

Making a splash



Sony World Photography Awards Open winner **Tobias Bräuning** talks to **Gemma Padley** about winning the award and how he takes his incredible macro water-droplet images

IF YOU think you've seen impressive images of water droplets, think again. German photographer Tobias Bräuning, who has just been named 2012 Sony World Photography Awards Open winner, takes water-droplet images to a whole other level. His image 'Dancing Queen' (see page 24) won the 'Split Second' category, which led to Tobias winning the overall Open (non-professional) title at the recent awards. It was the first time Tobias had entered the Sony competition. 'Winning the award was an amazing feeling,' he says. 'It's nice to have recognition for my images.'

Tobias, 29, who was born in Reutlingen, near Stuttgart, Germany, started taking pictures when he was 19. After studying mechatronics (a combination of mechanical, electronic and computer engineering) at university, he began working as a software

engineer in automation technology. His love of photography saw him photograph subjects ranging from macro shots of insects to fireworks, landscapes and wildlife. Yet for Tobias, photographing water droplets seemed the perfect way to combine his love of the technical with photography, and three years ago he started to concentrate more on water-droplet photography. 'I have always been fascinated by technical things,' he says. 'Through water-drop photography, I can combine physics with photography to produce beautiful results.'

PREPARATION

The water-droplet images may look simple, but there is a lot of preparation and fine-tuning that goes on behind the scenes. With his Canon EOS 40D camera and EF 100mm f/2.8 macro lens attached to a

tripod, Tobias uses apertures of f/16 or f/20 to achieve the maximum possible depth of field. He focuses his images manually, often placing an object such as a pencil in the water where the water droplet falls to fine-tune the focusing. He'll also carry out test shots and set the ISO on his camera to as low as possible to ensure minimum noise in his images. 'I prefer to use a focal length of 100mm,' he says. 'At this focal length, the distance to the water is sufficient while the field of view is also good. Even the depth of field is fine. At longer focal lengths or shorter distances the depth of field gets smaller, so 100mm is acceptable.'

Once he had mastered the basic technique, Tobias decided to be a little more adventurous. 'At the end of 2010, I was bored by the standard water-droplet pictures,' he says. 'I thought it might be interesting to try using different coloured water drops to see what effects I could create.' Tobias extended his set-up to include three valves to dispense the water drops, which collide to form various shapes. 'It wasn't easy to get the drops to follow the same path, but after some experimentation it worked,' he adds. ➔

'Golden Shot'
Canon EOS 40D,
100mm macro, 1/10sec
at f/18, ISO 100, flash
duration 1/15,000sec





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THE WATER-DROP COLLISION

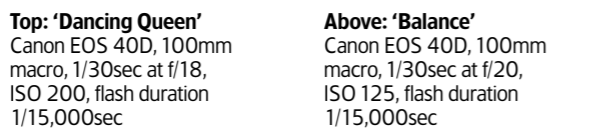
To create this 'drop-on-drop collision', Tobias explains there are three stages. First, the water droplet collides with the surface of the water. It then splashes upwards and collides with the next water droplet, which pushes the water in a circular motion and creates the array of shapes you see in the images.

'By varying the moment when the second drop collides with the upcoming water, it's possible to influence the shape of the droplet,' he says. 'There are many factors that influence the shape of the droplets. One main factor is the timing of the drops, but there are also others such as the depth of water, its temperature, its viscosity, the velocity of the drops and the height from which the drops are released. The challenge is to find a way to control these things effectively. Some factors are easier to control than others!'

For example, to make the water viscous, Tobias uses guar gum, which causes the drops to be more 'elastic' and prevents them from 'breaking off' as easily, as well as helping to create larger shapes. He uses ink to colour the water. 'To achieve standard shapes it is possible to set up and control everything manually,' he explains, 'but for advanced shapes, you need special technical equipment.' While there are ready-to-use devices available to buy to



Top: 'Dancing Queen'
Canon EOS 40D, 100mm macro, 1/30sec at f/18, ISO 200, flash duration 1/15,000sec



Above: 'Balance'
Canon EOS 40D, 100mm macro, 1/30sec at f/20, ISO 125, flash duration 1/15,000sec

enable photographers to try this type of photography, Tobias prefers to use a self-constructed set-up to allow more control.

LIGHTING

For his water-droplet images, Tobias uses background lighting as well as directly lighting each droplet using flash, which freezes them in motion. The flash is triggered when the water drops collide. He manually adjusts the intensity of the flash until he has the desired flash duration (the amount of time the flash emits light). This should be at least 1/15000sec to avoid motion blur, he explains.

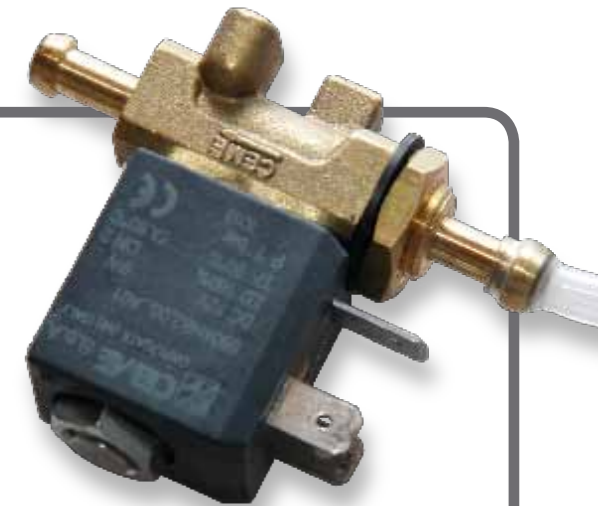
Tobias tends to use a shutter speed of 1/20sec. The shutter has to be completely open when the flash fires, but since the flash lights the droplet, the shutter speed of the camera is not too important, although 'you have to take into account the flash synchronisation speed, which varies between camera models,' he says. 'The flash sync speed is the shortest shutter speed at which the camera shutter is completely open. If you use a fast shutter speed you will see a shadow of the shutter on the image, but if the shutter speed is too slow ambient light may cause disturbance in the image.'

When lighting the background, Tobias generally uses two flashguns to illuminate a semi-transparent acrylic glass plate from behind. The glass plate diffuses the light, which creates a smooth, gradient light. He



TOBIAS'S EQUIPMENT

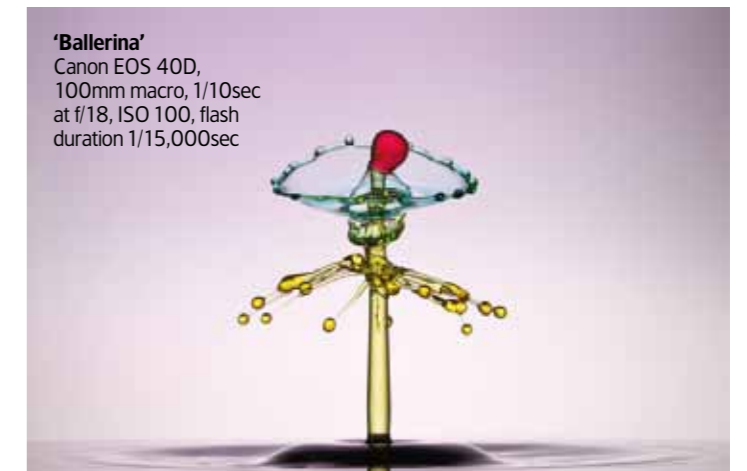
IN ADDITION to his camera and lens, Tobias uses an Arduino Microcontroller board to control the drop sequence from the 12V DC standard solenoid valves. Tobias built additional circuits to connect the camera, flashes and valves to the microcontroller to allow him to have precise control. The three valves are arranged side by side. The middle valve is fixed straight and the two outer valves are arranged in a 'V' shape to direct the water drops into the path of the droplets from the middle valve (see left). To connect the valves, he uses a transistor circuit. The flash is triggered



automatically and the camera is tethered to a computer so he can see the results immediately. He uses either a large tank or a glass bowl filled with water for the set-up. Tobias adjusts the size of the drops and also the timing between the drops, which can be milliseconds or microseconds.



'Red Circle'
Canon EOS 40D, 100mm macro, 1/30sec at f/18, ISO 160, flash duration 1/15,000sec



'Ballerina'
Canon EOS 40D, 100mm macro, 1/10sec at f/18, ISO 100, flash duration 1/15,000sec

also uses coloured filters attached to the front of the flashguns. He sometimes uses a home-made snoot to control the diameter and shape of the light beam. 'The lighting is one of the most difficult parts in water-droplet photography,' he says. 'Quite often there are unwanted reflections from the flashes, shadows or overexposed spots. A lot of experimentation is necessary. Minor changes in the set-up can have a really huge effect on the final outcome.'

Tobias records the images as raw files, which he then converts to TIFFs ready for processing. Using Photoshop Elements, he removes unwanted splashes and dust, adjusts the brightness and contrast, and occasionally reduces any unwanted noise and sharpens the image. Apart from carrying out these basic tidying-up measures, everything is done in-camera.

For now, Tobias intends to continue his macro water-droplet photography, although it is a case of fitting in his photography around his work and other commitments. 'I have lots of ideas,' he says. 'I'm always trying to create new shapes from the drops, and this motivates me to keep going. This photography requires a great deal of patience, but it's very addictive!' **AP**



'Levitation'
Canon EOS 40D, 100mm macro, 1/30sec at f/18, ISO 320, flash duration 1/15,000sec

To see more images by Tobias and video clips of the water drops, visit www.t-braeuning.de. For a complete list of winners from this year's Sony World Photo Awards, visit www.worldphoto.org