

# Welcome to Astronomy Workshop

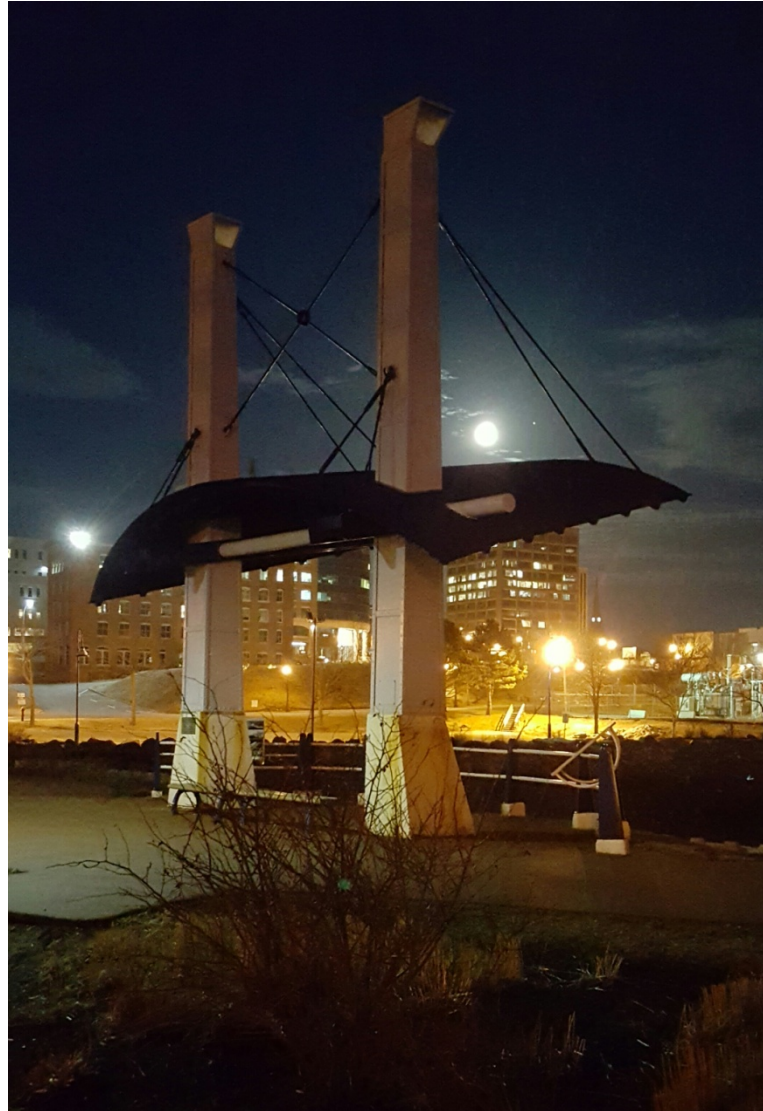
Sponsored by  
The Saint John Astronomy  
Club

# Astrophotography

Part

Two

# Astro images(Bonnie Roy)



# Cell phone Moon Rise (Bonnie Roy)



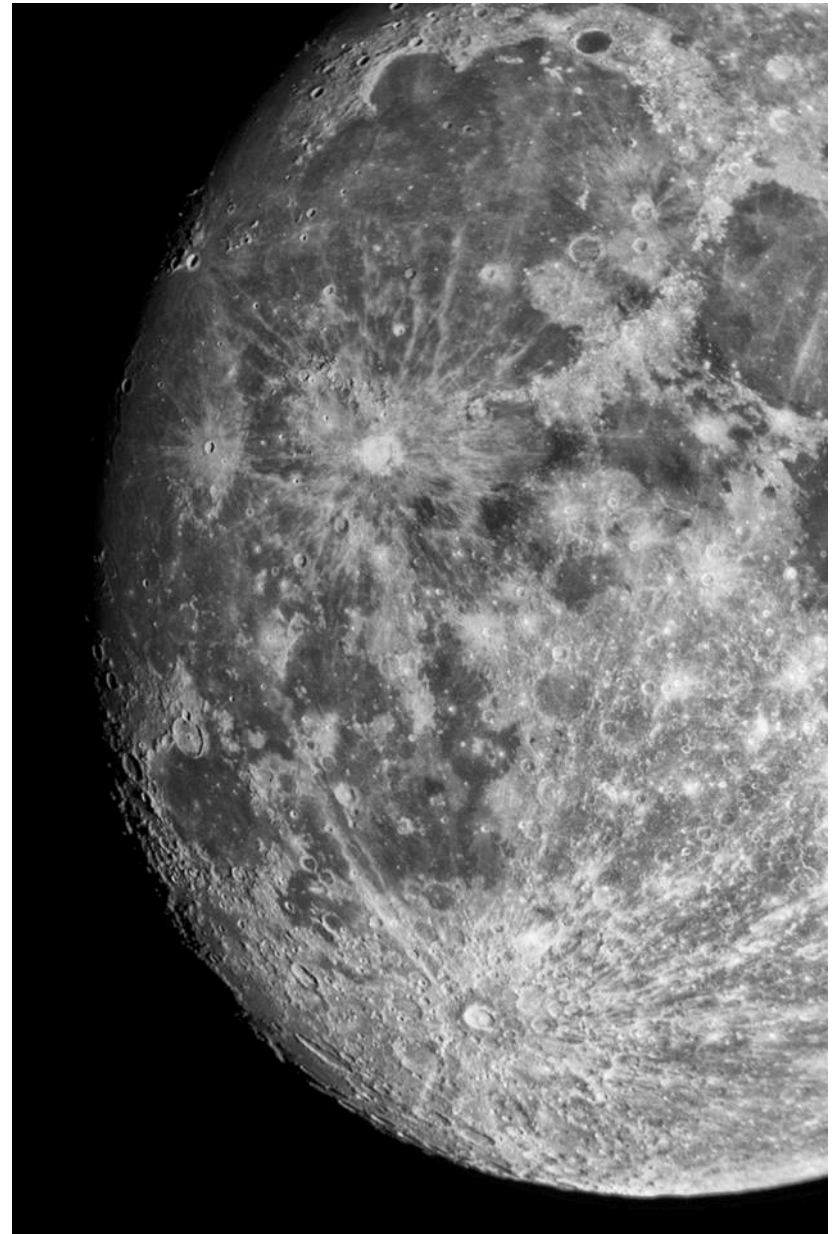
# Star Trails (Jim Stewart)



Almost full Wolf Moon, Nikon 5100 prime focus, ES6" 731mm  
f4.8 astrograph 1 x 60, ISO 100 (Jim Stewart)



Wolf Moon 98.5%  
Nikon 5100 Prime focus  
with 2x barlow on ES 6"  
731mm f/4.8  
astrograph. 1/60 sec  
@ISO 100  
(Jim Stewart)



Wolf Moon, 98.5% Prime focus, Nikon 5100, ES 6"  
731mm f4.8 astrograph, 1/60<sup>sec</sup> ISO 100 (Jim Stewart)





# Topics for tonight

Shooting the Milky Way

Star Trails

Advantages of Modified DSLR

# What we'll cover

- Equipment
- Technique
- Motion of the night sky
- Composition

# What Do I Need?



Memory card access light

# Equipment required

- Camera
- Lens
- Tripod
- Remote shutter
- Batteries
- Memory
- Warm clothes
- Dark Sky

9  
Inner City sky

7  
Suburban/urban  
transition

5  
Suburban sky

3  
Rural sky

1  
Excellent dark  
sky site

Altair

Rasalhague

IC 4665  
Cebalrai

IC 33

Sabik

Jupiter

Nunki

IC 4530

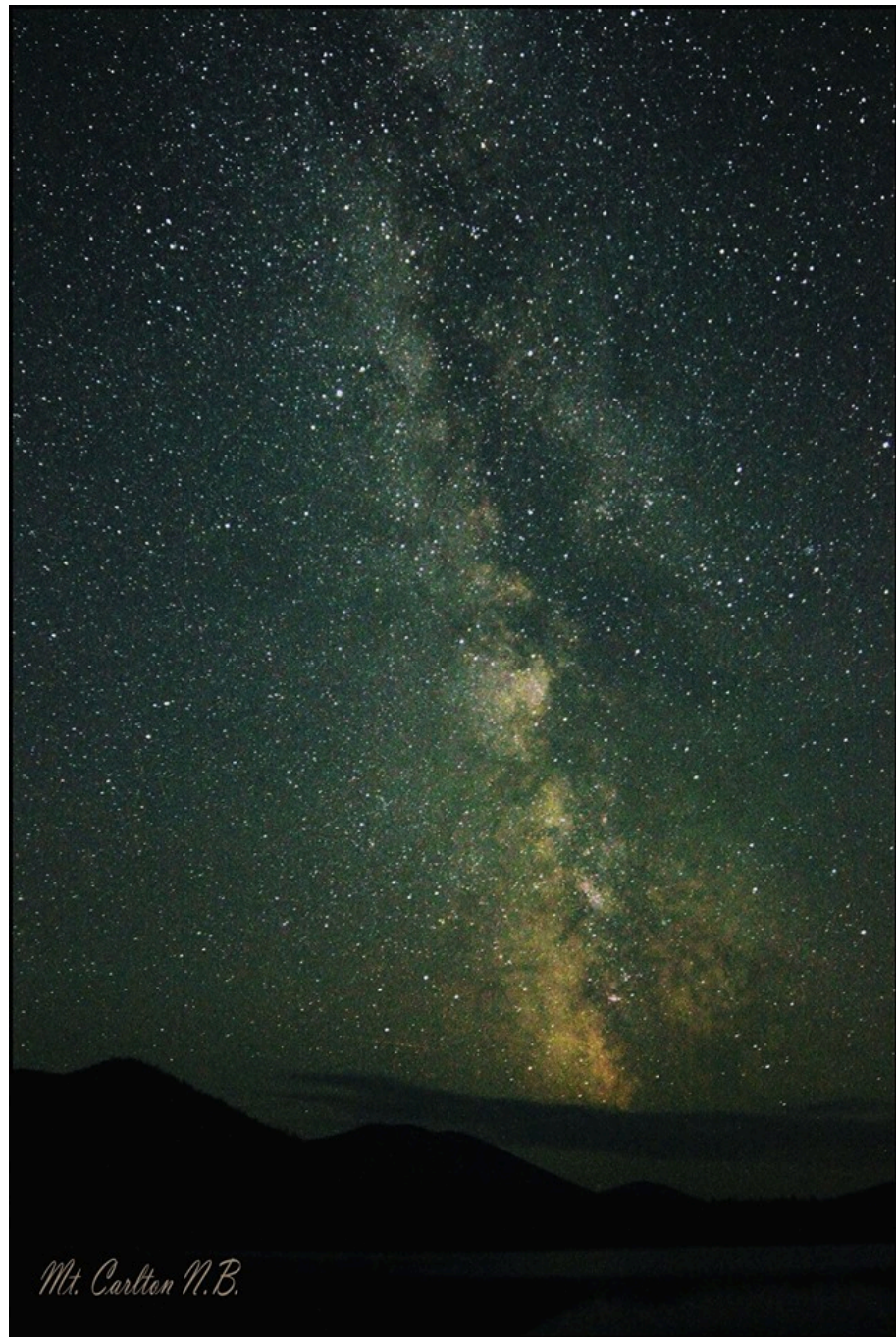
IC 40

# Skies in around city glow



LIGHT POLLUTION LEVEL - 5  
MONTE BELLO OPEN SPACE PRESERVE, CA

# Dark Sky



*Mt. Carlton N.B.*

# The Camera

- DSLR cameras offer a wide range of functions
- They have the widest range of settings
- Provide full manual control
- Interchangeable lenses for variety of target choices
- Shutter control increments up to 30 sec. and bulb setting after that for long exposures(great for star trails)
- Large sensor sizes(more picture to see)



# The Three Main Settings

- Aperture
- Sensitivity(ISO)
- Exposure

# Aperture



Aperture(f-#) is the diameter of the lens that allows light to reach the imaging sensor. The amount of light coming in is expanded or diminished with the iris in the lens. This determines the F number. The lower the number (F1.8 )the more light is allowed in.

# Sensitivity (ISO)



ISO speed						
Auto						
<b>AUTO</b>	L(50)	100	125	160	200	250
320	400	500	640	800	1000	1250
1600	2000	2500	3200	4000	5000	6400
8000	10000	12800	16000	20000	25600	
H1(51200)	H2(102400)					

SET OK

The ISO is an international standard for the sensitivity of the chip on digital cameras. Low values like 100 gives high quality images but need longer exposures. High ISO values like 3200 allow you to photograph faint targets but will decrease in quality.

# Exposure(shutter speed)



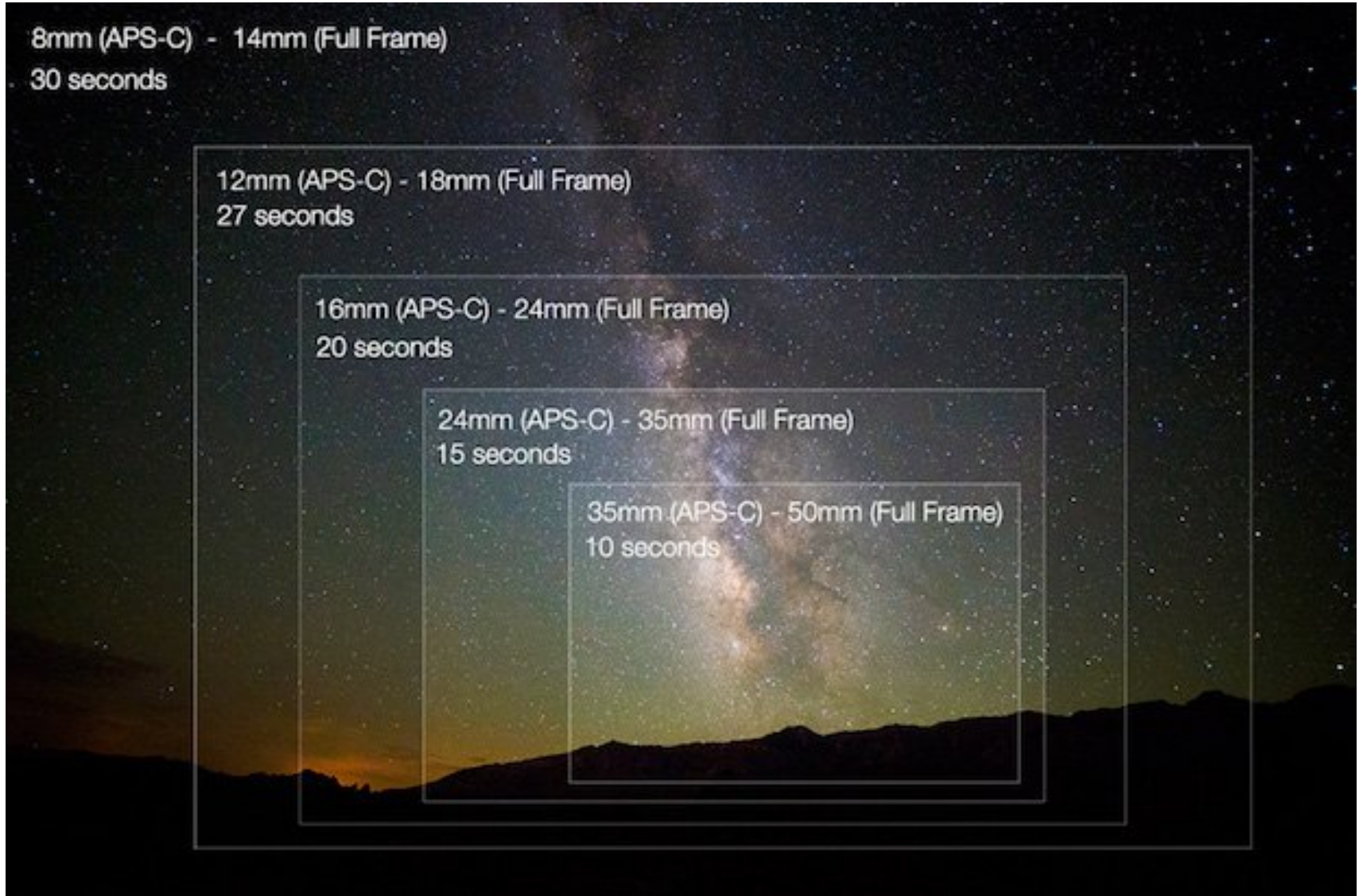
You can adjust your shutter speed quickly by using the smaller wheel (not for modes) on the top of your camera.

The shutter speed determines how long the imaging chip is exposed to the light the lens is focused on. For long exposures the shutter is open longer allowing more light to strike the camera sensor. Many cameras offer mirror lock up to minimize vibrations from the shutter action.

# Lenses



# Which lens should I use?



# Focal Length

- The shorter the focal length, the larger the portion of sky you can see.
- The wider the field of view the longer you can expose without star trails appearing.
- Kit lenses(18-55mm) have a fair wide angle but have a higher f #, usually F4.5 which will take longer exposures to gather the light needed for the photo.

# Settings

## The 500 Rule

- To get pinpoint stars, use the “500 rule,” which calls for you to divide 500 by the focal length of the lens you’re using. So, if you have a 24mm lens on a full-frame camera, you will set your shutter speed to 20 sec. ( $500/24 = 20.83$ ).



# Cropped Sensors(APS-C)

- If you're working with a crop sensor camera be sure to account for the crop factor (typically 1.5 for Nikon, 1.6 for Canon). As an example, using the same 24mm lens on a Nikon crop, you'd end up with an effective focal length of 36mm ( $24 \times 1.5 = 36$ ). Applying the 500 rule will yield a shutter speed of 13 sec. ( $500/36 = 13.89$ ).

# Solid Tri-pod



# Ball Head



# Remote Shutter release



**Stop the vibration**

You can also use the self timer on the camera if you don't have a remote shutter

# Lots of Memory



# Batteries



Single batteries should yield 600 + images so a battery grip using 2 should give you 1200 plus images