

JUPITER AND SHOEMAKER-LEVY-9

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John Pazmino  
NYSkies Astronomy Inc  
www.nyskies.org  
nyskies@nyskies.org  
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[These two articles were written before the establishment of NYSkies and have only minor editing. The issue date is that of publication in the club's newsletter.

[In 2009 by a remarkable coincidence of two similar events, they are here published again. 2009 July 20 is the 40th anniversary of Apollo and a new collision scar appeared on Jupiter on 2009 July 19.

[Some NYSkiers recall Shoemaker-Levy-9 and Jupiter from 1994. They, newer NYSkies folk, and other astronomers, are closely studying the new impact feature.

[Unlike in 1994, there was no grand public spectacle in the City for Apollo. The only significant public celebration was the NYSkies Seminar on 2009 July 1. It featured 'Remembering Apollo' with movies from the early space age, trading of memories, and show-&-tell of Apollo souvenirs and artifacts.]

IMPACT OF PARTICLE B OF SL9  
by John Pazmino

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[A few days after my party circulated this report, JPL informed us that we definitely saw the actual collision of SL9's particle B. The credit is based on our timing against an ephemeris that was about 20 minutes too early and our description of the plume that matched images released by various observatories.

[We also were one of only two groups of home astronomers in the United States to successfully witness the particle B crash, as distinct from examining the bullet hole after an impact. The other group was in New Mexico. Other Jupiter watches for particle B failed for various reasons, mostly bad weather.]

Lee Baltin, Arline Caldwell, David Greenberg, and John Pazmino possibly sighted the impact of particle B of SL9 on Saturday 16 July 1994. The group spent the weekend of 14-17 July at Arline's beachhouse in Amagansett LI partly to watch for particle B's landing, the only SL9 event scheduled for night hours during this period.

We departed directly from the Recent Astronomy Seminar, which was electric with talk of the upcoming comet-Jupiter events.

The rest of Thursday night in Amagansett LI was rainy and cloudy. Friday was cloudy. Saturday, however, looked hopeful with the Sun trying hard to burn thru the clouds. But, alas, it never cleared right thru sunset. Only the Moon shone dimly and diffusely in the gray sky.

We four went for supper on Saturday evening with intent to view a fireworks exhibition in Three Mile Harbor afterward. When we left the restaurant the sky had cleared enough to reveal the brighter stars! We went to the fireworks show anyway, being that it would end at 9:30PM with time to get back to the beachhouse for particle B's collision. We watched Jupiter at the show thru binoculars, he being to the upper right of the half Moon, and spotted one of his satellites. We later figured out that this was a blend of Ganymede and Callisto.

At Arline's place David turned his 200mm f6 Newton reflector on

Jupiter. It was still about a half hour before the impact. Nothing unusual was seen on Jupiter. The impact hour of 10:34PM came and went with no disturbance about Jupiter that we could see. This time came from an early July schedule pulled from JPL's posting on Internet and was the latest timetable we had at hand.

At quite [that is, a few minutes before] 11:00PM EDST Lee shouted that one of the satellites was just poking out from the disc of Jupiter. It to him looked like a burr or pimple on the limb. We all looked and, yes, there was a blip that for all the world would be a Jovian moon coming off the disc into the open sky. (The effect is the same for a moon coming around from the back of Jupiter and for one moving off from the front of him.) Which moon was it? We looked in my Observer's Handbook and, oh, no! All four moons were already in the clear sky east of the planet.

We saw them earlier but paid no close attention. Commonly the stellulae about Jupiter are certain of the four moons mixed in with regular stars nearby. Now we double-checked. The stellulae were all four moons in two pairs well away from the disc. And there was separately the little blip on the planet's limb.

We studied it for about fifteen minutes. It was an extension of the adjacent disc, of the same color and brilliance, definitely dottish, not stellar or scintillar. It stood 2/3 from the equator to the south pole of Jupiter. Apparently we spotted it at its maximum size for it didn't enlarge during our viewing. Or perhaps it erupted into its whole size suddenly? After a few minutes it subsided and ultimately collapsed into the disc by about 11:15PM, leaving a pure unblemished limb. Continued examination of the planet until he dipped into horizon trees towards midnight uncovered no other anomalies. Nothing unusual on the very disc was noticed. In our estimation a person first inspecting Jupiter after 11:15PM with a similar homesize telescope would have seen a normal planet with no indication that this burr ever appeared.

The sky during this interval was humid, warm, and grayed by the half Moon. Transparency barely reached 4th magnitude and the Milky Way was dilated and weak. However, the seeing was very stable. We could magnify Jupiter to about 280 power with a 9mm eyepiece and a Barlow, and the image was still sharp and steady. The clouds on the planet were easily seen as brownish or dark pinkish swirly bands.

We left for the City during the day on Sunday 17 July; that night was cloudy, as was Monday night. The next opportunity we had to inspect Jupiter was Tuesday 19 July during New York's Moon Landing celebration in Central Park. And then we saw....

I CAN SEE THE HOLES!!!

by John Pazmino

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[The people who witnessed Jupiter during the two days of this show were about 2/3 of the entire nation's public witnesses of the SL9 scars on Jupiter.

[In the years before 1994 astronomers were ramping up warning about a possible collision of an asteroid or comet against Earth with awesome consequences. They received little public reception. The feeling was that a collision is so infinitesimally rare it's not worth worrying about.

[Also there was the sense that astronomers and other scientists were trying to preserve their jobs from Star Wars projects after the fall of the Soviet Union. Some of those projects detected, tracked,

and fended off potential Soviet nuclear missiles. These skills and methods could now be applied to protecting Earth against asteroid crashes.

[A total of twelve thousand people assembled in Central Park, Manhattan, saw with their own eyes the scars of an actual crash of a comet onto Jupiter. At that moment Earth instantly accepted the reality of an impact threat against it.]

About [1994] July 10th the New York City Parks Department contracted the Amateur Astronomers Association to run a Moonwatch within the City's 25th anniversary festival of the Apollo 11 landing on the Moon. In working out the arrangements we called the Department's attention to the comet-Jupiter activity occurring in that same week.

So the Association got the job of demonstrating both the Moon and Jupiter on Monday 18 July thru Wednesday 20 July 1994. On Monday and Tuesday we were the sole park event; on Wednesday we were part of the overall City celebration. Monday's session was cancelled for clouds and intermittent rain.

On Tuesday we deployed in Central Park's Sheep Meadow adjacent to Tavern-on-the-Green. Visitors could reach this spot from crosstown buses and the transit junction at Columbus Circle. Visitors could also nosh in Lincoln Square or Tavern-on-the-Green and then stroll over to the field. We set out a dozen telescopes, an info station, and two video monitors. Telescopists were armed with charts and factsheets. Much of the equipment and collateral crew was supplied by the Parks Department.

The air was hot and hazy and humid, in the tradition of a New York summer. We announced the Moon landing festivities and noted that besides the Moon we will show Jupiter, upon which SL9 was right then smashing. However, we did caution the crowds against seeing actual damages from the collisions. After all we had only homesize instruments in the Sheep Meadow and the images already bannered on television were artificially puffed up.

As the sky darkened we demonstrated the Moon and Jupiter on the video system. People could examine the screen for interesting features to see in the scopes. On the screen with Jupiter there were two dark and annoying dots near the south pole. They moved about with the planet as we corrected for drift. Uh oh.

THEY WERE THE "BULLET" HOLES FROM THE COMET IMPACTS!!!!

Word flashed up and down the telescope lines. The telescopists centered their instruments on Jupiter and let the populace look. Everyone of the five thousand souls peeking thru the scopes gasped: "I can see the holes!!" There were two clear and obvious black dots -- like tiny eyes -- straddling the central meridian of the disc. After a while a one was centered and the other moved off to the west. They mimicked the shadow of a Jovian moon in transit across the disc. Every scope showed them, from an 80mm refractor to a 320mm reflector. Every person on the lines saw them and walked away in amazement. Strangers clustered on the lawn around the scopes and animated about the dots. Many people promised to come back the next day to see them again.

We prepared for a stay until 10ish based on the Park's schedule. But with the utter fascination from the stigmata on Jupiter the lines were full until 11:30PM. At that hour the Park managers asked us to wind things up and get some sleep [at home].

Wednesday the 20th there was a large setup of various exhibits for the anniversary. There was a projection screen for showing Moon

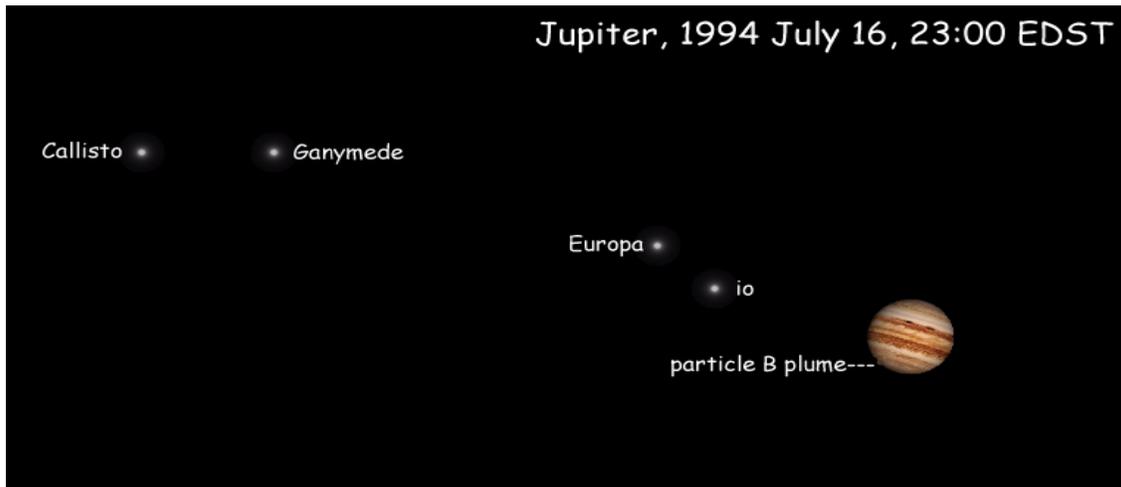
related movies, concession stands, bicycle and skating tourneys, political speeches, party balloons, T-shirt and bead vendors, and other let's-have-a-be-in attractions. We established our stations and the hordes poured in. A good sprinkling of people heard from the newscasts during the day of the sighting of impact marks from Central Park the previous night! However, the sky was adverse right thru civil twilight with a blanket of clouds over all the sky. Yet there were enough thin sections to let the Moon and Jupiter shine thru.

The folk who made the return visit were freaked out. THERE ARE MORE HOLES!!! Those seeing them for the first time were no less incredulous. THESE ARE THE BANGMARKS FROM THE COMET!!! Everyone of the seven thousand visitors that night took long studied gazes at them. Indeed, when we tried to show the Moon for a change, the crowds protested: "Nooo, leave the scope on Jupiter! We want Jupiter!!"

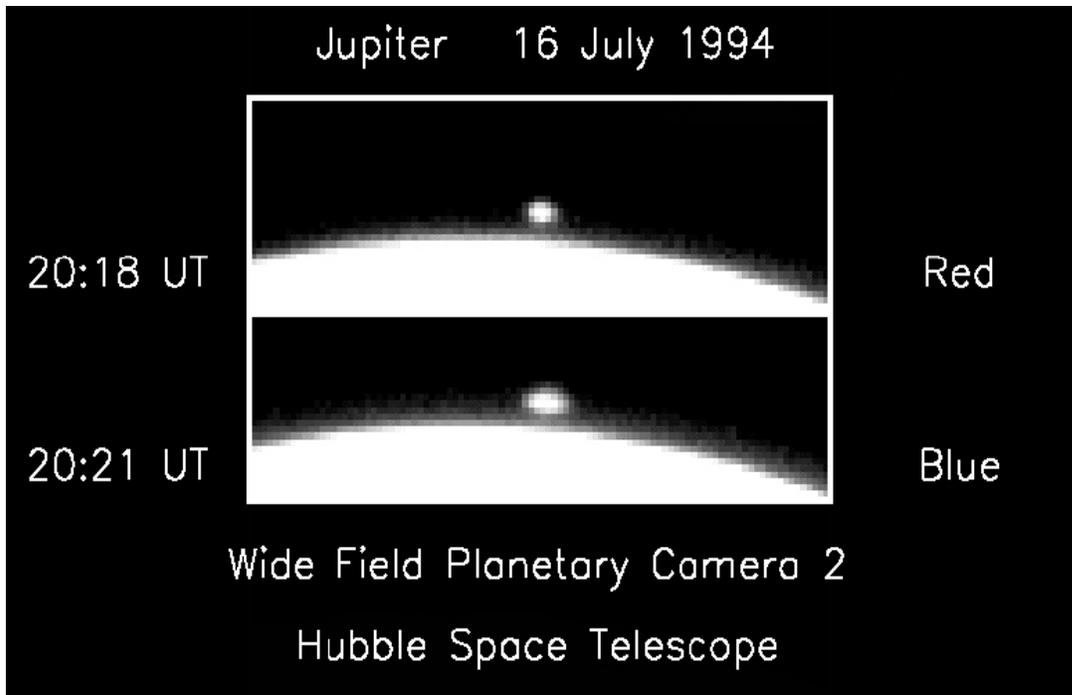
As people walked away talking about their vision, others entering the Park overheard them and hurried straight to our stations! All over the field groups gathered to talk about the spots. They had newspaper articles and compared their view with the published ones. Some laid out on blankets for Jupiter picnics. Others brought binoculars to learn how to spot Jupiter at home on other nights. Many hundreds of people after taking their look simply walked to an other telescope line and waited calmly for a second view!

And so there was this grassroots outswelling of townfolk on the broad lawns of Central Park, the peripheral trees, and enclosing 'stockade fence' of skyscrapers. As night fell the towers formed an all-around 'Milky Way' with their myriads of tinkling window lights. Above them danced the gibbous Moon and Jupiter amid the summer clouds.

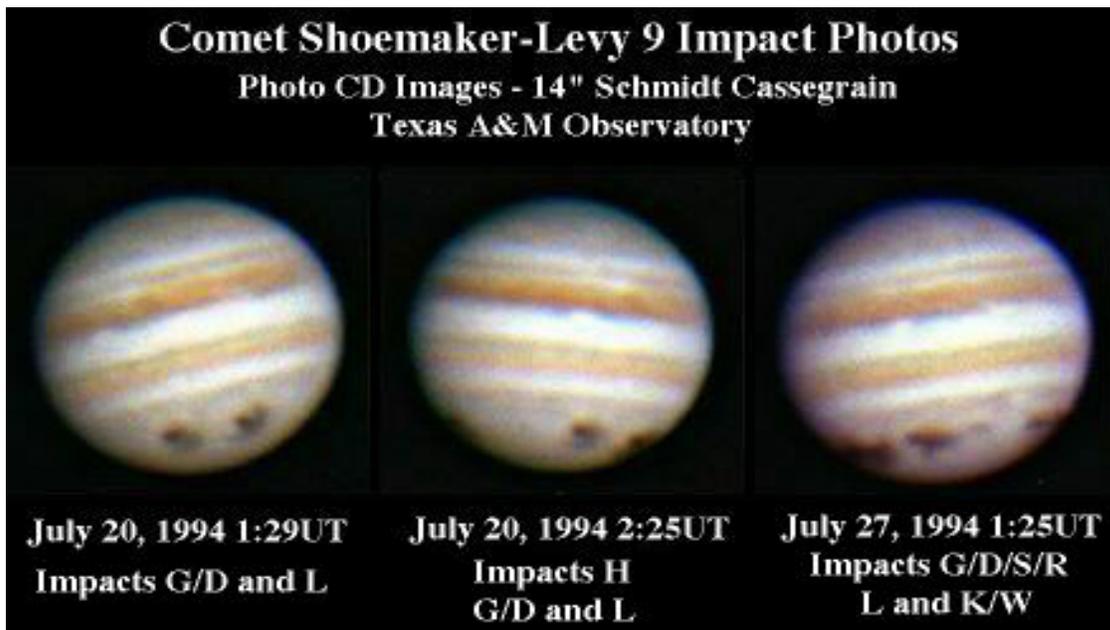
The other exhibits folded their tents starting at 9:30 and by 11:00 the Association was the only thing running in the Park! Finally at close to midnight the Park had to call it quits.



*Computer graphic of what we saw on 1994 July 16. In early evening we spotted Ganymede and Callisto in binoculars as a single feature next to Jupiter. The moons are exaggerated but the plume is realistically depicted.*

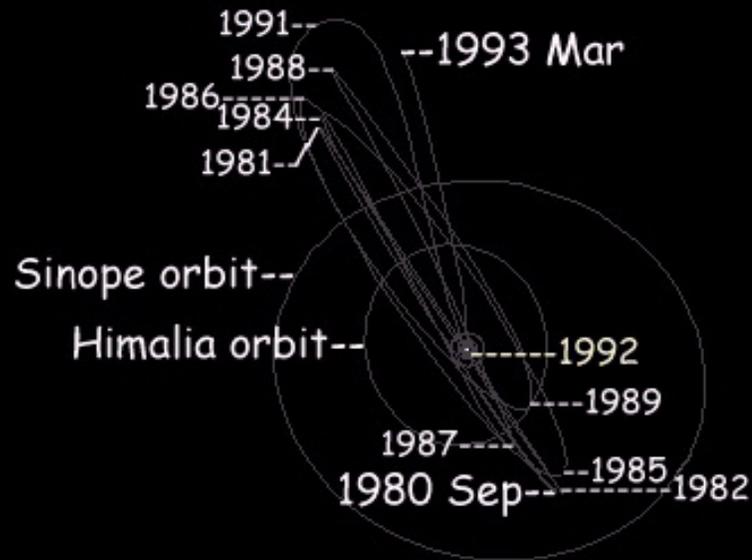


*Our telescopic view of the plume was virtually like this one of particle A's plume, except that ours was always attached to the disc with no separation.*



*The left view is what we saw in Central Park in early night of 1994 July 19 (New York time). The scars rotated during the night like in the middle image. The right scene is typical of what we saw on days following the Central Park show.*

# comet SL9 & Jupiter, 1980-1993



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*For my presentation at the 'New trends in astrodynamics' conference, Princeton NJ, in 2006 August I modeled the precollision history of Shoemaker-Levy-9. The graphic shows its path under the combined Sun and Jupiter gravity from 1980 thru its discovery in 1993.*