

Update on the Fight Against Light Pollution

By Milt Roney, Director, Washington, DC office of the International Dark Sky Association

It's something of a challenge to address NOVAC members on the fight against light pollution, because the group contains so many experts. Bob Parks is the Executive Director of the Virginia Outdoor Lighting Task Force (VOLT), and I know that William Pala and others have helped him in efforts to fight light pollution. The NOVAC website has a light pollution section at <http://novac.com/lp/> and this contains links to a number of resource materials.

Intimidated though I am by all this firepower, I'm going to present a little refresher on light pollution and a discussion of where we are in the fight, and where we are trying to go nationally. By way of introduction, I am currently the Director of the Washington, DC office of the International Dark Sky Association (IDA), and I've been working on light pollution issues for about a year and a half.

I would like to leave you with the idea that light pollution is a serious problem

that affects everyone, not just astronomers, that people like you are doing something about it, and that you can help.

Refresher

Most NOVAC members have seen dim, fuzzy celestial objects such as the Milky Way, the Andromeda Galaxy or the Orion Nebula, and don't need this paper to explain that it's more difficult to see these objects against a brightly lit background. The type of light pollution that interferes with astronomical observation occurs when light that is intended for some useful purpose such as walking at night, spills into the sky where it is not needed. Some light spill goes off into space, where it can be seen by satellites, the rest runs into water vapor or dust particles and is reflected back to earth in the form of light pollution. Unfortunately, light pollution is so pervasive that I've heard that most people on the East Coast of the United States have never seen the Milky

Way. Partly because of light pollution, few people really understand the astronomical references that pervade our culture, showing up in our flag, our literature, our songs and our history.

This type of light pollution, known as sky glow, is what most bothers astronomers, but there is more. Other types

of light pollution include:

- **Light Trespass**—light from a neighbor, streetlight or business intrudes on the property of another. Effects can include loss of sleep, spoiled views, and a feeling of being trapped because the windows must be covered.
- **Over Illumination**—Lighting a parking lot can be a good idea, but too much of a good thing can be a bad thing. Excessive lighting wastes energy, causes sky glow, and can trespass onto other property.
- **Glare**—Glare occurs when there is too much contrast between light areas and dark areas. If there is a bright light in your field of vision, your eye may only be able to see the light source, and miss other important details. When glare is an issue, you may be able to see the streetlight just fine, but miss the pedestrian in front of your car.
- **Clutter**—Too many lights in the background can interfere with pilots', boaters' and drivers' vision of important markers such as airport beacons, channel markers and stoplights. Proper shielding of these lights could prevent these problems, save energy, and reduce sky glow.

Continued on p. 2



PHOTO COURTESY NASA/JPL-CALTECH

Message from the President will return in the January/February 2009 issue



Officers 2009

President

Ed Witkowski president@novac.com

Vice President

Allan Mayer vp@novac.com

Secretary

Yvette Johnson secretary@novac.com

Treasurer

Kent Allingham treasurer@novac.com

Trustees

Paul Derby paul@paulderby.net

Bron Gervais

Richard Grauel

Pedro Martinez

Dave Sukites

Directors

Membership Director

Kent Allingham kent.allingham@
verizonbusiness.com

Outreach POC

John Stewart thestewarts@erols.com

Important NOVAC Numbers

Blue Ridge Regional Park 703-729-0596
(formerly Savage) wod@nvrpa.org

Mason Neck SP 703-550-9960

Crockett Park 540-788-4867

NOVAC Web Site

www.novac.com

Webmasters

Matt Roper &
Maurice Nelson webmaster@novac.com

NOVAC Newsletter

Editor

Tim Nicholson newsletters@novac.com

Production, Design & layout

Deb Stover deb@stoverstudio.com

Mentor Program

NOVAC Mentor Program Director

Jeffrey Topp mentor@novac.com

Light Pollution *Continued from page 1*

- Sky Glow—As already discussed, sky glow results when stray light bounces off water vapor or dust particles in the atmosphere.

Sky glow's interference with astronomical observations is more than enough reason for amateur and professional astronomers to want to stop it, but light pollution has other bad effects as well. We have to understand those other areas to build the broad support needed to get cooperation from local, state and federal officials to reduce light pollution.

Here are some of the other effects:

- Energy—We have all seen the light pollution map created by the Defense Meteorological Satellite Program that shows light pollution as seen from a satellite. All of this light is wasted—no one up there needs it. IDA Board members J. Kelly Beatty and Terry McGowan have estimated that energy wasted in the production of light pollution accounts for one half a percent of the entire U.S. electric bill.
- Ecology—Light pollution affects a number of species. Most often mentioned are baby sea turtles that must head towards the sea when they hatch. Before light pollution, the lightest area was toward the sea, but now, because of light pollution the turtles head in the wrong direction and are killed by predators, run over by cars, or simply die of starvation.

Many species of migratory birds use natural light to navigate, and millions of birds are killed each year because of light pollution. Some fix on lighted radio towers, and circle until they die from exhaustion. Other birds crash into tall lighted buildings which are a major source of light pollution in cities.

Nocturnal frogs and salamanders may fail to wake up because of light pollution. (Astronomers who don't care about the frogs may care very much about the mosquitoes they eat.)

Other

- National Parks—Many devoted park lovers are active in the fight against light pollution on historical and aesthetic grounds. Light pollution can travel up to 250 miles; it can hide the beauty of the night sky and interfere with the effort to recreate the environment of our ancestors.
- Safety—Glare from poor lighting can impair drivers vision, preventing them from seeing pedestrians and road hazards. High intensity lighting is often installed in high crime areas, but it can have unintended consequences if it creates shadows where possible attackers can hide.
- Military Training—Night fighting is an important requirement for today's military, and a number of military bases have reported that light pollution makes it impossible to simulate the darkness experienced in real combat.
- Military Intelligence—Light pollution makes it harder to track spy satellites.

Fighting light pollution isn't all that hard. No one is being asked to drive without headlights or go around in the dark. Better light fixtures that shine the light where it's needed, not into the sky, reduce light pollution significantly. Shutting lights off when they are not needed helps a lot. Reducing light levels to reasonable levels helps more. Historically, in our country increased population has been accompanied by increased light pollution, but studies have shown that implementation of dark sky friendly standards have stopped the increase in light pollution. It doesn't hurt that all of these changes save energy; every little bit of conservation is a good thing.

Current Status

This is a time of opportunity and challenge. Light fixtures around the country are old and in need of replacement at a time when people are concerned about energy costs and complain about light

shining into their windows. At the same time, the market is being flooded with compact fluorescent bulbs that produce more light per watt than incandescent, and bright Light Emitting Diode (LED) lights that can be good or bad, depending on how they are used. Our challenge is to replace those old lights with new lights that don't generate as much light pollution.

For many years, IDA and others have worked with state and local governments to enact lighting ordinances that require better lighting. Some of the progress on this front can be seen at <http://www.volt.org/VA%20Ordinances.html>. A model lighting ordinance was developed during this process, and it too is available on the NOVAC website. In conjunction with the Illuminating Engineering Society (IES), IDA has been working on an improved Model Lighting Ordinance (MLO) that incorporates a Backlight, Uplight, Glare (BUG) Rating System. This was formally presented to the IES this fall, and IDA is now in the process of negotiating with them before publishing the draft for comment.

This summer, IDA conducted well-attended light pollution briefings in the

House and Senate. Eleven supportive Representatives signed on to a letter to the Environmental Protection Agency urging that EPA codify a formal definition for light pollution, consider the environmental, human heritage, safety and health effects of light pollution in EPA research, expand discussion of well-designed lighting in Energy Star Publications and Standards, and support education about light pollution. A response to this letter has been received, and IDA will coordinate with other interested organizations in preparing a response in the next Congress.

Another development, which is mentioned in the EPA letter, is the submission of a citizen's petition. This petition, submitted by Robert Wagner, a private light pollution advocate who recently joined IDA, requests EPA to monitor atmospheric discoloration caused by light pollution, and develop regulations to achieve "Natural Visibility" as defined by the Clean Air Act. IDA supports this petition and will work to assist in its adoption by EPA.

IDA is planning to announce a vacancy for a position located in Washington so

it can more effectively tap into resources of the federal government. I will circulate this announcement to NOVAC as soon as I get it. ★

Do you have a story to tell?

Members are encouraged to submit photos, articles, tips and reviews of books, software and equipment. If you would like to submit an article for publication send an email to newsletters@novac.com.

What can I do?

NOVAC and its members are already doing a lot, not only with local ordinances, but in educating the public about the sky. Unfortunately, my unscientific analysis, conducted as I drive away from Washington to go star gazing, is that more and more lights are being put up, and many of them are awful. So more needs to be done. Local ordinances that have been proposed but not passed, should be passed, ordinances that have been passed should be enforced. Perhaps the easiest way to start is by joining the IDA. Visit www.darksky.org to sign up.

Common Astronomy Planetarium and Planning Software

by Allan Mayer | <http://www.novac.com> • vp@novac.com

All these programs interface with most computerized telescopes. Check websites for info on particular models, and features. Some are available only for \$\$\$ They are marked (pay)

Stellarium (Strongly recommended Mac, Win, Linux)

<http://www.stellarium.org/>

Simple, easy to use, stunning graphics, and great learning tool for the night sky. Great for binocular observers, those completing the Messier list, and those just wanting to browse the night sky. A must have for ALL people who observe the night sky.

Cartes Du Ciel 2.7.6

<http://www.stargazing.net/astropc/>

Excellent powerful planetarium program. Many features, access online DSS images, interfaces with AstroPlanner, and Virtual Moon Atlas. Good basic graphics. A must have, particularly for those starting out.

Cartes Du Ciel 3.0.1 (beta)

<http://www.ap-i.net/skychart/>

New beta version of the above. Better graphics, slightly different layout.

XEPHEM 3.7.3 (free & pay)

<http://www.clearskyinstitute.com/xephem/>

Planetarium program for Linux users. Very powerful, many many features. Simple graphics, realtime weather, and solar images. Stars down to mag 20 (pay ver) Can be run under Windows using cygwin.

MegaStar 5 (pay)

<http://www.willbell.com/SOFTWARE/MEGASTAR/index.htm>

Planetarium, aka, map program. Prints 1, 2, 3, 4, to a page. A serious but simple to use program for deep sky observers. Over 200,000 objects accurately plotted. 202,000 thumbnail images inc. in full version. Accurate PA, and plotting. Makes excellent charts (seen in many books) and easy to use in the field @ 3am. Well worth the high price, and a must have for those who want more than pretty graphics and small databases. Has Mitchell (Mac) as well as all the other galaxy catalogs. Good for telescopes up 30 in.

The Sky 6 (pay)

<http://www.bisque.com/Products/TheSky6/>

Top of the line planetarium program and soo much more. Depending on the version you get, (and cost \$) almost any features you want/need up to and including camera control, and robotic dome/telescope control. Excellent graphics.

Deepsky-AstroCards (pay)

<http://www.201.pair.com/resource/astro.html/AstroCards/software.htm>

Simple planetarium printing program to print finder charts and Telrad charts for viewing at the telescope. For us old timers who still like printed charts at the telescope.

SkyMap (pay)

<http://www.skymap.com/>

Another planetarium program. Many features. Simple graphics, very detailed.

StarCalc

http://www.relex.ru/~zalex/files_eng.htm

Very simple, nice planetarium program. Well detailed.

DeepSky (pay)

<http://deepsky2000.net/>

Nice, well done planetarium program. Decent graphics, over 400,000 images on optional DVD. Star charts down to 15.5

RedShift 5 (pay)

<http://www.redshift.de/us/h/rs5.htm>

A nice pretty planetarium program. From the old days, still useful for the casual observer, with decent graphics and animations, and many many viewing possibilities, angles and locations which sets it apart from the others. This can make it worth the low price alone to some people. No telescope control.

Meade AutoStar software

<http://www.meade.com/support/downloads.html>

Meade's astronomy software. The planetarium features are basic, and clunky to use, but can get the job done. Basic graphics.

Distant Suns (pay)

<http://www.distantstars.com/>

Interesting looking planetarium program. Has iPhone capability.

Aladin Sky Atlas

<http://aladin.u-strasbg.fr/>

Aladin is an interactive software sky atlas allowing the user to visualize digitized astronomical images, superimpose entries from astronomical catalogs or databases, and interactively access related data and information from the Simbad database, the VizieR service and other archives for all known sources in the field.

Planning, Logging, and Ephemeris Programs

AstroPlanner (pay)

<http://www.ilangainc.com/astroplanner/>

A powerful planning tool for observers, and imagers. Plan when objects will be up, what will be up, based on the plot of your own horizon and time of observing. Interfaces with USNO B 1 images online. Has online DSS images, and local storage of them. Gives full data on objects in the session. A must have for those who plan ahead.

SkyTools (pay)

<http://skyhound.com/cs.html>

A planner, that is used to setup observing/imaging sessions ahead of time. Incredibly powerful, well done. Same as AstroPlanner, gives full data on all objects on the list you choose by date time visibility etc. Another stunning planning program. A must have if you don't own AstroPlanner already.

Deep-Sky Planner (pay)

<http://knightware.biz/dsp/>

Observation, and planning software. Interfaces with other planetarium programs for sky views/charts.

Continued on p. 6

December Meeting: Volunteer Reception, Awards and Election Highlights

Volunteer Awards by Ed Witkowski

The Volunteer of the Year award is NOVAC's highest honor. The club depends almost entirely on volunteer labor to orchestrate its public programs as well as events and services that are provided for members. NOVAC recognized its outstanding corps of volunteers with a dinner prior to the December Meeting. The recipient of the Volunteer of the Year award for 2008 was Rob McKinney. The NOVAC Board received a number of nominations for Rob and enthusiastically voted to present the award to him. Over the years, many of us have worked with Rob. When Rob first joined NOVAC, he began volunteering at outreach events. He has since been a Board member, NOVAC President and coordinated a number of outreach events. But he didn't stop there! He has volunteered countless hours as the coordinator of a number of Star Gaze and Astronomy Day events. NOVAC greatly appreciates Rob's hard work and as a gift to him for his many years of vol-

unteering to NOVAC, he was presented with an engraved laser pointer with the following inscription, "Rob McKinney, Volunteer of the Year, '08." Thank you Rob for a great job!

This Year, NOVAC presented a Special Service Award to one of its outstanding members, Donna Blosser. The NOVAC Special Service Award was created to recognize members who have served NOVAC in many ways. Donna helped coordinate the NOVAC Public Outreach program. She also has volunteered to help at many of NOVAC's major annual events, Astronomy Day and the Star Gaze. The time and help she provided NOVAC and the astronomy community is greatly appreciated. As a gift to her for her many years of outstanding service to NOVAC, she was presented with an engraved laser pointer with the following inscription, "Donna Blosser, Special Service Award, '08." Thank you Donna for sharing the sky with NOVAC and others. *



Kent Allingham organized the buffet at the volunteer reception.



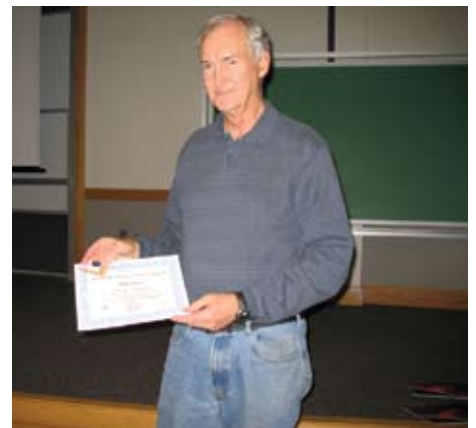
Donna Blosser, left, received the 2008 Special Service Award, and Rob McKinney was named 2008 Volunteer of the Year. John Stewart (not pictured) received a Special Recognition Award.



NOVAC officers from left to right: Vice President, Allan Mayer; Secretary, Yvette Johnson; President, Ed Witkowski; Treasurer, Kent Allingham.



New Trustees Dave Sukites (left) and Bron Gervais



An Honorary Messier Club Certificate was awarded to Ward Trussell.

Election

All current officers ran unopposed and were re-elected by acclamation. Also elected to trustee positions replacing John Stewart and Harold Geller were Dave Sukites and Bron Gervais. *

News from the Astronomical League | www.astroleague.org

Winter is here, the Solstice having just occurred and those crisp, clear, long nights stretch out for your observing pleasure. What better way to enjoy your hobby than by starting the season with two opportunities for amateur astronomy in 2009?

First, 2009 marks the International Year of Astronomy celebrating the 400th anniversary of Galileo's first astronomical observations with a telescope. Of course, mankind has been observing the heavens for millenia, but the use of technology, beginning with those rudimentary telescopes of Galileo's, has brought the practice into another realm entirely. You can celebrate IYA with your own observing program and goals or by suggesting and participating in club events, especially Outreach. Anytime we can popularize our hobby with all its attendant wonder, as well as enlisting new amateurs to deal with the challenges

of keeping the skies dark, along with the bonus of teaching science to a new generation, is a good time. So, plan to have a good time in 2009 and try to dedicate a bit of your observing to support IYA. [Go to the Astronomical League's website at www.astroleague.org to see the ever-changing news and info about IYA.]

For your own observing challenge, check out the newest Observing Club sponsored by the Astronomical League (www.astroleague.org/al/obsclub/galileo_club/galileo_club.html). This new club awards a pin and certificate for replicating Galileo's observations and limits your equipment to something approximating what that venerable astronomer used. There are 14 observing targets, though two are optional (supernovae and aurora borealis), most require multiple observations and all require sketches or plotting. The variety of targets includes the Moon, Venus, Saturn, Jupiter, Neptune, the Sun,

stars (groupings that appear as a single star or "nebulous" patch), and if we're lucky, comets and the optional supernovae and Northern Lights! Galileo made his telescope observations between 1609 and 1619 (the supernovae of 1604 was visible to the unaided eye), but it certainly wouldn't take you as long!

Finally, as NOVAC begins a new year with its new slate of Officers and Trustees, I hope you can begin working on one of the AL's Observing Club programs. Earning a certificate and pin would be nice, right? But better yet are the great experiences you'll have as you check off items on your observing list, filling up not just your notebook or journal, but filling up your mind and memory with great views of the heavens and great times with fellow NOVACians. Please let me know how I can help you get started (contact me at alcor@novac.com). *

Common Astronomy Planetarium and Planning Software Continued from p. 4

RTGUI (Real Time Graphical Interface)

<http://www.rtgui.com/>

Very simple to use program to find objects in other planetarium programs, and telescopes. Can download GPS data directly to Meade telescopes and others. Small footprint, and easy to use. An interesting and simple way to control a telescope.

AstroByte (another logger, planner)

<http://www.mainbyte.com/astrobyte/>

A logging program. Well done; can cross reference observations.

Observation Manager (like it sounds)

<http://observation.sourceforge.net/en/index.html>

Observation Manager is a free and open logbook for (amateur-) astronomical observations. It's written in pure Java and runs on every platform supporting Java 1.4 or higher. (my note; simple and basic program)

MICA (Multi Year Interactive Atlas from USNO, pay)

http://www.willbell.com/almanacs/almanac_mica.htm

An ephemeris calculator and computer almanac for compiling data for complete solar system. Excellent for when you need to know. Simple graphics, easy to use and learn.

Lunar And Planetary Institute (interactive Lunar map catalog)

<http://www.lpi.usra.edu/resources/mapcatalog/>

Online interactive lunar map. Nice.

Virtual Moon Atlas

<http://www.ap-i.net/avl/en/start>

An excellent program done by the author of Cartes Du Ciel Patrick Chevalley. Many lunar images, and mapping detail False color images to show geology, and other info. Full logging capability. A must have for Lunar observers.

Variable Stars Observer

<http://astrosurf.com/astroipc/varobs/index.html>

Another of Patrick Chevalley's programs. A must have for variable star observers. Record/log, and plot light curves for you variable star observations.

JupSat95

<http://indigo.ie/~gnugent/JupSat95/>

A very simple to use program to show the locations of Jupiter's moons, and GRS (great red spot) at any given time and location. Simple graphics, and small footprint.

"To observe, and to help others observe"

NOVAC is a non-profit, all-volunteer organization chartered to advance amateur astronomy in Northern Virginia. Members benefit from:

Access to dark sky observing sites:

NOVAC maintains agreements that provide club members with year-round access to observing sites away from city lights

Monthly meetings

Monthly meetings are held at 7 p.m. on the second Sunday of each month in Room 80 of the Enterprise Building on the campus of George Mason University. Each meeting features a lecture on an interesting topic by a local expert. See the web page or future newsletters for a schedule of speakers.

Bimonthly newsletter

The NOVAC newsletter provides information specifically for NOVAC members, as well as general interest articles on such topics as observing reports, equipment reviews, upcoming events, ATM projects, and more.

High-quality telescopes to borrow

NOVAC members may borrow one of the clubs several "loaner" telescopes at no charge. Members may choose from among three 6 in. reflectors, two 10 in. f/6 reflectors, an 8 in. SCT, and a hydrogen-alpha solar scope. Binoculars are also available for loan.

Club website

Up to date information about club events and activities is maintained on the club website at www.novac.com.

Large club library

NOVAC maintains a well stocked library that members may borrow from by contacting John Deriso (olgazer@verizon.net). A full list of titles is available from the club website.

Private email listserv

Members keep up with current club information by subscribing to the NOVAC email list, without fear of flame wars or spam emails.

Public outreach opportunities

Several times each year, volunteers from NOVAC present astronomy programs to schools, churches, Scout troops, and other public groups.

Membership in the Astronomical League

Through NOVAC's membership in the Astronomical League, NOVAC members gain access to the AL's newsletter, services, and observing programs.

Discounts on astronomy magazines

Subscriptions to *Sky & Telescope* and *Astronomy* magazines are offered to club members at a considerable discount. Contact Kent Allingham (see contact info at right).

Mentor Program

Young or old, new or experienced, this program is for everybody. If you would like to meet with a mentor, or think you would like to be a mentor, or have any questions about the program, write to: mentor@novac.com.

See your Membership Guide for more details.



The NOVAC Newsletter is the official publication of the Northern Virginia Astronomy Club and is published six times per year. The NOVAC Newsletter is sent to members of NOVAC as a regular membership benefit.

Membership

Membership in the Northern Virginia Astronomy Club is \$25.00 per year and is open to anyone interested in astronomy or the sciences. Additional memberships at the same address without additional copies of the newsletter are \$5.00 per person. Membership in the Astronomical League is an additional \$7.50 and includes the *Reflector* magazine plus access to their Observing Awards
Contact:

Kent Allingham
3510 Country Hill Drive
Fairfax, VA 22030
kent.allingham@verizonbusiness.com

Change of address

All notices of change of address should be sent to Kent Allingham. Please include both old and new addresses.

Advertising

NOVAC does not knowingly accept advertising for products of inferior quality nor does it accept responsibility for the quality of advertised products.

Submissions to the newsletter

NOVAC members are invited to submit articles for publication in the NOVAC Newsletter. The editor reserves the right to edit all materials submitted. Send article submissions to the Editor, Tim Nicholson, at newsletters@novac.com. The deadline for submissions is January 15, 2009 for the January/February 2009 newsletter.

© Copyright 2008, The Northern Virginia Astronomy Club. All rights reserved.

The NOVAC Newsletter may be reproduced with proper attribution.

Next Meeting

January 11, 2009

7 p.m.

Speaker: Dr. Duncan Lorimer, Department of Physics, West Virginia University

Topic: What's New in the Pulsar World?

Pulsars, rapidly rotating highly magnetized neutron stars, are fascinating objects to study.

Born in supernova explosions of massive stars, neutron stars have about the same mass of the Sun compressed down to the size of a large city. The incredibly density and magnetic fields that result from this violent birth make neutron stars one of the most exotic classes of objects known in our universe. The clock-like rotational stability of pulsars leads to a variety of applications in physics and astronomy, ranging from neutron star seismology, tests of general relativity to fundamental cosmology.

We review recent progress in radio observations of pulsars and highlight several exciting new discoveries which challenge long-held views about the formation and evolution of neutron stars in our Galaxy.

General membership meetings are open to the public, and are held at Enterprise Hall, room 80, on the campus of George Mason University (see www.novac.com for directions) in Fairfax, Virginia. The meeting hall is in the basement floor of the building. Since Parking Lot B is now closed, you should park across the street in the far reaches of the Patriot Center's parking lot, then walk up the path to the rear of Enterprise Hall.

c/o Kent Allingham, Membership Director
3510 Country Hill Drive
Fairfax, VA 22030



Non-Profit Org.
US Postage Paid
Reston, VA
Permit No. 6595