

POPULAR PHOTOGRAPHY



WHICH ONE
WILL BE 2015
CAMERA
OF THE YEAR?



HOW TO MAKE GREAT PICTURES

ARCTIC ADVENTURE

How to capture
all the drama
and beauty of
the frozen north



Projects: Find Your
Creative Voice

6 Easy Steps for
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AMY TOENSING
PHOTOGRAPHED BY TIM MANTOANI

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The right white balance doesn't always mean a *neutral* white balance. Learn how getting creative with color temperature can nudge your images closer to perfection. *By Debbie Grossman*



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To become better photographers, we must push ourselves. One way to do that? Shoot photo essays about subjects or locations that mean the world to you. Here's how the pros do it. *By Peter Kolonia*

COVERS: BRIAN KLUTCH (CAMERAS); JON CORNFORTH (WALRUS); THIS PAGE: SEBASTIAN COPELAND (ARCTIC SCENE); RACHEL HULIN (FLYING CHILD); BRIAN KLUTCH (CAMERAS); CHRIS TENNANT (MISTY LANDSCAPE); NEXT PAGE: DUSTIN SNIPES (ATHLETE); ALINE SMITHSON (STARLET).

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Who Will Win?

Drumroll, please!
As *Popular Photography's* editors wrestle with the annual question of which model will win its coveted Camera of the Year distinction, we invite you to join us in the fray. Compare and contrast these five finalists to determine which *you* feel should be king of the camera hill. *By Philip Ryan*

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Featured Photo By Chris Burkard
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PETER HURLEY

A Fresh Start

I've never believed much in New Year's resolutions. Year after year, I find myself making the same vows—which means I usually fail to stick to them.

For instance, some of you may remember a promise I made to scan and share my family's old photos. Still not done. A suitcase stuffed with my dad's slides sits waiting.

But optimism reigns, at least as the New Year begins. So in 2016 I swear I will scan all those old photos. But I have another resolution: Inspired by Peter Kolonia's feature, "Find Your Voice" (page 64), I'm going to start a fresh photo project. I won't tell you what it is now, but I plan to follow his advice to shoot a subject close to home and show my work in progress to a few helpful critics.

I'm not the only editor here making photographic resolutions. "Mine is to get all my old photos into my new catalog and backup system. Keeping everything where I can find it down the road and safe from data catastrophes seems pretty important," says Stan Horaczek. "My other one is to not let photos sit on my memory cards or on my computer without finishing and sharing them."

Dealing with archives is on many a list. Jeanette D. Moses plans to scan the film she's shot in the past year, then she'll rearrange her older images in Adobe Photoshop Lightroom to match her new system. Peter Kolonia wants to scan his favorite negatives of family and friends, to convert his parents' home videos to DVDs from VCR tapes, and to organize the thousands of images he's uploaded to Google Photos. Another resolution? "To finish my wedding album," he says. "I was married four years ago."

Similarly, Debbie Grossman resolves to make books. "I have this fantasy that I will make a photo book for every year, and so far I only have 2011. Yikes!" She also wants to "use a camera that's not my phone at least once a week."

Offers Adam Ryder, "I plan to consolidate the past several years' projects onto one portable drive and ensure it's mirrored on my home drive and backup, then put extra drives in storage as backups." He also wants to photograph more, looking for "images I can make at home on a table-top for when it's too cold to shoot outside."

As I learned from our projects story, focusing on a truly personal subject, with a lot of emotional resonance, can have profound repercussions. So I look forward to seeing how Philip Ryan fulfills his resolution to "complete, or at least start, two projects in honor of my Grandmother Josephine."

What are your photographic resolutions for 2016? Write to us at PopPhoto@bonniercorp.com or join the conversation on our Facebook page. We'll be asking about it there in the next few weeks and hope to hear from you!

Miriam Leuchter



NEWSSTAND Five groundbreakers, shot by Brian Klutch, vie to be our Camera of the Year, the model that best refined or redefined photography in 2015. Find out more on page 56.

SUBSCRIBER With tips from Sebastian Copeland and Jon Cornforth, who snapped this walrus in Norway, your Arctic adventure begins on page 49.

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SHOWCASE PHOTOGRAPH BY RODNEY LOUGH JR.



RODNEY LOUGH JR.



All in the Timing

Down to his last sheet of 8x10 Fujichrome Astia 100F film, Rodney Lough Jr. was about to capture one of the geysers in the background of this Yellowstone National Park scene, which was going off full-force. Then he heard a spurt to his right. He swiftly moved his tripod-mounted Arca Swiss 8x10 F-line with a 300mm lens (about a 40mm equivalent on this large-format camera) back a few feet, recomposed his shot, and managed to catch the peak of both the near geyser and the sunset. (We cropped the image, which he calls "Lion's Heart," slightly at top and bottom to better fit this page. You can see the original at rodneyloughjr.com.) His spur-of-the-moment exposure was 4 sec at f/64.5. Lough opines on truth in nature photography in this month's Point of View column, page 22.

NEXT

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THE HOTTEST NEW STUFF AND THE TECH TRENDS BEHIND IT

JUST OUT

GIFT PICKS

Benissimo! ▶

ZENELLI CARBON ZX GIMBAL HEAD

The Ferrari of gimbal heads claims that its new carbon fiber model, at just over 2 pounds, is the lightest of its kind. Rated to hold up to 154 pounds of equipment, this is no featherweight, though. Panorama enthusiasts should dig its central focal-point alignment and built-in spirit level. **\$1,480, street; zenelli.it**

Stick 'Em Up ▶

PODO CAMERA

Leave your regular compact at home and stick one of these adhesive 8MP cameras on virtually any surface for group photos or selfies. With eight LEDs ringing its lens and offering 720p video, the PODO won't miss out on the action. Its 1.8-ounce body stores up to 4GB of fun, and it comes in blue, red, black, or white. **\$99, direct; podolabs.com**



Less is More ▶

ADOBE PHOTOSHOP ELEMENTS 14

Not ready to pull the trigger on a Photoshop subscription? The latest version of Adobe's more basic Elements includes some of the perks of the full-blown Photoshop CC for a fraction of the price. Camera shake reduction, haze removal, and application-based resizing all contribute to beefing up this once-simple app. For PC and Mac. **\$90, download; adobe.com**



TELE TOTER



FULL VIEW

◀ Wide Appeal

ZEISS LOXIA 21MM F/2.8

Rounding out its full-frame Loxia line for Sony E-mount ILCs, Zeiss's newest is aimed at Sony Alpha 7 system users. A fully weather-sealed metal housing encloses a wide-angle optic that includes four low-dispersion elements and one aspherical one, designed to reduce chromatic fringing. Video shooters will delight in its "de-clickable" (smoothly adjusting) aperture. **\$1,499, street; zeiss.com**

MYTH:
Your new OM-D camera
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Image shot with the Olympus OM-D E-M1 and an M.Zuiko ED 12-40mm f2.8 PRO lens
by Olympus Trailblazer Peter Baumgarten.



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\$399, street; plustek.com

F.Y.I.

VOIGTLÄNDER, the venerable lens-maker, plans to release a new line of Sony E-mount glass this spring. All in the ultrawide-angle range, a 10mm and 12 mm (both f/5.6) and a 15mm f/4.5 have been optimized for full-frame Alpha cameras. Video enthusiasts will be happy to know that all three allow for stepless—or de-clicked—aperture control.

ZEISS announced recently that it will roll out a new addition to its high-end Otus line sometime this spring. Rounding out the wide-angle end of the spectrum, which so far includes a 55mm and 85mm, its newest will be a 28mm f/1.4. No word yet on how much it might cost, but it's a safe bet that you won't be picking one up for cheap.



Fast Glass

ROKINON 21MM F/1.4

Exclusively for the crop-sensor crowd—in mounts for Canon, Fujifilm, Micro Four Thirds (Olympus and Panasonic), and Sony—this wide-angle lens should deliver nice bokeh when stopped down courtesy of its rounded, nine-blade aperture. It's manual focus only, but there's nothing low-tech about its optical design: One extra low-dispersion and three aspherical elements work to fight chromatic aberration. **\$499, street; rokinon.com**

New Tonemapper MACPHUN AURORA HDR

Photographer Trey Ratcliff worked with Macphun to create this Mac-only HDR editing program. Aurora works with Lightroom, Photoshop, and Aperture as a plug-in or by itself. Layers, masking, brush tools, one-click presets and multiple file support make tonemapping simple. **\$90, download; aurorahdr.com**



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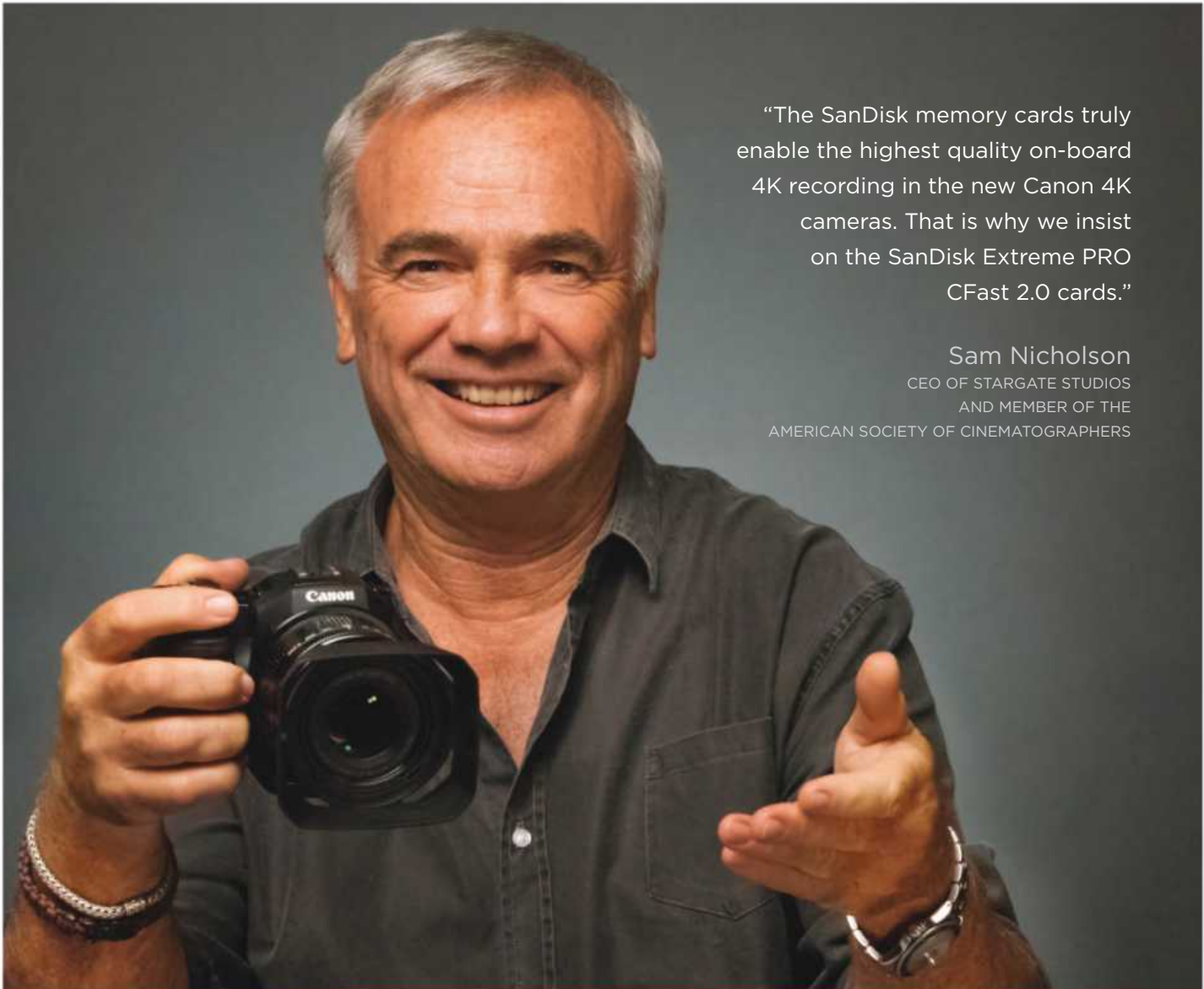
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THE LOWDOWN

AN INDUSTRY-WIDE survey conducted by the Professional Photographers of America (PPA) reveals that 67 percent of pro shooters have been the victim of copyright infringement. However, the study also revealed that 96% of pros don't regularly register copyrights even though all but 1% agreed that copyright protection is crucial to their career. The PPA urges pros to register all of their work (copyright.gov) and to mark all their images with copyright notices.



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BIGGER PICTURE

A new pro-level inkjet printer



IF THE RED line decorating Canon's new imagePROGRAF Pro-1000 reminds you of the company's L-series lenses, it's no accident. Canon clearly wants to remind photographers who trust its DSLR systems that photos aren't finished until they're printed. The Pro-1000, which prints on paper sheets up to 17 inches wide, offers some plusses for small studios and serious enthusiasts. Weighing 70 pounds and selling for \$1,300 (street), it's heavier and pricier than a desktop inkjet but delivers results that aren't possible with smaller printers such as Canon's 13-inch Pixma Pro-1.

The new head has 18,423 nozzles (50 percent more than the Pro-1) and can lay down 32 million droplets of ink per second. Canon rolled out a new 12-tank Lucia Pro inkset, too. Along with the usual pigments

STANDOUT SPECS

MAXIMUM SHEET SIZE: Standard cut sheets, 17x22 in.; custom sheets, 17x129 in.

INKSET: 11 pigment-based inks, plus Chroma Optimizer; 80ml cartridges

DIMENSIONS: 28.5x11.2x17.0 in. (closed); 70.5 lbs

PRICE: \$1,300, street; replacement inks, \$60; Chroma Optimizer, \$55

INFO: usa.canon.com

(cyan, photo cyan, magenta, photo magenta, yellow, red, blue, gray, photo gray, photo black, and matte black), it has a Chroma Optimizer to reduce metamerism. Nozzles dedicated to each black ink will save you money and time by not having to swap cartridges.

Other features are designed to conserve both ink and media. Taking some time off from the studio? Put the Pro-1000 on standby mode and it will periodically agitate the ink tanks and warm up the print head, keeping the precious ink from drying up and clogging nozzles. For when some nozzles do stop up, Canon has devised a clog-detection system: The printer fires backup nozzles to prevent drop-outs during printing.

The Pro-1000 has a built-in color-density sensor and calibration function to keep hues consistent

over time. And its image processor works with 1GB of internal memory to chew through large image queues.

Alas, it does not accept roll paper, but it takes sheets up to 10.75 feet long for panoramas. Two feeds let you use thicker papers; a new vacuum feed and skew sensor usher media through without damage.

On a press trip hosted by Canon, I made several prints on the Pro-1000 and was taken aback by its speed and silence. A few times I had to put a hand on it to check that it was on. Considering the print quality, it was remarkably fast, making a 17x22-inch at the highest resolution in just 6 minutes.

We recently got a full production sample of the Pro-1000 into the *Popular Photography* Test Lab, so check back for a full review.

—Adam Ryder

α

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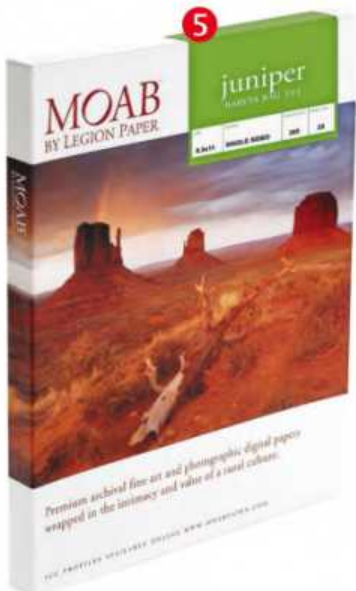


Not all features listed relate to each camera. Please check individual camera specifications for more details.

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BARYTA DAY

REMEMBER THE RICH tonal range and texture of fiber-based darkroom photo paper? A key ingredient, Baryta (also called barium sulfate), helps turn that regular fine-art paper into a bright substrate. The same stuff that helps inkjet paper makers bring such qualities to digital prints. Here are six, some new, that we think are worth a try. (All street prices are for a 25-count box of 8.5x11-inch sheets.)
—Adam Ryder



1 Red River San Gabriel SemiGloss Fiber \$24

Red River released this Baryta paper a few years ago with the aim of making high-end fiber affordable. A lightly textured surface and slightly warm tonality give it a natural look. **HOT:** It contains no optical brightener agents (“OBAs”). **NOT:** Unless you live in Dallas, you’ll have to order online—Red River doesn’t do retail sales. redrivercatalog.com

2 Innova FibaPrint Baryta \$28

The newcomer of the bunch, Innova has been quick to respond to the latest trends in inkjet paper. It offers an astounding 11 variations of Baryta paper—this one is its flagship. **HOT:** With a D-max rating of 2.7, the surface promises great contrast and rich blacks. **NOT:** Its glossy surface is easy to scratch, so use cotton gloves when handling it. innovaart.com

3 Sihl Masterclass Satin Baryta \$29

The group of companies that make this paper trace their roots to 15th century Switzerland, as the quality attests. Designed for black-and-white, it offers excellent contrast and tonal differentiation. **HOT:** A micro-porous coating lets it dry quickly. **NOT:** Looking for ultra-heavyweight media? You might not like its 290 gsm thickness. sihlusa.com

4 Canson Infinity Baryta \$29

Made from 100-percent alpha-cellulose plant fibers, this acid-free Baryta paper is, at 310 gsm, one of the thickest we sampled. Its satin finish is unusual for this class and gives the surface a smoother feel. **HOT:** Dries immediately and is available at up to 50 inches wide. **NOT:** The less-textured finish feels a bit like older RC darkroom papers—not to everyone’s taste. canson-infinity.com

5 Moab Juniper Baryta Cotton Rag \$34

Legion’s venerable Moab brand is just now releasing a Baryta option. Unlike its competitors, this one is a cotton-based rag paper. **HOT:** Because it’s made from cotton instead of from wood, its fibers are shorter, allowing the paper to bend easily while still keeping its thickness at 305 gsm. **NOT:** Some photographers might not like the way light breaks on its textured but glossy surface. moabpaper.com

6 Hahnemühle FineArt Baryta Satin \$37

A recognized name in paper for more than 400 years, Hahnemühle, brings its expertise to the inkjet world with its third Baryta release. The mild satin finish cuts down on the traditionally glossy surface seen in similar papers while still retaining some visible texture. **HOT:** This is the first Hahnemühle Baryta without optical brighteners. **NOT:** If you’re only experimenting, you may find it pricey. hahnemuehle.com

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Your Best
Shot P.28

CONVERSATION, INSPIRATION, CONTESTS, AND YOUR QUESTIONS ANSWERED



MY PROJECT

BRIGHT STARS

An independent Hollywood remake

GROWING UP in Los Angeles and working her first retail job on the corner of Hollywood and Vine, Aline Smithson became enamored with the Technicolor portrayals of Hollywood's most glamorous

celebrities in the films of the 1940s and '50s. The idea for her series *Hollywood at Home* began when she started to question how much of a movie star's image was based on the movies and how much was solely the styling and posing of their still photographs.

Though she originally entered

the art world because of her passion for and education in abstract painting, Smithson was transformed into a photographer the moment she picked up an old family Rolleiflex and some Kodak Portra film. "A light bulb went off in my head as soon as I started shooting," she recalls.



**Aline
Smithson**
A U.C. Santa
Barbara graduate,
Smithson originally
pursued a career as
an abstract painter.



ALINE SMITHSON (13)

SELECTIONS FROM HOLLYWOOD AT HOME

Smithson regularly expands her series. "I want to continue making work for all of my projects," she says. "When someone is a good subject, why not?"

Once she found her calling, Smithson needed to find her movie stars to glamorize. To prove that with the right clothing, lighting, and posing anyone can be elevated to celebrity status, she enlisted friends and even strangers to be her subjects.

Once she realized how easily the everyday person can become an apparent celebrity, her series

expanded rapidly and she kept a constant eye peeled for future starlets to shoot. "Once, I was in the hospital and one of my nurses became a subject for me," she says. "Everyone always loves the results."

Smithson still shoots with the same fixed-lens Rolleiflex and takes fewer than a dozen shots for each subject. "The makeup

and costumes are all me, and I work really fast," she says of the varied and unique shots.

Whether she supplies the costumes or her subjects bring their own, the clothing and scenery always come second to the person in the frame. "Really for me it is about capturing the person in a beautiful way," Smithson says. —Sara Cravatts

THE IMPLICIT LIE



When nature images are manipulated

A PHOTOGRAPHER, in a recent conversation we had about shooting landscapes and wilderness images, suggested that photographers have no responsibility to disclose whether their art reflects the reality of the scene as they saw it. Not even when it has been altered to appear realistic, and an unsuspecting viewer could think the scene accurate. His idea is that creativity is what photography is all about.

He is not alone. Many landscape images that I see today are highly manipulated but stay just within the borders of believability. Others go so over the top, I wonder how anyone could believe them. Skies photographed from a different season or time of night and composited in. Trees added where they didn't grow. Colors of foliage altered dramatically. Such images do not represent the scene that was before the "artist" at the time the shutter was snapped.

But landscape and nature photography is inherently representative. The creative part comes from framing, not inventing, an exquisite composition. If photographers alter an image, do they have a responsibility to inform viewers explicitly? I believe they do.

For me, a photographer's silence is an implicit, nonverbal communication to viewers that what they are looking at is real, especially when it looks plausible. I have always adhered to this definition: *A lie is any communication given with the intent to deceive.* This communication could be verbal or nonverbal, implicit or explicit. Creating an image that skirts reality without disclosing that it is not is tantamount to deception. Certainly we all believe that if the photographer were to tell the viewer outright that the image depicts reality when it does not, the photographer would be lying. And no one likes being lied to, do they?

Many artist/photographers use an Ansel Adams quote to qualify their actions: "The negative is the

CAPTURING THE NATURAL WORLD Kurt Lawson photographed Rodney Lough Jr. and his Arca Swiss RL3d 4x5 camera modified to accept a Phase One IQ180 digital back, at sunrise along the shores of Mono Lake, California, during the filming of a training video series to be released soon.

About the Author

Based in Portland, Oregon, Rodney Lough Jr. specializes in bold views of wilderness landscapes. His work can be found in private galleries and in museums such as the Smithsonian Institution. See more at rodneyloughjr.com.

equivalent of the composer's score, and the print the performance." Remember, Adams was a landscape photographer; we can infer that he referred to this specific genre. He was of course referring to black-and-white, a highly interpretive form of photography. Yet when we look at any of his works, we find images that look natural within their context—either in black-and-white or in the limited amount of color photography that he created before his passing.

These artists either ignore or don't know Adams's other famous remark: "Not everyone trusts paintings, but people believe photographs." Viewers perceive the visual, nonverbal communication of landscape images as truthful representations of nature. So when a photograph is visually represented as reality but its deviation from it is not disclosed, viewers are, in a way, under assault. What's worse, they don't even know it.

So who is to be held accountable? The unsuspecting viewer or the photographer who knows but remains silent? I do not see how tricking viewers could ever be a good policy to employ, nor do I believe that it is good for the art form. Perhaps it's time we become explicit about the content—and manipulation—of images, explicit in our implicitness.

My goal has always been to get back to what I saw, not what I *wanted* to see. How I get there I don't care, but I want to be able to stand in front of anyone and be able to say, "That is what I saw," and not be lying about it.

I realize there is nothing that I can do to control what is happening. I'm not sure I would even if I could, since I strongly believe in a person's freedom to choose between right and wrong. But I needed to state my position and hope that you can respect my choice as I do yours. —Rodney Lough Jr.



These are the 1,197 eye movements a photographer made while obsessing over the details.

BECAUSE IT'S ALL ABOUT THE DETAILS.

To prove how pro photographers obsess over the details, we invited world-renowned photographer Joel Grimes to print one of his most stunning photographs and have it be scrutinized by his toughest critic – himself. Using eye-tracking technology, we mapped every single eye movement of his relentless attention to detail, ultimately proving how obsessed he really is.

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ASPEN HUES

A vibrant grove wins our prize

WHILE HIS career might be in finance, Jay Huang's real passion is photographing majestic landscapes. His interest in photography blossomed early when as a child he began shooting and exploring urban scenery with his parents. "Both of my parents are civil engineering professionals, so I have been taking photos with them of city and architectural subjects since I was a kid," Huang says, "But I became more serious in landscape and nature photography six years ago when my own kids grew up."

His newfound leisure time allowed for plenty of exploration, and Huang ventured five hours from his home in Pleasanton, California, to Bishop Creek Valley in the Eastern Sierra, the far side

ROAD TRIP
To photograph autumn color at just the right time of day, Jay Huang made the five-hour drive to Bishop, California, where he happened upon this group of aspen trees.

of the Sierra Nevada region of California, on the hunt for the perfect autumn scene. "After I finished my sunrise shooting at North Lake in Bishop, I scouted the surrounding area and came across this patch of aspen trees in full fall colors," Huang recalls. "The dark markings in the main chunk of these aspens caught my eye, and I felt like I was chatting with a group of tree geniuses."

The white, wavy trunks with sharp black details made for a visually exciting contrast against the fiery yellow leaves and bright greenery on the forest floor.

Huang relied solely on the beautiful natural light blanketing the group of trees to capture the shot with his Nikon D800 and 50mm f/1.8G Nikkor lens at an exposure

of 1.4 sec at f/14 and ISO 100. He later made small adjustments in Adobe Photoshop CC.

"I enjoy photographing the stunning, grand scenes in the sunrise and sunset peak times as a landscape enthusiast," Huang says, "but once in a while I also want to try some heart-touching, abstract photos, and this is one of them."

Our judges found his stirring composition the best of a strong group of contenders in October's Photo Challenge. —Sara Cravatts

NEXT PHOTO CHALLENGE In this month's You Can Do It on page 34, photographer Sue Tallon shares her tips for a fresh take on the still life. Send us your best fruit or vegetable shot against a white background by January 31, and you could win \$100. Read the rules at PopPhoto.com/contests.



Introducing Blackmagic URSA Mini, the lightweight Super 35 4.6K digital film camera with 15 stops of dynamic range!

Introducing URSA Mini, a handheld Super 35 digital film camera with an incredible 4.6K image sensor, global shutter and a massive 15 stops of dynamic range! The super compact and lightweight design is perfectly balanced, making it comfortable enough for all day shooting. URSA Mini lets you shoot at up to 60fps, features a 5" foldout viewfinder, dual RAW and ProRes recorders, and more!

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You never have to stop recording because URSA Mini features two CFast 2.0 recorders! When one card is full, recording automatically continues onto the next. URSA Mini uses the latest, incredibly fast CFast 2.0 technology for recording speeds up to 350 MB/s. Wide dynamic range images are saved as 12-bit RAW files, which are perfect for high end grading and effects work, or as broadcast quality ProRes, for easy post production workflows with minimum storage requirements!



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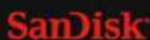
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JIM COLEMAN (CHURCH), JERRE COLEMAN (PORTRAIT)

WORK THE SCENE “The Mentors told me to do 360-degree evaluations of a scene, because the best picture may be behind you. That was exactly the case with this scene,” says Jim Coleman.

LIGHT THE WAY

Find detail in all layers
 of a landscape

HUNTING FOR photo opportunities, Jim Coleman, a civil and environmental engineer from Coeur d’Alene, Idaho, and wife Jerre drove around the outskirts of Quebec City in advance of a Mentor Series exploration of that part of Canada. As the couple drove through the Saint Lawrence Seaway town of Les Éboulements, the beautiful late-afternoon light convinced them that a great sunset was in the offing. Their quest? Finding a suitable foreground for it.

This church and the clouds above made them stop. “From the front it was very plain. The back of the church, however, was surrounded by a well-kept cemetery,” Coleman remembers. After hiking around the structure and assaying the graveyard, they had second thoughts.

“Looking west over the gravestones toward the setting sun, I realized that the surrounding area wasn’t going to work for the picture that I had in mind,” says Coleman. So they turned around to head back to the car—and saw the picture. He was struck by the soft, strafing light, the green grass, deeply blue sky, the shadows cast by the gravestones, and the church’s unique

architecture in the distance.

One of the lessons he’s taken from his five Mentor Series trips came into play here: A good landscape needs foreground, middle-ground, and background interest. The cemetery had all three. “All parts of the scene seemed to jump out at me,” he recalls. There was character in the gravestones, color in the grass and sky, and structure in the church—a perfect recipe.

Another lesson that came into play: Follow the light. That’s what the process of photography is all about. If a landscape’s lighting isn’t good, your picture probably won’t be either.

For this avid shooter, photography is more than pictures. “Carrying a camera forces me to really look at a scene. The geology, buildings, history, and people are fascinating,” he says. Photography serves as a gateway to understanding, as well as seeing, the world.

—Peter Kolonia



**Jim
 Coleman**

This engineer from Idaho hopes to continue photographing North American destinations—and maybe Africa.

DUE PROCESS

In "Film Rules" (November 2015), Rule 7 is incorrect, at least in Upstate New York. Rite Aid stopped photo processing (film and digital) at least six years ago. Target and Walmart stopped in the spring of 2012. The only local place that still does film processing is Walgreens.

Dave Hoffmann
Gansevoort, NY

WHY DO your camera tests use "RAW files converted to TIFFs using the software that comes with the camera," as stated in your Sony A7R II review (November)? I process RAW files using Adobe Photoshop and Lightroom. What I want is the best camera for producing RAW files.

Tom Reese
Atlanta, GA

EDITOR'S NOTE: RAW files must be converted to be read, and TIFFs preserve the most file data. Using the included software lets us test what people get when they buy the camera; it may be the only way new users (including us) can convert their RAW files—we often test cameras before Adobe has updated for them. Also, we use default settings to express what the camera maker believes to be optimum performance. But, of course, you should process RAW files in whatever way suits you.

IN "TOP DROPS" (You Can Do It, November), you talk about "reflecting" a subject "in hundreds of droplets." I see this misnomer often. Those images in the water droplets are not reflections but rather refractions, and the words are not interchangeable. A mirror reflects light; a lens (which is what these droplets are) refracts light.

Richard Bauman
West Covina, CA

POPULAR PHOTOGRAPHY

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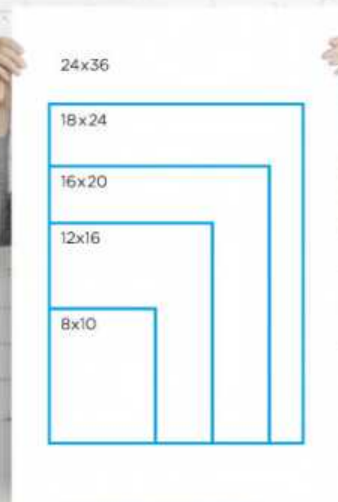
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YOUR BEST SHOT

This month's winners took high-impact images



3rd Place \$100 Prize

**BOB LARSON, 50, BEHAVIORAL HEALTH
TECH, PRESCOTT, AZ**

Bob Larson proved that art can be made anywhere when he captured this high-contrast photograph in a parking lot in downtown Prescott, Arizona. When business brought him to the garage one day, he noticed that the light was just right. "I love finding abstract beauty in something as innocuous as a parking garage," he says. The setting sun upped the contrast, and Larson got his shot; he later converted to black-and-white to boost its graphic appeal. **TECH INFO:** Sony Alpha 7 with 14mm manual Rokinon lens; exposure, 1/125 sec at f/11, ISO 100. RAW and b&w conversion and basic adjustments in Phase One Capture One Pro, Adobe Photoshop CC, and NIK Silver Efex Pro 2.



2nd Place \$200 Prize

**MIKE SWARTZ, 38, WEB DEVELOPER,
SEATTLE, WA**

While this photo is one of spontaneous action, the preparation for it was anything but. Mike Swartz studied the art of lighting water droplets before this shoot, and set up a tent in his driveway with someone on hand to splash his subject with water as he shot. Swartz used a Canon Speedlite 430EX II flash, a white shoot-through umbrella, a 4-foot LED shop light, and a Cowboy Studio remote trigger to freeze the droplets in mid-air. "When he looked toward the light, I knew it was really good," the photographer recalls. **TECH INFO:** Canon EOS 5D Mark II with 24-70mm f/4L Canon EF IS USM lens and B+W UV filter and Canon Speedlite 430 EX II flash and 4-foot LED; exposure, 1/160 sec at f/22, ISO 400. Basic adjustments in Photoshop Lightroom CC.

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1st Place \$300 Prize

**SUSAN TAYLOR,
60, FINE-ART
LANDSCAPE
& NATURE
PHOTOGRAPHER,
SAN FRANCISCO, CA**

When it comes to a lightening storm over Yosemite National Park, Susan Taylor can't resist. "I will drop what I'm doing, pack up my camera gear in minutes and drive my well-stocked truck to the mountains in a heartbeat," she says. When she camped out at Tunnel View in Yosemite on one particularly stormy night, she awoke near dawn and took advantage of her sleeplessness. When she aimed her camera for the shot, lightening struck at the perfect moment. "I didn't expect to capture a dramatic flash during my first attempt," she says, "It was once in a lifetime!"

TECH INFO: Canon EOS 5Ds R with a 16–35mm f/2.8L Canon EF II USM lens at 16mm, mounted on an Induro tripod and Really Right Stuff BH-55 head; exposure 10 sec at f/22, ISO 100. Edited in Lightroom 6.

THE REAL REASON WE NEED TO LEARN HOW TO USE OUR CAMERA GEAR



We talk to many people who look at learning their equipment the wrong way. They're not getting closer to the pictures they want to produce. If anything, they're getting further away. These aspiring photographers often say they want to know how to use all the buttons on their camera. They think there must be some settings, buried somewhere in all those menus, that will somehow unlock great images. They believe if they only knew what those features were, they'd finally start creating the high-quality results they see from the pros.

NOW HERE'S THE TRUTH

Do you really want to know which settings the pros use to go from good to great? The good news is there are just three of them. Shutter speed, aperture and ISO. That's it. It's those three features. All the other knobs, buttons, menus, and dials are nice to have, but they don't impact the quality of your photography nearly as much.

IT'S A LOT LIKE YOUR CAR

When it comes to settings, your camera is very similar to a modern car. Your car has a screen or two with menus, and there are lots of controls for things that have nothing to do with driving. These knobs and dials affect everything from air conditioning to the audio system. But in the end, it's only three things that you actually use to drive a car – the steering wheel, the gas pedal and the brake.

Everything else in your car is just extra stuff to make the experience more enjoyable. But you don't need any of those things to make your car go. You just need those main three features for a car to do what it is designed to do and drive you from point A to point B. Similarly, your camera only needs shutter speed, aperture and ISO.

A LEVEL PLAYING FIELD

The pros have the same three controls that you do. They don't have secret controls only they can access. We all create pictures the same

way, often using the very same equipment. But somehow the pros always seem to look more professional. It's funny how that happens.

PROS KNOW THEIR GEAR

Professional photographers understand exposure. They get how shutter speed, aperture, and ISO all work together. They also know their camera inside and out. They've taken the time to learn exactly which features make things easier and which to ignore. They don't have to think about their gear when they're shooting.

The camera isn't a tool that pro photographers are figuring out during shoots. It's not something they're tweaking and changing arbitrarily in a search for answers. When you're not thinking about your camera, you're thinking about the shot, and all the technical stuff fades into the background. Now you're in the moment – capturing images and being creative. The controls aren't on your mind at all.

WHAT PROS ARE THINKING

Veteran camera jockeys are focused on the stuff that matters. At the end of the day, photography comes down to two main factors. What you point your camera at and how you aim it. Is your subject beautiful, amazing, intriguing, captivating, fascinating, or just plain interesting? Does your composition do your subject justice for all that it is?

LEARNING THESE THINGS

You don't go it alone. You need help to get there. We all do. None of us got where we are by ourselves. It takes a partner. It takes a community. You need someone to help you get to a place where you can stop thinking about working your camera and start weaving stunning visuals together.

This requires someone you can trust – someone who can teach you, in plain English, everything you need to know about the process. Together,

you can make the kind of creations you know you're capable of. It's all about finding a guide to show you the path to follow along your journey.

There are so many that are struggling with their photography. They're frustrated. They're not growing as fast as they want to. They're having a hard time going it alone. But they're not alone. That's why we created KelbyOne – an online training community that teaches photography, Photoshop and Lightroom to creative people, just like you, all over the world.

Founded by award-winning author, photographer, and educator Scott Kelby – it brings together a world-class team of nothing but the best, most passionate, and most talented educators. Their goal is to empower you to take the photos you've always dreamed of.

The teachers at KelbyOne are absolute experts in making the hard stuff really easy. They've touched the lives and careers of photographers all across the globe by giving them the direct and concise training they need to take their craft to the next level.

Many people feel like they can learn anything if someone talks to them candidly and shows them how it's done. If that sounds like you and you want to learn your camera inside and out – along with everything else in the world of photography – then it's time to check out KelbyOne. They cover all kinds of stuff like lighting, posing, composition, post-processing and more.

You can sign up for 30 days to start and it's just \$19.95. You'll have a full month of full access to every class, every instructor and every technique. All day. Every day. Imagine what you could learn in just 30 days of fueling your creativity at KelbyOne.com. 📸



GRAB LIFE BY THE CAMERA.

A picture is just a picture. Until it's not. Because a picture can reach a point where it's worth more than any number of words. It doesn't matter how you try to describe it. You can talk all you want. At the end of the day, some pictures are just meant to leave you speechless. Take those pictures. Fuel your creativity.

HOW

Find the lovely in
Los Angeles P.38

Pick a picture's
best version P.40

Out-light the
sun P.44

EXPERT TIPS AND TECHNIQUES FOR BETTER PHOTOS

YOU CAN DO IT

RED ZONE

Try a raw still life

LOOKING FOR a new still life project? Try shooting raw fruits or vegetables. They're readily available, can be beautiful, cost little, and—unlike cooked or frozen food—they can hold their shape, color, and attractiveness for days or even weeks at a time. And you can still eat them when the shoot is over.

"The best food photography starts with the subject itself," says Sue Tallon, the San Francisco-based pro who shot this tomato with basil. "I didn't decide one day that I wanted to shoot a cool picture of a tomato. Instead, I saw the tomato and more importantly

SUE TALLON (TOMATO)



its wonderful, wiry stems and knew immediately that I had to photograph it.”

The takeaway? Don’t start your still life project until you’re inspired by a subject with the right combination of form, color, and character. Find a fruit or vegetable that you want to immortalize, and you’re ready to start.

“If you’re new to still life photography, I suggest that you keep it simple,” says Tallon. “Focus on beautiful things and don’t clutter the image with unimportant objects. Pick a

A STUDY IN CONTRASTS

This still life seems simple, but it is pictorially complex: Its reds and greens are opposites—warm- and cool-toned—and the subject is both angular and round.

TECH DATA

Tallon used a tripod-mounted Canon EOS-1Ds Mark II and 100mm f/2.8L Canon EF IS USM macro lens.

simple subject and let everything else in the shot fall away.”

Also, pay attention to your lighting, says Tallon. “Light your food to produce nice reflections off its shiny surfaces.” Light from above to help suggest your subject’s shape. “Use window light at first to get the hang of what makes beautiful light. Then figure out what mood you want: dark and moody with deep soft shadows, or bright and blown out with washed out highlights and very open shadow areas. You have to learn how to recognize beautiful light before you can make it,” says the photographer. —Peter Kolonia

Step 1

Source your subjects. Visit the best food markets and look long and hard for the right specimens. “Some fruits and vegetables have real personality or something that feels particularly interesting,” says Tallon. “That’s what you’re looking for. This tomato had a voluptuous shape and more importantly that beautiful stem! It reminded me of a Tim Burton character—all wiry and awkward.”

Step 2

Gather your gear. Almost any DSLR or ILC and macro lens will do. To add a flattering sense of compression, use a 100mm or 180mm macro. If you want to exaggerate the roundness of a fruit or vegetable, a wider macro (i.e., 60mm) will do the trick.

Step 3

Build your set.

Place the camera so you’re shooting straight into the subject. As for lighting, simple window lighting will often work. Tallon, however, placed a strobe light in a softbox above the tomato to produce the white reflections, a back light to brighten the white background, and two fill lights in front to lighten shadows. “Unless you want to convey a dark or mysterious look, avoid dark shadows,” she says.

Step 4

Finesse your setup.

Tallon didn’t want the tomato to appear to be floating freely in space, but needed it to appear anchored to a surface. To give it that anchored feeling, she created reflections underneath the tomato with the help of a sheet of clear, highly reflective Plexiglas placed on her white tabletop.

Final Step

Set exposure, shoot, then edit.

Tallon wanted a fully sharp subject from front to back and so set a minimum lens aperture (f/22) for the shot. After shooting, she took her tomato into Adobe Photoshop CS6. “Postproduction was all about cleaning up the white background to make it pure white with no detail and removing any dust, marks, or distracting details from my subject, while slightly pumping up its color and impact,” says Tallon.

THE GEAR

1 CANON EOS-1D X
Tallon shot with the Canon EOS-1Ds Mark II (since replaced by the 1D X, below). Its 16.7MP sensor captured all the detail she needed for her vegetable still life. **\$5,300, street**

2 CANON EF 100MM F/2.8L IS USM MACRO
“I positioned the lens so that I was shooting straight into the subject for an iconic point of view” says Tallon. **\$800, street**





OLD TIME

Keep the color but add some blur

JIM WOODSON'S pleasing scene along Bent Creek in Asheville, North Carolina, had an antique feel that I found lovely. When I opened the original file, though, I found that it already had a nice old-time look seeming more simple and authentic than Woodson's edited version.

At first glance, I thought the original file was very monochromatic, almost as though it had been captured in black-and-white. But a closer look revealed traces of green in the leaves and grass popping through the morning mist. I liked the picture more with these faint touches of color than I did as a strictly monochromatic rendering or the sepia tone the photographer chose. The weak color underscored the overcast charm of the landscape that morning, so I decided to keep the original color.

Next, a glance at the file's metadata



JIM WOODSON

told me that Woodson had used 1/60 sec for his shutter speed, and I couldn't help but wonder what the scene would have looked like if it had been taken at a full second or two. The creek's surface would have become a smooth blur, eliminating the distraction of its ripples and producing an overall simpler rendering of the scene.

I decided to try to replicate how the creek would have appeared if it had been captured with that longer, slower shutter speed. To do it, I applied a motion blur to the water

LAZY RIVER
Jim Woodson shot with the Nikon D700 and 24-85mm f/2.8-4D AF Nikkor, exposing for 1/60 sec at f/8, ISO 200.

in Adobe Photoshop CS6, angling it to parallel the shoreline and moving in the same direction that the water seemed to flow. Before doing that, however, I made a mask, selecting just the water so that the blur would be contained to that part of the scene. It simplified things in a way that didn't seem artificial, but natural. If I had been in Woodson's shoes, I probably would've shot a few brackets of the creek, experimenting with shutter speeds to find just the right water blur.

Total fix time: less than 5 minutes.

—Fiona Gardner

ESSENTIALS

DECODER

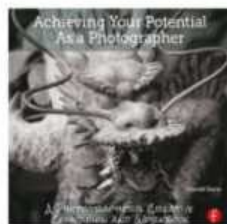
Confused by photography acronyms? Here are two you'll run into often.

CMOS—Complementary Metal-Oxide Semiconductor

The photo sensors of CMOS imaging chips convert light levels to corresponding voltages, which are then converted to digital data from which images are made. These chips are constructed using the CMOS technology used to make integrated circuits.

DNG—Digital Negative

Developed by Adobe, DNG image files constitute an unprocessed, lossless image format. Unlike most RAW formats, DNG is open, nonproprietary, and royalty-free. Due to its universal availability and the fact that it's supported by all Adobe image editing and organizing software, the DNG format is generally considered suitable for long-term archiving of digital images.



BY THE BOOK

ACHIEVING YOUR POTENTIAL AS A PHOTOGRAPHER
By Harold Davis; Focal Press, 2016 Quoted in our feature about personal projects (page 64), Harold Davis is a fine-art photographer and busy workshop leader. His book is an invaluable resource for those who want a more rigorous relationship with photography. Most interesting? Its 46-page workbook of creative exercises and projects. Among our favorites are his techniques for treating photography as play.

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Yang Lu (www.yangluphotography.com)



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CALIFORNIA COAST
Jesse Diamond shot this view of Santa Monica Beach using a Canon EOS 10D and 135mm f/2L Canon EF USM lens. His exposure was 1/350 sec at f/8, ISO 100.

STAR CITY

Explore the many faces of tinsel town

“LOS ANGELES is vast, and every section has a different look and feel,” says lifelong resident Jesse Diamond, who has been photographing there professionally for 15 years. “You can tell where you are in L.A. just by looking at your surroundings. Hollywood is very different than Malibu, which is very different than Beverly Hills.”

Hollywood Boulevard, says Diamond, offers an anything-goes circus-like atmosphere. “The boulevard itself has people dressed up in costumes, doing magic and animal tricks,” he says. Swarms of tourists make it easy to blend in with a camera. After dark he likes haunting the side streets along the boulevard, particularly between Highland Avenue and N. Western Avenue.

For a less familiar scene, head downtown. “About two blocks from City Hall are the fountains surrounding the L.A. Dept. of Water

and Power headquarters at 111 North Hope Street. They provide a great frame for architectural shots says local pro Stephanie Boltjes. “Every angle gives you a totally different view of the city.” At night, the colorfully lit fountains provide a continuously changing foreground.

L.A. has some of California’s best beaches, and one of Diamond’s favorites is Santa Monica and its 106-year-old pier. “It’s a tourist landmark, fishing ground, and amusement park rolled into one,” he says. “Early morning between 4 and 6 o’clock, the diehard fishermen come to cast off and the scene is both beautiful and spooky—depending on how you look at it.”

Nearby Venice Beach is also fun: “Venice has a wild variety of people and personalities,” he says.

Among Boltjes’s favorites: El Matador State Beach in Malibu. “Walk along this beach and you will find jagged cliffs, coves, caves, ever-changing rock formations, and even the occasional dolphin or sea lion,” says Boltjes.

—Jeff Wignall

MORE THAN MOVIES

L.A. IS LOADED WITH CONNECTIONS TO ART, SCIENCE, HISTORY, AND PHOTOS. HERE ARE FIVE WORTHY DESTINATIONS.

ANNENBERG SPACE FOR PHOTOGRAPHY

2000 Avenue of the Stars This prestigious L.A. space is devoted to exhibiting both digital and printed images. Current exhibit (ends March 20): *LIFE: A Journey Through Time* featuring the photos of *National Geographic* photographer Frans Lanting. Free. Info: (213) 403-3000. annenberghotospace.org

FOREST LAWN CEMETERY

1712 S Glendale Ave, Glendale More than just a final curtain for countless Hollywood legends (George Burns, Gracie Allen, Sammy Davis Jr. and more), it has a museum’s worth of art, including an exact replica of Michelangelo’s David and more than 1,000 stained-glass windows, including *Light & Hope: The Forest Lawn Christmas Windows*, through January 31. forestlawn.com

THE GETTY CENTER 1200 Getty Center Drive

One of the world’s great museums, the Getty has sprawling grounds on a mountaintop overlooking L.A. that provide photographers an architectural and landscape wonderland. And there’s a terrific photo collection. Free. Info: (310) 440-7300. getty.edu

GRIFFITH OBSERVATORY AND GRIFFITH PARK

2800 East Observatory Road Located on Mount Hollywood and offering spectacular views of the city and its Hollywood sign, the majestic-looking Griffith is a hub of all things astronomical. Photos permitted indoors and out (tripods allowed outdoors only). Free. Info: (213) 473-0800. griffithobservatory.org

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Small group and private tours of cool, off-the-beaten-path art enclaves, studios, lofts, and creative spaces. The L.A. Downtown Graffiti/Mural Tour takes you into the heart of street-art world. Check the online calendar for the specifics. laarttours.com

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TRY IT OUT

How to find the best version of your picture

AS WE WORK through ideas when editing an image, we often veer off in multiple directions, frequently straying far from our original idea. So it's crucial to be able to return our pictures to earlier states. Adobe Photoshop Lightroom (which incidentally turns 10 years old this month) offers two efficient ways to experiment and still avoid using the often-unwieldy History panel or fussing with multiple undos.

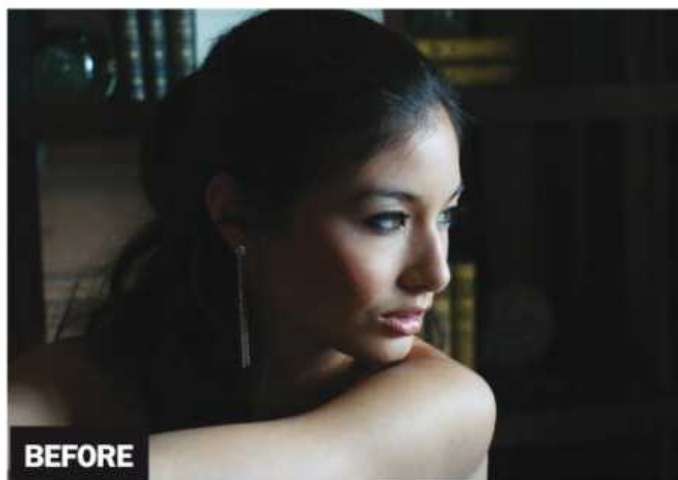
The first method, called Virtual Copies, allows you to create different versions of the same image (e.g., color, black-and-white, high key, etc.). Because Virtual Copies use only the develop settings and not the actual physical file, they take up scarce space on your hard drive. Virtual Copies are ideal for versions that you want to compare side by side to

decide which you prefer. Then you can output all the files at full resolution in one step.

In contrast, Snapshots capture an image in a specific state, retaining all the develop settings you applied to that point. You can make multiple Snapshots as you work and return to your edit at different earlier points, allowing you to branch off and re-edit from various stages in your process. Unlike Virtual Copies, you can view them only one at a time—not side by side. Snapshots take up less screen real estate than Virtual Copies (which appear as separate images) and are accessible from within Photoshop, too (see Quick Tip).

Both Virtual Copies and Snapshots offer efficient and easy methods of working your way through multiple edits.

—Theano Nikitas



SAMPLE STILLS
Use Virtual Copies to create multiple versions of your image without eating up hard drive space.

QUICK TIP

WORK WITH PHOTOSHOP
To edit Virtual Copies or Snapshots in Photoshop—directly from Lightroom—right-click on an image and choose Edit in > Open as Smart Object in Photoshop. Once in PS, double-click the image thumbnail in the Layers panel to adjust the image in Camera Raw. To access other Snapshots from ACR, click on the Snapshots icon (far right under the Histogram) and choose one of your earlier Snapshots. Click OK to return to Photoshop, then click File > Save. An edited version of the image will appear in Lightroom.

Step 1

Import your photo. **Then right-click on the image and choose Create Virtual Copy from the drop-down menu (or go to Photo > Create Virtual Copy).** A copy of the image will appear in the work area and in the filmstrip, where it will show a small page curl in the lower left corner.

Step 2

Select the Virtual Copy (if it isn't already selected), then switch to the Develop module. I wanted to give the image a warm, monochromatic look so I chose Creamtone from the Lightroom B&W Toned list in the Presets panel. I then used the Local Adjustment Brush to bring out some of the details in the shadows of the subject's hair. I left the background shadows as-is for a more dramatic look.

Step 3

When you're happy with the image, return to the Library module. If you're ready to Export the image, skip to Step 4. Otherwise, open the Metadata Panel. Click on Captions and add a description, such as "Creamtone with shadow adjustments to hair." To continue making variations, right-click on the original image to create another virtual copy. I made several variations using different presets and adjustments.

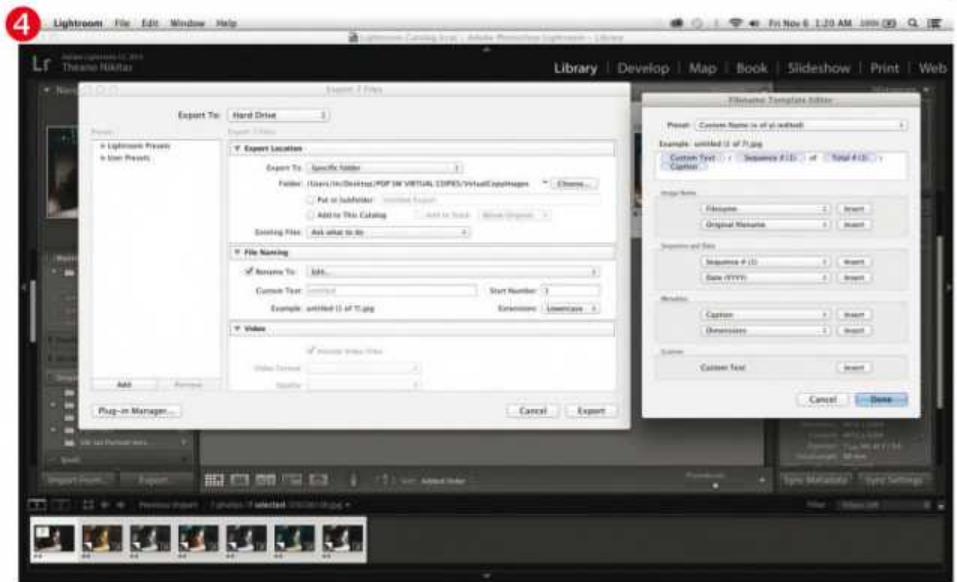
In the Library module, view the variations side by side to pick your favorite.

USE YOUR METADATA Add caption info and automatically add it to your file name later.



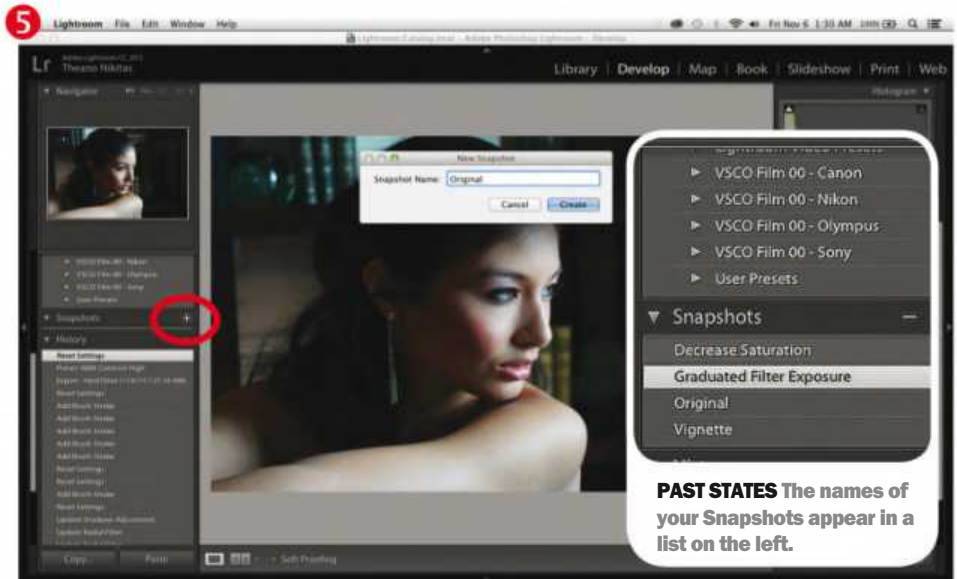
Step 4

To export virtual copies as individual files, select all the thumbnails you want to save. **Click File > Export and enter your preferred settings. Under File Naming, use the pulldown menu to select Rename to: Edit. In the metadata subsection, choose Caption.** This will allow you to include the caption information you entered earlier in the file name. Click Done, then click Export.



Step 5

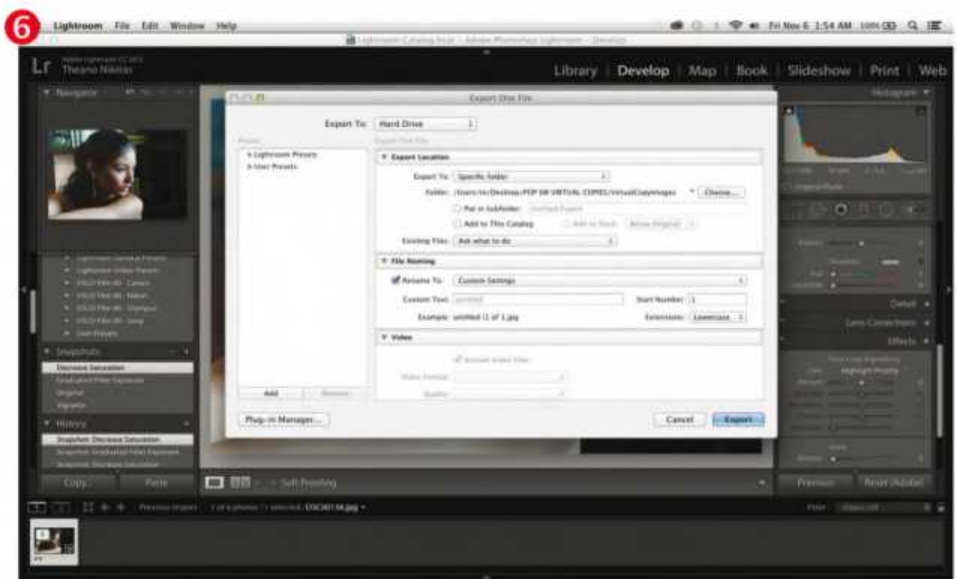
If you don't need to compare radically different versions of your photograph and instead want to keep track of your work at various stages, use Snapshots. To make one, start to process your image in the Develop module. **Then, in the left panel, click the plus sign (circled) next to the word Snapshots. Name it and click Create.** At various intervals of editing, continue to create Snapshots. As you edit, you can return to any Snapshot to further tweak the image without searching through your History or starting from the beginning. Click on a Snapshot to return to that step. Delete a Snapshot by clicking the minus sign in the Snapshots header.



PAST STATES The names of your snapshots appear in a list on the left.

Final Step

To export a Snapshot, click on the snapshot name in the Snapshots panel. **Go to File > Export. Choose the settings you want and click Export.** Then repeat for each Snapshot you want to save as an individual file.



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DUNK THE SUN

Make Helios your subject

“TO LIGHT this shot of NBA superstar Anthony Davis appearing to dunk the sun, I had to use almost every tool in my arsenal,” says Los Angeles-based sports pro Dustin Snipes. “It was definitely one of the most technically challenging

shoots, especially from a lighting standpoint, that I’ve ever done.” He and his client, Red Bull, spent months planning the project.

Why so difficult? Because the magic had to happen in the camera with minimal postproduction digital retouching, a task he had neither the time nor the budget for. As an example of an extremely creative exercise in

HIGH FLYING Dustin Snipes used a Nikon D810, exposing the scene for 1/250 sec at f/6.3, ISO 32. For more of his stellar sports photography, visit his website at dustinsnipes.com.

lighting techniques, his solutions amount to a strobe workshop in a single shot.

His challenges? He had to freeze Davis sharply in mid-air at an exposure that would record the sun at the right size, plus generate enough light to minimize flare from the sun, while still showing detail in both the athlete and the backboard.

First, to make the sun appear the right size, his assistant held a basketball on set in preshoot testing and Snipes adjusted the lighting until the sun matched

TOOL TIPS

1 TIFFEN VARIABLE NEUTRAL DENSITY FILTER Blocking between 2 and 8 stops of light, the filter lets you choose an exact degree of neutral density and eliminates the need for multiple ND filters. **\$145, street, for the 77mm size**

2 BRONCOLOR MOVE 1200L POWER PACK AND STROBE HEAD KIT Powered by a rechargeable Lithium battery capable of 230 full-power pops per charge, the pack delivers 1200 Watt seconds to two heads, with action-freezing flash durations as short as 1/20,000 sec. **\$7,105, street.**



KRIS HOLLAND/MAFIC STUDIOS

For this mid-air portrait of NBA great Anthony Davis, Dustin Snipes hauled in a mix of Broncolor Scoro and Move strobe lights (A) that gave him enough light “to overpower the sun.” He juiced five lights from four Broncolor power packs (B, only one is shown) and shot with a Nikon D810 and 24–120mm f/4G AF-S Nikkor ED VR lens (C). “Somebody asked me why I was shooting with a kit lens, and I answered that it was the right tool for the job,” says Snipes—he chose it after testing about 10 lenses because it produced just the right amount of flare around the sun. If the sun’s edge had been too sharp, it would have had to be positioned almost exactly next to Davis’s hand to look right. The lens flare gave the photographer some leeway. Want to try this yourself? Placing the lights much closer and shooting the subject in silhouette will make it easier.

the background,” says Snipes. “I knew if we doubled up a whole bunch of lights we could over power the ambient light and that’s what we did.” He used five Broncolor strobes running off of four powerpacks, configured as a single, very bright front light source.

The flash bursts had to be ultra short. “If your strobes’ flash durations aren’t fast enough, you can get a ghosting effect. You’ll freeze part of the player, but other parts of him will show a blurred trail behind him called ghosting,” Snipes explains. “I lit with Broncolor Scoro and Move packs because they have relatively short flash durations.” At his power setting, the durations were about 1/4000 sec, fast enough to freeze his entire moving subject.

Because Snipes had to position his lights off-court, their output had to travel relatively far to reach his subject. “I got the throw from my Broncolor P45 and P65 reflectors. These really hard reflectors delivered every Watt second of light that my Broncolor power packs could produce,” says the photographer.

All of this light on the scene led to a serious problem of its own: overexposure. Shooting with a DSLR whose maximum flash sync speed was a relatively slow 1/250 sec, even at his lowest ISO (32) and smallest aperture (f/22), Snipes would have blown out all the detail. So he tamed the exposure with the help of a variable neutral-density filter. Set to about –3 stops, the ND filter helped him balance the lighting between both his subject and the background. —Peter Kolonia

the ball in size from the camera’s perspective. During those preshoot tests, his team also mapped out to the inch where the athlete, lights, and camera needed to be positioned.

Sizing the sun led to its own problem: “To reproduce it at a small enough size that Anthony Davis could appear to be holding it, we had to throw enough light at him that we could seriously underexpose





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Making money from photography is not easy! I'm not trying to sound sensationalist or be negative but unfortunately this is the truth. You could be an extremely talented photographer but if you don't learn and implement the correct key business skills then you could be heading for a very costly and time consuming episode of your life.

Okay, let's not waste time - how can you make money from photography? You need to know 5 essential marketing skills and discover the answers to 3 very important business questions.

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How much do I charge for my commercial photography? I'm going to tell you exactly what I charge clients so you can gauge how much to charge for your photography. Professional photographers tend to be very secretive when it comes to this kind of information, however in this course I reveal everything.

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INTO THE ARCTIC WILD

GREENLAND ICE CAP

Ice crystals can create a halo called a “sun dog.” Copeland shot with a Canon EOS 5D Mark II and 16–35mm f/2.8L Canon EF lens; 1/1250 sec at f/7.1, ISO 100.

Photographers Sebastian Copeland and Jon Cornforth braved deep cold and dangerous predators to capture the stunning landscapes and incredible wildlife of the Arctic. These are the pictures and the stories they brought back.



50 SCENIC MASTER

Sebastian Copeland describes his photographic journeys on the ice—often alone.



53 ANIMAL EXPERT

Jon Cornforth shares his secrets for capturing Arctic wildlife and surviving unscathed.



ICE EXPLORER

Sebastian Copeland on ice, sea, and sky

LUCK HAPPENS when preparation meets opportunity. And preparation matters nowhere more than in wilderness expeditions, where the right gear, timing, and location can mean the difference between a career high and a very expensive camping trip.

Dedicated to environmental causes and polar exploration, my strategy has been to get in front of the right subjects and renounce the more traveled—and therefore more photographed—places, but that is easier said than done. In the polar regions, jockeying for position is a skill as important as your technical and creative prowess. And the research, planning,

QAANAAQ BAY, GREENLAND
The high mass of salt water and high density from frigid temperatures make for still waters and perfect reflections. Shot with the same gear as the previous page; 1/400 sec at f/5.6, ISO 200.

timing, and logistics involved in getting the shot are the things at which great outdoor photographers excel. Once you get there, pressing the shutter can be the easiest part.

My most memorable experiences have been my long trips onto the ice, whether on the Arctic sea or the Greenland and Antarctica ice caps. A long expedition always means pulling a heavy sledge and



traveling on skis—I have accumulated more than 5,000 miles under my skis. The sledge is your lifeline, but its weight is what you curse most days! So I pack carefully, especially as I usually travel either alone or with only one partner. Equipment failure or omission would force me to abort. And the consequences are significant: these trips take months and sometimes years

of planning at considerable cost, including chartering a special flight just to get to the starting line.

For visitors seeking immersive experiences, the Arctic makes for thrilling and humbling exploration. As with all landscape photography, your visual payoff is equal to the time you invest. But the Arctic richly rewards those efforts when everything lines up. The dominance

of water—frozen or liquid—and the low angle of the sun limit the color spectrum, while the stripped-down landscape imposes focus. Visually, clouds and ice are kindred spirits: Low contrast celebrates blues, and ice can acquire an iridescence unique to polar photography. During the melt season, the high density and mass of the coastal waters create ethereal reflections.



B&W IN GREENLAND
The wind shapes the surface of the ice one particle at a time. Copeland was pinned down in his tent for seven days by a vicious storm blasting 80 mph winds when this image was taken. Shot with same gear as before; exposure 1/400 sec at f/9, ISO 100.

ELLESMERE ISLAND, CANADA
Otto Fjord is on the northernmost island of Canada's Arctic. One of its glaciers spits out icebergs like an ice cube dispenser, making for great shooting opportunities—if you bring a skiff. Shot with the Canon EOS-1Ds Mark II and 16–35mm f/2.8L lens; exposure, 1/1600 sec at f/4.5, ISO 200.

The arctic sun will often spoil an image unless it is very low on the horizon, defining the landscape with shadows. Bright light on white ice creates too much contrast. I often travel in 24-hour daylight. This helps with ISO settings: I rarely shoot higher than ISO 160.

The transition to digital from film has been a blessing to polar photography. Gone are the days of frostbitten fingers from loading film, broken sprockets and spoiled rolls, and external light meters! Today, the histogram is my bible.

In cloudy environments, I favor the dark end of the histogram and work that in post to bring out the highlights. On sunny days I do the opposite, still careful not to clip the highlights but also being sure not to overcompensate for the scene's brightness by underexposing. In capture, I like a low-contrast shot that will give me the most informa-

tion without proposing to deliver a finished look. I do about 70 percent of my postprocessing in RAW, then finish in Adobe Photoshop where I selectively paint in areas to adjust tonal levels and sharpness. My frames rarely get cropped.

Weight issues limit my bag to three zooms and two DSLR bodies (one is a backup) and a carbon-fiber tripod (which I rarely use), all rugged enough to withstand extreme cold and moisture. But my go-to lens is the 16–35mm f/2.8 zoom; it accounts for 75 percent of my work. This dates back to my learning days, when I was told to shoot with only one lens and learn to master it—mine was a 24mm. Now I often shoot wider than that. And I avoid filters, but mostly for efficiency: Threading a filter in sub-freezing temps is just one more step that can go wrong. I sometimes miss my graduated neutral-

densities, so if the shot demands it, I will use the tripod and shoot two or three exposures to combine in post.

Gear management, like safety, requires planning. In the deep freeze, the warmth of an eyelid will fog your viewfinder for the day. When it is very cold, I will often capitalize on very wide lenses to deliver an approximate frame. Live view mode drains too much power, but the LCD is critical for micro framing adjustments and those histogram readings.

Some locations are conducive to solar charging for batteries, while others, in the colder months, won't allow it, given the sun's low angle. Battery life is a constant source of concern: To conserve power, keep them out of the frozen camera when not in use. They will lose up to 60 percent of their life in very cold temperatures. But that power can be recovered by warming the battery, which is why I always keep them on me, in spite of the handling hassle.

What about the joy of reviewing your work after a long day? Painful though it is, when battery life is an obsession, that is a luxury you can't afford. It will have to wait until you return to civilization—along with the hot bath and cocoa!

ANIMAL CHARMER

Jon Cornforth on the fauna you'll find

I WILL NEVER forget the first time I encountered a polar bear or stood waist-deep in water near a sunbathing walrus. Sure, Arctic regions are challenging, surreal places. But the icy wilderness and its inhabitants gave me some of my best images. Over the past decade, I have traveled to parts of Alaska, Canada, Iceland, and Norway.

The ideal season to photograph

Arctic wildlife is from late spring until early fall, but especially during the peak summer months when there are 24 hours of daylight. At 80°N in June the sun is never lower than 20 degrees above the horizon. Being able to photograph whenever I want presents me with the problem of finding time to sleep. I prefer to stay awake through the night and then sleep into the early afternoon. Of course, any time there are animals to photograph I stay up as long as the subject allows.

SVALBARD, BRENNE-VINSFJORDEN
Fisheye perspective of a mother polar bear walking on ice. Shot with a monopod-mounted Canon EOS 5D Mark III and 15mm f/2.8 Canon lens with Aquatech surf housing and remote trigger; 1/500 sec at f/13, ISO 320.

The biggest challenge is actually finding the wildlife. It helps to hire a local captain or guide who knows where to go. There are some locations where animals congregate, but with a predator like the polar bear roaming around, seals and walrus are extremely wary. It is especially hard to approach animals resting on ice: They will disappear beneath the surface at the slightest threat. On the other hand, polar bears can be too inquisitive, requiring your constant vigilance. Capturing wildlife demands a cam-





**UNDERWATER
WALRUS**
A fisheye lens view
of a walrus resting
on an iceberg
underwater. Shot
with the same gear
as polar bear on
page 51; exposure,
1/200 sec at f/7.1,
ISO 320.

era that can withstand the elements and shoot at a high frame rate. Traveling in the Arctic often means flying on small aircraft with weight restrictions, so skip the heavy supertele. A 300mm, 400mm, or a zoom in the 200–400mm range is ideal.

To explore Svalbard, Norway, for a workshop I was leading, I hired a captain with experience snorkeling with walrus. But he decided a polecam (basically an underwater camera on a stick) was more effective than getting in the water. I used a surf housing attached to my aluminum monopod. My DSLR with a 15mm fisheye lens snugly fits inside the housing with an 8-inch dome port attached. I trigger it using a long waterproof shutter-release cable. My standard underwater settings are to overexpose by about a half-stop at 1/200 sec in shutter-priority mode.

After several days of uneventful sailing north of Longyearbyen, we arrived in search of walrus at the ice edge near Svalbard's north cape. We eventually came across about a dozen, all resting on the same tiny iceberg. We loaded into our inflatable boat and set out to photograph them. Of course, they were quite skittish, so we maintained a respectful distance. Several of the beasts decided to move off, but a few remained in place as we approached. Leaning over with my polecam ready and my arm outstretched, I got right next to the walrus for an underwater portrait.

The apex predator of the Arctic is the polar bear. Every visitor hopes to photograph one, but since they are camouflaged and spend their lives on the ice stalking their prey, they are not easy to find. Most photographers will encounter them from the safety of a ship or, better, a small boat. Since the bears' fur and the snowy scene are so bright, overexpose your images by at least 1 stop to compensate.

Imagine my surprise when I found my underwater polecam necessary for photographing an exceptionally curious polar bear with her cub. I was



MOTHER AND CUB
Svalbard, Brennevinsfjorden, Norway. A fisheye lens perspective of a mother polar bear and her cub on ice, same setup as the previous page. Exposure: 1/500 sec at f/8, ISO 320.

ATLANTIC PUFFIN
A puffin in Iceland, NW Fjords, Látrabjarg, at sunset. Captured with 5D Mark III, and 300mm f/2.8 Canon EF IS II lens; Exposure, 1/640 sec at f/3.2 and ISO 320.

COLDWEATHERGEAR

How to pack when you're headed for frigid climes

- **PICK THE RIGHT 'POD.** "I prefer to use basalt or carbon-fiber tripods in cold climates," says Cornforth. "They are lighter and not as cold to handle. Basalt tripods do not dissolve in salt water like carbon fiber, plus they are slightly less expensive."
- **MIND YOUR BATTERIES.** "In cold weather—and I mean double negative digits—batteries will drain their power faster," says Copeland. "The good news is they will recover most of it when warmed. I keep them on me. It requires the extra steps—without gloves!—to load and unload them, but it is better than the alternative."
- **WATCH OUT FOR MOISTURE.** "Condensation is a traveling companion in cold environments," Copeland says. "It builds when gear is very cold and comes into a warm environment." He leaves his camera outside his tent most days to avoid this effect.

standing on the bow of the sailboat with my tele lens ready, when she quickly approached. She stood up on her hind legs just an arm's length away with only the metal railing between us! My captain assured me it was safe, so I grabbed my polecam and cautiously leaned over the edge. I set my camera to 1/500 sec in shutter priority and slightly overexposed the image. She repeatedly checked out my camera at point-blank range for more than an hour. It was an unforgettable encounter.

On another trip, I went to Iceland just to photograph Atlantic puffins. These charismatic birds live throughout the Arctic, but one of the

best locations to see them is the bird cliffs at Látrabjarg in the Northwest Fjords. The puffins are easily accessible and best photographed in late afternoon when they return from fishing. They are so approachable that you don't need a long lens. I also left my tripod and gimbal in the car since it was easier to move around and compose without them. I was lucky to get two nights in a row of beautiful light and I experimented with different backgrounds that varied from the sky to sunlit cliffs.

The Arctic is never easy or inexpensive to visit, but it offers the chance to photograph some of the most unique wildlife on earth. 📸



**OUR 2015
NOMINEES**
Clockwise from
top left, this year's
contenders are
the Canon EOS
5Ds, Panasonic
Lumix GX8,
Samsung NX1,
Sony A7R II, and,
in the center, the
DxO One.

Photographs by Brian Klutch

WHO WILL WIN?

Massive megapixels, incredible low-light performance, and superb connectivity: This year's nominees have all refined and redefined photography. By Philip Ryan

IN 2015 we watched pixel counts skyrocket. Camera sensor technology began to provide even better low-light shooting than we thought possible. And the way that we use cameras evolved as we become ever more connected by social media. Right now is a high point for imaging: The tools we use for capture are getting more powerful at the exact same moment that the ability to share and use those images has exploded.

When we look back across the cameras that we have assessed in the *Popular Photography* Test Lab and in the field in the past 12 months, we can see how each of these picture-making machines have

contributed to imaging's evolution—and it becomes clear which stand out from the rest. But we won't be crowning 2015's Camera of the Year—the model that best refined or redefined photography—in these pages yet. Here's a look at the finalists, along with the ways they played a part in some of the big ideas we've seen this year. Which camera do you think deserves to win?

Megapixels Matter

Every time a camera maker significantly raises the number of pixels its cameras can shoot, we hear people scream: "They've gone too far!" With its EOS 5Ds and EOS 5Ds R,

for example, Canon has pushed the limit of the full-frame 35mm format to a whopping 50.6MP. And that's only the beginning: At Canon Expo this year, the company showed off a prototype of a 120MP DSLR and a demo of the capabilities of a 250MP APS-H-sized sensor. But with the bump in megapixels we also continue to see increased real-world resolving power in our lab tests, and more detail in the images shot in our field tests. With so much progress clearly being made, it's hard for us to cry foul.

All these pixels produce very large image files. That means longer processing times and fewer images on your hard drive. Computers keep becoming more powerful, but how many of us want to replace our computer every time we get a new camera? And do we really need that many pixels if we're not going to make huge prints?

At Pop Photo, we still tend to say: Yes. Bring on the pixels. If you're printing an image file from the EOS 5Ds that is set to 240dpi, you'll get a print that's just over 36x24 inches. Granted, you can make large prints at a lower dpi count assuming that the viewing distance will be greater. But if you want to be able to have people

Canon EOS 5Ds

WHY IT MIGHT WIN

The reigning resolution champion of the *Pop Photo* Test Lab, the EOS 5Ds produces some of the best images you can get from a DSLR.

WHAT'S HOLDING IT BACK

With no Wi-Fi and no pop-up flash, non-pros might not value resolution over convenience.



approach the print relatively closely, 240dpi is nice. Now consider that cropping is something that many photographers tend to do before considering an image finished. If you were to crop 25 percent away from both the horizontal and vertical dimensions of one of the 5Ds's images, you'd end up with a 240dpi print size of just over 27x18 inches. While that's still a big print, it's not, by any stretch, absurdly large.

And that's just thinking in terms of current print technology. Televisions in the U.S. are starting the transition over to 4K from the current standard of HD—and 8K is on its way. If you want to fill an 8K display, you'll need more pixels than that aforementioned 25 percent crop would leave behind. The future of imaging will involve more and more pixels.

Canon isn't the only company pushing pixels. Sony's Alpha 7R II comes in at close second with its full-frame 42.4MP sensor. That's the most you'll find in any ILC. And, the 20.3MP Panasonic GX8 broke the 16MP barrier for the Micro Four Thirds system. Meanwhile, Samsung's NX1 remains the pixel count ruler of the APS-C world with its 28MP sensor.

The Rise of Backside Illumination

When it was introduced in late 2014, the NX1 was the first APS-C-sized backside-illuminated (BSI) sensor in a consumer cam-



era, and it was the largest BSI sensor you could get in a camera. That, along with plenty of processing power, UHS-3 memory card compatibility, and some changes in the materials used for the circuitry, helps Samsung's flagship camera deliver dazzling image quality at up to 15 frames per second with full autofocus and metering between frames.

What's so special about a BSI sensor? In this type of chip, circuitry is placed on the back side of the sensor so that the front side can be used for larger—or more—photodiodes to capture more light. The freed-up space also allows for “gapless” pixels where microlenses atop the pixel wells direct the light that would have otherwise landed between pixels into a photodiode. The result? Less light is lost. Making these is a complicated and delicate process that involves shaving down silicon chips so that

DxO One

WHY IT MIGHT WIN

The most seamless smartphone shooting experience you can get, this camera upgrades the imagery you capture using your iPhone.

WHAT'S HOLDING IT BACK

Though promised through updates, so far there's no burst shooting, and the One doesn't yet exist in a format that works with Android.

FUTURE OF COMPACTS?

As long as smartphones continue to use imaging sensors smaller than the 1-inch BSI CMOS found in the DxO One, the future of compact cameras may be something akin to this tiny connectable camera.

they can be sandwiched together. The larger the sensor, the more delicate the process becomes.

Samsung didn't hold the title of largest BSI sensor for long. Not even a year later, Sony announced the A7R II. That camera boasts the world's first full-frame 35mm BSI chip. The advantages that come along with that imager helped Sony's pixel-laden ILC achieve impressive low-light performance and cement its place among the best cameras we've seen this year.

The DxO One also uses a BSI sensor—in this case a 20.2MP 1-inch version. Small enough to carry with you anywhere, the One attaches to an iPhone and provides better low-light performance and more control over exposure than Apple's smartphone camera alone allows. By using a BSI sensor, DxO was able to maximize image quality and offer a compelling case for adding a camera to a phone that already has one built in.

Panasonic Lumix GX8

WHY IT MIGHT WIN

Boasting the highest resolution for Micro Four Thirds, the GX8 is also a pleasure to use and shoots bursts as fast as 8 fps.

WHAT'S HOLDING IT BACK

There's no built-in flash and the EVF blanks out some during 8 fps bursts.





Samsung NX1

WHY IT MIGHT WIN

The world's first APS-C BSI sensor and prodigiously powerful processing combine for speedy bursts, fast focusing (with tracking), and lovely images.

WHAT'S HOLDING IT BACK

It's a bit large for an ILC (and not full-frame) and it uses the uncommon H.265 video format.

Image-Saturated Lives

While it may sound trite to talk about the fact that images are becoming more and more a part of our everyday lives, it's undeniably true. The DxO One highlights this quite clearly. Just the fact that a company felt compelled to create a camera like the One shows that picture making has

MIRRORLESS MIGHT

There's no doubt that Sony's original Alpha 7R was a powerful camera, but this year saw all ILCs gain in pixel count and general image capturing prowess. Are ILCs on their way to taking over for DSLRs?

Sony A7R II

WHY IT MIGHT WIN

The first-ever full-frame BSI sensor has the highest resolution we've seen from an ILC while controlling noise well, plus it can capture 5 fps bursts.

WHAT'S HOLDING IT BACK

There's no built-in flash and only one memory card slot.



become so ingrained in our lives that iPhone shooters want to find ways to stand out from the rest of the smartphone-shooting pack. The drive to be the person with the best image, posted first, has become a badge of honor—and not just among those who consider themselves photographers. For others, being the only one to get a decent picture at a party, and being able to share it immediately, means everything.

That last part is really where the DxO One shines. Since it attaches to your iPhone's Lightning port, the images can be pushed to your camera roll just as fast as an image shot with the phone itself. Plus, you can use the images as you would if you were shooting with the built-in camera. The experience is seamless and smooth, and its controls are intuitive and flexible. Better still, the DxO One will continue to evolve as firmware updates and updates to the iPhone app roll out.

You can't say that the experience of connecting your phone to your camera through Wi-Fi is as simple and seamless as the DxO One experience, but it remains an excellent way to share your images shortly after they've been captured. All of the 2015 Camera

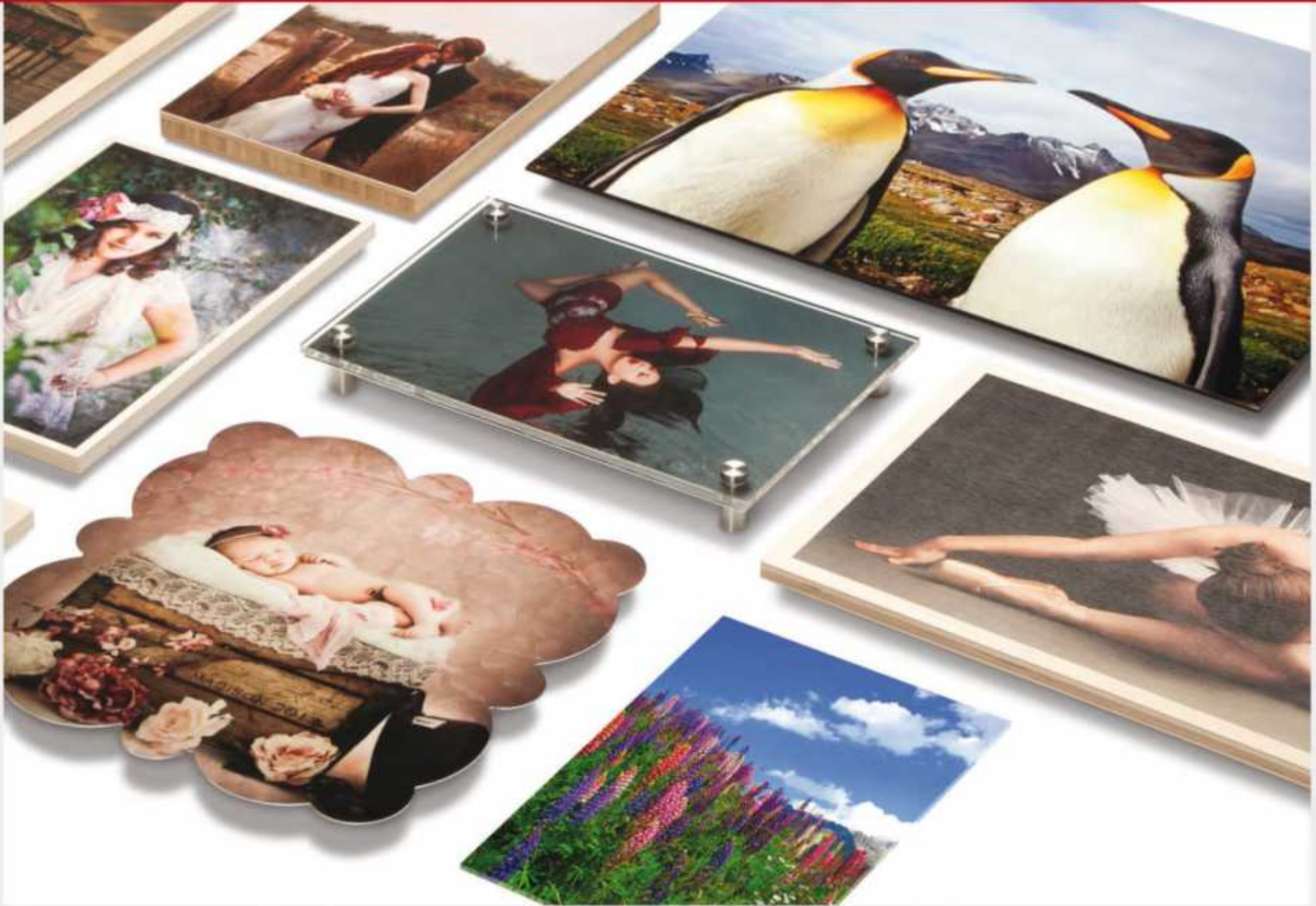
of the Year contenders, except for the Canon 5Ds, have built-in Wi-Fi. The Canon lets you add it, along with high-speed Ethernet, through its WFT-E7A (\$770, street) wireless file transmitter or add wireless alone through an Eye-Fi card (\$67, street, 16GB). More and more we've seen SLR bodies, outside of high-end pro models, with Wi-Fi built-in. Even die hard RAW shooters like me have been known to share JPEGs before going home to perfect the image later. I was able to send the image in the LCD of the Sony A7S II (see page 72) of my friend running the New York City Marathon to her smartphone before she even crossed the finish line.

This is the new normal. And we're sharing images that have more detail than ever before and can be captured in situations that used to be impossible to capture photographically. These are developments that not only impact photography but also the ways that we interact with each other—and the world.

And the winner is...

To be the first to know which of these cameras is *Popular Photography's* Camera of the Year for 2015, go to PopPhoto.com/CoTY2015 or follow us on Twitter @PopPhoto on January 5.

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Images by: Sal Cincotta, Max Seigal, Annie Rowland, Hansong Fong, Kfirfox Valentin, Nicole Sepulveda, Neil Simmons

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Balancing Act

When searching for the right white balance, look beyond neutral

Photo by Chris Tennant;
text by Debbie Grossman



CHRIS TENNANT is not just a professional photographer—he's also a professional scientist. So when he's processing his landscape images, he tends to err on the side of accuracy. "For me," he says, "I always start at neutral and expand from there. That's because I'm trying to maintain a certain level of realism." He notes that he often sees color balance applied badly and to extremes that don't serve

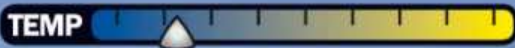
the photograph. In an effort not to go there, Tennant admits that he sometimes keeps himself inside a box that's too small.

How to expand that box, and see your images in new ways? Try moving the white balance slider to places you might not normally consider—even if your result doesn't match the scene as you originally saw it. Start by getting your contrast the way you want

MOUNTAIN MIST
This image of fog over Oregon's Sandy River Valley was originally shot at 4550 K using a Canon EOS 5D Mark II and 24-105mm f/4L Canon EF IS USM lens. Exposure: 1/320 sec at f/11, ISO 320.

it and retouching where you need to, then begin pushing that slider around. This kind of experimenting works best with RAW files but can be done, albeit not as smoothly, using a JPEG in a RAW converter that allows it.


Tennant shared this image with us taken at 7 a.m. from Jonsrud Viewpoint in Sandy, Oregon. When he first processed it, he went neutral, as usual. But after testing out a

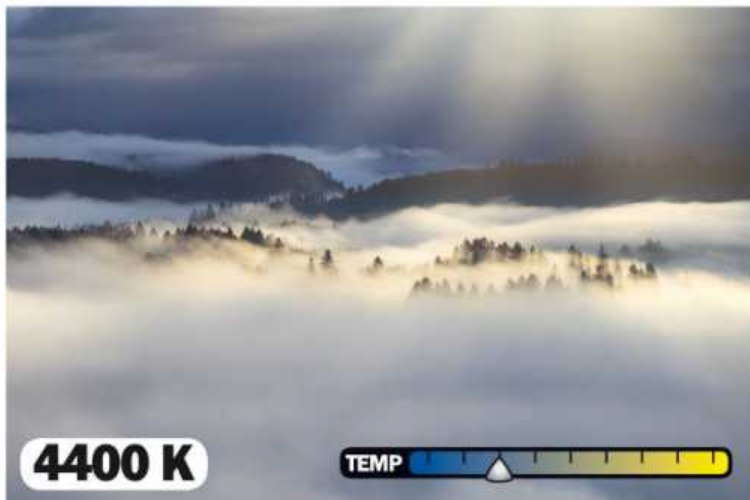


3700 K

The Keeper

Tennant surprised himself by preferring this image, set just to the left of neutral at 3700K. This photograph was a good choice for playing with white balance because of all its gray tones—the color could go in almost any direction without looking wildly unrealistic.

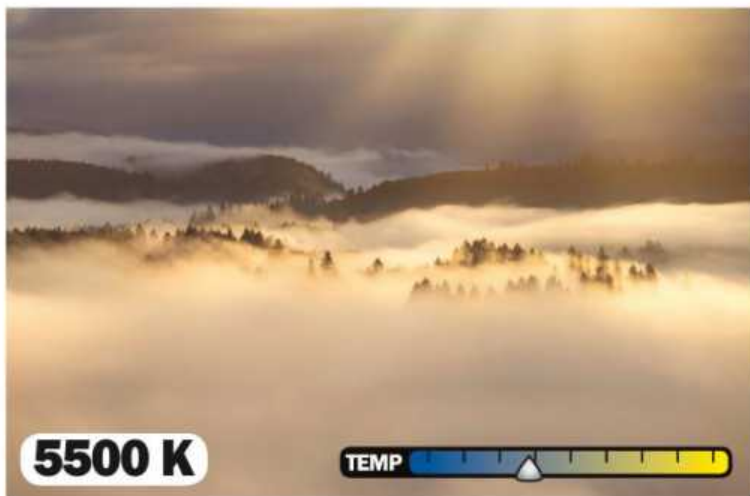
few different white balance settings at our behest, he realized the cool version was more evocative, more emotional, and simply more to his taste. Here's his final image (the coolest he made, at the equivalent of 3700 Kelvin) and three others. Which do you think is the best version of the shot? 



4400 K



Neutral Here's what it looks like when the picture is processed closest to "real." There's a nice range of tones, with warm sun and cool mountains and fog. But it's boring.



5500 K



Warmer At 5500 K you can imagine you're seeing the warm rays of early morning. It's a viable picture but not ultimately this photographer's favorite.



6500 K



Overcooked Here is warmth in the extreme, without almost any trace of the natural blue. Don't be seduced by its romance—this is fun with white balance gone too far.

Find Your VOICE

To become better photographers, we must push ourselves. One foolproof method? Begin a project or series and see it through to the end. You may just make the best pictures of your career.

By Peter Kolonia



Rachel Hulin

In 2011, this photographer from Providence, Rhode Island, noticed how her (then) six-month-old son Henry seemed to enjoy being held aloft and “flown” around, indoors and out. Soon, she started a project in earnest, editing out the adult who held the child up. The resulting project, *Flying Henry*, has been featured in media outlets, ultimately published by powerHouse as a children’s book of the same name. One source of inspiration? She was very curious about what the boy was thinking up there.

FLYING HENRY

Rachel Hulin shot this photo essay with a Canon EOS 5D and Canon EF 50mm f/1.2L USM lens. Each of its images are Adobe Photoshop CS6 composites of at least two separate shots: one of the empty background and the other of an adult holding Henry aloft.



“PERSONAL PROJECTS are one of the best ways for a photographer to find and develop a creative voice,” says Marc Prüst, a photography consultant and teacher based in Amsterdam. Unlike commercial work or the pictures you snap of your everyday life and your travels, focused personal projects let you explore your creative potential more deeply. And if the bond between you and your subject is strong, powerful visuals—perhaps the strongest you’ve ever made—will result.

According to Prüst, who teaches a course called “The Personal and Professional: Making Projects Viable” at the International Center of

Photography in New York City, there are two important components of a personal project to consider: The how and the why.

“How” refers to technical abilities. “An important aspect of developing a personal voice is technique,” says Prüst. “You really can’t grow a powerful photo project without a knowledge of photo technique.” In most instances, he says, the technique comes first, then the voice. “Your voice will articulate the why.”

For beginning photographers who haven’t nailed photo technique, the teachers we interviewed (unsurprisingly) suggest starting with workshops. “It’s a great idea



for an evolving photographer,” says Karen Marshall, a New York-based photographer and teacher. “Developing photographers can’t work in a vacuum. They need technical and aesthetic feedback. Other eyes can see things that yours can’t—both problems and strengths.”

Your First Project

What should be the focus of a debut project? Harold Davis, a Berkeley-based workshop leader and author of the book, *Achieving Your Potential as a Photographer* (Focal Press, 2016) says, “I believe that personal resonance is the key to a successful project. The single most important thing when picking a subject is that you feel fully engaged with it.”

Don’t pick something that’s ultimately going to work against you. If you’re not naturally gregarious, for example, don’t take on a people-

related photo project.

A first project should also be something local and accessible. “Look for a subject that’s very close by. You may be tempted to photograph something far away and exotic, but that can lead to complications,” says Prüst.

Also, start small. “Set a goal of creating a series of 5, 10, or 15 photos,” says Prüst, “and articulate something like an artist’s statement. It’s important to write it down.” Your written idea can serve as an anchor and give you direction. Rewrite it, if necessary, as the project progresses.

The photo teachers we talked to agree: Your first project should also be fairly easy to pull off, but not too easy. It should challenge you both aesthetically and technically. It might be, for example, a subject you’ve never attempted before or require a new lens or shooting skill.

100 MILES LATER
Tom Spurduto photographed his ultra marathoners with a Nikon D3 and Nikon 85mm f/1.4D lens. His three-point lighting involved two Profoto strobe heads powered by a Profoto 7B battery pack for main and fill, and a Profoto Acute B 600R head to light the background.

Without stretching beyond your comfort zone, you won’t grow.

Once you’ve selected a subject and articulated your goals, wait before you pick up your camera. “Sometimes, the best way to really see your subject—for any photographer, novice or professional—is to spend some time just looking at it,” says Davis. “For this reason, I suggest to my students that they go out without a camera.” His goal? To help spark visual ideas free from the interruptions introduced by having to control a camera and compose a scene.

And think your project through to the end. Before you start shooting, decide on the final format it will take. You could produce a self-published coffee table book, a portfolio of prints, a web gallery, or even a brick-and-mortar public exhibition. Each will require different approaches, both in terms of tech-



Tom Sperduto

A freelance advertising and commercial pro from Oxford, New Jersey, Sperduto posts half a dozen personal projects to his professional website. Among his favorites is *100 Miles Later*, portraits of ultra marathoners taken immediately before and after a 100-mile race. “I’m drawn to people who attempt what others see as impossible. I find something heroic in the struggle of every runner who attempts a 100-mile ultra marathon. It’s an emotional experience to witness it,” says the former Marine.

nique and scale. A website or book project, for example, will require far more images than a portfolio or gallery show and must consequently be a longer-term project.

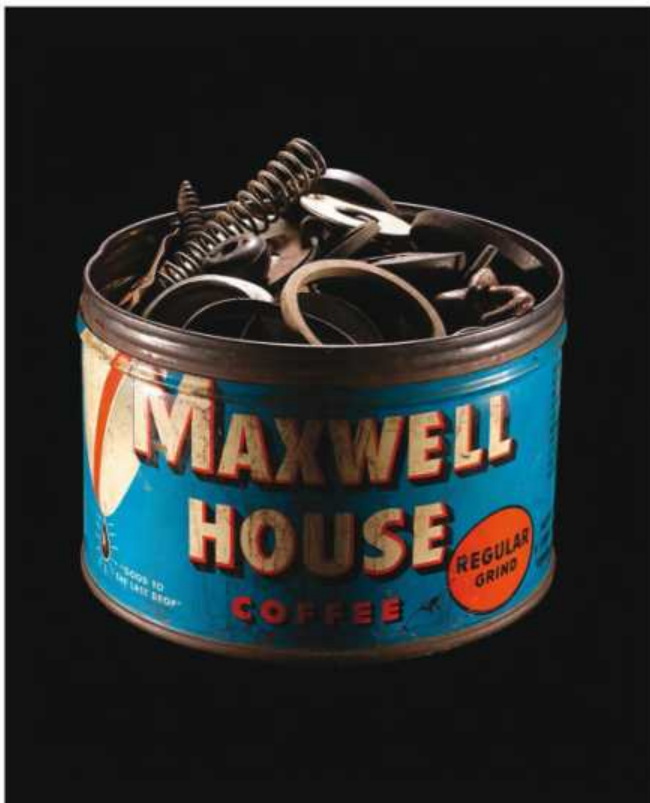
Once you’ve begun shooting, set aside time to analyze your work-in-progress. “Continually look over your



results,” advises Marshall. “Look at your photos as clinically as possible to find out what works and try to articulate why it works. That’s the first step in finding your voice.” Follow

the clues that are embedded in your pictures to reveal your strengths and suggest new, more interesting directions for the project.

Also, as you work, involve viewers



whose opinions you value. “It can be essential to seek the opinions of others,” says Prüst. “You have to present and talk about your work. Seek criticism that points out what’s working and what’s not.”

It can be difficult to find like-minded people who can give you constructive feedback, but they’re crucial. One way to generate feedback: Create a blog with text and photos about your project, and update it frequently.

Keep It Going

As you work, seek inspiration and encouragement from online photo sharing sites, other photographers’ online portfolios, and photo books. “Lenculture.com is an enormous resource that houses many personal projects in a variety of stages and sizes. It’s informative and inspirational,” recommends Prüst. It’s best to focus on photographers who produce essays or series of images rather than single-image “decisive moments.”

For concrete suggestions about how to move your project forward,

Harold Davis offers a 46-page workbook that accompanies his book. It offers a variety of vision-building exercises and is available as a PDF from Davis’s website (digitalfieldguide.com/achieving).

When you’re finished shooting, spend as much time editing your photos as you did taking them. “With a series of images, the editing process is just as important as the shooting,” says Marshall. “Don’t make a final edit on a first viewing. Study your images multiple times, in different light, and in different moods. Looking a lot can allow you to identify strengths and flaws, and is absolutely necessary.”

Marshall also suggests that you edit from a set of 4x6-inch prints (or larger, if funds allow), not a computer screen. “Prints are profoundly more helpful in pointing out strengths and weaknesses of a photo. Spread out on a table-top, they can also show how your pictures work as a group,” she says. Viewing on a computer, the electric glow of the screen can mask exposure problems, and give the images

GRANDMA’S BASEMENT

For a project in memory of his grandparents, Brian Klutch shot with a Hasselblad V-series body, Sinar digital back, and Zeiss Planar 100mm f/3.5 lens. He brought the objects to his studio and lit them with Broncolor Pulso strobe heads and Grafit 1600 power packs.

Brian Klutch

Klutch, a regular *Popular Photography* cover shooter, is a product pro who commutes from rural New Jersey to a mid-Manhattan studio. His project titled *Grandma’s Basement* is a series of dozens of still lifes of the objects removed from his grandparent’s Brooklyn basement after their passing. “The pictures are a remembrance of their lives, but also, for me, a sad reminder that we no longer had a foothold in the Brooklyn neighborhood that was so central to my extended family,” says Klutch.

a kind of life that can distract from critical problems.

When you’ve finished the project, get the word out. “Sharing is crucial,” says Prüst. “Get a project out on your website, on Facebook, and on your favorite photo sharing sites. Enter it in competitions, too.”

After all, one of the best parts of making a body of work is getting to see the impact it makes on the friends and strangers who admire and enjoy it.



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LAB

**Fujifilm Fujinon XF
35MM f/2 R WR P.80**

**Sigma 20MM f/1.4
DG HSM Art P.82**

**Zeiss Milvus
Distagon T* 50MM
f/1.4 ZE P.84**

AUTHORITATIVE TESTS, REVIEWS, & BUYING ADVICE



ILC TEST

DARK HORSE

**A sensitive full-framer
for video and low light**

WHEN SONY first announced the original Alpha 7S, we were told that it was primarily developed to capture video, but that it would also provide a unique experience when photographing stills. While we did not do a full lab test, the hands-on time we spent with it confirmed that

the availability of extremely high sensor sensitivities made it possible to capture images by available light as we never could before.

Now here's the A7S II, with the same number of pixels as its predecessor and a revamped body design that includes five-axis image

stabilization. Its top sensitivity? An incredible ISO 409,600.

This time we were eager to see how this \$2,998 (street, body only) full-frame mirrorless interchangeable-lens camera would fare in the *Popular Photography* Test Lab and in the field.

SONY ALPHA 7S II **KEY SPECS**

SENSOR: 12.2MP
Exmor CMOS (full-frame)

SENSITIVITY:
ISO 50–409,600

BURST: Up to 2.5 fps

AUTOFOCUS: Contrast
detection

PRICE: \$2,998, street,
body only

INFO: sony.net



In the Test Lab

We place a lot of weight on a camera's ability to resolve fine detail. But the A7S II's 12.2MP sensor has the fewest pixels we've seen in a full-frame camera since Nikon's now-discontinued D700, a 12.1MP DSLR released in 2008. Therefore, the odds were stacked against the A7S II earning top honors in our overall image quality rating, which combines the results of our tests for resolution, noise, and color accuracy. Indeed, the A7S II ended up with an Extremely High rating up to ISO 100, after which resolving power dropped down to Very High levels.

As we did with its sibling the A7R II, we used Capture One Express (for Sony) to process the RAW files—this time uncompressed, thanks to Sony's recently added support for this larger-file RAW capture. The software varied the default level of single-pixel noise reduction as the sensitivity increased, though there's plenty more noise reduction that could be applied if you want.

That said, we found quite a difference in resolution at either end of the sensitivity scale. At its lowest sensitivity of ISO 50, the A7S II nabbed 2275 lines per picture height, bringing it very close to the lower cutoff of 2250

for an Extremely High rating in our resolution test. It maintained this result at ISO 100, but when we stepped up to ISO 200, it dipped down to 2225 lines. For comparison, Nikon's D700 captured 2350 lines at ISO 200, (the D700's significantly larger body gives it some advantage in terms of mitigating heat, which can contribute to noise and thus image degradation).

The A7S II does a good job of holding its resolving power until the sensitivity is cranked up super high. At ISO 25,600 it turned in 1950 lines, nearly matching the D700's 1960. By ISO 204,800 resolution fell to 1660 lines before finishing up at ISO 409,600 with 1510 lines.

In our noise test the A7S II kept images very clean at its lowest ISOs and didn't reach an Unacceptable rating until ISO 12,800. Thereafter, noise didn't reach stratospheric levels until the top few sensitivity settings. Given that with this ILC you'll end up shooting in situations where you'd otherwise leave your camera at home, you may find yourself more forgiving of the noise you do get once you pass ISO 51,200. The A7S II held a Low or better rating up to ISO 1600—impressive for a camera of this size.

In our color accuracy test, the A7S II earned an Excellent rating with an average Delta E of 7.9.

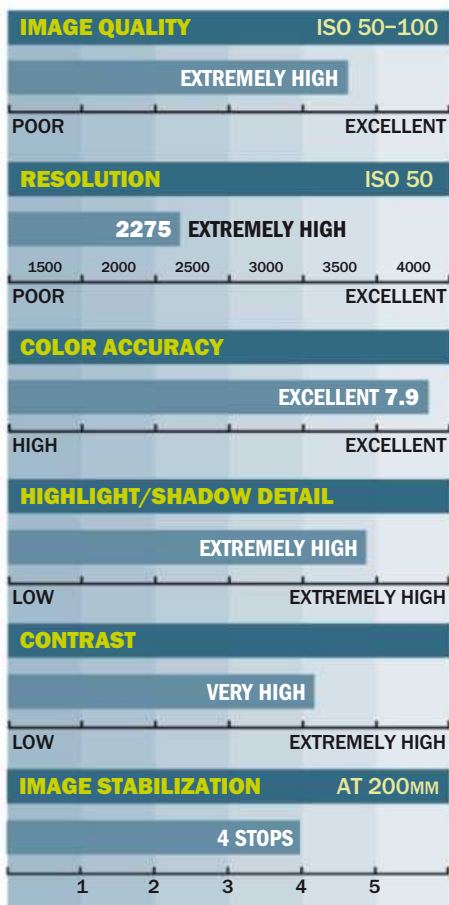
We tested the A7S II's five-axis SteadyShot image stabilization system using Sony's 70–200mm f/4 zoom racked out to 200mm. It uses the optical stabilization built into the lens in conjunction with the shifting sensor in the camera body to compensate for movements in yaw, pitch, roll, as well as the horizontal and vertical axes. We rarely see our test results reach the manufacturer's claims for stabilization, but this one came really close. Our testers averaged 4 stops of shutter-speed advantage shooting handheld with the A7S II. One tester actually matched the 4.5 stops that Sony says the system will allow. In practical

What's Hot
Sensitivity up to ISO 409,600 and 4K video capture

What's Not
Slow burst speeds when continuous AF and metering are enabled

Who It's For
Sony shooters looking for amazing low-light imaging

TEST RESULTS



terms this means that if you'd normally shoot at 1/200 sec to get a reasonably sharp shot, you could go as slow as 1/13 sec on the A7S II if you have a Sony OSS lens attached. Add this to the advantages of the high ISOs and the possibilities in low-light shooting grow ever greater.

In the Field

Sony has done a great job of maintaining a common feel across its A7 line of cameras. The A7S II benefits with an upgraded grip, a more ergonomically correct angled shutter button, more comfortable command wheels, and other minor changes to its predecessor.

All the key functions either have a dedicated button or can be assigned to one of the four custom function buttons. The latter are very useful; we assigned one to enable the Focus Magnifier while shooting with legacy manual-focus lenses, for example.

Coupled with Focus Peaking, this let us manually set proper focus faster than ever and with superb accuracy. Focus Peaking also came in handy when shooting with the recently announced Lensbaby Edge 50, which when tilted creates narrow bands of sharpness in your photos. Focus Peaking highlights what's in focus, making it easier to understand where that band of sharpness lands in the frame.

Sony's menu system is generally good, but at this point there are so many different settings in cameras that some things always seem to end up in strange places. For instance, you have to go to the penultimate page of the toolbox menu to format a memory card. To adjust image stabilization settings for lenses used through an adapter, go to the penultimate page of the shooting menu, just above the option for color space. You can definitely argue that color space might not have to be changed very often, but it should be easier to format a memory card.

SPECIFICATIONS

IMAGING: 12.2MP effective, full-frame (35mm) Exmor CMOS sensor captures images at 4240x2832 pixels with 14 bits/color in RAW mode

STORAGE: Memory Stick PRO Duo, SD, SDHC, and SDXC store JPEG, ARW RAW, and RAW + JPEG files

BURST RATE: Full-sized JPEGs (Fine mode), up to 200 shots at 2.5 fps (with continuous AF and metering enabled); RAW, up to 59 shots at 2.5 fps

AF SYSTEM: TTL contrast detection with 323 selectable spot areas; single-shot and continuous AF with focus tracking and face detection

SHUTTER SPEEDS: Mechanical: 1/8000 to 30 sec, plus B (1/3-EV increments); X-sync speed: 1/250 sec; 500,000-cycle rating

METERING: TTL metering with

1200-zone evaluative, centerweighted, and spot (size of spot unspecified)

ISO RANGE: 100-102,400 in 1/3-EV increments, expandable to 50-409,600

FINDER: 0.5-inch, 2,359,296-dot OLED with 100% accuracy; 0.78X magnification

VIDEO: Records at up to 3840x2160p 30 in XAVC S (at up to 100Mbps); up to 1920x1080p 60 in AVCHD (at up to 28Mbps); built-in stereo microphone; stereo microphone input; clean HDMI output to external recorder

FLASH: No built-in flash

LCD: 3-in. TFT with 1,228,800-dot resolution; five-step brightness adjustment

OUTPUT: Micro USB, micro HDMI video, Wi-Fi, NFC, minijack headphone

BATTERY: Rechargeable NP-FW50 Li-ion, CIPA rating 310 shots

SIZE/WEIGHT: 5.0x3.9x2.4 in., 1.4 lbs with a card and battery

PRICE: \$2,998, street

INFO: sony.net

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While the A7S II has a speed-priority burst mode that lets you capture 5 frames per second, you'll need to step back down to 2.5 fps if you want both metering and continuous autofocus between shots. That's not going to appeal to most sports shooters, but the lock-on AF tracking did a good, though not exceptional, job of following along

with runners in the New York City marathon. We got a nice shot of a friend running the race (see the camera LCD on page 73), and the A7S II locked on and held focus as she ran at us and rounded a corner.

In general, AF proved relatively fast, though not as speedy as with the A7R II or A7 II, both of which use a fancier hybrid system instead

APP HAPPY
Sony offers apps for its A7 series cameras to add fancier controls for functions such as time lapse and light painting.

of the contrast detection in this model. Still, we were impressed with the A7S II's ability to lock focus in very dim conditions. Even if it did sometimes take a little longer than we might have wanted, it got the job done nearly all of the time.

As with its predecessor, the A7S II was made for video, capturing 4K at up to 3840x2160 pixels and 30 fps. Unlike some cameras, the A7S II uses the full width of the sensor's pixel readout when recording 4K rather than using pixel binning (combining multiple pixels on the sensor for one in the finished video). The goal with this is to reduce moiré and jaggy lines. We don't currently have a 4K monitor to properly assess the footage we captured, but it looked nice when output as HD. Plus, the HD footage we captured looked great, with plenty of detail and nicely rendered colors.

The Bottom Line

If you're looking for a camera to shoot video in either 4K or HD, then the A7S II very well might be the best A7 model for you. It has a wide dynamic range and lets you make better video in very challenging conditions than you can with most other cameras in this price range. Similarly, if you really want to explore low-light still shooting, the specialized nature of the A7S II will likely appeal to you. We certainly enjoyed that aspect of this camera.

However, if you plan to print very large, or don't want to restrict that option down the line, then the A7S II's low pixel count might be something to worry about. For a couple of hundred dollars more, you can get the A7R II, which also did quite well in our noise test but will let you make huge prints. Or, if you think that 24.3MP is enough (and it probably is for many shooters), you can save a few hundred dollars with the A7 II and put it toward some fast glass. The choice is yours.

—Philip Ryan

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\$1,996⁹⁵

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I Panasonic Lumix DMC-GH4 Camera with Interface Unit
#PADMCGH4BK
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J BDR Solo Quadcopter Drone (No Gimbal)
#BDRSOLO
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K Nikon D750 DSLR Camera with 24-120mm Lens
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\$3,596⁹⁵

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EYE VIEW

A little 35mm that's better than normal

FUJIFILM CONTINUES its rollout of well-designed, weather-resistant lenses with the XF 35mm f/2 R WR, which popped onto the market recently for the reasonable price of \$399 (street). With a standard focal length equivalent of 53mm (in full-frame format) on Fujifilm's APS-C-format X cameras, its angle of view is similar to that of the human eye.

Like many primes in its focal range, it is fairly compact—a great companion for street shooters. Just 1.80 inches long and 2.35 inches wide, it has the smallest diameter in the Fujifilm XF lineup. Indeed, it was the smallest of the crop-sensor lenses we compared it with: Fujifilm's 35mm f/1.4, the Nikon 35mm f/1.8G DX, Pentax 35mm f/2.4, and Zeiss Touit 32mm f/1.8. The older Fujifilm and Pentax were the closest by fractions of an inch.

Nonetheless, it was not the lightest, weighing in at 0.37 pound; the Pentax is a bit lighter at 0.30. We can most likely chalk this up to the Fujifilm's all-metal exterior. Adding to its durable construction are eight seals on the lens barrel to keep out moisture and dust. Its optical configuration includes nine elements in six groups, of which two are aspherical, ensuring a compact size and reducing chromatic aberration.

When we took the new Fujifilm for a spin, we loved the look and feel. The small plastic lenshood that ships with it helps protect the front element and reduces flaring without being obtrusive. Its manual aperture ring clicks in 1/3-stops with a very pleasing resistance similar to its focus ring.

Using a "focus-by-wire" system, the focus ring has a turning radius programmed at an unusually long 260 degrees. Aesthetically, the lens pairs well with any of Fujifilm's X-series bodies in silver or black, and it sports engraved numbers painted in white and orange.

Our optical bench tests produced excellent-range results. We saw slightly better SQF numbers for sharpness and contrast from this new Fujifilm than from the comparable lenses. Using DxO Analyzer 5.3, we found Imperceptible-rated pincushion distortion in our test; at 0.05%, a great result, this was much better than either the Nikon (0.27%) or the Pentax (0.11%), which both came in on the Slight level. It even garnered a better rating than the other two lenses that achieved Imperceptible results, the Zeiss Touit (0.10%) and the Fujifilm f/1.4 (0.06%). Bravo!

In our test of light falloff, the new lens had no detectable vignetting by f/2, even better than the older Fujifilm, the Nikon, and



What's Hot
Small, sharp, and weather-sealed, with no light falloff

What's Not
Manual focus is electrical instead of mechanical

Who It's For
Fujifilm shooters looking for a great deal on a 35mm

the Pentax. Only the Zeiss Touit was able to match its coverage. In terms of close-focusing power, the Fujifilm 35mm f/2 could resolve a sharp image as close as 12 inches, similar to the others we compared it against. With a maximum magnification of 1:5.86, it scored pretty much in the middle of our test subjects within the focal range.

To sum it all up, this tiny lens outshone its four closest competitors in most optical characteristics. Its compact size and weather-sealed body both provide significant advantages to serious shooters, especially those who like to keep a low profile on the street and at events. Given these benefits, the new Fujifilm is a real steal, coming in \$200 below the older and slightly faster Fujifilm 35mm f/1.4.

—Julia Silber

TEST RESULTS

DISTORTION: 0.05% (Imperceptible)

pincushion

LIGHT FALLOFF: None

CLOSE-FOCUSING

DISTANCE: 12 inches

MAXIMUM MAGNIFICATION RATIO: 1:5.86

SPECIFICATIONS

35MM (34.48mm tested), f/2 (f/2.04 tested), 9 elements in 6 groups. Focus ring turns 260 degrees.

DIAGONAL VIEW ANGLE: 44 degrees

WEIGHT: 0.37 lb **FILTER SIZE:** 43mm

MOUNTS: Fujifilm X

INCLUDED: Lenshood, lens pouch

STREET PRICE: \$399

WEBSITE: fujifilmusa.com

SUBJECTIVE QUALITY FACTOR

Our standard lens test, SQF rates sharpness by print size

Size	5x7	8x10	11x14	16x20	20x24
2.0	86.2	86.2	92.3	88.6	82.6
2.8	87.1	86.2	94.1	90.1	85.1
4.0	87.4	85.5	94	91.1	86.6
5.6	87.5	85.5	93.9	91.5	87.2
8.0	87.5	85.5	93.9	92.1	88.4
11.0	87.5	86.1	94.2	91.5	87.5
16.0	86.9	86.5	93.5	89.0	83.5

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WIDEN UP

The latest Art lens embraces the view

SIGMA CONTINUES to broaden its Art line of lenses with this ultra-wide-angle, full-frame 20mm f/1.4 that streets for \$899. Although its respected Art line already includes a number of fairly wide primes (19, 24, 30, and 35mm), Sigma claims that its newest is the fastest lens ever made at this focal length for full-frame (35mm) cameras. The company also wowed us recently with the first 24–35mm f/2 zoom, another Art lens for full-framers.

The new 20mm has all the features of its siblings in the Art line: Super Multi-layer coating, durable construction, and a brass bayonet mount. In total, 15 elements in 11 groups combine a Low Dispersion (FLD) component with five Special Low Dispersion (SLD) elements to reduce color fringing in highlights. The built-in lenshood does not permit threaded filters; this is often the case with ultrawide lenses.

In our field shooting with the Sigma, we noticed that the coating did cut down on lens flare and ghosting, even when shooting into the sun. Also, its much-touted autofocus was indeed very quick to lock on, despite the heavy glass. Wide open at f/1.4, it exhibited nice bokeh for such a wide-angle lens.

With all that glass, it's fairly large and heavy, but it balanced well on our Canon EOS 6D. Compared to Nikon's 20mm f/1.8G and the older Sigma 20mm f/1.8, it was longer by almost two inches and heavier by almost a pound, though those two lenses have a smaller maximum aperture. We liked the built-in lenshood even though the cap didn't clip onto the front, making us feel less secure about it.

On our optical bench in the Popular Photography Test Lab, our SQF test earned it an Excellent A-plus rating for sharpness and contrast at our 11x14-inch benchmark.

That was only slightly better than the Nikon but almost 5 points better than the older Sigma—a vast improvement. At further magnifications of 16x20 and 20x24, the new lens scored significantly better than both of these two.

Our tests for distortion using DxO Analyzer 5.3 revealed Slight barrel distortion (0.30%), but this is standard for such a wide-angle lens. The Nikon 20mm f/1.8 pulled off a mildly better rating at 0.25%. We really started to see the new Art lens shine when compared to its older cousin, Sigma's 20mm f/1.8, which garnered a Visible score at 0.83%—very good progress indeed.

Any trace of vignetting with this new optic was gone by f/3.5, much better than the Nikon, which showed light falloff at the edges until a whopping f/6.3.

The new Sigma offers a relatively close focusing distance of

TEST RESULTS

DISTORTION: 0.30% (Slight) barrel
LIGHT FALLOFF: Gone by f/3.5
CLOSE-FOCUSING DISTANCE: 10.12 inches
MAXIMUM MAGNIFICATION RATIO: 1:5.90

SPECIFICATIONS

20MM (20.69mm tested), f/1.4 (f/1.47 tested), 15 elements in 11 groups. Focus ring turns 120 degrees.
DIAGONAL VIEW ANGLE: 94 degrees
WEIGHT: 2.21 lbs
FILTER SIZE: None
MOUNTS: Canon AF, Nikon AF, Sigma AF
INCLUDED: Case
STREET PRICE: \$899
WEBSITE: sigmaphoto.com



What's Hot
 Wide, fast, and super-sharp, with little distortion

What's Not
 Slip-cover lens cap doesn't click into place

Who It's For
 DSLR shooters who want a premium ultra-wide angle at a reasonable price

10.12 inches and a maximum magnification ratio of 1:5.90. This seemed to be close to the high end of the normal range for this ultrawide focal length.

Considering the new 20mm f/1.4 is truly in a class of its own, it is reasonably priced at \$899. With this lens, Sigma has nicely rounded out its f/1.4 lenses in the wide-angle end of its Art line. We're not sure what will be next for the lensmaker, but we'd love to see it bring an equally fast 85mm into the Art family. —Julia Silber

SUBJECTIVE QUALITY FACTOR

Our standard lens test, SQF rates sharpness by print size

Size	6x7	8x10	11x14	16x20	20x24
1.4	89.8	88.1	86.4	85.6	84.2
2.0	87.3	85.1	83.6	82.5	81.6
2.8	85.3	83.1	81.7	80.0	79.1
4.0	83.2	81.1	79.7	78.8	78.2
5.6	81.4	79.3	78.0	77.8	77.0
8.0	79.8	77.7	76.5	76.3	75.7
11.0	78.3	76.2	75.0	74.8	74.3
16.0	76.8	74.7	73.5	73.3	72.8

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HOT AT 50

The Milvus normal melts its competition

LAST MONTH we tested the first of the new full-frame Zeiss Milvus lenses, the 85mm f/1.4, and loved its sharpness and lack of distortion. This month we test another one, the Zeiss Milvus Distagon T* 50mm f/1.4, which hit the street at \$1,199. It has 10 elements in 8 groups, with a floating element design to drive high image quality throughout the focusing range. Zeiss says it made the Milvus line specifically for new ultra-high-resolution DSLRs to handle 6K video natively and churn out images in the 50MP range.

The Milvus 85mm was optically and financially right in the middle of Zeiss's Otus and Classic (as the company now calls it) 85mm lenses. Similarly, here we compare the Milvus 50mm ZE to the high-end Otus 55mm (tested in 2014) and Classic Planar 50mm f/1.4. We also tested it against other full-frame 50mm f/1.4 glass from Canon, Nikon, Sigma, and Sony, as well as Rokinon, which, like Zeiss, allows manual focus only.

In the field, it felt heavy for a 50mm. It is at least a pound heavier than the Canon, Nikon, Sony, and Zeiss Classic, and it weighs a few ounces more than the Rokinon and Sigma; it is about 6 ounces lighter than the Otus. While it is shorter than the Otus and the Sigma, it is also longer than all of the others.

This Milvus produced smooth and clean *bokeh*, especially with the aperture wide open. The level of contrast we saw in our photos in field use rendered subjects very realistically. Its excellent multi-coating suppressed most lens flare, and what flares did show up were mild. (You can see a gallery of our sample

images online at PopPhoto.com.)

The construction is top-notch. Its metal-clad body is weather-sealed to protect against dust and moisture. The focus ring, while well damped, has a turning radius that's quite long at 220 degrees. Once you've found your focus, however, the lens is really sharp and crisp, as our lab tests show.

In our SQF test on the optical bench, the Milvus was slightly outperformed by Zeiss's own Otus. But it scored a bit better than the Classic and slightly better than the rest of the lenses we tested, reaching Excellent at our 11x14 benchmark for sharpness and contrast.

In our distortion tests using DxO Analyzer 5.3, the Milvus ranked in the Slight pincushion range at 0.19%—not quite on par with the Milvus 85mm and Otus 55mm (0.09%) or the astonishing Sigma 50mm (0.02%). It scored slightly better, though, than the Zeiss Classic and Canon (both 0.24%) and the Sony (0.26%), and significantly better than the Rokinon (0.32%).

With vignetting, we found an opposite pattern. The Zeiss Classic

TEST RESULTS

DISTORTION: 0.19% (Slight) pincushion
LIGHT FALLOFF: Gone by f/2.5
CLOSE-FOCUSING
DISTANCE: 18.12 inches
MAX. MAGNIFICATION RATIO: 1: 6.11

SPECIFICATIONS

50MM (51.64mm tested), f/1.4 (n.a. tested*), 10 elements in 8 groups. Focus ring turns 220 degrees.
DIAGONAL VIEW ANGLE: 46 degrees
WEIGHT: 1.90 lbs **FILTER SIZE:** 67mm
MOUNTS: Canon AF, Nikon AF
INCLUDED: Lenshood
STREET PRICE: \$1,199
WEBSITE: zeiss.com

*Tested measurements not available due to instrument limitation.



What's Hot
 Very sharp, low distortion, solid build quality

What's Not
 Somewhat long turning radius for the MF ring

Who It's For
 Anyone who wants super sharpness at a sub-Otus price

and Sigma tested a little better than this Milvus, with light falloff gone by f/2. But falloff in the Milvus and Otus were both gone at f/2.5, better than the rest of the lenses we've tested. In close focusing and maximum magnification, all the lenses fell in line similarly, with the Milvus performing just slightly better than the Otus.

So this 50mm Milvus indeed occupies a middle ground between the Otus and Zeiss Classic lenses in both optics and price. It sells for about \$2,600 less than the very pricey Otus; the Classic now streets for just \$625. With the addition of this line, Zeiss offers a nice range of options. The question is what bird will Zeiss choose for its next series of great lenses? —Julia Silber

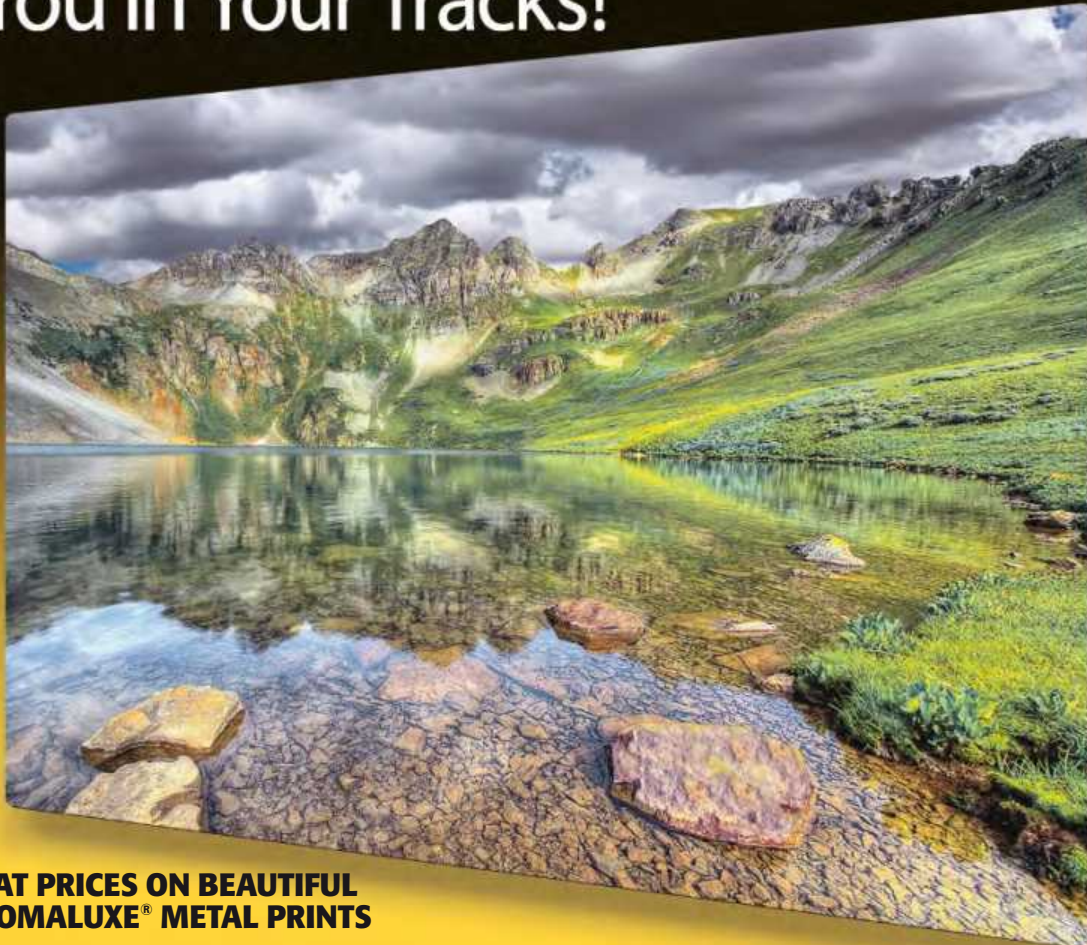
SUBJECTIVE QUALITY FACTOR

Our standard lens test, SQF rates sharpness by print size

Size	5x7	8x10	11x14	16x20	20x24
1.4	88.2	88.2	93.4	88.2	81.5
2.0	87.8	88.2	93.8	89.0	82.8
2.8	87.2	88.2	94.2	89.9	84.3
4.0	86.8	88.2	94.6	91.6	87.2
5.6	86.2	88.2	95.0	93.0	89.4
8.0	85.8	88.2	95.4	95.4	90.7
11.0	85.2	88.2	95.8	97.3	93.4
16.0	84.8	88.2	96.2	99.9	94.8

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Aspen Photo Art by Larry Bennett Clear Lake Colorado sets above timberline, about 13,000 ft. close to the old mining town of Silverton. This image is a 7 exposure HDR, shot early morning, Summer of 2012, with 24-70mm zoom on a Canon 7D.

SIZE	PRICE
8 x 12	\$20.95
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20 x 30	\$99.95

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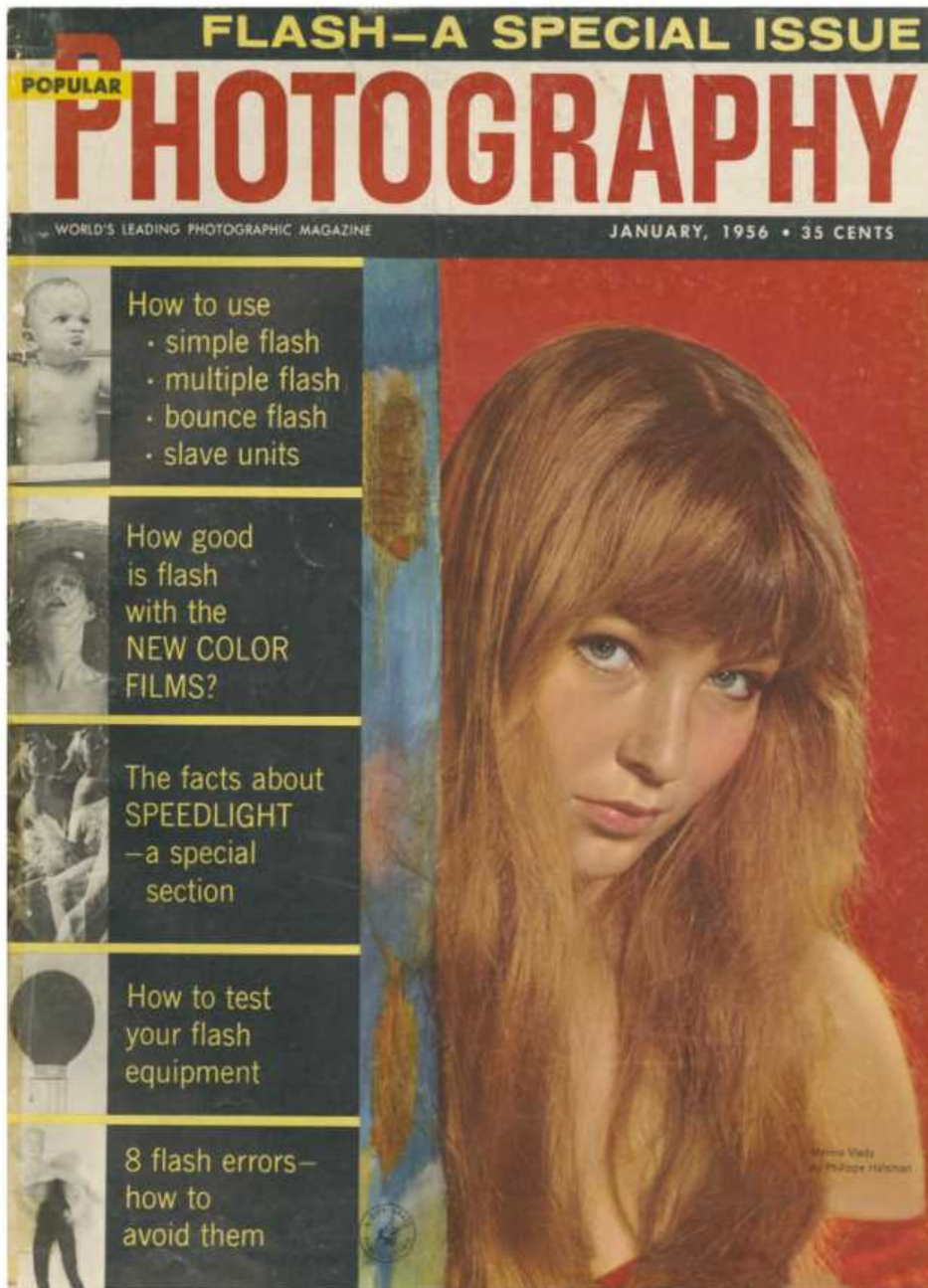
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Ever-Inventive Halsman

Not yet famous for his jumping portraits, Philippe Halsman used a camera of his own design to photograph French actress Marina Vlady. His 4x5 Fairchild-Halsman camera, fitted with a 210mm Bausch & Lomb f/4.5 lens, was an unusual twin-lens reflex made to use 4x5 sheet film for studio work. For this cover he exposed Kodak Daylight Ektachrome at f/22 for 1/100 sec.

60 YEARS AGO

We showed Philippe Halsman at work in his "portable speedlight studio."

Razor's Edge

The continuing search for sharpness prompted Kodak's introduction of Panatomic-X film, offering finer grain and higher acutance than its predecessor, Panatomic (without the "X"). Used properly, this new film produced 11x14-inch enlargements from 35mm negatives that closely approached the holy grail of contact-print quality.



All-in-One Processor

For impatient photographers, Brown-Forman Industries created this unusual processor that permitted complete roll-film processing in as little as seven minutes. The secret was a series of compartments for each stage in the development process, eliminating the pour-in, pour-out steps used in conventional roll-film developing tanks.

More Bounce

Famed war photographer David Douglas Duncan created a new bounce flash to lighten shadows: He drilled a small hole into the flash head to let a secondary beam of light shine directly on the subject (see arrow). Modifying this, the Mighty Light Speedlight manufacturer bored a 3/8-inch hole in the reflector, allowing an additional beam of light to hit the subject. —Harold Martin



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47770/62728
62570 shown

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SUPER COUPON

2.5 HP, 21 GALLON 125 PSI VERTICAL AIR COMPRESSOR

CENTRAL PNEUMATIC
LOT 69091/67847 shown
61454/61693/62803

Customer Rating

SAVE \$349

\$149.99 comp at \$499

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7 FT. 4" x 9 FT. 6" ALL PURPOSE WEATHER RESISTANT TARP

LOT 69115/69137
69249/69129/69121/877 shown

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\$3.99 comp at \$9.38

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SUPER COUPON

RAPID PUMP® 1.5 TON ALUMINUM RACING JACK

PITTSBURGH

Customer Rating

SAVE \$60

• 3-1/2 Pumps Lifts
• Most Vehicles
• Weighs 32 lbs.

LOT 69252
60053/62160
62496/62516
60569 shown

\$59.99 comp at \$119.99

33635218

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SUPER COUPON

TWO TIER COLLAPSIBLE EASY-STORE STEP LADDER

Customer Rating

LOT 67514

SAVE 39%

• 225 lb. Capacity

\$19.99 comp at \$32.99

33651526

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SUPER COUPON

ELECTRIC CHAIN SAW SHARPENER

CHICAGO ELECTRIC POWER TOOLS

LOT 61613
68221 shown

Customer Rating

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4-1/4" grinding wheel included.

\$29.99 comp at \$49.99

33673140

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SUPER COUPON

2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL

GADLAND

SAVE \$200

LOT 61258 shown
61840/61297/68146

\$59.99 comp at \$259.99

Customer Rating

33689104

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SUPER COUPON

26" 16 DRAWER ROLLER CABINET

US GENERAL

• 1060 lb. Capacity
• 14,600 cu. in. of storage

LOT 61609
67831 shown

SAVE \$633

\$319.99 comp at \$952.99

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SUPER COUPON

60 LED SOLAR SECURITY LIGHT

Bunker Hill Security

LOT 62534
69643 shown

SAVE 56%

\$30.30 comp at \$69.99

Includes 6V, 900 mAh NiCd battery pack.

33633513

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SUPER COUPON

1500 WATT DUAL TEMPERATURE HEAT GUN (572°/1112°)

drillmaster

LOT 62340/62546
96289 shown

Customer Rating

SAVE 70%

\$8.99 comp at \$29.97

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LOT 60338/69381 shown

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POWDER-FREE NITRILE GLOVES PACK OF 100

HARDY

• 5 mil thickness

Item 68498 shown

SAVE 56%

\$6.49 comp at \$14.97

SIZE	LOT
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LG	68497/61360
X-LG	68498/61359

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SUPER COUPON

PITTSBURGH 2 TON FOLDABLE SHOP CRANE

LOT 69514 shown
60388

SAVE \$120

\$179.99 comp at \$299.99

Includes Ram, Hook and Chain

33644701

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| 375mm F5.6.....299.95 | |
| 380mm F1.8.....498.95 | |
| 380mm F5.6.....299.95 | |
| 385mm F1.8.....498.95 | |
| 385mm F5.6.....299.95 | |
| 390mm F1.8.....498.95 | |
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| 395mm F1.8.....498.95 | |
| 395mm F5.6.....299.95 | |
| 400mm F1.8.....498.95 | |
| 400mm F5.6.....299.95 | |
| 405mm F1.8.....498.95 | |
| 405mm F5.6.....299.95 | |
| 410mm F1.8.....498.95 | |
| 410mm F5.6.....299.95 | |
| 415mm F1.8.....498.95 | |
| 415mm F5.6.....299.95 | |
| 420mm F1.8.....498.95 | |
| 420mm F5.6.....299.95 | |
| 425mm F1.8.....498.95 | |
| 425mm F5.6.....299.95 | |
| 430mm F1.8.....498.95 | |
| 430mm F5.6.....299.95 | |
| 435mm F1.8.....498.95 | |
| 435mm F5.6.....299.95 | |
| 440mm F1.8.....498.95 | |
| 440mm F5.6.....299.95 | |
| 445mm F1.8.....498.95 | |
| 445mm F5.6.....299.95 | |
| 450mm F1.8.....498.95 | |
| 450mm F5.6.....299.95 | |
| 455mm F1.8.....498.95 | |
| 455mm F5.6.....299.95 | |
| 460mm F1.8.....498.95 | |
| 460mm F5.6.....299.95 | |
| 465mm F1.8.....498.95 | |
| 465mm F5.6.....299.95 | |
| 470mm F1.8.....498.95 | |
| 470mm F5.6.....299.95 | |
| 475mm F1.8.....498.95 | |
| 475mm F5.6.....299.95 | |
| 480mm F1.8.....498.95 | |
| 480mm F5.6.....299.95 | |
| 485mm F1.8.....498.95 | |
| 485mm F5.6.....299.95 | |
| 490mm F1.8.....498.95 | |
| 490mm F5.6.....299.95 | |
| 495mm F1.8.....498.95 | |
| 495mm F5.6.....299.95 | |
| 500mm F1.8.....498.95 | |
| 500mm F5.6.....299.95 | |

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| 16-28mm F2.8.....748.00 | 12-28mm F4.....598.95 |
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| | 150-500mm F135.....24.95 |
| | 150-500mm F178.....17.95 |
| | 150-500mm F216.....13.95 |
| | 150-500mm F270.....10.95 |
| | 150-500mm F338.....8.95 |
| | 150-500mm F425.....7.95 |
| | 150-500mm F540.....6.95 |
| | 150-500mm F675.....5.95 |
| | 150-500mm F855.....5.45 |
| | 150-500mm F1080.....5.15 |
| | 150-500mm F1375.....4.95 |
| | 150-500mm F1755.....4.75 |
| | 150-500mm F2250.....4.65 |
| | 150-500mm F2895.....4.6 |
| | 150-500mm F3735.....4.55 |
| | 150-500mm F4725.....4.5 |
| | 150-500mm F5985.....4.45 |
| | 150-500mm F7620.....4.4 |
| | 150-500mm F9675.....4.35 |
| | 150-500mm F12285.....4.3 |
| | 150-500mm F15675.....4.25 |
| | 150-500mm F19950.....4.2 |
| | 150-500mm F25425.....4.15 |
| | 150-500mm F32275.....4.1 |
| | 150-500mm F40950.....4.05 |
| | 150-500mm F51675.....4.0 |
| | 150-500mm F65125.....3.95 |
| | 150-500mm F82650.....3.9 |
| | 150-500mm F104625.....3.85 |
| | 150-500mm F131625.....3.8 |
| | 150-500mm F164625.....3.75 |
| | 150-500mm F203625.....3.7 |
| | 150-500mm F253625.....3.65 |
| | 150-500mm F313625.....3.6 |
| | 150-500mm F383625.....3.55 |
| | 150-500mm F463625.....3.5 |
| | 150-500mm F543625.....3.45 |
| | 150-500mm F633625.....3.4 |
| | 150-500mm F733625.....3.35 |
| | 150-500mm F833625.....3.3 |
| | 150-500mm F933625.....3.25 |
| | 150-500mm F1033625.....3.2 |
| | 150-500mm F1133625.....3.15 |
| | 150-500mm F1233625.....3.1 |
| | 150-500mm F1333625.....3.05 |
| | 150-500mm F1433625.....3.0 |
| | 150-500mm F1533625.....2.95 |
| | 150-500mm F1633625.....2.9 |
| | 150-500mm F1733625.....2.85 |
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| | 150-500mm F2033625.....2.7 |
| | 150-500mm F2133625.....2.65 |
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| | 150-500mm F2633625.....2.4 |
| | 150-500mm F2733625.....2.35 |
| | 150-500mm F2833625.....2.3 |
| | 150-500mm F2933625.....2.25 |
| | 150-500mm F3033625.....2.2 |
| | 150-500mm F3133625.....2.15 |
| | 150-500mm F3233625.....2.1 |
| | 150-500mm F3333625.....2.05 |
| | 150-500mm F3433625.....2.0 |
| | 150-500mm F3533625.....1.95 |
| | 150-500mm F3633625.....1.9 |
| | 150-500mm F3733625.....1.85 |
| | 150-500mm F3833625.....1.8 |
| | 150-500mm F3933625.....1.75 |
| | 150-500mm F4033625.....1.7 |
| | 150-500mm F4133625.....1.65 |
| | 150-500mm F4233625.....1.6 |
| | 150-500mm F4333625.....1.55 |
| | 150-500mm F4433625.....1.5 |
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| | 150-500mm F4633625.....1.4 |
| | 150-500mm F4733625.....1.35 |
| | 150-500mm F4833625.....1.3 |
| | 150-500mm F4933625.....1.25 |
| | 150-500mm F5033625.....1.2 |
| | 150-500mm F5133625.....1.15 |
| | 150-500mm F5233625.....1.1 |
| | 150-500mm F5333625.....1.05 |
| | 150-500mm F5433625.....1.0 |
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| | 150-500mm F5633625.....0.9 |
| | 150-500mm F5733625.....0.85 |
| | 150-500mm F5833625.....0.8 |
| | 150-500mm F5933625.....0.75 |
| | 150-500mm F603362 |

SCREENED IN

A photographer uses windows as metaphor

AFTER AN emotional breakup and a failed business venture, five years ago Wyatt Gallery embarked on a nomadic lifestyle in search

of something new. What came from his exploration was the series *Introspect*, a catalogue of photographs documenting the view from the windows of each place he stayed. “Although I had immense freedom physically, I

wasn’t always able to experience the fullness of a location emotionally,” Gallery says. This shot perfectly embodies his complex frustration, placing the viewer in the same emotional state as the photographer. —*Sara Cravatts*



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