

Volume 16, No. 3

Third Quarter

Fall 2006

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Ribbon Cutting Ceremony Meteorite & Space Science Exhibit

The Challenger Learning Center in Woodstock, Illinois will be providing a meteorite and space science exhibit ribbon cutting ceremony on Tuesday, October 17 from 6:00 to 9:00 p.m.

The Planetary Studies Foundation in cooperation with the Challenger has developed a large room filled with cases of meteorites and space artifacts. Visitors will have the opportunity to explore these newly developed displays.

That evening, the doors will be open at 6:00 p.m. with a ribbon cutting by the Challenger Learning Center, the Planetary Studies Foundation and astronaut, Ken Reightler, Jr. Following the ribbon cutting will be a thirty minute presentation by the former astronaut with questions and answers and a one hour autograph session. Throughout the evening various programs will be presented.

Admission for this event is \$15 for the general public and \$10 for CLC and PSF members. For more information please contact the Challenger Learning Center at (815) 338-7722.

Beginning the first Saturday in November the Challenger Learning Center will be having

the exhibit areas open to the general public for use. PSF members are encouraged to support our cause and to take advantage of this wonderful opportunity to view the DuPont-PSF meteorite and space Collection. We are looking forward to see you and your family!



Check out page 7 for photos of the Mars Viking Event!

President's Message

As the third quarter comes to an end we find the Planetary Studies Foundation seeing “the light at the end of the tunnel”. The administrative move to Galena, Illinois has not been easy and it is still not complete. In late August, an opportunity to purchase our own building presented itself, and our Board of Directors appointed a committee to look into the possibility of buying it. As far as the facility itself, it suited our needs quite well. Unfortunately, the owner and our committee have two different opinions about its market value. Negotiations are continuing, but stalled for the moment. The concept of a permanent PSF headquarters that is owned by us, rather than a rental property is a very attractive idea. In the over seventeen years of our existence, PSF has accumulated a vast amount of administrative files, photos of events, astronaut memorabilia, a science library and various scientific artifacts. We certainly need a permanent facility to properly store these materials so they can be readily accessed when needed. For three, short years this was possible at our Crystal Lake rental facility, but that move has completely disrupted our organization. We hope to concentrate our science library at the Challenger Learning Center in Woodstock, Illinois to complement our meteorite and space science exhibit at that facility. Preparations are currently underway to open that exhibit with a ribbon-cutting ceremony by Space Shuttle astronaut Ken Reightler, Jr. on October 17th. All PSF members are invited and encouraged to attend.

Concerning our James M. DuPont Meteorite Collection, the total number of recognized meteorites in the collection is rapidly approaching the next milestone of one thousand, six hundred. Since acquiring the collection in 1995, the PSF has added over 600 new meteorites to the Collection through trades, purchases, or actual discovery of meteorites. This is a remarkable achievement and ranks the DuPont-PSF Collection among the top ten collections in the world. Our long-term goal is to eventually reach the benchmark level of two thousand recognized meteorites. In order to accomplish this goal, we need to establish a long-term research partnership that would provide us with access to the analytical tools we need to classify many of our meteorites. Also, there is still a huge amount of meteorites available on the open market that need to be studied, but their sheer numbers overwhelm the existing laboratories. It has always been a PSF goal to have it's own analytical laboratory, but the expense of establishing such a laboratory has been out of reach. A research partnership has been beneficial to us in the past and could serve our future needs. We are currently in contact with several institutions and hope to have a partnership agreement in place by the end of this year.

I would like to close by welcoming two new members, Kathy Farlow of Galena and Jennifer Schrank of Elgin, Illinois to our Board of Directors. Together they bring to our Board, years of management and financial expertise, as well as a fresh outlook on PSF's needs and direction. At the August Board meeting, a resolution was passed thanking past Board Members David Butts, Chris Penesi, and Frank Stokes for their years of dedicated service. The present Board has now been charged with finding new ways to address our financial needs and to establish new goals for the future. Looking back on the previous seventeen years, PSF has achieved many incredible things and we may find it hard to out-do ourselves. Certainly a challenge, but PSF loves doing what everyone else thinks is impossible!

Paul P. Sipierya

Donor's Spotlight

Thank you for your generous contributions!

\$2,000-\$2,999

Audrey & Albert Ratner

To honor the birthday of their son, James N. Pritzker

(\$1,000-\$1,999)

Joseph A. Auer

(\$500- \$999)

Paul & Diane Szipiera

Herbert Windolf

Re-New Members

Family

James & Linda Pushaw

Member's Corner

PSF Board Member Bruce Dod and his wife Geri recently returned from vacationing in Tibet. (Any sightings of the Abominable Snowman?)

Alaska,

The last Terrestrial Frontier of the US

A Travelogue by Herb Windolf

September 8, 2006

In three hops Alaska Airlines took us from Phoenix via Seattle and Anchorage to Fairbanks. On the leg from Anchorage to Fairbanks we even got to see the top of Mount McKinley, largest mountain in the USA with 20,320 ft, rising white above a solid cloud deck.

The next day our tour with Cruise West took us on a two hour trip on a sternwheeler along the Chena River at Fairbanks to its confluence with the larger Tanana River, which carried a heavy load of silt, rock flour from the glaciers farther south, producing a wild swirl of mixing waters. Along the Chena people built their homes. The recent governor Murkowski's wife came to its banks to greet our passing ship; a bit farther downstream the husband of Susan Butcher's, the winner of the Iditarod Race, who had just died from Leukemia, came to the water with his son and dog caretakers to wave to us and talk with the boat's owner, all giving the impression of down-home friendliness in this still raw land, more than twice the area of Texas. As the story was told to us: Years ago when Pope John Paul happened to pass through Fairbanks and President Reagan was also in town, the two met at the then senator Murkowski's house and, that the heavy, armored president's car sunk into the senator's unpaved driveway and had to be extracted. The oil spill from BP's pipe line from Prudhoe Bay was all the talk at the time. It turned out that BP had not sent a scanning device through the pipe for years to check for erosion, when, for instance, the transalpine pipe from Italy to Germany is checked monthly! Yet, every Alaskan resident, man, woman and child, can expect this year to receive a tax handout of about \$1,000 from oil revenues. And – there's no income tax in the state.

The following day a bus ride took us to Denali National Park and, subsequently, another bus took us deep into the Park. Denali provided a glimpse of the grandeur of this harsh land, with its broad expanses and, as it appears, plentiful tree and growth cover. However we learned that the annual rainfall in the interior is only 11 inches on average per year, less than the Southwest gets. Rain clouds are kept from the interior by the northern Brooks Mountain Range and the southern Alaska Range. The difference to the Southwest deserts is the muskeg, the boggy ground, which traps the moisture, thus providing for more luxuriant growth; Mt. McKinley also barely showed its base below the clouds. Except for a moose and some caribou we did not get to see any wildlife.

That evening we had opted for a Heli-hike tour. A helicopter took us, together with another couple and a naturalist guide up to alpine tundra for a four hour hike across soggy grounds on which over one hundred different plant species grow, among them willow trees only a few inches tall. The five mile walk was a delight! Up and down we went, seeing some caribou and finding dropped antlers, our guide staying in radio touch with the helicopter people. Eventually we were picked up at a different location by our young female pilot who, lo and behold, had received her pilot's license in our home town of Prescott, AZ.

The next morning we cruised down the Nenana river on an oar-powered rubber raft, piloted by a tough twenty six year old woman. Prior to takeoff we were bundled up in dry-suits. I asked one of our guides: And where's the relief valve? Out-a-luck for two hours plus! However, we had the excitement of the day, when, at a bend in the river, we spotted a grizzly putzing around on the shore. Seeing us, he stood up and raised a paw twice, waving at us, it seemed. We told our guide after passing that the puppet could now be removed.

The next day the McKinley Explorer provided a wonderful train ride in a dome car from Denali to Talkeetna north of Anchorage. There a bus brought us the rest of the distance to the big city. A visit to the Native Heritage Center the next morning gave insight into the lives of some of the native people, or First Nation People, as they are nowadays called. It was interesting to learn that at the turn of the previous century some Saami families together with their reindeer herds, domesticated caribou, were brought from Finland all the way to Alaska to provide and to teach the Athabaskan natives the herding of these animals for sustenance. It was a ringing success. Saami still dwell in Alaska today.

In mid-August there were only two and one half hours of darkness and, unfortunately, no coronal mass ejection directed towards Earth during our stay to let us experience the Corona Borealis, the Northern Lights.

During WWII when a Japanese attack on Anchorage was feared – the two westernmost Aleutian Islands had been occupied by the enemy – a secret military base, Whittier, was established in Prince William Sound, accessible only through a long but speedily dug tunnel across the neck of the Kenai Peninsula.

A bus took us there where we boarded our cruise ship, the Spirit of Oceanus, flagship of Cruise West. It accommodated one hundred twenty passengers. The crew was international, the Captain British, the first and second officers Russian and Ukrainian, the crew Jamaican and Filipino, with even a sprinkling of Americans, the naturalists et al. There was Alastair Newton, an Englishman and biologist, who also ran the 'show', organizing our outings and get-togethers. Meriwether Gill, a distant relative of Meriwether Louis & William Clark fame, a specialist in cetology, the study of whales. Professor of Geography, Susan Hardwick, specializing in the Russian history of Alaska. A most vivacious and engaged lady.

Nancy Lord, writer a fisher-woman of many years on the Alaska coast and, last but not least, the inimitable, only thirty four year old, story teller, writer and teacher, Jack Dalton, his mother native Yu'pik, his father German-American.

In word and gesture he conveyed to us in several performances Yu'pik myths, particularly the Raven Creation Myth, which has spread throughout Alaska. It has experienced variations of its content, yet always retaining the Raven as the Creator and Bringer of light and life to Earth. When he had finished the Raven story and the applause had subsided, I, sitting in the front row, got up, approached him and, telling him that his presentation called for more than applause, gave him a big hug.

Stowed at the stern our ship carried five Zodiac motorized inflatables. At multiple occasions of our trip south through the Inside Passage, when farther penetration of our ship was not possible or advisable, these Zodiacs were launched by crane, and eight to ten people boarded each for closer exploration of the surroundings, all piloted by the above naturalists.

On the first day of our cruise we navigated Prince William Sound, which has the most tidewater glaciers, that is a glacier reaching the sea, in Alaska. Many of these tidewater glaciers extend several tenths of feet below the water surface. Waterfalls dropped from steep cliffs on which kittiwakes nested in the hundreds. I skipped the first Zodiac excursion because – it was just too rainy, cold and miserable at the time. This is also the place of the Exxon Valdez oil spill in 1989.

The overnight passage from Prince William Sound brought us next day to Yakutat Bay with the 6 miles wide Hubbard tide-water glacier at its end. There the Zodiacs were launched for a closer approach to the calving glacier. Amazingly one part of this glacier is almost black from the rock debris it carries along, spilling icebergs, berger-bits, growlers and brash ice, as the floating ice is called in descending order of size, into the sea, adding nutrients and minerals to the Earth's oceans, a process still continuing for eons. Seals, with their cute faces, peered at us from the water or rested on the floating ice.

From Prince William Sound south to Sitka on Baranof Island, the cruise crosses open water and our ship was rolling just a bit that first night. While it made for good sleeping being gently rocked to sleep, this first dinner was not the most enjoyable for me. I did not even finish my wine when I excused myself from the table, but when I asked my wife Ute the next day how she had fared herself, she said: I did fine. I even finished *your* wine.

Being early risers we had breakfast 'outside', yes, outside on deck, where one could have it earlier than in the dining room. Seating for lunch and dinner was as one walked in. Tables seated from two to eight, except if one asked to be seated at a particular table. Most of the time we gathered among eight and, at times, had some lively conversations. But we also became closer to some couples and thus had dinner just the four of us. While the passengers were mostly American, there were a number of Australians and Britons, a few Germans and New Zealanders. We happened to socialize mostly with the more boisterous Aussies but also the more reserved Britons. Our favorite couples were Tony and Karrie Jordan from Sidney and Valerie and David Moss, originally from England, now residing in California. Who knows, we may yet see them again.

Another overnight cruise through open waters landed us next morning in Sitka. We had booked for a fishing excursion of four hours, which meant we didn't see anything of town, since the ship was to leave already shortly after noon. So, off we went on a small boat, an hour's ride into open waters with lots of bounce, to reach the fishing grounds. My first catch, hard to reel in, turned out to be a Ling cod of 45" and just as many pounds, the first fish of my life I wished to have been smaller for – it was over the legal limit. The critter had even a foot long rock bass in its mouth which I had hooked first, the cod going after it. Believe me, this is no fish story. In the really only two hour fishing time I could only land a Silver salmon, or Coho, as this species is also called, and a substantial-size rock bass.

North of Sitka lies Letuya Bay where, in 1954 an earthquake triggered an enormous rock slide at the end of the bay, causing a record tsunami with a height of 1,740 feet. Yes! 1,740 feet! Due to its remoteness 'only' a few lives were lost. A fishing boat, crewed by father and son, who survived the catastrophe, could even tell their horrific experience.

That afternoon Nancy Lord gave a lecture on "Sitka: The Russian American Capital". And next afternoon Nancy, again, talked about "John Muir's Alaska". More lectures were usually given in the evening after dinner.

Then we arrived at Glacier Bay National Park, having now entered the Inside Passage. In the two hundred years since its discovery by Captain Vancouver the bay has become virtually ice-free. We boarded a smaller vessel, a catamaran, to penetrate deep into the fjord to better view its glaciers and wildlife, among which were Steller sea lions, even some wolves along a shoreline, all under the auspices of a park ranger and a native Tlingit, explaining his tribal background.

The Tlingit occupy a larger stretch of the Alaskan coast rich in fish and other sea life, thus their livelihood was generally insured and, as Jack Dalton explained, they had plenty of idle time to develop elaborate rituals. Somewhat in jest, he told that, when a visitor showed up, it took him half an hour to do his greetings, then the host needed another half hour to do his part. This contrasted sharply with his own tribe, the Yu'pik whose first question when a visitor arrived was: Are you hungry? Only when he was sated were greetings exchanged and other questions raised.

Skagway is a favorite port for big cruise ships, easily accommodating four to five, never mind their many thousands of passengers swamping the small town of 800 summer residents. During our presence four other such ships were in port, one of them even blocking our ship from departure at the desired time. Passengers and crew of our Spirit of Oceanus looked somewhat snobbishly with disdain on these big ships. There floated even a rumor on ours, that one of the biggies had 1,400 passengers quarantined because of an intestinal illness. Hygiene on the Oceanus was enforced by urging all passengers to wash hands before eating. When entering the dining room, disinfectant wipes were handed out. After our enjoyable four hour rail tour to the White Pass, scratching the Canadian Yukon, I remained on board of our ship, letting the hordes of big-ship tourists have Skagway. In the evening Meriwether Gill told us about Humpback whales, her specialty.

The next morning we entered Tracy Arm, a steep-sided 25 mile long fjord, eventually boarding the Zodiaks to get closer to the Dawes glacier. From here we made our way through Frederick Sound. And then – our ship was almost surrounded by what may have been fifty humpback whales doing their dives, even breaching. When the Zodiaks were launched one came diving even so close to one that it splashed its occupants, eliciting a subsequently censored exclamation of Meriwether's, the Zodiac's pilot.

On it went through the very narrow Wrangell Narrows to Petersburg on Mitkof Island where, the next day we got an introduction to the muskeg and a folk dance of the Norwegian descendants. Proliferating in the muskeg, is sphagnum moss, which can absorb thirty times its volume in water. Together with its antibacterial characteristic the British used it in WWI as a blood-absorbent. Made rich by fishing, this community looks very prosperous. Our local guide told us that her fisherman-husband paid 100,000 dollars for his lifetime halibut fishing license. Then, when last fishing for halibut was open, he caught his limit of 25,000 pounds in seven days.

That afternoon Jack Dalton gave us his memorable presentation of: Raven and the Box of Light. Down the Clarence Strait and past Ketchikan we made our way to Metlakatla on Annette Island. There, a group of Tshimshian Indians settled in the late 1800's after a fallout with the Canadian government, led by a dictatorial preacher. It is Alaska's only reservation. An elaborate native dance was performed in their longhouse for us tourists. A variety of local handicraft and art objects were available.

And on it went into Misty Fjords National Monument, richly deserving its name. Typical for the many Alaskan fjords is their cloudiness, sure, what else, although there's supposed to occur the occasional sunshine. A variety of low, wispy, long-stretched-out clouds are special. Our naturalists called them: Dragon's Breath, a poetic and well deserved name. Two rangers, one of them a woman, came in kayaks to our ship. Then we left Alaskan waters to arrive at Prince Rupert in Canada, renowned for its Salmon and Halibut fishing and canning industry. The Tshimshian Indians who had stayed put there gave us also a performance of their creation myth in their longhouse decked in their elaborate costumes. Seemingly this group was better off compared to their expats in Alaska. That afternoon Meriwether told about Killer Whales, or Orcas, as they ought to be called nowadays, for we do not call lions killer cats! They all have to make a living. There's also no record of an orca ever having attacked a human. Later that evening, no dessert was for once offered after dinner, the ship's cooks offered a bounty of what they called the Chocoholics Gala Buffet. It was enormous!

And then the sun came out! Cruising down BC's Inside Passage, also called the Sunshine Coast, we spotted dolphins and porpoises several times, even some orcas passing along the shoreline. Sailing down some very narrow channels we eventually entered the Strait of Georgia to arrive at our destination, the port of Vancouver at 8:30 AM.

We settled into our B & B and went for a walk through what remained nearby of an Old Growth Forest park. The next morning the newly inaugurated Whistler Mountaineer took us on an all-day rail trip, which included a splendid breakfast and afternoon tea, to the alpine resort of Whistler, where the 2010 Winter Olympics are to be held.

The final day brought us to the Museum of Anthropology, affiliated with the University of British Columbia, with its excellent collection of northwest coast native art. The most impressive sculpture, eight foot in height created by the Haida artist Bill Reid was The Raven and the First Men, depicting his tribe's myth, its creation story, in which the Raven, creator and simultaneously trickster finds a huge clam on the beach after the world ocean had receded and coaxed the terrified little humans out to settle the Earth. The Myth of the Raven occurs in various permutations with the many Alaskan tribes bringing light to the world by creating the Sun, the Moon and the stars. Now – if he could once more give us the power of the Sun, the Moon, the planets and even the stars!



WATCH OUT for Upcoming PSF Activities



October 17 - 6-7 p.m. Challenger Ribbon Cutting Event hosted by the PSF and the Challenger Learning Center. Meet astronaut, Ken Reightler, Jr. and check out PSF's new meteorite and space exhibits.

October 21 - 2 p.m. Join Paul Sipiera at the Lizzadro Lapidery Museum in Elmhurst, IL.

Look for invitations to PSF's Annual Fundraising Dinner on **March 10, 2007!** This year's speaker is astronaut, Jack Lousma. Expect your invitation to arrive in November! If any of your information has changed, please contact Diane Sipiera.

**For more information on any of these events, please contact Diane Sipiera at:
(847) 854-0468 or dsipiera@planets.org**

Mars Viking Event

The Mars Viking Event at the Challenger Learning Center on Friday, July 21 was a success. The PSF would like to thank Paul Solarz, The Havlik-Butts family, The Schrank Family, The Sipiera Family and The Wotal Family for their dedicated volunteering support.

The attendees had the opportunity to tour the Challenger Learning Center, fly the Boeing 727 flight simulator, view an IMAX movie and utilize the Adventure Center. Diane Sipiera presented astronomy lessons in PSF's own Acton Inflatable Planetarium.



The Sipiera & Havlik Family



PSF Board Member, Jennifer Schrank



Paul Sipiera's presentation



Theresa Havlik-Butts & Carrie Sipiera



Maddie Havlik & Carrie Sipiera



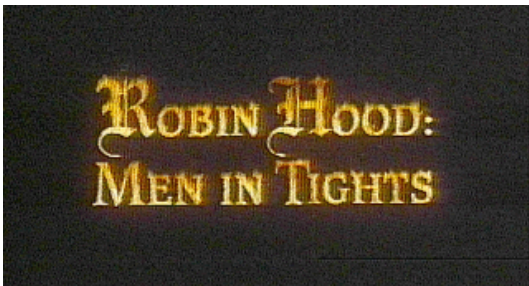
Diane Sipiera & Katie Havlik

WANTED: Participants For Galena Halloween Parade

Have you ever rode on a horse, used a bow and arrow or partied with your merry men? Join the PSF for a fun-filled evening at the Galena Halloween Parade. In the past years, PSF has participated in the annual parade which is highlighted in the Midwest Magazine which thousands of people attend each year. PSF's theme is always based on one of the sciences. This year's theme is "Robin Hood: Don't rob our nighttime skies!" This year's parade is October 28, 2006 at 6:00 p.m. Theresa Havlik-Butts and Jennifer Schrank are organizing the PSF's participation.



Galena is very beautiful and located in the northwest area of Illinois. The glaciers did not go through this part and how wonderful it is to see such extreme hills and valleys. The town keeps its look of the mid-1800's. The city is decorated for the fall harvest every October, a Norman Rockwell picturesque town.



If any PSF members or friends are interested in being part of this magical event or would like more information, please contact Theresa at (847) 854-3201 or Jennifer at (847) 931-1373.

We look forward to an exciting fun-filled event!

T•H•A•N•K Y•O•U

Thank you to all of the PSF Member's who voted in the past August 26th Annual Board Meeting. Your voting is extremely important in making PSF a professional organization.

Thank you to Theresa Havlik-Butts for her generous donation of purchasing a permanent parade banner for future functions.

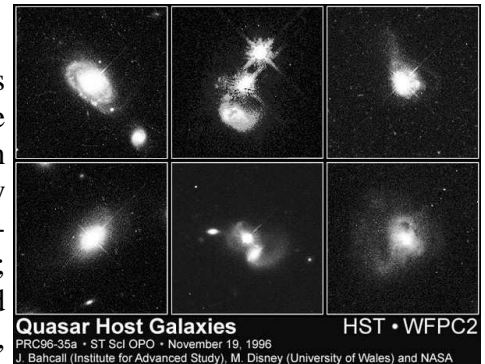
Thank you Dan Dod, who lives in California, for keeping up our web site. We truly appreciate it. Even long distance individuals can make a difference.

A special thank you to Jim Plaxco who helped over the summer to make a smoother transition from Algonquin to Galena.

Astronomy 101 by David Kahn

What are...*Quasars*?

At the outermost boundaries of the visible Universe, astronomers have found extremely bright and powerful objects called quasars. The word quasar is short for "quasi-stellar radio source," and was coined in the 1960s when quasars were first detected. This unwieldy name simply means that quasars are "star-like emitters of radio waves." Today, astronomers now know that most quasars are actually faint radio emitters; however the name has stuck, nonetheless. In addition to radio waves and visible light, quasars also emit ultraviolet rays, infrared waves, X-rays, and gamma-rays.



Though quasars appear to be point-like objects, they are nothing like stars. Quasars are quite small—about the size of our Solar System—yet they can produce more light and energy than one thousand galaxies. Quasars give off so much energy that they can be a trillion times brighter than the Sun! Further, because quasars are so bright they drown out the light from all the other stars in the same galaxy. The nearest quasar (called 3C273) is at a distance of about 2.5 billion light-years in Virgo, while most others lie beyond that at about ten billion light-years.

How were quasars first detected? When radio telescopes were first pointed towards the sky, point sources of radio waves were discovered (along with spread-out regions of emission along our Milky Way). Then, the astronomers turned their ordinary, visible-light telescopes toward these radio points and looked to see what was there. In some cases a supernova remnant was found, in others, a large star-birth region, and still others, a distant galaxy. However, in a few of the places where these point sources of radio waves were found, nothing was observed except an object resembling a star. Later, it was found that these sources could not be stars in our galaxy, but must be very far away—as far as any of the distant galaxies seen.

Scientists believe that quasars produce their energy from massive black holes in the center of the galaxies in which they are located. It is now accepted that in the center of many galaxies there may rest massive black holes, and around these black holes gigantic discs of matter are falling into them. This matter is heated to unimaginably high temperatures, and therefore shines so brightly that some actually outshine their entire host galaxies. The electrons near the center of the quasar can be accelerated to speeds near the speed of light, and in the presence of a magnetic field (which can be present in these same regions), the electrons move along helical paths (paths that look like a stretched out slinky). As a result, they emit radio waves which are detected from Earth. Black holes also form jets of matter that shoot out from the center of the galaxy for millions of light-years. It is believed that quasars are observed when these jets line up with our line of sight, so as we are looking straight down the path of the jet, it seems particularly bright to observers on Earth. Finally, even though it appears galaxies may only act as quasars during the early stages of their lives, that still provides for a lifespan of several billion years.

Many astronomers believe that quasars are the most distant objects yet detected in the Universe. Despite their incredible brightness, quasars cannot be seen with an unaided eye due to their great distance from Earth (the quasars near Earth have died down long ago). In fact, quasars are so distant, that the energy from quasars takes billions of years to reach the Earth's atmosphere. When we look at quasars which are ten to fifteen billion light years away, we are looking ten to fifteen billion years into the past. For this reason, the study of quasars can provide astronomers with valuable information about the early stages of the Universe.

SCIENCE FUN FACTS

1.) How many planets revolve around the Sun?

- A. 7
- B. 9
- C. 8

2.) Which planet is the hottest?

- A. Mercury
- B. Venus
- C. Jupiter

3.) In what year was the PSF founded?

- A. 1986
- B. 1989
- C. 1993

4.) How far has a spacecraft traveled into space?

- A. A well over 10 light years
- B. A bit less than one light year
- C. Some what less than one light day

5.) If you could travel in a spacecraft at the speed of light away from the Solar System, how long could you see the sun?

- A. 3 years
- B. 30 years
- C. 300 years

6.) Approximately how many stars does the Andromeda Nebula contain?

- A. 100,000
- B. 100,000,000
- C. 100,000,000,000

7.) Where do most of the known asteroids orbit the Sun?

- A. Between the orbits of Venus and Earth
- B. Between the orbits of Earth and Mars
- C. Between the orbits of Mars and Jupiter

8.) How fast does the Sun travel around the center of the galaxy?

- A. 150 miles/second
- B. 150 miles/minute
- C. 150 miles/hour



The Universe

- 13.7 billion years: approximate age of the Universe
- 200 million years: approximate interval between the Big Bang and the appearance of the first stars

4% Ordinary Matter
23% Dark Matter
73% Dark Energy

Membership Form

Sign up for:	Class	Price
<input type="checkbox"/> Regular Membership	1 Year	\$20.00
<input type="checkbox"/> Regular Membership	2 Year	\$35.00
<input type="checkbox"/> Family Membership	1 Year	\$35.00
<input type="checkbox"/> Family Membership	2 Year	\$60.00
<input type="checkbox"/> Sponsoring Membership	1 Year	\$50.00
<input type="checkbox"/> Sponsoring Membership	2 Year	\$90.00
<input type="checkbox"/> Contributing Membership	1 Year	\$100.00
<input type="checkbox"/> Contributing Membership	2 Year	\$180.00
<input type="checkbox"/> Life Membership	Life	\$500.00
<input type="checkbox"/> Student Member*	1 Year	\$10.00

Total: _____

*Proof of full-time student status at an accredited institution must be provided with this application.

Name _____

Address _____

E-Mail _____

Phone _____

ANNUAL DINNER

Each year we are honored to have our members help with the Annual Fundraising Dinner. This help includes volunteering for set up with the dinner itself, donations, supervising auction items, computer work, etc. to make the dinner possible. Although the dinner is several months away, the planning starts now. If you would be interested in helping or would like to find out what help is needed...please contact Diane Sipiery or Andrea Cosentino. Thank you for your continued support!

Email:
 dsipiery@planets.org
 andrea2986@aol.com

Phone:
 (847) 854-0468



!! Help Us Update Our Information !!

In a recent update of our members' contact information, we noticed that many of our members were missing key information that would help us to better serve you. Please help the PSF, fill this form out and send to the address below. THANK YOU!

Please send to: PSF Membership
 10 Winterwood Lane Unit B
 Galena, IL 61036

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Address: _____

Phone: () _____
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