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# nightscape

A PUBLICATION OF THE INTERNATIONAL DARK-SKY ASSOCIATION

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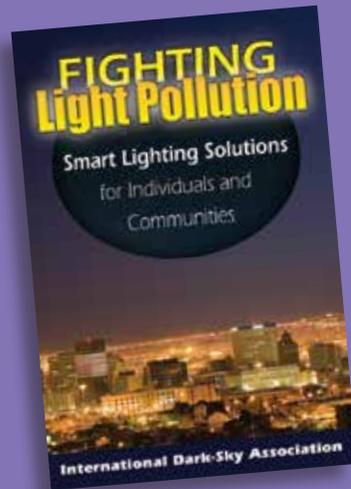
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# From the Executive Director

Dear Members,

A warm welcome to Chris Kyba, recently elected as a new director and to three returning directors who were reelected to the IDA board (page 9). Chris has written a great article on aerial mapping of outdoor lighting in Berlin (page 2). This project demonstrates the potential for documenting the lighting of entire cities using airplanes equipped with Night Sky Brightness Monitors (NSBM). Chris also co-chaired the NSBM standards committee that has just finalized the new data standards for NSBM devices that will allow IDA to develop a global database of night sky brightness measurements (page 5). IDA is planning to develop the next generation of NSBMs with a GPS and data logging capabilities built in to enable it to be used in mobile applications.

Congratulations to Jay Miller of Bethesda, MD who won the IDA Dark Sky Giveaway. Thanks to the generosity of IDA corporate sponsor TeleVue, Jay will receive a complete set of Ethos eyepieces. Wow!

Preparations are being finalized for the IDA Annual General Meeting at the Arizona Science and Astronomy Expo in Tucson. We hope to see a lot of you there. IDA members are also invited to a free reception to meet and mingle with other dark sky advocates. For more details, go to [www.darksky.org](http://www.darksky.org).

As 2012 draws to a close, IDA is extremely grateful for your steadfast support during these trying financial times. While it has been difficult for us, we realize many organizations have had to close their doors. IDA has been able to reduce expenses to balance the budget, but the missed opportunities continue to mount. The LED lighting revolution is upon us and it will transform outdoor lighting for decades. We will only have one chance to make sure that it is done in an environmentally responsible way. The Model Lighting Ordinance (MLO) is getting great reviews and we must increase awareness and training for planning departments. The interest in protecting dark sky parks has never been higher; the chance to make a profound difference has never been better, but we simply don't have the resources to meet all of the challenges.

Staff has been reduced significantly and we just can't do everything that we have in the past. If you have time to volunteer, please let us know. We have a long list of projects that could benefit from your skills and experience. We seek help with fundraising, grant proposals, web development, backend database development, iOS application development, attending conferences, talking to elected officials and planning staff, chapter activities, writing articles for *Nightscape*, accounting, legal; you name it and we can probably use help with it. We could even use a volunteer coordinator! Your contribution of time can be the difference between making progress and missing opportunities. Please contact Scott Kardel at [WSKardel@darksky.org](mailto:WSKardel@darksky.org) or call the IDA office at (520) 293-3198 to discuss your skills and how you can enable us to fulfill our mission. We'll provide the training if you can devote the time. Together we'll continue to make great progress.

If your time is too tight, please think about increasing your financial participation. Our annual appeal letter will be mailed shortly. Your contributions make everything possible and this year more than ever we require your support. Please read the appeal letter and I am certain that you'll agree that there is something in it worthy of your consideration.

Thank you,



Bob Parks, Executive Director

**On the Cover** This photo was taken through the nadir viewing port in an aircraft during aerial mapping over the Reichstag and Brandenburger Tor in Germany. (PHOTO CREDIT: CHRIS KYBA)



The mission of the International Dark-Sky Association (IDA) is to preserve and protect the nighttime environment and our heritage of dark skies through environmentally responsible outdoor lighting. IDA was incorporated in 1988 as a tax-exempt 501(c)(3) nonprofit organization. (FIN 74-2493011)

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República de Chile/Chile,  
Česká Republika/Czech Republic,  
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# Observing Light Pollution from *Air & Space*

by Christopher Kyba

*Freie Universität Berlin / Leibniz Institute of Freshwater Ecology and Inland Fisheries*

The image of the Earth at Night is likely to be one of the most iconic science images of the 21st century. The picture speaks to each of us in different ways, and has many stories to tell. The history of human civilization is woven into it, as can be seen by the intensive lights along coasts and waterways, and by the orderly progression of settlements in the American West. The image attests to the success or failure of political systems, as shown by the comparison of North and South Korea. The dazzling wealth of the modern industrial world is loudly proclaimed, as is the silent tragedy of the millions of members of our human family who live in regions without regular access to electricity.





Berlin's striking Hauptbahnhof (main train station) at night.

**M**any people, myself included, consider this image to be beautiful and intriguing, in part because of the way the night lights are reminiscent of the stars and constellations in the night sky. But in a cruel twist of irony, the very lighting that makes the picture possible actually prevents us from seeing the constellations it reminds us of! When we send light up into the night sky it can scatter off of molecules and aerosols to produce skyglow, the great domes of light that extend far beyond our cities into the surrounding countryside. This unintended light has permanently banished the night over huge areas of Earth's surface, and is arguably the single greatest environmental change that human beings have wrought upon the Earth. When we go to bed with our blinds shut tight, many of the world's other creatures are going to their work in an environment that is almost as different from the one they evolved in as night used to be from day.

The Defense Meteorological Satellite Program (DMSP) image helps us understand light pollution at international and city-sized levels but, because each of its pixels has a size of approximately 7 km<sup>2</sup>, it doesn't give us much information about where the light is coming from. To understand what the sources of upward going light are, the *Verlust der Nacht* (Loss of the Night) research group has produced and analyzed a detailed map (<http://ow.ly/e2Lub>) of the lights of Berlin. The map was stitched together from 2,647 aerial photographs taken using a camera designed for astronomical observations (FLI ML4022). The camera was mounted on a motion-stabilized platform, which keeps the camera orientation the same even if the pilot needs to correct the flight direction in response to wind gusts. The mosaic that we produced covers a total area of 878 km<sup>2</sup> with a resolution of 1 meter per pixel. Since we would like to see other researchers make use of our data we have made it available (for non-commercial use) at PANGAEA (<http://ow.ly/e2Lye>).

We flew a total of 14 tracks over the city (13 in the east/west direction and one final track from north to south) using the research aircraft of the Institute for Space Sciences at the Freie Universität Berlin. This specially configured Cessna T207A has several ports below the aircraft to make

nadir (directly below the observer) measurements as well as side windows that can be opened for instruments that view the sun. One of the specialties of the institute is in taking measurements at the same time that meteorological satellites pass over a site, in order to compare the satellite data to higher resolution measurements taken closer to Earth. We are particularly excited about the possibility of comparing our data to night images taken with the new VIIRS instrument on board the Suomi satellite, which produces nighttime images of Earth with a resolution of 750 meters. Our high-resolution data are important to help us understand exactly what it is that satellite sensors like the DMSP-OLS and VIIRS "see" as they pass over cities.

Our first analysis using the data compared the brightness of each pixel in the image to land use information about that location in the city, in order to learn what types

CONTINUES ON PAGE 4

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night used to be from day.**

LEFT: The nighttime lights of the Earth imaged by the DMSP-OLS instruments in 1994-1995. (PUBLIC DOMAIN IMAGE ACCESSED FROM WIKIMEDIA COMMONS)



Berlin at night. (COPYRIGHT WEW/IGB 2011)

of areas are responsible for producing upward light. It is perhaps unsurprising that the land use type that produces the most light is streets. What was surprising was that streets produce only 32 percent of the uplight. That means that more than two thirds of the light that the DMSP satellite sees when it flies over Berlin comes from sources other than streetlights and car headlights! The areas that produced the next greatest contributions were industrial and commercial areas (16 percent) and public service areas like schools and hospitals (10 percent). Together, these three classes were responsible for 57 percent of all the light, while

## These results can help us understand how we need to change our lighting practices to reduce skyglow.

taking up only 30 percent of Berlin's area. The sixth most important light source can be easily seen in the upper left hand part of the photo: Tegel airport. Even though it covers only 0.4 percent of the study area, it is responsible for almost 4 percent of the total light in the image. Finally, we found that historical buildings were considerably more brightly lit than most areas, but because of their small area contributed only 0.1 percent of all of the upward directed light.

These results can help us understand how we need to change our lighting practices to reduce skyglow. Replacing streetlights with fully shielded lamps is a good start, but

it is only a start. Areas in which work is done at night, like airports, industrial, commercial, and public service areas often need to be lit to perform work safely. But the same considerations that apply to good roadway lighting practice should apply in these areas. For example, lamps should be fully shielded, directed primarily at the work area, should not light above the level necessary to do the job safely, and should be dimmed or turned off when areas are not in use. Infrared lamps and cameras can be used for skyglow-free security, while requiring that would-be thieves or vandals carry their own incriminating flashlights to see.

Measurements like ours, and perhaps future observations from space, will help us understand the spread and growth of light pollution or, in the ideal case, to document how local ordinances have reduced uplighting. As long as our civilization flourishes, urban lights will continue to be visible from space. We should do everything possible to ensure that the light we send to space served a useful purpose, and was not needlessly directed upward without thought.

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#### ACKNOWLEDGEMENT:

Funding for this project was provided by the German Federal Ministry of Education and Research (BMBF-033L038A), the Berlin Senate project Lichtimmissionen im öffentlichen Raum, and by the Freie Universität focal area MILIEU.

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#### ADDITIONAL INFORMATION:

Verlust der Nacht Project: <http://www.verlustdernacht.de/>  
Homepage of Christopher Kyba: <http://userpage.fu-berlin.de/~kyba/>

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#### PAPER REFERENCE:

Kuechly HU, Kyba CCM, Ruhtz T, Lindemann C, Wolter C, Fischer J, Höcker F (2012) "Aerial survey and spatial analysis of sources of light pollution in Berlin, Germany." *Remote Sensing of Environment*, 126:39-50 (2012).

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A free, unproofed, preprint version of the paper is available:  
<http://ow.ly/eO0qj>

# The Future of Night Sky Brightness Monitoring

**T**he IDA Night Sky Brightness Monitoring (NSBM) program has taken a major step forward with the approval of an international NSBM data standard (see sidebar below for a full update). This clears the way for IDA to develop an international NSBM database for use by researchers, governments, officials, and the general public. For the first time, professionals and citizen scientists alike will have a place to send their measurements and share their efforts worldwide.

Already, work has begun to collect archival data from devices previously installed. The data is then converted using the new data interface standard. In addition, the current IDA Sky Monitor website is being upgraded to allow permanent NSBMs to transmit and share their data. The goal is to encourage the addition of new, permanent installations using any device conforming to the new standards to grow the database.

IDA is also embarking on the development of the next generation of NSBM device. We are evaluating several designs for a low cost NSBM device to expand on the work of the IDA project, funded by the National Science Foundation, which began four years ago. The devices developed with this grant are currently installed at leading observatories around the globe. The goals of this first device will be used as the basis for the next generation's enlarged goals. Accuracy, autonomous operation, Wi-Fi and field calibration will ensure ease of installation and reliable data. A range of options to adapt to more situations will be offered, including removable data card, customized photometers, GPS, and programmable measurement intervals for mobile operation.

An exciting recent development in Night Sky Brightness Monitoring is the ability to map large areas with mobile NSBM units, allowing a comprehensive baseline analysis of an

entire city. Surveys in the future will measure improvements and bring to attention the degradation of specific areas that need improvement. With this approach local officials will get valuable feedback quantifying the impact of outdoor lighting ordinances and promoting the continued creation of them. Documenting progress is the best tool to raise awareness and support efforts to save energy and control wasteful outdoor lighting practices.

In the future, we hope to include global lighting maps made from the Defense Meteorological Satellite Program (DMSP) and Visible/Infrared Imager/Radiometer Suite (VIIRS) satellites. Obtaining the financial resources necessary, we will have them updated regularly to promote the most up-to-date maps.

Night Sky Brightness Monitoring is the key to raising global awareness of light pollution and developing the scientific basis to control it. Follow the development of the new IDA NSBM device and Sky Monitor website at [www.darksky.org](http://www.darksky.org). Upon the website's completion, we will publish instructions on how you and your group may become a part of this global network.

## COMMITTEE UPDATE

### *International Night Sky Brightness Measurement Standards Finalized*

The newly formed IDA Night Sky Brightness Monitoring (NSBM) committee has finalized new standards for night sky brightness monitoring devices. The purpose of these is to ensure that the data from the many devices in use can be shared now and in the future. The new data format has been endorsed by Unihedron (creators of the Sky Quality Meter), by Knightware (the maker of the SQM Reader program) and international groups that have established networks of permanently mounted monitoring stations.

Approval of the standard was the first step to creating a global database of NSBM data. IDA will expand its current Sky Monitor website, created for the National Science Foundation funded NSBM network, to incorporate data from any monitoring device employing the new data standard. The goal is to make all night sky measurements publicly available.

Prior to formal adoption of the standard at the 12th Annual European Symposium for the Protection of the Night Sky at in Bielsko-Biala, Poland, the committee solicited public comments and the standards were reviewed at the General Assembly of the International Astronomical Union in Beijing, China in August.

A detailed explanation of the new standard can be found on IDA's website at: [www.darksky.org/measurements](http://www.darksky.org/measurements).



Participants of the 1st Dark Sky Session at the IAU conference in Beijing (PHOTO CREDIT: SZE-LEUNG CHEUNG)

# IAU General Assembly in Beijing

**A**stronomers from across the globe met last August to discuss light pollution as a part of the International Astronomical Union (IAU) General Assembly held in Beijing, China. At the IAU's previous General Assembly, held 2009 in Rio de Janeiro, a resolution was unanimously adopted to support the need to preserve the night sky and the right to see stars. This year's General Assembly went far past the 2009 resolution bringing a special session of presentations and discussions related solely to light pollution.

Topics presented were as far reaching as the astronomers who attended the session. Oral presentations covered outreach in light pollution and the role and popularity of dark sky places. More technical presentations were made on night sky brightness monitoring, observatory site protection, the threats seen to astronomy from blue-rich light sources, and how well the IAU is progressing in implementing its 2009 resolution.

Experts in light pollution research, education, and more were able to meet and interact in a way that hasn't happened before. While many of the names and faces familiar to IDA members were in attendance, the meeting's location in Beijing brought the topic of light pollution front and center with a new crowd being represented.

Connie Walker, a member of the IDA board of directors, was a major force in organizing the special session on light pollution and still had the time to present multiple talks. IDA's Bob Parks presented at the session on night sky preservation. Some of the talks given covered topics that should be familiar to readers of *Nightscape*. They included the new International Dark Sky Reserve in New Zealand, the SKYMONITOR program, and the "Losing the Dark" planetarium show (see facing page).

***Connie Walker, a member of the IDA board of directors, was a major force in organizing the special session on light pollution and still had the time to present multiple talks.***



# Special Evening Program at the Beijing Planetarium

**T**he International Astronomical Union Symposium included an evening program that focused on light pollution and night sky protection at the Beijing Planetarium on Wednesday August 29. The event was informative, well attended, and gave attendees an opportunity to interact in a casual environment.

The session began with an award ceremony for Dr. Malcolm Smith, National Optical Astronomy Observatory (NOAO) astronomer, who was honored for his substantial contributions to light pollution abatement on behalf of astronomical observatories and the community at large. NOAO Director Dr. David Silva and International Dark-Sky Association

Executive Director Bob Parks presented Dr. Smith with the *Dr. David Crawford Lifetime Achievement Award*. This award, in honor of the International Dark-Sky Association's (IDA) co-founder and first Executive Director, recognizes those who have made a sustained effort to raise awareness of light pollution and to who have implemented solutions to light pollution and real change.

After the award ceremony, the International Dark-Sky Association previewed a full-dome planetarium show entitled "Losing the Night." This short educational program explains in simple terms what light pollution is, its impact on the environment, and how it can be reduced. It was produced by Loch Ness Productions for IDA and

is intended as an intro to regular planetarium shows. With planetarium audiences reaching nearly 30 million annually, it is hoped that this program will help raise international awareness of issues related to light pollution while also reaching new audiences. It will be available for free to planetariums and a flat screen version will also be available for educational purposes.

The attendees were also treated to a showing of the documentary film "The City Dark." Independent film-

***With planetarium audiences reaching nearly 30 million annually, it is hoped that this program will help raise international awareness of issues related to light pollution while also reaching new audiences.***

*Dr. Malcolm Smith (center), Dr. David Silva and Bob Parks in Beijing. (SZE-LEUNG CHEUNG [HONG KONG UNIVERSITY] AND NOAO)*



maker Ian Cheney directed the light pollution documentary depicting his experiences moving to New York City from rural Maine. The film covers a wide range of issues related to light pollution in a very artistic and accessible fashion. For the film, Mr. Cheney interviewed individuals with unique perspectives on how the loss of the night sky impacts society and the environment bringing a contemplative close to the session.

More information on the event can be found at NOAO's website here: : <http://www.noao.edu/news/2012/pr1202.php>



# Astronomers Without Borders Teams with IDA for New Outreach Initiative

IDA is launching a new program that will incorporate light pollution education into the outreach programs that astronomy clubs run across the globe. The Astronomy Outreach Alliance Program is designed to simultaneously boost interest in amateur astronomy and awareness of light pollution. To help IDA reach the largest potential international audience, Astronomers Without Borders (AWB) will partner with IDA.

Mike Simmons, AWB Founder and President, commented, “We look forward to joining forces with IDA to raise awareness of light pollution globally and support astronomy outreach efforts worldwide.” AWB is the world’s largest organization creating programs for amateur astronomers and other astronomy enthusiasts. AWB’s Global Astronomy Month, which will feature the new collaboration, is the world’s largest regular celebration of astronomy.

Many astronomy clubs are already experts at performing public outreach. IDA will supply training and educational materials to raise awareness of the negative impacts of artificial light at night to be used at stargazing and other events. IDA and AWB will promote the events and provide recognition and support to those who are spreading the word about light pollution.

Today is a unique time in history where more people live in urban areas than in rural areas, making it all the more important to teach our youth about the cultural and scientific relevance of the night sky. This is especially im-

portant since many of them will not see the Milky Way near their homes. Through our new program we aim to bring the wonders of the night sky to the general public so that they can understand the impact of light at night.

The program will certify volunteer organizations in urban areas across the globe to specifically use light pollution education to demonstrate the negative effects of outdoor, artificial light at night. This will increase opportunities for active collaboration between astronomy clubs, AWB, and IDA.

The program is designed to improve outreach efforts, attract new members, and inform those who want to learn more about protecting the night sky, the environment, and humans from the effects of light pollution.

Participating clubs and individuals will receive a certificate of recognition. Annual prizes will be awarded to the groups that best meet the goals of the program. Prizes may include light pollution displays, night sky brightness monitoring devices, laser pointers, or other equipment.

Even better, clubs that are certified for the program will also become IDA affiliate member organizations and will be recognized for their efforts. Each individual member of the organization will receive a copy of *Nightscape* electronically and will have member access to the IDA website. Any individual member of an affiliate organization may also become a full voting member of IDA at a 50 percent discount.

Full details will be available on the IDA website soon.



*Astronomy enthusiasts enjoy some early evening views of the moon at an event on the grounds of the Naval Observatory in Washington, DC.*



# Votes are Tallied for Board of Directors Election 2013

**T**he International Dark-Sky Association (IDA) is pleased to announce the results of the Board of Directors election. Four directors were elected. Each will serve for a three-year term, constructively contribute to the organization, and act as spokespersons for the organization and IDA's mission.

We congratulate Dr. Mario Motta, Christian Monrad, Christopher Kyba, and James Benya on their selection to the 2013 Board of Directors.

Dr. Motta returns to the IDA board for his second three-year term. As a longtime dark sky advocate, he has supported light pollution laws going back to the 1980s, helped form the New England Light Pollution Advisory Group in the early 90s, and has advocated for light pollution laws in many individual towns and cities throughout New England. He has advanced a full cut off resolution with the American Medical Association (AMA) – adopted in 2008 – and now stands as AMA policy. In June of this year, his leadership was again demonstrated when the AMA approved

a monograph on the medical effects of light at night. On the IDA board, he is chair of the committee on medical effects of light pollution where he prompted medical societies into adopting groundbreaking policies, which are quoted and referenced worldwide.

Christian K. Monrad returns to the IDA board as our longest serving director. Chris began his tenure on the board in 1994. He is vice president of Monrad Engineering of Tucson, Arizona, USA. For over 24 years, he has provided assistance in the development of light pollution reduction ordinances throughout southern Arizona and for the state of Hawaii. He is a Life Member in the IDA, has been on its Board of Directors for 16 years, and currently sits as treasurer of the board. Chris is also past-president of the Southern Arizona Section of the Illuminating Engineering Society of North America (IESNA) and two-time past-president of the IDA. As an IDA board member, he will continue his mission of designing and promoting quality outdoor lighting.

Christopher Kyba will be serving his first term on the IDA Board of Directors, and the position is well deserved. He is a light pollution researcher working in Berlin, Germany and currently the chair of IDA's Night Sky Brightness Monitoring Committee. (See page 5 for an update of the committee's hard work and pages 2-4 for Chris' feature article.) Through his new position, Chris aims to further extend IDA's commitment to monitoring sky-glow, particularly through increased engagement of citizen scientists and backyard astronomers. As a member of the board, he will represent IDA at scientific conferences, as well as in discussions with other researchers.

James R. Benya returns to the IDA board for another term. Jim was first elected in 2001. He holds a BSE in electrical engineering and a BS (CCS) from the University of Michigan and is the director of the Advanced Lighting Design Program at California Lighting Technology Center at University of California Davis. Jim has won more than 250 lighting design awards worldwide for his residential and commercial projects. He chaired the IDA/IESNA (Illuminating Engineering Society of North America) Model Lighting Ordinance Joint Task Force.

## Model Lighting Ordinance Gains Momentum

**W**ord of the International Dark-Sky Association/Illuminating Engineering Society Model Lighting Ordinance (MLO) continues to spread. In August, former International Dark-Sky Association (IDA) Board Member Nancy Clanton presented a free webinar "Understand the BUG rating and MLO and RP-8 ramifications in outdoor lighting." The session was presented by *LEDs Magazine* and sponsored by Cooper Lighting. Over 350 people attended the live event. The event is still available to anyone that completes the free registration at <http://ledsmagazine.com/features/9/7/5>.

Also in August, Ringdale, Inc. announced that it had developed ActiveLED fixtures that had been

"Designed to comply with the Model Lighting Ordinance" (MLO) developed by the IDA and the Illuminating Engineering Society. According to Ringdale, "the fixtures and control systems allow cities, communities and farm owners to illuminate areas without the traditional light spill or compromise to performance or safety."

The Las Cruces City Council unanimously approved a revised lighting ordinance in their September 4 council meeting. The new ordinance is adapted from the MLO and includes the MLO's lighting zones, BUG ratings, and more.

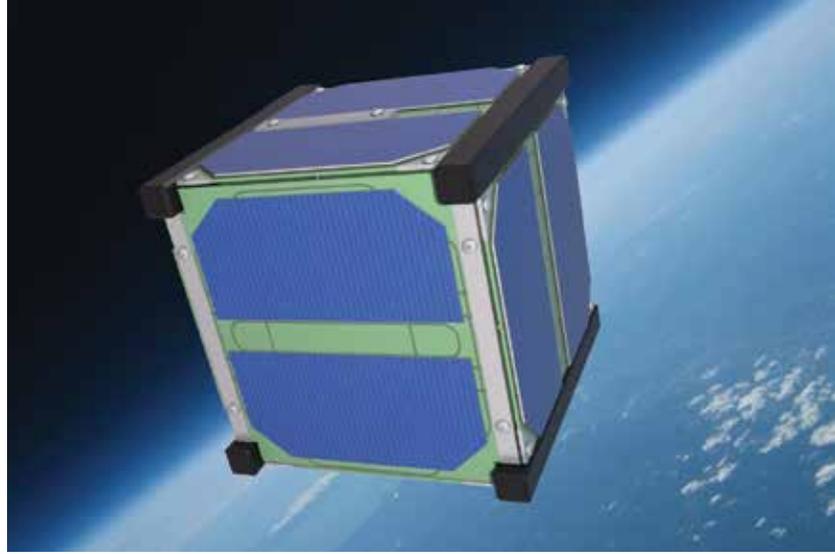
On October 3, IDA's Scott Kardel gave a presentation about the MLO in a session called "Outdoor Lighting Controls that Work for Cities" for more

than 40 members of the Colorado chapter of the American Planning Association.

Scott also spoke on the MLO to government officials and community members in Des Moines, Iowa on October 17.

The California Title 24 Energy Code already makes use of lighting zones and the 2013 updates to this code will add the MLO's BUG (Backlight, Uplight, Glare) ratings for all outdoor luminaires over 150 watts. The terms cutoff and full cutoff are disappearing as the MLO's code language continues to be absorbed into standards; making it easier for lighting designers to effectively deal with light trespass, light pollution and glare.

# SkyCube & IDA: The First Satellite Launched by You to Image City Lights from Space



**T**he people's satellite, SkyCube, has been funded through a campaign on [www.kickstarter.com](http://www.kickstarter.com) and will be flying into space and handing over the controls to you. This exciting project was dreamed up by Tim DeBenedictis; founder and owner of Southern Stars, creator of the popular planetarium app, SkySafari. Southern Stars website states SkyCube's mission is "to make a shared space exploration experience available to as large a number of people as possible, at minimal cost, using the modern web, mobile apps, and social media."

Making space exploration available to many is not SkyCube's only prospect. The simple 10-centimeter cube satellite is equipped with a small camera and transmission equipment to send pictures and "tweets" or short messages back to Earth. Messages will be detectable with amateur radio equipment. The International Dark-Sky Association (IDA) has decided to promote the use of SkyCube's camera not only for beautiful images of our planet Earth when it is lit with sunlight, but also when the sun has set and the city lights appear.

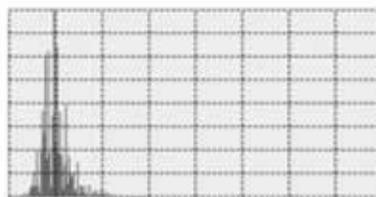
Along with it being 'your' satellite to tweet from space, you can also capture the nighttime view of Earth from Space for yourself. These images won't be quite the same as the high-resolution images taken by cameras on the International Space Station, but they will be your images. Now you can see how the lighting in your city and the areas around really appear from space. Document your city's light footprint and use these images to support debates for lighting legislation, for education about why we shield our lights, for many other purposes and good causes, or just because it means you took a picture from space of city lights!

After the mission's launch, expected in 2013, submit your nighttime photo taken by SkyCube to the IDA's social media pages (Facebook: <http://ow.ly/eO5Jp>, Twitter: @IDADarkSky, Google+: <http://ow.ly/eO5O7>, and Pinterest: <http://pinterest.com/idadarksky/>) to be entered for a raffle. Look for more details on our website and in our E-News.

To learn more details about SkyCube's creation, electronics, and goals visit these websites at <http://ow.ly/dZ2QF> and <http://www.southernstars.com/skycube/>.



Raw Image Data



Dark Frame Subtracted



Final Processed Image

*Images of San Francisco Bay Area at night, taken with a real SkyCube camera out an airplane window. Images taken from space will be from a different perspective.*

(IMAGES COURTESY OF SKYCUBE)

# IDA at Pacific Astronomy and Telescope Show

IDA was well represented at the fifth annual Pacific Astronomy and Telescope Show (PATS) held September 20-21 in Pasadena, CA. Our dark skies booth on the convention floor was visited by many and ably staffed by volunteers: Dark Skies Northwest Chapter Leader David Ingram, San Diego Chapter Leader Jim Traweek and San Bernardino County, California – High Deserts Region Chapter Leader Tom O’Key. IDA Managing Director Scott Kardel gave a general talk entitled “Light Pollution: Perspectives from Earth and Space” featuring dramatic nighttime images of city lights captured by astronauts aboard the International Space Station. The images, both in narrow and wide-field form show off not only the extent of city lights but also the types of lighting being used around the world. It was surprising for some to learn, that even from space, city lights are brighter than the stars. Also apparent from space is the visibility of lighting controls and the influence on cities’ light footprints as seen from space. Cities that employ lighting plans are not as intensely illuminated as those that do not.

The talk was followed by a workshop on fighting light



LEFT TO RIGHT: Jim Traweek, Tom O’Key, Dave Ingram, Scott Kardel

pollution. The workshop featured a short talk, a lighting demonstration, and interactions between the attendees. Questions and discussions focused on what people can do and have done in their areas to make positive changes in outdoor lighting.

During the show Southern Stars, an exhibitor at PATS, was wrapping up their promotion for their SkySafari 3 planetarium app. Thirty percent of the proceeds from their sales on the app were donated to IDA.

## EUROPEAN SYMPOSIUM IN POLAND: For the Protection of the Night Sky

The 12th Annual European Symposium for the Protection of the Night Sky was held on September 17-19 in Bielsko-Biala, Poland. *Polaris*, the Polish dark sky protection organization, hosted the event that brought together dark sky advocates and researchers from around the world. The symposium program included presentations on education and outreach programs, night sky brightness monitoring developments, and preservation of dark sky places. The organizers used language translation and webcasting to fully engage as large an audience as possible.

The highlights of the program included a talk on an aerial survey of artificial lighting in Berlin and new night sky brightness monitoring standards given by Chris Kyba (see pages 2-5); dark sky education in Japan by Nobuaki Ochi; and new European dark



Bob Parks (left) congratulates Friedel Pas (right) for his successful contributions to the European Symposium for the Protection of the Night Sky.

sky park progress by Günther Wuchterl (Austria), Andreas Haenel (Germany), Jan Kondziolka (Czech Republic), and Pavol Ďuriš (Poland).

As always there was a lively exchange of ideas on the best ways to increase awareness and how to increase participation on a global scale. One discussion focused on creating a European Council to promote cooperation and collaboration among the various separate anti-light pollution advocacy groups. The attendees debated a new definition of light pollution and there was a group discussion on how best to measure night sky brightness.

During the closing ceremonies IDA European liaison Friedel Pas was awarded the Galileo Award for his dark sky efforts in Europe and Fernando Jauregui announced plans to hold the 2013 symposium in Pamplona, Spain.

# IDA Chapter News

## IDA SOUTHERN ARIZONA

In August the Southern Arizona Chapter handed out dark sky information on a Teacher's Night held at the Arizona Sonora Desert Museum and followed that up by exhibiting at Pima Community College's Earth Science Day event held at their Northwest Campus. The Chapter has also developed their own brochure and handout on where people can locally buy dark-sky friendly lighting. Check out their website at <http://sa-ida.org/>

## IDA CALIFORNIA

Jack and Beverly Sales participated in the Lassen Volcanic Dark Sky Festival, held August 10-13. In spite of active wildfires burning in the area, the event was a success. Jack and Beverly set up IDA displays, had daily solar viewing, and IDA Q&A sessions. The evenings featured constellation tours and stargazing. There was also multiple screenings of the film "The City Dark." The theme of the festival was "Half the park is after dark". IDA board member Tyler Nordgren also presented at the festival.

## IDA TEXAS

IDA Texas is now working with the Texas Parks and Wildlife Department in performing lighting surveys in some of the Texas State Parks. The goal is to improve the lighting in the parks and to have some of them eventually apply to become International Dark Sky Parks.

## IDA SAN BERNARDINO COUNTY – HIGH DESERTS REGION

The IDA Chapter for San Bernardino County, California – High Deserts Region is working with the Morongo Basin Dark Skies Alliance on a light retrofit project. In a grant from San Bernardino County over \$1,800 worth of dark-sky friendly lighting fixtures are being made available to local residents in exchange for their old, non-compliant lights.

The group has begun a public outreach campaign for the effort that will hopefully replace 50 bad light fixtures with new dark-sky friendly lights.

## IDA PHOENIX

Phoenix, Arizona IDA Chapter Leader Howard Israel, passed away on August 31. Before his passing Howard was honored by having a solar system walk in Chandler, Arizona dedicated to him. In July Howard was able to attend the dedication and even helped to design it. Learn more about it and Howard at [www.chandlersolarsystemwalk.com](http://www.chandlersolarsystemwalk.com).

## Volunteers Needed!

Please consider helping International Dark-Sky Association fulfill its mission of preserving the night sky by offering the gift of time and talent. Your contribution could mean the difference between making progress and missing opportunities. For more information, contact Scott Kardel at [WSKardel@darksky.org](mailto:WSKardel@darksky.org) or call the office at (520) 293-3198 to discuss the opportunity of sharing your expertise and skills with us to move our mission forward. Thanks for your consideration!

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