



# The Spectrogram

## Controlling Light Pollution in Eatontown

*By John Batinsey – Eatontown Environmental Commission and Star Member*

### Inside this issue:

Important Announcements	2
Events and Star Parties	2
Notes from Last Meeting	3
Front Page Story Continued	4
Sky Show for September	4
Astronomical Fact or Fiction	5
Crossword Puzzle	6

To many people, Eatontown is probably the last place in New Jersey that would be the first to adopt an ordinance to reduce light pollution. The Asbury Park Press last year, highlighted the bustling activity in Eatontown - the Monmouth Mall, with 150 stores and over 100 acres of parking, many strip malls, major industrial and office parks and the Army's busy Fort Monmouth. We have plenty of light in Eatontown, but under our ordinance the new lighting is the right amount. You don't have to turn off lights to avoid light pollution.

Light Pollution is misdirected or excessive outdoor lighting that causes glare, energy waste, light trespass (nuisance light) and unnecessary skyglow. Light pollution affects everyone. An article in the March-April 2000 Audubon Society magazine details the negative impact of light pollution on birds and other wildlife. Other environmental consequences include unnecessary energy depletion and deterioration of air quality. Contrary to most press coverage light pollution is not a narrow astronomy issue. Press articles divide the issue between those who are for and those who are against outdoor lighting, instead of "good" versus "bad" lighting.

## Fact of the

Pluto is the only known example of a planet having synchronous rotation caused by tidal braking from Charon. Pluto always shows the same side to Charon. Charon always shows the same side to Charon. Thus from each sky, the other hangs in the same place in the sky all the time. The only motion is slight back and forth movements due to Charon's eccentricity.

### IES RECOMMENDATIONS

The Eatontown Outdoor Lighting Ordinance prohibits all new and replacement lighting equipment from shining directly into the eyes of drivers in passing vehicles, or into residential windows and other unwanted directions. Lighting must be restricted to the intended target areas such as streets, parking lots, buildings, sports facilities, and cannot be directed wastefully elsewhere. The ordinance also requires that the lighting levels recommended by the Illuminating Engineering Society of North America (IES) are not to be exceeded. The IES publishes lighting practices prepared by various committees of experts from the lighting industry and scientific institutions with knowledge of light and human visual perception. The Society also emphasizes the importance of glare reduction.

For example, the IES has maintained that 1.0 footcandles with good uniformity will provide enough light to illuminate a parking lot. If more light is needed, the IES recommends the enhanced security average of 2.5 footcandles, which will provide twice the light needed to identify someone on a police line-up. Customer attraction might warrant an increase to this level. But many fast food restaurants average about 15 footcandles and other businesses are also too high. **(Continued Page 4)**

## Important Announcements



- **The next S\*T\*A\*R meeting** will be held on Thursday, October 5, 2000 at 8 PM at the Colts Neck Fire House #2 on Conover Rd. in Colts Neck. The topic will be "Classic Collimation" with STAR's very own, David Britz. Learn the in's and out's of this complicated task and master your skills as we learn from one of the masters of collimation. Directions: From Rt. 520, turn south onto Rt. 34. Conover Rd. is on the right, one light south of Rt. 520. From Rt. 537, turn north onto Rt. 34. Conover Rd. is on the left, two lights north of Rt. 537. The fire house is on the right, just a couple of blocks off of Rt. 34.
- **The Spectrogram wants you!** If you would like to contribute an article, or news item, or if you have questions or suggestions, please contact me via email at [fblock@monmouth.com](mailto:fblock@monmouth.com).
- **STAR has a new Toll Free telephone and FAX number! 877-671-0386! (877-671-OFUN)** As discussed at the last meeting, I have setup a new, toll free phone number for the club. This number provides a general voice mail box so that we can leave messages for members or non-members alike. You can also send faxes to this number as well! A step in the right direction. This service is free for up to 30 minutes in calls per month. After that it would be \$9.95 for 100 minutes more. This is still MUCH cheaper than the phone bill we pay for now. Be aware, that at this time, this number can not be reached from a pay phone due to the additional charges involved to have this feature. When voice messages are left, all of the Board members will be notified via email. Should we set up another number just for observing plans for those of us without computers and the Internet? Let me know! Email me at [fblock@monmouth.com](mailto:fblock@monmouth.com) or see me at the next meeting.

## Upcoming Events and Star Parties



- **September 29 - October 1, 2000 – Connecticut Star Party 2000 -- Camp Bobriwka, Colebrook, Connecticut:** To help foster an interest in amateur astronomy, The Astronomical Society of New Haven will hold a star party, which will take place at Camp Bobriwka, Colebrook, Connecticut. Contact: [sunandmoon@freewwweb.com](mailto:sunandmoon@freewwweb.com)
- **September 29 – October 1, 2000 New Jersey:** The South Jersey Astronomy Club will host the **Fourth South Jersey Star Party** to be held at Belleplain State Forest, near Woodbine in southern New Jersey. For details and registration information please visit our web site at <http://members.aol.com/sjastroc/> or send email to [paostwald@aol.com](mailto:paostwald@aol.com).
- **September 28 - October 1, 2000 - No-Frills Star Party -- Tuckahoe State Park, Queen Anne, Maryland:** The Delmarva Stargazers host their 5th Annual No-Frills Star Party to promote general interest in astronomy and share information and examination of the dark-sky sites.
- **October 21, New York:** The sixth annual **American Urban Star Fest** sponsored by the Amateur Astronomers Association in cooperation with the New York City Urban Park Rangers and the Hayden Planetarium will be held from 6:00 to 9:00 p.m. in Central Park's Sheep Meadow, Manhattan. Admission is free. The event features stargazing sessions, informal talks, and light music. Bring your favorite binoculars, telescopes, lawnchairs, blankets, and sweaters/jackets. There are food vendors at the park and adjacent streets. Sheep Meadow is serviced by all buses and trains to the southern or western side of Central Park; there is no access for cars. For details call 212-535-2922 or go to <http://www.aaa.org>.

## Notes from Last Month's Meeting – *By Rob Teeter, Secretary*

**8:05pm:** John Gasparini (Treasurer) brought the meeting to attention. After receiving everyone's undivided attention, John announced that Gordon Waite (formerly Member-at-Large) will be taking the position of President on an interim basis. The floor is then turned over to Gordon who then gave the floor to Rob Teeter (Secretary) for his Scope 'n' Tell talk.

**8:08pm to 8:38pm:** Rob Teeter discussed his home-built 12.5" f/5.5 truss-dobsonian, from the planning to the construction. Rob brought the members at the meeting on the long journey (three years) of planning, constructing and ultimately using the telescope which he is so proud of. In the future, Rob plans to rebuild the telescope yet again (there has been 3 prior versions), pay very close attention to detail this time and when it is complete and up to his perfectionist standards, enter it at the Stellafane telescope-making competition. Rob graciously thanked his audience and turned the floor over to Ed Collett.

**8:40pm to 8:44pm:** Ed Collett took over the meeting and spoke briefly on his 12.5" f/6 Astrosystems Tele-Kit telescope. Ed spoke about the delivery time for the kit (one year) and how this project actually started well before the arrival of the kit. Ed had purchased the primary mirror from Galaxy back in 1990 with hopes to build a scope around it. With the general introduction of the telescope out of the way, Ed gave way to Mike Lindner to speak about the telescope.

**8:44pm to 9:15pm:** Mike Lindner, who helped Ed Collett with the construction of the telescope kit spoke on the process of putting everything together. In general, the Astrosystems truss-kit is a beefy monster with A LOT of parts. However, not too many parts for Mike and the rest of the Amateur Telescope Makers Special Interest Group branch of S\*T\*A\*R to assemble. Over the time of roughly a month, the ATM SIG met a few times to sand, assemble and sort through the pieces to finally get this beautiful telescope a reality. At the end, Mike concluded that, "It's been a really fun thing for me to do and it's a great scope for Ed!"

**9:16pm to 9:21pm:** Ed Collett spoke briefly on a really neat pair of binoculars he recently purchased. They are made by Bushnell and offer an incredibly large 17-degree field of view with 4x magnification and 25mm aperture. Ed commented on how they are great for viewing large asterisms, like the Coathanger, and even whole constellations the likes of Cygnus and Sagittarius.

**9:22pm to 9:30pm:** Gordon asked if anyone at the meeting was new to the meeting, a few new people stood up and introduced themselves. S\*T\*A\*R is still growing and is still procuring new members at each meeting. We hope to see them at coming meetings and down at Greenwood or Coyle Field for observing sessions.

**9:30pm to 9:35pm:** Gordon had Rob Teeter come up to the front again and alert the members of this year's speaker schedule, which can be found in this newsletter.

**9:36pm to 9:38pm:** The meeting place issue is spoken about briefly. Gordon Waite announced that the possibility of meeting at the Marlboro Fire House is still "in the air." S\*T\*A\*R has sent in an application in order to have the building for the coming meetings, but we have not heard back and the consensus was to stay put at our current location, the Colts Neck Fire House.

**9:38pm to 9:40pm:** Gordon then brought up the Astrophotography Exhibit which was to take place in October. Due to various reasons, it was decided to post-pone the exhibit until a later date, quite possibly this Spring.

**9:41pm to 9:42pm:** Astronomy Day(s) was discussed. The board has plans for S\*T\*A\*R to participate in one, possibly two, public events where we promote our wonderful hobby. One date would be held in January and the other in March where we plan to set up at the Monmouth and Freehold malls. More information is forth-coming.

**9:43pm:** The by-laws were discussed briefly. A call was made for volunteers by John Gasparini. Mike Lindner offered and was noted.

**9:50pm:** A public school star party in Millstone was announced for the night of November 6th with a rain-date of November 7th. Further information is forth-coming.

**9:54pm:** Project Astro-Nova to be held on November 2 in Tinton Falls was talked about.

**9:56pm to 10:05pm:** Fred Block (Member at Large) talked about his and David Segelstein's trek through the Pocono Mountains to find the perfect observing site. Believe it or not, it is so heavily wooded up in that area that finding an open clearing for observing is quite difficult. Despite having put 160 miles on their vehicles in one day, Fred and David left not having found the elusive perfect observing spot. The search will continue!

**10:05pm:** The 50/50 was called and Fred Block had the winning ticket. The "National Audobon Society's Guide to Stars and Planets" book was presented to Fred for having the winning ticket.

**10:10pm:** The meeting is officially over, the board members thanked the members for being so attentive.

# Controlling Light Pollution in Eatontown

(Continued from front page)



Since Eatontown has adopted its lighting ordinance, dozens of new or replacement lighting installations fall within IES guidelines without complaints from business or public.

To avoid unnecessary glare, the Eatontown ordinance requires that most lighting be cutoff or equivalent. Fixtures that are non-cutoff, even if the illuminance does not exceed IES recommendations, can cause annoying eye discomfort and fatigue. Excessive illuminance levels when the glare source is in the line of sight can disable our ability to see. Cutoff or equivalent light fixtures usually cost about the same as the non-cutoff types. Some facilities may use floodlights in parking lots to project intensely glaring levels of light on the roadway in an attempt to attract customers attention. Such practices can be dangerous, especially for older drivers more sensitive to bright glare.

## HOW THE ORDINANCE WORKS

The Eatontown ordinance requires exterior lighting be shown on major site plans in a photometric grid with horizontal illuminance point readings and a computed average. Catalog details of lighting equipment showing verticle cutoff angles and other pertinent data must also be furnished. The process avoids misdirected or excessive lighting, and insufficient lighting, too. Simply using cutoff fixtures does not assure good lighting because some light fixtures are poorly designed. The computer photometric grid will highlight dark spots and also overly bright spots, showing unacceptable uniformity that is sometimes seen in poorly lighted parking lots.

The Eatontown Environmental Commission invites you on a lighting tour. We'd like to point out the differences between some old lighting that would not meet the requirements of the present ordinance and some newly installed lighting that does. You might be surprised at how effective and comfortable these new optimum levels of light are.

## OUTDOOR LIGHTING GUIDE AVAILABLE

An Outdoor Lighting Guide is available from the ANJEC Resource Center. The guide contains a model ordinance (based on the Eatontown ordinance), information about the New Jersey Light Pollution Study Commission, and also pictures of the right and wrong kind of light fixtures to use.

## What's in the Sky This Month *(From Astronomy.com)*



- Jupiter and Saturn put on the finest planetary display during late evenings in October. The pair of glittering giant planets lies among the stars of Taurus the Bull. Saturn lies 6° south of the fine star cluster called the Pleiades, and Jupiter lies 4° north of the brightest star in Taurus, Aldebaran. Saturn rises first but Jupiter is the brighter of the two, dominating the late evening eastern sky after it rises around 10 p.m. local time. Saturn shines at magnitude -0.1 and brightens another two-tenths of a magnitude by October 31. Jupiter brightens by a similar amount this month but starts out on October 1 as the brightest night-sky object other than the moon, shining at magnitude -2.6. By midnight both planets are more than 30° above the eastern horizon and well placed for some serious telescopic observing.
- It's rare to witness a bright asteroid pass in front of a bright deep-sky object. On the evening of the 9th, the asteroid 3 Juno will appear to graze the northeastern flank of the globular star cluster M72 in Aquarius. At magnitude 9.4, Juno will be far brighter than any of the distant cluster's supergiants, which glow dimly at about 14th magnitude. Be wary of the star playing decoy just to the southeast of M72.



## Astronomical Fact and Fiction – *by Paul J. Nadolny*

Every beginner asking for advice about buying a telescope is told the same thing: aperture is what matters, not power. In other words, a telescope is used to make dim objects brighter, so that you can magnify the image to see it more clearly. The churn in the atmosphere limits the amount of magnification anyway, while the amateur's aperture size is limited by one's budget. It's true that there are plenty of small objects in the sky, but magnifying them without also brightening them would dim them to invisibility by spreading the light out too much.

An intriguing question to me is: *Why* do people assume that a telescope is primarily used to magnify objects? I'd like to explore some possible reasons. When one looks at the night sky with the unaided eye, the only object that has "size" is the moon. It presents features like dark maria and bright highlands in which people can imagine a face, a rabbit, etc. The only other objects visible are stars (twinkling pinpoints – no size), planets (steady pinpoints – no size), and the Milky Way (a cloudy band of light). So where are all the nifty, cool objects that are in magazines, newspapers, and television?

People are used to seeing colorful detailed images of the Ring Nebula, the Andromeda Galaxy, eta Carinae, the Whirlpool Galaxy, the Pillars of the Eagle Nebula, and so on. What is always missing from these images is a sense of scale. All images are usually shown at roughly the same size. No one can know that celestial objects range in apparent size from very small (the Ring Nebula, M57, in Lyra), to medium (the globular cluster, M13, in Hercules), to large (the Andromeda Galaxy, M31), to very large (Barnard's Loop, in Orion). The average person probably figures that these objects must be too small to be seen without a telescope.

In fact, if all celestial objects were magically brightened to be easily visible to the unaided eye, what could one see without a telescope? Some spectacular sights! The Andromeda Galaxy's nucleus would be about the same size as the moon, and the width of the galaxy would be about six times as wide as the moon. The Triangulum Galaxy, M33, would be about twice as wide as the moon and be a beautiful spiral in the sky. Looking at Orion, we would see Barnard's Loop, a half-arc of glowing gas about 30 moon-widths in diameter taking up much of the constellation. The North America Nebula, NGC7000, in Cygnus would be about four times the moon's width, as would the eta Carinae Nebula. Each of the following objects would appear as large as the full moon: the globular clusters omega Centauri and 47 Tucanae, the open cluster M35 in Gemini, each member of the double cluster in Perseus, and the Tarantula Nebula in Dorado. If all the galaxies in the Virgo Cluster could be seen with the unaided eye, the result would be a sphere of about 2000 galaxies with an apparent diameter of over 10 degrees, or 20 moon widths. It would look like a giant globular cluster of galaxies! But the most amazing sight of all might be the Gum Nebula and the Vela Supernova Remnant (SNR). The Vela SNR spans 7 degrees or 14 moon widths. It is embedded in the Gum Nebula which, at 40 degrees in diameter, would look like a great sphere of glowing gas, much brighter on the edges, stretching halfway from the horizon to the zenith!

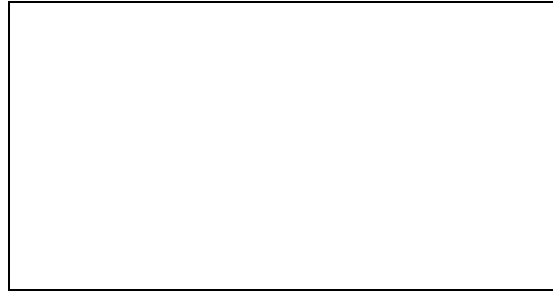
Unfortunately, our eyes are not sensitive enough to see such wonders. Instead we have learned of them through the brightening effect of telescopes, binoculars, and wide-field astrophotography. A challenge to astrophotographers is to take some images of various-sized objects *at the same scale*. That would make an interesting and informative display. A nice selection of objects might be Saturn, the Ring Nebula (M57), the spiral galaxy M81, the globular cluster M22, the crescent moon, the Great Orion Nebula (M42), the Pleiades (M45) (with the moon *in* them!), the North America Nebula (NGC7000), and the Andromeda Galaxy (M31). Good luck!

The Society for Telescopy, Astronomy, and Radio

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Here it is! This month's issue of...

# THE SPECTROGRAM

## This Month's Puzzle

The object of this puzzle is to fit these words into the grid at the right.

algol  
alphard  
atlas  
billion  
cdrom  
centaur  
Clear  
Cloud  
Comet  
Dwarf  
Earth  
Field  
focal  
focuser  
gamma  
helix  
light  
mimas  
optical  
orion  
pluto  
prism  
science  
scope  
skies  
spica  
umbriel  
venus  
world

