SANAE 52

THE PHOTOGRAPHY ISSUE

SANAE 52 Newsletter

THE PHOTOGRAPHY ISSUE

All of the team members brought cameras along. We wanted to capture our experience. Since none of us had a photography background, we did not know what to expect. Priorities were set and compromises made based on things which we did not understand. For some, capturing the experience is good enough. Some don't mind others capturing it for them. Others have become fanatics. This is a bit more relevant to the fanatic, but it should help those content with snapshots too.

We hope that the summary of our experiences helps you to choose the right gear so that you do not have regrets, either from spending more money than you needed to or being under-equipped.

A fair amount of experience was achieved by reading articles on the internet. There is no point in rewriting these. So the links are included in this section.

General resources:

www.dpreview.com
www.photozone.de
www.mycamera.co.za
http://www.the-digital-picture.com/Reviews/Comparison-Tools.aspx [HW Comparison]
www.reddit.com/r/photography
www.reddit.com/r/astrophotography
www.photography-on-the.net/forum/showthread.php?t=141406
www.lenshero.com
http://www.cambridgeincolour.com/tutorials/digital-camera-sensor-size.htm
http://www.pacific-landscapes.com/blog/2013/3/monument-valley-nightscapes-preparation
www.photo.net
http://www.astropix.com/HTML/I_ASTROP/TOC_AP.HTM
http://www.asignobservatoryii.com/tutorials.htm

Resources for aurora photography

http://1x.com/playlist/275614/featured [Click Info to See Equipment Used By Pros]
http://www.davidkinghamphotography.com/blog/2012/10/lenses-for-night-photography
http://www.alaskaphotographics.com/blog/2011/03/aurora-borealis-and-raw-processing/
http://thelightroomlab.com/2013/02/aurora-photography-equipment/
http://royhooper.ca/articles/aurora/
http://www.arcticphoto.is/aurora-photography-in-iceland
http://www.asignobservatoryii.com/tutorials.htm
http://alaskaphotographics.com/march_aurora_gear.sht

Software

Due to digital cameras, post-processing is a very nifty part of one's arsenal. The first item that most people would identify photo editing with is Photoshop. Our goal is to slightly tweak a few parameters, such as saturation, exposure and white balance (if shooting RAW) and to straighten or crop those skew shots, not to crowbar a polar bear into the scenery. Photoshop is not necessary. Creating panoramas is very nice, see Hugin.

Using the tools becomes easier with practice and especially the cataloging software allows non destructive tweaking so that a few months post tweak, when you have learned more, you can undo the awful mess which you were so proud of.

It is highly recommended that you acquire as much of this software as you can before getting to SANAE, because downloading it from the base could be a problem.

Most is free, but some is very pricy so be selective. If you just want to take snapshots, post processing is likely unnecessary.

Panorama Stitching:
Hugin ➤ $0

Catalogue and post processing:
Adobe Lightroom ➤ $$$
Apple Aperture ➤ $$$
Darktable ➤ $0

Noise/Lens Correction:
DxO Optics Pro ➤ $$$
LensFixCl ➤ $$$

HDR:
SNS HDR [HDR Top Pick] ➤ $$$
Luminance HDR ➤ $0

Star Trails:
StarStax ➤ $0

Astrophotography:
Deepskystacker ➤ $0

Firmware hacks:
CHDK, Magic Lantern ➤ $0

Remote camera operation:
Canon EOS Utility, gPhoto, automator.app ➤ $0

Becoming an average photographer

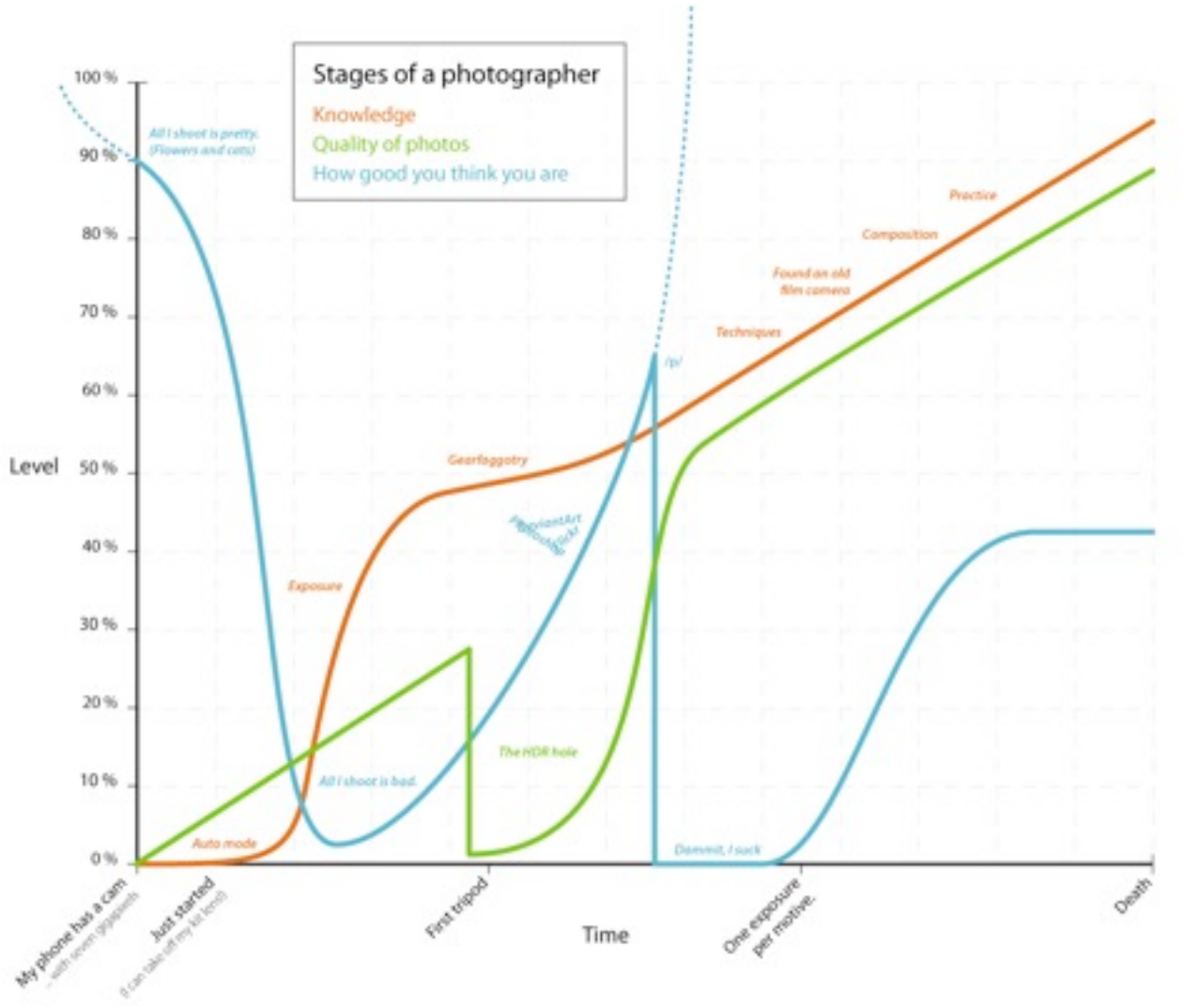
The path to realizing how much you suck pretty much starts with you putting your camera into M or manual mode. The sooner that you can get your camera off auto or one of the other semi-auto modes, the better. Ideally this should happen before you get onto the ship. A highly recommended book for your specific camera, besides the manual is the 'From Snapshots To Great Shots' series. The book is an introduction to your camera manual. It is Worth the money if the manual looks to daunting. Once you are done with it, you should know your manual inside out. Finish both before getting off the ship.

You have read all of the links at the beginning of the newsletter, right? Great, if not go back and read them, seriously.

After taking about 5000 photos you will have a sense of your camera. After about 7000 photos you should start taking some good photos because you have grasped photography the idea, rather than due to luck.

Practice also applies to post processing. The more often you practice the more subtle it will be.

As far as our skill goes, we're average.



GEAR REVIEW (what we wish we had)

CANON 60D

Brought	General Photography	Long Exposure Photography	Aurora Photography
Canon 60D	Good, but would like full frame camera e.g. Canon 6D for the wider angle.		
Canon 17-85mm f/4.0-5.6 Lens	Good	Good, but I would like a faster and wider angle lens.	
Canon 50mm f/1.8	Maybe	Good, because it is fast, but not wide enough angle for auroras on a crop frame camera.	
Tripod	Maybe	**ESSENTIAL**	
Trigger Release	Maybe		

The **Canon 60D** is a well constructed camera with a pro body layout. The sensor is the same as the 600D, but it does have upgraded components.

A disadvantage of this camera is that it has a crop frame sensor (APS-C), meaning that lenses used on it must be much wider angle than those use on a full frame camera to achieve the same result.

A wide angle, large aperture or low f lens is very important for a DSLR if you are interested in aurora photography.

Overall a great camera. Definitely overkill for snapshots, so don't buy this if you are just going to use auto all the time.

The **Nikon P7700** is very capable. Highly recommended. A good all rounder.

The lens is fast and it has a built in intervalometer. The P7700 is also very portable. A big problem with DSLRs is that they are impractical to carry around, so you miss great shots, because you have no camera. The optical zoom is great for wildlife photography while on the ship.

An alternative may be the Canon G15, due to the faster lens, but the zoom is not as capable.

An intervalometer and trigger release would be nice to have. The built-in intervalometer is a little limited, but would cover most use cases.

Would also be a great backup camera.

Brought	General Photography	Long Exposure Photography	Aurora Photography
Nikon P7700	Good. Very mobile.	Good, long exposure noise reduction cannot be disabled.	Very good results. The sensor is small, but the excellent lens really makes up for it.
Tripod	Not necessary	Essential.	I'd spend 4K on good one.
Trigger Release	Not necessary	Nice to have.	Nice to have.
Spare Battery	Nice to have	Bring 2. The battery suffers due to the cold, but keeping one warm in your glove and swapping them periodically works well.	

http://www.dpreview.com/reviews/canon-g15-nikon-p7700-shootout
http://www.cameracomparisonreview.com/2012/10/canon-g15-vs-nikon-p7700.html
http://photofocus.com/2013/03/14/seven-myths-about-the-need-for-full-frame-camera-bodies/

The 600D is very good value DSLR. Like the 60D, long exposure noise reduction can be disabled, which is useful for taking star trails.

A DSLR is excellent due to the large sensor size. I can take good photos even at 3200 ISO.

A crop sensor is a little bit of a problem with aurora photography. It reduces the field of view compared to full frame. To get around it, shoot a panorama of a slow moving aurora. Results are great. It is not the end of the world if you don't have a ultra wide angle lens.

The kit lens is great for daytime shots. The 18-55mm is a little plastic, but good enough.

Thinking back, I am not sure that having a pro camera and lens would have improved my photos more than having a good tripod, for example.

This is a really fantastic camera. I have lots of great photos due to some practice and patience and my trusty Canon 600D.

Brought	General Photography	Long Exposure Photography	Aurora Photography
Canon 600D	Excellent. Would have liked better bracketing, intervalometer*.	Would like preset focus to infinity*. Would like better performing ISO and full frame sensor. Maybe a Canon 6D ($$$).	
Sandisk 32GB SDcard x2 Class 10	Class 10 or higher. See your camera's requirement. Would not recommend < 8GB. Recommend at least two.		
Canon 18-55mm f/3.5-5.6 Lens. Stabilized.	Pleased.	Not that easy to lock the focus to infinity*. Could do with higher f. I would have liked a Sigma 18-35mm f/1.8 DC HSM (pricey) and a Samyang 14mm f/2.8, but I'm not sure that the money is worth it (R15 000). For the price, the lens is amazing value.	
Canon 55-250mm f/4.0-F5.6 Lens. Stabilized.	Used it on the ship for wildlife photography. Quite good.	Probably not useful.	NA
Cheapie Tripod	Good for HDR photography and good in low light. Useful for time lapse. Good for team photos.	Useless. A very sturdy tripod, ideally with ball head, which can be adjusted to be very low over the ground is mandatory. Wind will ruin shots. Bonus if camera battery can be removed while mounted.	
Trigger Release	Removing hands from gloves to take a shot can be very unpleasant. Highly recommended and cheap.		
Intervalometer	The features which Magic Lantern add to my camera make it unnecessary.		
Spirit Level	NA	NA	I would like one. It is possible to buy 3rd party ones. Some tripods have one integrated.

*Magic Lantern addresses these short comings and more.

A very important question that you must ask yourself is: 'Do I want to capture the experience or do I want to take photos that I can set as my background on a HD monitor'. I thought that I wanted to capture the experience with traditional postcard sized images, but I really wanted crisp high definition, low noise aurora photos. Fortunately I brought a good camera, though at a stage while I was learning, I did lust after high end bodies and lenses. I have recovered.

Skill does play a very important role in good photos, all the technology in the world will not fix your composition or inability to use your camera. For day time photography, any digital camera is fine. A high end rangefinder type, (Nikon P7700) is excellent and aurora capable.

To capture crisp wide aurora images, your budget is going to be significantly increased. A DSLR with an ultra wide angle lens is going to shine.

If you want a DSLR, a cheap zoom and a kit lens are where you should start. A wide angle prime with low f is the next addition.

If you want to go all out, A full frame body is expensive, but if you have some experience with photography and a stack of money lying around, it may be a good choice. Worst case, sell it when you get back. Be aware that gear can't compensate for your skill

ACCESSORIZE!

Do not skimp on accessories. Good accessories will improve your experience. You cannot quickly pop out to the shop to get a spare if something breaks or turns out to be rubbish. Be prepared.

1. A very rigid tripod with ball head which can be set up low and wide for stability in wind (40km/h) is vital for auroras. The Manfrotto 055XPROB (immediate right) with ball head is great. The Manfrotto 190XV with a ball head is entry level. Do not buy a tripod with a setup such as the one to the far right. It will catch on rocks, is flimsy and will ruin your shots. It will probably break too.

2. Spare <u>original</u> batteries are important. Smaller cameras like the P7700 seem to go flat quite quickly at -25°C, while the DSLRs last hours. Bring at least 2 batteries. A battery grip would be ideal, but you can do without.

3. A spare lens cap.

4. <u>Wired</u> remote release. Wireless may require you to stand in front of your camera, not practical.

5. USB SD card reader. Taking the SD card out and allowing the camera to acclimatize, is better than bringing the camera into a warm place immediately to plug it into a PC. Condensation could be a game ender, but hasn't been a problem for us.

6. Storage and <u>backup storage</u> for your photos. We have archives of 80 - 250GB after 8 months. Two 500GB drives are suggested

EXTRAS make a world of difference.

1. Hand/toe warmers. Essential for serious aurora photography. Bring 30.

2. Mercury Mittens and Heavy Weight Inners from Black Diamond.

3. A good spot with as little man made light as possible. Very important.

4. Patience and planning. Don't expect to run out of the base to take photos when an aurora occurs. A great display can be over in a few minutes. It will take you about 15 min to get outside. Consult aurora and weather forecasts and set up the aurora alarm. You cannot see an aurora if it is cloudy. Chances are that staying outside for 5 hours will produce < 10 exceptional photos. A high Kp display is spectacular, well worth the disappointment of failed waits. Less time spent outside will drastically reduce your chances of seeing outstanding aurora. Mediocre aurora occur all the time.

5. Be prepared. All of your gear must be ready and charged.

6. Practice makes perfect. Start off taking star trails so that you are experienced enough with low light/long exposure photography when an aurora comes around. Even if there is a poor aurora, get out there, it could flare up and you NEED to sharpen your skills for the big one anyway.

7. Chocolate. It might be a long wait.

8. Know your camera. If you cannot operate your camera with your eyes closed, you need more practice. Operating it outside in the dark in semi-unpleasant weather with gloves on isn't easy.

NOISE

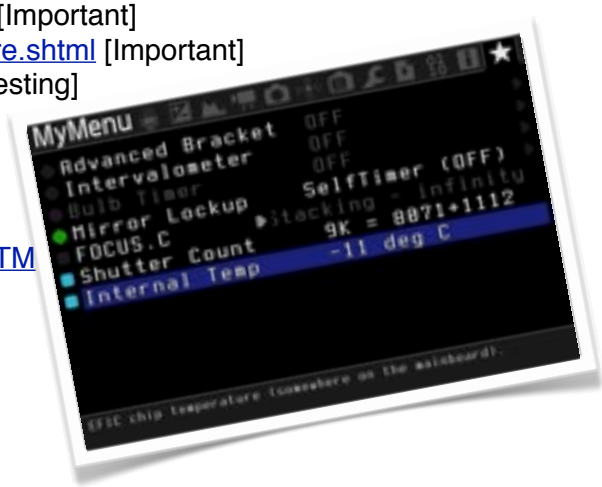
From research and experimentation we have come to the conclusion that that due to the low temperatures when shooting outside, thermal noise *should* not be a problem. The sensor of a 600D was noted with an operating temperature of -15°C while operating outside.

The consensus is that due to the very cold temperatures (roughly -25°C) at SANAE, there is no need for dark frame subtraction/ long exposure noise reduction, despite it being recommended by some experts. The extra time taken to perform the action is just time wasted.

There is a balance between short exposure times and low ISO to achieve crisp, low noise and well exposed photos of auroras. Try to keep exposure low in order not to capture smeared auroras and avoid star trails, but long enough for good exposure and noise reduction. ISO should be on the highest setting possible for your camera which avoids noise.

Expose to the right. This cannot be emphasized enough. Expose to the right.

http://www.luminous-landscape.com/tutorials/expose-right.shtml [Important]
http://www.luminous-landscape.com/tutorials/optimizing_exposure.shtml [Important]
http://www.magiclantern.fm/forum/index.php?topic=5693.0 [Interesting]
http://schewephoto.com/ETTR/
http://www.starrywonders.com/coolinghidden.html
http://www.cloudynights.com/item.php?item_id=2788
http://photocornucopia.com/1013.html
http://www.imaging-resource.com/PRODS/T3I/T3IHI_ISO_NR.HTM
http://www.reddit.com/r/photography/comments/17ap2o/canon_600d_bulb_mode_am_i_stuck_with_the_grainy/



Recommendations
For Aurora Photography.

These are the settings which we use on our cameras, but they are heavily dependent on the brightness of the aurora and the presence of moon light, so get used to your histogram and continually use it as a reference while shooting.

Every time that ISO is doubled, exposure halves. However, the higher the ISO, the more noise. There is definitely a sweet spot.

Camera	Setting	Value
Canon 60D (17-80mm)	ISO	800-1600
Canon 60D (17-80mm)	Exposure	15-20s
Canon 60D (17-80mm)	Aperture	f/4.0
Nikon P7700	ISO	200-800
Nikon P7700	Exposure	3-30s
Nikon P7700	Aperture	f/2.0
Canon 600D (15-55mm IS II)	ISO	1250-3200
Canon 600D (15-55mm IS II)	Exposure	8-30s
Canon 600D (15-55mm IS II)	Aperture	f/3.5

LENSES

When going to your local camera store tell the people that you will be taking photos of aurora. Give them your budget and state that you need a very fast lens which is crisp at the biggest aperture. The lens should also be wide angle (<20mm). Cry when they give you the price.

MISC TIPS FOR AURORAS

1. Always shoot RAW.
2. Don't shoot with filters on.
3. Focus to infinity. Use duct tape if necessary.
4. Auto white balance.
5. Tripods are mandatory. Anchor it down if at all possible.
6. Turn off image stabilization.
7. Use mirror lockup.
8. Shoot with time delay of 2s if you don't have a trigger release.
9. Expose to the right. Check your histogram.

FILTERS

Keep a clear or UV filter on your camera always to protect the lens.

A circularly polarized filter can be useful to remove glare.

CLEANING

A bonus with a range finder is that it is a sealed unit, so nothing gets in. When changing lenses with a DSLR be careful not to trap dust inside of the body as this could spell the end. Get advice from your local camera shop

SNAPSHOTS

Star Trails

A picture is worth 1000 words.

http://www.grelf.net/star_trails.html
http://stockfootage.vadervideo.com/content/star-trail-elimination-calculator-photography
http://www.sceneplanner.com/tool3.php

HDR Photography.

The scenery at SANAE is dominated by snow, making HDR (High Dynamic Range) photography a very useful tool. Snow reflects light, hence it is white, dominating pictures. Your camera cannot capture the colours of the whole scene in one exposure. By taking a few photos over the whole dynamic range and then combining them, a photo can show very dark and light areas in one scene.

Try not to over do it. HDR can look very fake.

There are lots of HDR tutorials on the net.

SNS-HDR

Luminance HDR

You have patiently read through the whole document and have decided that this stuff is far too complicated for me. 'I just wanna press a button and take photos', you say. Well, even if you have a DSLR, it is nice to have a good point and shoot with you, especially during takeover. A point and shoot will not be useful for auroras.

Smaller cameras tend to have much worse battery lives, especially due to the cold. A weather proof camera is not essential, but something which is water resistant may save you tears and weather proof cameras tend to be rated to negative temperatures, so they may be designed to work for longer periods at low temperatures.

If you have a Canon powershot camera check out CHDK.

Built in GPS or WiFi are gimmicky, rather spend the money on a better camera without those features.

Read camera reviews and go into the stores to get advice. If you just want to capture some of the experience, a point and shoot is the way to go. A Go Pro is quite cool too.