



**Jupiter with Io, Ganymede and Europa, taken October 12, 2012.
Imaged with AT106 refractor, Imaging Source DK video camera and 2x
Powermate; 800 images stacked and aligned with Registax, processed with
Photoshop. Photo by Joe Lopinot.**

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River Bend Astronomy Club is a
member of the Astronomical League.



River Bend Astronomy club serves astronomy enthusiasts of the American Bottom region, the Mississippi River bluffs and beyond, fostering observation, education, and a spirit of camaraderie.

Elected Officers

PRESIDENT	Jeff Menz
VICE-PRESIDENT	Joe Lopinot
TREASURER	Mike Veith
SECRETARY	Mary Hebert

Volunteer Administrators

NEWSLETTER EDITOR	Bill Breeden
LEAGUE CORRESPONDENT	Rich Dietz
OUTREACH COORDINATOR	Terry Menz
LIBRARIAN	Rita Breeden

Founding Members

Ed Cunniss · Gary Kronk · Kurt Sleeter · Eric Young

Contacts

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River Bend Astronomy Club is a member of the Astronomical League, dedicated to fostering astronomical education, providing incentives for astronomical observation and research, and assisting communication among amateur astronomical societies.
www.astroleague.org



River Bend Astronomy Club is a member of the NASA Night Sky Network, a nationwide coalition of amateur astronomy clubs bringing the science, technology and inspiration of NASA's missions to the general public. See our [online calendar](http://nightsky.jpl.nasa.gov) on the NASA Night Sky Network at <http://nightsky.jpl.nasa.gov>

Monthly Meetings

Saturday, May 11, 2013 • 7:00 PM

Saturday, June 8, 2013 • 7:00 PM

Saturday, July 6, 2013 • 7:00 PM

For meeting locations, please see our calendar at

www.riverbendastro.org.

Looked Up Lately?

Join River Bend Astronomy Club

Want to learn more about astronomy? The members of River Bend Astronomy Club invite you to join. You won't need expensive tools or special skills - just a passion for observing the natural world.

- Meetings offer learning, peeks through great telescopes, and fun under the stars.
- You will receive the club newsletter, *Current Astronomy*, packed with news and photos.
- Get connected with our member-only online discussion group.
- Borrow from the club's multimedia library.
- Borrow from the club's selection of solar telescopes.
- And that's not all! Through club membership you also join the Astronomical League, with its special programs and colorful quarterly newsletter *The Reflector* to enrich your hobby.
- We meet monthly, observe regularly, email news and quips constantly, and generally have a good time. Won't you join us?

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

Email address _____

Where did you hear of our club? _____

How long have you been interested in astronomy? _____

Do you have optical equipment? _____

Are you afraid of the dark? ___Yes ___No (just kidding)

I am submitted my application for:

_____Adult Membership(s) _____Youth Membership(s)

\$20/year each \$15/year each

(18 yrs. and up) (17 yrs. and under)

I enclose a check for \$_____ made out to:

Mike Veith, Treasurer, RBAC

Signature _____

Date _____

Mail to: River Bend Astronomy Club

c/o Mike Veith, 1121 St. Louis St., Edwardsville, IL 62025.

Questions? Contact us by email at rbac@riverbendastro.org.

River Bend Astronomy Club Has A New Website!

By Joe Lopinot

The River Bend Astronomy Club is proud to unveil its new digital home on the internet. The new site has expanded features and functionality, allowing club members and the public to browse and communicate the latest news in astronomy and what's new with the RBAC.

In order to gain greater visibility on the web, the RBAC site can be accessed through your Facebook or Google Plus accounts. Members or the public can register and log in through these accounts, making it more convenient for the general public to access the site. The home page features Quick Links to the RBAC pages on both Facebook and Google Plus; individuals can "Like" or "+1" the website, bringing public awareness to the club and direct persons with an interest in astronomy to our page.

The home page is arranged for easy access to all the features on the site and astronomy related links on the web. It includes feeds for current weather conditions in St. Louis, image feeds of the sun, the moon phase for tonight and astrophotos taken by club members. The main feature of the home page is our news feed, allowing club members to post astronomy and science stories they would like to share with others. The home page also features links to our membership application and a form for requesting outreach services through the club.

The River Bend Astronomy Club is a member of the Astronomical League and a link to the league's website is provided. The site also provides easy access to the club's calendar through the Night Sky Network link, allowing members and the public to see upcoming RBAC events. The new site includes a public forums area, a great place for club members to interact with the public by answering questions and sharing knowledge. There are also galleries for club members to post and share their astrophotos and pictures from club events. Finally, there is a resource page to find astronomy related links that will be updated regularly.

The club members would like to thank fellow member Dan Brandon for his great work in putting together our new website. The River Bend Astronomy Club hopes members and the public will visit and contribute to our new website and add it to their favorites, making it one of their first stops for astronomy related information on the internet.

Visit the new site at our same address, at www.riverbendastro.org. **RBAC**



The new River Bend Astronomy Club website features an updated look, access to the RBAC calendar on the NASA Night Sky Network, and a new forum for our members to interact with each other and with the public.

South St. Louis Outreach at Francis Park in 2013 UPDATE

By Bill Breeden

This is an updated schedule for Francis Park Stargazing in South St. Louis.

Please note that the sessions originally scheduled for November 6 and December 11, 2013 have been canceled.

These events are scheduled one Wednesday night per month, April through October, closest to the First Quarter Moon. Events are held from 7pm to 9:30pm.

2013 SCHEDULE

Remaining sessions for the year:

May 15, 2013 (5 day old Moon)

June 12, 2013 (4 day old Moon)

July 17, 2013 (9 day old Moon)

August 14, 2013 (8 day old Moon)

September 11, 2013 (6 day old Moon)

October 9, 2013 (4 day old Moon)

DIRECTIONS: Highway 40 or 44 to Hampton Ave south. Go south on Hampton to Eichelberger Ave. Turn right on Eichelberger Ave, then turn right on Tamm Ave. We set up at Tamm & Itaska in the park. You can't miss us!

Events are canceled for clouds, inclement or extreme weather conditions. RBAC

May 11 River Bend Meeting at Menz Observatory

By Jeff Menz

Terry and I invite you to the Menz home (see address below) for the regularly scheduled club meeting date of May 11, 2013. The forecast is once again for clouds and rain but we can sit around and talk about all things of interest to the group.

Gathering time is 6:45pm with the meeting start at 7:00pm. Refreshments are welcome but not an obligation for attendance.

Hope to see you then.

The address of Menz Observatory is:

13721 Kayser Road
Highland, IL 62249

RBAC



Exploring the Water World

By Diane K. Fisher

In some ways, we know more about Mars, Venus and the Moon than we know about Earth. That's because 70% of our solar system's watery blue planet is hidden under its ocean. The ocean contains about 98% of all the water on Earth. In total volume, it makes up more than 99% of the space inhabited by living creatures on the planet.

As dominant a feature as it is, the ocean—at least below a few tens of meters deep—is an alien world most of us seldom contemplate. But perhaps we should.

The ocean stores heat like a “fly wheel” for climate. Its huge capacity as a heat and water reservoir moderates the climate of Earth. Within this Earth system, both the physical and biological processes of the ocean play a key role in the water cycle, the carbon cycle, and climate variability.

This great reservoir continuously exchanges heat, moisture, and carbon with the atmosphere, driving our weather patterns and influencing the slow, subtle changes in our climate.

The study of Earth and its ocean is a big part of NASA's mission. Before satellites, the information we had about the ocean was pretty much “hit or miss,” with the only data collectors being ships, buoys, and instruments set adrift on the waves.

Now ocean-observing satellites measure surface topography, currents, waves, and winds. They

monitor the health of phytoplankton, which live in the surface layer of the ocean and supply half the oxygen in the atmosphere. Satellites monitor the extent of Arctic sea ice so we can compare this important parameter with that of past years. Satellites also measure rainfall, the amount of sunlight reaching the sea, the temperature of the ocean's surface, and even its salinity!

Using remote sensing data and computer models, scientists can now investigate how the oceans affect the evolution of weather, hurricanes, and climate. In just a few months, one satellite can collect more information about the ocean than all the ships and buoys in the world have collected over the past 100 years!

NASA's Earth Science Division has launched many missions to planet Earth. These satellites and other studies all help us understand how the atmosphere, the ocean, the land and life—including humans—all interact together.

Find out more about NASA's ocean studies at <http://science.nasa.gov/earth-science/oceanography>. Kids will have fun exploring our planet at The Space Place, <http://spaceplace.nasa.gov/earth>.



This image from September 2012, shows that the Arctic sea is the smallest recorded since record keeping began in 1979. This image is from NASA's Scientific Visualization Studio at Goddard Space Flight Center.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

RBAC's Monthly Observing Lists

These lists include brighter deep-sky objects that transit near 10:00 PM each month.

May Observing List

Prepared by Bill Breeden

Double Stars (Astronomical League's Double Star List)

- _____ 45. Delta Corvi SAO 157323 Algorah Const. CRB Type DS RA 12 29.9 Decl. -16° 31' Mag. 3.0 9.2
- _____ 46. 24 Comae Berenices SAO 100160 Const. COM Type DS RA 12 35.1 Decl. +18° 23' Mag. 5.2 6.7
- _____ 47. Gamma Virginis SAO 138917 Porrima Const. VIR Type DS RA 12 41.7 Decl. -01° 27' Mag. 3.5 3.5
- _____ 48. Camelopardalis SAO 2101 Const. CAM Type DS RA 12 49.2 Decl. +83° 25' Mag. 5.3 5.8
- _____ 49. Alpha Canum Venaticorum SAO 63256 Cor Caroli Const. CVN Type DS RA 12 56.0 Decl. +38° 19' Mag. 2.9 5.5
- _____ 50. Zeta Ursae Majoris SAO 28737 Mizar Const. UMA Type DS RA 13 23.9 Decl. +54° 56' Mag. 2.3 4.0

Carbon Stars (Astronomical League's Carbon Star List)

- _____ 54. SS Virginis GSC 282:753 RA 12 25 14 Decl. +00 46 10 Mag. 6.0 – 9.6 Per. 364 Class C6 (Ne)
- _____ 55. Y Canum Venaticorum SAO 44317 RA 12 45 07 Decl. +45 26 24 Mag. 4.8 – 6.4 Per. 157 Class C5 (N3)
- _____ 56. RY Draconis SAO 15945 RA 12 56 25 Decl. +65 59 39 Mag. 6.0 – 8.0 Per. 200 Class C4 (N4p)
- _____ 57. SAO 157721 (Virgo) GSC 6118:1194 RA 13 06 24 Decl. -20 03 31 Mag. 8.5 – 8.5 Per. ? Class C2 (K5p)

1194

Messier Objects

- _____ M3 NGC5272 Const. CVN Type GC RA 13 42.2 Decl. +28 23 Mag. 6.3
- _____ M40 WIC4 Const. UMA Type DS RA 12 22.4 Decl. +58 05 Mag. 9.1
- _____ M49 NGC4472 Const. VIR Type GAL RA 12 29.8 Decl. +08 00 Mag. 8.5
- _____ M51 NGC5194 Whirlpool Galaxy Const. CVN Type GAL RA 13 29.9 Decl. +47 12 Mag. 8.1
- _____ M53 NGC5024 Const. COM Type GC RA 13 12.9 Decl. +18 10 Mag. 7.6
- _____ M58 NGC4579 Const. VIR Type GAL RA 12 37.7 Decl. +11 49 Mag. 9.2
- _____ M59 NGC4621 Const. VIR Type GAL RA 12 42.0 Decl. +11 39 Mag. 9.6
- _____ M60 NGC4649 Const. VIR Type GAL RA 12 43.7 Decl. +11 33 Mag. 8.9
- _____ M61 NGC4303 Const. VIR Type GAL RA 12 21.9 Decl. +04 28 Mag. 10.1
- _____ M63 NGC5055 Const. CVN Type GAL RA 13 15.8 Decl. +42 02 Mag. 9.5
- _____ M64 NGC4826 Black Eye Galaxy Const. COM Type GAL RA 12 56.7 Decl. +21 41 Mag. 8.8
- _____ M68 NGC4590 Const. HYA Type GC RA 12 39.5 Decl. -26 45 Mag. 8
- _____ M83 NGC5236 Const. HYA Type GAL RA 13 37.0 Decl. -29 52 Mag. 7.6
- _____ M84 NGC4374 Const. VIR Type GAL RA 12 25.1 Decl. +12 53 Mag. 9.3
- _____ M85 NGC4382 Const. COM Type GAL RA 12 25.4 Decl. +18 11 Mag. 9.3
- _____ M86 NGC4406 Const. VIR Type GAL RA 12 26.2 Decl. +12 57 Mag. 9.7
- _____ M87 NGC4486 Const. VIR Type GAL RA 12 30.8 Decl. +12 24 Mag. 9.2
- _____ M88 NGC4501 Const. COM Type GAL RA 12 32.0 Decl. +14 25 Mag. 10.2
- _____ M89 NGC4552 Const. VIR Type GAL RA 12 35.7 Decl. +12 33 Mag. 9.5
- _____ M90 NGC4569 Const. VIR Type GAL RA 12 36.8 Decl. +13 10 Mag. 10
- _____ M91 NGC4548 Const. COM Type GAL RA 12 35.4 Decl. +14 30 Mag. 9.5
- _____ M94 NGC4736 Const. CVN Type GAL RA 12 50.9 Decl. +41 07 Mag. 7.9
- _____ M98 NGC4192 Const. COM Type GAL RA 12 13.8 Decl. +14 54 Mag. 11.7
- _____ M99 NGC4254 Const. COM Type GAL RA 12 18.8 Decl. +14 25 Mag. 10.1
- _____ M100 NGC4321 Const. COM Type GAL RA 12 22.9 Decl. +15 49 Mag. 10.6
- _____ M104 NGC4594 Sombrero Galaxy Const. VIR Type GAL RA 12 40.0 Decl. -11 37 Mag. 8.7
- _____ M106 NGC4258 Const. CVN Type GAL RA 12 19.0 Decl. +47 18 Mag. 8.6

Caldwell Objects

- _____ C3 NGC4236 Const. DRA Type SG RA 12 16 42.00 Decl. +69 28 00.0 Mag. 9.7

_____ C21 NGC4449 Const. CVN Type IG RA 12 28 12.00 Decl. +44 06 00.0 Mag. 9.4
 _____ C26 NGC4244 Const. CVN Type SG RA 12 17 30.00 Decl. +37 49 00.0 Mag. 10.6
 _____ C29 NGC5005 Const. CVN Type SG RA 13 10 54.00 Decl. +37 03 00.0 Mag. 9.8
 _____ C32 NGC4631 Const. CVN Type SG RA 12 42 06.00 Decl. +32 32 00.0 Mag. 9.3
 _____ C35 NGC4889 Const. COM Type EG RA 13 00 06.00 Decl. +27 59 00.0 Mag. 11.4
 _____ C36 NGC4559 Const. COM Type SG RA 12 36 00.00 Decl. +27 58 00.0 Mag. 9.8
 _____ C38 NGC4565 Const. COM Type SG RA 12 36 18.00 Decl. +25 59 00.0 Mag. 9.6
 _____ C45 NGC5248 Const. BOO Type SG RA 13 37 30.00 Decl. +08 53 00.0 Mag. 10.2
 _____ C52 NGC4697 Const. VIR Type EG RA 12 48 36.00 Decl. -05 48 00.0 Mag. 9.3
 _____ C60 NGC4038 The Antennae Const. CRV Type SG RA 12 01 54.00 Decl. -18 52 00.0 Mag. 11.3
 _____ C61 NGC4039 The Antennae Const. CRV Type SG RA 12 01 54.00 Decl. -18 53 00.0 Mag. 13
 _____ C77 NGC5128 Cen A Radio Source Const. CEN Type EG RA 13 25 30.00 Decl. -43 01 00.0 Mag. 7
 _____ C80 NGC5139 Omega Centauri Const. CEN Type GC RA 13 26 48.00 Decl. -47 29 00.0 Mag. 3.6
 _____ C83 NGC4945 Const. CEN Type SG RA 13 05 24.00 Decl. -49 28 00.0 Mag. 9.5
 _____ C84 NGC5286 Const. CEN Type GC RA 13 46 24.00 Decl. -51 22 00.0 Mag. 7.6
 _____ C94 NGC4755 Jewel Box Cluster Const. CRU Type OC RA 12 53 36.00 Decl. -60 20 00.0 Mag. 4.2
 _____ C98 NGC4609 Const. CRU Type OC RA 12 42 18.00 Decl. -62 58 00.0 Mag. 6.9
 _____ C99 Coal Sack Const. CRU Type DN RA 12 53 00.00 Decl. -63 00 00.0 Mag.
 _____ C105 NGC4833 Const. MUS Type GC RA 12 59 36.00 Decl. -70 53 00.0 Mag. 7.3
 _____ C108 NGC4372 Const. MUS Type GC RA 12 25 48.00 Decl. -72 40 00.0 Mag. 7.8

Royal Astronomical Society of Canada Objects

_____ 46. NGC4088 Const. UMA Type G-Sc RA 12 05.6 Decl. +50 33 Mag. 10.5
 _____ 47. NGC4157 Const. UMA Type G-Sb RA 12 11.1 Decl. +50 29 Mag. 11.9
 _____ 48. NGC4605 Const. UMA Type G-SBcp RA 12 40.0 Decl. +61 37 Mag. 9.6
 _____ 59. NGC4111 Const. CVN Type G-S0 RA 12 07.1 Decl. +43 04 Mag. 10.8
 _____ 60. NGC4214 Const. CVN Type G-Irr RA 12 15.6 Decl. +36 20 Mag. 9.7
 _____ 61. NGC4244 Const. CVN Type G-S RA 12 17.5 Decl. +37 49 Mag. 10.2
 _____ 62. NGC4449 Const. CVN Type G-Irr RA 12 28.2 Decl. +44 06 Mag. 9.4
 _____ 63. NGC4490 Const. CVN Type G-Sc RA 12 30.6 Decl. +41 38 Mag. 9.8
 _____ 64. NGC4631 Const. CVN Type G-Sc RA 12 42.1 Decl. +32 32 Mag. 9.3
 _____ 65. NGC4656/7 Const. CVN Type G-Sc RA 12 44.0 Decl. +32 10 Mag. 10.4
 _____ 66. NGC5005 Const. CVN Type G-Sb RA 13 10.9 Decl. +37 03 Mag. 9.8
 _____ 67. NGC5033 Const. CVN Type G-Sb RA 13 13.4 Decl. +36 36 Mag. 10.1
 _____ 68. NGC4274 Const. COM Type G-Sb RA 12 19.8 Decl. +29 37 Mag. 10.4
 _____ 69. NGC4414 Const. COM Type G-Sc RA 12 26.4 Decl. +31 13 Mag. 10.2
 _____ 70. NGC4494 Const. COM Type G-E1 RA 12 31.4 Decl. +25 47 Mag. 9.8
 _____ 71. NGC4559 Const. COM Type G-Sc RA 12 36.0 Decl. +27 58 Mag. 9.8
 _____ 72. NGC4565 Const. COM Type G-Sb RA 12 36.3 Decl. +25 59 Mag. 9.6
 _____ 73. NGC4725 Const. COM Type G-Sb RA 12 50.4 Decl. +25 30 Mag. 9.2
 _____ 74. NGC4038/9 Antennae Galaxies Const. CRV Type G-Sc RA 12 01.9 Decl. -18 52 Mag. 10.7
 _____ 75. NGC4361 Const. CRV Type PN RA 12 24.5 Decl. -18 48 Mag. 10.3
 _____ 76. NGC4216 Const. VIR Type G-Sb RA 12 15.9 Decl. +13 09 Mag. 9.9
 _____ 77. NGC4388 Const. VIR Type G-Sb RA 12 25.8 Decl. +12 40 Mag. 11
 _____ 78. NGC4438 Const. VIR Type G-Sap RA 12 27.8 Decl. +13 01 Mag. 10.1
 _____ 79. NGC4517 Const. VIR Type G-Sc RA 12 32.8 Decl. +00 07 Mag. 10.5
 _____ 80. NGC4526 Const. VIR Type G-E7 RA 12 34.0 Decl. +07 42 Mag. 9.6
 _____ 81. NGC4535 Const. VIR Type G-Sc RA 12 34.3 Decl. +08 12 Mag. 9.8
 _____ 82. NGC4567/8 Const. VIR Type G-Sc RA 12 36.5 Decl. +11 15 Mag. ~11
 _____ 83. NGC4699 Const. VIR Type G-Sa RA 12 49.0 Decl. -08 40 Mag. 9.6
 _____ 84. NGC4762 Const. VIR Type G-SB0 RA 12 52.9 Decl. +11 14 Mag. 10.2

June Observing List

Prepared by Bill Breeden

Double Stars (Astronomical League's Double Star List)

- _____ 51. Kappa Bootis SAO 29045 Const. BOO Type DS RA 14 13.5 Decl. +51° 47' Mag. 4.6 6.6
- _____ 52. Iota Bootis SAO 29071 Const. BOO Type DS RA 14 16.2 Decl. +51° 22' Mag. 4.9 7.5
- _____ 53. Pi Bootis SAO 101138 Const. BOO Type DS RA 14 40.7 Decl. +16° 25' Mag. 4.9 5.8
- _____ 54. Epsilon Bootis SAO 83500 Izar Const. BOO Type DS RA 14 45.0 Decl. +27° 04' Mag. 2.5 4.9
- _____ 55. Alpha Librae SAO 158836 Zuben El Genubi Const. LIB Type DS RA 14 50.9 Decl. -16° 02' Mag. 2.8 5.2
- _____ 56. Xi Bootis SAO 101250 Const. BOO Type DS RA 14 51.4 Decl. +19° 06' Mag. 4.7 7.0
- _____ 57. Delta Bootis SAO 64589 Alrakis Const. BOO Type DS RA 15 15.5 Decl. +33° 19' Mag. 3.5 8.7
- _____ 58. Mu Bootis SAO 64686 Const. BOO Type DS RA 15 24.5 Decl. +37° 23' Mag. 4.3 7.0
- _____ 59. Delta Serpentis SAO 101623 Const. SER Type DS RA 15 34.5 Decl. +10° 32' Mag. 4.2 5.2
- _____ 60. Zeta Coronae Borealis SAO 64833 Const. CRB Type DS RA 15 39.4 Decl. +36° 38' Mag. 5.1 6.0

Carbon Stars (Astronomical League's Carbon Star List)

- _____ 58. V Coronae Borealis SAO 64929 RA 15 49 31 Decl. +39 34 17 Mag. 6.9-12.6 Per. 358 Class C6 (N2e)

Messier Objects

- _____ M5 NGC5904 Const. SER Type GC RA 15 18.6 Decl. +02 05 Mag. 6.2
- _____ M101 NGC5457 Pinwheel Galaxy Const. UMA Type GAL RA 14 03.2 Decl. +54 21 Mag. 9.6
- _____ M102 NGC? 5866 Const. DRA Type GAL RA 15 06.5 Decl. +55 46 Mag. 10

Caldwell Objects

- _____ C66 NGC5694 Const. HYA Type GC RA 14 39 36.00 Decl. -26 32 00.0 Mag. 10.2
- _____ C88 NGC5823 Const. CIR Type OC RA 15 05 42.00 Decl. -55 36 00.0 Mag. 7.9

Royal Astronomical Society of Canada Objects

- _____ 85. NGC5746 Const. VIR Type G-Sb RA 14 44.9 Decl. +01 57 Mag. 10.6
- _____ 86. NGC5466 Const. BOO Type GC RA 14 05.5 Decl. +28 32 Mag. 9.1
- _____ 87. NGC5907 Const. DRA Type G-Sb RA 15 15.9 Decl. +56 19 Mag. 10.4

Have you checked off all of the objects from these 12 monthly observing lists yet? Or perhaps you have checked off all of a certain category of objects from these lists, such as Double Stars? If so, we would like to know about it! Send your story to us at rbac@riverbendastro.org.