Pastor Kevin Lea First Contacted Dr. Brownlee In The Form Of This Hard Copy Letter:

June 17, 2004

Dear Dr Brownlee,

I was encouraged to write you by Dr. Scott Niven, professor of astronomy at Olympic College in Bremerton Washington.

His encouragement came during a discussion of comets (among other things) in his office in early March, 2004. I mentioned to him that Dr Walt Brown (WestPoint Grad, MIT doctorate in mechanical engineering, tenured Air Force Academy professor and department head, Chief of Science and Technology Studies at the War College, Director of Benet Research, National Science Foundation Fellow, etc.) published several predictions related to astronomy and comets in 2001, some of which at the time of our discussion were being preliminarily validated by the Mars Rover project.

Dr. Niven replied that many scientists publish predictions, implying Dr. Brown's scientific prediction of finding salt on Mars was nothing exceptional. I agreed with Dr Niven that scientists make predictions, but I know of no one, other than Dr. Brown, who is making predictions, in writing, that salt (left behind by salt water) would be found in flow channels on Mars.

The Mars project team validated the first part of Dr Brown's Prediction 19 two weeks ago. On page 200 of his book published in 2001, Dr Brown states:

PREDICTION 19: Soil in "erosion" channels on Mars will contain traces of soluble compounds, such as salt from the subterranean chamber. Soil far from "erosion" channels will not.

When I mentioned to Dr. Nevin that other Dr. Brown predictions would be tested by the Stardust results when it returns in 2006, he told me he knew you and was aware of the Stardust project. I encouraged Dr. Nevin to read Dr. Brown's chapter on comets but he declined saying he was not interested in comet research but thought you may be, thus the purpose of this letter.

Because of other topics during our discussion, I felt Dr. Nevin's declining had more to do with not wanting to look through Dr. Brown's telescope than of not being interested in comet science. Paradigm shifts are always difficult for people to make, but just as in Galileo's day, the TRUTH will prevail. My hope is that it won't take hundreds of years of closed eyes and ears before real science and truth is embraced, even if it goes against the unfounded belief that, in the case of comets, they could not possibly have come from the earth during a cataclysmic event thousands of years ago.

Specifically, I hope you will ponder the following predictions and observations made by Dr. Brown and then dismiss them on scientific grounds or, for the sake of truth and science, be willing to accept the data and be a leader in the paradigm shift, no matter how painful it may be. No one would have wanted to be the Pope in 1992 when he had to finally admit the earth is not the center of the solar system. The "ignorant" masses embraced the truth hundreds of years earlier. The Internet will greatly shorten the time between facts being known and the inevitable exposure of those who maintained intransigent devotion to myths.

I have included a copy of Dr. Brown's comet chapter as an enclosure to this letter, but the following is a brief summary of the theory and specific predictions/observations that I hope you can take the time to answer/address.

Dr. Brown theorizes that all comets originated from earth when large amounts of water, originally contained under the crust of the earth, were jettisoned from the earth when the crust ruptured. The launching pressure was generated by the weight of the ten-mile thick crust, plus the explosive effect created by dissolved carbon dioxide in the water being depressurized as the water escaped. The combination of these two forces as well as the water hammer effects were more than sufficient to launch bursts of water, rock and crustal debris (including organic matter from the surface of earth) into space.

Lower energy bursts produced short period comets. Higher energy bursts produced long period comets. Some of the water, rock fragments, and organic material from earth would have been directed at the Moon, Mars and other planets. While traveling in space the water would have turned to ice, the carbon dioxide into dry ice. When the debris collided with Mars, the kinetic energy would have been converted into thermal energy resulting in the melting of the ice, turning it into liquid water that would have flowed on Mars into the low areas close to the impact locations. This explains why a planet whose average temperature is 117 degrees Fahrenheit below freezing shows evidence of past flowing streams of water.

Because of the low mass of Mars, and related little gravity, much of the water has sublimated back into space leaving behind salt and other compounds. The organic material from earth would have stayed in the soil of Mars. The anaerobic bacteria, which also came from earth, have been living off of the organic material since then. These microbes produce Methane as a byproduct of decaying organic material. Methane is also found (through light spectrometry) in comet tails.

Dr. Brown makes the following predictions based on his theory:

1. On page 212, prediction 26 – "The Oort cloud will never be seen, because it does not exist."

   Question: Is there any hard scientific evidence that the Oort cloud exists? Or is it based on wishful thinking?

2. On page 202, prediction 22 – "The equivalent of Jupiter's mass is thinly distributed 40-600 AU from the Sun."

	**PREDICTION 20:** The number of near-parabolic comets passing perihelion each decade will be found to be diminishing slightly. This effect will be seen as better telescopes, more searchers, and higher quality data allow adjustments to be made for our increasing ability to see comets.
	**PREDICTION 21:** Some large, near-parabolic comets, as they fall toward the center of the solar system for the first time, will reveal moons acquired as the comets formed. Tidal effects may strip such moons from their comets as they pass the Sun. (A moon may have been found orbiting incoming comet Hale-Bopp.[71])

If the comets represented by the red bar in Figure 125 on page 205 are falling in from distances of 50,000 AU, their orbital periods are about 4 million years. How then could they have been launched from anywhere in the solar system if the flood began only 5,000 years ago?

The distance (50,000 AU) may be in error. Comets more than 12 AU from the Sun cannot be seen, so the distance they have fallen and the time required must be calculated. Both calculations are extremely sensitive to the mass of the solar system. If this mass has been underestimated by as little as 16 parts in 10,000 (about the mass of Jupiter), the true distance would be 600 AU and the period only 5,000 years.[72]

Where might that mass be hiding? Probably not in the planetary region. The masses of the Sun, planets, and some moons are well known, because masses in space can be accurately measured if something orbits them and the orbit is closely observed.[73] However, if the equivalent of Jupiter's mass is thinly spread within 40 – 600 AU from the Sun (beyond Pluto's orbit), only objects outside 40 AU would be gravitationally affected. (Recall the hollow sphere analogy on page 202.) That mass would considerably shorten the periods of near-parabolic comets, because they spend 99.9% of their time at least 40 AU from the Sun.

Comet Herschel-Rigollet is the one periodically observed comet that ventures most deeply (57 AU) into this region 40 – 600 AU from the Sun. Its only recorded return was much earlier than expected, as if it encountered extra mass beyond 40 AU. [74]

What if two comet sightings, a century or more apart, were of comets which we assumed had such long periods that they should not be the same comet, but whose orbits were so similar they probably were the same comet? We might suspect that both sightings were of the same comet, and it encountered a slight amount of extra mass beyond 40 AU that pulled it back much sooner than expected. Twelve "strange pairs" are known, suggesting that extra, unseen mass beyond Pluto's orbit affects long-period comets but is not felt within the planetary region. These "strange pairs" are explained in Figure 126 and Table 14.

This "missing" mass could be composed of particles as small as gas molecules up to asteroid-size objects 100 miles wide. They would be difficult to detect with our best telescopes. However, with recent technical advances, dozens of large, asteroid-size objects are being discovered each year beyond Neptune's orbit. They are called transneptunian objects. So far, 700 have been discovered. Of course, no one knows their total number or mass.

Much is unknown about the distant region 40 – 600 AU from the Sun. For example, spacecraft launched from Earth many years ago are now entering that region's inner fringes. These spacecraft are experiencing a slight, but additional, gravitylike acceleration toward the Sun. So far, efforts to explain this acceleration have failed. While its magnitude is too small to give near-parabolic comets 5,000-year periods, the effect is strengthening as the spacecraft begin to penetrate this region.[76]

Detecting the Hidden Mass That Comets Feel

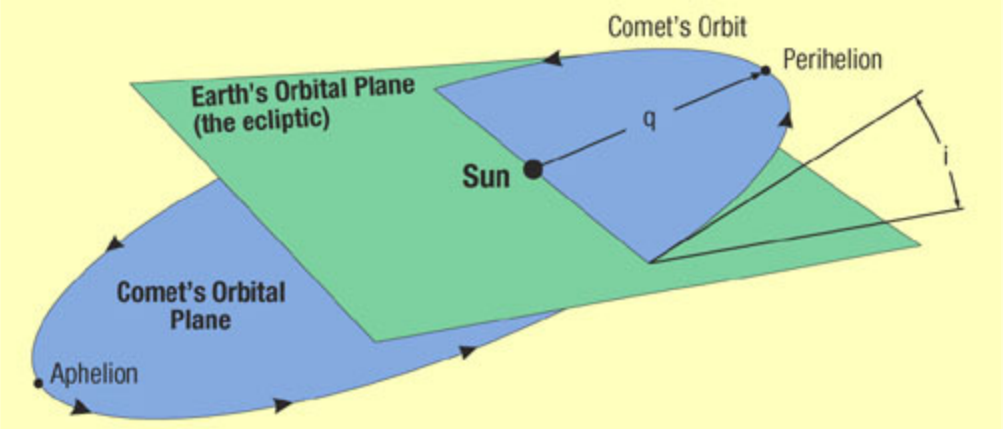


Figure 126: An Orbit's Fingerprint. A comet's orbit closely approximates an ellipse. Each ellipse and its orientation in space are specified by five numbers, two of which are shown above. The first, i, is the angle of inclination—the angle the plane of the ellipse makes with Earth's orbital plane. A second number, q, measures in astronomical units (AU) the distance from the Sun to the perihelion. The other three numbers (e, w , and W) need not be defined here but are explained in most books on orbital mechanics or astronautics.

In the last 900 years, almost 1,000 different comets have been observed accurately enough to calculate these five numbers. Surprisingly, 12 pairs of comets have very similar numbers. Could some *"strange pairs"* really be the same comet on a subsequent orbit? The estimated period (the far right column in Table 14), the time to complete one orbit, for each member of the "strange pair" is so extremely long they should not be the same comet. However, the chance of any two random comets having such similar orbits is about one out of a 100,000.[75] The chance of getting at least 12 "strange pairs" from the vast number of possible pairings is about one out of 7,000. *If the solar system's mass has been slightly underestimated, those estimated orbital periods would be much less. If so, some "strange pairs" are the same comet, and the estimated period (far right column) is wrong.* Other reasons are given in this chapter for believing that a slight amount of extra mass exists in the solar system. It should be approximately the mass of Jupiter but spread thinly outside the planetary region—where long-period comets spend most of their time.

Each pair of rows in Table 14 describes two sightings of comets with remarkably similar orbits. The far left column tells when, to the nearest tenth of a year, the comet passed perihelion. The next five columns

specify the comet's orbit. The bottom two pair may be the same comet seen in 1097, 1538, and 1947. [Endnote 75 tells how Table 14 was developed.]

Table 14. Twelve "Strange Pairs"

Comet (year)	i (°)	q (AU)	e	w (°)	W (°)	Period (year)
1877.7	102.2274	1.575904	1.000000	143.2049	252.710	infinite
1994.8	101.7379	1.845402	0.999517	142.7849	249.943	236,165
1846.4	122.3771	1.375992	1.000000	78.7517	163.464	infinite
1973.4	121.5982	1.382019	0.998723	74.8598	164.817	35,603
1439.4	81.0000	0.120000	1.000000	140.0000	192.000	infinite
1840.3	79.8512	0.748504	1.000000	138.0440	188.271	infinite
1785.1	70.2380	1.143400	1.000000	205.632	267.214	infinite
1898.6	70.0300	0.626438	1.000000	205.613	260.528	infinite
1863.0	137.541	0.803238	1.000000	230.576	357.695	infinite
1978.7	138.264	0.431870	1.000000	240.450	358.419	infinite
1304.1	65.0000	0.840000	1.000000	25.0000	88.7000	infinite
1935.2	65.4251	0.811148	0.991304	18.3969	92.4472	901
1770.9	148.555	0.528240	1.000000	260.375	111.944	infinite
1980.0	148.6018	0.545164	0.987598	257.5849	103.2190	291
1580.9	64.6120	0.602370	1.000000	89.3670	24.9480	infinite
1890.5	63.3509	0.764087	1.000000	85.6608	15.8347	infinite
1337.5	143.6000	0.749000	1.000000	79.6100	97.6100	infinite
1968.6	143.2384	1.160434	1.000665	88.7151	106.7471	infinite
1742.1	112.9480	0.765770	1.000000	328.0430	189.2010	infinite
1907.2	110.0572	0.923861	1.000000	328.7561	190.4170	infinite
1097.7	41.0000	0.300000	1.000000	298.0000	352.0000	infinite
1538.0	42.4600	0.147700	1.000000	287.7000	356.2000	infinite
1097.7	41.0000	0.300000	1.000000	298.000	352.000	infinite
1947.4	39.3015	0.559799	0.997427	303.7545	353.909	3,209

PREDICTION 22: The equivalent of Jupiter's mass is thinly distributed 40 –600 AU from the Sun.

PREDICTION 23: Because the solar system is slightly "heavier" than previously thought, some strange comet pairs listed in Table 14 are a single comet on successive orbital passes. More "strange pairs" will be found each decade. Probably the comet sightings of 1785 and 1898 were of the same comet. [See Table 14.] If so, it will return in about 2012.

4. ***Random Perihelion Directions.*** Comets were launched in almost all directions, because the generally north-south rupture encircled the rotating Earth.

The Following Article Came Out the Day after Sending the Above Letter to Dr. Brownlee and Was Right after the Stardust Spacecraft was Able to Take Close-Up Pictures of the Wild2 Comet

Comet Dust Seen As Key to Life
Probe Will Carry Samples to Earth

Chicago Tribune 06/18/04
author: Andreas von Bubnoff

https://www.chicagotribune.com/news/ct-xpm-2004-06-18-0406180353-story.html

Organic chemicals found on a comet may support the idea that ancient cosmic collisions helped spur the origins of life on Earth, scientists said Thursday as they presented data from a probe that passed within 147 miles of comet Wild 2 earlier this year.

The probe, called Stardust, is bringing back to Earth the first dust samples ever returned from a comet. But data and pictures published Friday also give detailed clues about the comet's anatomy that indicate it is surprisingly different from comets studied before.

Comets offer unique insights into the formation of the solar system because they contain material that has changed little since the sun and planets formed more than 4 billion years ago. They are

essentially dirty snowballs, composed mostly of frozen water and dust, and they are visible only when their orbits take them near the sun. The sun's heat causes jets of dust and water vapor to burst from the comet's surface--forming the comet's tail.

Because the young Earth was too hot for many organic molecules to last for long, some experts have proposed that impacts by comets in a later period may have seeded the planet with some of life's chemical building blocks.

"We don't expect that life came from comets," said Donald Brownlee, the leading scientist of the Stardust mission. "But we do expect that the molecules used by life probably came from comets and asteroids."

That theory gained support from Stardust data analyzed by a German team led by Jochen Kissel. Their findings appear in Friday's edition of the journal Science along with three other papers on the comet probe, including one by University of Chicago scientists.

Kissel's group used instruments on the probe to analyze dust near Wild 2 and found an organic compound called PQQ that had never been detected in a comet. Researchers believe PQQ plays a key role in cell growth.

"PQQ is found in [almost] every cell of every living entity on earth," Kissel said.

In addition to its chemical findings, Stardust obtained the highest resolution photos ever taken of the solid part of a comet, called the core. The comet was riddled with craters, which scientists said indicates that Wild 2's original surface has not been burned away by the sun.

Named after the Swiss scientist who discovered it, Wild 2 (pronounced "vilt two") entered the inner realm of the solar system only recently, in 1974, after a close encounter with Jupiter changed its orbit. Only then did the comet's ancient core start losing material to the heat of the sun.

"We were expecting craters," Brownlee said. "Craters mean that some of [Wild 2's] surface is really old."

Yet the craters and structures were unlike anything seen before on the surface of comets, the researchers said.

"We were totally stunned by what we saw," Brownlee said, describing craters with almost vertical walls. "The vertical walls are amazing because if the comet were made of a powdery material, you couldn't support vertical surfaces."

Many scientists had thought of comet cores as fragile, said Claudia Alexander, project scientist at NASA's Jet Propulsion Laboratory in California. Other comets seemed so tenuous that they fell apart easily, as when comet Shoemaker-Levy 9 broke up as it approached Jupiter in 1994. But Wild 2's craters suggest its composition is more solid.

Scientists were also surprised to see that the comet had about 20 jets coming from its surface.

"We thought that there would be maybe one jet," said Benton Clark, chief scientist of space exploration systems at Lockheed Martin.

About Two Years Later the Stardust Probe has been Opened and Kevin Posted the following to the Church Website:

Stardust results support Dr. Walt Brown's Predictions

Increasing Evidence That His Hydroplate Theory Explanation of Comet Formation Is Accurate

March 18, 2006 (About 6 weeks before Dr. Brownlee Gave His Lecture at the UW)

Note from Pastor Kevin Lea: As many know, I have been researching Dr. Walt Brown's Hydroplate Theory explanation for the flood of Noah for about 13 years. The 7th edition of his book was published in 2001 and included a chapter on how the comets of our solar system were formed. The updated version of his book (which will become the published 8th edition in about two years) can be read on line at www.creationscience.com.

The magnitude of the global cataclysm associated with the biblical flood of Noah's day is something that few consider or try to understand. I trust that those who do try will be blessed as the Lord lifts the veil and gives the searcher a better glimpse of His awesome power.

The Bible states that the flood occurred when the fountains of the great deep burst up (through the crust) in one day creating a global rainfall for forty days (Gen 7:11-12). This implies that the pre-flood earth was created with a large amount of water under the crust and that the crust broke allowing the trapped waters to explode upward through a growing crack that within hours stretched around the earth.

Dr. Brown, who has a doctorate in mechanical engineering from MIT and was a tenured professor at the Air Force Academy before retiring as a full Colonel, has studied the forces that were at play as water trapped under the earth was released through a crack that circled the earth. He has demonstrated that some of the water, dirt, minerals, etc. of earth would have been expelled with enough velocity to escape earth's gravitational attraction and entered into highly elliptical orbits around our Sun.

Comets are often referred to as dirty ice balls orbiting the Sun. However, evolutionary (big bang) minded astronomers and astrophysicists can't accept (or even consider) that they came from the dirt and water planet (earth), since doing so seems absurd to them. So they have invented various theories of how comets are formed, such as the Oort Cloud (never seen observed or otherwise found outside of the minds of evolutionist fairy tale makers), all of which fall horribly short of explaining even some of what we know about comets.

Dr. Brownlee of the University of Washington is one of the world's leading researchers in Comets (from a Big Bang mindset) and is credited with making the Stardust Probe mission a reality. The Stardust spacecraft, launched in February 1999, came within 150 miles of the comet Wild 2 on Jan.

2, 2004, and collected thousands of tiny dust particles streaming from its nucleus. The Stardust sample-return canister parachuted onto the Utah desert salt flats Jan. 15, 2006, following a journey of nearly 3 billion miles.

The week before the Stardust Probe landed safely, a NASA Fellow who has followed Dr. Brown's work encouraged Dr. Brown (in the e-mails below) to put his predictions (of what would be found based on his theory) in writing. I called Dr. Brown on Jan. 13th, 2006 with an encouragement to answer the e-mail request with his written predictions.

*On Jan. 14th, Dr. Brown sent the following predictions in response to our requests. The e-mail history predating the predictions are included, but the name of the NASA Fellow has been replaced with **** since this person desires to maintain a low profile with Dr. Brownlee for obvious reasons. Two brief unrelated statements made in the e-mails to Dr. Brown are also omitted and replaced with [****] to help prevent identity disclosure.*

On Sunday, Jan. 15th, (the day that Stardust landed) I made a public statement during our morning study about how the evolutionist would be surprised by the Stardust data results, but that the data would be consistent with Dr. Brown's theory and predictions. This brief statement can be listened to by clicking here: pastor-kevin-public-statement-about-stardust-space-probe-the-day-it-landed-on-jan-15-2006/. To listen to the Jan. 15th Galatians study which contains this public statement (about 15 minutes into the study), then click here: Galatians 3:4-29

January 14, 2006 Dr. Brown Sends His Predictions in an E-Mail to NASA Ambassador and Kevin Lea

Note: Three months later, on April 29, 2006 after Dr. Brownlee gave his presentation on Stardust results, these predictions along with a color copy of Dr. Brown's Comet chapter were given to Dr. Brownlee at the University of Washington.

Sent: Saturday, January 14, 2006 3:52 PM **(The day before the Stardust Space Probe landed)**
Subject: Stardust Predictions

****,

Dr. Walt Brown writing: I am attaching the current version of the comet chapter, as it would appear if the 8th edition were printed today. (It will be printed in two years.) I know you read several drafts of that chapter seven years ago, but there have been many new discoveries, such as the results of Deep Impact mission that I describe on page 222. Reading the whole chapter will be the best way to understand what should be discovered by the Stardust mission and future missions. This chapter is at our web site (www.creationscience.com); the comet chapter begins at www.creationscience.com/Comets.html.

I will try to summarize (a) what I think should be found and (b) what evolutionists think should not be found.

1. The dust particles will be mostly crystalline and mostly silicates. Silicates contain silicon, oxygen, at least one metal, and perhaps hydrogen. Silicates comprise about a third of all

minerals on Earth. About 95% of the Earth's crust consists of silicates. Of that 95%, about 60% are feldspars and 12% quartz. Olivine is one silicate that I think will be found, because the metals in olivine—iron and magnesium—make olivine dense and very likely to have been part of the pillars.

A particular type of powdery rock particle that I think the aerogel probably snagged is loess. Loess' outward characteristics are particularly telling: extremely tiny (15-50 µm) and very angular. One-seventh of the earth surface contains loess. In the mind's of evolutionists, the angularity raises the question as to why weathering and millions of years of erosion haven't rounded the sharp edges, and loess' location on high mountains raises the question of how it got up there. Some have said loess must have come from outer space. Finding loess in comets will heighten the mystery, and isotopic studies of what Stardust brings back will clearly identify it as loess. You can read what I believe are the answers in the Frozen Mammoth chapter (pages 166-167, 173-174).

As you will recall, olivine was discovered in comets in 1997. (See Endnote 39.) I explained that to you on the phone in 1999, and you later asked Don Brownlee why crystalline minerals, as opposed to amorphous minerals, should be found in comets. As I recall, you told me that Brownlee's response was that he didn't believe the data, and he wanted to get more definitive data. Let's see.

If crystalline minerals are brought back by Stardust, a good question to ask Brownlee is, "How did crystalline material form in outer space?"

2. Other minerals that might be found are those that require liquid water to form, such as salt (NaCl) and carbonates (limestone, dolomite, and others). According to all theories for the origin of comets, except for the hydroplate theory, the water in comets should never have been liquid because outer space is too cold, especially where comets are thought to have formed.

3. Some have written me saying that Stardust might bring back a few cells from organisms. If cells are snagged, I would not be surprised, but the fraction of a comet that is organic is probably so small that cells will not be retrieved. Organic molecules have been detected in comet tails spectroscopically since 1868.

4. Chemical elements—such as aluminum, iron, calcium, sodium, potassium, magnesium, carbon, oxygen, and the heavier elements—that are extremely rare in space but common on Earth will be brought back in minerals by Stardust.

I am again attaching the PDF I sent yesterday. Made a change to it this morning. I hope the recovery of the space capsule goes as planned tomorrow and that you have a safe and enjoyable trip to Houston to see the canister in the clean room. Please let me know how it goes.

Walt

At 10:38 PM 1/13/2006 -0600, you wrote:

Walt,

Thank you for sending the information and letter. My students do not understand how the

scientists cannot see alternative points of view. I have tried to explain to them that most of the scientific world is trained only in evolutionary thinking; not in critical thinking.

During the Stardust Return Briefing on Thursday, Dr. Don Brownlee showed a new instrument that will be used to analyze the particles. He stated that the particles from this comet dust would be pristine material from the formation of the solar system. He also stated that the ions would show that this dust would be very different than material from Earth. This difference was not in the elements but something to do with the ions. [****]. But, my simple way of understanding this is that I expect he will pop one of those particles in that expensive machine and find out it is the same stuff we find on Earth. And this will be very shocking and unexpected. These are words I hear often from NASA researchers.

Thank you for thinking about this and pondering the possibilities from a different point of view.

****

Hi Walt,

I was wondering if you have any predations before STARDUST lands on Sunday. I will be flying to Houston on Tuesday to [*****]. I would love to have your comments with me.

See the attachment to see what I'm up to.

****

The following articles were published the week of March 12, 2006. They broke the news about preliminary results of Stardust probe comet sample testing. The results are completely contrary to the Big Bang mindset and the expectations of evolutionists but are 100% consistent with Dr. Brown's predictions.

NASA FIND THROWS SPACE EXPERTS

Mineral traces in Stardust samples upset long-held assumptions about origins of comets
By MARK CARREAU
Copyright 2006 Houston Chronicle
March 13, 2006

Tiny pieces of minerals that form at high temperatures have been found in the comet fragments retrieved by NASA's Stardust mission, scientists announced Monday. The discovery challenges conventional thinking on how comets — collections of ice and rock — formed in the early days of the solar system.

The robotic Stardust spacecraft descended into the Utah desert by parachute on Jan. 15, ending a seven-year, nearly 3-billion-mile journey through the solar system to retrieve fragments of the comet Wild 2.

Astronomers have long assumed that comets formed in the most distant reaches of the solar system, where temperatures barely rise above absolute zero. But an initial examination of the Wild 2 fragments revealed tiny pieces of minerals previously extracted from meteorites that had been born close to the sun at temperatures exceeding 2,000 degrees Fahrenheit.

"This is very exciting. It's a mystery story," said University of Washington astronomer Don Brownlee, who served as the chief scientist for the $212 million Stardust mission. Brownlee and others presented their findings to the 37th annual Lunar and Planetary Conference meeting in League City during a three-hour session.

The tiny fragments are being extracted in the same laboratory at Houston's Johnson Space Center that houses the Apollo moon rocks. They are being shipped to scientists around the world for additional analysis.

Astronomers believe comets are leftovers from a vast swirling disk of gas and dust that provided the building blocks for the assembly of the sun and planets 4.6 billion years ago.

The early studies found microscopic bits of peridot, diopside, anorthite and other minerals rich in magnesium, calcium, aluminum and titanium in the comet fragments. Until the Stardust findings, the minerals were thought to reside no more distant than the asteroid belt between Mars and Jupiter.

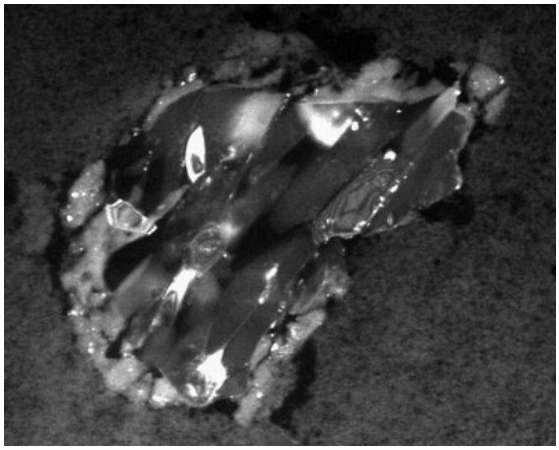
"There's a kind of temperature zoning in the solar system," said Mike Zolensky, a mineralogist and Stardust co-investigator from Johnson Space Center.

Comet from Coldest Spot in Solar System Has Material From Hottest Places

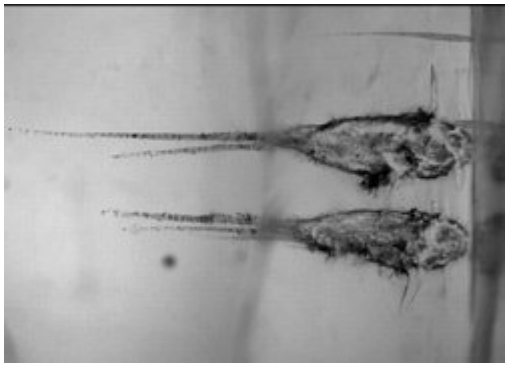
University of Washington

March 13, 2006 (About six weeks before Dr. Brownlee lecture at UW)

https://phys.org/news/2006-03-comet-coldest-solar-material-hottest.html#:~:text=Comet%20from%20coldest%20spot%20in%20solar%20system%20has%20material%20from%20hottest%20places,-This%20particle%2C%20a&text=Scientists%20analyzing%20recent%20samples%20of,outer%20reaches%2C%20where%20comets%20formed.

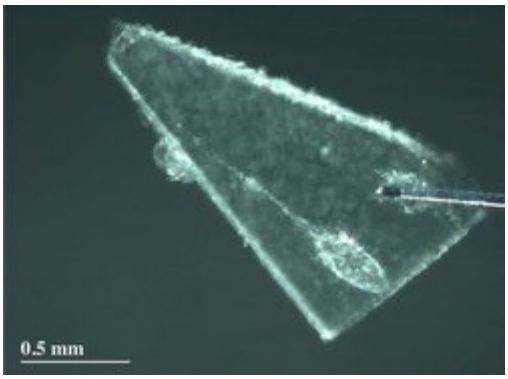


This particle, a type of olivine called forsterite, was brought to Earth in the Stardust sample-return capsule. The grain, encased in melted aerogel, is about 2-millionths of a meter across.
Mar. 13, 2006 | Science and Tech



University of Washington
This image shows the tracks left by two comet particles after they impacted the Stardust spacecraft's comet dust collector. The collector is made up of a low-density glass material called aerogel. Scientists have begun extracting comet particles from these and other similar tadpole-shaped tracks.

A 'keystone' cut of aerogel showing a track.



University of California/NASA
comet particle and

Scientists analyzing recent samples of discovered minerals that formed near stars. That means materials from the the solar system could have traveled to where comets formed.

comet dust have the sun or other innermost part of the outer reaches,

"The interesting thing is we are finding these high-temperature minerals in materials from the coldest place in the solar system," said Donald Brownlee, a University of Washington astronomer who is principal investigator, or lead scientist, for NASA's Stardust mission.

Among the finds in material brought back by Stardust is olivine, a mineral that is the primary component of the green sand found on some Hawaiian beaches. It is among the most common minerals in the universe, but finding it in comet Wild 2 could challenge a common view of how such crystalline materials form.

Olivine is a compound of iron, magnesium and other elements, in which the iron-magnesium mixture ranges from being nearly all iron to nearly all magnesium. The Stardust sample is primarily magnesium.

Many astronomers believe olivine crystals form from glass when it is heated close to stars, Brownlee said. One puzzle is why such crystals came from Wild 2, a comet that formed beyond the orbit of Neptune when the solar system began some 4.6 billion years ago.
"It's certain such materials never formed inside this icy, cold body," Brownlee said.

The comet traveled the frigid environs of deep space until 1974, when a close encounter with Jupiter brought it to the inner solar system. Besides olivine, the dust from Wild 2 also contains exotic, high-temperature minerals rich in calcium, aluminum and titanium.

"I would say these materials came from the inner, warmest parts of the solar system or from hot regions around other stars," Brownlee said.

"The issue of the origin of these crystalline silicates still must be resolved. With our advanced tools, we can examine the crystal structure, the trace element composition and the isotope composition, so I expect we will determine the origin and history of these materials that we recovered from Wild 2."

Brownlee is among scientists presenting the first concrete findings from the Stardust sample this week at the annual Lunar and Planetary Science Conference in League City, Texas.

Stardust's captured dust from comet Wild 2 in January 2004, and the sample-return capsule parachuted to the Utah desert on Jan. 15 to complete the seven-year mission. The samples from Wild 2 were taken to the National Aeronautics and Space Administration's Johnson Space Center in Houston, and from there they have been sent to about 150 scientists around the world, who are using a variety of techniques to determine the properties of the comet grains.

The grains are very tiny, most much smaller than a hair's width. But there appear to be thousands of them embedded in the unique glassy substance called aerogel that was used to snare the particles propelled from the body of the comet. A grain of 10 microns -- one-hundredth of a millimeter -- can be sliced into hundreds of samples for scientists to study.

"It's not much, but still it's so much that we're almost overwhelmed," Brownlee said, noting that his lab has only worked on two particles so far. "The first grain we worked on, we haven't even cut into the main part of the particle yet."

The material, which came from the very outer edges of the solar system, has been preserved since the start of the solar system in the deep freeze of space 50 times farther away from the sun than Earth is. Brownlee believes the material will provide key information about how the solar system was formed.

"A fundamental question is how much of the comet material came from outside the solar system and how much of it came from the solar nebula, from which the planets were formed," he said. "We should be able to answer that question eventually."

Besides the UW, other major partners for the $212 million Stardust project are NASA's Jet Propulsion Laboratory, Lockheed Martin Space Systems, The Boeing Co., Germany's Max-Planck Institute for Extraterrestrial Physics, NASA Ames Research Center, the University of Chicago, The Open University in England and Johnson Space Center.
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For more information, contact Brownlee at (818) 726-5563, (206) 543-8575 or brownlee@astro.washington.edu
Stardust on the Internet, http://www.nasa.gov/stardust

Celestial Dust Challenges Basic View of Comets

http://seattletimes.nwsource.com/html/localnews/2002863682_cometdust14m.html Seattle Times March 14, 2006
By Sandi Doughton

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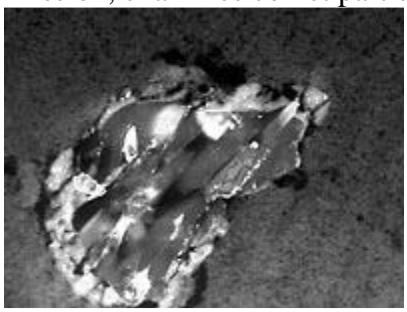
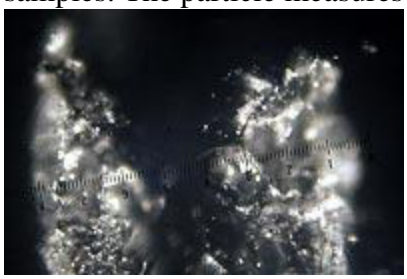
THOMAS JAMES HURST / THE SEATTLE TIMES
University of Washington astronomer Don Brownlee, principal investigator for NASA's Stardust Mission, examines comet particles.



NASA/JPL-CALTECH/UW
This comet particle collected by the Stardust spacecraft is made up of the silicate mineral forsterite, also known as peridot. It is surrounded by a rim of melted aerogel, used to collect the comet dust samples. The particle measures about 2 micrometers across.



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NASA/JPL-CALTECH/UW
In the two months since the Stardust capsule parachuted to Earth, scientists have extracted hundreds of bits of comet dust. Averaging less than one-fifth the diameter of a human hair, the particles have been distributed to researchers around the world.

At first, Don Brownlee thought he was looking at a bit of debris from the spacecraft.

The crystals he saw in his microscope were so unexpected, the University of Washington astronomer didn't think they could have possibly come from a comet.

"It was truly astounding," he said Monday at a briefing in Houston to unveil the first scientific results from NASA's Stardust mission. The robotic probe flew by the comet Wild 2 in 2004, grabbed dust from its halo and brought it back to Earth in January.

Tiny grains embedded in the capsule's collector contain minerals such as olivine, found on Hawaii's green sand beaches, and spinel, a rubylike gemstone used in jewelry.

Both form at temperatures higher than 2,000 degrees Fahrenheit.
But that doesn't jibe with the standard view that comets are made up only of materials from the distant fringe of the solar system, where temperatures hover around minus 400 degrees.

"Remarkably enough, we have found fire and ice," said Brownlee, principal investigator for the $212 million mission. "We have found samples in the coldest part of the solar system that formed at extremely high temperatures."

Unraveling the mystery will reveal much about the creation of the solar system, which scientists believe coalesced about 4.5 billion years ago from a spinning disc of gas and dust. The center of that disc was a turbulent inferno that eventually gave birth to the sun and the inner planets.

The new findings from Stardust suggest high-temperature materials like olivine were somehow hurled from the blistering center of the vortex to the icy edges where comets were born, said Mike Zolensky, of NASA's Johnson Space Center in Houston.

"They would have been ejected ballistically all the way out across the solar system ... like a conveyor belt," he said.

Astronomers scanning the galaxy with high-powered telescopes have seen massive jets spouting from nebulae where they believe new solar systems are forming, Brownlee said.

It's also possible the high-temperature minerals in the comet dust originated in the fiery environs of far-flung stars, not our own solar system.

Scientists will be able to tell the difference once they have time to analyze the comet particles in greater detail, Brownlee said. Grains that form on other stars differ from those formed in our solar system.

In the two months since the Stardust capsule parachuted to the Utah desert, researchers have extracted hundreds of bits of comet dust from the collector, made of an extremely light-weight material called aerogel. Averaging less than one-fifth the diameter of a human hair, the particles have been distributed to 150 researchers around the world.

Stardust marks the first time a NASA mission has delivered extraterrestrial material to Earth since the Apollo moon missions in the 1970s.

Brownlee has been studying two particles in his Seattle lab. With diamond blades called microtomes, he can carve one speck into a hundred slivers. His electron microscopes are powerful enough to resolve individual molecules.

"For us these are actually quite large rocks," he said.

One of the first particles extracted from the aerogel — on Valentine's Day — was shaped like a heart. Others fractured into dozens of even tinier particles.

While the early results are exciting, there's much more to come, Brownlee said.

Comets almost certainly contain organic material. Some scientists believe comets may have delivered the ingredients of life to Earth. There are already some hints of organic compounds in the Stardust grains, but it's a laborious process to rule out any possibility of contamination from Earth.

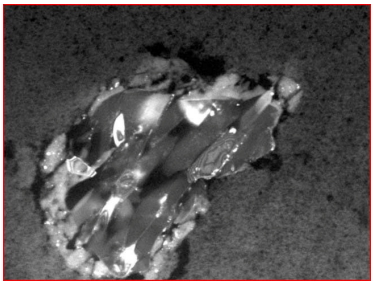
"It's a very exciting mystery story," Brownlee said. "So stay tuned."

Sandi Doughton: 206-464-2491 or sdoughton@seattletimes.com

"Stardust" Shatters Comet Theory

The first results from NASA's Stardust mission are in, leaving mission scientists in a state of shock and awe. The tiny fragments of comet dust brought back to Earth did not accrete in the cold of space, but were formed under "astonishingly" high temperatures.

Author:???
Mar 16, 2006
http://www.thunderbolts.info/tpod/2006/arch06/060316stardust.htm



Credit: NASA/JPL-Caltech/University of Washington
This image shows a comet particle collected by the Stardust spacecraft. The particle is made up of the silicate mineral forsterite, also known as peridot in its gem form.
It is surrounded by a thin rim of melted aerogel, the substance used to collect the comet
dust samples. The particle is about 2 micrometers across.

It seems that the gulf between the impressive successes of modern technology and the depressing failure of theory has grown by another giant leap.

NASA's celebrated Stardust mission was a technical triumph, achieved at a respectable cost. The mission collected the first samples ever of the dust discharged by comets. On January 2, 2004, the Stardust craft had entered the dusty clouds around Comet Wild 2 (pronounced VILT 2), gathering samples of the minute particles as they struck the "aerogel" in a 100-pound capsule. The capsule returned to Earth and parachuted to touchdown on a Utah desert January 15, 2006.

A surprise—the particles revealed abundances of minerals that can only be formed at ***high temperatures***. Mineral inclusions ranged from anorthite, which is made up of calcium, sodium, aluminum and silicate, to diopside, made of calcium magnesium and silicate. Formation of such minerals requires temperatures of ***thousands of degrees***.

How could that be? For decades we have been assured that comets accreted uneventfully from the leftovers of a cold "nebular cloud" in the outermost regions of the solar system. The theoretical assumption has been stated as fact repeatedly in popular scientific media, and its proponents believed it. Indeed, the implication of a fiery past was so unexpected that an early sample of dust was thought to be contamination from the spacecraft.

"How did materials formed by fire end up on the outermost reaches of the solar system, where temperatures are the coldest?" asked Associated Press writer Pam Easton.

"That's a big surprise. People thought comets would just be cold stuff that formed out ... where things are very cold," said NASA curator Michael Zolensky. "It was kind of a shock to not just find one but several of these, which implies they are pretty common in the comet".

Researchers were forced to conclude that the enigmatic particle material formed at a superheated region either close to our Sun, or close to an alien star. “In the coldest part of the solar system we’ve found samples that formed at extremely high temperatures,” said Donald Brownlee, Stardust’s principal investigator at the University of Washington in Seattle, during a Monday press conference. “When these minerals formed they were either red hot or white hot grains, and yet they were collected in a comet, the Siberia of the Solar System.”

Space.com reports that the finding “perplexed Stardust researchers and added a new wrinkle in astronomers’ understanding of how comets, and possibly the Solar System, formed”. But did it really? Paradigms do not die easily. Our own impression is that comet researchers have yet to revisit their “big picture” assumptions. A litany of surprises has not deterred them, and they continue to discuss the formation of comets “at the outermost regions of the solar system”. The idea does not deserve such unyielding devotion. It was never more than a guess, and it never successfully predicted any of the milestone discoveries in cometology.

So the paradoxes and contradictions continue to accumulate. Michael Zolensky, Stardust curator and a mission co-investigator at NASA’s Johnson Space Center (JSC), said astronomers believed that a sort of material “zoning” occurred during the Solar System’s formation. In the eons-long collapse of the primordial “nebular cloud”, material closer to the emerging “sun” formed under hotter conditions, while farther away from the sun everything remained dark and cold. The comet was supposed to be the case par excellence of a body accreted in the outermost region and constituted primarily of water ice and other volatiles.

Speculations erupted. Could it be that something occurred in or very near the Sun in its formative phase, flinging immense quantities of material out to the periphery of the Sun’s domain (far, far beyond the orbit of Pluto), to the “Oort cloud”, the legendary—but never-witnessed—sea of comets?

Then the researchers reminded themselves that this would produce a mixing and contradict the zoning that is evident in the asteroid belt. “If this mixing is occurring, as suggested by these results, then how do you preserve any kind of zoning in the solar system”, Zolenksy asked. “It raises more mysteries.”

Perhaps the paradigm could be redeemed by finding the signature of primordial water, whose existence is essential to the survival of official comet theory.

A report by the journal Nature is illuminating. A writer for the journal spent a day with Phil Bland, a planetary scientist at Imperial College London, as he and his team analyzed part of a grain. When he found large amounts of calcium, Bland was excited. Could the calcium be present in the form of calcium carbonate, a mineral that almost always forms in water? He bet his colleague Matt Genge that this would indeed be the case.
Bland lost the bet, owing Genge a dinner. According to the Nature report NASA “scientists have not yet found any carbonates in their grains”.

Today, the study of comets has reached a crisis. Every key finding comes as a surprise, but no one seems to realize that the surprises are not random— they are ***predictable*** under a different perspective. The tragedy is the way inertia can leave well-intentioned scientists with their feet in the sand. The momentum of prior belief, working in concert with pressing demands of funding, creates

nearly endless obstructions to open-minded exploration and discourse. Even a brief vacation from an oppressive paradigm could do wonders.

Dr. Donald Eugene Brownlee's Key Stardust Statements made at the University of Washington on April 29, 2006. Kevin Lea attended this lecture

At 24:11 minutes into the lecture, surprising impact features:

> And we would have thought normally this kind of like an impact feature, but it has this huge pillar (?) sitting out in the middle of it. so they have the middle that's several 100 meters high the sun is on the right the pillars in the middle …pinnacle…several hundred meters high. And you see its shadow on the cliff, on the left behind you. And you can also see in the upper right a mesa, a flat top mountain with vertical cliffs around it, a big blocked-shape mountain. And then on the perimeter, on the lower left, you can see another mesa…vertical cliffs. This is very bizarre, so actually a mystery, how it formed and why it's so different than other comets.

47:30 Surprising minerals:

> And in the middle of the bottom is a spectrum that tells us the composition, … different elements there, calcium and chromium, manganese, iron, nickel, germanium, arsenic, selenium, bromine, so forth. Amazing how you can do this.

50:23 Exotic/Shocking find of Crystallized Olivine that formed under extreme heat conditions:

> Here's a sample, this is a crystal of olivine. The famous mineral that makes up the green beach sands in Hawaii. It is magnesium silicate, almost pure magnesium silicon and oxygen, and has a rim of melted aerogel around the outside, and gray stuff up way around the outside, the aerogel hasn't been affected all. But this particular mineral is interesting because in the growing solar system it took tremendously high temperatures to form this. When this mineral formed, it was glowing white hot. ---- In practice so far these minerals are unusual for extraterrestrial material. Exotic. I think they're gonna tell us a lot.

51:38 More minerals that formed under extreme heat:

> Here's an iron sulfide grain, --- the mineralogy is amazing. There are seven different minerals in this tiny little slice of sample; --- we can identify minerals with things like anorthite, spinel dioxide and even vanadium titanium nitride. This is really exciting that these are considered refractory minerals that form at extremely high temperatures. The highest temperatures that could have possibly existed in the early solar system. This is amazing because we went to the edge of the solar system, the coldest, most distant place and we found the hottest place …they weren't hot when we collected them, they were hot when they formed. -- Lots of weird minerals that we found, we just didn't expect to be so surprised, we were actually overwhelmed with the phenomenal things that we have found so

far. We believe we have found things in the inner part of the solar system that formed very close to the sun and also we're pretty sure we found particles that are older than the solar system … and formed around other stars.

58:37 Statement during answer to question that Pluto is a comet

> The reason for thinking that is that Pluto is essentially a comet, even though it's also it's also planet.

1:03:46 Admission of being "boggled" in answer to another question:

> So the most important thing about our mission, was that this was the first time we went out and got primitive solar system material, means it hasn't changed since solar system formed. So here now we have a sample from a known body. Now the expectation was that we were gonna say Oh yeah we've seen this stuff before. This is category, you know ZYP kind of material, close the book. Well so far we've been boggled. Our minds have been boggled by the things that we've seen, they were not things we expected to see. I never expected to see the hottest minerals on earth …The ramifications of that was that there was a process that took things from very close to the sun all the way out to Pluto in the early part of the solar system, and in a short period of time too.

01:05:00. Statement that comets formed close to the sun (HPT – in the heat of the subterranean chambers) and then ejected out to the Oort cloud

> The process is the comets form either out by Pluto or maybe some of the comets actually form closer to the sun and then were ejected out in to what's called Oort clouds.

[01:07:32] And then over time those, rocks diffuse (?) … But the comets themselves are actually quite spectacular and meter showers are perhaps maybe the most spectacular things in the sky when they have really big ones. Most of them that you see are not all that impressive, but there have been historic meteor showers that basically filled the sky with meteors. Terrified lots of people, thought the sky was falling.

01:12:39 (Kevin Lea's question). Dr. Brownlee, you said that you didn't expect these things to come, so from the view of the solar system, you didn't expect minerals etc so is there anything you know … Dr. Walt Brown published predictions where he did expect minerals. Are you familiar with his kind of theory? He also said that he predicted that there would be loess, you know LOESS, that real fine highly angular dirt, and possibly even some organic molecules. Have you found any of that?

Answer. We know there are organic compounds in comets and also see them in the stardust … The question was about the identification of these materials. There was an expectation that the comet might contain olivine because all that we have seen in the infrared spectra of some comets, and not others, but it's pretty rare (?). For instance, the comet the Deep Impact mission smashed into last 4th of July, that showed no evidence for olivine crystals before the impact. After impact for a day or so it showed olivine, and then it went away. -- The standard story, is that you have glassy materials, silicon, glassy materials in comet (?), what you see between the stars, the interstellar medium, …and then somehow when they get close to a star, they get heated up and the heat crystallizes the glass to form crystalline olivine, and some other kinds of minerals. The trace element, "The abundances of calcium and aluminum and chromium and manganese we're finding are bizarre. And I think are impossible to produce by an annealing process. There's no way to get glass and turn into olivine,

like we see …That's my impression so showing the difference. So the kinds of minerals that we're finding are unexpected totally to have formed the way the standard astronomical description is.

This is science, we'll see how things change in time. And we don't actually have any stake in the answer, we're actually thrilled with any answer that we get. And one really cool thing about this, in astronomy you rarely have what geologists call "Ground Truth." So if you wanna say the moon is green cheese, you know, someone can't really prove you wrong until Neil Armstrong goes up there and brings some of it back and says it's not green cheese and there no more doubt. Well, this is one of the few cases in astronomy, where we can actually get a piece of a comet and bring it home and really test out these things.

We have a wealth of data, all these fantastic mineral grains have not been heavily modified after … we could really look into questions like you know how these minerals formed, we found some quite bizarre minerals out there... The fine-grained nature of comets, a really a nice way to think of comets is it's basically a sediment, like cosmic bodies settling around the edge of the solar system, but they're basically sedimentary rock that formed out of debris. Pieces of ice and organic (?) material and rocky materials that were very fine and out there got together to form these bodies which … Our body [Wild2] was born half a kM in diameter, others get up to Pluto size.

> After the Lecture, I (Kevin Lea) gave Dr. Brownlee the current edition of Dr. Brown's Comet Chapter and the email where Dr. Brown predicted (the day before Stardust landed) the types of crystalline minerals that were found and that he (Brownlee) had just described how shocked he was to find. I encouraged him to read Dr. Brown's work and he said he would. A couple weeks or so later I called to ask him if he had taken the time to look at what I had given him. He responded that he had started to but then chose not to spend more time reading because he knew that Dr. Brown's ideas were not what could have been the source of comets.

Three Years after Dr. Brownlee's Lecture, NASA Went Public That They Had Also Found Glycine from the Wild2 Comet - The Following Articles Appeared the Week of August 17, 2009

Fundamental Ingredient for Life Discovered in Comet

http://www.foxnews.com/story/0,2933,540103,00.html

Monday, August 17, 2009 SPACE.com

A fundamental ingredient for life has been discovered in a comet sample, supporting the idea that such icy objects seeded early Earth with the stuff needed to whip up living organisms.

New research firms up past suggestions of glycine, the simplest amino acid used to make proteins, inside samples from the comet Wild 2 (pronounced "Vilt 2").

"This is the first time an amino acid has been found in a comet," said lead researcher Jamie Elsila of NASA's Goddard Space Flight Center in Greenbelt, Md. "Our discovery supports the theory that some of life's ingredients formed in space and were delivered to Earth long ago by meteorite and comet impacts."

How life arose on Earth has long puzzled scientists and philosophers alike, with possible evidence for such building blocks showing up floating about in the cosmos and even inside the mouths of volcanoes.

The new finding, which has been accepted for publication in the journal Meteoritics and Planetary Science, also has implications for finding alien life.

"The discovery of glycine in a comet supports the idea that the fundamental building blocks of life are prevalent in space, and strengthens the argument that life in the universe may be common rather than rare," said Carl Pilcher, director of the NASA Astrobiology Institute, which co-funded the research.

NASA's Stardust spacecraft captured samples of gas and dust from Wild 2 in 2004. The material parachuted to Earth in 2006. Since then, scientists around the world have been analyzing the samples to learn the secrets of comet formation and our solar system's history.

Preliminary testing had suggested glycine was present in the samples. But since glycine is used by terrestrial life, the team couldn't rule out contamination from Earthly sources, according to a NASA statement released today.

"It was possible that the glycine we found originated from handling or manufacture of the Stardust spacecraft itself," Elsila said.

To tease apart contamination from the real McCoy, the researchers recently analyzed the samples for different carbon isotopes, which are versions of the same element with different masses.

Glycine molecules from space tend to have more of the heavier Carbon 13 atoms than glycine from Earth. That's exactly what the team found.

"We discovered that the Stardust-returned glycine has an extraterrestrial carbon isotope signature, indicating that it originated on the comet," Elsila said.

Building block of life found on comet

Tue Aug 18, 2009 12:47am EDT
https://www.reuters.com/article/us-space-comet-life/building-block-of-life-found-on-comet-idUSTRE57H02I20090818

By Steve Gorman

LOS ANGELES (Reuters) - The amino acid glycine, a fundamental building block of proteins, has been found in a comet for the first time, bolstering the theory that raw ingredients of life arrived on Earth from outer space, scientists said on Monday.

Microscopic traces of glycine were discovered in a sample of particles retrieved from the tail of comet Wild 2 by the NASA spacecraft Stardust deep in the solar system some 242 million miles (390 million km) from Earth, in January 2004.

Samples of gas and dust collected on a small dish lined with a super-fluffy material called aerogel were returned to Earth two years later in a canister that detached from the spacecraft and landed by parachute in the Utah desert.

Comets like Wild 2, named for astronomer Paul Wild (pronounced Vild), are believed to contain well-preserved grains of material dating from the dawn of the solar system billions of years ago, and thus clues to the formation of the sun and planets.

The initial detection of glycine, the most common of 20 amino acids in proteins on Earth, was reported last year, but it took time for scientists to confirm that the compound in question was extraterrestrial in origin.

"We couldn't be sure it wasn't from the manufacturing or the handling of the spacecraft," said astrobiologist Jamie Elsila of NASA's Goddard Space Flight Center in Greenbelt, Maryland, the principal author of the latest research.

She presented the findings, accepted for publication in the journal Meteoritics and Planetary Science, to a meeting of the American Chemical Society in Washington, D.C., this week.

"We've seen amino acids in meteorites before, but this is the first time it's been detected in a comet," she said.

Chains of amino acids are strung together to form protein molecules in everything from hair to the enzymes that regulate chemical reactions inside living organisms. But scientists have long puzzled over whether these complex organic compounds originated on Earth or in space.

The latest findings add credence to the notion that extraterrestrial objects such as meteorites and comets may have seeded ancient Earth, and other planets, with the raw materials of life that formed elsewhere in the cosmos.

"The discovery of glycine in a comet supports the idea that the fundamental building blocks of life are prevalent in space, and strengthens the argument that life in the universe may be common rather than rare," said Carl Pilcher, the director of the NASA Astrobiology Institute in California, which co-funded the research.

Glycine and other amino acids have been found in a number of meteorites before, most notably one that landed near the town of Murchison, Australia in 1969, Elsila said.

(Editing by Anthony Boadle)

Spark of Life from Outer Space?

By Glenn Farley/King 5 News
http://www.king5.com/localnews/stories/NW_081809WAB-comet-life-earth-SW.f210e843.html

August 18, 2009

While science has long thought of life on Earth as the product of the Earth, there has been a standing theory that the spark that set life into motion may have come from space. Now, scientists say they have the proof to back that theory up.

Our planet teems with life, from whales down to bacteria.

But while we think of life on Earth as home grown, does it have an extraterrestrial spark?

"What is the trigger for the origin of life? Of course, this is one of the greatest scientific questions there is," said University of Washington astronomer Don Brownlee.

Brownlee is also part of the UW's Astro-Biology program.

And he is the Principle Investigator behind "Star Dust," a space mission that caught up to and grabbed samples from the tail of the comet Wild II.

"The goal of Star Dust was to find out what Comets are made from. And we found an amazing number of highly unexpected things," said Brownlee.

And this week, Brownee's NASA colleagues concluded that their sample contained microscopic quantities of an amino acid called glycine. Glycine is used by living organisms to make proteins. That's what allows animals and humans to build things like hairs and create enzymes to digest food.

So where do scientists think these amino acids come from? They think these protein builders are hitching rides aboard comets that travel far outside our solar system.

This is an artist's concept of the Stardust spacecraft beginning its flight through gas and dust around comet Wild 2.

This has been going on for billions of years. Other worlds have been pummeled by this life-giving space debris. We know life caught on here, but could life begin on other planets?

"Microbial life might actually be fairly common in the universe, but the conditions supporting animal life are rare," said Brownlee.

Microbes on Earth are found in the most extreme places. But Brownlee also says the Earth is likely to be a very rare combination of just the right elements for supporting life as we know it.

Brownlee says scientists discovered some amino acids in meteorites in 1969. But comets can also cover a lot more distance.

On Tuesday, August 18, 2009, Kevin Lea Calls Dr. Brownlee after Reading some of the Above Articles

After greetings, I reminded Dr. Brownlee that I was the one that gave him Dr. Brown's comet chapter and predictions after his lecture at the University of Washington on April 29, 2006, and that

I was the one that asked him the question of whether they had found any organic molecules. He replied that he remembered me. I told him the reason that I was calling was because of the recent news that they found the amino acid glycine on Stardust and wanted to hear from him what he thought. He admitted that he was totally shocked by this discovery. I then reminded him that he had rejected the idea of reading Dr. Brown's work because he "knew" that Dr. Brown was wrong and then stated that Dr. Brown's theory on the origin of comets predicts that they would find glycine. I then made the statement that everything that he (Brownlee) and other comet scientists are finding are perfectly consistent with the idea that comets formed as a result of debris that was ejected from the earth. He did not balk at this statement, and instead let me continue. I then admitted to him that the idea seems preposterous because it is hard to imagine that there was a point in earth history where there was an event with enough energy to eject large amounts of crustal material from the earth at escape velocity, but that Dr. Brown's theory included how this event happened and where the energy came from. I then also admitted that Dr. Brown's theory is way outside of the paradigm box that the entire world is sold on, but that he should at least take the time to read his ideas, even if it was under his bed sheets at night. The conversation was about ten-fifteen minutes long and he listened and discussed with professional respect. At the end of our discussion, he asked me to again tell him what Dr. Brown's web site address was. I gave it to him and then followed it up with the following email.

I Then Sent Dr. Brownlee this Follow-Up Email

-----Original Message-----
From: Kevin Lea [mailto:****_calvarypo@hotmail.com]
Sent: Tuesday, August 18, 2009 5:31 PM
To: Dr. Brownlee
Cc: ****_calvarypo@hotmail.com
Subject: from Kevin Lea - web site for Dr. Walt Brown's work on comets - per your request 8/18/09

August 18, 2009

Dear Dr. Brownlee,

Thank you for taking the time to take my call today. I am so appreciative of the work you did to bring comet debris back to earth for study - a truly amazing feat.

I hope you can find the time to read Dr. Brown's work. I can't help but think you will find it fascinating if you can get past potential feelings of discounting his work out-of-hand because it is so radically different than the paradigm you have worked with for so long.

I recently read the history of Chester Carlson (inventor of the photocopier). Many intelligent people kicked him out of their office because the idea of making copies using static charges on plates was too radical at the time. But one company took the time to listen (in detail) to what Chester had to say. This company became known as Xerox and made billions; those who hadn't taken the time to listen lived to regret it.

Below is Dr. Brown's website, but you can also find it on a Google search. It is currently the fifth hit when searching on {"origin of comets"}. I would imagine Dr. Brown's theory will gain even more attention now that the amino acids that Stardust brought back fit with what Dr. Brown's theory

predicts, and you won't regret being informed about that ideas are out there.

http://www.creationscience.com/onlinebook/Comets2.html

Sincerely,

Kevin Lea

Kevin did not receive a response.

Two Months later, Dr. Brownlee Writes an Executive Summary Article Summarizing the Findings of Stardust in this Article:

Stardust: A Mission with Many Scientific Surprises

Dr. Don Brownlee
Stardust Principal Investigator
October 29, 2009

https://solarsystem.nasa.gov/stardust/news/news116.html

The primary goal of the Stardust mission was to collect samples of a comet and return them to Earth for laboratory analysis. Comets are ancient bodies of frozen ice and dust that formed beyond the orbit of the most distant planet. They were expected to contain materials that the solar system formed from, preserved in ice for billions of years. When the international team of 200 scientists began examination of the returned particles, we found that the particles were indeed ancient building blocks of the solar system but the nature and origin of the particles was quite unexpected. Before the mission, there were very good reasons to believe that we knew what comets would be made of and there was a general expectation was that the particles collected from comet Wild 2 would be mainly be dust that formed around other stars, dust that was older than the Sun. Such particles are called stardust or pre-solar grains and this was the main reason why the mission was named Stardust.

What we found was remarkable! Instead of rocky materials that formed around previous generations of stars we found that most of the comet's rocky matter formed inside our solar system at extremely high temperature. In great contrast to its ice, our comet's rocky material had formed under white-hot conditions. Even though we confirmed Comets are ancient bodies with an abundance of ice, some of which formed a few tens of degrees above absolute zero at the edge of the solar system, we now know that comets are really a mix of materials made by conditions of both "fire and ice". Comet ice formed in cold regions beyond the planet Neptune but the rocks, probably the bulk of any comet's mass, formed much closer to the Sun in regions hot enough to evaporate bricks. The materials that we collected from comet Wild 2 do contain pre-solar "stardust" grains, identified on the basis of their unusual isotopic composition, but these grains are very, very rare.

Among the high temperature materials some are already well known components of primitive meteorites; rocks from asteroids that formed between Mars and Jupiter. These include odd rounded particles called chondrules and white irregular particles known as Calcium Aluminum Inclusions (CAIs). Chondrules are the dominant material in many primitive meteorites and they are rounded droplets of rocks that melted and then quickly cooled as they orbited the Sun. CAIs are much rarer than chondrules and are distinguished by their unusual chemical and isotopic composition. They are also the oldest solar system materials and are composed of exotic minerals that form at the very high temperature.

It was very exciting to find that pieces of CAIs and chondrules in the comet and the scientific implications of this are profound. When we first presented the discovery of comet CAIs at the annual Lunar and Planetary Science conference, just three months after Stardust landed, you could see jaws drop in the room crowded with 600 scientists. It was just phenomenal to discover something this profound, right in the beginning of the analysis program. The discovery of chondrules and CAIs proves that matter abundantly formed in the inner solar system was somehow transported to the edge of the young solar system where comets formed. There are some theories that suggest that CAI's formed just a few radii from the surface of the Sun, 4.567 billion years ago. The finding that inner solar system materials, formed at very high temperature, were transported all the way to the edge of the Solar System to the region where Pluto is one of the major scientific findings of Stardust. In other words, instead of being dominated by particles formed around other stars, our comet's rocks were predominantly formed close to the Sun. Thus, these comet sample studies have provided a direct look at the nature and origin of the building blocks of planets, materials that were sprayed all over the young solar system and must have been incorporated into all planets and moons.

Stardust also had variety of other surprises. One of the most unexpected was the 2009 discovery of the amino acid glycine by a team of scientists from the Goddard Space Flight center. While perhaps not totally unexpected that a comet would contain amino acids it was unexpected that this molecule could be detected in the tiny particles that were collected at such high speed (six times the speed of a rifle bullet!). It was quite a technical triumph to develop the methods that made the detection possible and incorporated the use of isotopic composition to prove the glycine was not a contaminant from our own planet. The significance of this discovery is that comets must have delivered at least one amino acid to our planet before it had life. Because most stars have comets it suggests that all Earth-like planets obtain important pre-biotic molecules from space.

Another surprise from the 2004 comet flyby came when we flew through the dust escaping the comet. It had been expected that the impact rate of particles on the spacecraft would increase with time, reach a peak, and then decline as the comet nucleus disappeared "in the rear view mirror". Instead, the rate of impact rate changed in spurts, probably caused by entering and exiting "jets" of dust flowing off the nucleus and also the breakup of "cometary dirt clods" as they drifted away from the nucleus and lost ice that had served as glue to hold them together.

But the biggest surprise discovered during the flyby came with the comet images (72 taken during the pass). The camera team, led by JPL's longtime comet expert, Ray Newburn, had expected that the comet would be a rather bland object looking somewhat like a black potato. What we saw, even in the very first picture sent back, was quite dramatic. We saw kilometer-sized deep holes bounded by vertical and even overhanging cliffs; flat topped hills surrounded by cliffs; spiky pinnacles hundreds of meters tall, pointed skyward: in addition to the numerous jets of dust and gas escaping into space. Two of the dust jets came from the comet's night side, a region that was expected to be inactive because if its lack of heating by sunlight. What we did not see in the images were impact craters, such those found on the Moon, Mars and practically every other surface exposed to space. The lack of impact craters indicates the surface is new, the old cratered surface is gone. The

astounding thing is that the surface of Wild 2 is very different from the surfaces of any other asteroids and comets that have been imaged by spacecraft. It is much rougher, much more dramatic and it clearly is not the bland body that we expected it to be.

These Following Two Letters Were Never Responded To By Dr. Brownlee:

Five plus Years after talking to Dr. Brownlee:

From: Kevin Lea <****_calvarypo@hotmail.com>
Sent: Friday, February 20, 2015 4:59 PM
To: brownlee@astro.washington.edu <brownlee@astro.washington.edu>
Cc: 'Kevin Lea' <****_calvarypo@hotmail.com>
Subject: from Kevin Lea - Update on Dr. Brown's hydroplate explanation for comets

Dear Dr. Brownlee,

I met you in person on April 29, 2006, when you gave the Stardust press brief at the UW. After the briefing, I gave you a copy of Dr. Walt Brown's Origin of Comets chapter from his book.

On August 17 [18], 2009, you and I had a short phone conversation about this same subject a day or so after you went public with finding amino acids in the Wild 2 comet dust that was captured in the Stardust probe. At the end of our conversation, you asked me to give you the link to Dr. Brown's online book.

Since our last interaction, I have noticed that every mission to space (comets, asteroids, Mars, etc.) sends back results that are contrary to what is expected with conventional origin theories. Assuming you did read Dr. Brown's work on the subject back in 2009, I wonder if you have noticed that ***every*** discovery ***is*** perfectly consistent with Dr. Brown's theory of origins.

I would love to discuss and compare thoughts with you about the recent news from Comet 67P, the near earth flyby of Asteroid 2004 BL86, etc. I work in Port Orchard and will gladly drive to your office at the UW so we can have a face-to-face discussion, or we can set up a good time to talk on the phone. I welcome any stipulation that you would like to place on a meeting should it occur.

If you would like to hear Dr. Brown explain his take on the 67P discoveries, then here is a link to a 30 minute radio interview between Bob Enyart and Dr. Brown following the discovery of rounded-off boulders on the 67P Comet:

http://kgov.com/comet-67P-rounded-rocks-confirms-creationist-prediction

Sincerely,

Kevin Lea
Cell 253-549-5484

Kevin did not receive a response.

About Sixteen Months Later Kevin Wrote Dr. Brownlee Again:

From: Kevin Lea <****_calvarypo@hotmail.com>
Sent: Wednesday, June 22, 2016 11:25 AM
To: brownlee@astro.washington.edu <brownlee@astro.washington.edu>
Cc: 'Kevin Lea' <****_calvarypo@hotmail.com>
Subject: RE: from Kevin Lea - Update on Dr. Brown's hydroplate explanation for comets

Dear Dr. Brownlee,

Congratulations on another year completed at UW. I trust things are well with you and yours.

This letter is a request to take you to lunch to discuss Dr. Walt Brown's theory on the origin of Asteroids, as it pertains to how asteroid threats to earth should be mitigated if he is right.

We know that tens of millions of dollars are currently being spent trying to find NEO asteroids that could threaten earth. Should we detect one, billions will be spent trying to send something into space to deflect it if there is time (example - http://www.outerplaces.com/science/item/11450-scientists-develop-a-death-star-laser-weapon-to-protect-earth-from-asteroids).

Any plan to deflect will have to be based on assumptions about the composition of the asteroid. The physics behind the chosen plan may work for one composition (solid rock) but fail if the asteroid consists of a loosely held together rock pile.

Whatever the plan becomes, it is likely that the scientific community will only get one shot at a killer asteroid, so the importance of making sure they are right is paramount. The reason I am approaching you is that I suspect your opinion would be highly regarded should the citizens of planet earth need to come up with something in the not too distant future. If you have the information that I would like to discuss in your mix it might be extremely valuable to the team decision, even if you choose to discount it after we talk.

The last time we talked on the phone you admitted you were somewhat surprised to find Glycine on Wild2. But Dr. Brown's theory expected to find organics and even amino acids in comets and/or asteroids based on where he postulates they came from. Now the Europeans have found Clycine on 67P along with fourteen other complex organics, rounded off boulders, the shape of the comet being consistent with other asteroids and comets that appear to have been two bodies that became one; all of which are perfectly consistent with Dr. Brown's theory, but very surprising to others.

With data continuing to support that Dr. Brown may be right, and with the importance of knowing what comets and asteroids are made of should one be out there with our name on it, wouldn't it be worth it to get together for an hour or two to discuss - just in case, off the record and with any other stipulation you would like to make?

Sincerely,

Kevin Lea

Kevin did not receive a response.

C