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THE MONTHLY NEWSLETTER OF SCIENCELENS LTD

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From the editor

SCANZ Science Communicators Association of New Zealand
Full member

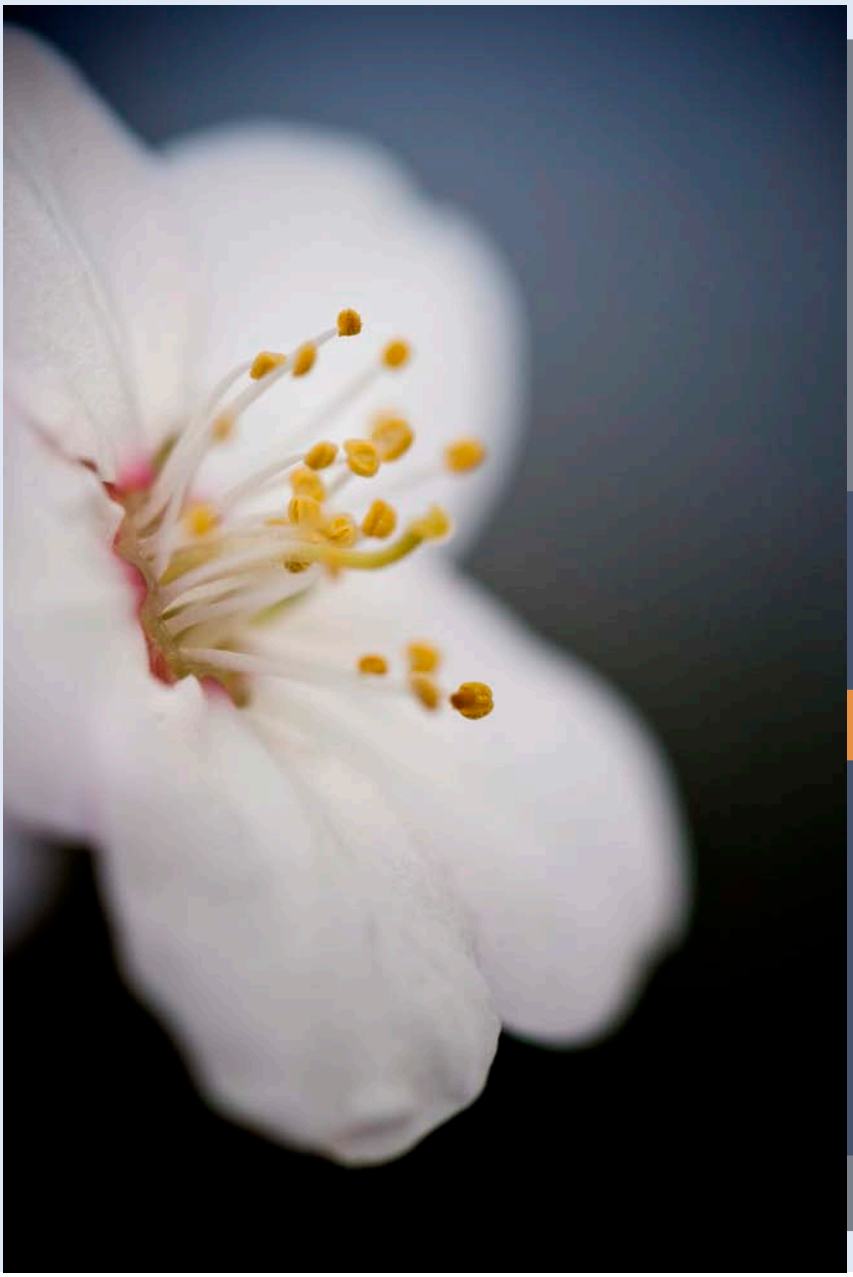
Hello, and welcome to the latest edition of Sciencelens Monthly.

This month we focus on the subjects of light metering and exposure, explaining how a basic understanding of your camera's light meter can significantly improve the quality and impact of your photographs. Check out the article on pages 4 and 5 for tips on photographing anything from snow to brides to All Blacks!

Then we talk popcorn (just for the heck of it) and we also share some news snippets relating to science, photography and science communication. Included in the news snippets are a number of science photography and art competitions with fast approaching deadlines, so it may be advisable to read this newsletter back-to-front!

Have fun, and don't forget to send me your comments. Thank you to everyone who have been in contact with me - I really appreciate your feedback. If you have any thoughts or suggestions regarding subjects you'd like to see discussed in future newsletters, please let me know.

Gerry



Coming up...

I recently upgraded to a lovely new macro lens, and I'm really having fun with the new toy. Don't miss next months newsletter, where we will be discussing the subject of macro photography in more detail. We will touch on the specific complexities and challenges of this genre, and also discuss how macro photography can be useful in both a scientific and corporate context.

Incredible pressure, violent explosions!

What makes popcorn pop?

The secret to popcorn's popping ability lies in the composition of the kernel. The popcorn kernel consists of a hard, watertight outer shell, containing starch and a small amount of water and oil.

When the kernel is heated, the water inside tries to expand to steam, but the hard shell prevents this. The heat also gelatinizes the starch inside the shell. Once sufficient pressure has built up (to an incredible 930 kPa), the kernel bursts open in a violent explosion, freeing the steam and starch.

As the hot starch bursts out of the shell, it expands rapidly to as much as 50 times its original size. At the same time it experiences rapid cooling as it comes into contact with the air outside the shell. It is this rapid cooling that sets the gelatinized starch into the familiar foamy popcorn puff.

So a popped popcorn is basically a starch explosion frozen in action!

Talking about popping...

*If you're looking for some eye-popping science photography, look no further than **Sciencelens** - our skill and experience in photographing science, technology and scientists in action, make us the first choice to capture your scientific endeavours.*

Keeping your whites white & your blacks black

How many snow images have you seen since August? And how many of those appeared dull, tepid and dark, rather than punchy and bright?

In fact, how many amazingly brilliant snow scenes did you experience in the past months, that you just had to photograph, only for it to appear grey and lifeless in the resulting photographs?

Understanding your light meter

To understand what went wrong with all these photos, you need a basic understanding of how your camera's light metering system works:
The fundamental assumption of the light meter is that the light intensity of any scene, when all the highlights and shadows are averaged out, is medium grey. Look around you, try picturing the scene in black & white, and imagine what the average light intensity of the scene is. About mid-grey, right? Correct, and that is why the camera's built-in light meter is correct 9 times out of 10.

However, when you consider the previously mentioned gloriously white snow scene, the average light intensity of the scene is not mid-grey. It is much brighter. But of course the camera, clever as it is, does not know you're pointing it at a snow scene (how could it?). It assumes its pointing at just another average scene, so it adjusts the light to make the scene mid-grey – in effect, it under-exposes the scene to make it darker than it is. So, given that unlike your camera you know what you are looking at, you have to start thinking for your camera. You have to force your camera to over-expose the scene (or to think it's over-exposing, when in fact you are merely forcing it to correctly expose the scene). Do this, and your snow photographs will no longer be dull and grey, but bright, white and punchy as they should be.

So how do you force your camera to over-expose?

There are many ways, varying from camera to camera, but basically you need to adjust your camera's "Exposure Value" (EV) or "Exposure Compensation" (EC) setting to a value between +0.5 and +1. (This means causing over-exposure by 0.5 to 1 F-stop.) It may take a bit of hunting around the camera's menu settings to find the EV function (or you can always try the manual) but once you figure out where to adjust your camera's settings it's really quite simple. Just remember to return the setting to 0 when you're back to photographing "normal" stuff if you don't want all your subsequent photos to be over-exposed!

So, before your next ski-trip or Alpine tramping adventure, remember to search out and make use of your camera's EV function, to ensure some brilliant snow photos. And once you understand the above principle, it can really help you achieve better photographic results in a variety of different circumstances.

World Cup fever

Think about the Rugby World Cup, for example. While many of the photos you took over the past months were likely filled with "white stuff", I can imagine for the next month you may end up with many pics featuring predominantly "black stuff". Groups of friends and family proudly donning their All Black supporters jerseys, all the way to the final.

So you'd want to keep your blacks black, rather than having an album full of people wearing dark grey jerseys, right? If we again consider the logic of the camera's light meter, you can appreciate how a photo filled

The fundamental assumption of the light meter is that the light intensity of any scene, when all the highlights and shadows are averaged out, is medium grey.

to the brim with black jerseys may also be problematic. In this case, the average light intensity of the scene will be darker than mid-grey, so your camera may well be fooled into thinking that it needs to increase the exposure to achieve the "desired" mid-grey intensity, resulting in photos that are over-exposed.

Using the inverse of the actions explained with the snow photos, what you need to do to avoid the above over-exposure is to force your camera to under-expose by changing the EV value down, probably to about -0.5. Again, just remember to reset the EV to zero after your black photos to avoid continued under-exposure.

Black and white combinations

So how, you may ask, can one use the EV function when you photograph a bride in white and a groom in black in the same photo? Do you over-expose to correct the white, or under-expose to correct the black? Well, in this case, you don't do anything! As explained, the camera tries to turn any scene into an average mid-grey. So if half of the image is made up of the white of the bride's dress while the other half features the black of the groom's suit, the average of the whole image will be approximately 50% white + 50% black, i.e mid-grey. So if you allow the camera to automatically expose the image, it should be spot-on.

Of course if you do a close-up photo of the bride, and the whole scene is filled with brilliant white, you need to remember to use the EV compensation trick to ensure that your whites stay white.

Application to corporate photography

Of course these exposure tips are also applicable in the workplace. If you photograph a person against a large white wall, the camera's automatic exposure settings may well under-expose the scene, resulting in your model being too dark. To counteract this, simply adjust your camera's EV upwards to between +0.5 and +1.

Similarly, photographing a speaker illuminated by a single spotlight in a darkened room (i.e. a predominantly dark scene) may result in the

speaker in the photo being too bright, due to the over-exposure caused by the camera. (This is likely to be the case whether you use flash or not.) The solution – step down the EV to between -1 and -0.5, and *voila*, problem solved!

The important point to remember is that your camera does not know what it is photographing, so whenever you photograph a scene that is not average, e.g. when the scene is predominantly black, or predominantly white, you are likely to run into exposure problems. Being aware of this, and knowing how to compensate for the problem, can be the difference between a useful picture or a wasted photo opportunity.

Happy snapping!

News snippets

Upcoming conferences

- *NZ Clean Energy Expo,* 3 – 16 Oct 2011, NZ Clean Energy Centre, Taupo.
- *Winery 2011*, 6 – 10 Nov 2011, Marlborough Convention Centre, Malborough
- *ScienceTeller Festival,* 15 – 19 Nov 2011, Dunedin
- *HINZ - Health Informatics New Zealand conference,* 23 – 25 Nov 2011, Auckland

Scienceteller 2011

University of Otago's **Centre for Science Communication** will host the inaugural ScienceTeller Festival, 15-19 November 2011. In the words of the organisers, *"ScienceTeller is a celebration of Storytelling and Science dedicated to documentary filmmaking, writing and other creative media."*

This is a quick reminder that submissions of creative work for ScienceTeller 2011 are now open and will close on the 1st October 2011.

Creative works can be submitted in the following categories:

- Science Documentary (incl. relevant Natural History, Wildlife, Health, Travel & Cultural Films)
- Short Science Film (less than 12 min)
- Science Story
- Science Podcast
- Science Poem
- Science Song (includes music videos)
- Science Photograph
- Science Art

For more info on this exciting event, visit the website at http://www.scienceteller.com/

Manchester Science Festival Microbiology and Art competition

Art provides an opportunity for visualisation and communication of science. During the Manchester Science Festival 2011, MadLab will be hosting its first science themed exhibition, on the subject of Microbiology and Art (Oct 20 – Nov 11).

To take part in the exhibition, think about the obvious links between microbiology and art – deterioration of cultural heritage, images of infectious disease, the beauty of microscopic images, disease in history, literature – and the not so obvious.

If you are inspired to produce your own artwork, then submit it to hwayoung@madlab.org.uk by the 30th September.

More info at http://manchestersciencefestival.blogspot.com/2011/09/microbiology-and-art-competiton-call.html.

Chemical and Engineering News (C&EN) photography competition

Calling all chemistry shutterbugs! C&EN invites you to enter its second photo contest. Show them what the theme "Beauty at the Lab Bench" means to you. Winners will receive a bag of mystery prizes and have their images printed in the October 31, 2011 issue of C&EN.

How to enter:

1. Email your photos to CENphotocontest@acs.org by September 30, 2011. Mulitple entries are permitted.
2. Include a caption of no more than 125 words for the photo along with your full name.

For more details, including the competition rules and guidelines, visit http://pubs.acs.org/cen/_ads/cen-photo-contest.html.

The 2011 International Loupe Awards

Entries are now open for the 4th annual International Loupe Awards. This competition, catering for professional and amateur photographers, cover a range of photographic categories, including 'Science and Nature'.

Entries close at the end of October 2011.

More info on the competition is available at : http://www.loupeawards.com/

Even if you're not interested in entering photography competitions yourself, the galleries of winning entries from previous years are already well worth a visit to the site.

What's shaping the media in 2011?

On Wednesday 28 September 2011, 5.30pm-7.30pm at the Turnbull House, 11 Bowen Street, Wellington, you can hear respected journalists from print, radio, online & television discuss how and why they report on science, what they and their editors are looking for in a science story and what you need to know before you pitch a story or when the media calls.

Cost: $10.00

Panellists include:
Alison Ballance – Radio New Zealand
Simon Morton – Radio New Zealand
Mike White – North & South
Renee Graham – TVNZ
Rebecca Priestley – New Zealand Listener
Kirsty Johnson – Stuff.co.nz

Peter Griffin of the Science Media Centre will facilitate the panel and discussion time.

SCANZ Auckland panel discussion

SCANZ is holding a panel discussion and springtime networking event on Thursday 29 September (5.30pm – 7.30pm) at Auckland Museum. A panel will share recent learnings about science & innovation communication and look ahead 5-10 years to describe a science issue with potential to hit NZ's front pages.

The panel will include:
Dr Jilly Evans, San Diego-based 2010 World Class New Zealander Award winner (Life Sciences)
Dr Bruce Campbell, Chief Operating Officer, Plant & Food Research
Vincent Heeringa, Tangible Media Director and Idealog Publisher

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