

Camerasaderie

The Newsletter of the NIH Camera Club, Bethesda, MD Vol. 55 (12); December 2018



Karen Goldman

“Pink Pop-Up Ostrich”

This image was selected for display in
the 2018 Nature Visions Photo Expo



The NIH
CAMERA
CLUB

December
2018

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2018 DECEMBER

SUN	MON	TUE	WED	THU	FRI	SAT
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9	10 	11 Holiday Pot Luck Party	12 	13	14	15
16	17	18 Travelogue	19	20	21	22
23	24	25 	26 	27	28	29
30	31					

2019 JANUARY

SUN	MON	TUE	WED	THU	FRI	SAT
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6	7	8 Competition Night Landscapes	9	10	11	12
13	14	15	16	17	18	19
20	21	22 Travelogue	23	24	25	26
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President's Chat

December 2018

By Linda Eisenstadt



It was Happy Thanksgiving and now it's Happy Holidays!!! Wow, time flies by at this time of year.

How many of you went out to photograph our unexpected snow storm? Hope you got some good ones, perhaps I'll see some at a competition or during our December Holiday Party! Did you read what we're doing this year at the party? It's time for you to show your favorite photographs to your fellow members. Quentin will be producing a slideshow for our party and it'll be shown all evening.

Speaking of the Holiday Party, I hope you'll plan to come this year. As we did last year, we'll have a raffle, take a group photo, and enjoy fabulous food and drink. You'll find the details in this newsletter.

When you see Stan Collyer, be sure to congratulate him. His photograph, "Havana Mural" won 1st place in the Street Division of the 2nd annual MPA photography contest. His photograph will be hung, with the other winners, at the Maryland State House of Delegates.

December offers many photographic opportunities, Zoo Lights, Brookside Gardens Lights, Hillwood House, Union Station, and many more. Read about the events, dates and times, go to the Washington.org website: <https://washington.org/visit-dc/cant-miss-holiday-displays-events-washington-dc>

Our program committee has been busy securing judges for the first part of 2019. Our January judge will be Dave Blecman, judging landscapes. Based on the surveys that Melissa Park sends out, everyone seems to enjoy his presentations and judging. When you attend an activity or competition, please take the time to complete these surveys as quickly as you can. The surveys provide valuable information for the program committee and board.

I'll see you at the Holiday party.

Linda Eisenstadt

The best way to learn and meet other members is work with us! Without volunteers, we would not have a camera club. Thank you to all our volunteers.



PSA Rep Rap December 2018 By Dick Sprott



Serving as the PSA rep for NIHCC usually isn't very difficult, nor is it thrilling! I bring news of PSA to you, either in person at club meetings, or in these RepRap articles, share PSA Journals at meetings, and remind the club of various competitions. However, I am writing this the day after the November meeting and boy was that fun! I got to present PSA awards to four club members, well deserved rewards for their hard work and vision.

First were the award certificates to Nick Raymond and Jim Turner for their images which were part of the Mid-Atlantic Chapter's First Runnerup finish in the 2018 Chapter Showcase competition. Unfortunately, Jim was ill and I could only announce his awards.

Next I presented David Terao with a Bronze medal he earned in the PSA Projected Image Division (PID) for his image, Ballerina, in Group E. Is it complicated? You bet. There are 5 skill levels in the PID competitions and each group selects its ten best images of the year. The selection is done by a panel of independent judges, ranking them Gold, Silver, Bronze and seven Honorable Mentions. Achieving a

Bronze Award from the hundreds submitted is quite an honor. Our club competed in group E this year, entering all four rounds of competition and did well, including David's Ballerina image. That is no doubt why we have been moved up to group D and why we are the host club for the current round of entries (the first round of the 2019 year). Three club members will judge 138 images entered in this round, from Group E, before Mid-December. We can do that since we have moved up and will not be judging our own images.

Then I presented Jim Turner and Emma Beatty Howells (in absentia) with their Desk Plaque for the second place finish of the NIHCC website in the small club division of the PSA web site competition. And finally, there was the great pleasure of presenting Diane Poole with certificates for the many "Best" awards for various Newsletter pages and features AND a lovely trophy for the best of all entries, regardless of club size for the Cameraderie newsletter.

Many thanks to Bob Cox for the pictures of the award presentations.



Nick Raymond for his image which was part of the Mid-Atlantic Chapter's First Runnerup finish in the 2018 Chapter Showcase competition.



David Terao with a Bronze medal he earned in the PSA Projected Image Division (PID)



Diane Poole receives certificates and BEST of the BEST award for the Newsletter for our club



For the 2017-2018 end-of-year, best of the best competition, in the Photographic Society of America's (PSA's) Projected Image Division (PID), **David Terao won a bronze medal for his image, "Ballerina."**

I took this image of a ballerina gracefully leaping through the air at a Ballet Photography workshop using two strobe lights - one on each side of the dancer (hatchet lighting). Taken with a Canon 5D Mk III camera with 24-105mm f/4 lens. Exposure was 1/125 sec @ f/8.0 and ISO 100.

Congratulations to **Nick Raymond and Jim Turner** for their images which were part of the Mid-Atlantic Chapter's First Runnerup finish in the 2018 Chapter



"Cyano-bells" By Jim Turner

These flowers are from an Enkianthus shrub. Each flower is about 1/4 inch high. They were lit from below to make them appear to glow. The flowers are yellow with red veins but I converted the picture to cyanotype toning using Topaz B&W effects. Shot with a Nikon 105mm/2.8 lens at f/11, 1/13 s, ISO 100.

"Poul nabrone Pastel Rapture" By Nick Raymond

Ancient megalithic dolmen from Poul nabrone, Ireland. Originally captured under dull cloud cover in summer of 2011, for a while I chalked it off as a tourist snapshot to document my travels and a lingering childhood fascination with Celtic lore.

Fast forward a few years, I used the magic of Photoshop to swap in vibrant sunset clouds from a separate picture I captured in Gettysburg (Pennsylvania) of all places + some extra "pastel" colour manipulation in the foreground vegetation to complement these sunset clouds.





NATURE VISIONS REPORT

BY DAVID TERAO
DECEMBER 2018



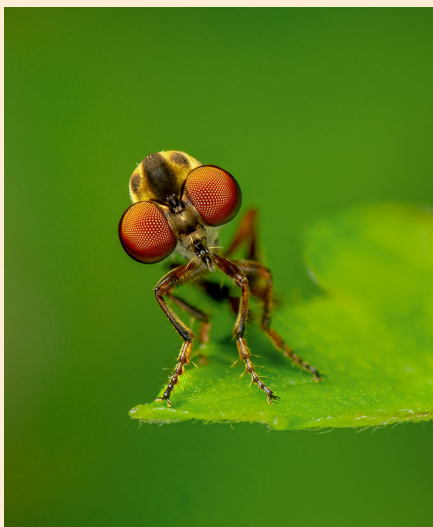
This year, we had another successful Nature Visions Photo Expo with inspirational speakers, excellent hands-on workshops, and an awesome photo exhibit that just gets better every year. This year, 1166 images were submitted to the photo exhibit, and 476 of those images were juried into the show.

The NIHCC had a total of 55 images juried into the 2018 Nature Visions Photographic Exposition - 42 in the nature categories and 13 in the photo art category. The following NIHCC members were juried into the photo exhibition including those who submitted under another club (*):

Beth Altman*	Dale Lewis	Stan Collyer	David Terao
John Norvell*	David Blass	Kay Norvell	
Jim Turner	Malgorzata Klosek	Guillermo Olaizola*	
George Lea	Kate Woodward	Nathanael Lee	
Diane Poole	Margaret Sprott	Karen Goldman	

Of these members, five had top-scoring images in their categories that were candidates for the People’s Choice Awards in the Nature and Photo Art categories. Several NIHCC members were honored with Special Award ribbons from speakers and vendors including Jim Turner, Kate Woodward, Stan Collyer, Dale Lewis and David Terao. Of particular significance, Jim Turner won the Best in Macro Award for his spectacular Little Robber Fly image, and Stan Collyer won Best in Photo Art for his superb Shanghai Staircase print.

I want to thank all of you who attended and participated in NVPE 2018 and for your continuing support in making it such a success this year. Lastly, I want to thank everyone who volunteered to help with behind-the-scenes jobs such as setting up and taking down the photo exhibits, picking up and returning the photo display racks, and helping with vendor check-in. Your time and efforts helped make the expo run smoothly and efficiently and are greatly appreciated.



“Little Robber Fly” By Jim Turner

I found this little guy in my backyard, he is clinging to the edge of a leaf, you are looking down on him. Robber flies are predators so he was probably waiting for lunch. Shot with a Nikon 105mm/2.8 lens at f/11, ISO 200 and 1/250 s with an off camera flash.



“Shanghai Staircase” By Stan Collyer

This is an elliptical staircase in the Portman Ritz Carlton Hotel in Shanghai, photographed from above (the objects at the bottom are tables.) I was able to lean my tripod far enough over the railing to get the angle I wanted. This is a 30 second exposure, at f/14, ISO 400. After cropping and converting to black & white, I used Lightroom's post crop vignetting tool to create the dark and somewhat fuzzy border.

MPA CORNER

December 2018

by Linda Eisenstadt,
NIHCC Rep to MPA



The **NIHCC** is a member of the Maryland Photography Alliance, which is a group of 17 clubs working together to enhance our enjoyment of photography.

Congratulations Stan Collyer! His photograph “Havana Mural” won 1st place in Street Competition, at the 2nd annual MPA Photography contest. Photographers of the top images are invited to display and sell their images at a gallery show during January, February and March at the Maryland State House of Delegates. There were over 350 images entered this year. Nine NIHCC members submitted their images to the contest. To see the winning photographs go to MPA website at: <https://www.mdphotoalliance.org/2018-photo-contest/>

Also kudos to David Blass (who entered via the Silver Spring CC), for his 1st place award in the Other category, with his image "Pensive Gorilla"!

The MPA website is a good source for great areas for photography. You can also see the calendar for the member camera clubs and attend events that interest you, <https://www.mdphotoalliance.org/news/>

Stan Collyer’s photograph “Havana Mural” won 1st place in Street Competition



"Havana Mural" When walking the streets of Old Havana it's not hard to find fascinating sights to photograph. I noticed these old posters of Che Guevara and Hugo Chavez, and decided to wait for an interesting car to come along. It didn't take long. The family of pedestrians was an added bonus. Photographed at 1/250 sec, f/8, ISO 400.

Stan Collyer’s photograph “Foggy Night in Venice” was also chosen to be shown at the Maryland State House of Delegates



"Foggy Night in Venice" Walking back to our hotel after a late dinner, we passed by Venice's Piazza San Marco. I was amazed to find it almost deserted. Even the pigeons had gone to bed. This image was shot, handheld, at 1/25 sec., f/2.8, ISO 800. After converting to black & white, I cropped it slightly and darkened the two figures in the foreground.



**Competition Winners
November 2018
Topic: Still Life**



Novice Digital:

First: Nancy Axelrod "Graveside Flowers"

Advanced Digital:

First: Doug Wolters "Lilies in a Vase"

Second: George Lea "Coffee Table"

Third: John Norvell "Italian Dinner at Sunset"

HM: Quentin Fisher "Autumn Leaves"

HM: Nicolas Raymond "Falkirk Twilight Kelpies"

Advanced Color Prints:

First: John Norvell "Maine Frosty Morning"

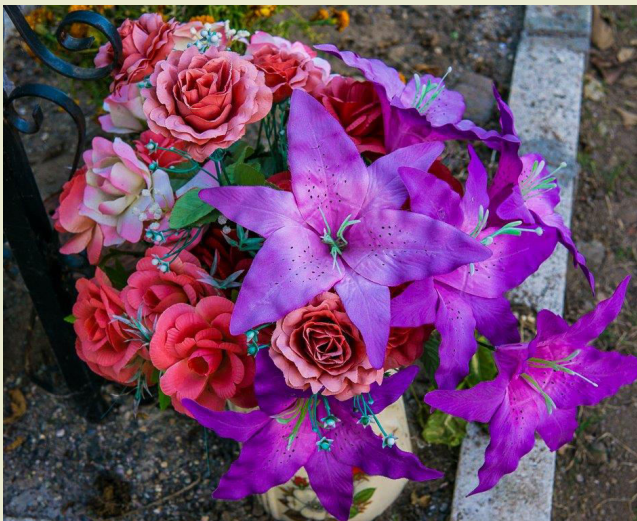
Second: Karen Goldman "In Perfect Harmony"

Advanced Monochrome Prints:

First: Nicolas Raymond "Neglected Woolen Mill Scale"

Second: John Norvell "Old Palouse Barn"

Digital Novice



First Place: Nancy Axelrod “Graveside Flowers”

I shot this in a cemetery in Mexico during Day of the Dead (Nov. 2) in 2017. Most of the grave sites where people hold all night vigils are decorated with marigolds, but I was attracted by the varied and vibrant colors of this offering. The photo was shot with a Sony a6000 camera with a Sigma 30mm lens at f/6.3, 1/100 second, ISO 400.

Digital Advanced

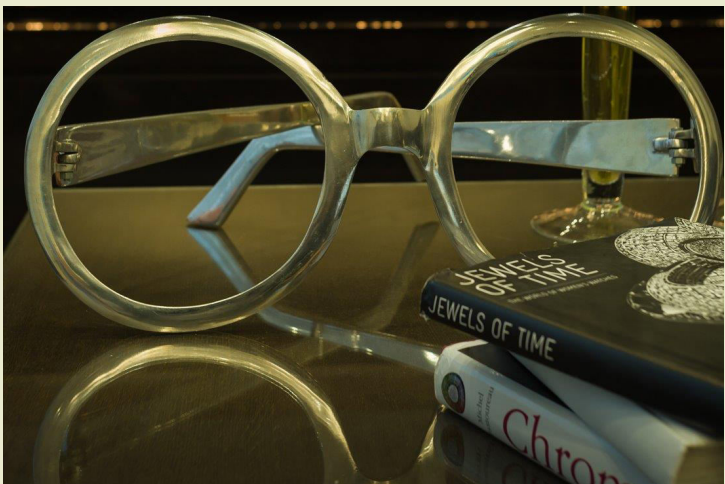
First Place: Doug Wolters “Lilies in a Vase”

This was on a rail (stack of 9 shots) with a Canon 5D Mark III and a Canon EF 100mm f/ 2.8L Macro IS lens, 0.8 sec at f/ 11, ISO 100.



Second Place: George Lea “Coffee Table”

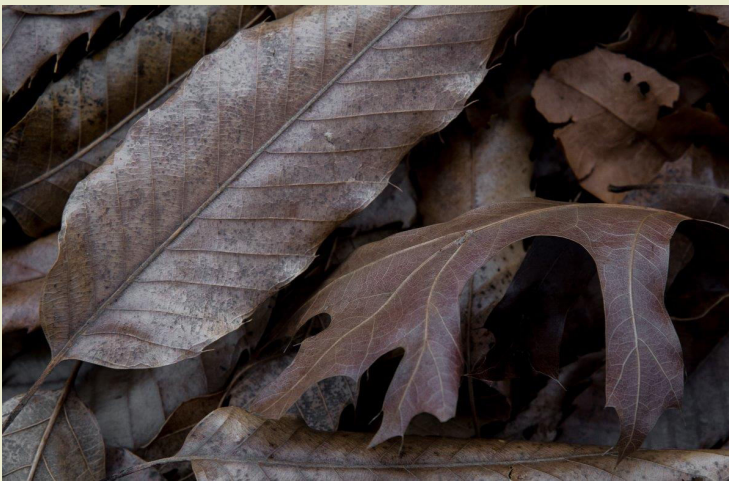
As Anna and I were waiting to be checked-in at our Amsterdam hotel, I noticed this display in the waiting area. The illumination was just right and the scene spoke to me, this is one of three views. Sony a7R, full frame, Summicron f2.0/35mm, ISO 400, f5.6, RAW capture.





Third Place: John Norvell
“Italian Dinner at Sunset”

This image was captured during a dinner at sunset at a restaurant on Lake Como, Italy. I was impressed with the sunset, lake reflections, mountains, and artistic coffee cup. The light contrast required HDR processing. 1/125s, f/8.0, ISO100, 135mm. Fuji X-Pro2, 18-135mm lens at 18mm, f/3.5, 1/160 sec, ISO 400.



HM: Quentin Fisher
“Autumn Leaves”

Sometimes when out looking for birds, it pays to look down! These are a collection of leaves on the ground I noticed while walking in Black Hill Regional Park. I especially liked the sense of depth created by the shadows. Taken with my Nikon D7200 with a 24-120 lens.

HM: Nicolas Raymond
“Falkirk Twilight Kelpies”

Long exposure twilight photo of the Kelpies horse-head sculptures from Helix Park in Falkirk, Scotland. Captured in May of 2018 when I thought I had done a pretty good job of mapping places I wanted to visit ahead of time, although I was only made aware of this site until my AirBnB hosts recommended it to me. Needless to say I was in for a very pleasant surprise, serving as a continued reminder to ask locals for insight on places to visit and photograph.



Advanced Color Prints



First Place: John Norvell “Maine Frosty Morning”

This image was made in our daughter's yard in Maine on a frosty fall morning. Most of the ground cover had frozen and turned brown, but some were still colorful and edged with frost. I gathered several colorful and frosty leaves and arranged them for this photo. Nikon D610, 24-120mm lens at 70mm, f/8, 1/2 sec, ISO 200, tripod.

Second Place Karen Goldman “In Perfect Harmony”

I wanted to show the similarity between the logarithmic spirals of a nautilus shell and the scroll of a stringed instrument. My mother's violin was the perfect size for this purpose, and enhanced the image with delicate flower carvings. Nikon D7200, Nikkor 18-55mm at 27 mm, f/9, 1/25s, ISO 2200, flash.



Advanced Monochrome Prints



First Place: Nicolas Raymond “Neglected Woolen Mill Scale”

Old discarded scale from the abandoned Waterside Woolen Mill in Bedford County, Pennsylvania (USA). Captured in May of 2015 as part of a group outing & paid workshop at a time I was especially interested in urbex photography; although I only recently processed this image in black & white for submitting it as a print in the club competition.



Second Place: John Norvell “Old Palouse Barn”

This image was made in an old barn during a tour of the Palouse region in Washington state. Conversion to B&W was with Silver Effex2. Fuji X-Pro2, 10-24mm lens at 10mm, f/16, 1/160 sec, ISO 400, tripod.

Topics for 2019 for the NIH Camera Club



January 8, 2019

Landscapes -The photograph should show a view or vista of scenery on land and /or sea. It could be vast and unending as can be seen by the eye. You should place emphasis on interest, visual impact, composition, and technical excellence. Photos could include seascapes, cityscapes and landscapes.

February 12

Architecture - Photos in which buildings, interiors, ruins, bridges, or any other man-made structures are the principal interest. The photographer may isolate aspects of the subject to emphasize design portions. Buildings are prime examples but other subjects having strong design elements of an architectural nature are appropriate as well.

March 12

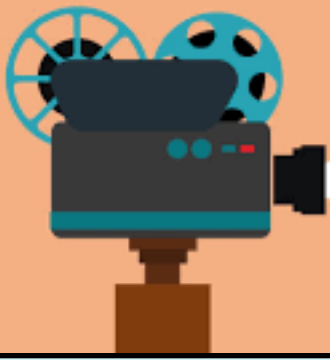
Photojournalism - Storytelling pictures or people doing things where the activity itself is the theme.. PSA description: Photojournalism shall consist of pictures or sequences with informative content and emotional impact, including human interest, documentary, and sport news. The journalistic value of the photograph shall be considered over pictorial quality. In the interest of credibility, photographs which misrepresent the truth, such as manipulation to alter the subject matter, or situations which are set up for the purpose of photography, are unacceptable. The only editing that can be done includes cropping and color correction that could be done in a darkroom.

April 9

Decay, Detritus, Abandoned things- Any photograph may be entered where the main subject is easily seen in a discarded or abandoned state or shows a general sense of abandonment. Examples include but are not limited to: abandoned buildings (either individual rooms or the whole building, interior or exterior), cars or other items found in a junkyard, or crops left to wither in the field. Images of objects that have been abandoned or fallen into disuse (cars, buildings, factories, etc.)

May 14

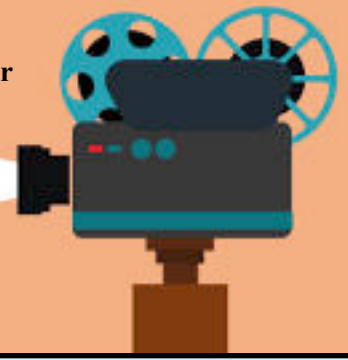
Workshop: Improving your travel photography



**NIH Camera
Club**

**Holiday Party
Image Projection
Time**

**Tuesday, December 11, 7pm
FAES Social and Academic Center
9101 Old Georgetown Road
Bethesda, Maryland 20814
(Corner of Cedar Lane and Old
Georgetown Road)**



15 seconds of Fame!

As in the past, during the holiday party we'll be presenting a looping display of club members' work.

This year, you are invited to submit up to 4 digital photos of anything you'd like to show.

The only requirement is that it has not won a 1st, 2nd or 3rd award in a club competition. Otherwise . . . absolutely ANY photos you'd like to show off. Maybe something you entered in PSA, Nature Visions, etc? Maybe some favorite shots? Artistic? Funny? Abstract?

Please be sure the photo meets the usual submission requirements - it must not exceed 1280 pixels in width and 800 pixels in height and should be in jpg format and sRGB color space.

Submit photos in the usual manner on the club website under the December 11 competition - you can submit up to 4 images, 2 images at a time. There is no novice or advanced distinction (though the software might download it that way, that will be erased later).

Deadline is Midnight Thursday December 6th.



**You are Cordially Invited to the Annual
NIH Camera Club Holiday Potluck Dinner
Tuesday, December 11th, 7pm**

PLEASE BRING FOOD TO SHARE OF WHAT YOU
WOULD LIKE TO EAT AND THINK THE CLUB
WOULD ALSO LIKE

Ready to serve by 7 P.M.

Family and Significant Others Welcome

The 2nd floor bar will serve beer and wine at no cost to you.

WHERE: FAES Social & Academic Center
9101 Old Georgetown Road,
Bethesda, Maryland 20814
Corner of Cedar Lane & Old Georgetown Rd.

Questions, please e mail:

Leonor Guillen: leoriberoguillen@gmail.com

Margaret Sprott: margaret.sprott@gmail.com

Famous Photographers By Stephen Levitas



#35 December 2018
Cameraderie
Yousuf Karsh
(1908-2002)



You have all seen Yousuf Karsh's portraits of famous people, I am quite sure.

Wikipedia article:

https://en.wikipedia.org/wiki/Yousuf_Karsh

Yousuf Karsh ... was an Armenian-Canadian photographer best known for his portraits of notable individuals. He has been described as one of the greatest portrait photographers of the 20th century. An Armenian Genocide survivor, Karsh migrated to Canada as a refugee. By the 1930s he established himself as a significant photographer in Ottawa, where he lived most ... of his adult life, though he traveled extensively for work. His iconic 1941 photograph of Winston Churchill was a breakthrough point in his 60-year career, through which he took numerous photos of known political leaders, men and women of arts and sciences. Over 20 photos by Karsh appeared on the cover of Life magazine, until he retired in 1992. Karsh's photos were known for their use of dramatic lighting, which became the hallmark of his portrait style. The [Churchill] photo, which according to The Economist is the "most reproduced portrait in the history of photography," has been described as one of the "most iconic portraits ever shot." USC [University of Southern California] Fisher Museum of Art described it as a "defiant and scowling portrait [which] became an instant icon of Britain's stand against fascism." It appeared on the cover of the May 21, 1945 issue of Life, which bought it for \$100.

The Karsh website is here, and contains unending portraits, many of which you have probably seen. Please browse through the website. It is like walking through a magical gallery of famous faces. Absolutely everyone is there.

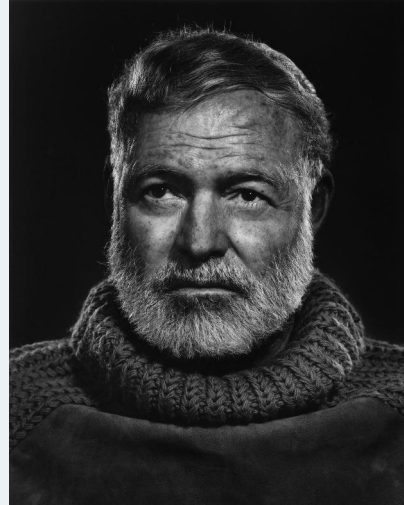
<https://karsh.org/>

Here are two of Karsh's most famous and iconic portraits.

Winston Churchill



Ernest Hemingway



Who has not seen these famous shots of Churchill and Hemingway? How did Karsh get them to pose so well? Maybe it's just that this is who they are, and Karsh did not interfere with showing it? After all, all his shot of famous people were of—famous people (with lots of talent, skill, and character). Of course, Karsh was a master of lighting, and it shows in every image.

Here are two more that particularly impress me.

Queen Elizabeth II and Prince Phillip



Sir Edmund Hillary



The young Queen Elizabeth and Prince Phillip appear to be looking out a window, but it might be that Karsh has placed a light there, just out of sight. Notice that Elizabeth is nearer to the camera, more fully illuminated, and dressed in lighter-color clothing, so as to make her more prominent in the photo, as is appropriate, since she is the Queen and Phillip merely her consort. Next month, I will show you another photographer's approach to the same problem (make a mental note of that sofa behind the couple). Sir Edmund is certainly in a studio, carefully lit, but with tousled hair and an outdoor garment, he looks just the mountaineer. The lighting is classic portrait lighting: a strong light from one side, a fill light from the other, a light on the backdrop, and perhaps a spot on his hair.

Karsh has done significant work in the field, and here are a couple of samples. Please go to the Karsh website to see more of such work.

Rear Window Ford Motor Plant



Porter at Union Station, DC



No doubt Karsh spotted this Brando-esque auto worker and knew he had a compelling face to shoot in the natural frame of the rear window of a car being built.

We all know Union Station in DC, and it's nice to see Karsh's shot of one of our monuments. Look how he used the night illumination to advantage for a dramatic effect.

I could not resist including this one.

The Marx Brothers [Groucho, Chico, Harpo]



This is a tremendous shot. Aside from getting the brothers to pose perfectly (well, they are actors and can do that, maybe), the lighting work is fantastic. Each brother has advantageous but slightly different lighting on his face. If it was done with a single light, then did Karsh instruct the brothers to “turn this way,” “tilt that way?”

Do You really Need a Camera?

Part III

By George Lea



We have introduced a definition of an image and described the process by which images are projected on a film plane using a lens system. Estimates of our visual acuity, resolution and acutance were used as guides in the manufacturing of the same lens system. The lens is the collector of light rays; it should collect and transmit the maximum amount to the film plane.

Whenever light rays cross an air-glass interface along being refracted, some are reflected, going backwards; therefore, not transmitted and thereby incurring a loss. This is *internal reflection* and reduces the lens' efficiency. By applying coatings of molecular thickness to lens surface, internal reflections or flare are greatly reduced. Most modern lenses have transmission efficiencies of close to 98% per air-glass interface. It is common to have four or more such interfaces so that the overall lens transmission efficiency is 98% for each interface resulting in an overall efficiency of 92%.

If you look into a 21st century vs. a 1930 lens, the former will exhibit a color hue while the latter will be clear. We will not go into the details of thin film refraction, as the only way I can explain is by referencing to π -shift, a phase shift, invoking electron

microscopy (EM) theory. The technology works, as the coated lens will always project images that appear sharper with more contrast.

Light waves are *dispersive*, meaning the behavior of light waves depend on wavelength or color. The same lens refracts, bends – Blue more than Green, Green more than Red. The Blue circle of confusion (CoC) will focus closest to the lens front with Green-CoC next and the Red-CoC being the furthest, this is *lateral chromatic aberration* – a mouthful.

Today ALL lens are color corrected only for the **Blue and Red channels** by addition of corrective optical elements. This partial cure is adequate in most cases. However, high quality macro-lenses are **apochromatic (APO)** lenses. The individual R, G, B circles of confusion must not only focus on the same plane, they must remain circular with the identical diameter. APO lenses aim to correct CoC for all three-color channels for focus plane, as well as shape. We view macro capture with great detail and color smear will be perceived as “less sharp”. APO, asymmetric, macro-lenses designed to project an image circle (43.27mm diameter) large enough to cover a full 35mm frame are \$\$\$\$\$.

Design philosophies differ among the various lens families in their aim to achieve a balance between resolution and acutance for photographic lenses. To be sure, both attributes are highly desirable but not simultaneously realizable to the same degree in design and manufacturing. Leitz Summicron series of lenses are renown for their acuity, high contrast, not for resolution. Whereas the Zeiss Planar series are known for their resolution and perception of 3-D draw and less for contrast.

In the previous article, I had compared the techniques of Millet and Van Gogh; there are parallels also in lens projections or lens draw between the different manufacturers.

Finally we arrive at the **digital sensor** that defines a digital camera. Its development tracks the advancement of science from pre-20th century analogue wave theories to post-29th century quantum theory and is based on the dual character of light – both a wave and a particle, called the **photon**. Sensor development and manufacturing brought together experts from different branches of physics, optics and solid state, but also from computer science, information and image processing – and of course, the camera people. As with multi-discipline projects, terminology becomes an issue – the same object is referred to by different names depending on your discipline or worse, the same name may have a different meaning. I will try to navigate the straight and narrow and fill in just

enough to carry on the narrative without appearing to being anal.

Thus far, light has been treated as an analogue signal, the *ray cone*, as well as the projected image on the film plane, where we now have the sensor. However, before going into the functions of the sensor, I would like to touch on analog to digital conversion, **ADC**, and its inverse – digital to analog conversion, **DAC**. All ADC processes will incur quantizing errors. Since the captured image will be stored as a digital file, the original lens projection must be digitized or quantized passing through ADC. For the digital camera images, this error results in *aliasing*, an artifact that appears as patches of waves in a set of otherwise straight parallel lines, Moiré pattern.

The ADC is overwhelmed by the analogue data from lens resolution. The digital camera solution is to place an **Anti-Aliasing** or **AA** filter in front of the sensor element. This is a low-pass filter that cuts off all the high frequency data from reaching the light sensitive sensels (pixels) below – in effect, it reduces the resolution of the projected image. As the sensor performance improved over the years, the AA filter has become softer thereby improving its high frequency response. All CMOS digital cameras have an AA filter unless its stated there is no AA filter – the AA filter being the default position. Images captured using cameras with strong AA filters cannot readily distinguish differences in lens draw.

A word of explanation on the use of sensels vs. pixels. Sensel refers to the light sensitive sites/the active sites which are the photodiodes grown on a Silicon substrate. A pixel is a picture element that defines a raster image resolution on a monitor screen. The 14 mega-pixel camera should be referred to as a 14 mega-sensel camera. Sensel count is hardwired to a particular camera. Pixel count depends on monitor for viewing and can be altered by scanning rate.

During camera exposure, the beam of incoming light, interpreted as a shower of photons impinge on the photodiodes and initiate an internal cascade of electrons, which are then collected and save temporarily. The electron count is directly proportional to the photon count, but not equal to each other – doubling the photon count will double the electron count. Sensels serve as a counter and records light intensity, luminosity as a gray scale.

In order to achieve color capture, a sheet of colored filters is aligned over each sensel, as shown below.

R G R G R G
 G B G B G B
 R G R G R G

This is the standard Bayer array pattern used to construct the Bayer filter invented and patented by Bryce E. Bayer of Eastman Kodak in 1976. Notice there are twice as many Greens than either Red or Blue, just as the color sensitive cones in the human eye. Thus, each sensel is a colored photon catcher, and since there are twice as many Green sites, Green will have the twice the total number of catches: Green 50%, Red 25%, and Blue 25%.

Before completing the description of the sensor function, let's examine the consequences of what has been done. As a

reminder, a 14 megapixel, full-frame camera means there are 14 million sensels packed into 35 x 24 mm piece of real estate. These sensels actually occupy about half the total surface area, as there needs to be electrical connections (i.e., “plumbing”) between and among each site. The location of this plumbing can reduce the photon count and thereby increases noise in the shadows. In the manufacturing process, active photodiode sites are grown on a silicon substrate, then a layer with conductors is laminated on *top*, interposed between the Bayer filter and the sensels. This conductor layer is etched with openings aligned over each sensel element to let in the photon for counting. However, the conductors are metal; therefore, they reflect light. So, a number of photons will be reflected, thereby reducing the incoming photon for count. If one can place the wires below the sensel layer, then this loss of count will be eliminated. The recent **back side-illuminated sensor** in consumer cameras solved this problem using the up-side-down cake approach, of course \$\$\$.

There are always loose photons in the system independent of camera exposure or system noise. If one collects a thousand photons from exposure and the noise is ten, then the **signal-to-noise ratio (S/N)** is 10/1000 or 1%, which is not too bad. On the other hand, in the shadow areas of an image capture, the photon count is 100, and we have S/N of 10%, which is unacceptable. We want to maximize S/N and the solution is to increase luminosity in capture.

Increasing the collector bucket entrance area can increase collection efficiency; however, increasing individual sensel area to fit into a fixed area means decreasing the total number of sites. Generally lower pixel count cameras will have cleaner shadows, but less resolution than higher pixel count cameras.

Understanding proper exposure to maximize S/N can also help. Expose-to-the-Right (ETTR) has been used as a single capture technique to increase S/N by increasing exposure, overexpose, but not to the point of blowing out the highlights. This requires practice: using the histogram as a shooting guide and then the image has to be edited for viewing after RAW capture. One can also use multiple captures, such as bracketing and HDR, that effectively increases photon count.

System noise is also generated by sensel temperature. Leaving a camera ON increases noise, since there is no fan to cool. The camera will continue to operate when warm, but shadows noise will increase. As long as the power is on, even if the camera is in sleep mode, heat is being generated. Let's return to the sensel function where the incoming photons have been transformed into electrons and are temporarily stored. There are two strategies for reading and processing the electron counts stored in the sensels. These are based on manufacturing processes and computational efficiency, meaning \$\$, and computational time. As a reminder, everything is still analog – even though we are counting photons that have been converted to electrons.

The first strategy is the older CCD approach that incorporates two microprocessors, one taking data from the leftmost column and other from the rightmost column of the array: starting from the top row, reading sequentially down, and then repeating the process next column over. The data acquisition starts from the two ends working towards the middle.

This sequential reading of electron numbers is then converted into voltages and digitized, ADC, resulting in a digital file. This RAW data file includes all the available

information gathered by the optics and recorded by the sensels. The grey scale data must now be reconstructed, demosaicing, into color and image pixels for viewing.

The pair of microprocessors used has sufficient computing power to handle data resulting from high-resolution lenses, high frequency data, so no AA filter is included. Demosaicing algorithms are the pride and joy of each camera manufacturer, each is designed to show the *best* for their product so RAW files are brand dependent. Be sure that your image editing software can read RAW camera files; if not, there are interpreters available that are not necessarily user friendly.

However, sequential reading of data even by a pair of fast processors takes time, latency, so no video and much delayed live-view. The question being, do you want to wait for the high fidelity image or will the quick view of an adequate quality image suffice?

The second more recent strategy is the CMOS approach which is often referred to as the “camera-on-a-chip.” A micro-microprocessor is attached on site next to each sensel! All the data processing, computing, is completed onsite then read into memory. We have video and live view. CMOS also has the advantage of running cooler than CCD at half the operating voltage. With manufacturing improvements, the data handling ability of these local processors have improved, so we now have a number of CMOS cameras without AA filter. However, the \$\$\$ for no AA filter cameras with a *lower* sensel, pixel, count is *higher* than higher pixel count cameras with AA filter. Today pixel count should not be used as a measure for selecting a camera.

We finally reach the point of viewing the recorded image. Previously, a distinction was made between a point, a mathematical abstraction without any physical dimension and a dot, a physical entity with an associated area. Here we need to clarify **ppi** and **dpi**. **PPI**, or pixels per inch, refers to number of physical sites per inch in a raster image as viewed on your monitor, be it on-camera, monitor, etc. **DPI**, or dots per inch, refer to small circular areas filled with ink and can only appear on prints. While both are correlated with the image, they are totally different animals.

We are ready to read the image files either in print or view on a monitor. In both cases, we edit the digital file in an editor, such as Photoshop, then prepare the results for output for print or monitor. Print is the traditional method and we need to convert the digital files to analog (DAC), which is accomplished at the juncture between the computer output and the printer input. A quick word about printers and printing.

Ink jet printers are most popular for photographers today. A series of micro-droplets of ink are ejected from nozzles targeting a printable surface, paper, plastic, and even metallic surfaces. Multiple droplets are sprayed on to a *single dot* to print a color image. Ink sets of eight colors are common for photo-printers, so eight different color ink droplets of different volumes are produce to fill each printed dot. For the user, the choice of ink type is critical, dye or pigment.

Ink is an aqueous mixture of water, glycol , and xxx, with either dyes or pigments for color. Dyes produce deeply saturated images, but are not *fast* so these images will readily fade. Pigment inks generally cost a bit more, but should last the century when not directly placed under UV exposure. It is

prudent to air-dry prints for at least 48 hours before encapsulating in a glass enclosure to outgas the volatiles.

When the digital image file is send to the inkjet printer an **Error diffusion dither** is automatically applied to the digital file. This protocol is universally used when applying digital to analog file transfers. All DAC processors employ this operation to smooth the quantized digital data, which can be granular, chunky, not smooth, so a little bit of noise is added; the precise amount or its spectral content added is only known to the printer manufacturer. Therefore, when preparing for print output, over *sharpening* is a must to compensate for the printer-imposed dither and retain sharpness.

In part I, we introduced edges, formed by a distribution of differing grey patches define an image. Using a digital editor, we can *frame* any edge by either a single pixel or more and then increase the relative luminously between inside and outside the framed edge. We can select the edges based or hardness or softness. This is the fundamental of digital sharpening. Recently, yellow frames have been added to the green Montgomery County road signs, an application of sharpening using color contrast in place of luminosity.

The original premise in setting up the boundaries for acuity and resolution was based on viewing at arms length of an A4, 8x11.5", print. If we keep the dpi fixed, the final print can be up-scaled or downscaled, preserving image resolution. With any current 14+ megapixel camera 11x14" archival quality prints can easily be achieved, if one does not aggressively crop and delete too many pixels, then one can still print at 2880 dpi.

Note at 2880 dpi means that each printed ink dot has a diameter of $1/2880''$ or $.00035''$ that is well below our visual acuity; therefore, we perceive a smooth gradation of tones and details in the print.

If your choice is to view electronic image files on handheld devices and even up to laptops, there is no DAC – so in theory, there is no need to sharpen for output. However, there are always noises added, here and there, so a mild sharpening is recommended. We have both digital and print submissions for monthly competitions. Digital images are viewed via a projector/screen, which is back lit, additive color. On the other hand, prints are viewed via reflected light; therefore, subtractive color. In order to best show your image, these differences should be taken into consideration.

Unless the goal is to print an 11x14'' or larger print, additional image information captured via camera capture will not be readily apparent over that of a current smart phone capture. Our club member(s) have exhibited A4 size prints captured with a phone and the technical details were flawless.

Do you really want to buy a camera? Creativity and creative applications of tools are always evident in great images.

As difficult as it has been, I have tried to present facts and be objective – however, now for some GKL observations. Camera manufacturers would like for you to believe that each new model is a new discovery, a “must have.” It is true improvements have come, but they are improving on what has been known for decades - better manufacturing processes so that higher performance components can be made more

affordable. Doing what we know, only better; therefore, more affordable.

Mention was made of back side-illuminated sensors that are manufactured using the upside-down cake approach. Sensel site are grown on Silicon substrate as before, then flipped top to bottom. Now the substrate is on *top*, followed by sensels then the conductor layer on the *bottom*. A new substrate is laminated on the bottom for structure support. The original substrate on top is then *shaved* to 1 per cent of its original thickness! Now the backside of the sensels can see the incoming photons directly. We have back side-illuminated sensor.

Shaving off 99% of Silicon substrate, while maintain tolerance is quite a manufacturing feat and the improvement of at one f-stop in exposure and high ISO, 4000 and more is worth the \$\$\$? Actually these sensors have been available for special application for some time, astronomy, digital microscopy and other low light situations where shadow details are important. For us resolving shadows details and minimize shadow noise, in an other wise two-dimensional image, gives perception of depth.

There is an interesting development with curved sensors. Recall our retina is hemispherical, shaping a curved substrate with imbedded sensels would reduce the number of optical elements by half and improve image quality. The Microsoft R&D team developed the bending process and Sony is developing a camera system for market. I believe they discovered that the quantum efficiency of the device also improved by stressing/bending the solid-state junctions??

In order to obtain edge-to-edge uniform resolution images, astronomers have long used curved focal plane cameras. They used 8x10" sheet film in curved holders while applying a slight suction to hold the film true. Also multiple digital arrays have been arranged on a hemispherical dome to match the curved image plane of the optical system. In this case, much computing power is needed to stitch together data with precise orientation to compute the final image. These are used in telescopes mounted on satellites.

Light waves are part of the electromagnetic wave spectrum. Why not construct an antenna structure to focus the waves? There are numerous research centers growing Nano-structure phase antenna, flat laminated sheets to function as lenses – Star Trek 101.

Digital editing applications present layers, opacity as being unique to their domain. In the late 15th century/early 16th century – there was a person named Leonardo da Vinci. He was a scientist, engineer, storyteller, perfectionist, and a great painter.

He used oil and pigments to create layers with varying opacity, introducing micro-contrast as we understand today. He discussed edges in detail and thought there is no place in painting for hard edges. Leonardo made extensive studies of luminosity and produced diagrams of light rays reflecting off curved surfaces and graded shadows. He taught us the fundamentals and 21st century software provided the means. I learned more about perception after studying reproductions of his paintings and, in particular Leonardo's sketches, than from many contemporary sources.

The fundamentals of perception have not changed, but the tools have advanced to a point that we think we are Leonardos. ☞

I thank my number one daughter, Irene, for reading and re-reading these words.



January 8, 2019

Landscapes -The photograph should show a view or vista of scenery on land and /or sea. It could be vast and unending as can be seen by the eye. You should place emphasis on interest, visual impact, composition, and technical excellence. Photos could include seascapes, cityscapes and landscapes.

Better Query Saul

Flash Basics

By Saul Pleeter



I assume that most of you do not shoot in Auto mode. You probably use aperture priority, shutter priority, manual or even program mode to shoot and you make that selection because you want to control things like depth of field, motion blur and exposure. If you have an external flash, your flash basically has two modes – automatic and manual. Automatic exposure means that the flash basically decides what the exposure should be. If you are two feet from your subject and you take a shot using your flash in automatic mode, it will likely produce an ‘acceptable’ exposure. If you move 4 feet away and again use your flash, you should get the same exposure. In other words, the flash is ‘correcting’ for the light falloff (inverse square law) by upping the power of the light emitted. Move another two feet and, if your flash is powerful enough, again the same exposure! You are essentially surrendering your ability to control the light – and your photograph – by putting your flash on automatic.

Now those of you who are familiar with a flash have probably noted that your flash does not have an Automatic setting – but it really does - the automatic setting is called TTL, or, Through The Lens. Using TTL obviates the ability to select, for example, the harshness or softness of light falling on a subject.

Alternatively, your flash has a Manual mode. Putting your flash in manual mode allows you to control the amount of light directed towards your subject. The intensity of the light is a product of the amount of power (a setting on your flash), the aperture setting on your camera and the ISO. Shutter speed does not directly change the amount of light!!

Canon flash units use radio signals to initiate a flash. The flash unit can be disconnected from the camera, positioned anywhere near the camera, aimed at any angle towards the subject, and, when the shutter is pressed the flash unit will work. Nikon units operate via infrared wavelength. The flash unit can be disconnected from the camera, but must remain in line of sight in order to operate. Pressing the shutter will release an infrared ray that will then lead to the discharge of the flash unit.

Canon, Nikon and Sony flashes are expensive largely because of their TTL feature. Manual only flashes are much less expensive. For example, the Nikon SB-5000 flash costs about \$600 – about the same as the Canon 600EX II-RT. Both Nikon and Canon make less expensive flash units and there are third party manufacturers that also make flash units for both Nikon and Canon. For example, Yongnuo makes the YN600EX-RT II that is Canon compatible has TTL as well as wireless modes for about \$100.

There are also purely manual flash units that sell for even less, however, many of these units require a transmit and receiving device to be attached. Pocket Wizard and Vello are two manufacturers that make transmitters and receivers for manual flashes and strobes.

What are some guidelines for using flash in Manual mode? The table below is from Scott Robert Studio and presents power settings, apertures and ISOs for his particular flash². It is a good starting point to use for most flashes.

¹Shutter speed will, however, effect the mix of ambient and flash lighting

²Flash units have differing power levels indicated by a guide number

Flash Distance 6-8ft	ISO 100	ISO 200	ISO 400	ISO 800	ISO 1600	ISO 3200
F16	FULL	1/2	1/4	1/8	1/16	1/32
F11	1/2	1/4	1/8	1/16	1/32	1/64
F8	1/4	1/8	1/16	1/32	1/64	1/128
F5.6	1/8	1/16	1/32	1/64	1/128	
F4	1/16	1/32	1/64	1/128		
F2.8	1/32	1/64	1/128			
F2.0	1/64	1/128				
				scottrobertstudio.com		

The procedure for using your flash for fill-in lighting is:

1. Set the flash to manual mode
2. Set the shutter speed to less than 1/200 of a second.
3. Set the aperture to f8 (for example)
4. Set the ISO to 100
5. According to the table above, the power setting should be 1/4

These settings are for a flash distance of 6 (to 8) feet. What happens if you move the flash closer to 3 feet? The Inverse Square Law applies and according to the Law, decreasing the distance by half increases the lighting capacity by 4. In which case you would decrease the power from 1/4 to 1/16.

One other setting is important. Many flash units have zoom capability, that is, the angle at which the flash is outputted varies with the zoom setting selected. Typically, you would select the zoom setting that matches the length of your lens. For example, if using a 35mm lens, select 35mm on the zoom-head of the flash. By varying the angle at

which the flash is outputted, it is possible to produce special effects.

Some flash units are more powerful than others. The power of a flash is represented by its Guide Number. A Guide Number is given by:

$$\text{Guide number} = \text{f-number (aperture)} \times \text{distance}$$

If you had the Guide Number and were looking for the maximum distance that you could use the flash, you could solve the equation below for the distance.

$$80 = 8 \text{ (for f-8)} \times ?$$

A flash unit with a higher guide number at the same aperture would mean that it is capable of lighting at a greater distance, therefore, a more powerful flash.

What happens when you open up the lens at ISOs that are 400 or higher? What happens when the combination of ISO and aperture produces a setting that is not on your chart? For these situations we would turn to constant or LED lighting.

NIH Camera Club Presents Travelogue for December 2018

BIRDS IN THE SEVEN CONTINENTS



**As photographed by Suzanne Taylor Dater
between 1998-2018**

**December 18, 8:00 pm, Community Room
Five Star Premier Residences, Chevy Chase**



Maryland Photography Alliance

MARK YOUR
CALENDAR!

2019 "Odyssey of Light" Seminar

Saturday, April 27, 2019

Notre Dame of Maryland University
4701 North Charles Street
Baltimore, MD 21210

Join a Canon Explorer of Light and a Pulitzer Prize Winning Photographer for a refreshing, fast-paced, information-packed ONE-DAY seminar



Ken Sklute has been honored as one of Canon's Explorers of Light, a designation shared by only 40 top photographers worldwide. During Ken's 41-year professional photography career he has accomplished the title of "Photographer of the Year" in 32 out of 41 years in the states of New York, Arizona and California. Topics: Landscape and Night Photography

Essdras Suarez is a Pulitzer prizewinning photographer and is the chief photographer for million eyez an internet-based platform that brings talented writers and photographers together. Essdras was a photojournalist for 20 years and he's had his images published in publications such as National Geographic, Time Magazine, New York Times, Washington Post to name a few. Topic: Street Photography



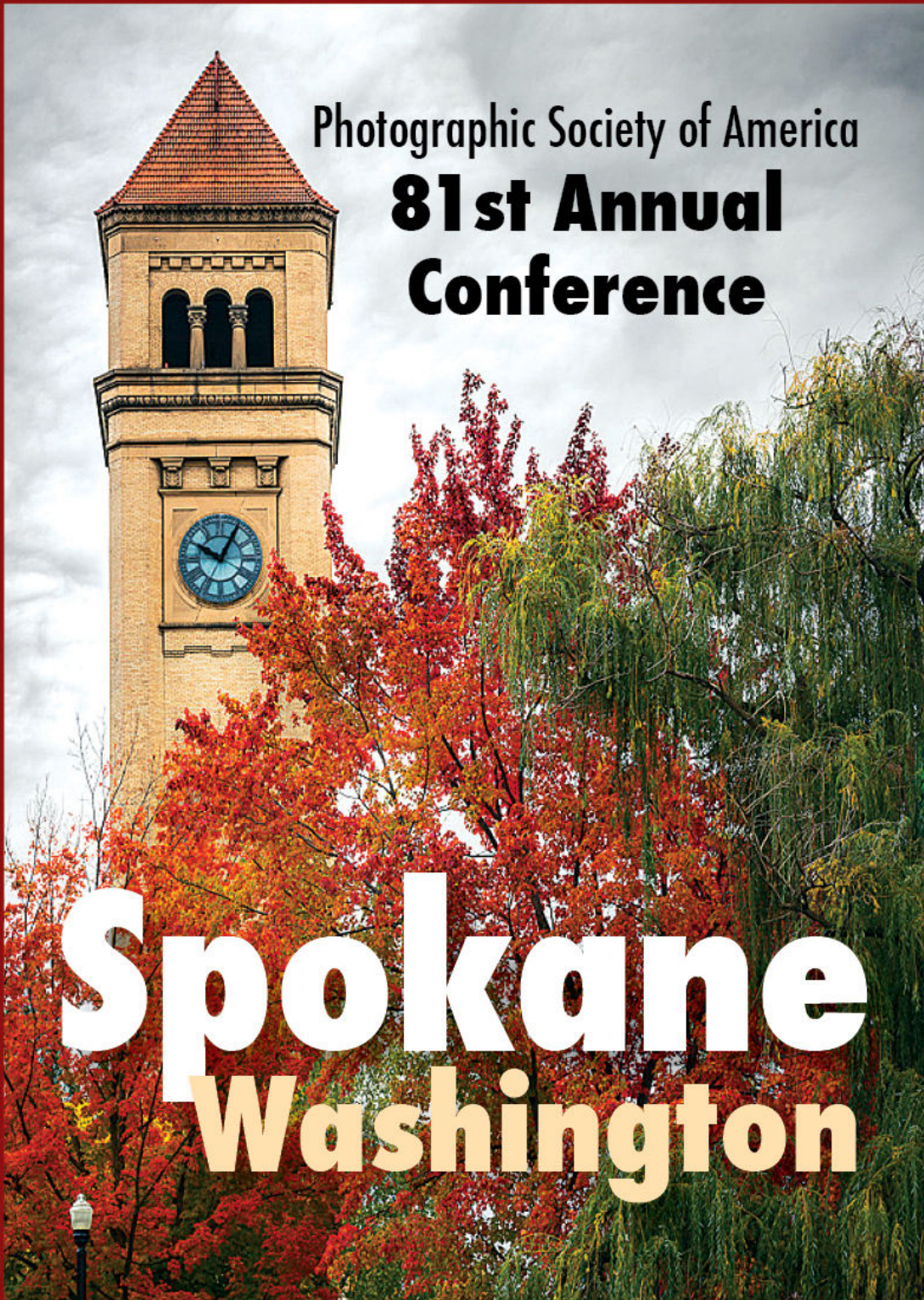
**Last year the "Odyssey of Light" Seminar sold out in 3 weeks!
If you want to be one of the first to know when tickets go on sale, let us know your email address**

The Maryland Photography Alliance (MPA) is an association of Maryland-based photography clubs dedicated to:

- Enhancing photography as a hobby.
- Making photographers aware of meetings and group-shooting opportunities.
- Providing mutual assistance to member clubs through pooling resources.

MPA conducts one competition, one gallery show, and one all-day seminar with a nationally known photographer every year.

MPA clubs promote education, provide information, create inspiration, and afford an opportunity for individual growth to those interested in photography.



Photographic Society of America
**81st Annual
Conference**

Spokane
Washington

September 25th – 28th 2019

Photo tours available Sept 22- Sept 25, 2019



The NIH
CAMERA
CLUB

Register on the NIHCC Website

Our Webmaster Jim Turner is working very hard to make our website awesome. If you haven't registered yet, please do! If you have any questions about the way things work, please feel free to e mail Jim and he will be able to help you with the easy



Silver Spring Camera Club

You might be interested to see what our sister club, the Silver Spring Camera Club, is up to! Here is a link to their site. They also publish a newsletter, Cable Release, and it is available here.

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



A Proud Member of the



**Maryland
Photography Alliance**

<https://www.mdphotoalliance.org/>

Several members of the NIH
CC have entered and done
well in past years.



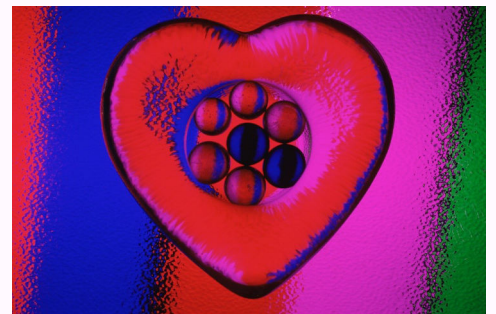
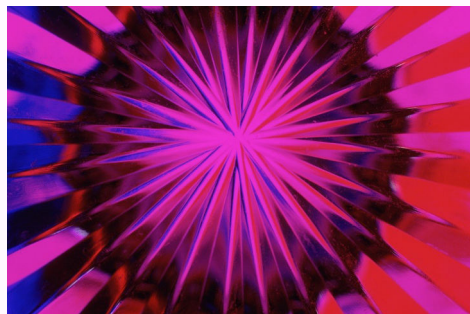
Call for Entries
Ninth Annual Joseph Miller Abstract Photography Exhibit
MAY 4 – MAY 27, 2019

The Joseph Miller Center for the Photographic Arts once again takes great pride in announcing its NINTH ANNUAL juried abstract exhibit. ALL interested photographers are invited to submit entries for this much anticipated spring event. Over the years, because of the influence these exhibits have had in encouraging and promoting abstract photography and due to their reputation, recent JM Abstract Exhibits have been attracting entries from international as well as national photographic artists. Whereas submissions to the First Annual JM Abstract Exhibit had been limited to local NVACC-related clubs, many current participants come from photographic groups outside the Greater Washington / Northern Virginia area or are non-affiliated / independent photographic artists.

The Joseph Miller Center will begin accepting entries for the upcoming NINTH ANNUAL EXHIBIT on Saturday, December 22, 2018.

The deadline for submissions will be Saturday, February 23, 2019.
A detailed PROSPECTUS containing all relevant information regarding the exhibit can be found on the Northern Virginia Alliance of Camera Clubs website at <http://NVACC.org>.

9th Annual Joseph Miller Abstract Photography Exhibit
Open from 12:00 pm - 5:00 pm Saturdays and Sundays in May.
2:00 pm 5 May 2019 - Abstract Artist's Reception.
12:00 pm - 5:00 pm Monday, 27 May 2019 - L



Club Officers and Committees

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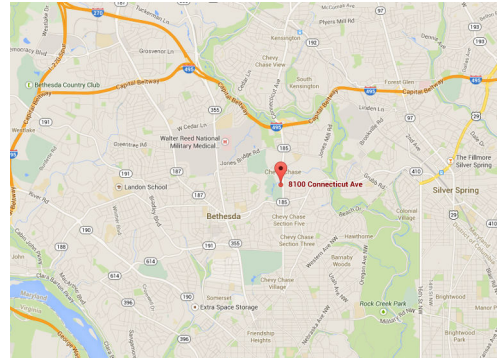
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This newsletter is published monthly by the
National Institutes of Health Camera Club,
Bethesda, MD.

Meeting Location

**Five Star Premier Residences
of Chevy Chase**
8100 Connecticut Avenue
Chevy Chase, MD 20815



**Competition Night: Second Tuesday
of the month**

About Our Club

The purpose of the NIH Camera Club is to encourage its members to increase their knowledge, skills, and enjoyment of photography by holding meetings, classes, lectures, and demonstrations of the various phases of photography, and conducting workshops, photographic competitions, and other photography related activities. **Membership is open to all, not just NIH employees.**

Meetings are normally held on the second Tuesday of each month from September through June at 7:00 P.M. at the Five Star Premier Residences on Connecticut Avenue in Chevy Chase, MD. Special events will be held at The FAES Social and Academic Center 9101 Old Georgetown Road, Bethesda, MD 20814

Complete membership form (find on the web site and attached to each newsletter or pick up at a meeting). Please note that you must be a member to compete in the monthly competitions.

Mail membership form and check to the Treasurer:
Stan Collyer 8817 Belmont Road Potomac, MD 20854 or submit at a regular meeting.
You do not have to work at NIH to join the club.

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MEMBERSHIP APPLICATION and RENEWAL FORM

National Institutes of Health Camera Club (NIHCC)

Membership in the NIH Camera Club historically consisted of current and former NIH employees and their families. The club is now open to anyone who has an interest in photography. The Treasurer collects Camera Club dues in September.

DATE: _____

NAME: _____

HOME or WORK ADDRESS: _____

PHONE #: HOME _____ CELL _____ WORK _____

E-MAIL ADDRESS _____

FEES (please check the appropriate line(s):

\$__ Single membership: \$40

\$__ Family membership (Family members must live in same household):

2 family members: \$64 3 family members: \$88

TOTAL AMOUNT PAID \$ _____ Cash ___ Check # _____

MAKE CHECKS PAYABLE TO: NIH Camera Club

SEND TO: Stan Collyer, Treasurer
8817 Belmart Road
Potomac, MD 20854
H-301-299-6955

Please indicate how you would like to be involved in NIH Camera Club activities:

- | | |
|--|---|
| <input type="checkbox"/> Help find program speakers/judges | <input type="checkbox"/> Assist with field trips or workshops |
| <input type="checkbox"/> Assist with bi-annual and other social events | <input type="checkbox"/> Help with educational activities |
| <input type="checkbox"/> Help to welcome new members | <input type="checkbox"/> Help with club outreach activities |
| <input type="checkbox"/> Help with club exhibitions | |
| <input type="checkbox"/> Other _____ | |

WAIVER

I hold the NIH Camera Club (NIHCC) and each member of NIHCC, individually and collectively, blameless for any injury that may occur to me or my guests, or my property while participating in any NIHCC activity or event.

Print Name

Signature

Date