ASTROPHOTOGRAPHY

Bill Betts

August 21, 2019

Planning a Night of Astrophotography

- **What do you want to shoot?**
  - The Milky Way
  - Stars or Star Tracks
  - Moon
  - Landscape & sky
- **Where do you want to shoot?**
  - Backyard, desert, mountains …

Picking the Conditions for Your Shot

- **Sun rise/set/full darkness**
  - Don’t forget the blue hour
  - Wait till 2 hours after sunset for full darkness
- **Dark skies**
  - Light pollution
    - Amount
    - Direction
- **Moon/visible stars/constellations/Milky Way**
  - Where in sky at what time

Computer Tools & Sites

- **Location**
  - *Google Maps* – *map & satellite views*
  - *Dark Sky Finder* – Jshine.net and others
- ***Location and times of sun and moon***
  - *The Photographer's Ephemeris* – App requires internet connection
    - http://app.photoephemeris.com/?ll=16.768800,-3.007300&center=16.7688,-3.0073&dt=20170215173100%2B0000

Computer Tools & Sites – cont'd

- **Map of stars**
  - Stellarium - App does NOT require internet connection
    - http://www.stellarium.org/en_CA/
- **Others**
  - AstroAms – Facebook page for learning astrophotography (others too)
  - LonelySpeck – web site w/tutorial on sources of noise in photos, products to help focusing …
    - http://www.lonelyspeck.com/how-to-find-the-best-iso-for-astrophotography-dynamic-range-and-noise/

Apps – Android Phone

- **PhotoPills – integrated planner (Allen Baxter to present)**
- **PlanIt – Integrated planner**
- **Google Maps – cell service required or save map**
- **600 Tool – no cell service required**
  - Calculates max exposure time
- **Compass – no cell service required**
- **Lunar Phase – no cell service required**
- **Clear Outside – gives likelihood of cloud cover**

Prepping Your Camera

- **Select your lens –**
  - The shorter the focal length the better
  - Zoom acceptable
- **Pre-focus during daylight using tripod**
  - Auto-focus cannot work if too dark
  - Find hyper-focal length
    - App - Hyperfocal
    - Enter focal length and aperture
  - Go outside and focus subject distance
  - Infinity should be in focus
- **Secure the focus ring using gaffer tape or Gorilla tape**
  - Neither leaves a residue

Equipment to bring

- **Jacket, bug spray, flashlight, water, etc.**
- **Camera w/lens**
- **Tripod**
  - The sturdier the better
  - Don’t use it with the center column extended
- **Remote trigger**
  - If none, use 10 sec delay
- **Extra batteries and memory**
  - You’ll be taking a lot of pictures

Setting up for the Milky Way

- **Set up**
  - Find a spot where you don’t interfere with others
  - Aim your tripod & camera to the south
  - Attach remote
  - Start Live View if you have it
  - Or raise your mirror
  - Set speed to 20 seconds
  - Set ISO to 2000
  - Set aperture to the lowest number (wide open)

Guidelines

- **500 Rule**
  - Calculates Max time the shutter is open before stars start to blur
  - Full Frame at 14mm and *f*/2.8 = 35 seconds
  - APS-C 1.5 at 14mm and *f*/2.8 = 23 seconds
- **ISO settings**
  - Experiment with ISO settings and Shutter time
  - Less time needs > ISO
  - More time needs < ISO
  - Higher ISO = more graininess and noise

Test Shots

- **Double check your focus is still good**
  - Use Live View at max zoom
  - Take a picture and examine at max zoom
- **Start experimenting with shutter speed and ISO**