ULTIMATE GUIDE TO PHOTOGRAPHIC GEAR & TECHNIQUES

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SPORTS SUPERSTARS
HIT A HOME RUN WITH YOUR ACTION SHOTS

PORTRAITS
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51 LENSES
REVIEWED & RECOMMENDED

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SUMMER 2018

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/// SUMMER 2018 /// VOL. 22 NO. 2

/// HOW-TO ///

/// FEATURES ///

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SUMMER 2018
VOL. 22 NO. 2

PHOTO BY DAVID SCHLOSS

The cover image was shot by Editor David Schloss, as part of the rigourous testing and evaluation of products we do for our guides. Shot with the Sony FE 85mm FI.8, it's a great example of the look possible with today's high-quality lenses, with sharp foreground and beautiful background blur. We put all the lenses in this issue through their paces in the conditions they were made for to find the best lenses for you.

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/// EDITOR'S NOTE ///

Shot just outside Joshua Tree at Thunderbird Lodge Retreat, this long exposure wouldn't have been as expressive without a wide-angle lens.

WHICH LENS IS RIGHT FOR YOU?

"Beauty is in the eye of the beholder," and in photography, there's no way to behold something without a lens. In fact, there wouldn't be photography at all if it weren't for the magic light-modifying power of a lens. In an era where cameras all sport sensors capable of resolving the tiniest detail and the most vibrant color, there's no component more important to creating an image than a lens.

Half of the art of photography comes down to being able to select the right lens to create the image in your mind's eye. The other half of the art of photography is figuring out how to use the lens you have with you to create the image in your mind's eye that requires another lens.

In this issue, the Ultimate Guide To Lenses, we walk through each type of photography and give you the information you need to make a good purchase decision, plus a guide to our favorite lenses in each category.

Of course, nothing says you need to use a portrait lens to take a portrait or a travel lens to take travel photos, so each of these guides talks about the fundamentals of the different types of photography, the lenses that are usually used for the different subjects, plus how to break the rules and create masterful images with unexpected gear.

This issue also has a resource to help you pack your gear and hit the road, a tutorial for creating interesting compositions from moving subjects and a deep look at lighting fundamentals and how to use any lighting tool to improve your photos.

At the end of the day, photography is about creativity and the willingness to experiment. But having the right lens certainly makes it easier to get the image you're hoping for.

—David Schloss, Editor
@davidjschloss, editors@dpmag.com

Olympus OM-D E-M1 Mark II, Olympus M.Zuiko 40-150mm f2.8 PRO. **Exposure: 1/1500 sec., ƒ/6.7, ISO 400. Photo by Olympus Visionary Scott Bourne.**

SPEED & PRECISION

Responsive performance, superior optics and unbeatable portability make the Olympus mirrorless system an ideal choice for wildlife photography

Arguably, no photographic subject is more challenging than capturing birds in flight. "Take eagles, for example," explains Olympus Visionary Scott Bourne, "which change direction mid-air at 40 mph. Your AF system has to be up to the challenge."

Bourne found the perfect camera for his photography in the Olympus OM-D E-M1 Mark II. Capable of capturing up to 18 frames per second with Continuous AF Tracking using its electronic shutter, the camera provides the speed and precision that Bourne needs to record the sharp, detailed images of birds in flight that have earned him a stellar reputation among clients and fans.

He judged the system critically as any professional would, and decided to sell his professional DSLR system to make the switch to the much lighter OM-D E-M1 Mark II. "I can't pretend I have an eagle in sharp focus—it either is or it isn't," Bourne says. But for Bourne's work, the advantages of the Olympus system go beyond those of mere physical weight and size. "Up until now, there hasn't been tracking AF reliable enough to do what I do," he says. Referring to the OM-D E-M1 Mark II's AF system, Bourne notes the exceptional performance of its 121 AF points that cover the entire sensor. "That gives you an advantage right off the bat. Once I have made appropriate adjustments to set the AF system correctly, depending on my subject, my keeper rate exceeds that of my previous pro cameras. When I switched to the Olympus system, my clients didn't notice."

For Bourne, it's not just the impressive capabilities of his camera but also the extensive lens selection that make the Olympus system the best choice for him. His go-to lenses are the M.Zuiko 40-150mm f2.8 PRO and 300mm f4.0 IS PRO. Speaking of the 40-150mm f2.8 PRO, Bourne says, "I'm in love with that range," which, with the camera's Micro Four Thirds sensor, gives him an equivalent of 80-300mm. "When I'm shooting eagles in Alaska, for example, 75 percent or more of my images are taken with that lens."

If he needs extra telephoto reach, it's the 300mm f4.0 PRO, equivalent to a 600mm super-tele. "That lens is amazing. I can't say enough about it. It's one of the most impressive lenses ever created," he says. It's exceedingly sharp, and Bourne notes its superior close-focusing capability. "A close-focusing distance of less than 5 feet—instead of 15 feet with lenses of equivalent focal length for DSLRs—means I can fill a frame with a bird's eye if I want to, while remaining at a respectful distance."

Another big advantage is the system's advanced 5-Axis Image Stabilization, which compensates for all types of camera motion to provide up to 5.5 stops of correction when shooting handheld, giving Bourne the freedom to react quickly to his fast-moving subjects. And because this technology is built-in to the camera body, it's available no matter which lens Bourne chooses.

To those photographers who are wary of trading their large DSLRs for a mirrorless system, Bourne is quick to reassure. "I'm making 30x40-inch prints with the images from my OM-D E-M1 Mark II. And with its much lighter weight, I can stay out and shoot longer, which is a huge advantage for wildlife photography."

Hear more from other photographers who have made the switch to the Olympus OM-D system at ***getolympus.com/neverlookback.***

OLYMPUS

/// ANNUAL BLACK & WHITE PHOTO CONTEST WINNERS ///

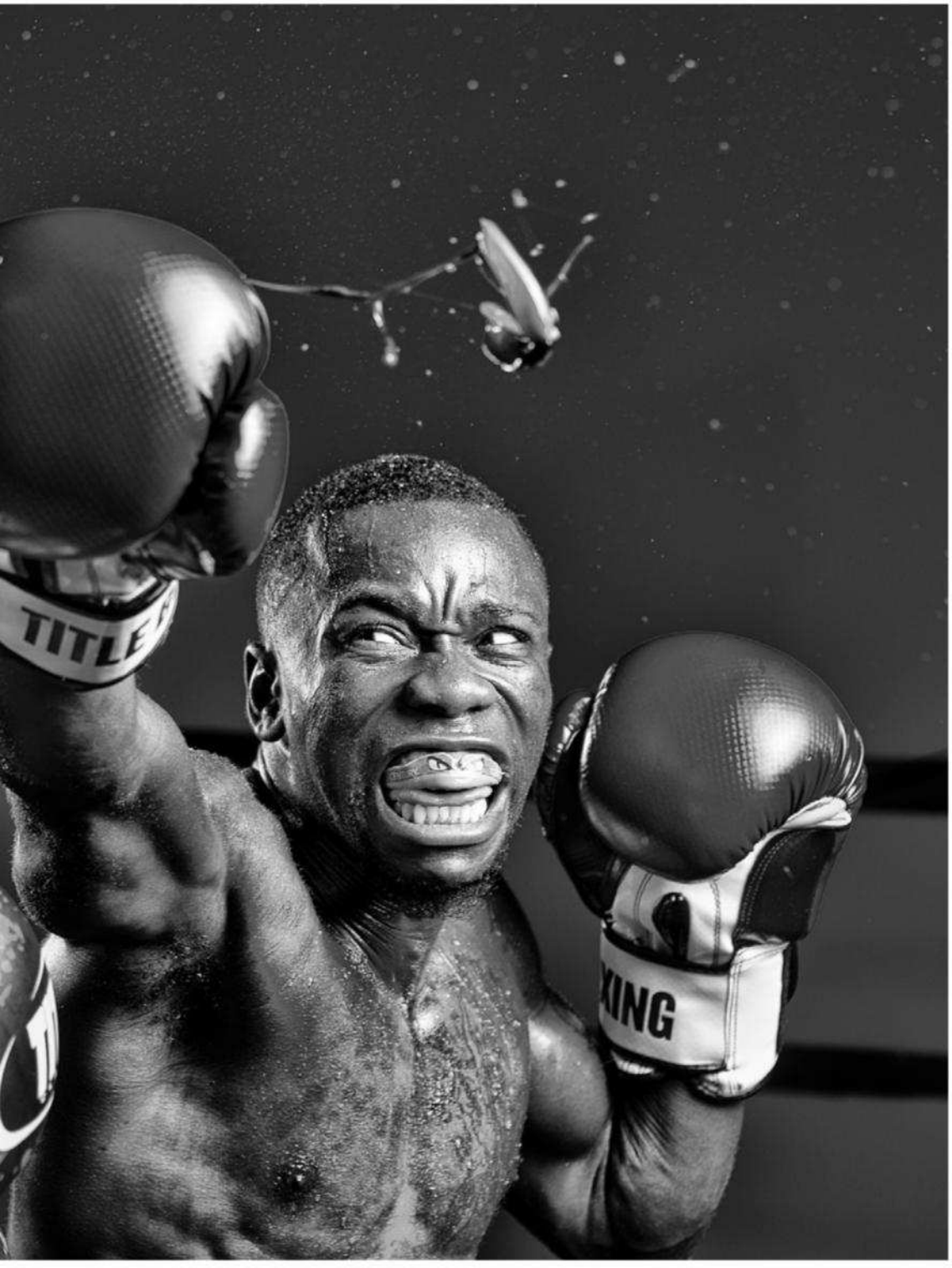
GRAND PRIZE

"The Knockout Punch"

BY CHRISTOPHER BERG

"As a portrait photographer, my subjects are almost always still. But after having made a more traditional portrait of North Carolina-born pro boxer Dewayne Beamon earlier, I asked if I could capture him at maximum performance, intensity and action—throwing a knockout punch. I approached our session very similarly to a movie shoot—plan, prepare, setup, rehearse, capture."

Hasselblad H5D-50c with an f4/120mm lens and three Profoto strobes.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SECOND PRIZE

"Snow Princess"

BY DARCY PINO

"I made this image with my infrared-converted Nikon D300 at Gibbs Garden and used my granddaughter as a model. This image was shot around noon, which is the best time to shoot infrared. I wanted the viewer to feel a sense of peace and purity."

28-300mm lens, F-16 and 1/125sec, ISO 200.

/// ANNUAL BLACK & WHITE PHOTO CONTEST WINNERS ///

THIRD PRIZE

"Swept Away In Bagan"

BY MARTIN DUNN

"This image was taken mid-morning in one of the minor monasteries in Bagan, Myanmar. The rays of the sun cast wonderful streaks as two monk novitiates proceeded with their daily chores."

Nikon D610, 28-300mm f/3.5-5.6 ED VR lens, 28mm, ISO 1600, 1/500sec. at f/8.0, converted to B&W with Nik Silver Efex Pro 2 plug-in to Lightroom.

HIT THE TRAILS

THINK SMALL WHEN GEARING UP FOR SUMMER TRAVEL

BY MARK EDWARD HARRIS

ANDREY ARMYAGOV/SHUTTERSTOCK

While many cameras continue to downsize thanks to the mirrorless revolution, the quality of their images keeps ramping up. Many photographers are switching over to small full-frame, APS-C and Micro Four Thirds camera systems and enjoying the incredible results these systems provide while equally enjoying the weight savings they provide.

As we gear up for summer travel, what can we do to reduce our payloads without sacrificing quality? While I'm still a full framer, I've created a methodology that helps me travel lighter, saving my back and reaction time to photo ops on the road. No matter what camera system you use, the following should make travel photography more compact and open up more opportunities with more efficient solutions.

From North Korea to Namibia, I've made packing a vital part of my workflow. Since much of the editorial work I do is on my own, I limit my luggage count to two. My carry-on contains my camera equipment, while my checked bag transports my clothing, tripod and sometimes a small knapsack. It's too cumbersome and too easy to lose track of a third bag when traveling solo.

Dual-purpose rolling camera backpacks have had major advancements in the last couple of years, saving countless backs from the pain of vertebrae-pinching compression. But unless you strictly work in modern cities with smooth paved roads, there are times when a backpack is a necessity.

Think Tank's Airport TakeOff V2 complies with most U.S. domestic and international airline carry-on requirements and saves space with integrated backpack straps, a shoulder harness and back panel padding. It can hold up to two standard bodies, four to six assorted lenses, including a 400mm f/2.8, and has a large front pocket that can fit a 17-inch laptop.

LowePro's Pro Runner x450 AW II convertible roller/backpack can hold up to two DSLRs, one with lens attached. For example, I've packed a Canon 5D Mark III with up to 70-200mm f/2.8 or 300mm, five to six extra lenses and a speedlight, as well a 15-inch laptop in one.

While these bags can hold larger computers, I've found that the 13-inch MacBook Pro is large and powerful enough to do whatever I need to do on the road. This more demure size isn't only lighter but also easier to work with when sitting in a plane or train seat. Everything gets backed up on a small external hard drive at the end of a shooting day.

On the occasion that I do have to part ways with my rolling camera backpack, such as when I connect to a small commuter flight, I pull out my MacBook Pro and noise-canceling headphones and lock the bag with a TSA-approved combination lock before handing over my bag at the gate.

Think Tank's Airport TakeOff

LowePro's Pro Runner x450 AW II

I used a Nikon D850 with a Sigma 150-600mm f/5-6.3 lens to photograph a plane bound for LAX passing in front of the moon.

Photo by Mark Edward Harris

While it's fairly straightforward to decide which camera bodies and lenses to bring along, I take my time choosing accessories to make sure I'm getting the most out of what I put in the bag.

We also love the bags from Manfrotto, Tenba and Sirui as they're designed to hold up to the rigors of travel and provide all the features that a photographer could ask for.

Profoto is billing its new Profoto A1 as the world's smallest studio light. Its round head gives a soft, smooth fall-off, and, besides power versatility, offers a fast recycling time and a long-lasting exchangeable Li-ion battery. This 1.232-pound strobe can be shot on-camera or off (I prefer off utilizing the AirTTL) with the spread of light easily adjusted between wide and narrow and focused with a twist of the zoom ring on its head. To take full advantage of the system, the A1 has a dedicated set of light-shaping modifiers that can be quickly clicked on and off and stacked because of their built-in smart magnetic mount. These include Profoto's Dome Diffuser, Bounce Card, Wide Lens, Gel Kit and Soft Bounce.

The "Air" feature can communicate with another A1 or other Profoto lights, and its HSS (High-Speed Sync) enables flash use up to a 1/8,000 of a second shutter speed—extremely helpful for doing dramatic outdoor environmental portraits. The A1's built-in modeling light provides a clear idea of how shadows

Profoto A1 AirTTL

Matthews Fly-A-Way Sandbag

Manfrotto Befree Live

Really Right Stuff
TQC-14

will fall as well as providing an additional light source in low-light situations.

The A1 is expensive—it'll cost the same as several standard speedlights, but it's versatile, flexible and, thanks to the modeling light, great for previsualization. For a lower cost flash, we'd recommend those from the camera manufactuers and the gear from Flashpoint.

If I'm on my own and I want to use an off-camera flash farther than an arm's distance away, it's great to have a sandbag at the ready to keep a light stand from tipping over. Regular sandbags aren't an option since they're the antithesis of a weight-saving accessory, so I carry an empty bag such as the Matthews Fly-A-Way or its Matthbag that can be filled on location with rocks, gravel or sand. The Matthbag has four zippers and the Fly-A-Way a Velcro strip to seal in the filling.

Tripods are an important tool but a major source of additional weight. One made out of carbon fiber is ideal for its combination of lightness and strength. When every inch counts, tripods with reverse-folding legs make the best use of limited space. For example, the 2.43-pound Manfrotto Befree Compact Travel Carbon Fiber Tripod extends to 56.7 inches, supports 8.8 pounds and folds to only 15.75 inches. Its legs fold up and around the ballhead, a feature that helps make this tripod so compact.

Really Right Stuff's TQC-14 tripod is engineered to be a companion to the BH-30 ballhead, supporting loads up to 25 pounds without sacrificing stability. Its built-in quick column provides an additional 11 inches for a total height of 59 inches. The 2.7-pound TQC-14 collapses down to 17.7 inches, still within the size limit to fit into most roller/backpacks when carrying fewer lenses.

Our favorite tripod for mixed photo and video use is the Manfrotto BeFree line, particularly the BeFree Live, as it has an integrated and easy-to-adjust tripod head that makes it easy to go from a smooth video pan to a solid long exposure shoot. The tripod comes in both carbon fiber and aluminum versions.

We also like Benro because they make affordable, durable tripods with all the features of the more expensive models.

Regardless of the tripod I use, I keep dedicated plates on my camera bodies and longer lenses so I can quickly slip them into my ballhead. This keeps me from the impulse many of us have to not bother with a tripod in borderline situations when in reality the use of one will improve the final result.

The digital world has allowed me to downsize my filter carrying to just a polarizer, a neutral-density and two graduated neutral-density filters. My B+W 77mm XS-Pro Kaesemann High Transmission Circular Polarizer MRC-Nano Filter reduces light loss down to 1-1.5 stops.

For those who want to lighten their bags by not packing a macro lens, diopters such as Canon's 77mm 250D and 500D Close-up Lenses are a quick and easy solution for close-up photography. They have two achromatic elements to correct chromatic aberrations to avoid degradation on EF lenses. The 250D is designed for lenses with focal lengths from 30-135mm with the 500D geared for lenses with a focal length anywhere from 70-300mm.

I've added a new camera to my bag for BTS (behind the scenes) snaps and video around and under water, Fuji's 16.4-megapixel back-illuminated CMOS sensor FinePix XP120. The 7-ounce camera with a 3.0-inch LCD monitor has an internal 5x optical FUJINON zoom with coverage from 28-140mm that can be doubled with Intelligent Digital Zoom technology without the major degradation that traditionally occurs with digital zooms, and it's waterproof to a depth of 65 feet.

There's a saying in the movie world that an audience can endure a bad picture for a bit of time but not bad sound. Whenever I need to turn my DSLR into a movie-making machine, I make sure that audio doesn't become the clip's Achilles' heel.

Canon 77mm Close-Up Lens

Fujifilm FinePix XP 120

Rode VideoMic Go

Black Diamond Distance FLZ Trekking Poles

That means not relying on my DSLR's onboard mic for sound.

Weighing in at just over 2.5 ounces, Rode's extremely user-friendly VideoMic GO has no switches or battery to deal with, drawing a small voltage from the camera itself through the 3.5mm mini-jack output. Because of this plug-in power, there are a few cameras that don't support the VideoMic GO, including the Nikon D7000 and a number of Canon's consumer models. For those that do accept the mic, the result, especially when using a windscreen, is clear, crisp, directional audio. The VideoMic GO's integrated thermoplastic shock mount isolates the mic from bumps and vibrations that could interfere with sound.

CLOTHING

Photographic equipment isn't the only thing that weighs travel shooters down on the road. Unless you're a participant in a nudist camp and you exclusively shoot within its confines and travel there in your birthday suit, clothing is a necessity and makes a big difference in terms of weight and space.

Ultra-breathable pants and shirts from The North Face, Patagonia and others that are manufactured with FlashDry fabrics have accelerated moisture-wicking technology and evaporative drying power. They're particularly well suited for assignments that involve hiking and climbing. This means packing just two pairs of pants and a couple of shirts, then washing and hanging them to dry overnight.

When an assignment does involve hiking, I'll pack my Black Diamond Distance FLZ Trekking Poles, which fold into three sections with a collapsed length of 13.4 inches, with a pair weighing 15.5 ounces.

There are so many great things about nature photography. Being out in the wild is the ultimate in mindfulness. Unfortunately, flying insects seem to enjoy the great outdoors as well. To stay focused on shooting and not spraying, I've found donning ExOfficio's BugsAway clothing with Insect Shield technology an excellent solution when working in "buggy" locations. The Insect Shield process is designed to prevent loss of the active ingredient Permethrin outside the system by tightly bonding to fabric fibers. Clothing retains full effective repellency through 70 launderings.

What to bring and what to leave behind is a constant balancing act. Having an up-to-date equipment checklist will speed up the packing process and reduce the chances of leaving a vital piece of gear behind. When it comes to photography, as in life, it's the little things that can make a big difference. **DP**

Mark's latest book is The Travel Photo Essay: Describing A Journey Through Images (Routledge). Website: MarkEdwardHarris.com; Instagram: @MarkEdwardHarrisPhoto

Sequence created using frames at 1/3200 sec., ƒ/9, ISO 400, Nikon D4, 14-24mm F2.8.

FOLLOW THE ACTION

CREATE AN IMAGE SEQUENCE ON YOUR NEXT SHOOT

TEXT & PHOTOGRAPHY BY TOM BOL

"Wow, I just missed most of that jump," I tell Chance as I review images on my camera LCD. This isn't one of my best moments. How could I miss that jump? In this case, Chance flew so high off the jump that I only see the lower half of his bike tires in my frame.

"No problem, I can do it as many times as you need," Chance replies, and pedals back up the hill for another run. Chance is a local BMX rider I've brought out to be a subject for an action shoot.

I'm still cursing under my breath. I had no idea just how far Chance would fly through the air. This guy can do amazing aerials or, in BMX bike terms, tailwhips, supermans and backflips. I need to use a wide-angle lens and start capturing the action instead of missing it.

Chance blasts down the hill and launches off the lip. For what seems like a minute, but in reality is about one second, Chance flies over my head, spinning his bike around the handlebars. It's a sublime moment. My Nikon D4 blazes away while my Elinchrom strobes pop off like an August thunderstorm. This time I know my camera was pointed in the right direction. And I'm not trying to capture a single frame on this shoot. Instead, I'm creating an action sequence of the entire jump.

Action sequences allow the viewer to see every move your subject makes. You might photograph a skier catching air, your dog jumping into a lake or maybe a bear chasing salmon. With the right gear, technique and a little help from Photoshop, anyone can create an action sequence. And seeing all the action from start to finish in one frame is a powerful concept.

EQUIPMENT

You can't create an action sequence without a camera that can shoot at a high frame rate. Today, that couldn't be easier. Blazing frame rates used to be reserved for high-end pro cameras that were very expensive. Now, almost any mirrorless camera can shoot plenty fast, and even moderately priced DSLRs are up to the task. How fast do you need? While my D500 can shoot at 10 FPS, I find that seven frames per second captures enough frames for most of the action I photograph. Subject speed, focal length and shooting distant all affect how many frames you need to create a compelling action sequence.

Lens choice will be determined by how close you are to the action. I have shot action sequences using my telephoto lens as well as my wide angle. Whenever possible, I like to be really close to the action to create dramatic punchy sequences. My favorite lens for this is my Nikon NIKKOR 14-24mm F2.8. Photographing sports games will keep you on the sidelines, so you might need a telephoto to get the right composition.

Another important item I use is a solid tripod. Photographing a sequence from a tripod does two things. First, it keeps the

Sequence created using frames at 1/2000 sec., ƒ/7.1, ISO 200, Nikon D3, 14-24mm F2.8

Sequence created using frames at 1/250 sec., ƒ/5, ISO 100, Nikon D4, 14-24mm F2.8.

camera tightly fixed in position as your subject moves through the frame. This eliminates any perspective problems when blending the images together in Photoshop. And second, using a tripod keeps your camera steady, eliminating any chance of blurry photos caused by camera shake. You can shoot an action sequence without a tripod—just hold your camera in the same position and as steady as you can. Since you're only merging frames with the subject in the center, you shouldn't have to worry about perfect frame edge alignment.

Another item that's handy is a two-way radio to talk to distant subjects. Sometimes when I'm below a jump, I can't see the athlete approach. I rely on him calling on the radio to let me know when he's starting his run to the jump. Inexpensive radios can be purchased at hunting and department stores.

Sequence created using frames at 1/500 sec., ƒ/6.3, ISO 100, Nikon D800, 24-120mm F4.

TECHNIQUE

The first thing I do to create an action sequence is visualize where my subject will be in the frame. If they're moving along the ground, this won't be difficult. But if they're flying off a large ski jump and traveling hundreds of feet through the air, you need to compose the shot with this in mind. I like to include both takeoff and landing spots to show the entire sequence, but stunning sequences can be made with four to six frames of the athlete in the air.

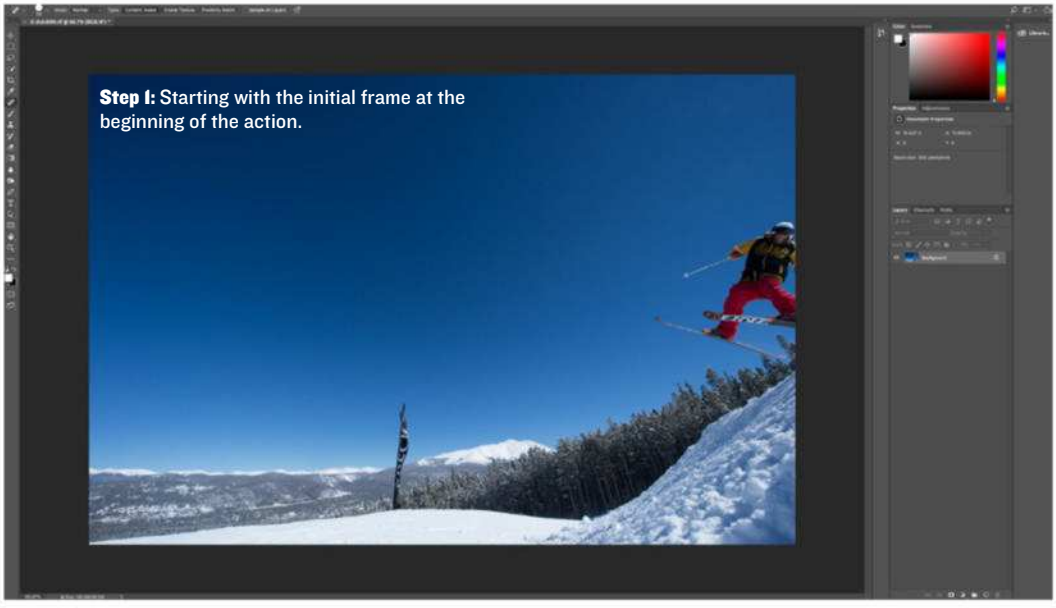
Next, I pre-focus the shot. Since an action sequence happens so fast, the last thing I want to happen is for my camera to start hunting for focus. I use back button focus, which eliminates focus when I depress the shutter. As long as I hold the shutter button down, my camera will take images with no autofocus engaged. I use my back button to focus on a point in the plane of travel my subject will take. Often, this is the edge of a jump or a place on a trail. As long as I'm parallel to this point and my subject travels in a straight line, my focus should be tack sharp.

Exposure is extremely important with sequence images. Since you're going to be combining multiple images into one, you want your exposure to be consistent throughout the sequence. I use manual exposure mode and a consistent ISO (no auto-ISO) for the entire sequence. Choose a shutter speed that will freeze the action, often 1/1000 or faster, and an aperture that will have enough depth of field for the shot. When you combine the images later, each frame will have the exact same exposure, which will create seamless blending of the frames.

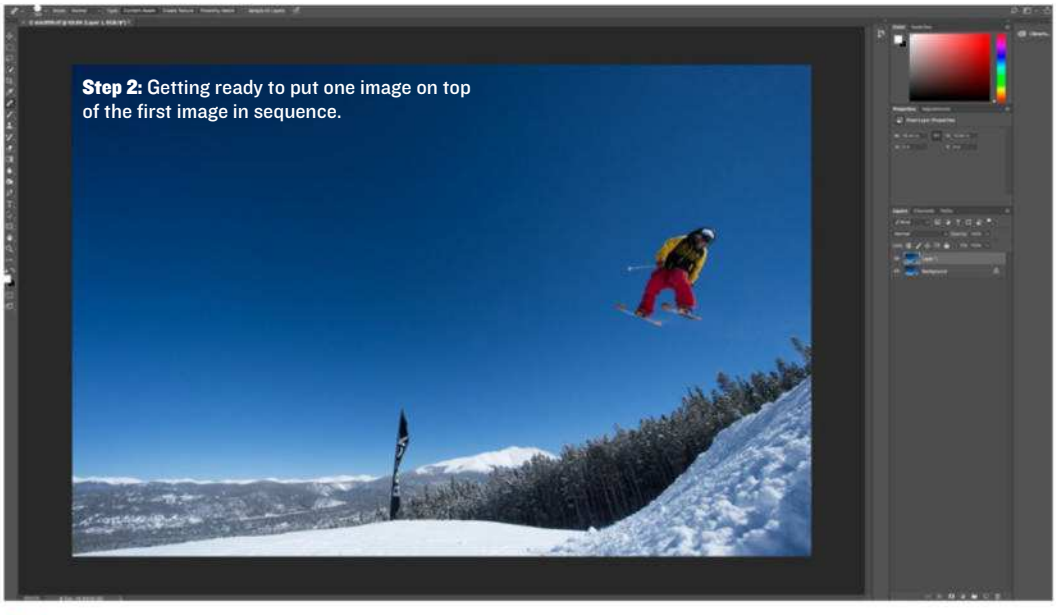
Now you're ready to go. Let the action begin! Make sure your camera is solid on your tripod, and hold the shutter button down as your subject moves through the frame. Remember, you're not panning with the subject. Changing the angle and perspective while panning will change the subject's appearance, which will look strange in an action sequence.

Can you use flash for an action sequence? Yes, but it has to be a special fast-recycling strobe. Most strobes can't recycle and keep up with seven frames a second, and the strobe output has to be consistent for each frame. I use my Elinchrom ELC Pro HD 1000 strobes along with a 2000 watt generator on

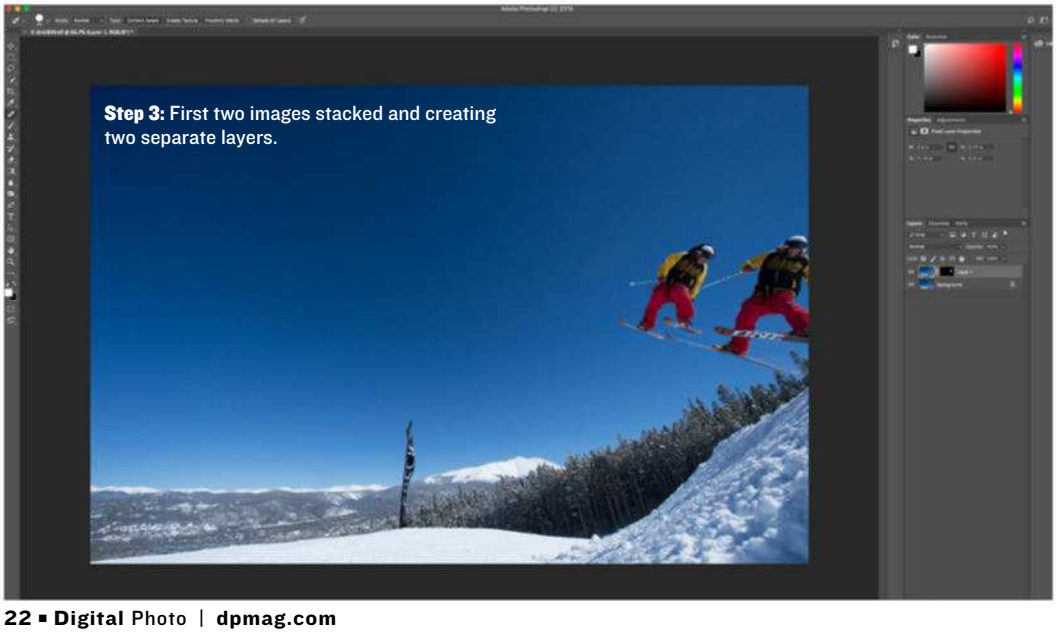
IMAGE SEQUENCES



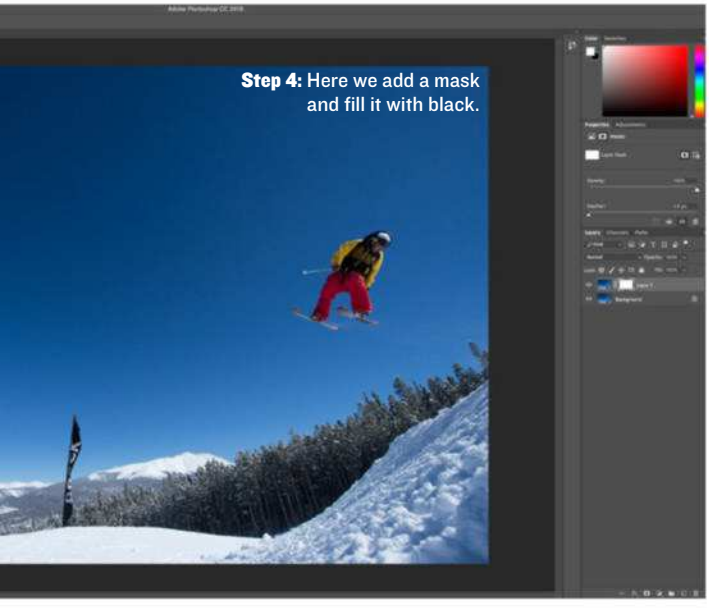
Step 1: Starting with the initial frame at the beginning of the action.



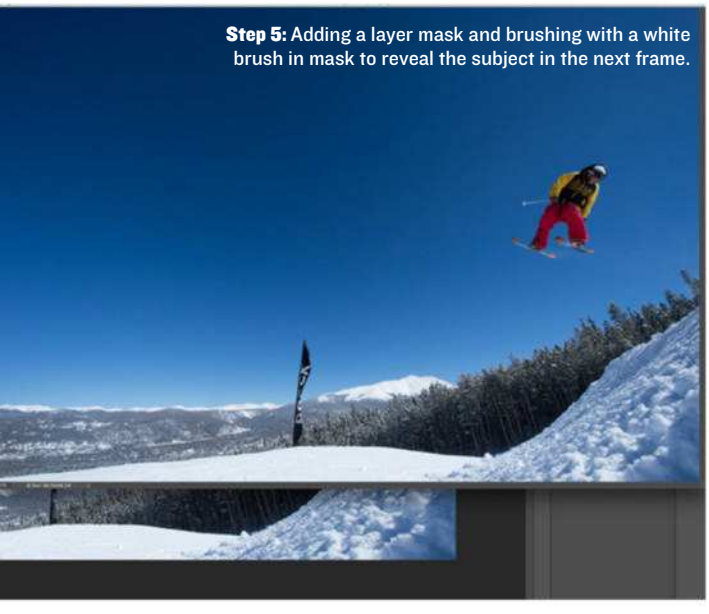
Step 2: Getting ready to put one image on top of the first image in sequence.



Step 3: First two images stacked and creating two separate layers.



Step 4: Here we add a mask and fill it with black.



Step 5: Adding a layer mask and brushing with a white brush in mask to reveal the subject in the next frame.

Step 6: Final image showing all the layers of individual images with masks.

some shoots. This is a lot of gear to set up, but the results can be dramatic.

COMBINE IMAGES

After so much fun in the field, now comes the post-production part of the shoot. There's sometimes confusion when discussing image sequence creation. Another way of creating an image sequence is using in-camera multiple exposure. You choose the number of frames, and the camera will automatically create the correct exposure and blend all the frames together in-camera. The result is one frame, but the subject is slightly transparent (ghosting) in each shot in the sequence. When you combine individual frames and brush in the subject from each frame, the subject is solid with no transparency, resulting in powerful, dramatic shots. Follow these steps to seam the images together in Photoshop:

Step one: Open the first image in your sequence. If you shot jpegs, then simply open the file. If you shot RAW images for your sequence, then the RAW window will appear before you can go to the next step. If you make any adjustments in the RAW window, you need to do the exact adjustment to every shot in the sequence for consistency. Once you have done any necessary RAW adjustments, open the image.

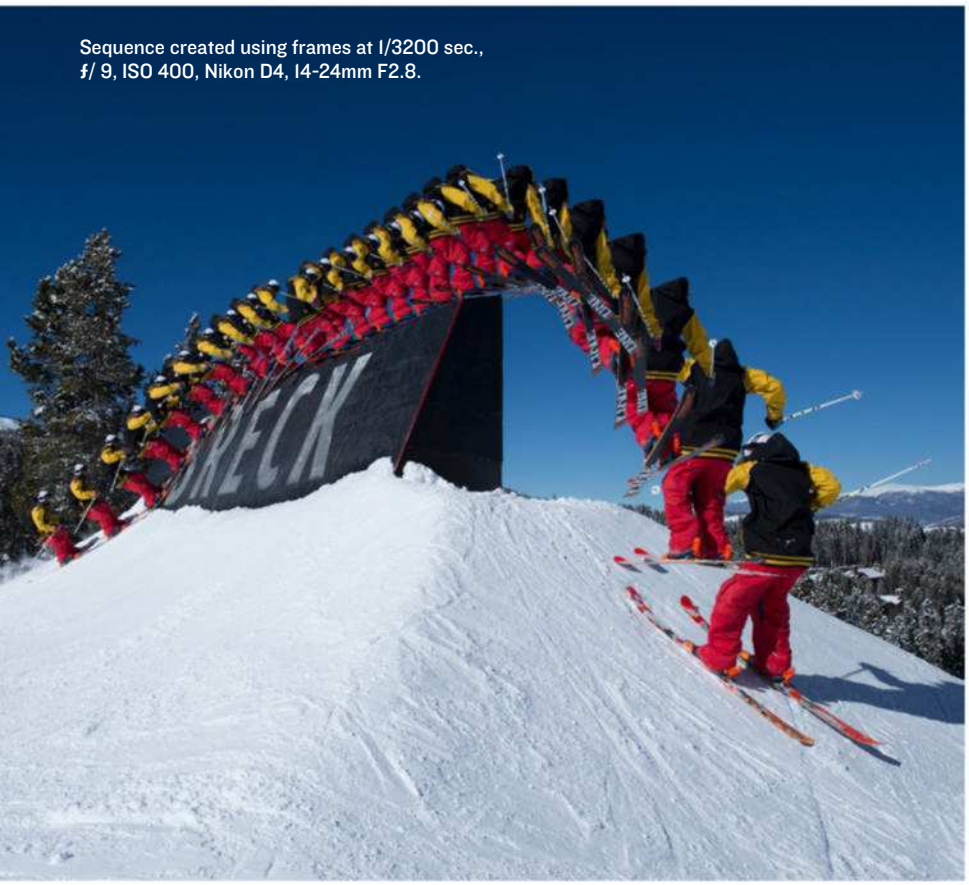
Step two: With the first image open, open the second image. In Photoshop CC, the second image will be visible, and at the top of the image will be tabs showing both images. Using the move tool, grab the second shot on the tab at the top and move the image to separate the shot from the first. Now you should have the first two images of your sequence open and visible on the screen.

Step three: Next, using the move tool, grab the second image and place it on top of the first image. If you hold down the Shift key as you place the image on top of the first image, Photoshop will automatically align the images. The layers window should show both images as layers at this point, with the second image on top of the first image.

Step four: Now we want to add a mask to the second layer. This can be done from the file menu by choosing Layer>Layer Mask>Hide All. This will add a mask filled with black, hiding the second (top) layer. You can also add a mask filled with black by choosing the Layer Mask icon at the bottom of the layers window. Hold the Option (ALT on PCs) key down when you click on the icon, and the mask will be added filled with black.

Step five: Here's where the fun begins. First, set your foreground color to white. This is located at the bottom of the tools panel. Use the arrow keys to switch colors or click on the foreground color and set it to white. Now, choose the Brush tool (shortcut is the "B" key), and set the brush hardness to 100 percent. Then, brush on the image where you think your subject will be based on his direction of travel. Presto! Your subject magically appears. Since you used manual exposure and a tripod, everything else in the frame should stay the same. Sometimes your subject will merge over his previous position in the image below. I generally brush the top image subject over the earlier sequence shot.

Step six: Repeat steps two to five for the next image in the sequence. Do this again with all the frames in the sequence. After all the sequence images are merged, you should have a single image



Sequence created using frames at 1/3200 sec., ƒ/ 9, ISO 400, Nikon D4, 14-24mm F2.8.

with your subject rendered multiple times moving through the action.

Step seven: Since this process takes a lot of time, I save the layered version of the image as a PSD file I can go back to if necessary. For my final version, I will flatten the layers (Layer>Flatten Image) to create a smaller file to work on and send to clients. I'll do any other touch-up, like color, dust spotting and sharpening, on this image before I send it out.

My son is getting way into skateboarding. He's ready to attempt a big jump at the local skatepark. I'm not sure how this is going to end up, but I'm going to follow the action. Whether he sticks the landing or hits the pavement, I'm going to capture the entire action sequence. The next time you're photographing action, why not capture all of it? Just set your frame rate to maximum and blaze away. With a little processing in Photoshop, you'll have stunning action sequences. DP

Sequence created using frames at 1/250 sec., ƒ/6.3, ISO 100, Nikon D4, 14-24mm F2.8.

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PRETTY AS A PICTURE

WHAT TO LOOK FOR WHEN SHOPPING FOR A PORTRAIT LENS FOR ANY CAMERA, ANY FORMAT AND ANY BUDGET

TEXT & PHOTOGRAPHY BY WILLIAM SAWALICH

Just about the moment the camera was invented, it was used to create portraits. Historic records of people have always been a main photographic focus. In an era of selfies, a portrait stands out as a composed and intentional representation of a person.

The first consideration when choosing a lens for portraiture is typically focal length because it has the biggest impact on the function and efficacy of a lens for portraiture. It determines whether a portrait is a tight head-and-shoulders shot or a wide waist-up or even full-length shot. Focal length impacts how close to a subject the photographer must be, how much of the subject can fill the frame and, most importantly, the focal length has a huge effect on a subject's features—making them look big, exaggerated and distorted if you choose the wrong lens for portraiture.

To minimize distortion, professional portrait photographers rely on telephoto lenses. That's a broad categorization, though, as any lens longer than 50mm might be considered a telephoto. Should you use the longest focal length you can for portraiture—like a 600mm supertelephoto lens? Not hardly. Those lenses are too long to use comfortably in portrait situations. Instead, most portrait lenses top out around 150mm, though 200mm is still useful, particularly for close-ups and tight headshots. At 150mm (on a full frame DSLR), a photographer making a head-and-shoulders portrait is likely to be standing about 10 feet from the subject—close enough to comfortably talk but not so close as to invade one another's personal space.

In practice, portrait lenses generally fall between 70mm and 200mm, with traditionally popular focal lengths of 85mm, 100mm, 135mm and 150mm cropping up more often than most. These short telephoto lenses, by and large, are great portrait lenses. But why?

Unlike complicated superzooms or ultrawide lenses, short telephoto lenses are fairly simple, optically speaking, which makes them easier for manufacturers to make fast and sharp—two things portrait photographers love—as well as compact and affordable (something every photographer loves). A lens is fast if it has a wide maximum aperture—like $f/2$ or $f/1.8$, for instance. This allows the use of a fast shutter speed at a low ISO and produces a shallow depth of field. Both of these, too, are useful for portraiture as the shallow depth of field isolates the subject and draws the viewer's eye to the face, while a fast shutter speed makes handholding possible and minimizes the chance of motion blur from a moving human subject.

With a focal length of 70mm or 85mm, a portrait lens will be especially useful for making full-length and waist-up portraits from fairly close proximity to the subject. This is particularly useful for, say, fashion photography, wedding photography or senior portraits where head-to-toe photos are a popular request. From 85mm to 135mm, waist-up portraits and head-and-shoulders shots are right in the lens's sweet spot—good for a variety of general portrait applications, including model and actor headshots, as well as editorial and corporate portraits. For close-up portraiture, it's the focal lengths beyond 135mm—like 150mm and 200mm—that are called on the most. With these long portrait lenses, an extreme close-up doesn't require invading the subject's personal space.

Speaking of space, where you work has an impact on the focal lengths you can use, too. If you primarily make studio portraits in a small indoor space, a wider telephoto may be a necessity simply to ensure you can work within the confines of the studio. On the other hand, a photographer who specializes in outdoor portraits may be able to get away with a 200mm lens or even longer—though standing far away still becomes an issue, as it makes it harder for a photographer to connect with her subjects.

GEAR

PORTRAIT PRIMES AND ZOOMS

OLYMPUS M.ZUIKO DIGITAL 45MM F1.8

Users of the Olympus PEN Micro Four Thirds camera system will appreciate the compact and light 45mm f1.8 prime lens from Olympus. Equivalent to 90mm, the lens is ideal for shooting portraits. The fast $f/1.8$ maximum aperture helps isolate subjects against out-of-focus backgrounds, and it's useful when working in low light, too. Fashion-conscious photographers will appreciate the interchangeable color rings that allow the lens to be matched to different PEN cameras. An affordable price makes this lens user friendly, too.

Price: $399 **Website:** getolympus.com

SONY FE 50MM F1.8

Used with one of Sony's full-frame mirrorless cameras, the FE 50mm F1.8 is a normal prime lens. But paired with a camera using an APS-C sensor, the focal length becomes equivalent to a 75mm lens—great for portraits, particularly of the full-length variety, or when working in close quarters. The lens uses one aspherical element of its six elements in five groups and a seven-bladed aperture for beautiful bokeh. Most of all, the lens is a very affordable option in a field crowded by pricey portrait lenses.

Price: $249 **Website:** sony.com

PORTRAIT LENSES

One way some photographers choose which focal lengths they'd like to use for portraits is to choose a zoom lens that covers a range of focal lengths instead of a prime lens, which is fixed at a particular focal length. Zoom lenses aren't necessarily better for portraits, as they're often a little slower and heftier than prime lenses, but they do make it easier to change from full-length to close-up without ever having to change lenses. A 70-200mm lens, for instance, becomes great for portraits in this way. A traveling photographer might also prefer zooms to primes in order to carry less overall weight without sacrificing focal length range.

Another difference between zooms and prime lenses is that some zooms feature a variable maximum aperture—one that automatically stops down from, say, $f/4$ to $f/5.6$ when zoomed to the full telephoto position. Such a variable maximum aperture makes lenses smaller and lighter, but it also makes it harder to get a particularly shallow depth of field.

Prime lenses have also traditionally been favorites of professionals because they tend to be very sharp. Zoom lenses have come a long way in the last few decades, and now they're regularly just as sharp as primes. However, the relative simplicity of a prime lens's optical construction means that they tend to be higher quality, having elements optimized for a specific focal length, along with fewer moving parts than a zoom. Still, there are great portrait lenses to be had in the ranks of both prime and zoom lenses.

For each of the focal lengths mentioned here, in every case the measurements are given for cameras with full-frame sensors approximating the size of 35mm film. Users of cameras with

GEAR

CANON EF 85MM F/1.4L IS USM

It's hard to imagine a situation in which the new ultrafast EF 85mm f/1.4 L lens from Canon needed more light, but with built-in image stabilization up to four stops, it can be handheld at low ISOs practically in the dark. Canon's L series of lenses is its pro line, defined by highest sharpness and image quality as well as heavy-duty construction, and professional portrait photographers will certainly love the features of this lens. Nine rounded aperture blades produce sublime bokeh when shooting this ultrafast lens wide open to isolate portrait subjects from backgrounds.

Price: $1,599 **Website:** usa.canon.com

ROKINON 100MM F2.8 ED UMC MACRO

Macro lenses are particularly useful for portraits of kids and babies, or any time you'd like to make extreme close-ups. The Rokinon 100mm F2.8 ED UMC Macro can be used on full-frame cameras as well as cameras with smaller sensors—on which it is equivalent to a 160 to 200mm telephoto prime—still quite useful for portraits. The lens focuses as close as 12 inches for life-size enlargements of fine details. The circular, nine-bladed aperture produces smooth bokeh for attractive portrait backgrounds, too. UMC-coated ED glass elements minimize the ghosting and flare that sap color and degrade contrast from lesser lenses. The 100mm lens is available in Canon EF, Nikon F, Sony A, Sony E and Fujifilm X mounts.

Price: $549 **Website:** rokinon.com

SIGMA 105MM F1.4 DG HSM ART

The newly announced Sigma 105mm f/1.4 DG HSM Art lens is the longest in Sigma's Art lens lineup. It uses 17 elements in 12 groups, including two SLD elements and three FLD elements for maximum color accuracy and minimum chromatic aberrations, as well as an aspherical element to eliminate distortion and spherical aberrations across the field of view. Super Multi-Layer Coatings applied to the elements eliminate flare and ghosting that degrade sharpness, color saturation and contrast. The large-diameter front element minimizes vignetting, while the nine-bladed aperture helps to produce beautifully smooth bokeh. Though it's designed for full-frame cameras, on APS-C sensors this ideal portrait prime becomes a slightly longer 168mm focal length that's still quite useful for people photography. Available for Canon, Nikon, Sigma and Sony FE mounts.

Price: TBD **Website:** sigmaphoto.com

Lens focal length determines the look of a portrait. Wide angle lenses make faces look narrower and taller, while telephoto lenses flatten out the perspective. It's important to pick the right focal length for your subject.

FUJIFILM GF110MMF2 R LM WR

Fujifilm's finest class of lenses is the GF line, and the GF110mmF2 R LM WR is a high-quality mid-range portrait lens designed for use with Fujifilm's GFX 50S medium-format mirrorless camera. On the larger sensor of the GFX 50S, this 110mm lens is equivalent to an 87mm lens in the 35mm format—an ideal portrait focal length.

Price: $2,799 **Website:** fujifilm-x.com

NIKON AF-S NIKKOR 105MM F1.4E ED

Professional portrait photographers demand the utmost in speed and image quality from their lenses. Nikon's AF-S NIKKOR 105mm f/1.4 ED is just such a pro-level portrait lens, at an ideal 105mm focal length. The lens utilizes 14 elements with Nano Crystal coatings for minimized chromatic aberration from edge to edge. Nine aperture blades produce smooth bokeh, and the superfast *f*/1.4 maximum aperture means that bokeh will play prominently in the quality of the portraits, particularly in natural light. Durable construction with moisture and dust-resistant seals make the lens even more useful for professionals who work in all kinds of weather.

Price: $2,199 **Website:** nikonusa.com

ZEISS BATIS F2.8/135

Users of Sony Alpha E-mount cameras will appreciate the high quality of the Zeiss Batis f/2.8 135mm portrait lens. The Apo Sonnar optical design uses 14 elements in 11 groups plus T* anti-reflective coatings to practically eliminate color fringing and chromatic aberration of all kinds as well as lens flare and ghosting. The lens construction radiates high-tech quality, built on a smooth medal body with an OLED display that provides focus distance and depth of field information. On APS-C camera models, the lens becomes a 202mm-long portrait prime, great for close-ups and headshots. Optical image stabilization provides added usability in low light, and dust-resistant and weather-sealed construction make the lens useful when working in inclement weather, too.

Price: $1,999 **Website:** zeiss.com

sensor formats smaller than full frame—like APS-C and Micro Four Thirds, for instance—actually offer a benefit for portrait photographers by way of the crop factor that in practice turns a 70mm lens into a 105mm perfect-for-portraits lens. On a Micro Four Thirds camera, a 24-70mm zoom will behave much more like a 50-150mm lens—again, great for portraits.

The quality of the out-of-focus area of an image is called bokeh. Smooth, spherical out of focus highlights and shadows, which are considered good bokeh because of their unobtrusive nature, come from a circular aperture. That requires more iris blades, as well as blades that are shaped in such a way as to produce a perfectly round aperture at all sizes. Some lenses are made with this quality specifically in mind, and manufacturers usually make mention of it.

For photographers who handhold their cameras in almost every circumstance, vibration reduction (also called shake reduction and image stabilization) is a hugely beneficial addition to a portrait lens. The longer the focal length, the more amplified any shaking from handholding will be, so for photographers using portrait lenses—particularly longer ones in the 135 to 200mm range—vibration reduction can provide an additional two or more stops of handholding capability. This is helpful particularly when working with low levels of natural light, which can be great light for portraits. When handholding with a telephoto lens, a good rule of thumb is to use a shutter speed no slower than the equivalent of the focal length of the lens. For instance, with a 200mm lens, use at least a shutter speed of 1/200th to ensure sharp pictures. With vibration reduction switched on, an even slower shutter speed can still produce tack-sharp focus with no motion blur. DP

GEAR

PANASONIC LUMIX G X VARIO 35-100MM F2.8 II POWER OIS

Users of Micro Four Thirds cameras should consider the Panasonic Lumix G X Vario 35-100mm f/2.8 ASPH Power Optical I.S. zoom lens for portraits. Paired with the Micro Four Thirds sensor, the lens is equivalent to a 70-200mm zoom—a great range for portraits because it covers all the popular portrait focal lengths—and then some. Vibration reduction is built in thanks to Panasonic's Power Optical Image Stabilization system. The lens is also constructed to be dust- and moisture-resistant, with a freeze-proof design that works even in freezing temperatures. The fast ƒ/2.8 maximum aperture is great for portraiture while ELD and ULD lens elements work to eliminate chromatic aberration and color fringing—all at a lower price than the older model this lens replaced.

Price: $1,099
Website: shop.panasonic.com

TAMRON 70-210MM F4 DI VC USD

Covering a long-popular telephoto zoom range, the new 70-210mm f/4 Di VC USD zoom from Tamron encompasses the entirety of popular portrait focal lengths. The fixed ƒ/4 maximum aperture means no loss of brightness at any focal length, while the minimum focusing distance of just 3.1 feet makes extreme close-up portraits a snap. The rounded nine-blade aperture improves bokeh while fast, quick and quiet USD autofocus provides precise AF for both stills and video. Built-in vibration reduction helps to improve handhold-ability, which is especially helpful with a lens of this size—although it's relatively compact for a zoom covering 70-210mm. Available for Canon EF and Nikon F mounts.

Price: $799 **Website:** tamron-usa.com

TOKINA AT-X 70-200MM F4 PRO FX VCM-S

The compact and affordable Tokina AT-X 70-200mm F4 PRO FX VCM-S was built for full frame DSLRs. On DX-cameras, with smaller-than-full-frame imaging sensors, the lens performs like a 105-300mm zoom—great for close-up portraits. The zoom features a nine-bladed aperture for smooth bokeh, super-low-dispersion glass to minimize chromatic aberration and three stops of vibration reduction to make handholding this compact lens even easier. Available for the Nikon F lens mount.

Price: $829 **Website:** tokinalens.com

Car Forest - Lance Keimig - www.nationalparksatnight.com
Nikon D750, Irix 15mm f/2.4 Blackstone, f/3.5, ISO 1600, 13.0 sec

Trust the Experts

These lenses must have been designed for night photographers. Both lenses perform extremely well for astro and night photography.

Lance Keimig: Night photographer and instructor at National Parks at Night
www.nationalparksatnight.com

When I have a wide-angle composition in front of me, I always reach for one of the Irix lenses...

Richard Bernabe: Photographer and adventurer
www.richardbernabe.com

- Minimal distortion for Full Frame and APS-C
- Chip enables aperture control through camera
- Passes EXIF data & supports focus confirmation
- CPL, UV and ND screw-in filters for 15mm
- Rear ND gel filters available for 15mm and 11mm
- The 11mm is the widest rectilinear lens in its class
- Prices starting from **$475** (Firefly 15mm f/2.4) and **$525** (Firefly 11mm f/4.0)

Blackstone UV reflective marks for night photography, metal housing

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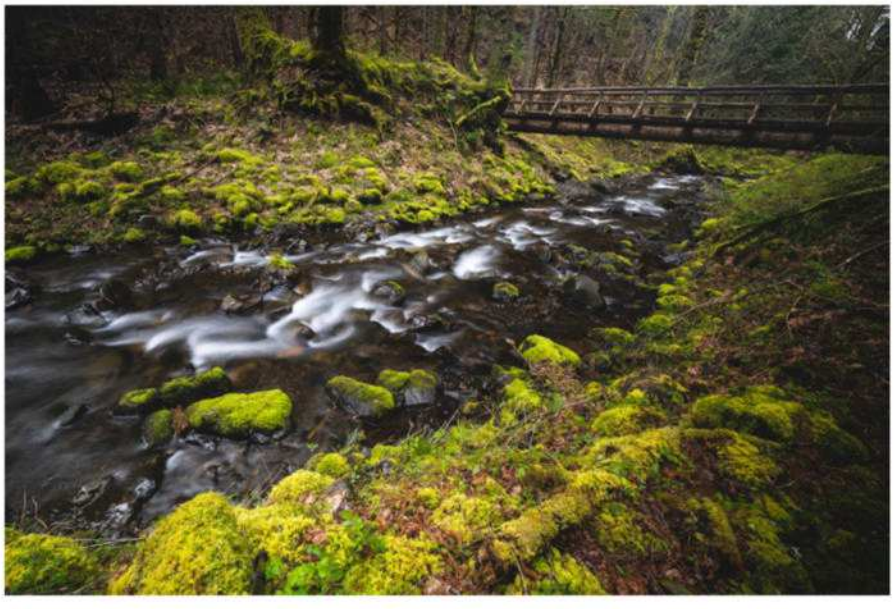
TAKING IT ALL IN

LANDSCAPE PHOTOGRAPHERS NEED A WIDE VARIETY OF LENSES TO CAPTURE NATURE'S SPLENDOR

BY BRIAN MATIASH

One of my favorite things to do with my standard zoom lens is to take advantage of how close you can focus to your subject. While it isn't exactly macro photography, it does give me the opportunity to create some very compelling photos of subjects that would probably get totally overlooked.

One of my favorite things to do with landscape photography is to use an ultra-wide focal length—in this case, 12mm—and fill the frame with a dominant element. The distortion created gives the sense of something being much larger than it may be.



It's very important that I provide viewers with a clear path within my photos, especially when I'm using an ultra-wide focal length. I want to avoid the problem of confusing the viewer as to what the primary focal points are by establishing a clear sense of direction.

It's fair to say that landscape photography can mean different things to different people. What unifies us all is that we strive to share a piece of this amazing planet with each exposed frame, and when you render that down to a technical level, the lens you choose plays a critical role in that endeavor. Whether you use a super-wide focal length to capture an expansive vista or go tighter to showcase a blossoming fern, your lenses will help you figure out the visual story you're aiming to tell.

There are several ways to categorize lenses when thinking about which ones to use when photographing nature scenes. Perhaps one of the most obvious is whether the lens is a prime or a zoom. There's no shortage of discussions covering the benefits of one versus the other, and while they may each hold some merit, it will ultimately boil down to your preference (and budget).

A prime lens has a fixed focal length that requires you to "zoom with your feet," but one of the clear benefits is that it's typically smaller, lighter (especially the manual focus variety) and has a larger maximum aperture than zoom lenses. There are also a number of fantastic prime lenses that command lower prices than zoom lenses. The key limiting factor, though, is that you're fixed to a specific focal length. Your other option is to go with a zoom lens. The obvious benefit here is that your lens offers variable focal lengths, making it easier to include more or tighten up on the scene in front of you without moving. This benefit typically comes at the expense of being larger, heavier and with a smaller maximum aperture compared to prime lenses. For the purposes of this article, I'm going to focus on three primary categories of lenses: 1. Wide-angle lenses, 2. Standard lenses, and 3. Telephoto lenses.

WIDE-ANGLE LENSES

If I had to wager a guess, I'd say that most landscape photographers veer toward the wider end of the focal length spectrum, and that makes sense. In a lot of cases, our aim is to convey the grandeur of the scene in front of us. Tall, sprawling trees and meandering mountain ranges often require wider focal lengths to "fit it all in." So, let's start there. Nowadays, there are a vast array of lens options that afford photographers with dizzyingly wide focal lengths. Whether your camera uses

LENS OPTIONS

WIDE-ANGLE LENSES

Admit it. There are many landscape scenes that are too grand to not be captured in a single frame. There are plenty of instances when you want to fit that giant mountain along with the sweeping tree line and that perfectly still lake into a single frame. This is where your wide-angle lens shines. When considering alternative lenses to the common 16-35mm lens, there are several worthy options to look at. One thing to consider with these alternative lenses is that you'll need to use proprietary filter systems custom-built for these particularly bulbous front elements.

PRIME LENS OPTIONS

ROKINON 14MM F2.8 IF ED UMC

This affordable manual-focus lens provides good image quality and sharpness, and is available in a variety of camera mounts.

Price: $500 **Website:** rokinon.com

ZEISS TOUIT 2.8/12

The quality of Zeiss glass is world famous, and this wide-angle APS-C lens for Sony or Fujifilm shooters lens is no exception. [Ed. Note: Matiash is a Zeiss Ambassador, but we completely agree with the quality of their lenses.] The lens has excellent edge-to-edge sharpness and the T* coating reduces flaring and ghosting.

Price: $1,000 **Website:** Zeiss.com

ZOOM LENS OPTIONS

SONY FE 12-24MM F4 G

Sony makes two wide-angle zooms, this 12-24mm and a G-Master 16-35mm. Although the G Master lens is better on paper, we like the 12-24mm for the uniquely wide (but not fish-eye) field of view, and the lack of distortion and flare, something that's pretty common at this super-wide focal length.

Price: $1,700 **Website:** Sony.com

NIKON AF-S NIKKOR 14-24MM F2.8G ED

The distinctive shape of this lens makes it easy to spot out in the field, and the optical quality makes it hard to beat. This is a legendary wide-angle lens.

Price: $1,900 **Website:** nikonusa.com

a cropped or full-frame sensor, odds are that you can find a lens that offers you a focal length as wide as 16mm or wider. That's *a lot* of space to cover.

Fortunately, there are a number of fantastic prime lenses that offer exceptionally wide focal lengths along with large, maximum apertures. While image quality will vary from manufacturer to manufacturer, it's fairly easy to find solidly built ultra-wide prime lenses between 14mm and 18mm and with max apertures of $f/2.8$ or faster. If lens weight is a chief concern, you'll certainly want to look at manual focus options, as those tend to weigh less.

I had mentioned that one of the most common lenses used within the wide-angle zoom lens category is the 16-35mm variety. Virtually every camera manufacturer has this type of lens. However, I've recently found myself going even wider with a 12-24mm lens, and the results have been impressive. The important point to remember is that the wider your focal length, the more important it is to direct your viewers through the frame. If you present a photo with no clear direction or anchor, your viewer will get lost, quickly lose interest and move on. Therefore, orchestration of what you choose to include, especially at wider focal lengths, is critical.

You may have noticed that I haven't touched on aperture much here, and that's with good reason. When I recently audited my landscape library, the clear majority of photos were taken using apertures ranging between $f/11$ and $f/16$, and that doesn't surprise me. In most of my wide-angle photos, my aim was to convey vast scenery, and while I often included a clear focal point, I didn't want drop focus by using a fast aperture. So, I'd argue that at wider focal lengths, having a fast aperture won't benefit you as often as you may think. Of course, there's one notable exception: night/astral photography. In that situation, having an ultra-wide and ultra-fast lens can be a massive boon, especially if your goal is to get pin-sharp stars.

STANDARD LENSES

Let's start by defining what the general focal range of a standard lens is. I loosely define this as a lens with a focal length between 24mm and 70mm. You're not quite ultra-wide, nor are you getting to that tight telephoto zoom area, but you are covering the general angle-of-view that we use to see with our own eyes, and that's an important point to bring up. If you're composing a landscape photo at a focal length that most closely covers our eyes' angle-of-view, it's that much more important to pique your viewers' attention.

In other words, if your goal is to share a landscape photo at a mid-focal range, do you think that composing it the way that we humans would perceive it ourselves if we were standing there makes the most sense? That is to say, don't just hold your camera (or position your tripod) so that it's at eye level—the way we typically perceive the world in front of us. Creatively composing your photos at these mid-focal ranges will do wonders with getting your viewers' attention.

Similar to the wide-angle lens category, the standard zoom lens category has a clear favorite range by photographers and manufacturers. That range is 24-70mm, and I'd wager that this particular lens is probably the most commonly owned lens out there. Virtually every manufacturer who makes zoom lenses has a 24-70mm offering. However, there's another alternative that gets you just as wide but allows you to zoom in much tighter. That lens is the 24-105mm standard zoom, and it has been a longtime favorite of mine. Aside from the extra 35mm of zoom afforded to users, the 24-105mm lens typically offers near-macro-style focal distance, allowing you to get really close to your subject.

TELEPHOTO LENSES

Now we find ourselves at the longer end of the focal length range and, in my opinion, the most fun class of lenses to use for landscape photography. In most cases, landscape photographers who work in

LENS OPTIONS

STANDARD LENSES

As far as standard prime lenses go, my choice will always be 35mm. It's an absolutely classic focal length and one that I find immensely enjoyable to use when practicing street photography. If I had to choose one zoom lens to take to a location that I had never been to, it would be a 24-105mm lens. Both sides of this focal range offer something for photographers to create unique and memorable photos. The 24mm is a great wide-angle focal length that allows you to capture your scene while minimizing barrel distortion, and the 90-105mm range is great if you're photographing a person in a forest, especially because it introduces some pleasing compression.

PRIME LENS OPTIONS

OLYMPUS M.ZUIKO ED 17MM F1.2 PRO

It's been nearly impossible to get a super-sharp wide-angle, wide-aperture lens in the Micro Four Thirds platform, as it's difficult to maintain edge-to-edge image quality in a lens that has such a wide aperture, but the engineers at Olympus have made it possible with this 17mm f1.2 PRO lens and the other lenses in the trio of PRO glass.

Price: $1,200 **Website:** getolympus.com

CANON EF 50MM F/1.4 USM

For the budget-minded Canon shooter stll looking for great performance, the Canon EF 50mm f/1.4 USM fits nicely between the lower-end 50mm f/1.8 STM and the high-end EF 50mm f/1.2L USM (which is a great lens if you can afford it.) The image quality is excellent, yet it won't break the bank.

Price: $400 **Website:** usa.canon.com

FULL-RANGE ZOOM LENS OPTIONS

TAMRON 18-200MM F/3.5-6.3 DI III VC

With a full-frame equivalent of 28-310mm, this all-around travel lens is also a great choice at the wide end for landscape and great for capturing wildlife at the long end of the zoom. With vibration reduction and a number of elements designed to reduce aberrations, the compact lens is a great choice for mirrorless shooters, and it comes in both black and silver.

Price: $550 **Website:** tamron-usa.com

SIGMA 24-105MM F4 DG (OS)* HSM | ART

Another great all-around lens, the 24-105mm F4 DG HSM is part of the company's "Art" lens lineup, known for its excellent image quality at a price that's lower than you'd expect. The lens has image-stabilization and a nine-blade aperture for smooth background blur. The Hypersonic Motor (HSM) is fast and quiet, which makes this lens great for video use too.

Price: $900 **Website:** sigmaphoto.com

LENS OPTIONS

TELEPHOTO LENSES

Over the past year or so, I've found myself using telephoto lenses more and more because I find the resulting compositional opportunities quite rewarding. When you teeter at these longer focal lengths, you become more discerning about what you include in your frame and how everything is arranged. It becomes more about what you should exclude rather than how much you can include. Additionally, the sense of distance and scale of elements throughout the frame is very visually pleasing.

PRIME LENS OPTIONS

FUJIFILM XF90MMF2 R LM WR

You'd be hard pressed to find a nicer prime lens than this Fujifilm 90mm, and it's lightweight too. With 11 elements in eight groups and three ED elements, the small lens packs quite an imaging punch.

Price: $950 **Website:** fujifilm-x.com

ZOOM LENS OPTIONS

SONY FE 100-400MM F4.5-5.6 GM OSS

This G Master lens from Sony has a wide reach in the long telephoto range. I've used it to shoot everything from moon rises to distant mountains. It's also an incredible sports lens, giving it extra value for the versatile shooter.

Price: $2,500 **Website:** sony.com

CANON EF 100-400MM F/4.5-5.6L IS II USM

Canon's EF 100-400mm f/4.5-5.6L IS II USM is a legendary lens, found on the sidelines of most pro sporting events. It's also a great lens for capturing landscapes and wildlife, with super-speed AF and tack-sharp images.

Price: $2,200 **Website:** usa.canon.com

TAMRON SP 150-650MM F/5-6.3 DI VC USD G2

There's just about no more versatile super-telephoto than this Tamron, with a reach to 600mm and a locking-zoom mechanism that allows you to keep the lens set at a certain focal length. When you need to reach out and touch the landscape—or just about any other subject—this lens is for you.

Price: $1,400 **Website:** tamron-usa.com

the telephoto range use zoom lenses that cover the 70-200mm span but can also go well beyond. While the 70-200mm lens is certainly one of the most popular telephoto zoom lenses, I've come to love my 100-400mm lens. The extra focal length alone makes it worth having a slower, variable aperture over its 70-200mm sibling. Of course, these lenses tend to be larger and heavier and, at the expense of my own frustration, are painted white by the manufacturer.

The longer end of this focal range offers its own set of unique challenges and benefits. These longer focal lengths require you to be even more discerning with what you choose to compose in your frame. Whereas at 12mm, all you need to do is point your camera and virtually everything in front of you will be in frame, at 70mm and longer, identifying the key focal points in your frame becomes that much more important.

The benefits come with the added lens compression introduced at these longer focal lengths. At 16mm, it can be quite challenging to convey a sense of depth and distance when photographing a mountain range. You'll certainly be able to capture all of it, as well as what's in front of it, but the distance from the foreground to the background won't be as apparent. By using the longer focal length of telephoto zoom lenses, you may need to tighten up on what you include in the frame, but the relationship of distance between the foreground, middle-ground and background elements will be much clearer. An added benefit with lens compression at these longer focal lengths is that distortion tends to be eliminated almost completely when compared to wider focal lengths. DP

Brian Matiash is a professional landscape and travel photographer, published author and podcaster. He specializes in fusing photography with experiential storytelling and practical instruction to help others grow their creativity. He also co-hosts the "No Name Photo Show," one of the most popular photography podcasts in iTunes.

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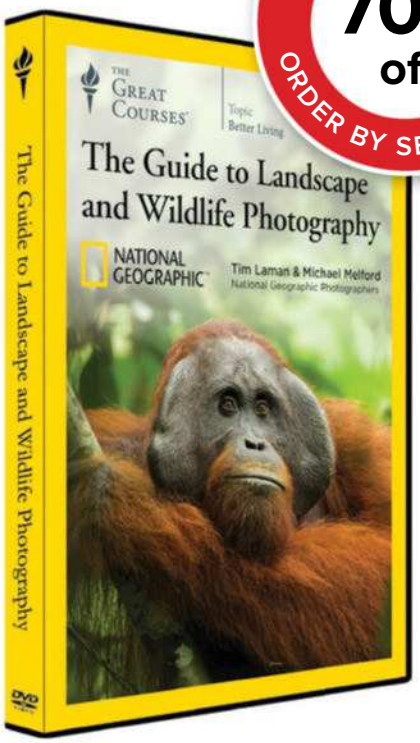

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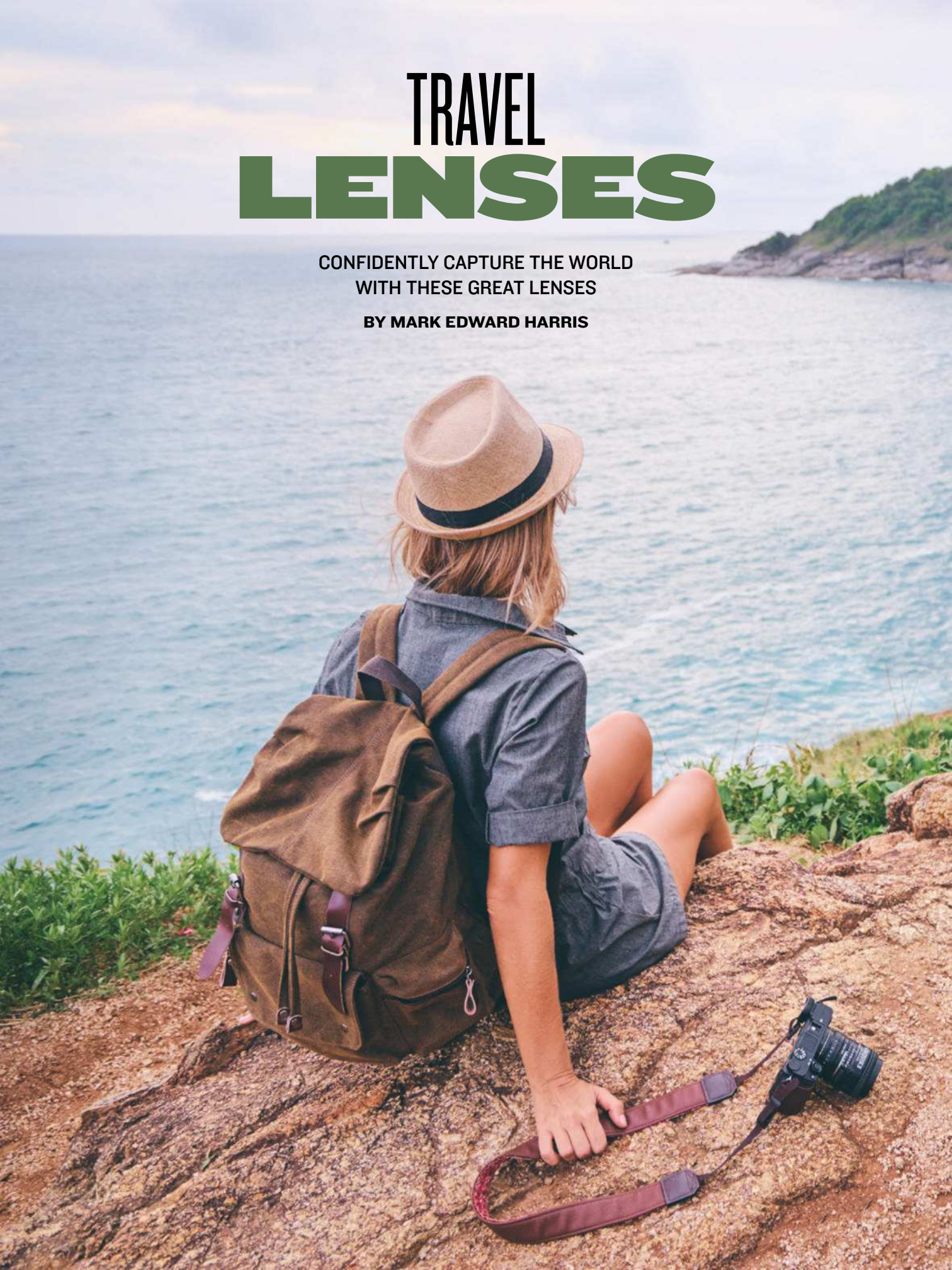
TRAVEL LENSES

CONFIDENTLY CAPTURE THE WORLD WITH THESE GREAT LENSES

BY MARK EDWARD HARRIS



KUDLA/SHUTTERSTOCK

TRAVEL LENSES

While there's no single defining characteristic that makes something a travel lens, there are definitely pieces of glass that are geared for work on the road. When it comes to zooms for travel, one focal length range must be covered—a 24-70mm for a full frame camera or a 16, 17 or 18-55mm for a camera with an APS-C sensor.

With travel photography, it's always a balancing act between weight and productivity. Starting out with a clear idea of what you want to achieve and the potential photo ops you're likely to encounter will help clarify which lenses to pack and which ones can take a vacation at home.

Keep in mind that regardless of the lens you have attached to your camera when you're exploring the world, focusing in on unique aspects of the cultures and places will yield stronger photographic results and more meaningful experiences by delving deeper into your subjects. Keep in mind the travel magazine editor's mantra: "A location is not a story." Their writers search out unique aspects of a culture or place. We can do the same with our cameras.

My week in Chile can serve as an example of producing two dramatically different stories from a single trip and the lens choices needed to accomplish them.

Because of its geography stretching over 2,670 miles north to south through many ecoregions, Chile could easily be dubbed a land of a thousand photo stories. The Andes tower to the east, its long and narrow coast teems with sea life, the country is dotted with world-class wine regions, and its cities and towns have vibrant street life. There are fascinating stories for every genre of photography; we just need to define the subjects to produce focused photo essays.

Instead of a general story on Valparaíso, Chile, nicknamed the "Jewel of the Pacific," for instance, I documented how the city has turned its graffiti problem into a citywide outdoor museum with street artists creating fantastic murals. I used my NIKKOR 24-70mm f/2.8 on my Nikon D850 body for the entire series. This setup was perfect for the Valparaíso project

GEAR

CANON EF-S 17-55MM F/2.8 IS USM STANDARD ZOOM

Designed for use with Canon EOS DSLR cameras with APS-C sized sensors, the Canon EF-S 17–55mm f/2.8 IS USM combines a fast autofocus with image stabilization for consistent image quality. The constant *ƒ*/2.8 maximum aperture throughout the zoom range opens up low light possibilities and bokeh-infused portraits. Its precision lens focuses the light rays into a single point to reduce aberration, while its ring-type USM permits manual focusing without the delay caused by having to switch out of auto mode.

Price: $880 **Website:** usa.canon.com

SIGMA 17-50MM F2.8 EX DC (OS) HSM ZOOM

The lightweight and compact Sigma 17-50mm F2.8 EX DC (OS) HSM zoom is designed for DSLR cameras with APS-C size sensors. The lens has a fast *ƒ*/2.8 maximum aperture throughout the entire zoom range. It features a construction of 17 elements in 13 groups with glass that corrects for flare, ghosting and aberrations. Sigma's OS (Optical Stabilization) expands handheld shooting opportunities up to 4 stops without apparent camera shake. The lens is also equipped with Sigma's Hyper-Sonic Motor (HSM), which provides for fast and quiet autofocusing.

Price: $370 **Website:** sigmaphoto.com

SONY E PZ 18-105MM F4 G OSS

The major focal lengths for travel photography can be covered with Sony's E PZ 18-105mm F4 G OSS lens. Designed for Sony's APS-C-format E-mount cameras, the lens has a 27-157.5mm 35mm equivalent zoom range and a constant *ƒ*/4 aperture for consistency through all focal lengths. Its optical SteadyShot image stabilization reduces the effects of camera shake, especially at the lens' longer focal lengths while its internal focus design keeps the overall length of the lens from changing during focusing. The zoom's rounded seven-blade diaphragm contributes to elegant bokeh quality when working with selective focus techniques with wider apertures.

Price: $600 **Website:** sony.com

and is well suited for other travel-related imagery from landscapes and cityscapes to general street photography and environmental portraiture. It would have, however, fallen short for the second Chilean story I needed to produce out of the same trip.

Chiloé National Park on the island of Chiloé has a great diversity of marine life, including blue and sei whales, Magellanic and Humboldt penguins, Chilean and Peale's dolphins, marine otters and sea lions. When travel photography includes wildlife, longer lenses are the name of the game. This makes for a heavier camera bag but opens up photo opportunities that wouldn't otherwise be possible. All-in-one super telephotos

The local government of the Chilean coastal town of Valparaíso supports and promotes its local street art culture, with many cafés, restaurants and bars joining in to have their community's artists turn their walls and sidewalks into works of art. I spent the day traversing the rolling hills of the "Jewel of the Pacific" with my Nikon D850 with a NIKKOR 24-70mm f/2.8 lens.

Photo by Mark Edward Harris

NIKON NIKKOR 28MM F/1.4E ED

The Nikon AF-S NIKKOR 28mm 1.4E ED replaces the NIKKOR 28mm f/1.4D as the company's latest super-fast, state-of-the-art fixed wide-angle lens. Sharpness and fast focus in extremely low light situations make this an impressive piece of glass. It's especially well-suited for astrophotography, low-light street and documentary photography. An extremely selective focus with a magnificent bokeh can be achieved with its *f*/1.4 aperture, two f-stops wider than most top-of-the-line short zoom lenses.

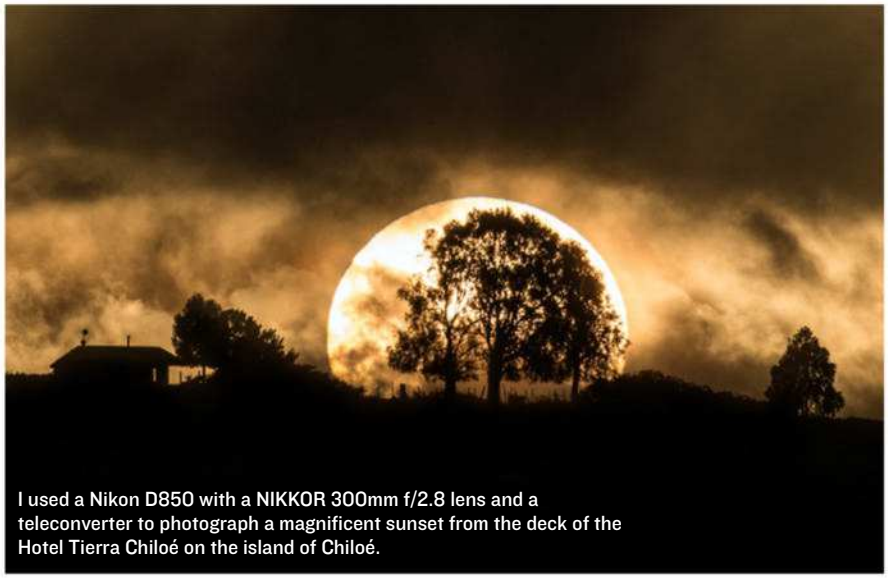
Price: $2,000 (B&H)
Website: nikonusa.com

TAMRON SP 150-600MM F/5-6.3 DI VC USD G2

The 150-600mm F/5-6.3 Di VC USD G2 features three low dispersion (LD) glass elements to reduce chromatic aberrations and color fringing throughout its zoom range. The lens incorporates a FLEX ZOOM LOCK mechanism to permit locking the zoom position at any focal length position to prevent accidental zoom extension. For handholding, its Vibration Compensation (VC) is a 4.5-stop-effective image stabilization mechanism that helps to reduce the appearance of camera shake when working with slower shutter speeds. Three separate VC modes are for various shooting scenarios: Mode 1 is a balanced setting for general use; Mode 2 is designed exclusively for panning movements; Mode 3 is optimized to stabilize only during capture without stabilizing the viewfinder image. Its Ultrasonic Silent Drive (USD) autofocus motor delivers quick and precise focusing performance to suit working with moving subjects. This motor also allows for full-time manual focus control.

Price: $1,400 **Website:** tamron-usa.com

TRAVEL LENSES



I used a Nikon D850 with a NIKKOR 300mm f/2.8 lens and a teleconverter to photograph a magnificent sunset from the deck of the Hotel Tierra Chiloé on the island of Chiloé.

such as Tamron and Sigma's 150-600mm f/5-6.3 lenses can cover an incredible focal range but have f-stops that close down as you zoom in. Once again, this is the balancing act. Weight, cost and convenience versus giving up lens speed and a bit of bokeh. Ironically, one of my favorite shots from the trip was of a sunset, shot from the deck of my hotel, the Tierra Chiloé. Without packing a long lens for the wildlife part of my Chile trip, this image of the unique sunset with the huge ball of the sun wouldn't have been possible. Travel photography will give us an endless amount of opportunities; we just have to be open to them and know how to translate what we see with our eyes onto our sensors. DP

GEAR

TOKINA AT-X 116 F/2.8 PRO DX II (11-16MM)

The AT-X 116 f/2.8 PRO DX II (11-16mm) is an ultra-wide-angle autofocus zoom designed for digital cameras with APS-C sensors. Nine diaphragm blades help to produce soft out-of-focus backgrounds while two Super-Low Dispersion glass elements and two aspheric elements help to achieve excellent contrast, sharpness and minimal chromatic aberration. Tokina's One-Touch Focus Clutch Mechanism allows the photographer to switch between autofocus and manual focus with a push or pull of the focus ring; no need to adjust the AF/MF switch on the camera body. A constant f/2.8 maximum aperture makes it a great lens for working in low light or when trying to create a bokeh, an especially effective tool for portraiture on location.

Price: $400 **Website:** tokinausa.com

OLYMPUS M.ZUIKO DIGITAL ED 12-100MM F/4 IS PRO

The Olympus M.Zuiko Digital ED 12-100mm f/4 IS PRO has a 35mm equivalent coverage of 24-200mm for its Micro Four Thirds mirrorless cameras. This makes it a great all-in-one travel lens, going from wide-angle way into the telephoto. It's able to maintain a constant maximum aperture of ƒ/4, something not common when traversing such a wide range of focal lengths. The lens' optical image stabilization system works in conjunction with the Olympus camera's 5-axis image stabilization to form Sync IS, which compensates for up to 6.5 stops of camera shake. A manual focus clutch permits fast changing to manual focus for more precise control.

Price: $1,170
Website: cameras.olympus.com/en-us

FUJIFILM XF16-55MMF2.8 R LM WR

With a 24-82.5mm 35mm equivalent, Fujifilm's XF16-55mmF2.8 R LM WR lens gives great coverage from wide-angle to portrait-length perspectives. The constant ƒ/2.8 maximum aperture makes it an effective lens to work within low-light situations regardless of focal length, while its 9-blade circular diaphragm renders a pleasing bokeh. In the macro mode at the wide-angle end of the lens, the minimum focus distance is 11.8 inches, opening up additional travel imagery opportunities by focusing in on the macro world around us.

Price: $1,200 **Website:** fujifilmusa.com

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TAKE TO THE FIELD

SPORTS PHOTOGRAPHERS NEED TO REACH OUT AND GRAB THE SHOT. HERE'S HOW TO PICK THE RIGHT LENS.

TEXT & PHOTOGRAPHY BY MARK EDWARD HARRIS

SPORTS LENSES

When it comes to sports photography, since speed is the name of the game, pros turn to "fast" lenses. But what constitutes a fast lens and why are they important?

The next time you're watching a professional outdoor sporting event, look at the sidelines or photographers pit, and you'll see huge $5,000 to $13,000 lenses focusing in on the action. Notice that many will be attached to monopods because of their weight. Apertures can be opened to ƒ/2.8 on 300mm and 400mm lenses and as wide as ƒ/4 on 500mm and 600mm lenses. Because of all the light coming into the camera body through these wide openings, shutters can be set to faster speeds, hence the expression "fast lens." A secondary advantage of these lenses is the opportunity to create a beautiful bokeh—that magical aesthetic quality of blur in the out-of-focus areas of an image created by an extremely shallow depth of field. This can be used to keep the focus of the viewer on the action rather than being pulled away by distracting elements in the background.

Because of their price, these lenses tend to be the property of professional sports and wildlife photographers, photo agencies that lend out equipment to their photographers on assignment, and non-professionals with healthy savings accounts.

Yet for those where money is an object, there are still plenty of lens choices that can keep you in the game at a reasonable cost. As the focal length gets shorter and/or as the widest f-stop closes down, so does the price. You'll sacrifice a bit of the bokeh and possibly have slower auto focus capabilities, but you'll gain in savings and portability.

What's not lost is the ability to freeze the action. While less light is coming through the lens into the camera, necessitating higher ISOs to maintain fast shutter speeds at times in excess of 1/1000th of a second, state-of-the-art sensors have allowed photographers to increase their cameras' sensitivity without sacrificing an image to digital noise. In the not-too-distant past, even setting your ISO beyond 800 was venturing into dangerous territory.

One way to get more bang out of your lenses, when the rules of the game keep

Los Angeles Dodgers pitcher Hyun-Jin Ryu on the mound at Dodger Stadium photographed with a Nikon D4 with a NIKKOR 300mm F2.8 lens and a Nikon tele extender that got me to 420mm with an exposure of 1/1600th of a second, ƒ/4, 800 ISO.

GEAR

SIGMA 120-300MM F2.8 DG OS HSM

The Sigma 120-300mm F2.8 DG OS HSM is the manufacturer's first lens introduced into its Sports category. The fast ƒ/2.8 aperture is a constant all the way through the zoom from 120mm to 300mm, giving the sports photographer great coverage without giving up speed. Its Hyper Sonic Motor (HSM) gives a quiet, fast and accurate autofocusing while its Optical Stabilizer (OS) compensates for potential camera shake when shooting handheld. The dust- and splash-proof design of Sigma's Sports line lenses keep you in the action when working in inclement weather.

Price: $3,400 **Website:** sigmaphoto.com

CANON EF 70-200MM F/2.8L IS II USM

The EF 70-200mm f/2.8L IS II USM is a must-have lens in the camera bag for professional photographers covering sports using the Canon system. This L-series telephoto zoom has a bright ƒ/2.8 constant maximum aperture and excellent optical image stabilization. Its five ultra-low dispersion elements and one fluorite element reduce color fringing and chromatic aberrations while its Super Spectra coating reduces lens flare and ghosting. Fast autofocus with a full-time manual focus override keep the photographer in constant control of the final image. Its rounded eight-blade diaphragm contributes its ability to render a beautiful bokeh at wide apertures.

Price: $1,900 **Website:** usa.canon.com

TAMRON 70-200MM F/2.8 DI VC USD G2

The 70-200mm zoom range is great for dugout portraits to nearby action on the field and is often the second lens professional sports photographers have at the ready after their big glass. The constant ƒ/2.8 aperture allows for fast focus while its BBAR and eBAND lens coatings reduce ghosting and flare, the latter being a potential issue when working under stadium lights. VC image stabilization helps to minimize camera shake while the rounded nine-blade diaphragm of the Tamron 70-200mm F/2.8 Di VC USD G2 contributes to an elegant bokeh quality.

Price: $1,300 **Website:** tamron-usa.com

you at a distance from the action, is to attach them to an Advanced Photo System type-C (APS-C) camera body. These cameras have smaller sensors than their full-frame brethren, meaning that the lenses will have a magnification factor of typically 1.5 or 1.6. For example, if I put my AF-S NIKKOR 300mm F2.8G ED VR II lens on my full frame Nikon D850, the focal length will still be 300mm. But if I put that same lens on a crop sensor body such as a Nikon D500 with its crop factor of 1.5, the effective focal length will be 450mm. The Canon 7D has a slightly smaller sensor and a 1.6 crop factor. Putting a Canon EF 300mm *f*/2.8 IS II USM lens on that body will make it in essence a 480mm lens. That same lens on the full-frame Canon EOS 5D Mark IV will keep it at its original 300mm focal length.

To take this one step further, a Micro Four Thirds format camera, such as the Olympus OM-D E-M1 Mark II, has a magnification crop factor of 2. That means that its Olympus M. Zuiko Digital ED 300mm f4.0 IS Pro lens on that

I used my Nikon D4 with my NIKKOR 300mm F2.8 lens set to 1/2000th of a second, f/4.5, ISO 200 to capture the action of a steer wrestling competition at the PRCA Rodeo during Cheyenne, Wyoming's Frontier Days.

GEAR

SIGMA 150-600MM F5-6.3 DG OS HSM

The dust- and splash-proof 150-600mm F5-6.3 DG OS HSM Sports lens offers professional-grade optics and an Optical Stabilizer (OS) that features an accelerometer for improved vertical and horizontal panning, particularly useful for motorsports photography. While its widest apertures are slower, which keeps its price in the ballpark, its Hyper Sonic Motor (HSM) provides fast, quiet autofocus. One particularly useful setting built into the lens barrel includes two switches, one zoom lock that can hold the lens at any focal length and a manual focus override for when more precise control is needed.

Price: $1,800 **Website:** sigmaphoto.com

NIKON AF-S NIKKOR 200-400MM F/4G ED VR II

Nikon says this lens delivers unrivaled speed, consistency, low-light performance and image quality in the most demanding situations. This quality comes with a price tag, but that's part of the balancing act that comes into play when shopping for high-quality glass. Memory Recall can be especially useful in sports when certain actions can be predicted. For instance, when covering a baseball game, you can pre-set the focus from the camera to second base in anticipation of a bang-bang double play, then cover another area of the field, then engage Memory Recall to quickly capture the action at second base without having to refocus. This heavyweight in the professional photo world weighs in at a fit 118.5 ounces.

Price: $7,000 **Website:** nikonusa.com

SONY 18-200MM F3.5-6.3 OSS

This versatile zoom covers wide-angle to super telephoto with its full frame equivalent zoom range of 27-300mm, giving sports photographers the opportunity to cover a full range of subjects from near and far. The variable f/3.5-6.3 aperture keeps the lens relatively compact. The lens features Optical SteadyShot image stabilization. The lens elements are designed to reduce chromatic aberrations and astigmatism, field curvature and other monochromatic aberrations. An internal focus mechanism contributes to faster, more responsive autofocus and easier handling since the lens won't change in length during use. A rounded seven-blade diaphragm contributes to a pleasing bokeh quality, especially important when shooting at wider apertures.

Price: $900 **Website:** sony.com

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body will have an effective focal length of 600mm but will be much smaller and lighter than an actual 600mm f/4 lens.

The key when buying lenses for sports is to contemplate your need for speed, budget and how much weight and size you're willing to carry. Keep in mind that it might be more cost effective to rent a big piece of fast glass if you only occasionally find yourself on the sidelines of a sporting event, camera in hand.

Present-day sports photographers have the luxury of fast autofocus lenses, something that one of the greatest photographers in the history of the genre, Neil Leifer, has only gotten to experience late in his career. I asked him how he was able to manually focus on constantly moving subjects so quickly when covering football. He said, "That's what separated the big boys from the rest of the pack. What separated the big boys when I shot was eye-hand coordination. I was pretty good at it. Walter [Iooss] was the best I'd ever seen at it. John Beaver, who will be shooting his 50th straight Super Bowl, is phenomenal with his hand-eye coordination working with a 600mm lens. He can track a player coming at him and have the whole damn play in focus. So would Walter. I was very good at it. Jim Drake was very good at it. What separated the really top photographers from the second tier was that ability to focus a 600mm lens at a player running right at you or capturing a shot of a pass receiver just as the ball is coming into his fingers. That was hard to do in the days of manual focus. Today, the cameras are so good that they take a lot of the hard work out of the equation. But even with autofocus, it's still about the photographer behind the lens." DP

GEAR

OLYMPUS M.ZUIKO ED 75-300MM F4.8-6.7 II

The Olympus M.Zuiko ED 75-300mm f4.8-6.7 II for its Micro Four Thirds cameras is a compact super-telephoto lens with a 35mm equivalent focal length of 150-600mm. Its MSC mechanism provides fast, silent focusing while its ZERO (Zuiko Extra-low Reflection Optical) lens coating controls issues such as excessive flare in backlight environments. When combined with an Olympus OM-D or PEN series camera, image stabilization on the 15-ounce lens will open up a world of handheld, slow-shutter, possibilities.

Price: $550 **Website:** cameras.olympus.com/en-us

FUJINON XF100-400MMF4.5-5.6 R LM OIS WR

The Fujinon XF100-400mmF4.5-5.6 R LM OIS WR has a 35mm full-frame focal length equivalent of 152-609mm. The high-performance optical construction of 21 elements in 14 groups includes five ED lenses and one Super ED lens to help reduce chromatic aberration. Weighing a demure 3 pounds, the lens has been designed for handheld shooting with a 5.0-stop image stabilization system which, when it detects panning, will automatically switch camera shake correction to the vertical plane only.

Price: $1,900 **Website:** fujifilmusa.com

TAMRON 100-400MM F/4.5-6.3 DI VC USD

Another budget-friendly option when going long is the Tamron 100-400mm F/4.5-6.3 Di VC USD lens. Its three low-dispersion glass elements are effectively positioned to eliminate aberrations that can occur with a telephoto lens. Tamron's eBAND (Extended Bandwidth & Angular-Dependency) Coating prevents reflections that flatten out color. An Ultrasonic Silent Drive (USD) autofocus motor delivers quick and precise focusing performance, well suited to covering moving subjects, a constant in sports photography. Through the use of magnesium alloy components, the lens is both lightweight, at approximately 40 ounces, and extremely durable.

Price: $800 **Website:** tamron-usa.com

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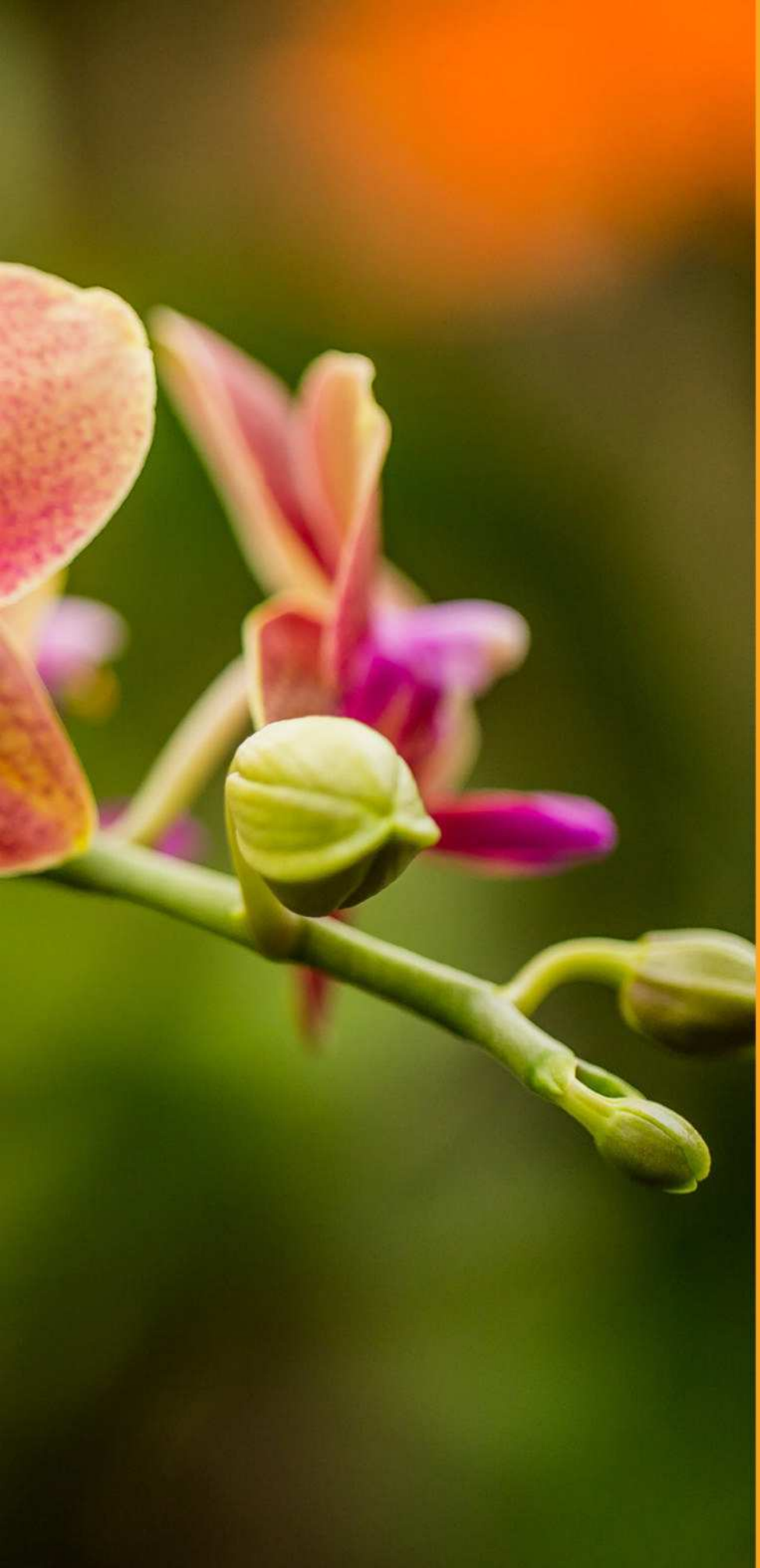
SPECIAL LENSES FOR SPECIAL EFFECTS

WHETHER YOU WANT TO MAKE ENLARGEMENTS OF TINY SUBJECTS WITH A MACRO LENS OR ALTER THE FOCAL PLANE AND PERSPECTIVE WITH A TILT-SHIFT LENS, THESE SPECIALTY LENSES PRODUCE TRULY UNIQUE OPTICAL EFFECTS.

TEXT AND PHOTOS BY WILLIAM SAWALICH



When most of us think about camera lenses, we think about things like focal lengths and maximum apertures and how they allow us to photograph certain subjects most effectively. Lots of lenses work for lots of different things, most of the time. But some lenses are built to do things that are especially unique.

These specialty lenses may be designed with movable focal planes for amazing depth of field, or built to focus extremely close to tiny subjects for macro enlargements, or even to produce a specific type of soft focus that's flattering for portraits. These lenses may not be as all-around versatile as some zooms, but for the specific things these lenses do, they do them incredibly well—and no other lens can compare. That's why we're calling them specialty lenses, after all. If you're looking for something special, a lens with a unique capability, consider investing in one of these prime specimens.

MACRO LENSES

For photographers who want to make big pictures of very small things, a macro lens should be at the top of their list. When enlarged to life size and well beyond, a whole world of pattern and detail and color is revealed. Whether that's found in plants and flowers or insects and butterflies, seeing the world from the extremely magnified perspective of a macro lens is a tremendous way to make uniquely interesting photographs.

Just because a lens focuses close doesn't make it a true macro lens. If a subject can be rendered truly life size or larger on the sensor (or film), it's technically a macro lens. In practical terms, that means a 1-inch stamp photographed with a macro lens will fill an actual inch on an image sensor.

Along with a traditional focal length, lenses are measured by a magnification ratio expressed as 1:1 or 1:2 and so on. A 1:1 ratio means a lens is capable of producing truly life-size enlargements. A 1:2

GEAR

MACRO LENSES

CANON EF-S 60MM F/2.8 MACRO USM

Users of Canon APS-C DSLRs will want to check out the Canon EF-S 60mm f/2.8 Macro USM. This true macro lens is optimized for APS-C sensors and features 1:1 magnification and a minimum focusing distance of just under 8 inches to make big enlargements of little subjects. Its 96mm equivalent focal length makes this lens great for portraits, too. Lens elements have been treated with Super Spectra coating to minimize flare and ghosting, which rob images of contrast and saturation. An Ultrasonic Motor makes focusing quick and quiet, while internal focusing makes it easy to use filters, too.

Price: $399 **Website:** usa.canon.com

TAMRON SP 90MM F/2.8 DI MACRO 1:1 VC USD

The life-size 1:1 magnification produced by the Tamron SP 90mm F/2.8 Di Macro VC USD lens is ideal for close-up photography, and the lens focuses as close as 11.8 inches. The built-in vibration reduction on this updated version of a classic 90mm macro lens makes handholding even easier—particularly because small movements are amplified when working close up to subjects. Coated elements fight flare and increase contrast when shooting in backlit situations. The rounded nine-blade aperture produces beautiful bokeh as well.

Price: $649 **Website:** tamron-usa.com

NIKON AF-S MICRO NIKKOR 60MM F/2.8G ED

Nikon shooters who want to make close-up photos will like the updated 60mm macro, the AF-S Micro NIKKOR 60mm f/2.8G ED lens. It produces true macro images with its 1:1 magnification ratio and 7.3-inch close focusing distance, as well as utilizing elements for better light transmission, plus minimized flare and ghosting. When used on a DX format camera its equivalent focal length is 90mm. A nine-bladed diaphragm produces beautiful, smooth bokeh.

Price: $599 **Website:** nikonusa.com

ROKINON 100MM F/2.8 MACRO

Available for Sony E and A mounts, the Pentax K-mount, Fujifilm X mount, Nikon F-mount, Samsung NX mount, Micro Four Thirds mount and Canon EF mount, the Rokinon 100mm f/2.8 Macro lens uses one high refractive index element and an extra-low dispersion element to reduce distortion and chromatic aberration while producing life-size 1:1 magnification. It can focus as close as 12 inches from the subject, and with its 100mm focal length it's ideal to make detailed enlargements of the tiniest subjects—on practically any camera you choose.

Price: $429-$549 **Website:** rokinon.com

ratio means the lens is capable of rendering an image half of life size, while a 1:4 magnification ratio means one quarter of life size. This magnification ratio also expresses how close a lens can focus, with a 1:1 lens being able to focus at a distance equal to its focal length. A 100mm macro prime with a 1:1 magnification ratio, for instance, can focus at a distance of 100mm from the subject. A 1:2 100mm lens can focus at 200mm from the subject, meaning it can technically only enlarge a subject to half the size of a 1:1 lens. While technically these less-than-1:1 lenses are not truly macro lenses because they don't reproduce at life size, many manufacturers use the term loosely because a lens approximates the macro enlargement effect.

The best way to measure the power of a macro lens is to rely on the magnification ratio while using the focal length of the lens to help determine how close you might like to be to photograph the subject. A 65mm macro with a 1:1 ratio might be the better choice for photographing something like the grains of pollen on a flower petal, while a 150mm lens with a lesser magnification ratio may be wonderfully useful for photographing wider scenes of flowers and insects in the wild with a bit more context. Those macro photographers who are less likely to tie their camera down to a tripod may also want to ensure they choose a macro lens with image stabilization as well. When focusing on tiny subjects, the slightest hand movements translate into huge changes in the viewfinder. Whatever you're shooting, for photographers who really want to make close-up macro photography a part of their repertoire, it's best to skip extension tubes and close-up filters and go straight for the higher quality and better results produced by true macro lenses.

PERSPECTIVE CONTROL LENSES

Based on the incredible functions of view camera movements, tilt-shift or perspective control lenses are capable of doing things no other lenses can—like shifting the plane of focus so that it's no longer parallel with the subject and the sensor plane. This type of lens is particularly

useful for architectural photographers because it fights the distortions that occur when a camera's sensor isn't parallel with the vertical lines in an interior or on the exterior of a structure, for instance. When does this happen? Any time a camera is pointed up at a building in order to get it in the frame, you'll see the parallel lines of the corners of the building begin "keystoning," or appearing to converge at the top of the frame the way train tracks appear to converge as they run off to the horizon.

Tilting the front element of the lens downward, however, corrects for this type of distortion and enables architectural photographers to keep straight lines straight while photographing interiors and exteriors.

Specialty lenses open up worlds of new possibilities for the creative photographer. With a macro lens, like the one used here, nature's beauty is even more evident.

GEAR

TILT-SHIFT LENSES

CANON TS-E 50MM F/2.8L MACRO

Last fall, Canon added three new tilt-shift lenses to its lineup: two medium telephoto lenses (a 90mm and a 135mm) and the TS-E 50mm f/2.8L Macro. The name is a bit of a misnomer, as it produces just a 1:2 magnification ratio, but it's still great for close-up photography—as well as landscape, architectural interiors and exteriors, and portrait photography. This normal focal length lens has a minimum focusing distance of just over 10 inches, and the lens movements provide more control, particularly to the focus plane and depth of field when photographing close-up subjects.

Price: $2,199 **Website:** usa.canon.com

NIKON PC-E NIKKOR 24MM F/3.5 ED

This wide-angle lens provides perspective control via tilt and shift movements that can be used to eliminate distortion for architectural interiors and exteriors, landscape photographs and more. The lens mount can rotate 90 degrees in either direction to allow for tilt and shift control on any axis. The 24mm lens provides a wide angle of view that's ideal for landscapes and architectural photography, with enhanced control over the composition and plane of focus as well as distortion correction.

Price: $2,199 **Website:** nikonusa.com

LENSBABY COMPOSER PRO II

For photographers who want to approximate funky focus shifts without the extreme precision and higher price of true tilt-shift lenses, less-expensive options from Lensbaby compress or extend around a single axis in order to create a strong focus shift that can make shallow focus effects and perspective adjustments. This lens doesn't have the durable construction of most tilt-shift lenses, but it does provide an affordable alternative that still approximates the effects achieved by these highly specialized lenses.

Price: $349-$749 **Website:** lensbaby.com

Another option is to make an even bigger image file and wider angle of view by shifting the lens from its center point to the left for an exposure and to the right for an exposure (or up and down, as well). In this way, these additional exposures can be combined with the main image using Photoshop to produce a larger image file with a larger view than the original single exposure alone.

Aside from architectural and landscape photography, tilt-shift lenses can be used to change the plane of focus in order to create an incredibly deep depth of field that would be impossible in a normal fixed lens. That same functionality can be used in reverse, too, in order to create an impossibly thin depth of field. Have you ever seen an image in which a city streetscape looks like a miniature?

GEAR

SOFT FOCUS LENSES

NIKON AF DC-NIKKOR 135MM F/2D

This old-school lens may look like a thing of the past, but it can still be purchased brand new today. It's the AF DC-NIKKOR 135mm f/2D, and along with being an ideal lens for portraits thanks to its 135mm focal length and fast *ƒ*/2 maximum aperture, it's the Defocus Image Control that really makes this lens special. Using a secondary ring on the lens barrel, the photographer can manually adjust the quality of the bokeh, in either the foreground or the background, to produce supremely pleasing selective focus images, or when pushed to its limits creating an actual soft focus effect even at sharp apertures and when the focus point is spot on.

Price: $1,399 **Website:** nikonusa.com

LOMOGRAPHY DAGUERREOTYPE ACHROMAT 2.9/64 ART

Now available in brass, black and chrome-plated finishes, the Daguerreotype Achromat 2.9/64 Art Lens is designed to provide tack-sharp or silky-soft focus depending on the aperture used. Based on the design of the first photography-specific lens, an achromat popularized by Louis Daguerre in the 1830s, when shot at small apertures (from *ƒ*/5.6 to *ƒ*/16), this simple doublet optical design produces precise, sharp focus. But wide open, or below *ƒ*/4, the lens produces beautifully soft focus, ideal for portraits with a dreamy, ethereal feel. Interchangeable aperture plates also alter the look of the images by changing the bokeh from softly glowing to painterly textured. Available for Nikon F and Canon EF mounts.

Price: $399 **Website:** lomography.com

LENSBABY VELVET 85 F/1.8

The Lensbaby Velvet 85 produces a soft, glowing effect at wide apertures that's ideal for portraits. The relative softness of the lens can be adjusted by stopping down or opening up. The 12-bladed diaphragm helps to produce beautifully smooth bokeh, and the manual focus design keeps the lens compact and affordable and helps it to focus as close as 9.5 inches. The 85mm focal length is ideal for portraits on full-frame sensors, while on APS-C sensors the lens is equivalent to a 128mm—still good for portraiture. Available in mounts for Nikon, Canon, Sony (A and E), Pentax, Fujifilm, Samsung and Micro Four Thirds cameras.

Price: $499 **Website:** lensbaby.com

This optical special effect is only possible with a tilt-shift lens. These lenses are expensive—that's their prime drawback—but they can do amazing feats of optical physics unlike any other lens.

SOFT FOCUS LENSES

Most portrait lenses are known for being especially sharp and high fidelity, but in fact sometimes portrait photographers want a bit of softness in order to impart a more pleasing effect on the subject's skin or to help hide imperfections such as blemishes, lines and wrinkles. Manufacturers used to make a lot more lenses that were otherwise just like a normal portrait lens but with specifically soft-focus capability for this very purpose—and some of them are still available. These days, though, digital imaging has largely replaced lenses at approximating this look, but there are some other particularly unique options out there for photographers who want everything from subtle softness to a downright dreamlike, hazy effect.

LENSES FOR ASTROPHOTOGRAPHY

If you walk into your favorite camera store and ask for an astrophotography lens, the sales team isn't likely to show you to a particular model. There's technically no dedicated category of lenses made specifically for astrophotography, you see. But in recent years, as high-ISO capture has become increasingly high-quality, ultrawide lenses have gained new popularity specifically for astrophotography. The huge angle of view encompasses more of the sky, sometimes practically from horizon to horizon, but because the view is so wide it takes more for movement to register on the sensor. That makes these wide-angle lenses particularly useful for astrophotographers who want to photograph the stars without creating star trails—those illuminated lines of motion blur that occur with an exposure long enough to register the rotation of the earth and its impact on the galaxy. The wider the lens, the longer the exposure that can be used without creating star trails. A 24mm lens with an $f/1.4$ or $f/1.8$ maximum aperture tends to be particularly popular for astrophotography because of its ability to render stars accurately and to minimize coma—distortion of the shape of stars—at the sharpest apertures on the lens. DP

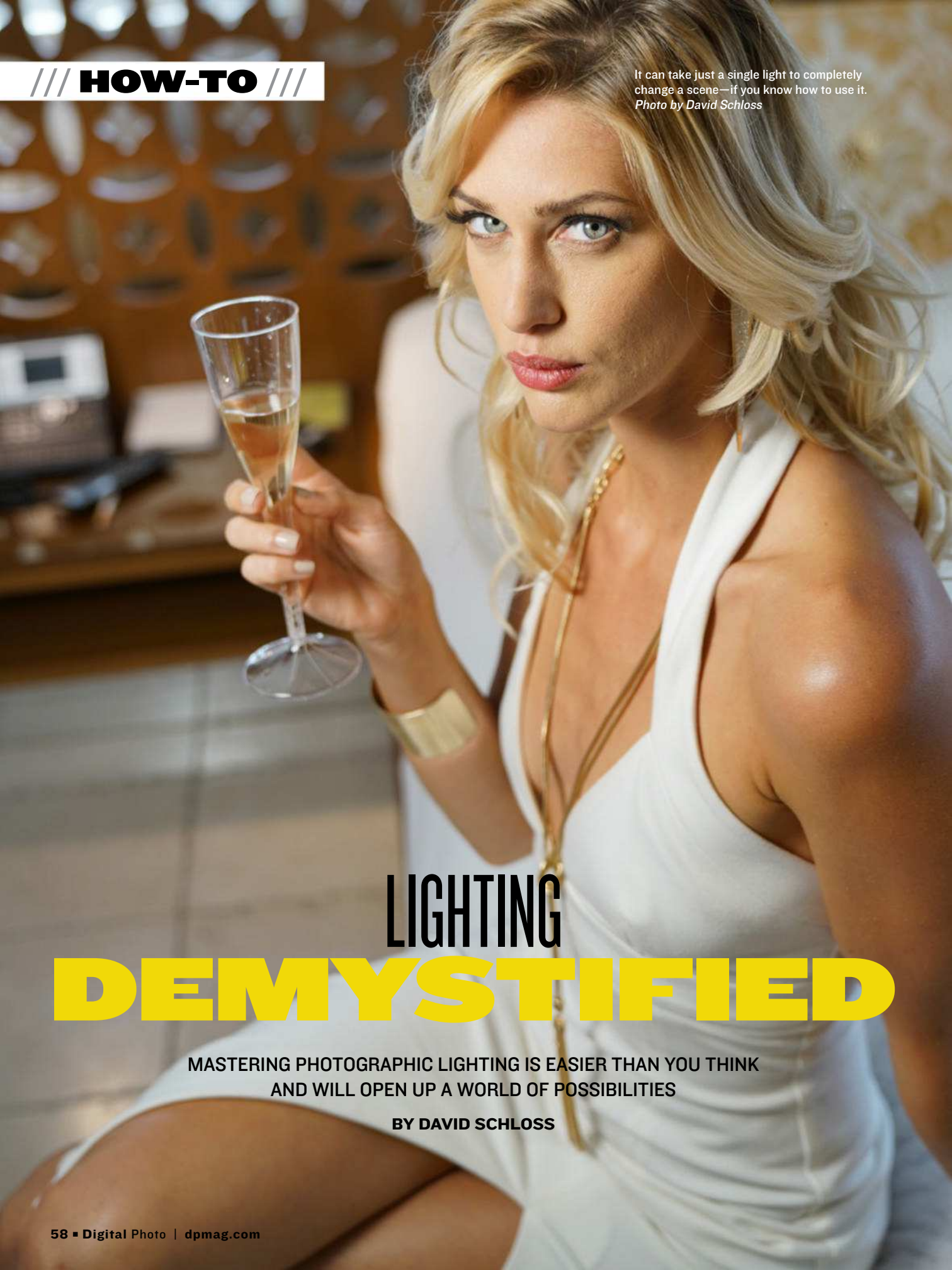
GEAR

LENSES FOR ASTROPHOTOGRAPHY

ROKINON 24MM F/1.4 ED AS UMC

The superfast Rokinon 24mm f/1.4 UMC lens may be great for low-light action photography because of its fast f/1.4 maximum aperture, but it's especially ideal for astrophotography due to its optical quality and wide angle of view. Edge-to-edge sharpness and minimum distortion are thanks to aspherical elements and multilayer coatings. The lack of an autofocus motor—which isn't necessary for astrophotography—keeps the cost down too. Available for Sony E mount, Micro Four Thirds, Canon EF, Nikon F and Pentax K-mount cameras.

Price: $449-$599 **Website:** rokinon.com



It can take just a single light to completely change a scene—if you know how to use it. *Photo by David Schloss*

LIGHTING DEMYSTIFIED

MASTERING PHOTOGRAPHIC LIGHTING IS EASIER THAN YOU THINK AND WILL OPEN UP A WORLD OF POSSIBILITIES

BY DAVID SCHLOSS

Whenever I hear a photographer say "I just use natural light," sometimes what they mean is "because I don't know how to use lighting equipment." For most photographers, understanding how to set up and modify lighting to achieve a desired result is a much larger mental hurdle than grasping the connection between aperture, shutter speed and ISO.

Realistically, though, all lighting tools are made to do the same job—increase the amount of light falling on some or all of your subject. The confusing thing about photographic lighting is that there's just so much of it available, and people often think they have to master dozens of different lighting tools. But if you understand the basics, all of the gear just becomes a tool for taking some light from over here and putting it over there in a specific way.

The other day, I took a ride in a private plane with a seasoned pilot, and he went through a long pre-flight and pre-takeoff checklist. As we were flying, he adjusted switches and turned knobs, and to me it was all a bit bewildering. There didn't seem to be a correlation between turning dials and not falling out of the sky. If, however, I had a pilot's license, I'd know what each switch did, even if it were in a plane I was unfamiliar with. I'd recognize the fuel tank switch and the dials for tuning in air traffic control and the flaps adjustment, and so on. I might not know where a switch was, but I'd know the principles of how a plane worked, and once I found the right dial or toggle, I'd know how to use it.

Luckily, lighting an image is vastly easier than flying a plane, although it doesn't always feel that way. Once you know the basics, the various components make sense.

THE BASICS

There are three things that control how light falls on your subject, and to understand how they interact, simply grab a garden hose with an adjustable nozzle. (Note: Let's just mentally grab a garden hose, things are going to get a bit wet here.) While light doesn't function exactly like water, it's close enough to understand basic lighting concepts. Water splashes and sticks around in a way that light does not, but when it comes to intensity and brightness, it's a good stand-in.

Point your garden hose at a person (if you're doing this in real life, I suggest someone extremely understanding), stand very close and adjust the nozzle so the water comes out in a tight jet. You'll end up with the subject being hit very hard with a stream of water and that stream only hitting a small portion of their body (ignoring the water splashing onto other areas for now).

Next, adjust the pattern of the water until it's a wide-open fan of water. The

It's helpful (though not entirely accurate) to think of photographic lighting like a stream of water from a hose. The closer and tighter the spray of water, the harder it hits an object, while the farther away and wider the spray is, the more gentle the water is when it hits a subject.

ALTANAKA/SHUTTERSTOCK

same water now covers more of your subject and is much softer. Back away from your subject with the spray still in a wide pattern, and you'll end up covering a greater area of the subject, with increasingly softer force, up until the point at which the water no longer reaches them.

At this point, adjust the stream of the water again until it's a tight jet, and once again, the water should reach your now-drenched subject. The water won't hit with as much force as when you sprayed it close, and it will hit a wider area, but it will still cover a smaller area than the misting setting and feel much harder to your subject than the mist—but significantly less so than if you were standing close.

At this point, if you want to get more water to reach your subject, you can either move closer or increase the water pressure so more water is coming out of the hose per second. Either way, you'll have more water hitting your subject, but you'll have a different quality of water.

The larger the radius of the water is, the softer it is when it reaches your subject, and the smaller the radius of water is, the harder it is when it reaches your subject. That's because as you open up the spray of water, more of the water molecules strike the subject from a variety of angles, while a tight spray of water sends most of the water in the same direction.

The closer you are to the subject, the more forceful (intense) the water is when it hits your subject, and the farther away you are, the less forceful it is when it reaches your subject. That's because as you move away from your subject, the water molecules spread out over distance, so they're hitting a wider surface area.

Replace the water in this analogy with light, and the same thing happens. Wide, far-away light is the softest, while narrow, close light is the hardest. The wider your light source and the farther away it is, the softer your light, with less light arriving at your subject the farther away you get.

The entire trick of lighting is to take your light source and find the right distance, brightness and shape to create the lighting you want. This can be done through the right selection and use of lights and modifiers.

All you really need to remember is that the farther and the larger the light source is, the softer the light on the subject.

But wait, I can hear you think: When you take photos outside with the noonday sun shining on a subject, the light is really harsh—and what light source can we find that's bigger than the sun? The issue here is that we're only getting a small section of the sun's light—most of it has gone off in other directions before it hits earth. The result is an effectively small light source that's far away. If you look at it (don't look at it for real, that was a mental experiment), it appears to be a small point of light smaller than even a typical flashlight.

> "ALL YOU REALLY NEED TO REMEMBER IS THAT THE FARTHER AND THE LARGER THE LIGHT SOURCE IS, THE SOFTER THE LIGHT ON THE SUBJECT."

That's why cloudy days are so great for photography—clouds cover more of the earth than you or I do, so more light hits them, and the clouds diffuse and diffract the light, and the result is a soft light covering the earth.

THE INVERSE SQUARE DANCE

One of the crucial ways in which streams of water and beams of light differ is in the way they travel to their destination and what happens along the way. Beads of water are pulled to the ground by gravity, but that doesn't affect light (well, it does, but let's stay clear of advanced physics for a now). Spray water here on earth, and it'll eventually be pulled to the ground by gravity and friction with the air.

Shoot a beam of light, and it will travel indefinitely until it's absorbed or hits an object that converts it to heat. Stand under an intense light source, and the heat you feel is your skin absorbing some of that light and converting the photons into heat.

The way that light travels across distance is governed by something called the Inverse Square Law, which is a complex-sounding way of saying that as you double the distance from a light source, only a quarter of the energy reaches the subject. In other words, if your lights are a distance from your subject, let's say 1 yard, moving the lights to 2 yards away doesn't mean you'll get half as much light but a half of a half as much.

If you're good with f-stops, you can think of this in terms of stops of light instead. Imagine that, with a strobe positioned 1 yard away from your subject, you set up lighting so that your photo is properly exposed when you set your camera at 1/60th at $f/22$ at ISO 100. If you move your lights to be 2 yards away from the subject (double the original distance), you'd now be losing two stops of light, and to get the same exposure, you'd need to set the camera to 1/60th at $f/11$ at ISO 100. Move the subject back to 4 yards away (doubling the distance again), you'd lose two more stops and now have to set the camera to 1/60th at $f/5.6$ at ISO 100.

If you're not good with f-stops, just remember that as your light gets farther away, you need to either increase the intensity a lot or change the camera's settings a lot to keep the same amount of light.

What are the implications of all of this on your choice of strobes? With an understanding of how light works (or garden hoses, depending on how much you understood my analogy) you can figure out what kind of lights and what kind of modifiers will work for you.

SMALL, HARSH AND CRUCIAL—PORTABLE FLASH

In our garden hose analogy, it's clear that portable flashes, the kind that sit atop

Canon EOS Speedlite 470EX-AI

Elinchrom ELB 400

your camera and/or that can be used wirelessly off-camera, are the equivalent of spraying a close, narrow blast of water. Without any modifications, they'll produce a harsh light on a close subject and, thanks to Inverse Square, throw little to no light on a far-away subject.

Sometimes you want a narrow, intense light, either because it's what the photo calls for or because it's all you have available. If you move the portable light away, you don't end up with entirely smooth light because you're still dealing with a small light source.

One solution is to put a diffuser of some kind, like a softbox, in front of the light. You'll lose a lot of the power of the light, but because of the way the material is constructed, you'll make a bigger light source with your small strobes. There are countless models of softboxes for flash units and adapters that let you put one (or more) flash units together inside a studio-sized modifier.

You can also bounce the light of the strobes off walls and other surfaces, essentially turning the walls or ceiling into a diffusing material.

BIG, HEAVY AND BEAUTIFUL—STROBES

On the opposite end of the lighting spectrum (I couldn't resist), we find "studio" strobes. With bigger lighting elements than flashes, these produce a softer light at the same distance, and with greater power, these can be moved back much farther and still have enough light to reach the subjects. They're also powerful enough to light a subject even with light modifiers like umbrellas and softboxes mounted to them.

Strobes can be AC powered for unlimited flashes, or they can be battery powered, which limits the number of "pops" (flashes) they produce but makes them portable. If the strobe has a separate component that plugs into an AC outlet, that's called a "pack," and the individual lighting elements that connect to the pack are called a "head." Most packs have to be plugged into outlets to function, though an increasing number of packs can run on battery power or AC power.

Some strobes have the pack portion built into the light, for portability, and these are called monolights. Both standard pack-and-head kits and monolights can be battery powered as well.

The power of a strobe system is listed in watt/seconds—a fancy way of saying how much light it produces in a certain period of time. A 300-500 w/s pack is on the low end of the power scale, and a 1200 w/s or higher is on the upper end. How much power you need depends on how far away you plan to shoot and the type of modifier you're planning to use. All the units can be scaled down, so a 1200 w/s unit can still flash at 200 w/s, but a 500 w/s unit can't produce more output than 500 w/s. That means that when purchasing lighting gear, it's better to buy a bit more power than you think you need.

Flashpoint 620M

Fotodiox Ez-Pro-Mini Flash Softbox K50 20"

Many strobe "packs" can power more than one strobe head, which divides the total power across them. Plug in two lights to a 1200 w/s pack, and you'll usually be able to decide individually how much light each head produces to a total of 1200 w/s, though some systems just divide the total power across each head.

CONTINUOUS

An increasingly popular choice in photographic lighting is continuous light sources, like LED panels. Before LEDs became cheap and ubiquitous, the main type of continuous lighting was HMI lights, which were expensive, heavy and hot.

LEDs are lighter, cheaper and cooler, and getting more powerful by the day. Turn on an LED light and you can see exactly where the light is going to fall. Put something in front of the LEDs to soften them, and you can see the effect of the use of the material. It's a straightforward way to work. In order to get the same level of brightness as a flash can produce, you'll need very bright LEDs, and since they're always on (by definition), these can be harsh on the eyes of your subjects. Sometimes there's no substitute for flash.

ALL SHAPES AND SIZES

There are a ton of different shapes for light modifiers, and they come in a wide range of sizes. The most common of them are designed to enlarge the light source (to make it softer) and to shape it a bit.

A popular modifier (especially for beginners) is an umbrella. These slide into the light body or the stand and point toward the subject, with the light pointing backward toward the umbrella. It's the fastest, easiest light modifier to use.

A light-modifying softbox can be square, rectangle, octagon (usually called an "octobox") or circular. A commonly used circular modifier that's shaped like a fancy lampshade is called a "beauty dish" for the excellent portrait light it creates.

The surfaces of the modifiers can often be changed, with different colors for different needs. They'll often come with inserts that are white, silver and gold—gold is a good one for flattering, warm skin tones and to match tungsten light.

There are also light modifiers designed to limit how much light comes out, in order to direct or shape it. Some common modifiers like this are snoots (long tubes that make the output look much more directional) and barn doors, which can be moved in front of a light to cut off the edge of that light.

ACCESSORIES

Part of the reason that flash photography is so bewildering to many people is that

Litepanels Astra IxI Bi-Focus Daylight LED Panel

Avenger SuperClamp

there are just so darned many accessories available. There are dozens of companies making light stands; there are hundreds of different clamps on the market. Many of the studio strobes have their own system to connect the lights to modifiers, so there are adapters available to take a softbox from Company A and put it on a light from Company B. There are portable reflectors; there are pop-open boxes to put models inside for soft light photography.

All accessories, though, perform a task, and as you work with lighting more, you'll come to understand what they are and what they do. Photograph a model wearing a cowboy hat, which casts shade onto the face of your subject, and you might think "if only there was a tool to bounce some of the light under the brim of the hat." There is. It's called a reflector, and they come in different sizes and materials. There's even a modifier designed to reduce light, a black sheet or cloth called a "flag" that helps reduce highlights and cut off light sources.

If you think it would be great to hang lights from a pole above your subject, you can. Almost every possible photographic scenario has been considered, and an accessory (or a thousand) exists to solve any problem.

If you want to learn more about what the accessories do, simply browse their descriptions in an online store. Often, you'll find exact details of what the accessory does and videos about how to use it.

A FLASH OF CLARITY

One of the most confusing things about working with photographic flash lighting is that you can't see the effect of a setup until you review the images. This is disconcerting to photographers, as we're used to seeing our composition as we're creating it. Setting up strobes is largely a matter of trial and error and experience. Just as a seasoned photographer can evaluate the lighting in a scene and dial in the aperture and shutter speed, a photographer who's used to working with strobes can look at a scene and get a feeling for how much light they need.

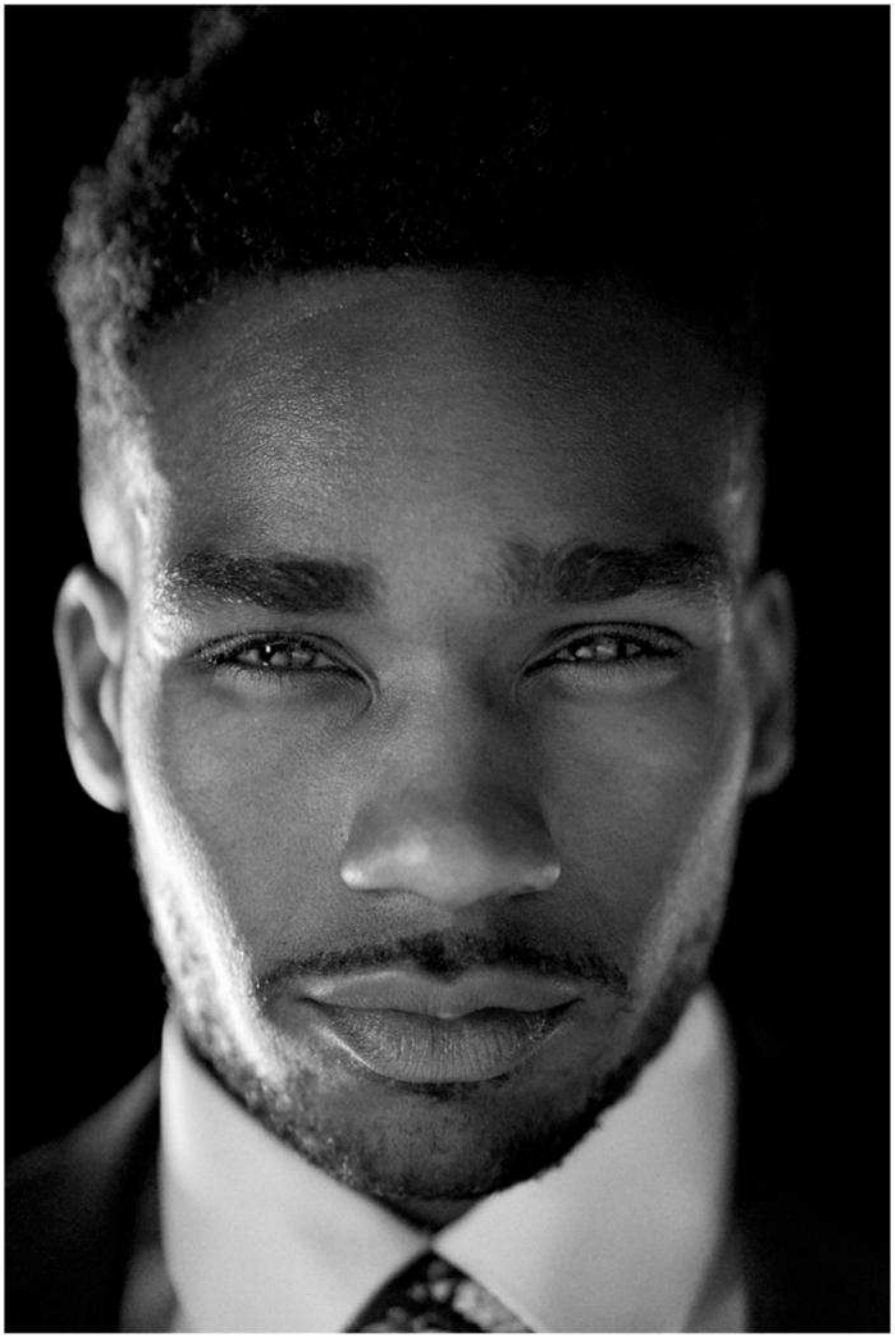
Even if you plan to work with continuous lighting, it's important to master flash and strobe photography because there are going to be times when the subject requires it. For the photographer new to strobes, simply set up the lighting gear, get a willing subject and play around. There's no better way to see how lighting gear works than by trying it out. If you take a shot and it's overexposed, turn down the power or change your f-stop or shutter speed; if it's overexposed, increase the power or change your camera settings. It really is that easy to become proficient in lighting. DP

Put Your Subjects In Their Best Light

My father, a commercial photographer, used to remind me that when we look at something, we don't see that thing at all. Instead, we're looking at what's bounced *off* of that subject, a reflection and refraction that means we never see the actual object. Some of the light that hits a subject is absorbed, and some of it's scattered so that our eyes can't perceive it. Heck, there's even a delay between when the light leaves the object and when we see it—sometimes milliseconds and sometimes millenia—so we don't even perceive things when they happen.

Photographic lighting is the art of taking a light source and harnessing it to tell a story of what you want the eyes to see. There is no right, no wrong. Just manipulation of light so that it creates the desired effect. Some people think that using lighting makes a "fake" image, but there's no "real" in the way we perceive light, it's just a reflection.

The next issue of *Digital Photo* is the Ultimate Guide To Lighting, and in it we'll give you the techniques and tools to shape and modify light to create whatever you see in your mind's eye.



You can't take a photo without light and you shouldn't take a photo without good light. In the next issue, you'll find everything you need to know to create the perfect lighting for every photographic subject.

Photo by David Schloss

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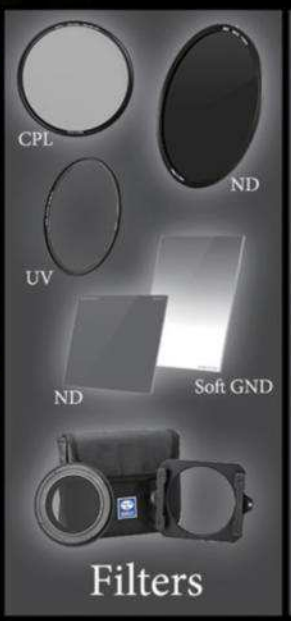

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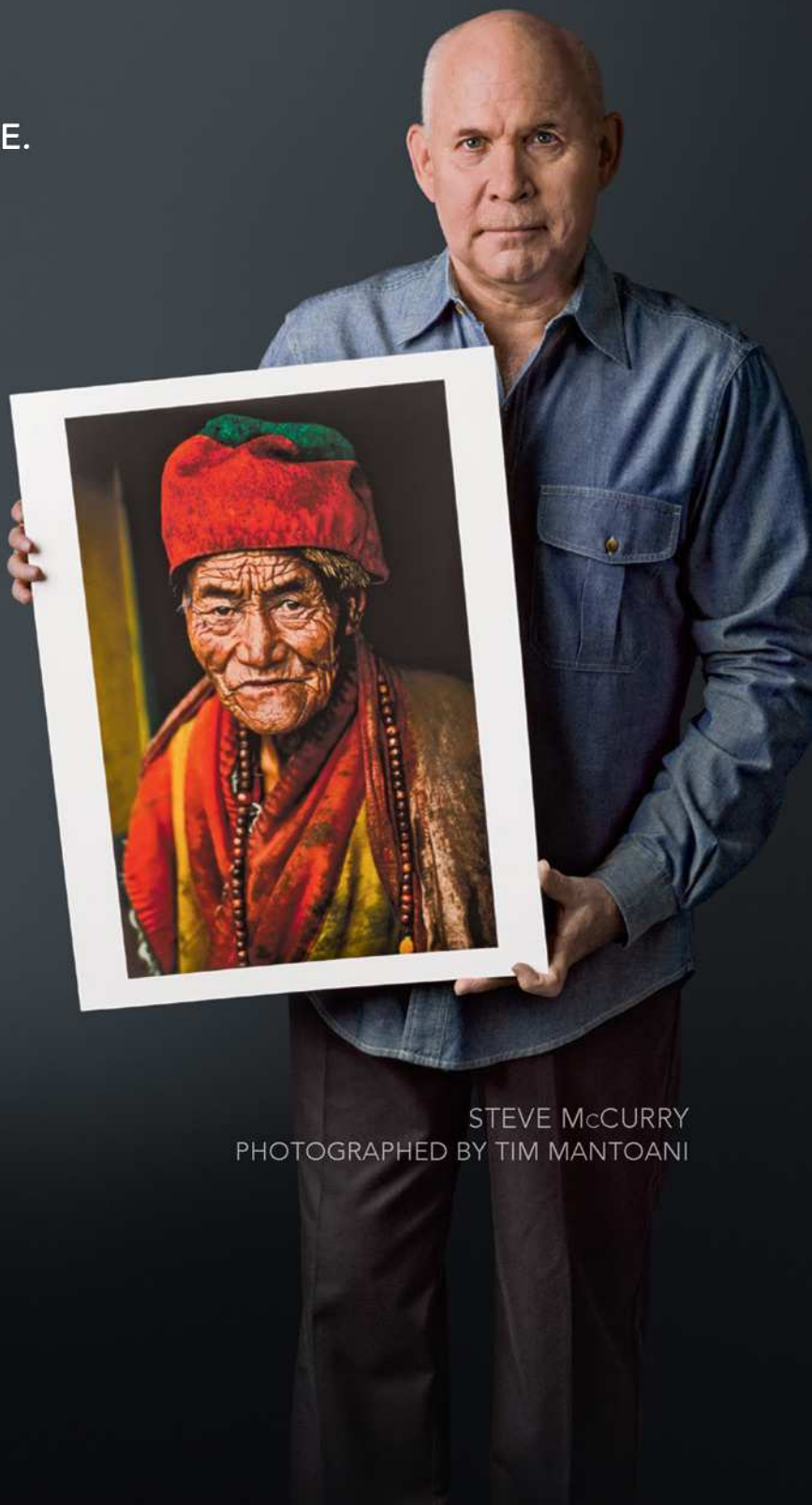

STEVE McCURRY
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