

DISLIGHT

Rockland Astronomy Club Journal ~ September 2005



AT LAST!

Space Shuttle Discovery finally lifted off on July 26th after numerous delays, and returned to Earth on August 9th. The landing concluded a historic 14-day, Return to Flight mission to the International Space Station.

**SAVE THE DATE
RAC SUN & STAR
PARTY/BARBEQUE
SEPTEMBER 10TH
FREE FOR MEMBERS**

DETAILS ON PAGE 2

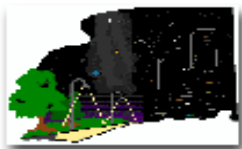


DISTANT LIGHT
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 (requires Adobe Acrobat): send an email to Memberships@RocklandAstronomy.com

BECOME A RAC MEMBER
 Complete and mail the Membership



International Dark Sky Association



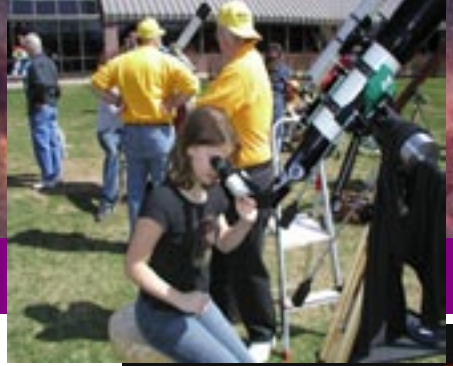
Rockland Astronomy Club is proud to be the first astronomy club to become a lifetime member of the International Dark Sky Association, is a longtime member of the Astronomical League, and is the 2005 recipient of the prestigious Pride of Rockland Award.

[CLICK HERE FOR MONTHLY SKYDATA: P. 7](#)

[CLICK HERE FOR RAC MEETINGS SCHEDULE AND ADVISORY COMMITTEE: P. 8](#)



RAC SPECIAL EVENT

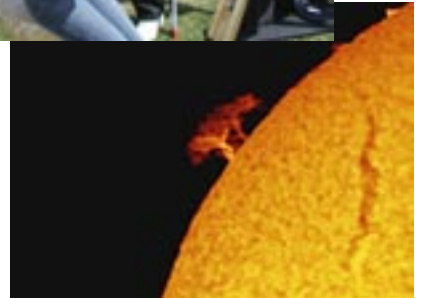


SUN & STAR PARTY BBQ: JOIN ROCKLAND ASTRONOMY CLUB FOR A FUN FAMILY GET-TOGETHER

Saturday, September 10th
 Noon to midnight
 (September 11th Rain Date)
 Lake Sebago, Harriman State Park
 FREE Admission for all Club members and their families.
 (General public is welcome, admission is only \$10 for the BBQ.)

- > Great Catered BBQ
- > Music and Entertainment
- > Daytime solar observing (H-Alpha & white light)
- > Night time Joy of the Universe Star Party

Don't miss out on this exciting event, enjoy great food and entertainment, view the Sun in all its glory, see sun spots, solar flares and prominences



larger than the planet earth! When the sun goes down get ready for a great nighttime star party as club members supply telescopes large and small to view the wonders of the night sky. ★
 Please RSVP by email prior to August 31: JoseAlvira@RocklandAstronomy.com

RAC MEMBERSHIP APPLICATION

Club members receive this journal, enjoy special prices for annual subscriptions to S&T and ASTRONOMY magazines, discounts to club events and much more. Make checks payable to RAC and mail with this form to: Rockland Astronomy Club, attn: Memberships, 214 Route 59, Ste. 10-304, Suffern, NY 10901- 5205.

Name _____
 Address _____
 City _____ State _____ Zip _____
 Home Phone () _____
 Email _____

Note: The Journal is sent to Members via email. For mailed hard copies, add \$18/year.

Membership Type	1 Year	2 Year (Save \$2)	3 Year (Save \$5)	5 Year (Save \$10)	Hard Copy (by US Mail)	Total
Family	\$30	\$58	\$85	\$140	+\$18/yr.	_____
Individual	\$20	\$38	\$55	\$90	+\$18/yr.	_____
Senior Citizen (65+)	\$15	\$28	\$40	\$65	+\$18/yr.	_____
High School Student	\$10	\$18	\$25	\$40	+\$18/yr.	_____
Grand Total						_____

CLUB NEWS

Memoirs of SSP 2005

by Ed Siemenn & Keith Murdock

The 14th Annual RAC Summer Star Party and Family Camping Vacation was held July 29 through August 7, 2005 at Shady Pines Campground, Savoy, MA

The only way I can describe stargazing at SSP-05 is: "Gems in the rough". The best night for viewing was the last Saturday of the event, for those of us who persevered through intermittent weather the rest of the week. Wednesday and Thursday were marginal with only half of the night being adequate for viewing. The first night, Friday was also marginal, the over all trend seemed to be either cloud cover the first half of the night with skies clearing towards morning, or clear until midnight with clouds forming afterwards.

Although the southern sky was mostly obscured by schmutz (that's a technical term), some spectacular views of clusters, double stars, and planetary nebulae could be had in clearer moments in that half of the sky near the zenith and to the north, particularly in Hercules, Lyra, Cygnus, Cassiopeia, Perseus, and Andromeda. Also tantalizing was our first good look at the 2005 Mars apparition late at night. Even more than 3 months before opposition, the South polar cap could be made out clearly, as well a suggestive outline of the albedo features of Mare Erythreum and Margaritifer Sinus. With perseverance, fine viewing could be had in various areas of the sky during 4 or 5 of the nights.

The usual day excursions were enjoyable as always; a trip to the Bridge of Flowers and a great lunch in a local restaurant, perusing one of the many local museums or perhaps the butterfly conservatory. Some also made a pilgrimage to Mt. Greylock where the vistas are stunning, allowing a view from the Hudson Valley, into Vermont and Mt. Monadnock in New Hampshire, and all the way past Mt. Wachussets almost to the



edge of Boston in the east. The Daniels put extra effort into our dinner meals this year, serving up some excellent home cooked meals.

There were several lectures all of which were well received. Josh Roth from S&T talked about Behind the Scenes at Sky & Tel. Keith Murdock repeated his wonderful talk on the Saturn Cassini Mission, with some new material from recent flybys of the Saturnian moons. Lucian Sadowsky also gave a fine presentation on the Sun, including some of his spectacular photos from numerous solar eclipses he has attended.

Wednesday afternoon, everyone chipped in to assemble 18 telescopes which were donated to the club and will be given away to kids at RAC Children's Astronomy Fair later in the year. The scavenger hunt was well-attended, and an unqualified success. Overheard from Don at start of the scavenger hunt: "Now I have to tell you the REAL reason you're here. You're going to go around the campsites policing cigarette butts" (!?) Once the kids realized that their leg was being pulled, the real fun began. Don had thought that his list

was challenging, but did not count on the resourcefulness of the kids and the well-connected network of astronomers they hounded for various oddities and trinkets. As a consequence of their cleverness, we had a 5-way tie for first place. 5 kids won beginners telescopes refurbished at Wednesday's scope-a-thon, and were very enthusiastic to learn how to use them on the first clear night (photos above).

The model rocket launch was a lot of fun as usual. Especially fun were the "drag races" where two identical models were launched simultaneously. The most spectacular flight of the evening was a large custom model Nike-something built by our own Bill Thys (one of the older kids in the launch) Powered by a 3 D engine cluster, it's flight was straight and true.

Although the skies was not as clear as some of the better years at Shady Pines, the Summer Star Party is a great experience, it's a fun gathering of club members and astronomy enthusiasts, and a leisurely opportunity to share time together and get to know each other. Clear nights of viewing are a bonus to a great camping vacation. ★

CONSTELLATION

Coma Berenices (Berenices Hair) Part Two

Edited by Dr. Bernard Sokolowski

Coma Berenices has many deep sky objects, particularly in the southern regions, along the border with Virgo. This is a fertile part of the night sky, rich in galaxies visible in medium sized telescopes. A part of the night sky worth investigating as the evenings grow warmer and more inviting.

Mel 111, is also known as The Coma Star Cluster. Mel 111 is an open star cluster with an apparent diameter of 5 degrees, an actual distance of 250 light years, and is one of the closest ones to our solar system. Because of its size the cluster is best seen with the naked eye or with 7x35 or 7x50 binoculars. The brightest members range in brightness from magnitude 4.8 to 6.3. Most have spectral types ranging from A to F. Even in binoculars, the cluster fills the entire field of view, with about 40 stars spread out over a 20 square degree area. One interesting fact to note about Mel 111 is that the cluster is slowly dispersing into the general stellar population and, as its members are lost, it will cease to be a cluster in about another 100 million years.



Photo: M100: Rob Gendler

M53 (NGC 5024) is a magnitude 7.5 globular star cluster, of integrated spectral class F4, with an apparent diameter of 12.7 arc-minutes. It lies one degree northeast of Alpha Comae. The cluster was first discovered by J. E. Bode in February 1775, and later re-discovered and cataloged by Charles Messier in February 1777. The actual distance of the cluster is estimated to be 65,000 light years, which would give it an actual diameter of 100 light years at this accepted distance. Because M53 is compact and has a high surface brightness, it is visible as a circular bright hazy globe in telescopes as small as 3 or 4". The bright core begins to resolve into individual stars with telescopes as small as 6". Larger scope of 8" or more in aperture resolve ever increasing amounts of detail within the core and outer halo revealing the cluster's unique structure.

M64 (NGC 4826) is a magnitude 8.5 Sab spiral galaxy with an apparent diameter of 10.0 x 5.4 arc-minutes. Also known as the "Black Eye" galaxy, M64 was discovered by J. E. Bode in April 1779 and re-discovered by Charles Messier in March 1780. The actual distance of the cluster is about 22 million light years, with an actual diameter of 60,000 light years at this distance. M64 is one of the closest of the Virgo Galaxy Group. The galaxy is easily found just one degree east-northeast of 35 Comae. The dark dust lane which gives M64 its nickname, can only be seen when sky conditions are ideal; dark, clear, and steady. The dust lane can be found bordering the

central oval shaped core along the northern and eastern rim. The galaxy itself is visible in scopes as small as 3 inch aperture. The "Black Eye" can be glimpsed in scopes as small as 6", but 8" or more is needed to observe it with reasonable certainty.

M85 (NGC 4382) is a magnitude 9.1 SO spiral galaxy with an apparent diameter of 7.1 x 5.5 arc-minutes. It is a member of the Virgo Galaxy Group and of the peculiar type, do to its classification being on the border between elliptical and spiral in structure. M85 was first discovered by P. Mechain in 1781, and cataloged by Messier later that year. The actual distance of the galaxy is approximately 42 million light years and has a diameter of about 75,000 light years at this accepted distance. M85 appears as an elliptical galaxy in amateur telescopes, having a fairly bright central core with a fainter halo. It is visible in scopes as small as 3-4" aperture, but needs at least a 6" glass to start to bring out some detail. As always, dark, clear, steady skies are best when observing this object. For the adventurous, a fainter companion, NGC 4394 lies 8 arc-minutes to the east, shining at magnitude 10.9.

M88 (NGC 4501) is a magnitude 9.6 Sb spiral galaxy with an apparent diameter of 6.9 x 3.7 arc-minutes. It was discovered and cataloged by Charles Messier on March 18, 1781. The actual distance of M88 is about 42 million light years, with an actual diameter of about 70,000 light years at
(continued on next page)



CONSTELLATION: COMA BERENICES

(continued from previous page)

this accepted distance. This galaxy is near the center of the Virgo Cluster and, because of its high surface brightness, has been reported to be one of the easier to observe galaxies for the small telescope. It is clearly visible in even some larger finder scopes. An 8" scope shows considerable detail at moderately high magnifications, with M88 revealing a rather luminous core with a fairly bright halo, both of which represent the nucleus and spiral arms of the galaxy respectively. As with all galaxies, dark, clear skies will reveal the most detail.

M91 (NGC 4548) is magnitude 10.2 SBb barred spiral galaxy with an apparent diameter of 5.4 x 4.3 arc-minutes. M91 is believed to be one of the Messier discoveries that got away. It is believed to be a duplicate observation of M58, whose location was exactly 2 degrees directly south, however, another galaxy, NGC 4571 is another possible candidate and is paired with it. The actual distance of M91 is approximately 37 million light years. The actual diameter is about 61 thousand light years at this distance. As with all galaxies, a clear, dark moonless night shows it best. It is easily visible in scopes as small as 4" diameter, but shows no more detail as the aperture increases, it only appears brighter.

M98 (NGC 4192) is a magnitude 10.1 Sb spiral galaxy with an apparent diameter of 9.5x3.2 arcminutes, lying just half a degree west of 6 Comae Berenices. It was first discovered by P. Mechain in 1781, and re-discovered and cataloged by Messier later that same year. Long exposure photos show M98 to be a nearly edge on spiral galaxy with numerous dust lanes. One unusual fact about M98 is that it has no red shift, implying that it is stationary relative to our own galaxy. The actual distance is estimated to be 36 million light years with an actual diameter of about 80 thousand light years at this distance. The galaxy is visible in telescopes as small as 3" in aperture. However, larger apertures (8" and larger) reveal a

rather bright, almost star like nucleus with faint extensions extending to the northwest and southeast. Again, dark skies are a must to observe this object effectively.

M99 (NGC 4254) is a magnitude 9.8 face on Sc spiral galaxy with an apparent diameter of 5.4x4.8 arc-minutes. Its position is roughly one and a half degrees east-southeast of M98 and 1 degree southeast of 6 Comae Berenices. M99 was discovered by P. Mechain in 1781 and cataloged by Messier soon afterward. Messier found it to be clearer to see than M98, indicating that more detail was visible in even the small primitive telescopes of his day. M99 also seems to be the second galaxy discovered to be a "spiral" by Lord Rosse in 1848. The actual distance of M99 is about 41 million light years with an actual diameter of 81 thousand light years at this accepted distance. Under dark skies, M99 can be glimpsed in scopes as small as 2.5" in aperture. Larger scopes of 4 to 6 inches in size begin to bring out detail, showing a brighter nucleus with a faint halo. Apertures in the 10" plus range reveal M99 in all its glory, presenting considerable detail, particularly in the spiral arms. The galaxy's core and arms become distinct structures. The arms themselves begin to show mottling, suggestive of dust lanes, with several arms becoming identifiable. The largest backyard scopes (20 plus inches) make the view of M99 resemble that of M51 as it would appear in a 10" telescope. This is one galaxy no amateur should miss. View it at medium to moderately high magnifications to tease out the most detail possible.



M100 (NGC 4321) is a magnitude 9.4 nearly face on Sc spiral galaxy with an apparent diameter of 6.9x6.2 arc-minutes. This is another of the galaxies discovered by P. Mechain in 1781, and observed by Messier only a few weeks later. Its spiral structure was first detected by Lord Rosse in 1850. The distance of M100 is approximately 41 million light years with an actual diameter of about 92 thousand light years at this distance. This galaxy is the largest of a group consisting of the spiral galaxies M88, M98, and M99. Although difficult to appreciate in small telescopes, it still shines with a faint round glow that resembles a distant unresolved globular cluster. M100 only begins to show some detail in 8" and larger telescopes, appearing as a dim halo of light with a brighter core. Only the largest amateur and professional instruments bring out the spiral detail and dust lanes first glimpsed by Lord Rosse in 1850.

NGC 4565 is a magnitude 9.6 Sb edge on spiral galaxy with an apparent diameter of 16.2x2.8 arc-minutes. Lord Rosse is one of the first to observe the object with his great reflector and his drawings clearly show the bright central core and dark dust lane bisecting the galaxy along the entire length of NGC 4565's long axis. The actual distance of NGC 4565 is 30 million light years. This would give it a diameter of approximately 120 thousand light years making it one of the largest known spiral galaxies. This object can be observed in scopes as small as 4" in aperture and begins to show considerable detail in even a good 6" glass. Personal observations with an 8" Schmidt Cassegrain telescope

clearly revealed the dim but well defined needle of light, a distinctly brighter nucleus, and the dark dust lane which bisects the galaxy along the entire length. Larger telescopes show a brighter object with additional mottling on either side of the rift, and around the nucleus. Dark skies are absolutely essential to observe any of these features. Any light pollution at all will degrade the view considerably. For those who prefer to star hop, NGC 4565 can be found one degree due east of 17 Comae Berenices. ★

AUTUMNAL EQUINOX

(continued from page 7)

When the Sun passes Autumnal Equinox, the nights begin to grow longer than the days, and they continue to do so until the Winter Solstice in December. In the Southern hemisphere, it is reversed, the Spring is just beginning.

There are other significant occurrences that take place as a part of the equinox:

At the South Pole the Sun will begin to rise after six months of darkness and it will now be daytime there for the next six months.

On the day of the equinox, the Sun rises directly in the East, and sets directly in the West. At sunrise and sunset, the shadow of a Sun Dial will point exactly in those directions.

For people at the equator such as Kenya or Ecuador, on the day of equinox, the Sun passes straight overhead, at the zenith. For a period of time, there will not be any shadows.

For us, the most significant thing about the Autumn equinox is the signaling of the change of seasons. Since the nights are getting longer, and the days are getting shorter, the sun is shining on us less and less every day. And since it's lower in the sky, its slanting rays spread out over more area, the lower solar energy will bring cooler days and cooler nights as we are heralded into the winter months. The equinoxes have a rich place in mythology and ancient traditions. Ancients believed

DAY INTO NIGHT



the gods guided the Sun across the sky, and so they paid attention to the way that it moved. They used a variety of tools to watch that motion.

The Mayans in particular, aligned their temples carefully with the compass directions. The famous pyramid at Chichén Itza in Yucatan, was built so that as the Sun rises and sets, the stairway on the north side is lit up at a steep angle. On the day of the equinox, something special happens; the rim of the stair is lit with a slender ray of light which resembles a snake sliding down the pyramid (See inset picture.) This was a great time of celebration for the Myans.

In addition to the traditional harvest, it is a time to celebrate a variety of Fall Festivals. People enjoy fall festivals as they sense the closure of the summer season and the coming of a long winter.

A technical note: If you look at the rising and setting time of the Sun on the day of the equinox, it will look as if the day is still a bit longer than the night. That is because “sunset” and “sunrise” are defined by the top edge of the Sun, not the middle of it. The middle of the sun sets and rises a few minutes before or after the edge does. ★

SUPER NOVA

Congratulations to Advisory Committee member Bob Lyons on his new star! Lauryn was born on July 7th at 5:09 pm, 7 lbs., 4 oz. and 20.5 inches. ★





New
Sept 3

1st Qtr
Sept 11

Full
Sept 17

Last Qtr
Sept 25

SEPTEMBER SKYDATA

Highlights

- Sept 1 Uranus at Opposition
- Sept 2 Venus 1.4° south of Jupiter
- Sept 4 Mercury 1.1° north of Regulus
- Sept 5 Venus 1.8° north of Spica
- Sept 13 Jupiter 1.8° north of Moon
- Sept 17 Spica 1.3° south of Moon
- Sept 22 Antares 0.2° south of Moon
- Sept 22 Jupiter 3° north of Spica
- Sept 23 Mars 6° south of Moon
- Sept 27 Autumnal Equinox occurs 18:23 EDT
- July 27 Saturn 5° south of Moon

The Autumnal Equinox

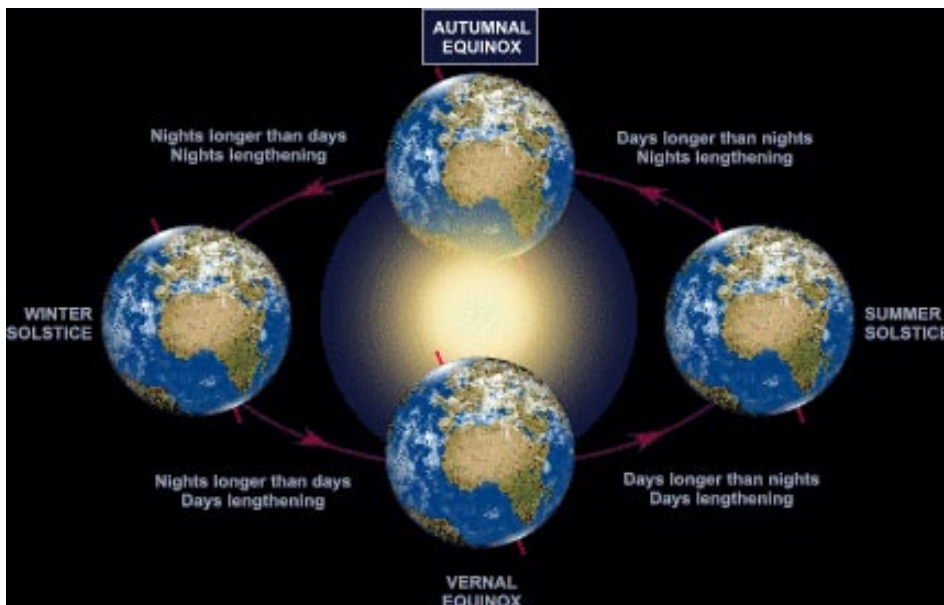
This year the Autumn Equinox occurs on September 22 at 18:23 EDT.

So, what is an equinox? Well, nothing to stay up for...it is simply a geometrical alignment; it is one that reminds us about the passage of time, the motion of the Earth, and the changing of the seasons. Equinox occurs two times each year, the Vernal Equinox marking the first day of spring, and the Autumnal Equinox marking the first day of Autumn.

The Autumnal Equinox is the point, presently lying in the constellation Virgo, where the Ecliptic crosses the Celestial Equator. Equinoxes occur because the Earth's axis of rotation isn't aligned with the plane of its orbit around the Sun: it tilts over by about 23½°. The direction of this tilt is effectively constant, relative to the stars, such that the Earth's north pole always points towards Polaris, and the south pole always points at the constellation of Octans.

Each year, the Earth completes one orbit of the Sun, and for its poles to remain fixed against the stars, their direction must rotate relative to the Sun. This effect gives us the seasons. When a pole is angled towards the Sun, its hemisphere receives more hours of sunlight, and when a pole is turned away from the Sun, its hemisphere experiences long cold nights.

The equinoxes are the points where the direction of the poles are at a right angle to the Sun. In other words, if you were to draw a line from the Sun to the center of the Earth, the Equinox occurs when that line passes through the equator. As summer wears on, the nights have been growing longer and the days shorter. (Continued on page 6)



Prime Observing Window

Monday Aug 29 thru Wednesday Sept 7

Sun & Moon Rise & Set Times

Date	Sunrise	Set	Moonrise	Set	Phase
Sept 3	06:25	19:26	06:04	19:39	New
Sept 11	06:33	19:12	14:53	23:29	First Qtr
Sept 17	06:39	19:02	19:03	05:51	Full
Sept 25	06:47	18:49	23:44	15:09	Last Qtr

Planetary

Visible Planets in the Night Sky

September 1

	Rise	Transit	Set	Mag
Mercury	05:05	12:01	18:57	3.9
Venus	09:43	15:20	20:57	-3.9
Mars	22:19	17:15	12:11	-0.5
Jupiter	09:42	15:22	21:03	-1.8
Saturn	03:34	10:46	17:59	0.2

September 15

	Rise	Transit	Set	Mag
Mercury	06:24	12:46	19:08	1.8
Venus	10:13	15:25	20:38	-4.0
Mars	21:36	16:36	11:37	-0.7
Jupiter	09:01	14:37	20:14	-1.8
Saturn	02:46	09:57	17:09	0.3

September 30

	Rise	Transit	Set	Mag
Mercury	07:41	13:22	19:03	-0.9
Venus	10:45	15:33	20:22	-4.0
Mars	20:40	15:44	10:48	-1.0
Jupiter	08:18	13:50	19:23	-1.7
Saturn	01:55	09:04	16:14	0.3

All data calculated for Suffern, New York, Eastern Time:
Latitude: 41:06:48 N; Longitude: 74:08:38 W

The RAC Essentials

MONTHLY CALENDAR

**201-768-2238
or 845-47STARS**

Message Hotline: The latest information or last minute changes to club events.

Prime Observing

Period: August 29 through September 7

Fri/Sat, Sept. 2-3

Observing at Wawayanda*

Sat, Sept. 3

Lake Taghkanic - Up All Night*

**Sat, Sept. 10
Noon - midnight**

**RAC Sun & Star Party BBQ,
Lake Sebago, Harriman State
Park, Rockland County
FREE Admission for RAC Members
(details: see page 2)**

Tues, Sept. 13, 8pm

RAC Advisory Committee meeting
Challenger Center

LOCATIONS

ADVISORY CMTE.

**North Rockland
High School Planetarium**
Hammond Road, Thiells, NY

Rockland Community College
College Road, Suffern, NY

**Lower Hudson Valley
Challenger Center**
Rt. 59, Suffern, NY

**Anthony Wayne
Recreation Area***
Exit 17, P.I.P., NY

Silvermine Ski Area*
Exit 18, P.I.P., NY

Wawayanda State Park*
973-853-4462,
Highland Lakes, NJ

Taghkanic State Park*
Taconic State Parkway,
Ancram, NY

Jose Alvira
Frank Bifulco
Jim Burnell
Mark Hettinger
Mies Hora
Rob Lyons
Keith Murdock
Al Nagler
Dr. Jack Rosen
Audry Salvatore
Len Salvatore
Ed Siemenn, *Chair*
Bernie Sokolowski
Bill Thys
Alan Traino
Don Urban

Life & Honorary Members
Tom Massey (L)
Al Nagler (L)
Andrew Warrington (H)

*Special permits required to observe at these locations. Contact Frank Bifulco for permit copies.

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