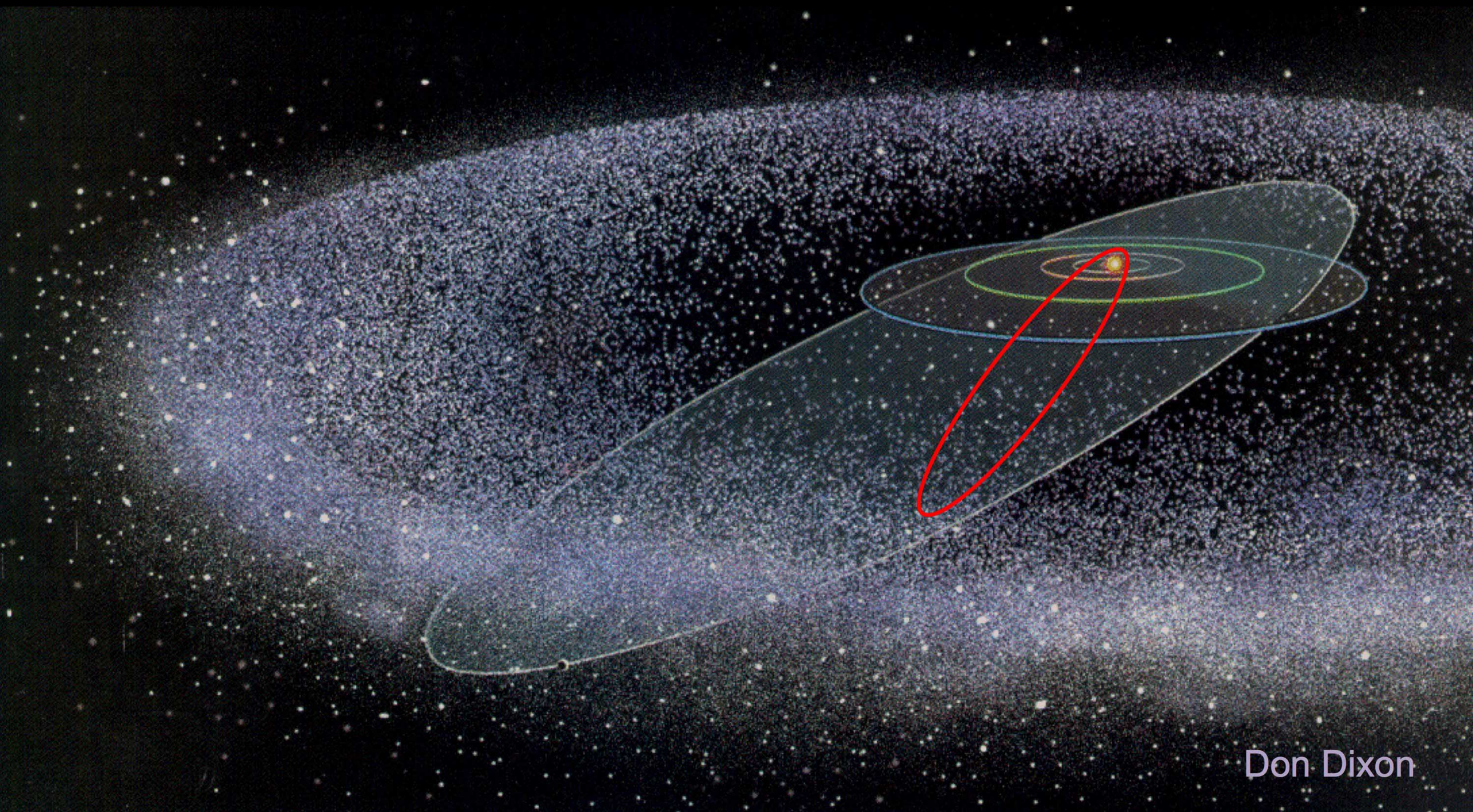
ESO

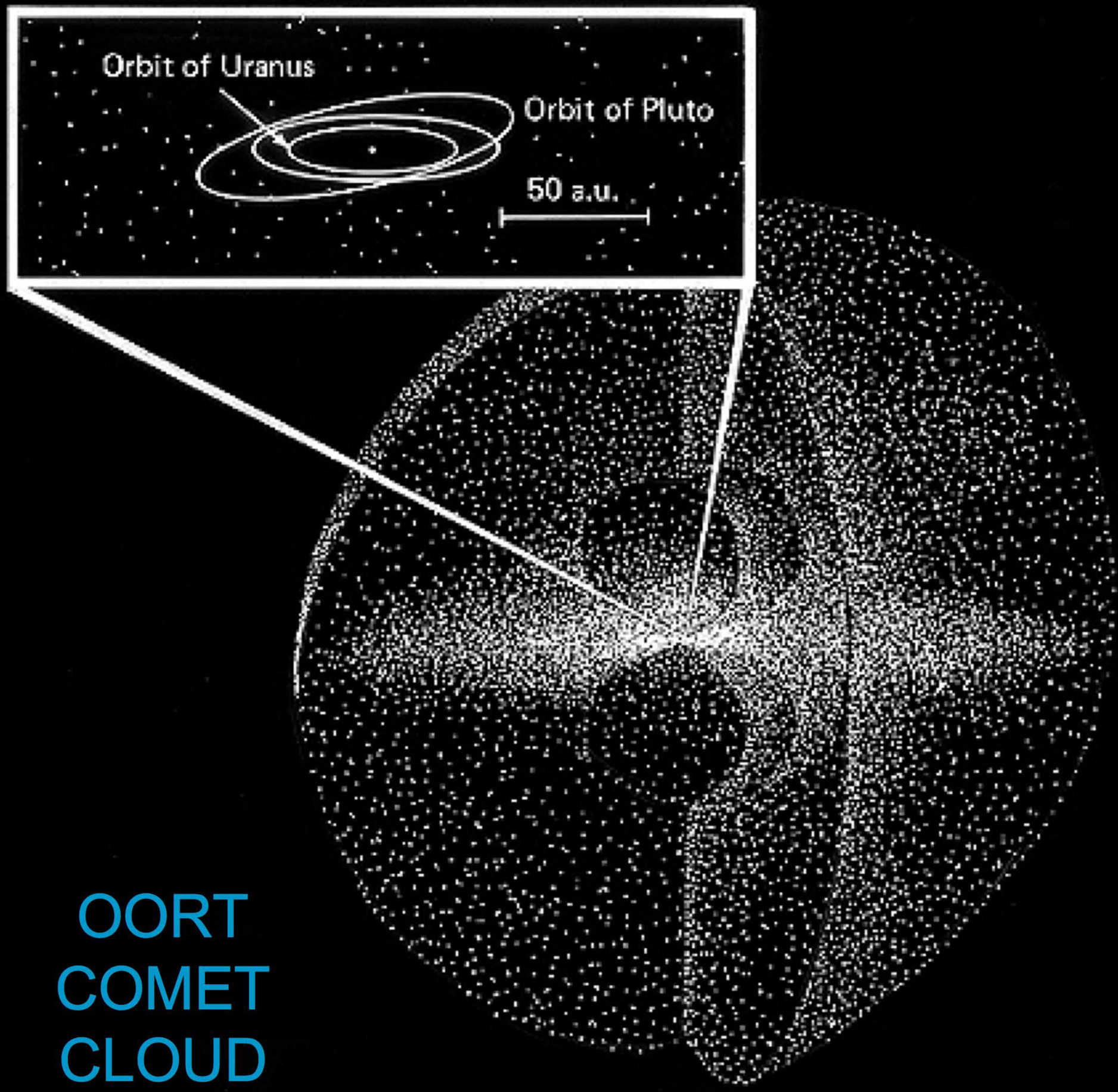

Sun
Earth
Ecliptic
Path of ancient comet




cooler regions
warmer regions
rocky planetismals
icy planetismals

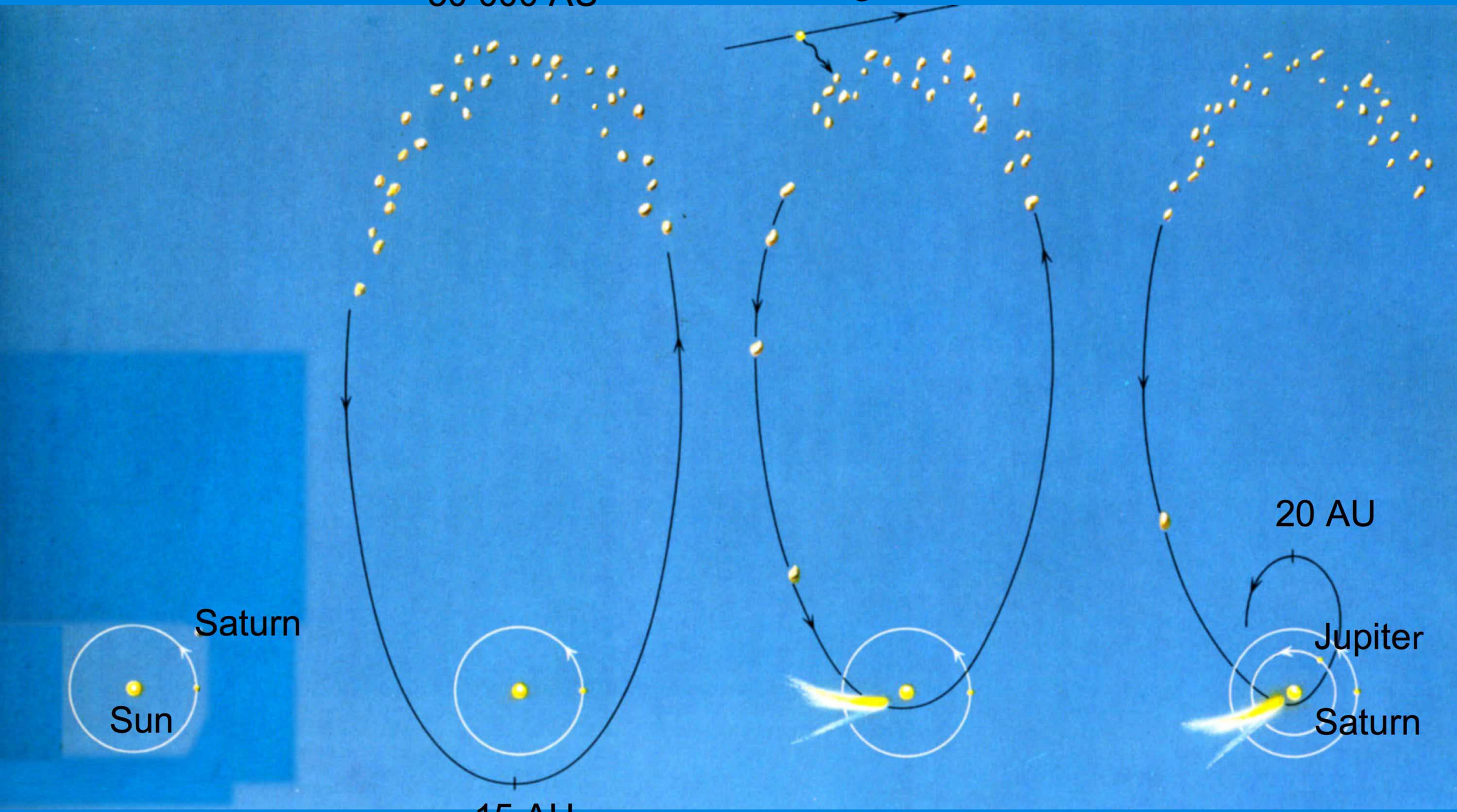
# KUIPER BELT



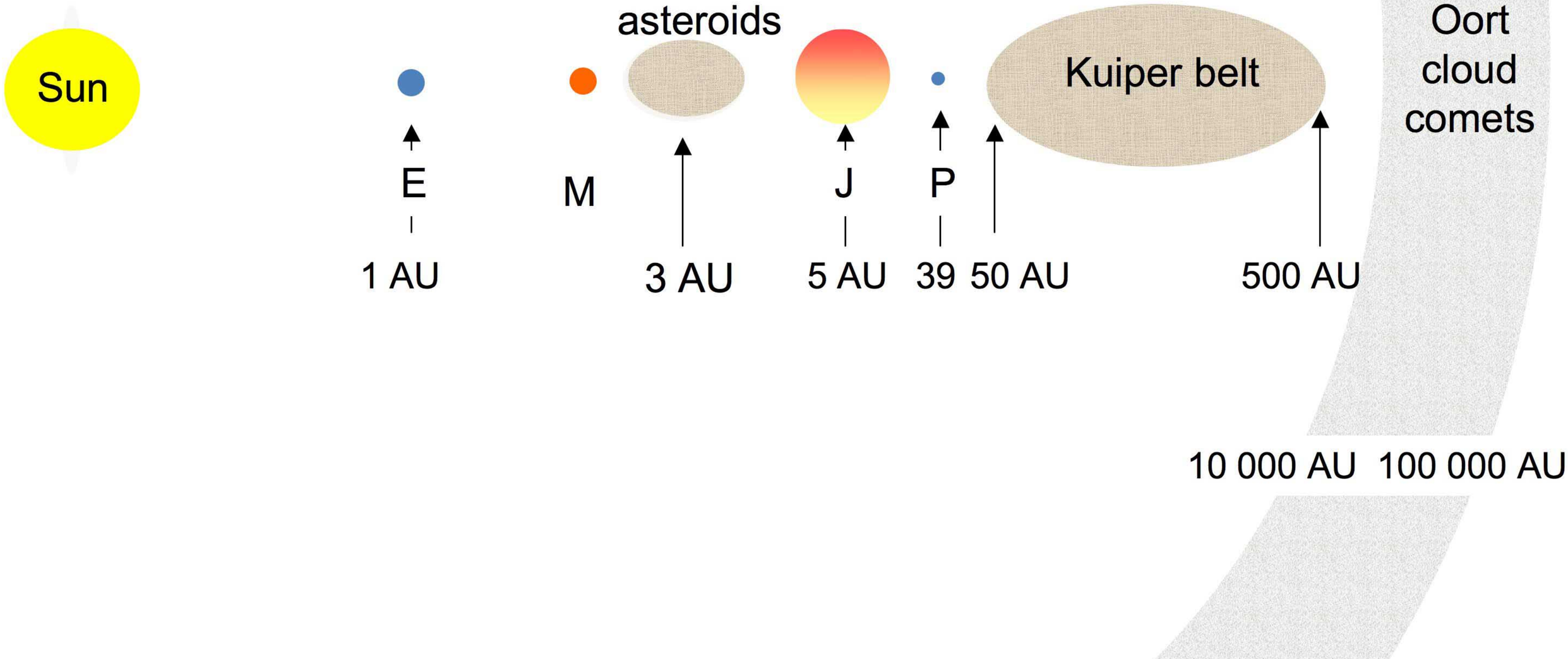



# OORT COMET CLOUD

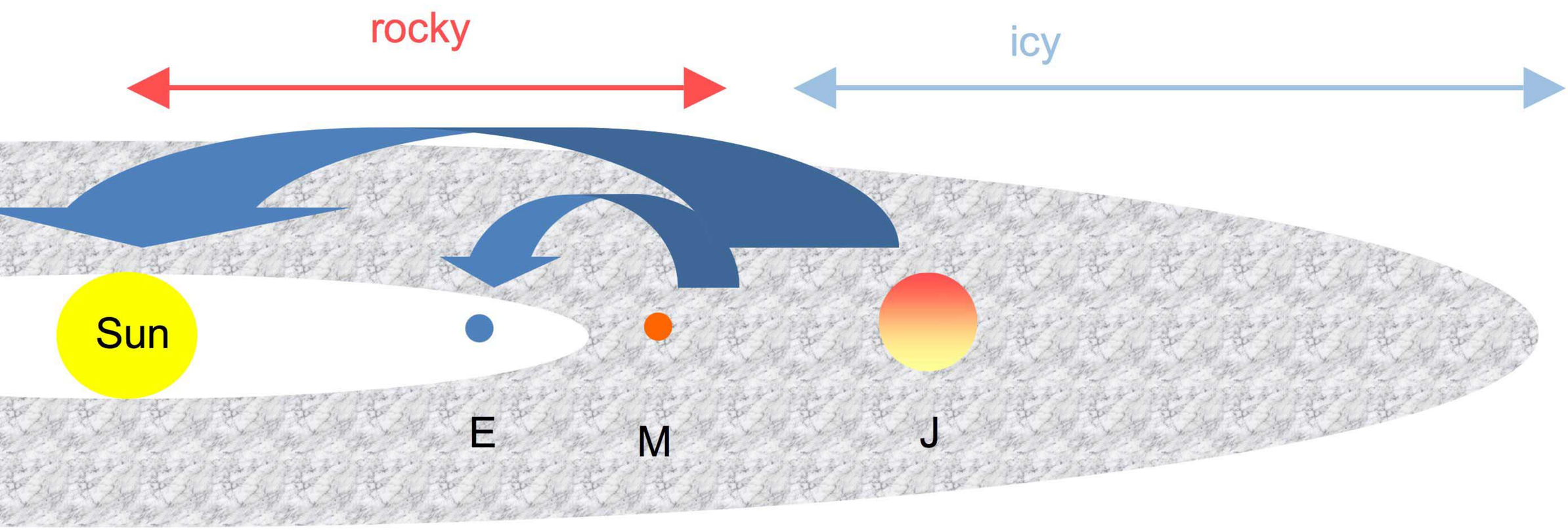
JPL

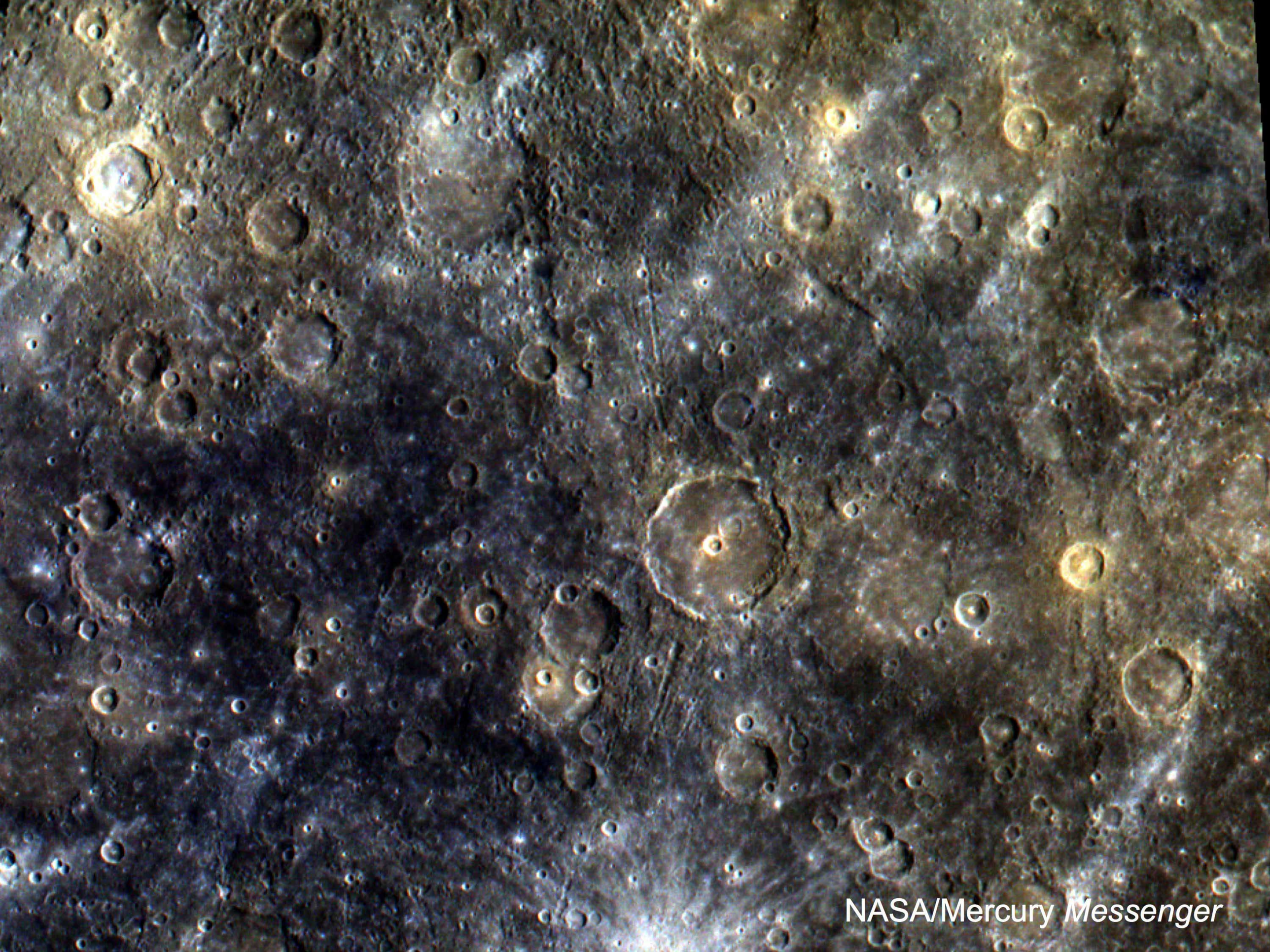

50 000 AU
Passing Star
Saturn
Sun
15 AU
20 AU
Jupiter
Saturn

# CONTENTS OF SOLAR SYSTEM



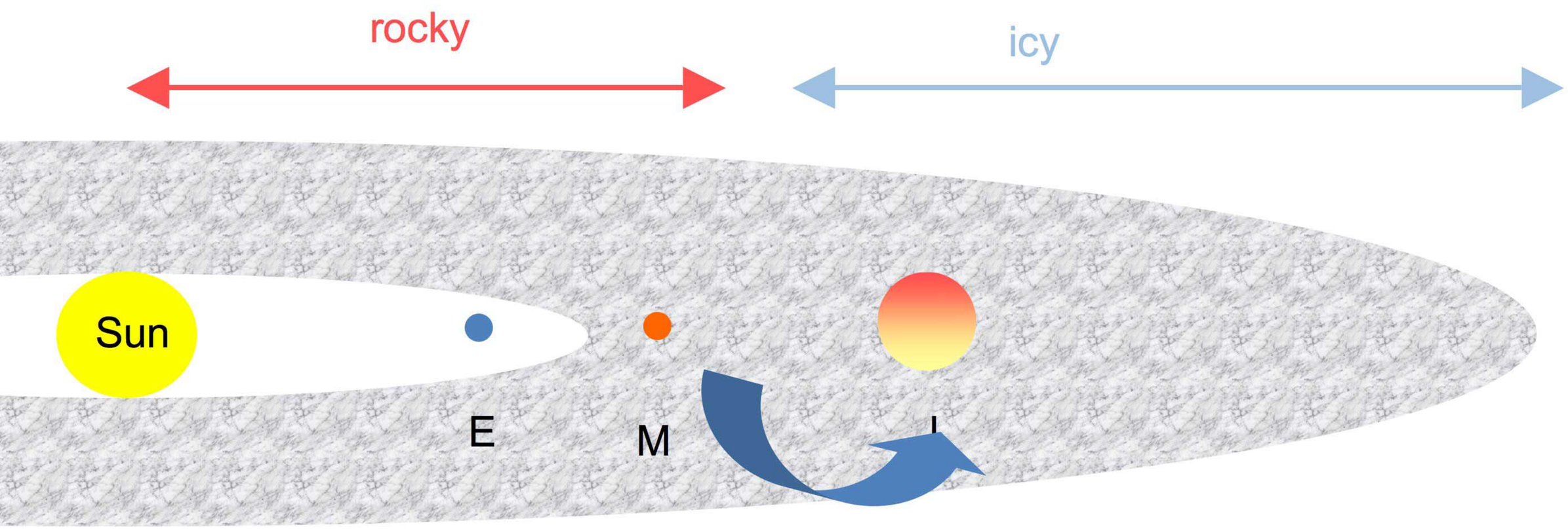
# THE EARLY SOLAR SYSTEM




NASA/Mercury *Messenger*

1668

# THE EARLY SOLAR SYSTEM



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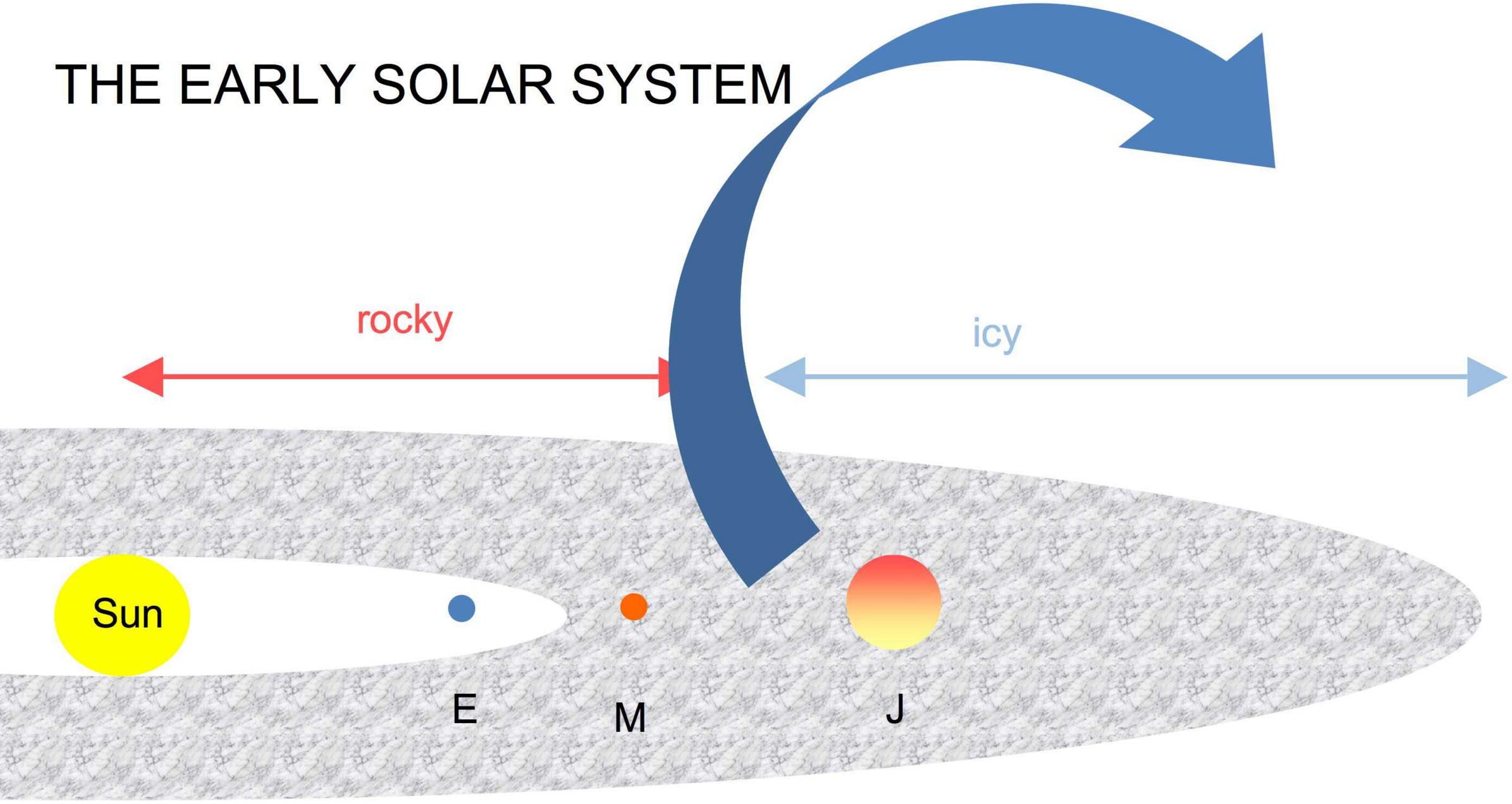
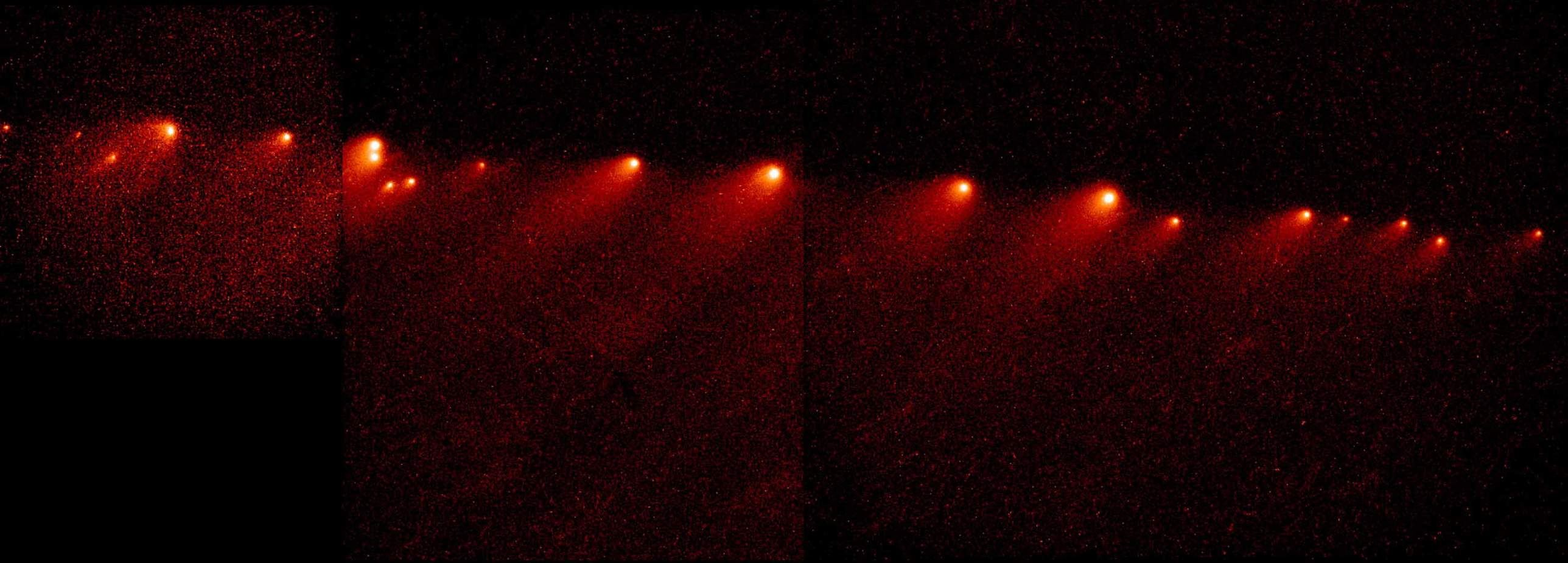


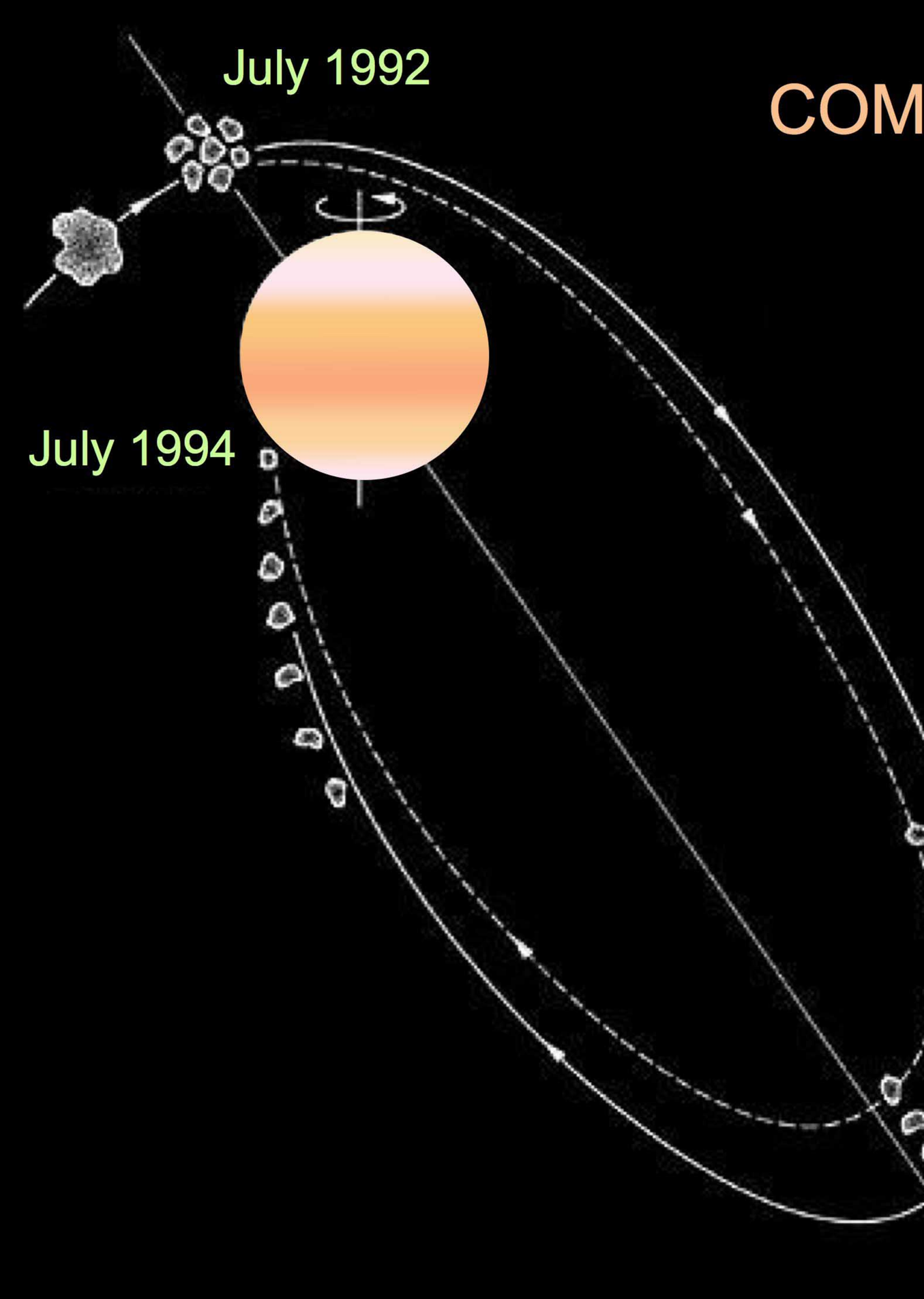
NASA/NOAA/GSFC/Suomi NPP/VIIRS/Norman Kuring

# COMET SHOEMAKER-LEVY 9



HA Weaver & TE Smith, NASA/ESA/HST

# COMET SHOEMAKER-LEVY 9



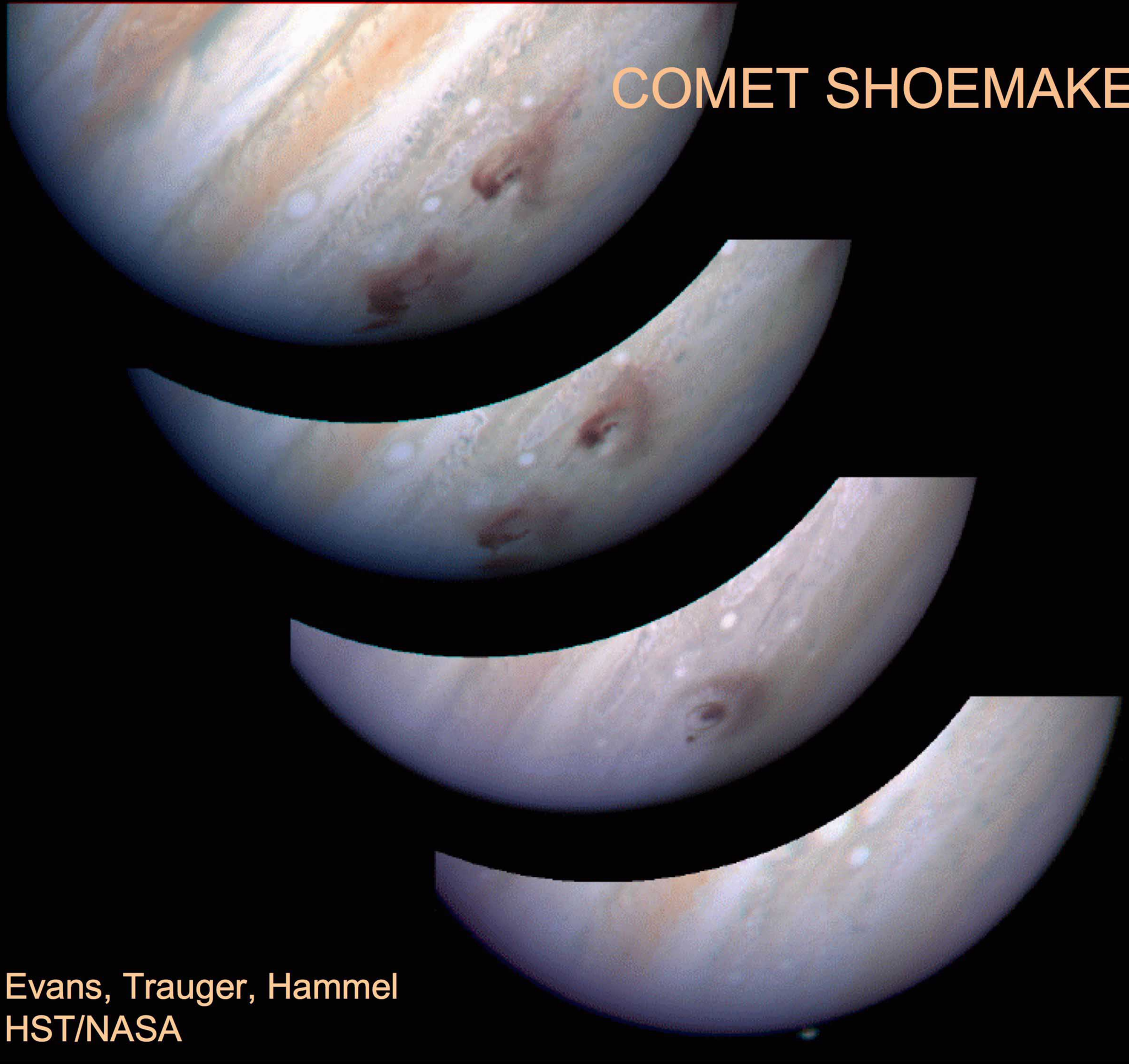
# COMET SHOEMAKER-LEVY 9

HA Weaver & TE Smith,
NASA/ESA, Trauger & Evans (JPL)

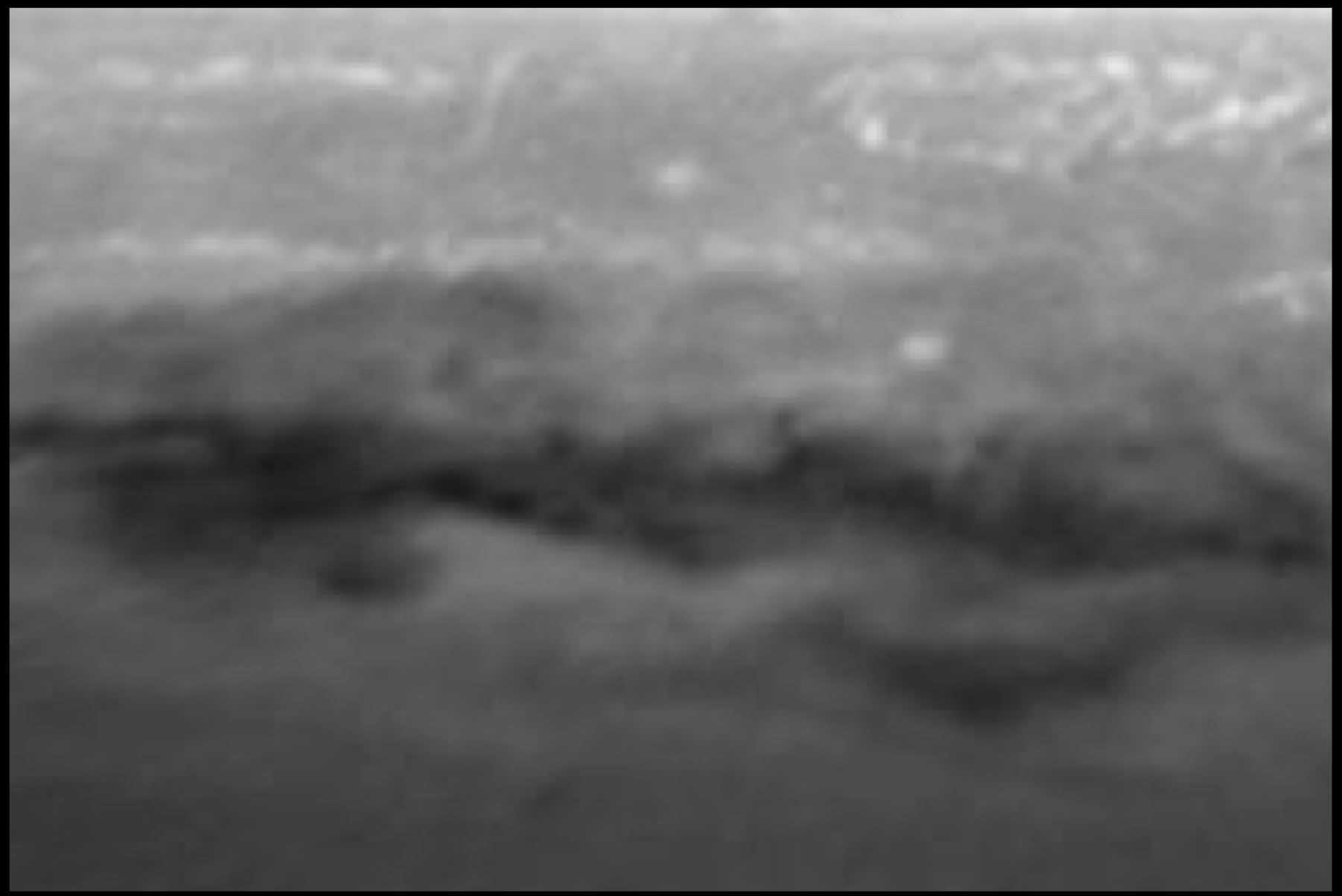
# COMET SHOEMAKER-LEVY 9

HA Weaver & TE Smith,
NASA/ESA, Trauger & Evans (JPL)

# COMET SHOEMAKER-LEVY 9



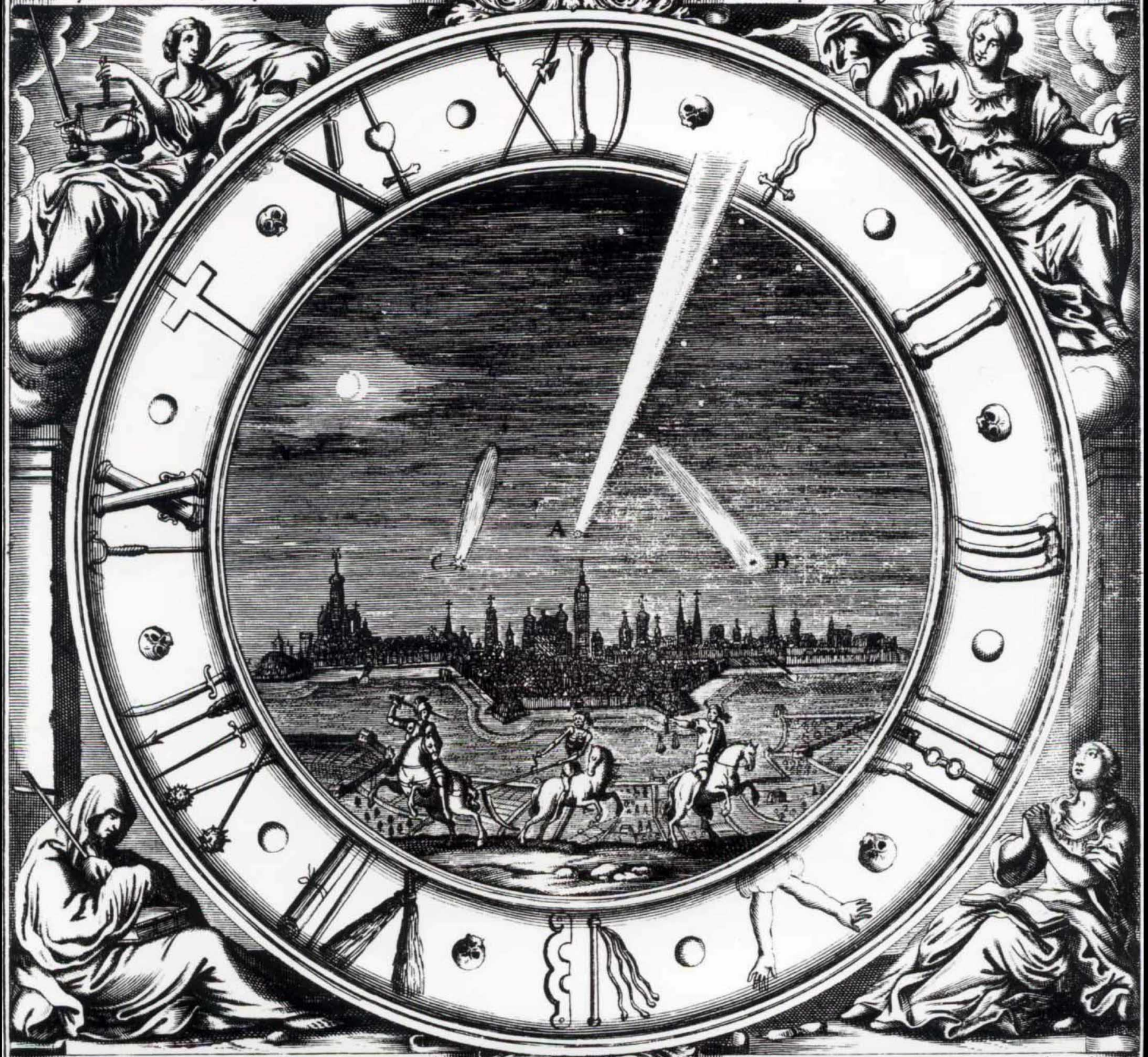
Evans, Trauger, Hammel
HST/NASA



H Hammel, MIT &NASA

Soll ich nicht billich ein Adama aus dir machen
und dich wie Zeboim zurichten. *Hoseæ XI.*

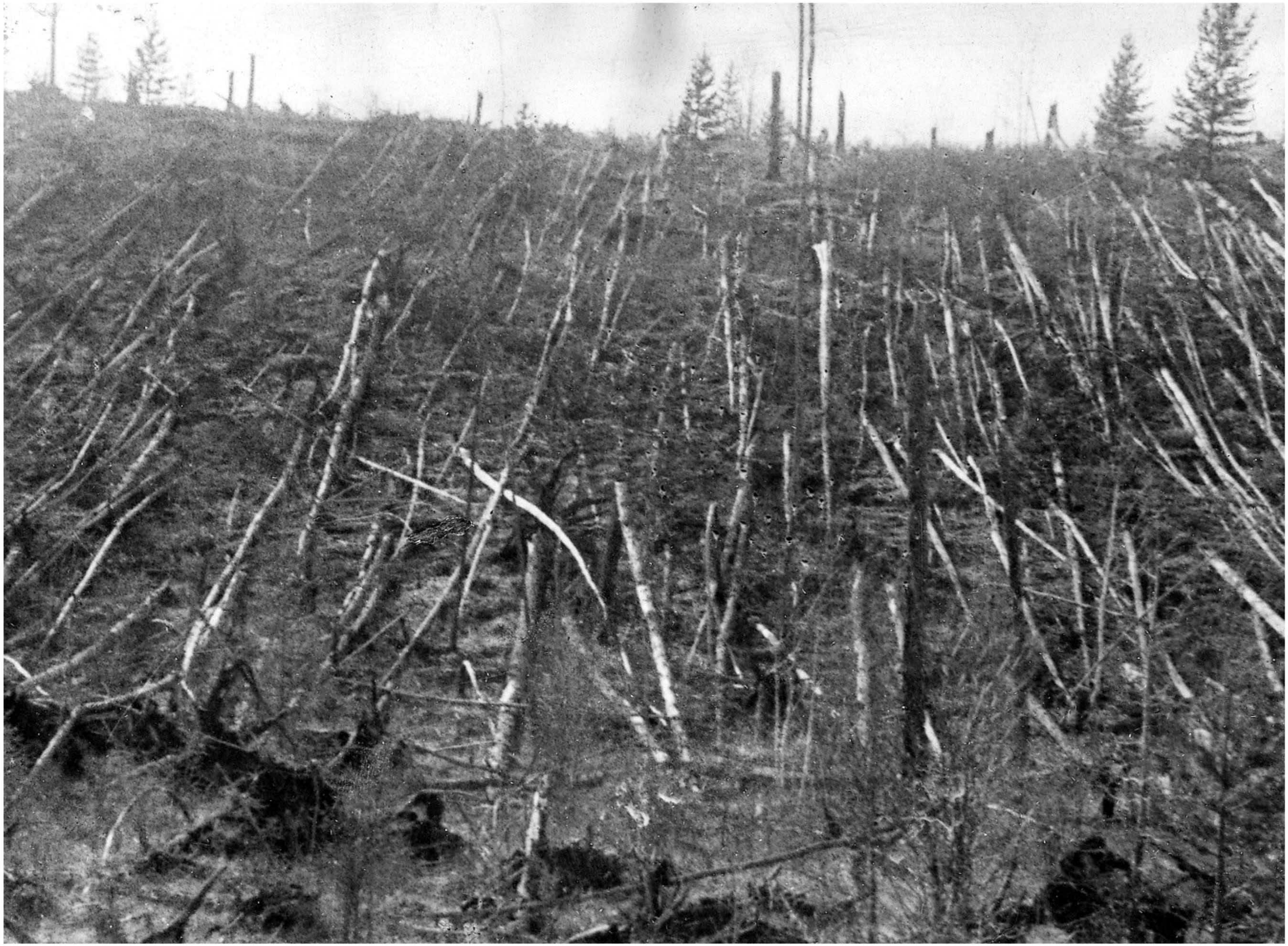
Meine Barmhertzigkeit ist zu brünstig das ich mich
thun will nach meinẽ grimmigen zorn. *Hos. XI.*




Herr Vergib uns alle Sünde, und thue
uns wohl. *Hoseæ XIIII. 13.*

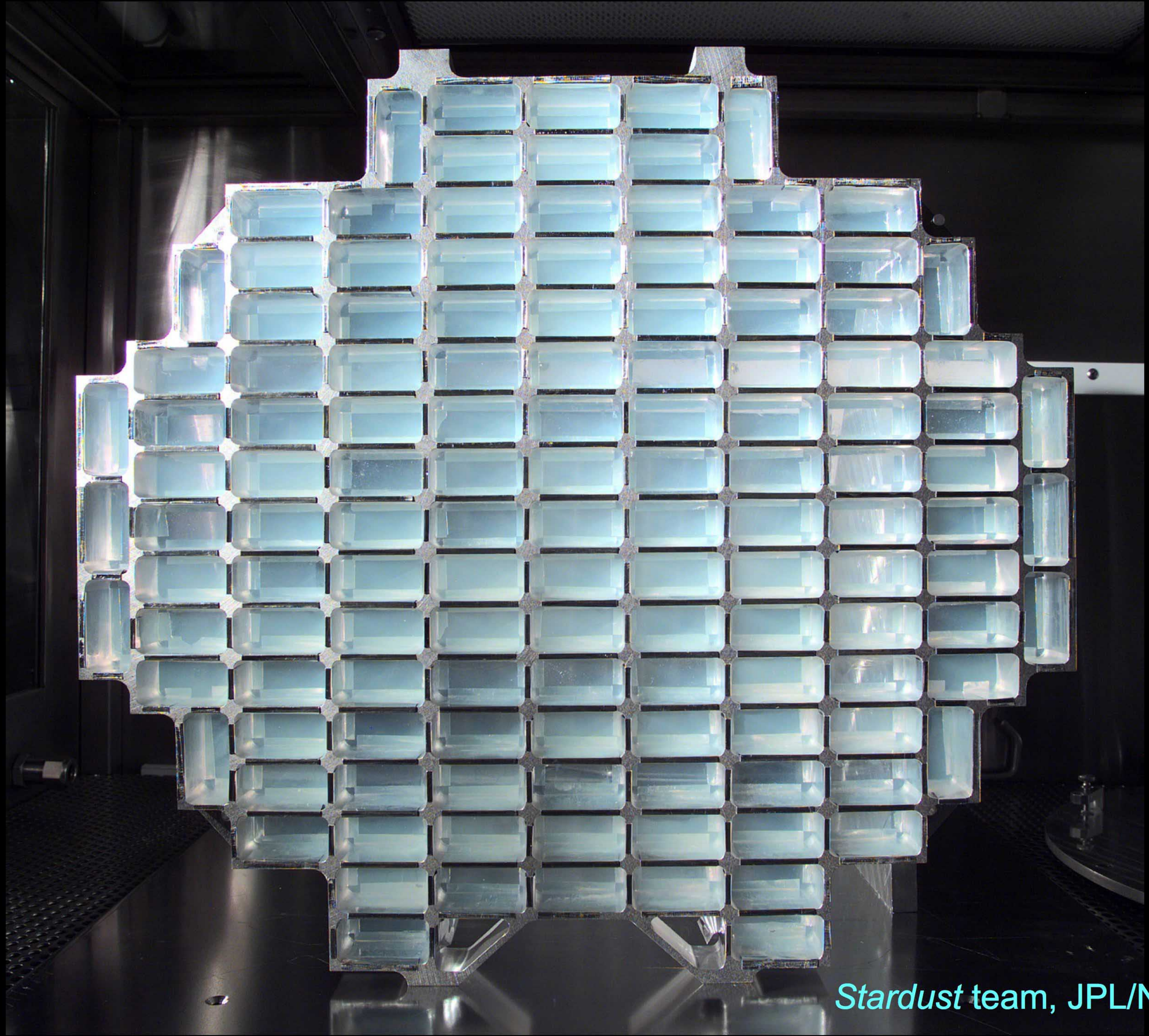
Da bettet jederman das es ja nichts bö-
ses bedeuten solte. *II Macc. V. 4.*

Tunguska event: 7:17am June 30, 1908

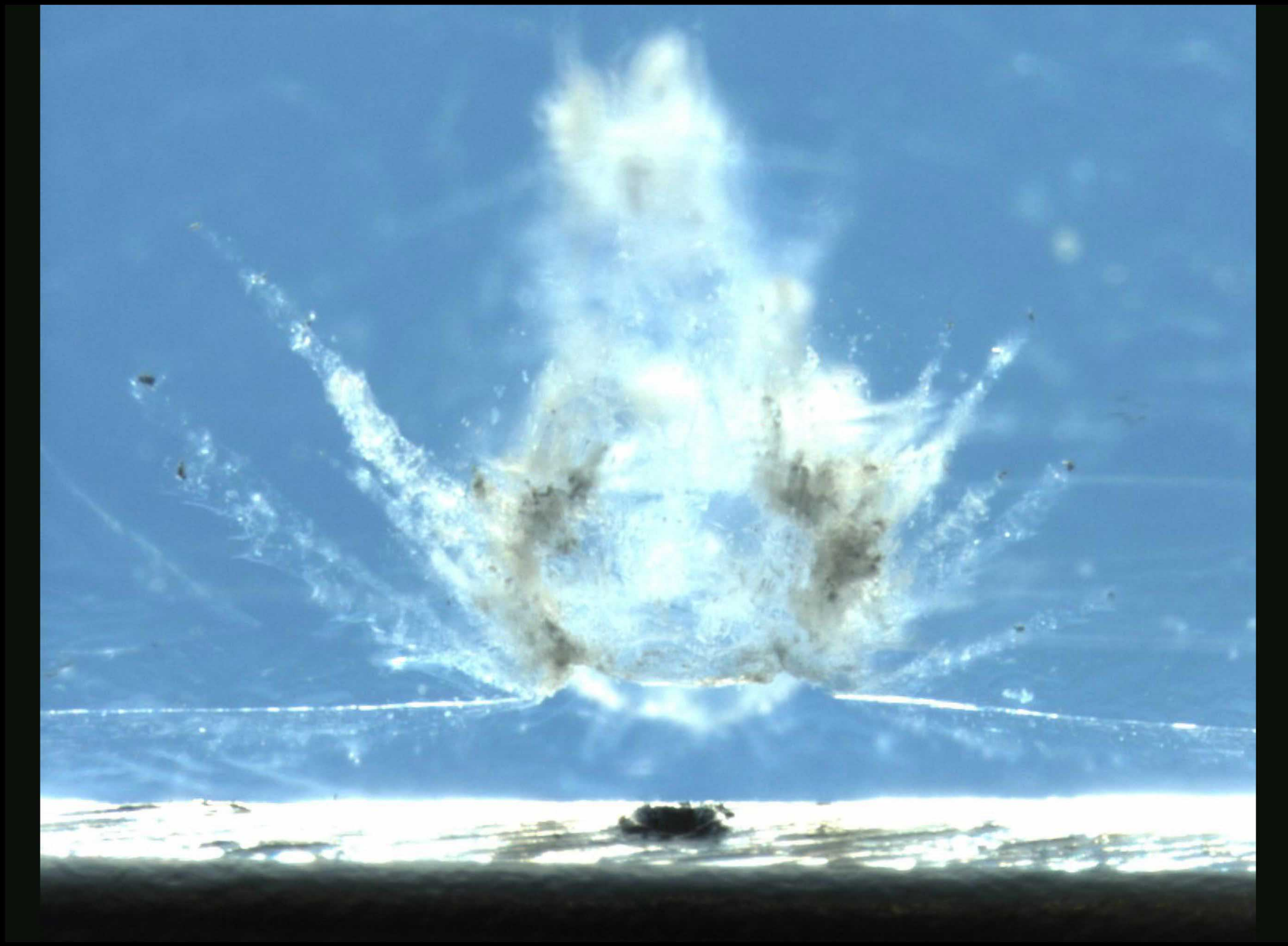


# COMET WILD

*Stardust* team, JPL/NASA



*Stardust* team, JPL/NASA



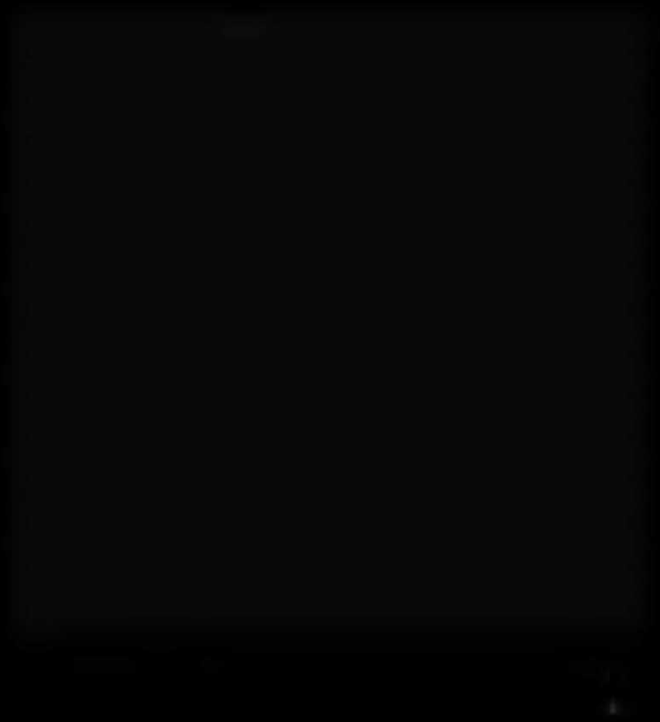
*Stardust* team, JPL/NASA

COMET TEMPE

1 km

*Deep Impact* U Maryland/JPL/NASA

# COMET TEMPE



*Deep Impact* U Maryland/JPL/NASA

# COMET TEMPE

*Deep Impact* U Maryland/JPL/NASA

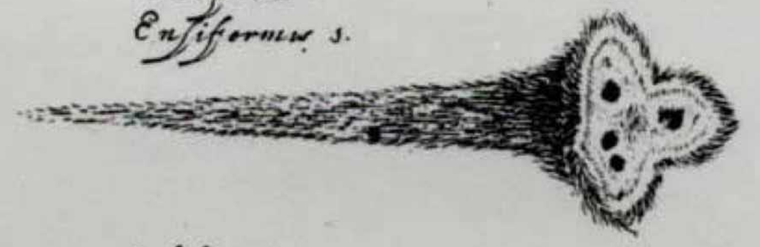
# COMET TEMPEL 1 REVISITED...

*Stardust-NEXT* mission, NASA, JPL-Caltech, Cornell

Xiphiæ

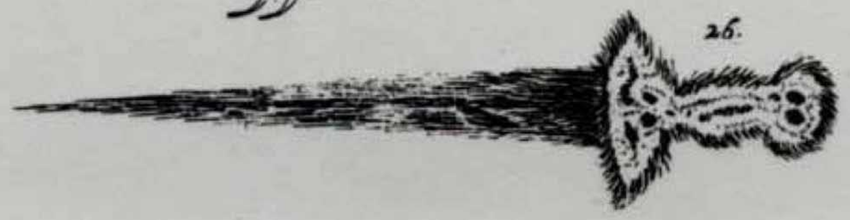
25.

Ensiformis 3.



Ensiformis 2

26.



Ensiformis 3

27

Ensiformis incurvatus.

28

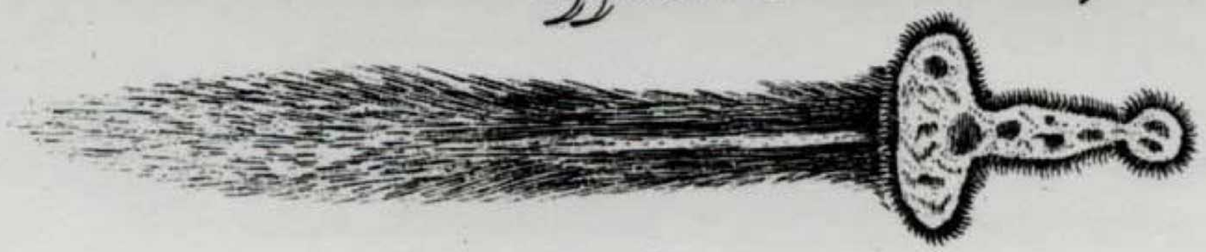
Longirostres.

Hastiformis. 1.

30

Ensiformis. 4.

29.



Hastiformis. 2.

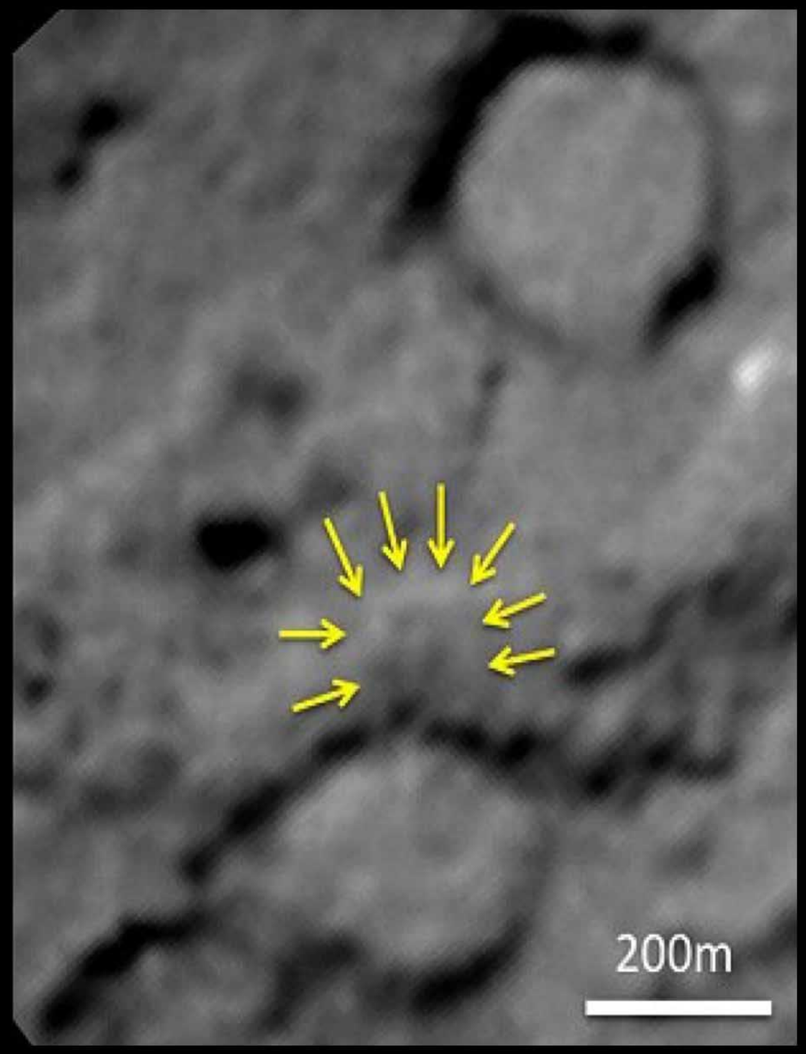
31.

Fig I

Autor sculpsit.

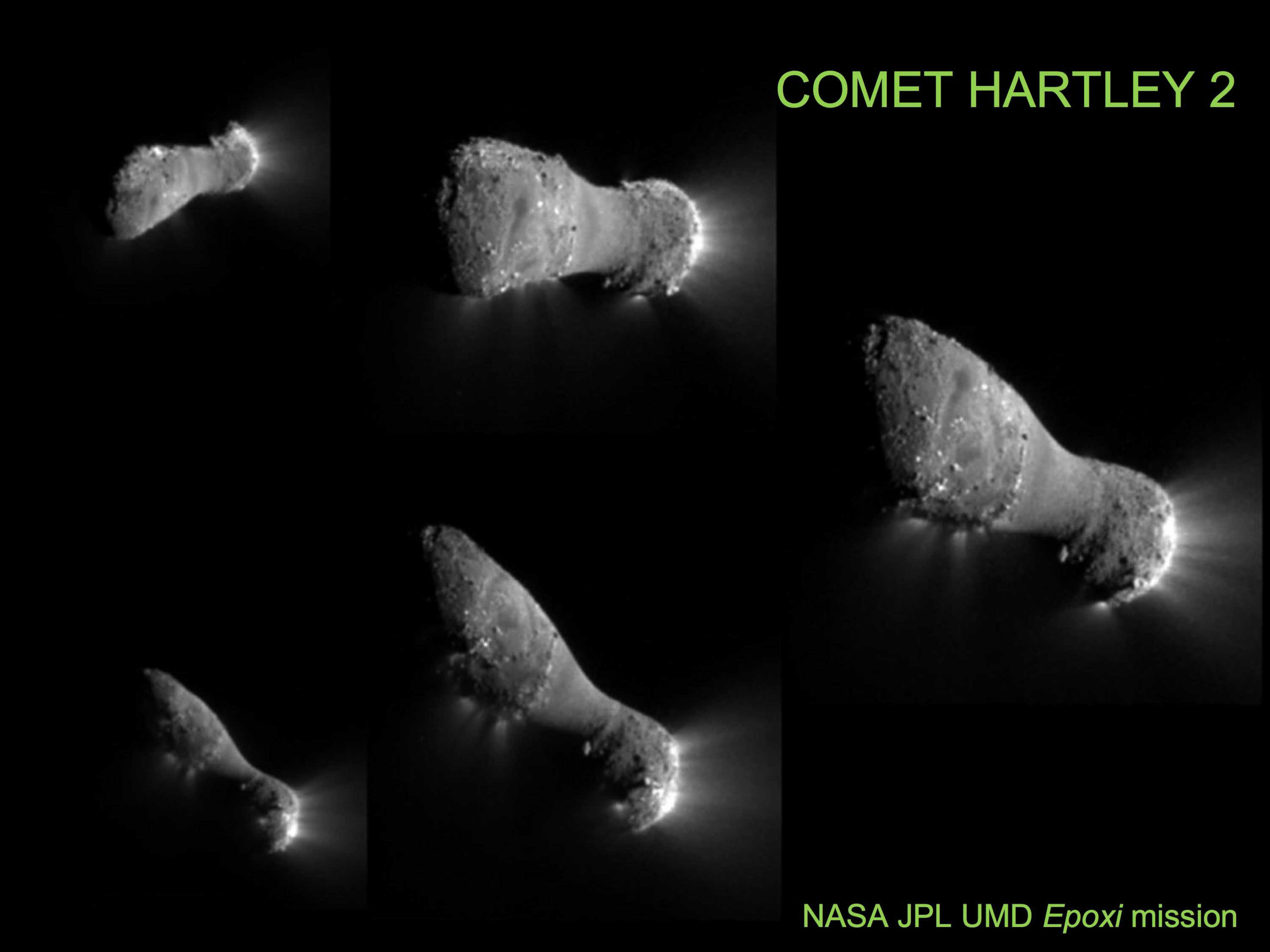
1668

# COMET TEMPEL 1 REVISITED...




*Stardust-NEXT* mission, NASA, JPL-Caltech, Cornell

# COMET HARTLEY 2

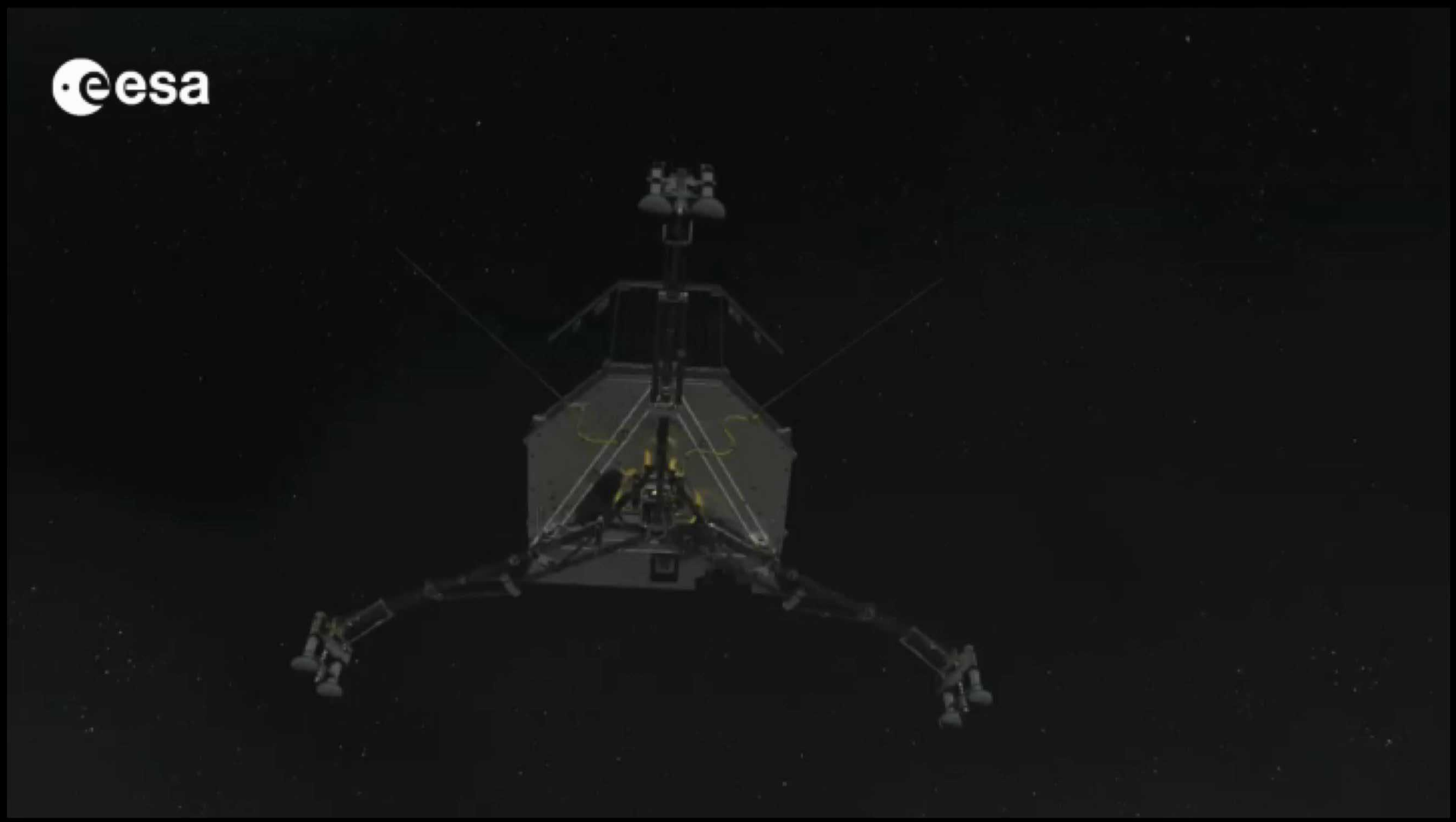


NASA JPL UMD *Epoxi* mission

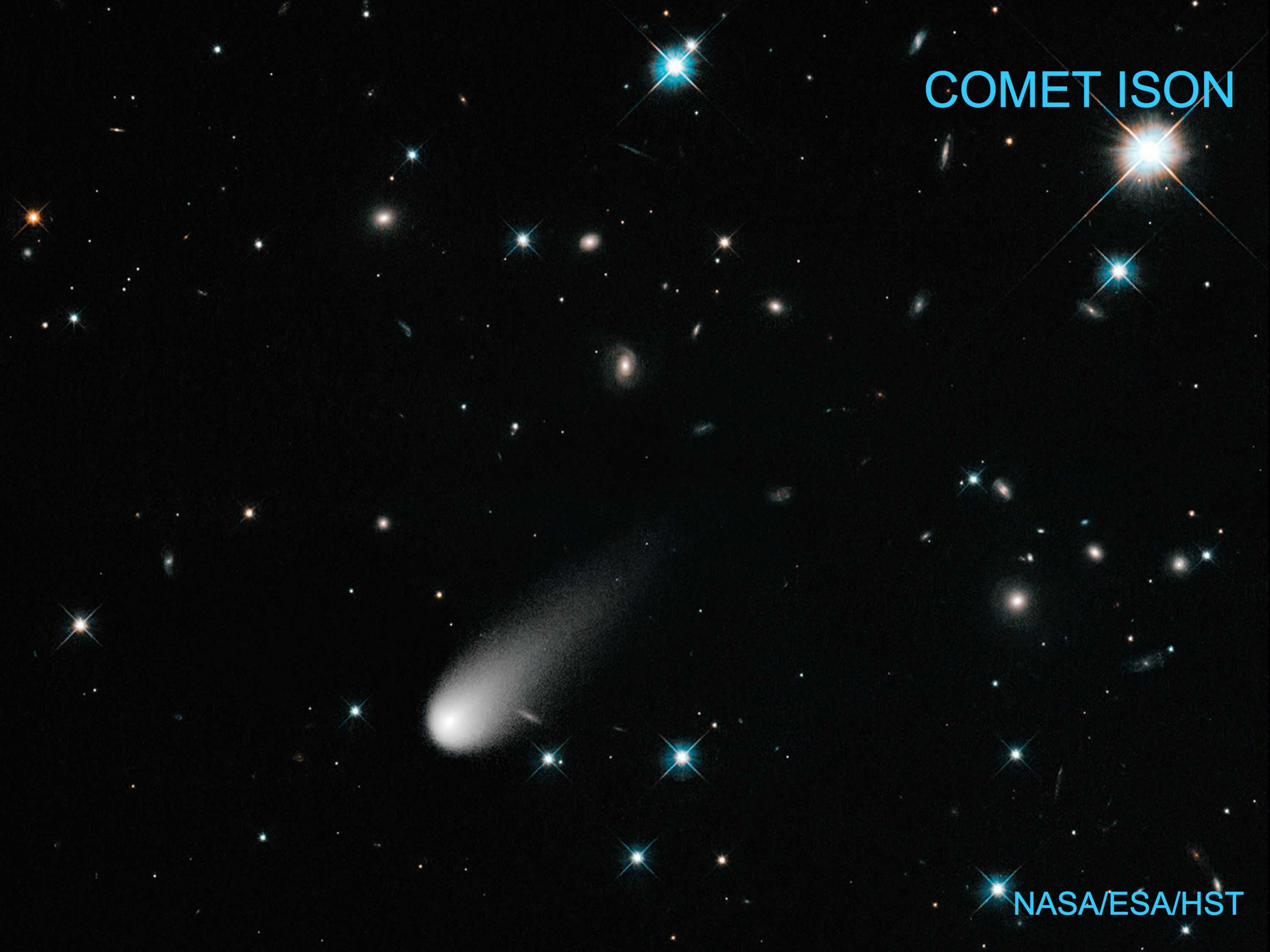
# COMET CHURYUMOV-GERASIMENKO

*Rosetta* mission, ESA

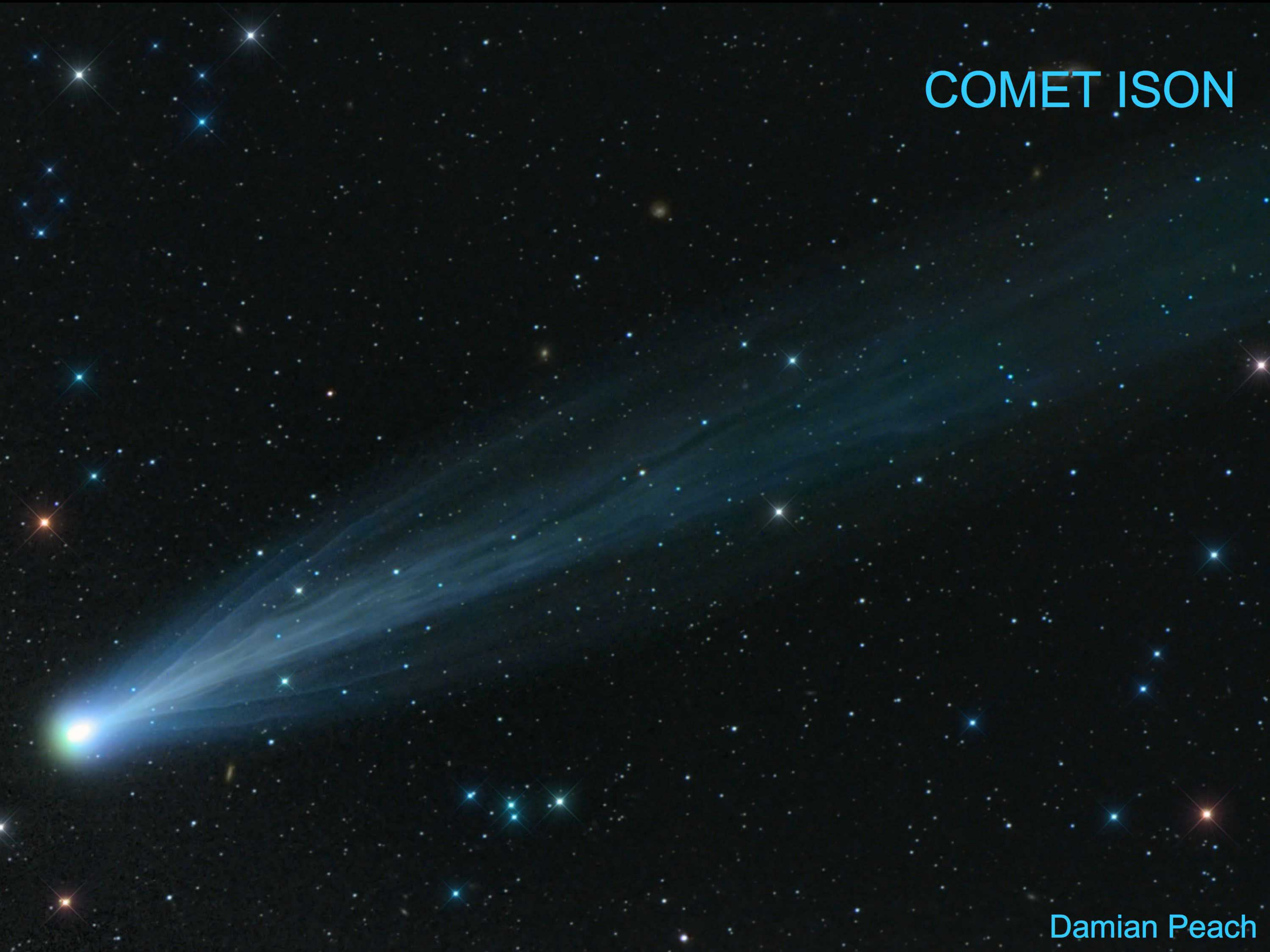
*Rosetta* mission, ESA



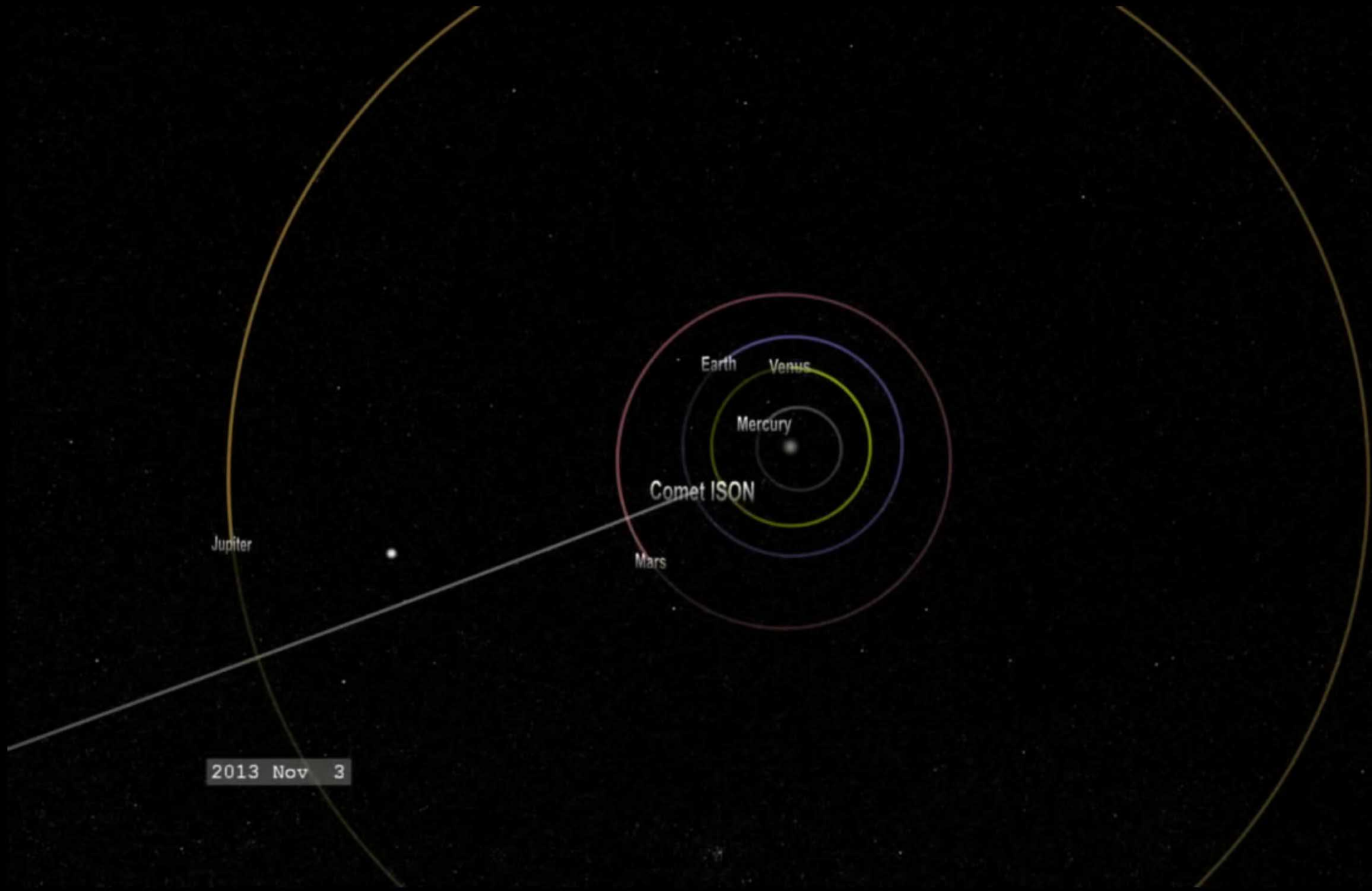

*Rosetta* mission, ESA

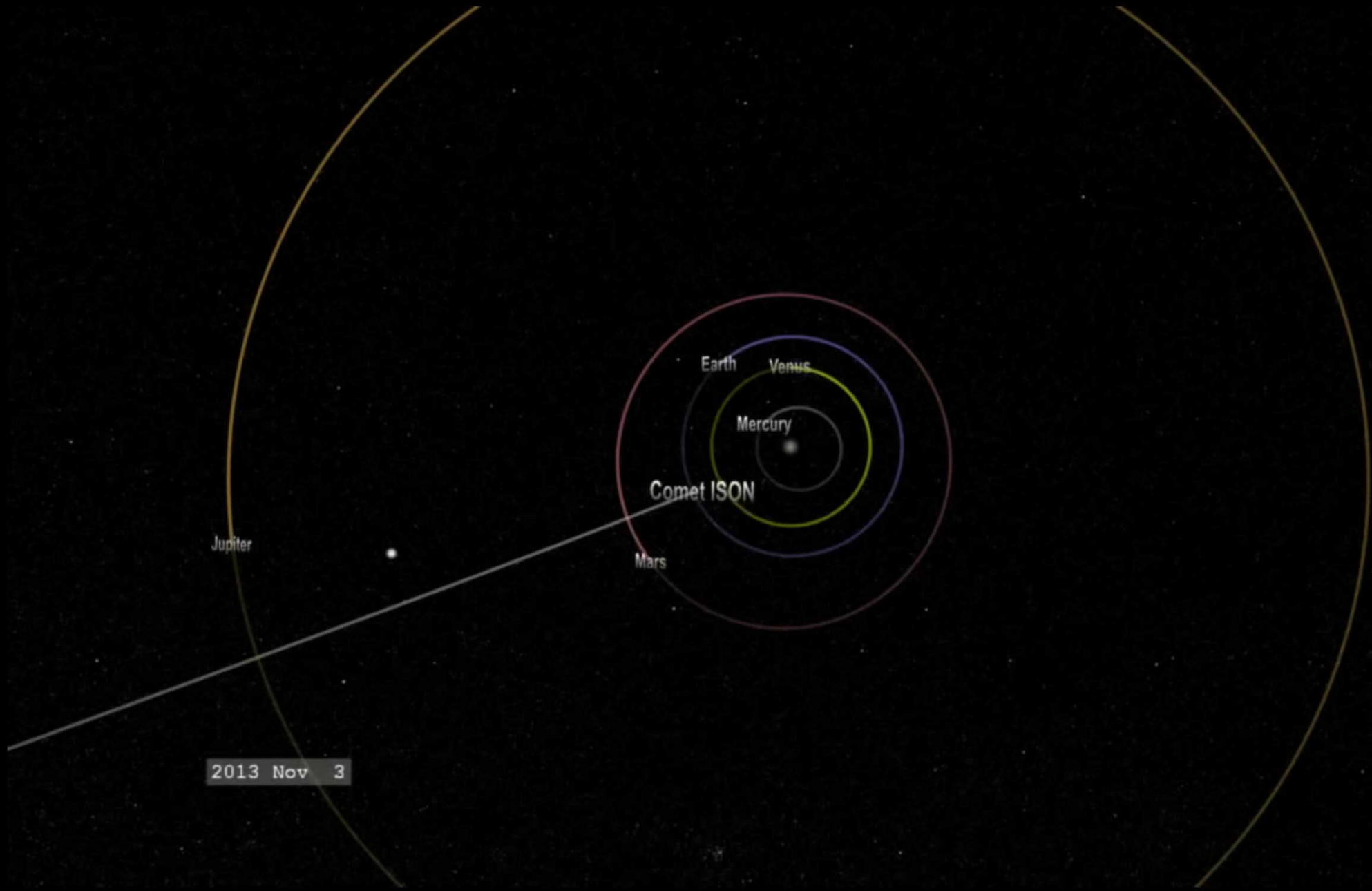

COMET ISON
NASA/ESA/HST

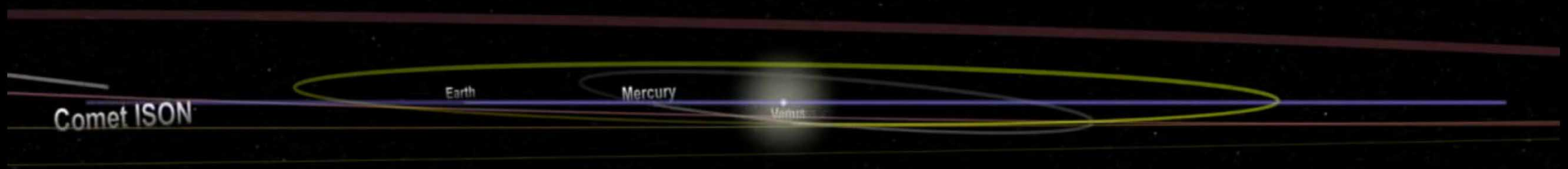
# COMET ISON



Damian Peach

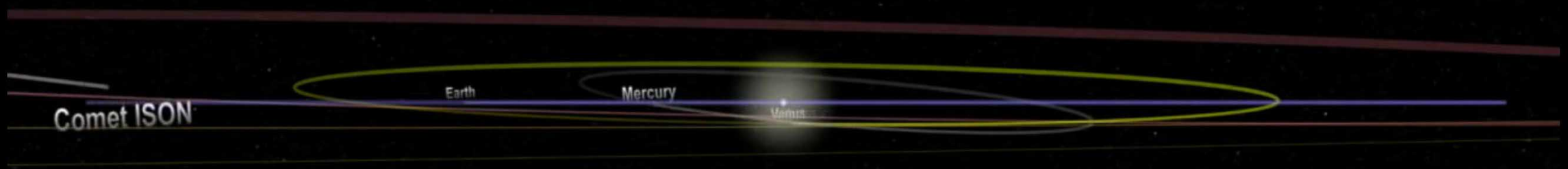

Earth
Venus
Mercury
Comet ISON
Jupiter
Mars
2013 Nov 3


Earth
Venus
Mercury
Comet ISON
Jupiter
Mars
2013 Nov 3




2013 Nov 2

# 44BC




2013 Nov 2

# COMET ISON

*Wendelstein Observatory of the LMU/MPS*

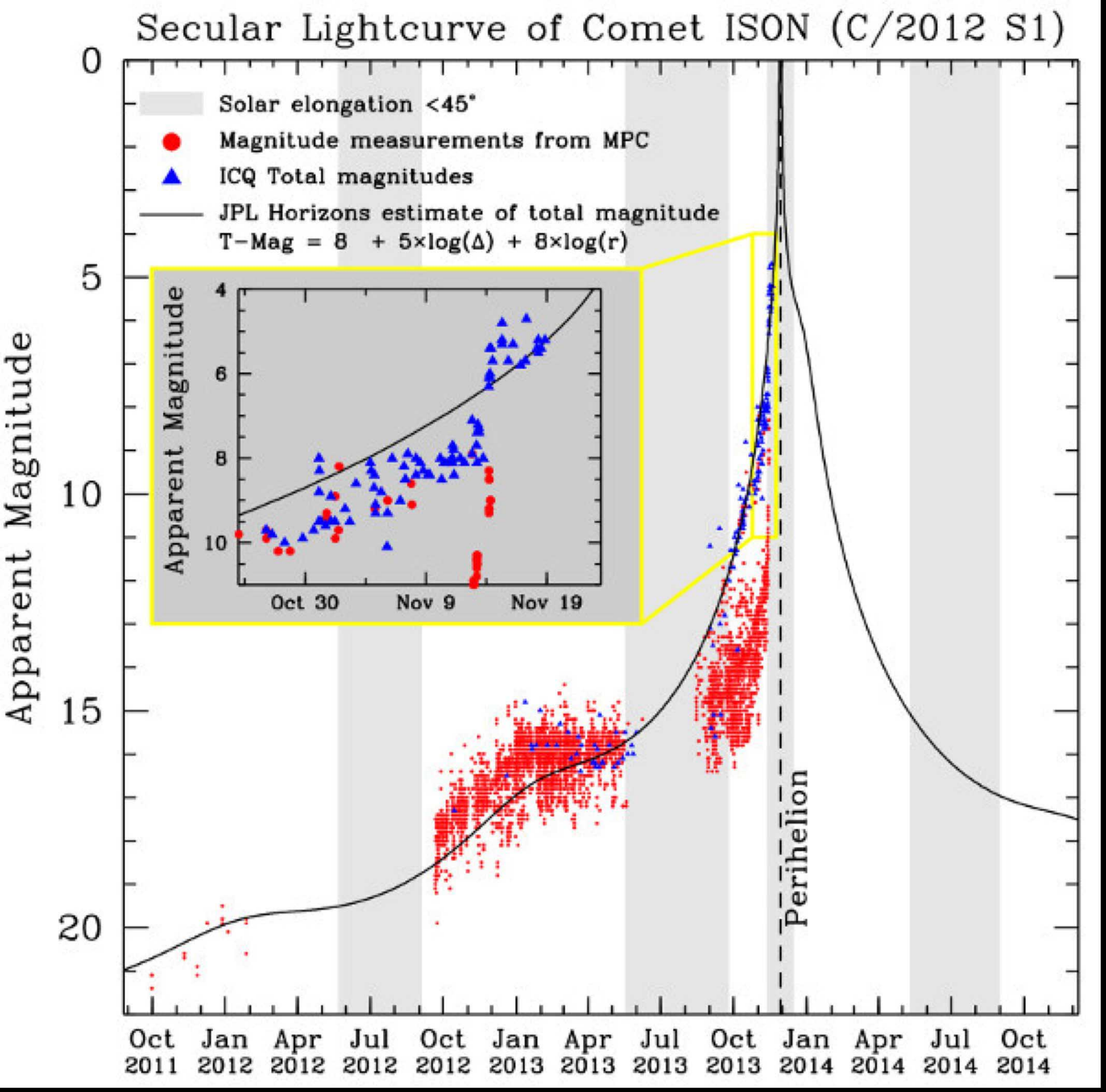
Noel Munford

WED 5TH FEBRUARY
1PM
# THE LIVES OF STARS

NASA, ESA

# 12 years through space

*Rosetta* mission, ESA

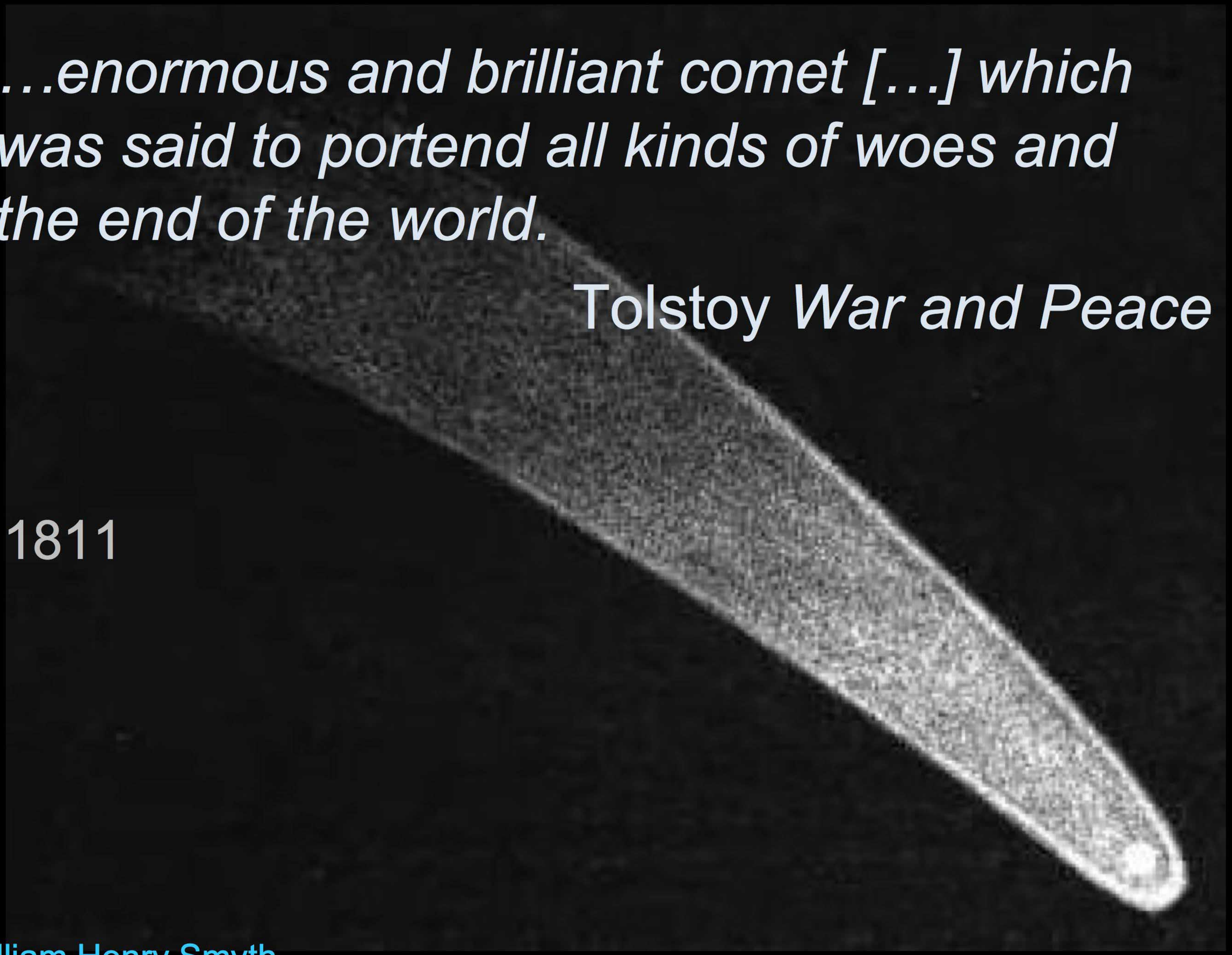



NASA CIOC/Matthew Knight

*…enormous and brilliant comet […] which was said to portend all kinds of woes and the end of the world.*

Tolstoy *War and Peace*

1811



William Henry Smyth