

BEST BUDGET TELE-ZOOMS
8 OPTICS THAT WON'T BREAK THE BANK



THE WORLD'S BEST-SELLING DIGITAL PHOTO MAGAZINE

9-15 MARCH

ISSUE 233

Photography week

INSPIRATION | IDEAS | IN-DEPTH REVIEWS



INVISIBLE TORCH

MASTER THE ART OF LIGHT PAINTING

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Photography Week



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reader, thanks for your continued support and involvement; if you're new to *Photography Week*, you've come to the right place! In addition to expert advice, brilliant tips and step-by-step tutorials, every issue features interactive galleries of the best new photos, how-to videos on

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But that's not the whole story. *Photography Week* is more than a magazine – it's a community of like-minded people who are passionate about photography. To get involved, just follow any of the links below and share your shots and comments – your photo might even appear on our cover!

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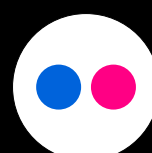
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We're more than just a magazine – read on and discover the many ways you can interact with and enjoy *Photography Week*



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NEWS

WHAT'S HOT

THE WEEK'S TOP HEADLINES IN PHOTOGRAPHY

OPPO'S NEW PHONE CAMERA TECH LETS YOU ZOOM IN 5X

A big leap in zoom capability with no loss in quality – and there's improved optical image stabilisation too



Smartphone cameras are getting better all the time, but one thing they're still not great at is zooming in, usually not letting you zoom very far, and degrading the quality of your shots when you do. But Chinese phone maker Oppo has used this year's Mobile World Congress event in Barcelona to unveil new camera tech that could solve that problem.

Catchily called '5x Dual Camera Zoom', this new technology offers 5x lossless zoom, according to Oppo – so you can zoom in five times closer to

your subject without any visible loss of image quality. Most current smartphone cameras top out at 2x lossless zoom, if they offer any at all, so this is a big jump.

Inspired by submarines

Oppo's technology works by combining wide-angle and telephoto lenses in a periscope-style structure, giving the lenses more space for achieving a deep zoom, without them having to stick out the back of the phone, as you can sort of see in the image above.

In fact, Oppo's solution is apparently

10% thinner than a typical 2x optical zoom, so it can be implemented into a smartphone without adding too much bulk, and it's accompanied by a new optical image stabilisation (OIS) solution that's supposedly 40% better than OIS on other smartphone zoom lenses, so shots stay crisp and clear even when fully zoomed in.

If you want to grab a phone with this new tech, well, you can't – not yet anyway, although if it lives up to the claims we'd expect to see it start filtering into new handsets this year.



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THE LIGHT FANTASTIC

Armed with a few torches and LEDs, **James Paterson** spends an evening by a lake – and shows you how to create symmetrical light paintings

In 1882, pioneering photographer Georges Demeny attached some light bulbs to an assistant and told him to jump – and ever since then photographers have been combining moving lights and long exposures to 'paint' with light.

For a fresh approach to the technique, we thought 'Why not use reflective surfaces to enhance the effect?' Whether it's water, mirrors or just simple image-flipping in Photoshop, a little reflected

symmetry can take amazing light-painted patterns to a whole new level.

If you're new to light painting, you're in for a treat. It's one of those wonderful techniques that demonstrates just how exciting photography can be once you start experimenting with your exposure. A light painting is created by moving any light source through a dark scene while the camera's shutter is locked open. In exposure terms light is accumulative, so dragging a torch across the frame is like

taking chalk to a blackboard.

Besides a sturdy tripod, a dark environment and a few torches, the key here is your camera's Bulb exposure mode, which lets you lock open the shutter for as long as you like. With it we can take exposures that last for several seconds or even minutes. Once you get the basics right, the real fun is in experimenting with different light sources and moves to create wonderful patterns like this. So let's go...



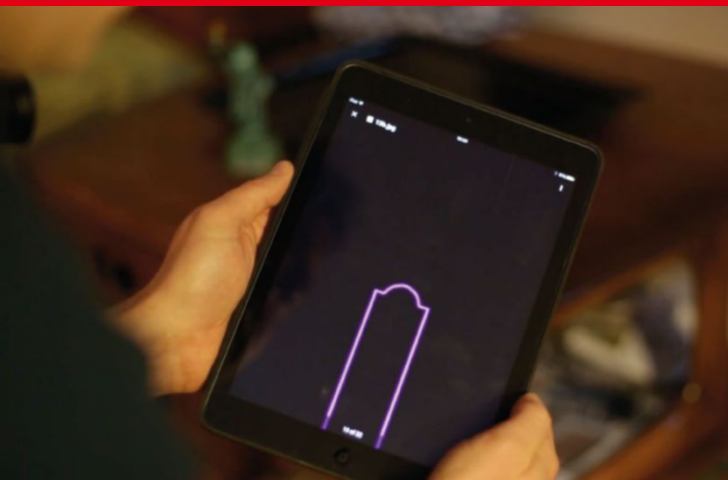
FEATURE

ESSENTIAL KIT

DIY LIGHT-PAINTING GEAR

1 TORCHES

An LED torch is great for light painting, as they're fairly powerful and you can shine them through coloured materials. For flowing lines, attach them to a rod or piece of string and twirl them around.



2 IPAD

Tablet and phone screens can emit plenty of light, so you could use on-screen images to create all manner of light painting effects (such as the New York skyline you'll see later).



3 COLOURED CUPS

There are lots of specialist light-painting products out there, but you probably have items around the house that will work just as well. Taping a torch to a coloured plastic beaker worked for us.



F E A T U R E

ESSENTIAL KIT



4 PHONE TORCH

Moving around in the dark, particularly near water, is tricky. A weak light, such as your phone's lock screen, will help, and shouldn't show in the exposure if you shield the screen from the lens.



4 LIGHTSABRE

Kids' toys, such as lightsabres or other light-emitting wands, are great for light painting. They also make it easier to create, flowing shapes, as you can swing them in smooth arcs.

HOW DARK?

Light painting needn't be carried out in the pitch black. In fact, a little dim ambient light will help enormously, as you can see what you're doing. But the longer the exposure, the more the ambient light plays a part and the lighter the scene will be. You can see in our opening image that the glow from the city beyond the lake has lightened the sky – to the naked eye it was nowhere near as bright, but when exposed for a hundred seconds, it becomes much brighter.

FEATURE

GET SET UP FOR LIGHT PAINTING

Find out about the shooting techniques and camera settings you need to paint with light



1 COMPOSE AND FOCUS

Set your camera up on a tripod. It can be tricky to get the framing right, so compose loosely. We don't want the lens hunting for focus, so pre-focus on a point in the scene, then switch to manual focus to lock the focus.



2 SET BULB MODE

Camera shutter speeds max out at 30 seconds, which usually isn't long enough. For more time select Manual mode and dial the shutter speed down to Bulb – this way the shutter stays open for as long as the button is engaged.



3 LOCK THE SHUTTER

We need a remote release to lock open the bulb exposure, either a cable release or – even better – a wireless one. If your camera has Wi-Fi it can be triggered with a smartphone and compatible app (Canon's Camera Connect app here).



4 TAKE A TEST SHOT

Take a test shot to work out the appropriate ISO and aperture values. Start at ISO100 and f/8, then start a Bulb exposure and try shining your light sources. If it's too dark, open the aperture further or bump up the ISO.



FEATURE

SETUP 1 SYMMETRICAL CREATURES

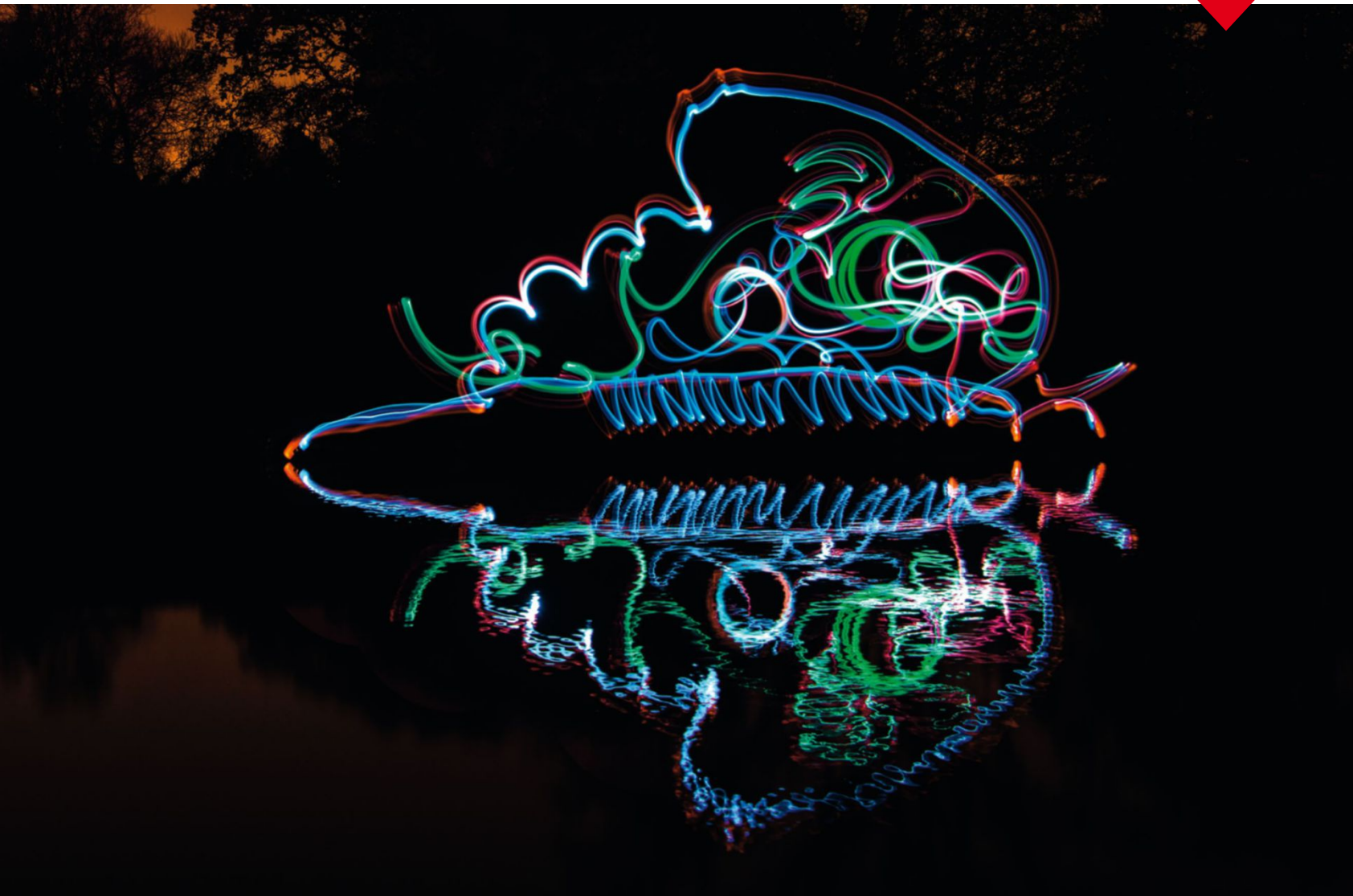
After positioning the camera across the water and locking open the shutter, we used a torch and coloured cups attached to a tripod leg to paint half a moth-like shape, starting at the surface of the water. The reflection did the rest. You need to keep a mental picture of the object in your head as you paint with the torches – it's a bit of a guessing game, but each time you try you'll learn something, and the next attempt is usually better.

KIT NEEDED:

Tripod,
remote release,
torch,
coloured cups

EXPOSURE:

97 secs,
f/6.3,
ISO100

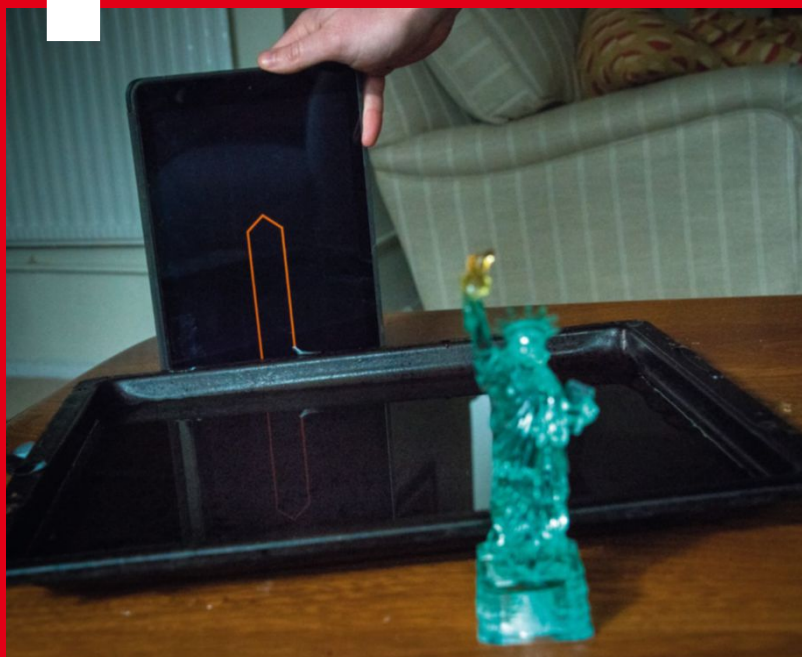


FEATURE

SETUP 2 IPAD CITYSCAPES



Whether painting outside at night or indoors in a dark room, you can get some amazing effects with a little time and effort. Here we placed a small Statue of Liberty figure in the foreground with a tray of water behind. Then we used an iPad screen to paint the buildings. We made a set of images of simple outlines for each individual building, then by scrolling through the images while shifting the iPad across the water, we created the city, one building at a time. A few torch flashes in the background completed the effect.



KIT NEEDED:

Tripod,
remote
release, torch,
tray of water

EXPOSURE

131 secs,
f/13,
ISO100



FEATURE

SETUP 3 SINISTER SILHOUETTES

You can have lots of fun with light painting by creating silhouettes, like this sinister-looking figure. All you need to do is move the lights behind a person while they stand perfectly still. Here we took our time, swinging a set of double torches around behind the figure and making sure the entire area behind his body was painted. Once done, we used a green coloured cup in front of the face, flashed twice to create his glowing green eyes.

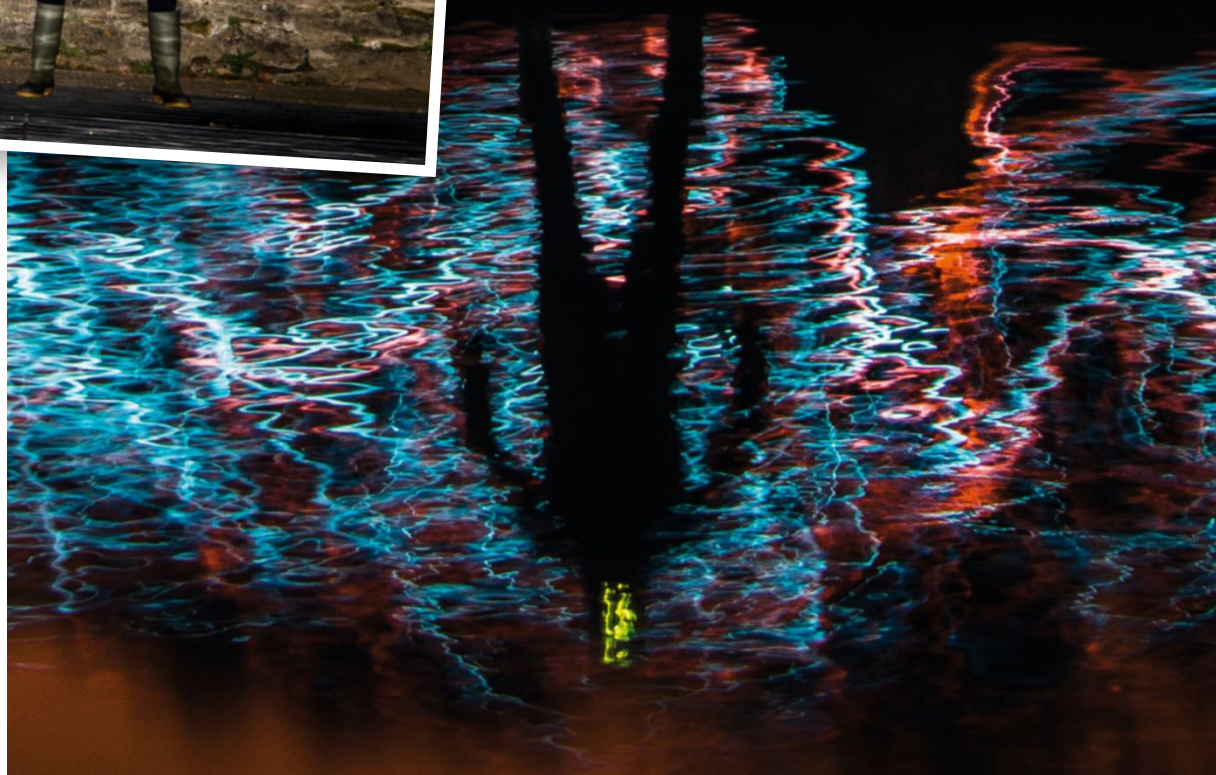


KIT NEEDED:

Tripod,
remote release,
torch,
coloured cups

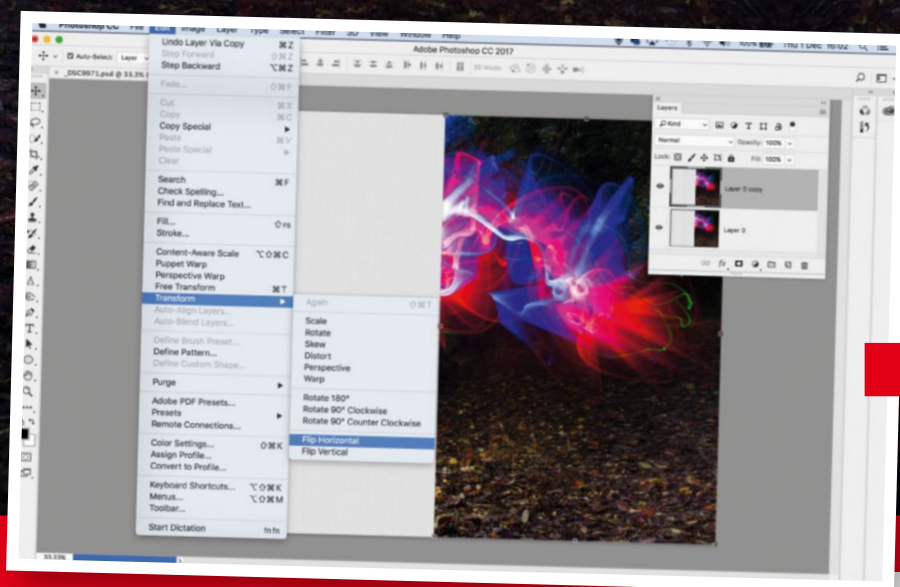
EXPOSURE:

160 secs,
f/6.3,
ISO100



FEATURE

SETUP 4 PHOTOSHOP FLIP



W

hile this project is all about using reflections, there sometimes won't be any to hand, so you could try image-flipping. Here we light-painted with a toy lightsabre, and when the image is flipped it looks a bit like one of those ink-blot tests psychologists use (we see a looming monster...). To flip an image in Photoshop or Elements, duplicate the background layer (Ctrl+J) then draw a crop box over the image and drag a handle out to double the image width. Go to Edit > Transform > Flip Horizontal, then use the Move tool to reposition the duplicate layer.

KIT NEEDED:

Photoshop



EXPOSURE:

76 secs,
f/8,
ISO100

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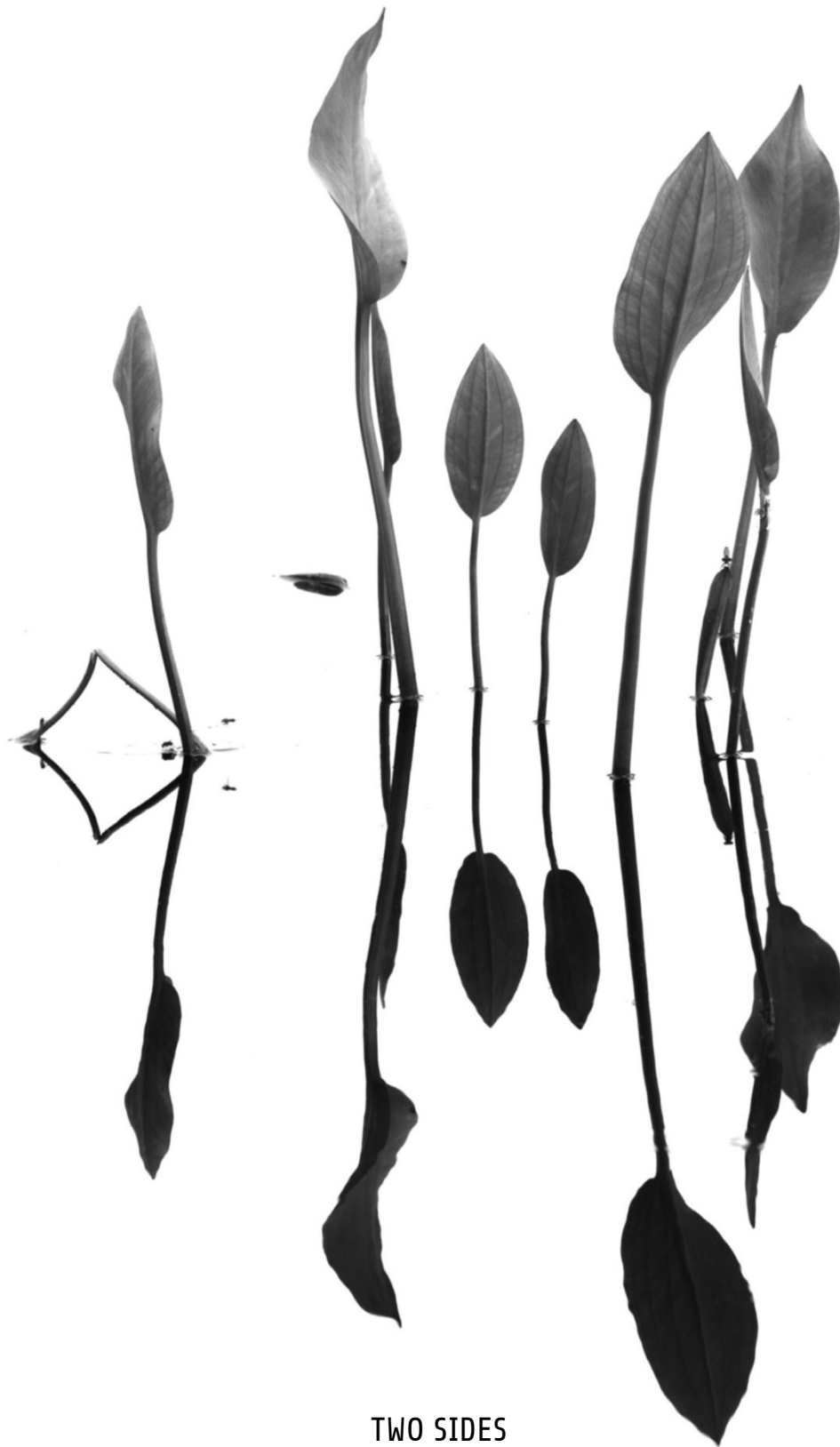
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GALLERY

XPOSURE

THE WEEK'S MOST INSPIRING READER PHOTOS



TWO SIDES

JUSSI-TEPPA TOIVONEN

"This photo was taken when I was trying to photograph some birds at Lake Sääjärvi, near Janakkala in southern Finland. All the birds avoided me successfully, so I started to take photos of reeds and other plants in water."

<http://tiny.cc/32jjjy>

GALLERY

THE WEEK'S MOST INSPIRING READER PHOTOS



SHIPWRECKED

PAUL STEVENS

"The was taken on the pebble beach at Dymchurch, in Kent in south-east England. I converted the image to black and white for a more dramatic look."
<http://tiny.cc/9vkijy>

SENSITIVITY

MARCELLO MACHELLI

Marcello has combined a 105mm focal length with an f/2.5 aperture to capture wonderful background bokeh in this enchanting portrait.
<http://tiny.cc/ptkijy>



GALLERY

THE WEEK'S MOST INSPIRING READER PHOTOS

MIAMI SKY VII

DEZ KARPATI

"This is a photo of the exterior of a building in the urban neighborhood of Brickell in Greater Downtown Miami"
<http://tiny.cc/phkijy>



INTEGRATED

YURIY MARUTYAK

"This was shot during my second visit to Clevedon in south-west England, which has this beautiful pier that I've wanted to photograph for a long time. Everything was just perfect for this shot – the weather was lovely, with nice clouds, and it was high tide."
<http://tiny.cc/6mkijy>



GALLERY

THE WEEK'S MOST INSPIRING READER PHOTOS



ORCHID II

BENJAMIN HARWOOD

"The photo came about when I was taking some photographs of an amaryllis my wife had received for Christmas. Those shots came out quite nicely so I decided to try and capture the glory of this old orchid we have that keeps on flowering. The background was the cushion of our Ikea chair! Lighting was simply from a table light diffused with a white lamp shade."

<http://tiny.cc/dcljiv>



STRIKE A POSE

TERRY GREEN

"One of my favorite things to do during the winter time is photograph short-eared owls and eagles. This is a short-eared owl enjoying a beautiful sunset outside Stanwood, close to the US-Canada border in Washington State."

<http://tiny.cc/9akjiv>

GALLERY

THE WEEK'S MOST INSPIRING READER PHOTOS



SOMETHING SPECIAL

NATHAN EMERY

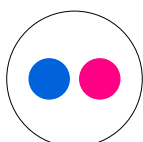
"Sunrise at Avoca Beach on the Central Coast in New South Wales, Australia. I captured this seascape on the morning of a friend's wedding – the ceremony was a short distance away on the beach. This morning was the start of what continued to be a special day."

<http://tiny.cc/c7kijv>



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PHOTOGRAPHY WEEK WANTS YOUR PHOTOS!

Taken a portrait you're particularly proud of? Shot a sensational sunset you'd like to show off? Then join the *Photography Week* Facebook community and share your best photos today! You'll get feedback from fellow readers and the *Photography Week* team, plus the chance to appear in *Xposure*, or even on our cover!

INSPIRATION

IT'S COOL, THAT

THE BEST THING WE'VE SEEN THIS WEEK



Images © Sam Forencich



A STUNNING TRIP ALONG THE INFRARED OREGON TRAIL

Stunning IR timelapse captures state's landmarks in a whole new light

Just when we thought we'd seen every variation on the timelapse movie that could be conjured, along comes US photographer and filmmaker Sam Forencich with *Invisible Oregon*, a breathtaking six-minute timelapse tour through his home state that's shot entirely in infrared.

The film features some of the state's best-known landmarks, including Crater Lake National Park, Painted Hills, Mt Hood and the Columbia River Gorge – familiar locations to many photographers, but which take on a very different character

when rendered in the otherworldly pinks, blues and sepias of IR; there are also some equally striking cityscapes of Portland, where Forencich is based. The timelapse was shot using an IR-converted Nikon D750 and Canon 5D Mk II, and is set to a suitably haunting soundtrack.

At his Vimeo channel Forencich says his film is, in part, an exploration of the nature of reality, and of what other creatures are able to experience that we humans can't, and asks "what exactly are we missing?". You can see more of Forencich's work at his website, www.samforencich.com.



WATCH THE VIDEO
<http://tiny.cc/9ibkiy>



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S K I L L S

CRASH COURSE

ESSENTIAL PHOTO SKILLS MADE EASY

SHOOT ORIGINAL SEASONAL MACROS

Say goodbye to winter and hello to spring – and get closer to the season with these six macro ideas to try out

LESS
THAN
AN
HOUR

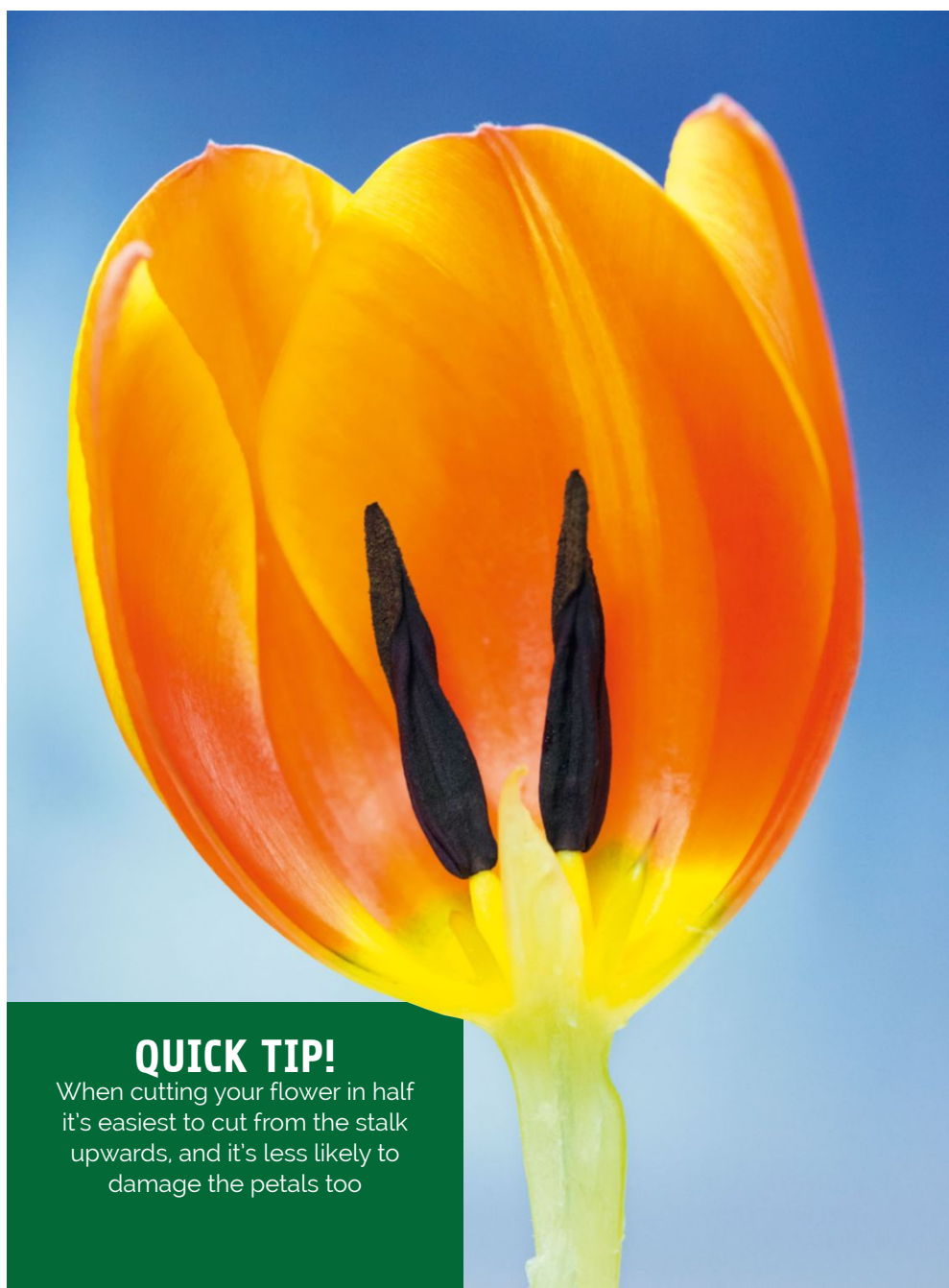
Macro photography always captures our eye, because the distortion of scale and level of detail that we're not

familiar with draws our attention. This makes the familiar, unfamiliar, making us think twice about what we're seeing.

Nature is an abundant source of subjects for macro work. Spring is the perfect time to give this a go, with the longer days and warmer weather, and with the vibrant flowers and greens springing back to life.

While there are several methods for capturing images close up, if you're serious about macro photography you'll need a dedicated macro lens. This is a lens that can focus exceptionally close to a subject. Be wary of lenses claiming macro features though, as not all will deliver the results you expect. A true macro lens will focus around 10-15cm away from the subject. You can get a variety of focal lengths for macro, and most are prime lenses. Each lens is suited for a different use, from 50mm (ideal for portraits) up to 105mm, 150mm and even higher for shooting insects and other minute creatures/objects.

The basic technique can take a little time to master. Autofocus can often struggle when you're shooting macros, while focusing manually can also prove challenging because you're so close to your subject that any slight movement can lead to completely the wrong part of your image being sharp. However, with practice you'll get the knack, and the results will be greatly rewarding.



QUICK TIP!

When cutting your flower in half it's easiest to cut from the stalk upwards, and it's less likely to damage the petals too



S K I L L S

STEP BY STEP TIME TO SPRING INTO ACTION



1

LIGHT IT UP

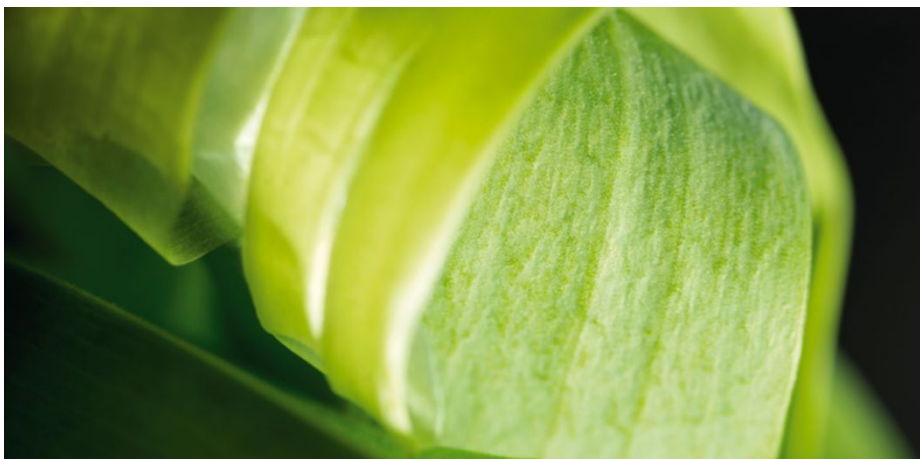
Snowdrops are one of the first signs of spring. Try using a small LED light or flashlight to highlight shots of them or other blooms.

You don't need a fancy light – we used a mountain bike light to illuminate our flower and fill in shadows. Using lights like this will also enable you to use faster shutter speeds and smaller apertures.

2

GO ABSTRACT

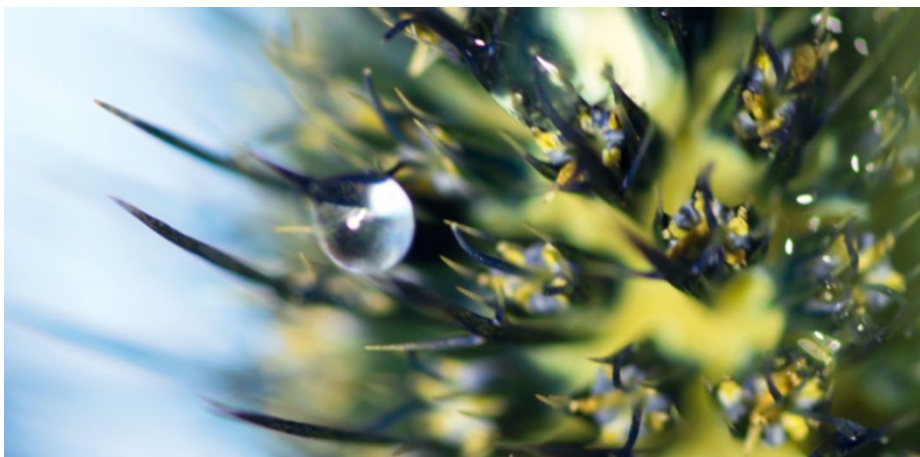
After taking the obvious shot, try something more abstract. Using the leaves and stems of plants, we've created a blend of curves and shapes here. The close-up abilities of macro lenses mean you can get close enough to the leaves to eliminate the background and also have incredibly shallow depth of field, leaving an interesting, but less recognisable, subject.



3

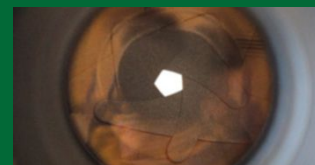
DROP IN

Don't let the rain stop you taking pictures! Adding some water to your shots will liven them up and bring another element into the image. A wet subject also has increased contrast. If you're unfortunate enough to be blessed with good weather, take a bottle of water to sprinkle around your subject before you begin shooting.



GO NARROW

It's a good idea to use a narrow aperture for these images. When you get close up to your subject even a small item fills the frame, and if you use a wide aperture such as $f/2.8$, you'll only have a fragment of your subject in focus. Try keeping your aperture above $f/8$ or $f/11$ to ensure that more of your subject is sharp.



S K I L L S

STEP BY STEP TIME TO SPRING INTO ACTION



4

BLIND THEM WITH SCIENCE

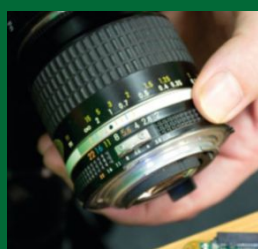
Take a scientific route and dissect a flower. Opening your subject up gives a new perspective, making your shots more eye-catching. You can use a piece of coloured paper for a backdrop. This technique could be used to produce a themed series.

MORE WAYS TO GET CLOSE



ADD GLASS

Screw-on magnifying filters usually come in sets of +1, +2 and +4 diopter filters, which can be combined for increased effect. The magnifying effect is greater with a telephoto zoom.



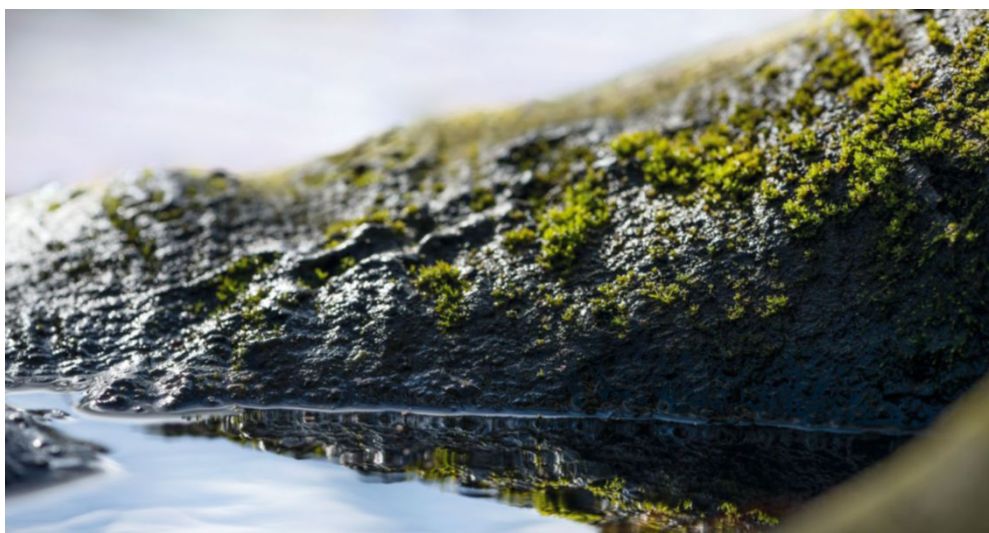
REVERSE YOUR LENS

You can also buy reversing rings, which enable you to mount the lens backwards. This allows for exceptionally close macro photography, and the wider the lens the closer you can get.

5

FIND A PATTERN

The level of detail achievable with macro photography lends itself perfectly to capturing textures. Rocks and shells can show beautiful sharp patterns when viewed up close. While live snail makes for a more peculiar image, both shell and skin. Getting in close will make the image all about the patterns, leaving the object more of a mystery.



6

EXPLORE NEW WORLDS

Macro photography can unlock a whole new miniature world. By getting close up we can give the viewer a large-scale look at a minute environment. This can be used as the basis for an optical illusion, creating a slightly surreal landscape. We have done this here by using the exposed roots of a large tree as a mountain.

E D I T I N G

PHOTOSHOP

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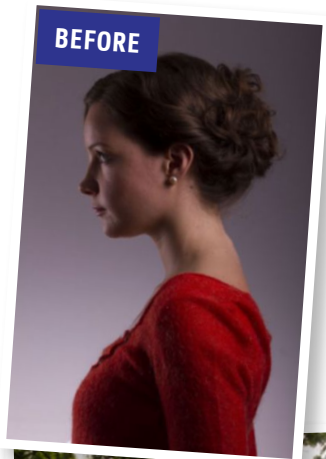
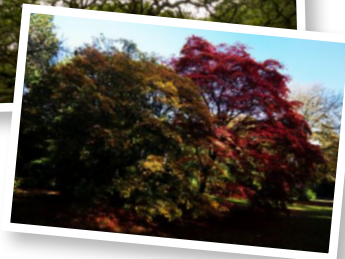
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HOW TO...

COMBINE EXPOSURES

Combine images with quick and easy blending mode effects to create striking multiple exposures

Multiple exposure effects are a great way to creatively combine two or more images. Traditionally, multiple exposures were made by exposing the same frame of film more than once, and Photoshop's Screen blending mode works in much the same way, by multiplying the light values on one layer by those on the layers below – so the scene can only get brighter, never darker, and white areas stay white. This creates a striking effect when you combine textures with strong shapes, such as a side-on figure, because the texture is confined within the outline. In this video tutorial we'll take you through the process, and you can then experiment with your own images.



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GEAR GROUP TEST

BUDGET TELEPHOTO ZOOMS

Matthew Richards looks at appealing and cost-effective telephoto options



For many of us, the purchase of our first compact system or DSLR camera kit will be closely followed by buying a telephoto zoom lens. It's an obvious addition, enabling extra telescopic reach that's ideal for shooting anything from family fun to action sports and wildlife. Budget-friendly options are plentiful, although

there's been a shift in the market lately.

Many of the latest own-brand offerings from camera manufacturers are designed for 'crop sensor' rather than full-frame bodies. It makes sense, because reducing the size of the image circle that a lens delivers enables a more compact and lightweight build. The physical size and purchase price are

therefore more in keeping with entry-level APS-C format and Micro Four Thirds cameras. Meanwhile, Sigma and Tamron are bucking the trend. They both used to make budget telephoto zooms for crop-sensor cameras, but now only manufacture full-frame compatible lenses for this sector of the market. Let's see how the main contenders compare.

- 1 **CANON EF-S 55-250MM F/4-5.6 IS STM** £270/\$300
- 2 **FUJINON XC 50-230MM F/4.5-6.7 OIS II** £320/\$400
- 3 **NIKON AF-P DX 70-300MM F/4.5-6.5G ED VR** £300/\$400
- 4 **OLYMPUS M.ZUIKO ED 75-300MM F/4.8-6.7 II** £390/\$450

- 5 **PANASONIC 45-150MM F/4.0-5.6 ASPH OIS** £180/\$250
- 6 **PENTAX 55-300MM F/4.5-6.3 DA PLM WR** £400/\$400
- 7 **SIGMA APO 70-300MM F/4-5.6 DG MACRO** £150/\$200
- 8 **TAMRON SP 70-300MM F/4-5.6 DI VC USD** £300/\$450



GROUP TEST: BUDGET TELEPHOTO ZOOMS



**Canon EF-S 55-250mm
f/4-5.6 IS STM**
£270/\$300

Around half the price of Canon's new full-frame compatible 70-300mm tele zoom, this 'EF-S' optic for APS-C format bodies is smaller, lighter and considerably more affordable. It offers a powerful effective reach of 400mm at the long end of its zoom range, while at the short end it picks up where your 18-55mm kit lens hits the end-stop.

An upgrade over the previous IS II model, the STM lens features redesigned optics and a stepping motor instead of a basic electric motor for powering autofocus. As used in many of the rival lenses, a stepping motor enables smooth and virtually silent autofocus transitions that are well suited to both stills and video capture.

PERFORMANCE

Outright telephoto reach falls short of some of the lenses on test, but sharpness is maintained very well throughout the entire zoom range. The optical image stabiliser also performs well, with an effectiveness of about 3.5 stops. Handling is an improvement over previous generations of the lens, in that the focus ring no longer rotates during autofocus.



**Fujinon XC 50-230mm
f/4.5-6.7 OIS II**
£320/\$400

Available in silver and black options to colour-coordinate with Fujifilm's range of X-series bodies, this lens is practically identical in size and weight to the Canon. With a smaller zoom range and Fujifilm's 1.5x crop factor, the maximum effective reach is a more modest 345mm.

With the usual stepping motor autofocus, manual override of autofocus and fully manual focusing are available via an electronically coupled 'fly by wire' focus ring. Focus modes and operation of the 3.5-stop optical image stabiliser are selected via camera menus – the lens lacks control switches. As in the Canon and Nikon lenses on test here, the mounting plate is plastic rather than metal, and the overall build feels lightweight.

PERFORMANCE

Sharpness and contrast are good throughout most of the zoom range, even at the widest available apertures. Autofocus speed is pretty good under decent lighting but, coupled with our X-T10 body, we saw a lot of autofocus hunting and false positives for focus acquisition in dull conditions.



GROUP TEST: BUDGET TELEPHOTO ZOOMS



**Nikon AF-P DX 70-300mm
f/4.5-6.5G ED VR**
£300/\$400

Nikon is the latest manufacturer to jump on the stepping motor bandwagon: it's used for autofocus in this AF-P (Pulse) lens. It's available with or without VR (Vibration Reduction); the edition without stabilisation is a little cheaper to buy. Both are fully compatible with D3300/3400, D5300/5500/5600 and D500 bodies, but completely incompatible with many older Nikon cameras like the D7000, where autofocus and even manual focusing are unavailable.

The 300mm focal length and 1.5x crop factor of Nikon's DX format gives an effective reach of 450mm, overtaking the Canon and Fujinon lenses. It's physically bigger and heavier, and relies on a camera menu for switching off stabilisation. This can't be done in some 'compatible' Nikon cameras, even after a firmware update.

PERFORMANCE

In our lab tests, the non-VR version of the lens proved slightly sharper than the VR edition. However, the four-stop stabiliser is particularly effective in hand-held shooting, with the VR lens yielding more consistently sharp images.



**Olympus M.Zuiko ED
75-300mm f/4.8-6.7 II**
£390/\$450

Boosted by the 2x crop factor of the Micro Four Thirds system, this 75-300mm lens delivers a monstrous effective zoom range of 150-600mm. That's super-telephoto territory in full-frame terms, from a lens that's slightly smaller and heavier than the Nikon 70-300mm. Build quality feels a little more robust than in some of the lenses on test, with a metal rather than plastic mounting plate. A stepping motor enables quick yet smooth autofocus transitions, along with electronically coupled manual focusing. There are no on-board switches or controls, other than the zoom and focus rings. Unlike all the lenses we've covered so far, the Olympus has no optical image stabiliser, instead relying on in-camera, sensor-shift stabilisation.

PERFORMANCE

On an OM-D E-M5 II body, image stabilisation equated to four stops, so the lack of an optical stabiliser isn't a concern. Autofocus is fast and accurate, and manual focusing is precise. Image quality is pleasing, although sharpness at the long end of the zoom range proved disappointing in our tests.



GROUP TEST: BUDGET TELEPHOTO ZOOMS



Panasonic 45-150mm
f/4.0-5.6 ASPH OIS
£180/\$250

Looking every inch like a 'standard' zoom but smaller than most, the Panasonic is incredibly compact and light. Indeed, at just 62 x 73mm and 200g, it's only about half the length of most competitors, and only a quarter of the weight of some in this test.

The downside is that maximum telephoto reach is similarly small. Applying the 2x crop factor of the Micro Four Thirds system, you still only get an effective focal length of 300mm at the long end. Even so, the Panasonic equals the maximum reach of a traditional 70-300mm budget tele zoom on a full-frame SLR.

PERFORMANCE

Testing the lens on a Panasonic G7, we found autofocus to be fast and reliable. The optical stabiliser is worth about 2.5 stops, so doesn't compare favourably with the non-stabilised Olympus MFT lens on a late-generation Olympus body with sensor-shift stabilisation.

Image quality is pretty good on the whole; however, despite the relatively modest zoom range, we found that images taken using the long end of the lens actually looked quite soft.



Pentax 55-300mm
f/4.5-6.3 DA PLM WR
£400/\$400

For a 'budget' lens, the build quality of the Pentax feels particularly good, and it's the only lens in the whole group to feature weather seals. It's big on zoom range, equating to 82.5-450mm on a Pentax APS-C format body, yet physically small when stowed away. This is thanks to a clever retractable design that enables the lens to collapse down to just 89mm in length. Even so, it's the joint longest here, along with the Tamron, when it's used at its maximum zoom setting.

Like all the lenses apart from the Sigma and Tamron contenders, the Pentax features a stepping motor autofocus system, the near-silence of which is an improvement over some of Pentax's notably noisy lenses. There's no optical image stabilisation, with the lens instead relying on in-camera stabilisation.

PERFORMANCE

The autofocus system is quick and highly accurate. Testing the lens on a K-70 body, we found stabilisation to work well, with a four-stop effectiveness. Despite having the outright biggest zoom range of any lens in the test group, image quality is excellent.



GROUP TEST: BUDGET TELEPHOTO ZOOMS



**Sigma APO 70-300mm
f/4-5.6 DG Macro**
£150/\$200

With a classic 70-300mm zoom range, the effective reach of this full-frame compatible lens is boosted on an APS-C format camera. It's available in Canon, Nikon, Pentax and Sony (A-fit) mount options. In all cases, a switch on the lens barrel enables shorter focusing in the 200-300mm sector of the zoom range, with a macro magnification ratio of up to 0.5x. That beats any other lens on test.

The APO (apochromatic) edition of this lens is claimed to produce less colour fringing than the standard version. Even so, it's quite basic in some respects, with a noisy electric motor for autofocus. It's the only lens in the group in which the focus ring and front element rotate during focusing, and there's no optical stabilisation.

PERFORMANCE

Image quality is a little lacklustre compared with all the other, relatively new, designs of lenses. Sharpness and contrast are both disappointing, especially when shooting wide-open. The lack of a stabiliser can be a real problem in Canon and Nikon bodies, which lack sensor-shift stabilisation.



**Tamron SP 70-300mm
f/4-5.6 Di VC USD**
£300/\$450

The Tamron is very conventional, but it follows the traditions of high-end rather than budget telephoto zooms. As such, it has a ring-type ultrasonic autofocus system that enables full-time manual override, and not just when the stepping motor is being powered by the camera body. It also means you get a physical, mechanical link for manual focusing, which operates with smooth precision, complete with a focus distance scale beneath a viewing window.

Switches are fitted on the barrel for AF/M focus modes and VC on/off. The Vibration Compensation system is Tamron's proprietary form of optical stabilisation, and is fitted to both the Canon and Nikon mount options of the lens. The Sony A-fit version of the lens relies on in-camera stabilisation instead.

PERFORMANCE

Autofocus is fast and effective and, throughout testing on Nikon D7200 and D750 bodies we found the stabiliser had an effectiveness of four stops. Image quality is very good overall, matched by top build quality that combines sturdy barrel parts with a metal mounting plate.



GROUP TEST

BUDGET TELEPHOTO ZOOMS

HOW THE LENSES COMPARE



	Canon EF-S 55-250mm f/4-5.6 IS STM	Fujinon XC50-230mm f/4.5-6.7 OIS II	Nikon AF-P DX 70-300mm f/4.5-6.5G ED VR	Olympus M.Zuiko ED 75-300mm f/4.8-6.7 II	Panasonic 45-150mm f/4.0-5.6 ASPH OIS	Pentax 55-300mm f/4.5-6.3 DA PLM WR	Sigma APO 70-300mm f/4-5.6 DG Macro	Tamron SP 70-300mm f/4-5.6 Di VC USD
Street price	£270/\$300	£320/\$400	£300/\$400	£390/\$450	£180/\$250	£400/\$400	£150/\$200	£300/\$450
Mount options	EF-S	X	DX	MFT	MFT	K	EF FX K A SA	EF FX A
Elements/groups	15/12	13/10	14/10	18/13	12/9	14/11	14/10	17/12
Diaphragm blades	7	7	7	7	7	9	9	9
Min aperture	f/22-32	f/22	f/22-32	f/22	f/22	f/22-32	f/22	f/32
Optical stabilizer	Yes	Yes	Yes	No	Yes	No	No	Yes (C N only)
Autofocus motor type	Stepping motor	Stepping motor	Stepping motor	Stepping motor	Stepping motor	Stepping motor	Electric motor	Ring-type ultrasonic
Internal zoom/focus	No/Yes	No/Yes	No/Yes	No/Yes	No/Yes	No/Yes	No/No	No/Yes
Min focus distance	0.85m	1.1m	1.1m	0.9m	0.9m	0.95m	0.95m	1.5m
Max magnification	0.29x	0.2x	0.22x	0.24x	0.17x	0.3x	0.5x	0.25x
Filter size	58mm	58mm	58mm	58mm	52mm	58mm	58mm	62mm
Mounting plate	Plastic	Plastic	Plastic	Metal	Metal	Metal	Metal	Metal
Weather seals	No	No	No	No	No	Yes	No	No
Included accessories	None	Hood	None	None	Hood	Hood	Hood, soft case	Hood
Dimensions (diameter x length)	70 x 111mm	70 x 111mm	72 x 125mm	69 x 117mm	62 x 73mm	77 x 89mm	77 x 122mm	82 x 143mm
Weight	375g	370g	415g	423g	200g	442g	550g	765g

ZVZ

PENTAX POWERS AHEAD

THE PENTAX 55-300MM F/4.5-6.3 DA PLM WR IS A WORTHY WINNER

Perhaps it's splitting hairs to say the Pentax has the biggest outright zoom range of any lens in the group. What's more important is that it delivers excellent image quality, has refined handling characteristics, and is very robust for a 'budget' telephoto zoom, complete with weather seals.

The Canon and Nikon lenses are good choices for APS-C format bodies, although the Canon isn't overly generous in telephoto reach, while the Nikon is only compatible

with a limited number of recent cameras. For both Canon and Nikon cameras, we prefer the Tamron lens, which has superior build quality and performance, as well as being full-frame compatible.

For Micro Four Thirds, the Olympus 75-300mm wins out over the Panasonic 45-150mm, not only for its extreme telephoto reach, equivalent to 600mm, but for its sharper image quality. For Fujifilm shooters, the XC50-230mm is a smart buy at the price and delivers pleasing image

quality, but we had a few autofocus problems. The Sigma 70-300mm is an antiquated design that feels past its sell-by date.



A P P S

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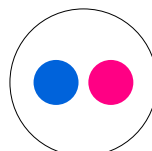
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MARKETING

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LICENSING

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& Syndication Manager

Matt Ellis

matt.ellis@futurenet.com

SENIOR MANAGEMENT

Creative Director, Magazines

Aaron Asadi

Art & Design Director

Ross Andrews

THE TEAM

Editor Jeff Meyer

jeff.meyer@futurenet.com

Art Editor

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Production Editor

Mike McNally

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Head of Testing

Rod Lawton

Lab Manager

Ben Andrews

REGULAR CONTRIBUTORS

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Marcus Hawkins, Rod Lawton,

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