

From InfraRed to UltraViolet Photography

WPS Program by Albert Tang 1/20/2012 8:00pm

Light Spectrum : Wave length is measured by Nanometer Nm = 1 millionth of a meter. A human hair is approximately 6nm.

- Ultraviolet light Spectrum 10 — 380 nm
 - Far UV 200 — 280nm (germicidal between 254 and 264 nm)
 - Medium UV 280 — 320nm
 - Near UV 320 — 380nm
- Visible Light Spectrum 380 — 730nm
- Infrared Light Spectrum 730 — 1,200nm
 - Near IR 730 — 900nm
 - Far IR 900 — 1,200nm
- Thermal Infrared Spectrum 6,000 — 7,200nm

What do infrared light and ultraviolet light have in common. Both are invisible to the naked eye. Why then should we shoot in these lights at all? The answer is objects reflect light differently under infrared and ultraviolet lights than under visible light, thus creating interesting images different from images captured in visible light spectrum. By the way, both infrared and UV images are excellent candidates for OM

image creation. You will see some examples later on in the show. Let us look at Infrared Photography first.

Part 1 - Digital InfraRed (IR) Photography

Ways of rendering Infrared images:

1. Regular digital color image manipulation (pseudo IR)
 - Capture landscape image using polarizing filter to darken the sky.
 - In Photoshop: Go to image > adjustment > channel mixer > check monochrome box > push Red channel to +200%; juggle Blue and Green channels so that their sum is roughly equal to -100% (for example Blue -60% and Green -40%) > adjust levels and curves if image looks flat > add noise filter and diffuse glow filter if desired > save image as...
 - Process regular digital color image in software which has this function, such as: Nik Silver Efex Pro, Topaz, OnOne Tool,
2. Shooting digital color images using Infrared filter : Hoya R72 (mostly black), Tiffen T187 (no visible light)
 - Both CCD and Cmos sensors capture complete light spectrum from UV to Infrared. Camera manufacturers put in " Hot Filter " to block out the Infrared and UV lights to give the best image in the visible spectrum. Infrared light spectrum reflects color differently

from visible light spectrum. Let's look at how objects reflect Infrared radiation:

- Neutral colors remain unchanged - white is white, grey is grey and black is black, however,
- Greens will be different shades of white; Reds will be different shades of grey; and Blues will be different shades of black. You have to train your eyes to interpret colors as light and dark shades.
- Shoot image in Adobe RGB either in raw or jpeg.
- Custom white balance with green glass image.
- Infrared images focuses a little behind the subject. In some lens, you can find a red mark on the focus ring which is made for this purpose. Manual focus yields the best result. Focus on the nearest object. The depth of field rule of 1/3 in front and 2/3 behind still applies. If in doubt, set focus to infinity. Focus first before putting on the filter.
- Minimize motion blur by using tripod, mirror lock-up, and self-timer or cable release. You may need to cover the eye piece to avoid straight light from affecting the image for some cameras.
- Manual mode — bracketing is recommended. Winter sun is weaker, you may need to add 1 full aperture stop

- Lens — any focal length is good. I mainly use the 18 to 200mm zoom.
- ISO — 200, 400, 800 (lower the ISO, lesser the noise)
- Aperture — f/5.6, f/8, f/11 (f/8 usually gives the best result)
- Speed — 4, 6, 8 seconds

Elements affecting Infrared reflections:

- Moisture or humidity affects the clarity. The lower the relative humidity (RH), the clearer the image. A brisk and cold sunny day in winter is ideal for shooting Infrared landscape. High RH will make the image appears murky (fuzzy or dreamy).
- Foliage is a good subject. White zone — broad leafs and willows stand out. Dark zone — conifers such as pine.
- Sky — a clear blue sky with puffy white cloud is the best. An overcast sky is disappointing.
- Water — pool, pond, or any calm water body which has good reflection is best subject.
- Light direction — Frontal light gives a black sky; 45 degrees gives graduating sky from top black to low grey; 90 degree side light gives dull grey sky and black light gives an almost white sky.
- Infrared images need high contrast lighting. Hence, the best time to shoot is after the golden hours. i.e. between 10:00am to noon. The

light is too flat from noon to 2:00pm, and so, treat yourself to good lunch and a siesta and continue between 2:00pm to 4:00pm. From 4:00pm to 7:00pm golden hours again. Then dinner between 7:00pm and 8:00pm follows by ultraviolet shooting at night. So, shooting three lights -- infrared, visible & ultraviolet will keep you busy day and night. No rest for the wicked!

- Human subjects — increasing interest in using IR in high school year books and wedding photos because of the blemish free marble skin look. Watch out for dark/hollow eye sockets. Subject should look away from the camera. Use dodge tool to lighten dark eyes. You will see examples in the slide show to follow.
- Photo paper — Ilford Fine Art Matt and Epson Water Color Matt give good result
- Inks — dye-base ink gives good results. Avoid chrome-base ink unless you are using the more expansive photo rag papers, bronzing is unattractive.

Work flow:

- Image > adjustment > de-saturate -100% > add or reduce noise > crop to size > level - set black and white point > pull curve if needed > set contrast as needed > dodge and burn > add diffuse glow if needed > smart sharpen filter > save image as...

Camera Conversion:

- Remove “ hot filter ” in camera and replace with Wratten W87 infrared filter. Some of the camera converters are Life Pixel, Digital Silver Imaging, Precision camera, Spencer Camera... Most Canon and Nikon cameras, and some Sony, Olympus and Panasonic cameras are convertible.
- PROs: You can achieve handheld speed without using tripod. You can see a black and white image on LCD in real time or play back mode.
- CONs: Conversion cost is high -- between \$200 to \$500 depending on your camera. It voids your camera's warranty. Some converters offer a 50% charge to convert your camera back to light spectrum, but this still voids your camera warranty.

Color Infrared images

- Shooting infrared in Adobe RGB has the advantage of getting a better tonal image and also the image can be manipulated to become color infrared. Traditional color infrared renders three pastel colors pink, blue and grey, like so... You can manipulate the image further in photoshop CS or color software like the Color Mechanic Pro to achieve dramatic results, like so ...

To conclude this segment of Infrared Photograph, please enjoy a 15 minute slide show of the infrared images I shot in the years passed before we move on to Ultraviolet photography.

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Part 2 - UltraViolet Light Photography

This section is a joint effort by Elinor and myself. Elinor was kind enough to provide me with some valuable info, props, images and a slideshow which you may see later if time permits. In fact, Elinor has been my inspiration in UV image creation ever since the short talk she gave on UV photography complimented by many lovely images a few years ago. I was hooked on UV photography from the first get go.

Folks, when you have nothing to do at night especially during the cold winter months and TV program sucks, don't you wish you could have something meaningful to shoot which you can use for the next competition? Here is the rescue to your boredom. You simply can't beat shooting UV images at night in the comfort of your own home!

UV radiation or black light is invisible to our naked eyes. But if you shine it on certain objects which contain fluorescent pigments, they will reflect visible light which you can photograph. Look around you, there are more fluorescent objects than you realize starting with fabrics, plastics, powder detergents, cosmetics, petroleum jelly, toothpaste and your teeth, yarns, ropes, papers, inks, crayons, chalks, felt tip markers, pencils, play dough, oil paints, make-up, nail polish, the list goes on and on. They are easily obtainable from party shops, art supply shops, super markets and department stores. Read the labels to see if they are fluorescent

before you buy any of them. If no indication can be found on the label, bring a 6 " portable UV tube and a big brown paper bag. Put the object in the bag and shine you UV light on it. You can tell immediately if they are florescent. Black light photography of people also yields a stunning result especially with a dark skin person who has oily skin and wearing fluorescent make-up, but you will need large studio UV light equipments to accomplish it.

For shooting at home, you need the following equipment to set up your table top UV light booth :

- Two 15 watt UV or Black light fluorescent Tube 13" mounted on metal book ends with tapes.
- A stripe of white poster board behind the black light tube can serve as reflector.
- Hand held UV florescent tube 6" .
- Black Velvet Cloth (cotton is best) 60" running - 1 yd
- Black plexi-glass or plain glass 20" x 20" as a base reflector. The reflecting surface has to be very clean otherwise dust shows up very noticeably on the image.
- Three pieces 3/8" black foam boards each measures 12" x 16" . A piece of white and silver reflector board to cover the top of the booth.

I have set up a table top UV light booth in the back to show you exact what it looks like. Please mind the steps when you go up to take a look because we need to keep the lights low for the purpose.

Set up the table top booth with 3/8" black foam board covered by a piece of black velvet. Place black plexi-glass or plain glass at the bottom. Place the objects on the glass. Angle the two black light tubes at 45 degrees towards the subjects leaving a 10" - 12" clearance between the tubes for your camera to shoot through. Put the 6" hand held tube in front or on the top as a booster. Set camera to manual. ISO 400 or above. Aperture at f/8, f/11, f/16 . Time from 3" to 5" (varies depending on subject brightness), and auto-focus, then change to manual focus. Use a tripod, mirror lock-up function and either use cable release or wireless trigger to minimize blur. Put a yellow filter 2A or 2B to cut off the slight amount of blue tint the UV tubes emit. No filter is needed if you shoot in Raw because you can adjust the color temp later. Boosting the contrast will make image looking 3D. Very good for the creating OM images.

Electronic flash gives out some UV light thus making the image appears bluish. A yellow filter can be use to counter this effect. Nikon has electronic flash lights dedicated for UV photography — Nikon SB14 stage 1, 2 or 3. Fuji Fine Pix IS pro is a fully spectrum camera capturing light ranges from 380nm to 1,000nm, meaning that it can take Infrared and UV images without the use of filters.

Please see some of the images I shot with Black Light.

To conclude tonight' s program, I would like to present a slideshow
make by two pros Judy Switt and Gordi Corbin entitled " Black Magic "
courtesy of our Elinor.

I will be happy answer your questions.