

# Ongoing News

concerning the **new primary planet**  
of our Solar-System,

*long suspected to be between Mars and Jupiter*  
and now possibly discovered.

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On the 16th of May, I received a letter from Bremen from my highly esteemed friend, Dr. Olbers, in which he inquired after the unexpected and immense news of the times: that a moving star, discovered in the very first days of this century, commonly reported as a comet, was identified as the *eighth* planet of our solar-system, missing up until now; and requested further news concerning this tremendous astronomical event for the satisfaction of his eagerness for knowledge. I had already anticipated Dr. Olbers's request, for I myself knew all too well what a gain it would be for science to grant the observations of the aforementioned to such a scholarly and sharp-witted Astronomer as Dr. Olbers is as soon as possible. And actually I already received a reply from him on the 30th of May, in which he had communicated the new elements of a circular orbit of this planet to us from the two observations of Piazzi's that were communicated to him from the 1st and the 23rd of January.

"It was simple," writes Olbers, "to guess a planet for such a small, and slow moving star without any cloud, so near to the ecliptic. However, the credit remains to Piazzi, not only for discovering the new planet, but for already having announced it as such. Could Piazzi have thus robbed our sprouting society of the glory of discovering a new planet? For we certainly would have found it, if our plan were to have come fully into operation from the start, since a moving star of magnitude eight could not have been easily missed."

Dr. Olbers calculates the following elements of an orbit from the only two known observations sent to him, according to a circular hypothesis, noting however, that, naturally, these are determined with little reliability, since the observations are only 22 days apart from one another, and are only given in whole minutes. Also, the lines of sight do not lie very favorably. However, with these only probable assumptions, he finds and makes known to us the data:

the radius of the orbit . . . 2.947465  
Longitude of ascension, nodes  $2^{\circ}21'55''10''$   
Inclination of the orbit . . . .  $7^{\circ}54'38''$   
helio. longitude of Jan. 1st, 1801  $2^{\circ}7'40'36''$   
sidereal period . . . 1841.24 days = 5.04096 years

daily helioc. motion  $11^{\circ}43'$ ,<sup>87</sup>

yearly motion . . .  $71^{\circ}24'57''$ ,<sup>6</sup>

“With these elements,” adds Dr. Olbers, “the planet will hardly be able to be calculated so far in advance as to be able to find it in its reappearance in the morning in August, if it does not actually distinguish itself as a magnitude 8 star already by plain sight. For most likely, it has a not inconsiderable eccentricity. At opposition, it can perhaps grow up to a luminous intensity of a magnitude 6 star. I hardly doubt that it will not have already been encountered among La Lande’s stars. Therefore, I am very eager for each further observation which Piazzi might perhaps make known.”

On the 16th of May I received a reply from Prof. Bode, in which he imparted to me: “It was very enjoyable for me to hear from your letter that you are of the same mind as me concerning the subject of Piazzi’s comet, and that Oriani as well, and Piazzi himself agree with it. How often have I not wished to live to experience this discovery.... I have scorned the known harmonic progression of the distances of the planets from one another many times.... Assuming the distance 2.75, I find the difference of the heliocentric longitude between the 1st and the 23rd of Jan. to measure up pretty well with the observation, the planet goes to its node, which I had to set its inclination as passing  $6^{\circ}$  into Taurus, and also I here find a reason why it had not yet been found. The existence of this new planet will consequently be proven true with more observations, which I impatiently await from Piazzi, so I will not fail to communicate them to you straightaway.”

Until around the end of May I received no further news of this star; however, I had without fail given my Parisian friends news thereof, and communicated our elements of the orbit to them for the time being; and since I presumed that La Lande, who had obtained the first news of the comet from Piazzi, surely obtained the ongoing observations, and would have communicated his supposition of a planet to him as well, I thus requested the observations of this planet from La Lande, who would attain knowledge of it.

However, at the beginning of June, I received, with no little surprise, more letters from Paris, from Senator La Place from the 29th of May, from La Lande and Burckhardt from the 26th of May, from De Lambre from the 24th of May, from Mèchain from the 26th of May, from Henry from the 28th of May; and not a one of all *six* of these astronomers, who have communicated many important observations and new discoveries to us, made mention of the new planet- not a syllable! Only Mèchain mentioned Piazzi’s *comet* in his letter, which was a definite proof to me that nothing was yet known of this new supposed planet in Paris at the end of May, since we in Germany already had knowledge of it in the month of May from professor Bode. Mèchain writes merely, “Have you seen the Comet that the newspapers say has been discovered in Palermo last January? No one here came across it. Our astronomers have found nothing of it since December 1799. Even so, I search for it, but without success.”<sup>1</sup>

On the 10th of June I again received a letter from Prof. Bode, in which

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<sup>1</sup>Translated from French by Jason Ross.

he had the kindness to announce to me, “I received Piazzi’s first letter on the 20th of May, and the next post day, on the 23rd, I replied; he had not, however, awaited the reply, but rather, imagine my joy, and at the same time displeasure: I received a letter from Piazzi, broke it open filled with expectation, and found only the following concerning the new star, which I communicate to you to the letter: “I wrote to you in January, telling you about a Comet that I had discovered in Taurus, and that I followed until February 11th, at which time I was attacked by a serious sickness, of which I am still not entirely cured. If I can recuperate, I will calculate its Elements, which I will then send to you. While waiting, I have shared my observations with Mr. La Lande.”<sup>2</sup> He thus informs me only that he observed the star, which he had still called *a comet in his first letter* to me, up to the 11th of Feb., and then fell ill, without communicating the observations themselves...”

On the 18th of June I received the following letter of Dr. Burckhardt’s from Paris: “I hasten to communicate to you what I have found up until now concerning Piazzi’s comet, as incomplete as it still is: but I hope to send you the continuation of my investigations with the next post. La Lande had received Piazzi’s observations on the first of May in the evening; I immediately began to occupy myself with the calculation of its orbit. Two days later, we received your letter with yours and Oriani’s investigations, which permitted us to hope that this body is a planet. My investigations have already showed me that the described arc is not very considerable; I therefore believe that it must necessarily be satisfied by means of a parabola. The small geocentric and heliocentric motion of this comet has caused me an extraordinarily great effort in the determination of its orbit. At first I had chosen the observations from the 14th, 21st, and 28th of January, and from this case, I found it necessary to choose the furthest observations, namely, the ones from the 1st and 21st of January, and the 11th of February. Over the course of these 42 days the comet had only changed its geocentric longitude by around  $3^\circ$ , and its heliocentric longitude by only around  $10^\circ\frac{1}{2}$ . Since I wished to improve the parabola found by my method by means of La Place’s method, I found that the equations of condition permitted absolutely no means to hope for doing so. I tried La Place’s method of approximation, but with so little success, which I could have seen beforehand, since the unavoidable observational errors had too great an influence on the difference of the geocentr. longitudes and latitudes. I then tested eight hypotheses by means of La Place’s method of improvement, but without coming any closer to the truth. I then calculated the following *circle*, which satisfies the three observations within  $\pm 2\frac{1}{2}$  minutes:”

Radius of the circle . . . . . 2.74  
 1801 Epoch . . . . .  $2^z 8^\circ 16' 20''$   
 ascending node . . . . .  $2^z 20^\circ 15'$   
 Inclination of the orbit . . . . .  $11^\circ 21'$   
 Period . . . . .  $4\frac{1}{2}$  years.

As manifold as the attempts employed up until now were, they do not prove,

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<sup>2</sup>see above.

however, that there is no possible parabola for these observations. I have decided to apply a method to this which has often been successful for me when all other methods of interpolation abandon me. Namely, as long as the equations of condition are set up such that they cannot be made equal to zero without giving both of the changing magnitudes extremely improbable values; then one is satisfied with changing merely one of the changing magnitudes, until he has found a hypothesis, where both of the errors are set equally great, and cancel each other out, in which the errors are as small as possible, and by which one can obtain the magnitude taken as changing. Only the remaining magnitudes are changed, and the values of the first magnitudes are determined anew by attempts in which both errors are equally large, but cancel each other out. The changes of the absolute values of the smallest possible errors indicate which changes must be applied in both cases so that the value of the smallest errors will become zero. For example, I set the logarithm for the distance to the sun for Piazzi's comet equal to 0.438; the smallest error was  $\pm 8'$ ; I then set the logarithm of the distance equal to 0.378; the smallest error was  $\pm 4'$ . Thus, I saw that the distance must be even smaller; after 20 hypotheses I found the following *parabola*:

Position of the ascending node  $2^z 20^o 50'$   
 Inclination of the orbit . . .  $9^o 41'$   
 Position of the perihelion .  $4^z 8^o 38' 25''$   
 least distance from the sun 2.21883 its Log. 0.3461250  
 Logar. of the diurnal motion 9.4409408  
 time of transit through the perihelion June 30th, 1801 19 hours 1'.

This parabola satisfies the three observations for the longitude; however, it is not possible to represent the three latitudes with it. The errors in longitude on the 14th and 28th of January are  $-1' 47''$  and  $+38''$ .

I believe I can be sure that there is no parabola which more closely satisfies the observations. Piazzi had written absolutely nothing concerning the precision with which he had been able to observe this comet.

My inclination is very different from that of yours and Oriani's determination; this is due to the first observation, where the declination which had been transmitted to you, and probably to Oriani as well, was around 3 minutes too great. For this and various other reasons, I have requested of Piazzi a completely new, reliable copy of his observations. Then it will be shown, whether I can find something more determined concerning this peculiar star, which, however, will always be very uncertain, since the traversed arc is only [??-unreadable] degrees."

On the 21st of Jan., the promised letter from Burckhardt came, which contained the following: "I am sending the promised continuation of my investigations concerning Piazzi's star. I have not been vexed by the effort to seek out an ellipse, though the traversed arc is too small to hope for a great precision; but I believe it will advance and facilitate the seeking out of this star.

Position of the ascending node . . . . .  $2^z 20^o 58' 30''$   
 Inclination of the orbit . . . . .  $[??]^o 47' 0$   
 Position of the aphelion . . . . . 285937

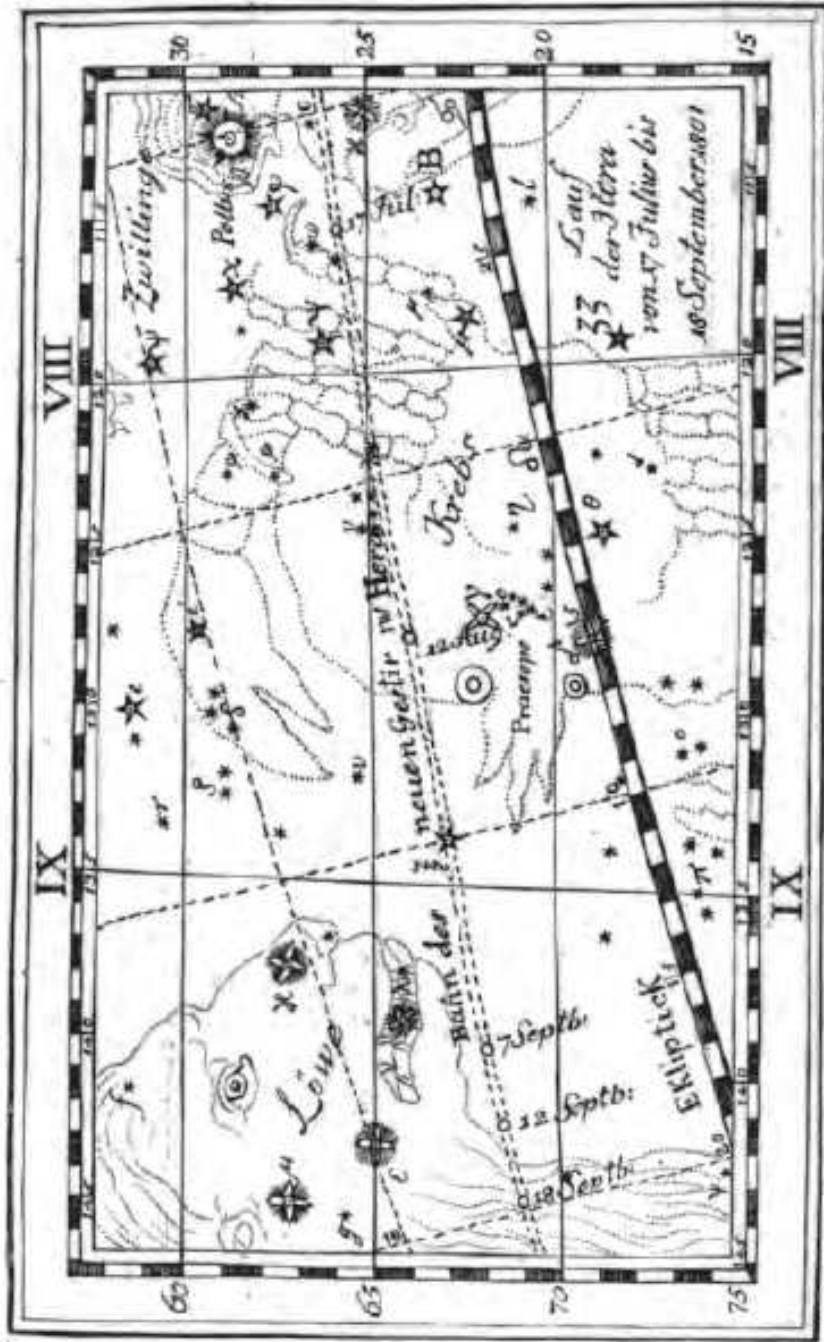
Time of transit throught the January 1801 aphelion 1, 3328  
 Eccentricity . . . . . 0, 0364  
 Logarith. of the semi major axis . . . 0, 4106586  
 Sidereal period . . . . . 4, 13 years.

This ellipse represents the longitudes and latitudes of five observations within a few seconds; a greater precision could easily be obtained, however that would be entirely superfluous since the traversed arc is so small. In order to obtain an idea of the parts that belong to the changes [*Aenderungen zusammen gehörender Stücke*], I have decreased the position of the aphelion by around 45°, or set the true anomaly equal to 45° on the 1st of Jan.; the eccentricity is then 0.0344, and the log. of the axis is 0.41544. The period is 4.2 years. I have made various attempts to decrease the position of the aphelion to around 90° to 100°, but without success.

This ellipse has given me the following determinations: and I very much wish that the friends and admirers of astronomy [*Sternkunde*] might occupy themselves with the seeking out of this star, whether or not we in Paris are neglected [emphvernachlässigen werden], in order to discover it. However, the matter at hand is too important not to deserve the united efforts of all astronomers. It had always been better if Piazzi would have communicated his observations earlier; it would then have been discovered more easily, and would have been observed for much longer; namely, an illness had necessitated Piazzi to give up his observations on the 11th of February.

*Positions of the new star discovered by Piazzi*

1801	<i>mean time</i>	<i>geoc. longitude</i>	<i>geoc. latitude</i>
<i>June 20th</i>	( <i>o'clock</i> ) 13 4'	101° 45'	3° 26' N.
<i>July 17th</i>	1 43	113 3	4 6
<i>Aug. 12th</i>	10 54	124 21	4 51
<i>Sept. 7th</i>	16 19	135 28	5 41
-- 12th	22 0	137 40	5 52
-- 18th	3 0	139 50	6 3
-- 23rd	8 0	141 58	6 15
-- 28th	13 0	144 5	6 27
<i>Oct. 3rd</i>	17 41	146 9	6 40
-- 8th	22 0	148 12	6 53
-- 14th	3 0	150 12	7 8
-- 19th	7 0	152 11	7 22
-- 24th	11 0	154 8	7 37
-- 29th	14 45	156 3	7 53
<i>Novb. 3rd</i>	18 0	157 56	8 9
-- 8th	22 0	159 48	8 26



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In order for the admirers of astronomy to facilitate the seeking out of this small star still more, we have devised a small piece of advice, both for those who are not provided with any instrument save a telescope, and for those who are able to put a telescope on a parallactic tripod. The former will be found preceding the map of the entire course of this star from the 17th of July until the 18th of September, drafted in great haste, at the conclusion of this issue. Such a small star, as the presumed planet appears to be, may hardly be found earlier; for on the 17th of July, it will rise at about 3:30 in our northern reaches of Germany; the sunrise will follow at about 4:00, preceding which such a small and unrecognized star, so near to the horizon, and to the great morning twilight, will not be easy to discover; it will rise approximately an hour before the Sun, and will come to stand one and a half degrees above the northern donkeys [*nördlichen Eselein* ( $\gamma$ [69]), until it is nearly between the two stars  $\lambda$ [69] and  $\lambda$ [?] in the parallel. On the 25th and 26th of August it will come very close by to the star  $\xi$ 69. On the 7th of September it will come between  $\gamma$ 69 und  $\gamma$ [?] in the parallel, and will almost enter into the constellation of the lion [Leo]; on the 23rd of September it will come to stand  $2\frac{1}{2}^\circ$  below  $\chi$ [?], and  $1\frac{1}{2}^\circ$  below  $\gamma$ [?] on the 5th of October. By then, this star will probably have been long discovered, and observed by astronomers with better instruments; however, the planet rises at about 1:30, preceding the sunrise by five hours, in the pitch-dark night; it will therefore be able to be observed very well by [eintretendem Neuen nde?-unreadable]. To say more upon this would be unnecessary, since it will probably appear in the following August issue of our *M. C.*; and its determination will be able to be announced.

For those who have parallactic motion with their telescope, in order to convenience and quicken the finding of this new star, we here put the following calculated right ascensions and declinations. Those astronomers, however, who are provided with meridian [*Mittags*] telescopes, may hardly be able to observe this small star on the meridian before the end of November.

It was to be expected that many new names would be attached to a new planet. In the *Leipziger Allgemeine Literarische Anzeigen* Nr. 72, an anonymous person proposes the name *Vulcan*. He thinks that it may not be unbecoming to assign a place in the heavens to the god of he who forged the weapons of Achilles, next to the god of war, and to the spouse of Venus, next to his lover. Also, *Vulcan* could himself not complain that this honor was bestowed upon him so late [*die Ehre erwiesen*], and that such an inconsiderable planet had been named after him, since he himself is something less than a resplendent form, due to a small flaw in the feet, not even swift-footed. *Vulcan* also belongs to the family as the son of Jupiter, and may thus have, in this respect, a well-founded claim upon the honor intended for him.

Doctor and Prof. Reimarus in Hamburg is of the opinion that it must be named *Cupid*. Because it had once been so established to name the planets after the deities of the ancients, it were indeed an entirely valid reason for this name, for he had been the next lover of Venus, after Mars (counted from Venus downwards). Other beliefs that the name *Cupid* is well-suited on that account as well, are that it is in keeping with the concept of blindness. Namely, the new

planet appears as a star of only the eighth magnitude, and can not be seen by the natural eyes of man. Indeed, if it should prove to be a planet, then the majority of votes will decide, or perhaps it will even be left to chance. It is also possible that, just as with Uranus, a general unification and accordance will never come about. In Italy, for example, the name *Ferdinandeam Sidus* has been retained, *la Planète Piazzzi* in France, and various mythological names in the rest of Europe, until time, means, and circumstances fully decide. Fortunately, the name does not cost any labor, if this important conquest in the universe is not left to us, which, as our noteworthy and most ingenious scholar expressed it<sup>3</sup>, unlike a political conquest on the small planet Earth, costs us not blood and tears, but rather only human industry, the spirit of observation, and ingenuity.

Even in most ancient times, in order to indicate the order of the planets according to their distances from the Sun, they had been put into memorable Latin verses [*Gedächtnissverse*], for example, there are the two old, and well known flawed verses:

[insert Latin verse]

When Herschel discovered the new planet past Saturn, he wanted Poinset Desivry to name it after the wife of Saturn, *Cybelle*, and he brought up the order of the seven planets in the following verse:

[insert Latin]

One of my friends expressed the order of the henceforth *eight* major planets in the following, not inauspicious verse, which, however, implies a thought contrary to the customary usage of memorial verses.

[insert Latin]

*or*

[insert Latin]

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<sup>3</sup>*National-Zeitung der Teutschen* 25th Issue, June 18th, 1801.