The ECLIPSE

March 2011
Volume 4, Issue 3

The newsletter of the Barnard Seyfert Astronomical Society, PO Box 150713, Nashville, TN 37215-0713

Upcoming Events

Board of Directors Meeting

March 3rd at the Cumberland Valley Girl Scout Council Building – 7:30 pm

April 7th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

Membership Meeting

March 17th at the Adventure Science Center – 7:30 pm

April 21st at the Adventure Science Center – 7:30 pm

Star Parties

March 5th – BSAS Private Star Party at Natchez Trace mm 412 - Practice for Messier Marathon

March 12th – BSAS Public Star Party at Edwin Warner Park 7:30 – 9:30 pm

March 26 – BSAS Public Star Party at Adventure Science Center 8:00 - 10:00 pm

April 2nd – BSAS Messier Marathon at Spot Observatory (rain date April 30th)

April 9th – BSAS Public Star Party at Adventure Science Center 8:00 – 10:00pm

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Monthly Membership Meeting

Thursday, March 17th, 2010
Adventure Science Center
7:30 pm

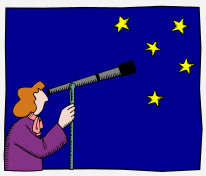
Dr. Brian Hart, University of California, Irvine, will present ***Galaxy Clusters: Giants of the Universe*** – a story about the big questions of existence. Who are we? Why are we here? Where did we come from? A public lecture for the whole family!

From The President

Greetings from your BSAS president. This month brings a new season and with it, the March rains. The month has begun on a wet note but hopefully we will see a few clear nights before it ends. March is, of course, the changing of the seasons with spring officially beginning at 6:21pm Central Daylight Time on March 20. Since the full Moon of March is the day before on March 19, this year will have one of the latest Easter Sunday's possible. March also marks the return to Daylight Saving Time. Since 2006, Daylight Saving Time begins on the second Sunday in March so this year we set our clocks forward one hour at 2:00am on March 13. Since I will be at Kitt Peak observing that night I would like to think that would give me an extra hour of observing but it won't. Despite all our tinkering with clocks, there are still only so many hours of daylight (or night), we're just shifting it from morning to afternoon and back again. I will, however, be awake at 2:00am to set my watch forward.

Get ready to be deluged with news of Mercury! The Mercury Messenger mission starts orbiting the closest planet to the Sun on Thursday March 17 (there must have been an Irishman involved in choosing that date). It has taken almost 6 and ½ years to reach the scorched planet with one Earth, two Venus and three Mercury flyby's on the way. The orbital insertion burn will begin around 7:30pm local time and last for 15-minutes. At the end of that time the spacecraft should be in a highly elliptical 12-hour orbit with a periapsis of 200km and apoapsis of almost 15,200km. The reason for the extreme eccentricity is so that the spacecraft doesn't stay too close to the surface of Mercury. At periapsis, the thermal radiation coming off the surface of the daylight side of the planet is four times the heat we receive from the Sun here at Earth. Mercury is truly a scorched world. In addition to avoiding the heat from Mercury, Messenger must also avoid being burnt to a crisp by the Sun. The spacecraft has an extensive sun-shade which it must always keep pointed at the Sun to shield the spacecraft. Since Messenger will be in a nearly polar orbit, that means the craft will keep its orientation toward the Sun and simply let Mercury rotate underneath it. During the one Earth year primary mission this will allow the spacecraft to experience two Mercurian days. At the end of the primary mission the Messenger scientists hope to have a global map of over 90% of the surface of Mercury with 250 meters lateral and 1.5 meter altitude resolution. They also hope to have a multipole model of the magnetic field of the littlest planet to an accuracy of 20%.

Continued on Page 2



"It's a pretty bittersweet moment. As the minutes pass, I'm actually getting sadder and sadder about this being the last flight."

Steven W. Lindsey
(Colonel, USAF, Ret.)
Commander - STS 133
(the final flight of space shuttle Discovery)

FREE TELESCOPES!

Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time.

We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books.

Some restrictions apply, and a waiting list may be applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear.

For information on what equipment is currently available, contact Lonnie Puterbaugh at (615) 661-9540.

Observing Highlights

all times listed are Central Standard Time

LUNAR PHASES

March 2011

03/04 NEW Moon
03/12 FIRST Quarter
03/19 FULL Moon
03/26 LAST Quarter

April 2011

04/03 NEW Moon
04/11 FIRST Quarter
04/17 FULL Moon
04/24 LAST Quarter

OBJECTS VISIBLE THIS MONTH

Messier Objects:

Open Clusters:

M41, M44, M46, M47, M48, M50, M67, M93

Galaxies:

M81, M82

From the President, cont.

Other than Earth, Mercury is the only terrestrial world with a global magnetic field and scientists are anxious to find out why. The gravity field map of the planet should help them to find out how much, if any, of the core of the planet is still molten. Once the spacecraft enters orbit there will be a month long check-out phase with the full science mission beginning April 4. After the Messenger mission ends Mercury will be left alone until 2020 when the European Space Agency's BepiColombo mission arrives.

Before I close this month's president's message I would like to be sure everyone knows about the upcoming star parties. The first public night is Saturday March 12 at the model airplane field of Edward Warner Park starting at 7:30pm. Unfortunately I won't be there, I'll be on top of Kitt Peak using a 0.9m telescope but I'll be thinking of all of you using your 5" to 10" 'scopes. I'll especially be hoping for clear skies both here in Nashville and in Arizona. Our second public star party is Saturday March 26 at the Adventure Science Center starting at 8:00pm. This one is in conjunction with Earth Hour in which we are all supposed to turn off as many outdoor lights as possible. The city of Nashville has been part of Earth Hour for the last couple of years so let's hope they find a few more light switches this year. Finally, don't forget the public meeting at the Adventure Science Center on Thursday March 17. Our speaker this month is Dr. Brian Hart, recently of the University of California, Irvine and currently working at Nissan. He will be speaking to us on "Galaxy Clusters: Giants of the Universe". Bring a friend, especially a young friend! See you then.

Dr. Spencer Buckner
President

Happy Birthday Uranus by Robin Byrne

This month we celebrate the discovery of a planet whose name has been the "butt" of many jokes over the years. Because it is barely visible to the naked eye, under ideal conditions, Uranus had been observed many times throughout history, although considered a star rather than a planet. The first recorded sighting was by John Flamsteed in 1690, at which time he designated it 34 Tauri, considering it merely a star in Taurus.

It wasn't until Sir William Herschel observed it, that the nature of this object began to be understood. On the evening of March 13, 1781, William Herschel first spied an object in his telescope that he thought must be a comet. As he observed it at various magnifications, he knew it couldn't be a star, since, unlike a star, it showed a disk at higher magnifications. Four nights later, observing this "comet" again, he noticed that it had moved relative to the background stars, confirming his suspicions that it was a comet. While Herschel was reluctant to call this new object a "planet", others were not. After Herschel notified Nevil Maskelyn, the Astronomer Royal, Maskelyn observed that it had no coma or tail, like a comet, and thought it was more like a planet. Anders Johan Lexell, a Russian astronomer, computed the orbit, and found it to be closer to a circular obit, like the planets, than the more typically elliptical orbits associated with comets. Similarly, Johann Bode in Germany felt the orbit was more like that of a planet. While others more readily accepted this new planet, it took Herschel two years to conclude that it was, indeed, a planet. At a distance from the Sun of roughly twice that of Saturn, this discovery effectively doubled the size of the known solar system!

In recognition of his achievement, King George III gave Herschel an annual stipend of 200 Pounds, and encouraged Herschel to move to Windsor, so that the royal family could observe this object through Herschel's telescopes. Meanwhile, Maskelyn felt that Herschel, as the rightful discoverer, should be given the honor of naming this new planet. In repayment for the King's generosity, Herschel proposed the name Georgium Sidus, literally, George's Star. In addition to acknowledging his new benefactor, Herschel also thought that the name should correspond with the era of discovery. Just as the planet names from antiquity say something about the time in which they were named, this name would forever identify this planet's discovery with the reign of King George III. However, outside of those in England, most astronomers around the world were not happy about one country's monarch being singled out. Other suggestions included naming it Herschel (suggested by Lalande) and Neptune (Prosperin's proposal). It was Bode who suggested Uranus, after the Greek god of the sky. In mythology, Saturn is the father of Jupiter, and Uranus is the father of Saturn. One of Bode's colleagues, Martin Klaproth, was so enamored with this name, that he used it to name a new element he had discovered: uranium. Interestingly, this is the only planet whose name is derived from its Greek origin rather than from the Roman version. Bode's suggestion won universal favor, and was adopted by most countries immediately, although it wasn't until 1850 that England finally recognized this name over the one honoring King George.

Most of what we know about Uranus comes from the January 1986 Voyager 2 fly-by, which was our only up-close encounter with this planet to date. We now know that Uranus and Neptune both have an internal structure that is composed of a rocky core, an outer layer of hydrogen and helium gasses, and is dominated by an internal layer of water, ammonia and methane ices, giving them a sub-classification as "Ice Giants." However, the "ice" is actually more of the consistency of a hot, dense fluid due to the immense pressures in the planets' interiors. Because this layer is electrically conductive, and likely the source of Uranus' magnetic field, it is sometimes referred to as a water-ammonia ocean.

The lovely blue color of Uranus is due to clouds composed primarily of methane ices. During the Voyager 2 fly-by, the cloud tops showed virtually no distinct features. Unfortunately, this is because of Uranus' unusual seasons. Being tilted a little over 90 degrees relative to the plane of its 84-year orbit, the polar regions experience 42 years of darkness, followed by 42 years of sunlight. The fly-by was during midsummer for the pole facing the Sun. As such, with such a constant weather condition, not much activity was taking place. More recently, as Uranus has been in the fall/spring season, Hubble images indicate an increase in the development of cloud features.

How did Uranus get such an unusual tilt? It is widely believed that all the planets formed with axes roughly vertical relative to the plane of their orbit, and that any significant tilt must be due to a collision with a large protoplanet in the distant past. Until recently, that was the only explanation given. However, Gwenael Boue' and Jacques Laskar at the Paris Observatory have developed another model for Uranus' odd tilt. They have shown that it could instead be due to a large moon, whose gravity caused Uranus to wobble (much as our moon is responsible for Earth's 26,000 year precessional wobble). Over millions of years, the wobble would continue to be exaggerated, until it reached the current extreme. If that is true, where is the moon today? In the realm of the giant planets, it is possible for a passing planet to disrupt, or even steal, another planet's moons. If such a large protoplanet ventured near to Uranus, the moon could have been removed from the solar system entirely.

While that recent study was concerned with Uranus' tilt, another recent study looked at the planet's interior. Up to 10% of Uranus' interior is composed of carbon under high pressure, which we usually think of as diamonds. What was not known about until recently had to do with how diamonds behave at their melting point. Melting diamonds is not easy due to two facts: diamonds melt at extremely high temperatures, and, once melted, it reverts to graphite. In order to maintain a true diamond during the entire process, scientists had to melt it under extremely high pressure conditions, like those found in the interiors of the giant planets. What they discovered is that diamonds have something in common with water: the solid state has a lower density than the liquid state. For the vast majority of materials, the solid is more dense, and would sink. However, just as ice floats on water, solid diamonds float on top of liquid diamond. This strange characteristic in the behavior of diamonds may provide a clue as to why the magnetic filed of Uranus is tilted so much relative to the axis of rotation.

Enigmatic since its discovery, Uranus continues to amaze and surprise us with new possibilities. Although not currently well-placed for observing, this summer Uranus will grace our morning skies. Easily visible in a pair of binoculars or a small telescope, try to find this little blue dot. And if you'd like even more of a challenge, once spotted, see if you can pick it out naked-eye. Who knows? Maybe if you had been an ancient astronomer, this distant planet may have been known about all along!

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Eric Bland
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Board Meeting Minutes – February 3, 2011

Bob Rice, Secretary

The board of directors of the Barnard-Seyfert Astronomical Society (BSAS) met in regular session at the Cumberland Valley Girl Scout Council Building in Nashville, Tennessee on February 3, 2011. A sign-in sheet was passed around in lieu of a roll call. Board members Dr. Spenser Buckner, Jana Ruth Ford, Bill Griswold, Dr. Donna Hummell, Santos Lopez, Kris McCall, Curt Porter, Dr. Terry Reeves, Bob Rice, and Theo Wellington were present. Board member Steve Cobb was absent. A quorum being present, President Dr. Spencer Buckner called the meeting to order at 7:40 P.M.

Treasurer Bob Norling reported that the BSAS had $2,270.47 in its regular checking account and $407.31 in its equipment account. Mr. Norling also reported that he had been unable to get in touch with Daisy Ramsey about picking up her pre-ordered copies of Guy Ottewell's Astronomical Calendar 2011 and the RASC's Observer's Handbook 2011. Jana Ruth Ford offered to attempt to contact her. Mr. Norling also announced that he had two copies left of Kalmbach's Deep Space Mysteries 2011 calendar; Santos Lopez purchased one on the spot.

Dr. Spencer Buckner announced these upcoming star parties:

- Feb 12 – Public star party at Shelby Bottoms Nature Center from 7:30 to 9:30 P.M.
- Mar 05 – Private star party & practice session for the Messier Marathon at mile marker 412 on the Natchez Trace Parkway.
- Mar 12 – Public star party at the Warner Parks from 7:30 to 9:30 P.M.

Dr. Spencer Buckner announced that the BSAS had executed an agreement with the National Park Service to conduct star parties on the Natchez Trace Parkway during 2011 on the dates and at the locations requested by the Society. Dr. Buckner thanked Bill Griswold for his hard work on this project and handed out copies of the agreement to the board members.

Dr. Spencer Buckner noted that he would present his "I Got A New Telescope For Christmas – Now What?" program that was cancelled due to snow last month at the public membership meeting on February 17, 2011. He again encouraged board members to ask anyone who had received a recent gift telescope to bring it to this meeting. He stated that he would bring one telescope – a new Orion go-to dobsonian – and that, following a brief introductory presentation, everyone would break out into small groups with BSAS members assisting the new telescope owners (a practice that has worked well at similar past meetings). Santos Lopez pointed out that this would be an excellent opportunity to encourage attendees to join the BSAS.

Dr. Spencer Buckner reported that the BSAS had again been invited to sponsor prizes for astronomy projects at the 59th Middle Tennessee Science and Engineering Fair to be held at Austin Peay State University on March 17-19, 2011. Following a brief discussion Bob Norling moved that that the Society provide a $100 first place prize and a $50 second place prize and Kris McCall seconded his motion. The board additionally decided that prizes would not be awarded if no astronomy-related projects were entered or if those entered were deemed to be unworthy of merit. This motion was subsequently approved by a unanimous voice vote. Dr. Spencer Buckner stated that he would ask for volunteers to serve as judges at the upcoming February membership meeting.

Santos Lopez presented the board with a written copy of suggested changes to the work-in-progress draft Memorandum of Understanding (MOU) between the BSAS and the Adventure Science Center (ASC) where we hold our monthly public membership meetings. These proposed changes emphasized among other things specific assistance that the BSAS provided to the ASC such as bringing equipment for star parties and for Astronomy Day along with manning various information stations as requested. Note: a copy of Mr. Lopez's suggestions is attached as an addendum to these minutes . The board also decided that a specific reference to the BSAS' non-profit status should be included. Kris McCall stated that she would email copies of the ASC's mission statement to the board members. Curt Porter said that he would prepare an updated draft MOU for the board's review. Dr. Spencer Buckner noted that he wanted to set up a meeting with the ASC's Chief Executive Officer as soon as possible.

Bob Rice, reporting for the Program Committee, announced that speakers and programs for the BSAS' monthly membership meetings had been obtained through June 2011. Dr. Spencer Buckner said that he would contact several professors at Tennessee State University about speaking to the Society. Kris McCall announced that Dr. M. Beatrice Magnani, a seismologist at the University of Memphis' Center for Earthquake Research and Information, was scheduled to conduct programs during December at the Adventure Science Center on the 1811 New Madrid earthquake. Ms McCall noted that, although it was not an astronomy topic, Dr. Magnani would also be available to speak at the BSAS' December 15, 2011 Christmas Pot-Luck Dinner. The board immediately determined that this was important and locally relevant science and unanimously agreed to ask Dr. Magnani to speak.

Kris McCall asked to be provided with summary information as it became available about the upcoming membership meeting speakers and topics so this could be included on the ASC's website. Theo Wellington announced that staff at Bells Bend Park had informed her that, since the last scheduled star party was cancelled due to snow, they could set up an additional star party date preferably on a Friday evening. Santos Lopez suggested that the BSAS have a plan and/or a contact person if a sudden stupendous astronomical event such as a supernova occurred.

Since there was no further business to discuss, President Dr. Spencer Buckner declared the meeting to be adjourned at 8:36 P.M.

Board Meeting Minutes Addendum

Bob Rice, Secretary

ADDENDUM

Being a copy of the detailed and thoughtful proposed changes made by Santos Lopez to the outstanding draft Memorandum Of Understanding under consideration by the board of directors.

VERSION 2.1
February 4, 2011

Memorandum of Understanding (MOU) Between The Barnard-Seyfert Astronomical Society (BSAS) and The Adventure Science Center (ASC).

The purpose of this MOU is to continue the mutually beneficial relationship that already exists between BSAS and ASC, and to identify some specific areas of cooperation. In short, ASC provides facilities that promote the mission of BSAS, and in return BSAS provides experienced amateur and professional astronomers and their state of the art equipment for events at ASC.

The Barnard-Seyfert Astronomical Society, a nonprofit corporation under Title 48 of the Tennessee Code Annotated, is dedicated to the advancement of the science of astronomy and the support and encouragement of amateur and professional astronomy in Middle Tennessee, and the support and encouragement of the exploration and utilization of space for the advancement of civilization.

The Adventure Science Center ignites curiosity and inspires the lifelong discovery of science.

There are two specific areas of cooperation:

MEETING SPACE

ASC will allow BSAS to hold its general membership meeting on the third Thursday of each month in a space designated by the ASC.

- The space should be sufficient to accommodate BSAS members and a reasonable number of general public.
- BSAS will hold meetings open and free of charge, which will typically begin at 7:30PM local time, and end by no later than 9:30PM.
- The December BSAS meeting traditionally consists of a potluck meal provided by its members plus a program. This requires a space with tables and chairs for about 75 people. Set up begins at 6:00PM. Meal is from 6:30 - 7:30. Program should end by 9:30, and BSAS members take care of garbage disposal and cleanup.

FACILITATE STAR PARTIES AND OTHER EVENTS

Throughout the year BSAS will help facilitate star parties with the planning and cooperation of ASC on astronomically relevant dates, at the ASC facilities and other locations throughout middle Tennessee.

- BSAS members will be responsible for the set up of their personal astronomical telescopes and other equipment.
- BSAS members will safely assist the general public in using their personal telescopes and related equipment.
- BSAS members create an educational environment relevant to the mission statements of BSAS and ASC by providing hands-on-learning about the science of Astronomy.
- BSAS members will actively participate in ASC's Astronomy Day events by volunteering their time and resources. In the past BSAS members' participation has included displays and demonstrations, lectures, assistance in astronomical observations, and other hands-on-activities which have helped make it a success.

This MOU will become effective when signed by the President of BSAS, having been ratified by the BSAS Board of Directors, and the party designated by ASC as having sufficient signing authority.

This MOU will automatically renew every 366?? days unless either BSAS or ASC wishes to modify or terminate it, with either BSAS or ASC giving a sixty(60) days advance notice of the need to change it.

For BSAS:_____ Date:_____

For ASC:_____Date:_____

BSAS Affiliations

The Astronomical League
http://www.astroleague.org/

The Night Sky Network
http://nightsky.jpl.nasa.gov/

International Dark Sky Association
http://www.darksky.org/

Monthly Meeting Minutes, February 17, 2011

Bob Rice, Secretary

President Dr. Spencer Buckner called the meeting to order at 7:37 P.M. in the Skyline Room of the Adventure Science Center (ASC) and welcomed new members and visitors. Dr. Buckner announced these upcoming star parties:

- Mar 05 – a private star party & practice session for the Messier Marathon at mile marker 412 on the Natchez Trace Parkway.
- Mar 12 – a public star party at the Warner Parks from 7:30 to 9:30 P.M.

Treasurer Bob Norling reported that the BSAS had $2,224.23 in its regular bank account and $407.31 in its equipment account. Mr. Norling also announced that he still had two copies of the Royal Astronomical Society of Canada's Observers Handbook 2011 and a copy each of Guy Ottewell's Astronomical Calendar 2011 and Kalmbach Publishing Company's Deep Space Mysteries Calendar 2011 for sale at a discounted price to BSAS members. Dr. Buckner announced that the upcoming March 17 membership meeting would feature a program on "Galaxy Clusters – Giants of the Universe" delivered by Dr. Brian Hart,

Dr. Spencer Buckner then began the evening's program on "I Got a New Telescope For Christmas – Now What?" that was intended to assist anyone who may have received an astronomy-related device over the holidays with learning how to use it. In fact attendees had been previously encouraged via various public announcements to bring their new telescopes or other devices to this meeting for that purpose. Dr. Buckner first showed a very brief PowerPoint display illustrating the basic types of telescopes and mounts. He then quickly discussed these additional "things to consider" that could assist or improve the observing process:

- Illuminated reticule eyepieces to better center observed objects in the field of view
- Planispheres or sky maps to better locate objects at different time of the year
- Star atlases to show more detailed views of the sky
- Planetarium software to provide yet more detailed and automated views
- Go-to & push-to mounts made the set-up of scopes so equipped more difficult
- Using smart phone applications & planetarium software

Following a round of answering several preliminary questions, the business meeting was adjourned with the audience forming into groups according to the telescope types that were brought. BSAS members then joined these groups to provide one-on-one assistance as needed. These friendly and informal gatherings typically lasted for about the next 30 to 45 minutes.

Thank Goodness the Sun is Single

Space Place Partners Article, February 2011
By Trudy E. Bell

It's a good thing the Sun is single. According to new research, Sun-like stars in close double-star systems "can be okay for a few billion years—but then they go bad," says Jeremy Drake of the Harvard-Smithsonian Astrophysical Observatory in Cambridge, Mass.

How bad? According to data from NASA's Spitzer Space Telescope, close binary stars can destroy their planets along with any life. Drake and four colleagues reported the results in the September 10, 2010, issue of The Astrophysical Journal Letters.

Our Sun, about 864,000 miles across, rotates on its axis once in 24.5 days. "Three billion years ago, roughly when bacteria evolved on Earth, the Sun rotated in only 5 days," explains Drake. Its rotation rate has been gradually slowing because the solar wind gets tangled up in the solar magnetic field, and acts as a brake.

But some sun-like stars occur in close pairs only a few million miles apart. That's only about five times the diameter of each star—so close the stars are gravitationally distorted. They are actually elongated toward each other. They also interact tidally, keeping just one face toward the other, as the Moon does toward Earth.

Such a close binary is "a built-in time bomb," Drake declares. The continuous loss of mass from the two stars via solar wind carries away some of the double-star system's angular momentum, causing the two stars to spiral inward toward each other, orbiting faster and faster as the distance shrinks. When each star's rotation period on its axis is the same as its orbital period around the other, the pair effectively rotates as a single body in just 3 or 4 days.

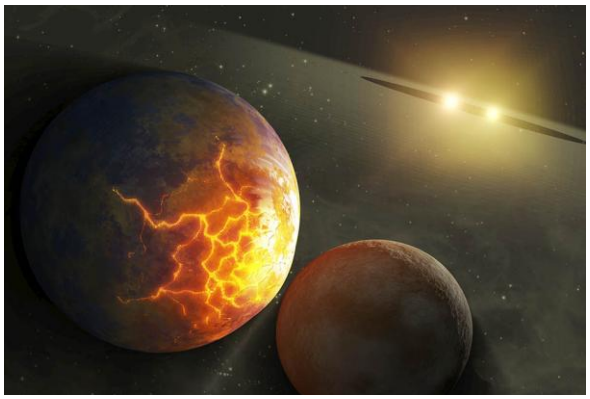
Then, watch out! Such fast spinning intensifies the magnetic dynamo inside each star. The stars "generate bigger, stronger 'star spots' 5 to 10 percent the size of the star—so big they can be detected from Earth," Drake says. "The stars also interact magnetically very violently, shooting out monster flares."

Worst of all, the decreasing distance between the two stars "changes the gravitational resonances of the planetary system," Drake continued, destabilizing the orbits of any planets circling the pair. Planets may so strongly perturbed they are sent into collision paths. As they repeatedly slam into each other, they shatter into red-hot asteroid-sized bodies, killing any life. In as short as a century, the repeated collisions pulverize the planets into a ring of warm dust.

The infrared glow from this pulverized debris is what Spitzer has seen in some self-destructing star systems. Drake and his colleagues now want to examine a much bigger sample of binaries to see just how bad double star systems really are.

They're already sure of one thing: "We're glad the Sun is single!"

Read more about these findings at the NASA Spitzer site at www.spitzer.caltech.edu/news/1182-ssc2010-07-Pulverized-Planet-Dust-May-Lie-Around-Double-Stars . For kids, the Spitzer Concentration game shows a big collection of memorable (if you're good at the game) images from the Spitzer Space Telescope. Visit spaceplace.nasa.gov/en/kids/spitzer/concentration/.



Planetary collisions such as shown in this artist's rendering could be quite common in binary star systems where the stars are very close.

Become a Member of the BSAS!

Download and print the Application for membership from www.bsasnashville.com (Adobe® Acrobat Reader® required).

Then fill it out and bring it to the next monthly meeting or mail it along with your first year's membership dues to:

BSAS
P.O. Box 150713
Nashville, TN 37215-0713

Annual dues, which include membership in the BSAS and Astronomical League, and subscriptions to their newsletters, are:

$20 Individual
$30 Family
$15 Senior (+65)
$25 Senior Family (+65)
$12 Student*

* To qualify, you must be enrolled full time in an accredited institution or home schooled.

All memberships have a vote in BSAS elections and other membership votes,

Also included are subscriptions to the BSAS and Astronomical League newsletters.

IMPORTANT DUES INFORMATION

To find the expiration date for your current membership, visit our web site at http://www.bsasnashville.com and click the Renewals link.

There will be a two month grace period before any member's name is removed from the current mailing list.

We're on the Web!
See us at:

www.bsasnashville.com

BSAS on Facebook

About Our Organization

Organized in 1928, the Barnard-Seyfert Astronomical Society is an association of amateur and professional astronomers who have joined to share our knowledge and our love of the sky.

The BSAS meets on the third Thursday of each month at the Adventure Science Center in Nashville. Experienced members or guest speakers talk about some aspect of astronomy or observing. Subjects range from how the universe first formed to how to build your own telescope. The meetings are informal and time is allotted for fellowship. You do not have to be a member to attend the meetings.

Membership entitles you to subscriptions to Astronomy and Sky & Telescope at reduced rates; the club's newsletter, the *Eclipse*, is sent to members monthly. BSAS members also receive membership in the Astronomical League, receiving their quarterly newsletter, the *Reflector*, discounts on all astronomical books, and many other benefits.

In addition to the meetings, BSAS also sponsors many public events, such as star parties and Astronomy Day; we go into the schools on occasion to hold star parties for the children and their parents. Often the public star parties are centered on a special astronomical event, such as a lunar eclipse or a planetary opposition.

Most information about BSAS and our activities may be found at www.bsasnashville.com. If you need more information, write to us at info@bsasnashville.com or call Dr. Spencer Buckner at (931) 221-6241.

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