# 2019 Observing Notes

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## Year in Review

* TBD

## January

### Winter 2012 Planning

Last Updated 12/20/2017

* Observations – January 5th first visibility times; Dark around 6:00 pm
  + Imaging – wide field (135mm)
    - 8:30 pm –NGC1499 California Nebula (486HIB, 672SII, 658NII, 807NIR)
    - 10:00 pm – M42
    - 10:00 pm – Simeis 147
  + Video – 4500mm
    - 7:00 pm – Uranus – multiple broad (807NIR, 685NIR, 650RED, 550GRN, 450BLU)
    - 10:00 pm – M42 – CRGB covering the bar (2hrs total). Also, better focus. Key bands to add are 685NIR, 656HIA, and 501OIII (2-4 hrs total)
* Analysis
  + M31 Multispectral Analysis *ala* M33, M81, M101 etc.
  + Solar Eclipse Movies, ratio analysis, etc.
  + Questions for OPT:
    - GoTo Mounts
    - Motorized Focuser
    - Custom Filters

### 2019-Jan-03 (Jan-04 UT): Mars and Uranus Video

Last Updated 1/7/2019

Very good seeing 4/5, but transparency degraded as clouds moved in during the 685NIR imaging of Uranus. I had not yet made deep exposures to detect moons, so establishing the orientation of Uranus unambiguously may be difficult.

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| **Video File** | **Exposure** | **Gain** | **Gamma** | **Binning** | **Capture Area** |
| 2019-01-04-0154\_7-Mars\_650RED.avi | 0.05 | 50 | 50 | 1 | 320x240 |
| 2019-01-04-0157\_1-Mars\_685NIR.avi | 0.03 | 50 | 50 | 1 | 320x240 |
| 2019-01-04-0158\_6-Mars\_807NIR.avi | 0.03 | 50 | 50 | 2 | 320x240 |
| 2019-01-04-0201\_2-Mars\_450BLU.avi | 0.02 | 50 | 50 | 2 | 320x240 |
| 2019-01-04-0204\_0-Mars\_550GRN.avi | 0.05 | 50 | 50 | 1 | 320x240 |

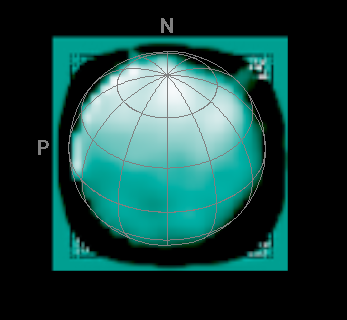
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| --- | --- | --- |
|  |  |  |
| 2019-01-04-0158\_6-Mars\_807NIR.png | 2019-01-04-0157\_1-Mars\_685NIR.png | 2019-01-04-0154\_7-Mars\_650RED.png |
|  |  |  |
| 2019-01-04-0156\_8-Mars\_807NIR+685NIR+650RED.png | 2019-01-04-0204\_0-Mars\_550GRN.png | 2019-01-04-0201\_2-Mars\_450BLU.png |

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| 2019-01-04-0156\_8-Mars-807-685-650-RGB-ClrSmth-WhtBal-Sat150pct-Wavelets-L(R)RGB.png | 2019-01-04-0156\_8-Mars-807-685-650-RGB-ClrSmth-WhtBal-Sat150pct-Wavelets.png | 2019-01-04-0156\_8-Mars-807-685-650-RGB-ClrSmth-WhtBal-Sat150pct-Wavelets-L(B)RGB.png |
|  |  |  |
| 2019-01-04-0200\_0-Mars-RGB-ClrSmth-WhtBal-Wavelets-L(R)RGB.png | 2019-01-04-0200\_0-Mars-RGB-ClrSmth-WhtBal-Wavelets.png | 2019-01-04-0200\_0-Mars-RGB-ClrSmth-WhtBal-Wavelets-L(B)RGB.png |
|  |  |  |
| 2019-01-04-0200\_7-Mars-AllNIR+RED-G-B-RGB-ClrSmth-WhtBal-Wavelets-L(R)RGB.png | 2019-01-04-0200\_7-Mars-AllNIR+RED-G-B-RGB-ClrSmth-WhtBal-Wavelets.png | 2019-01-04-0200\_7-Mars-AllNIR+RED-G-B-RGB-ClrSmth-WhtBal-Wavelets-L(B)RGB.png |

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| **Video File** | **Exposure** | **Gain** | **Gamma** | **Binning** | **Capture Area** |
| 2019-01-04-0235\_1-Uranus\_550GRN.avi | 0.999 | 100 | 50 | 2 | 1280x960 |
| 2019-01-04-0318\_0-Uranus\_550GRN.avi | 0.05 | 100 | 50 | 2 | 640x480 |
| 2019-01-04-0319\_3-Uranus\_450BLU.avi | 0.05 | 100 | 50 | 2 | 640x480 |
| 2019-01-04-0321\_2-Uranus\_650RED.avi | 0.1 | 100 | 50 | 2 | 640x480 |
| 2019-01-04-0327\_7-Uranus\_685NIR.avi | 0.3 | 100 | 50 | 2 | 640x480 |
| 2019-01-04-0332\_8-Uranus\_685NIR.avi | 0.3 | 100 | 50 | 2 | 640x480 |
| 2019-01-04-0337\_2-Uranus\_685NIR\_DARK.avi | 0.3 | 100 | 50 | 2 | 640x480 |
| 2019-01-04-0338\_2-Uranus\_650RED\_DARK.avi | 0.1 | 100 | 50 | 2 | 640x480 |
| 2019-01-04-0339\_0-Uranus\_550GRN\_DARK.avi | 0.05 | 100 | 50 | 2 | 640x480 |

TYC 0625-1184-1 is a nearby field start that appears in one of the early long-exposure sequences I took, before realizing it was not Uranus. In the images where both the star and planet appear, I can estimate an orientation and plate scale in order to navigate Uranus’s disk in WinJUPOS.

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| 2019-01-04-0330\_3-Uranus\_685NIR.png | 2019-01-04-0321\_2-Uranus\_650RED.png | 2019-01-04-0318\_0-Uranus\_550GRN.png | 2019-01-04-0319\_3-Uranus\_450BLU.png |
|  |  |  |  |
| 2019-01-04-0322\_5-Uranus\_685NIR-RGB-Whtbal-L(R)RGB-Str-4X.png | 2019-01-04-0322\_5-Uranus\_685NIR-RGB-Whtbal-Str-4X.png | 2019-01-04-0322\_5-Uranus\_685NIR-RGB-Whtbal-L(B)RGB-Str-4x.png | 2019-01-04-0322\_5-Uranus\_NIRoverBLU.png |



Screen cap of grid over 2019-01-04-0322\_5-Uranus\_NIRoverBLU-PseudoColor.png to highlight the north polar brightness.

### 2019-Jan-08 (Jan-09 UT): NGC1499 California Nebula in 672SII

Last Updated 1/7/2019

Poor seeing 2/5, but very good transparency 4/5. Used a very old 501OIII flat field for calibration because I couldn’t get a good sky flat. I’d like to recalibrate when I get the chance with a good, recent 672SII flat.

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| NGC1499-SII-20190109UT-672SII-sum3h22m-Flattened-Log-HalfSize.jpg |

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| NGC1499-SHO-WhtBal-HalfSize.jpg | NGC1499-SHO-NarrowBlend-WhtBal-HalfSize.jpg |

### 2019-Jan-13 (Jan-14 UT): Mars, Moon and M42 Video (RGB)

Last Updated 1/7/2019

Very good seeing 4/5 and very good transparency 4/5. The C8 corrector plate started too frost up during the 450BLU videos of M42.

**MARS**

|  |  |  |  |  |  |
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| **Video File** | **Exposure** | **Gain** | **Gamma** | **Binning** | **Capture Area** |
| 2019-01-14-0207\_8-Mars\_450BLU.avi | 0.03 | 50 | 50 | 2 | 640x480 |
| 2019-01-14-0210\_3-Mars\_550GRN.avi | 0.05 | 50 | 50 | 1 | 640x480 |
| 2019-01-14-0212\_2-Mars\_650RED.avi | 0.05 | 50 | 50 | 1 | 640x480 |
| 2019-01-14-0213\_8-Mars\_685NIR.avi | 0.03 | 50 | 50 | 1 | 640x480 |
| 2019-01-14-0214\_9-Mars\_685NIR.avi | 0.03 | 50 | 50 | 1 | 640x480 |
| 2019-01-14-0216\_4-Mars\_807NIR.avi | 0.03 | 50 | 50 | 2 | 640x480 |
| 2019-01-14-0218\_0-Mars\_807NIR.avi | 0.03 | 50 | 50 | 2 | 640x480 |

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| --- | --- | --- |
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| 2019-01-14-0217\_2-Mars\_807NIR.png | 2019-01-14-0214\_3-Mars\_685NIR.png | 2019-01-14-0212\_2-Mars\_650RED.png |
|  |  |  |
| 2019-01-14-0214\_6-Mars\_807+685+650-Wavelets.png | 2019-01-14-0210\_3-Mars\_550GRN.png | 2019-01-14-0207\_8-Mars\_450BLU.png |

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| 2019-01-14-0214\_6-Mars-807-685-650-RGB-ClrSmth-WhtBal-Wavelets-L(R)RGB.png | 2019-01-14-0214\_6-Mars-807-685-650-RGB-ClrSmth-WhtBal-Wavelets.png | 2019-01-14-0214\_6-Mars-807-685-650-RGB-ClrSmth-WhtBal-Wavelets-L(B)RGB.png |
|  |  |  |
| 2019-01-14-0210\_1-Mars-RGB-ClrSmth-WhtBal-Wavelets-L(R)RGB.png | 2019-01-14-0210\_1-Mars-RGB-ClrSmth-WhtBal-Wavelets.png | 2019-01-14-0210\_1-Mars-RGB-ClrSmth-WhtBal-Wavelets-L(B)RGB.png |
|  |  |  |
| 019-01-14-0210\_9-Mars-AllRed+NIR-GB-RGB-ClrSmth-WhtBal-Wavelets-L(R)RGB.png | 2019-01-14-0210\_9-Mars-AllRed+NIR-GB-RGB-ClrSmth-WhtBal-Wavelets.png | 2019-01-14-0210\_9-Mars-AllRed+NIR-GB-RGB-ClrSmth-WhtBal-Wavelets-L(B)RGB.png |

Note that for the first time this apparition, the south polar cap is undetectable.

**MOON**

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| **Video File** | **Exposure** | | | **Gain** | **Gamma** | | **Binning** | | **Capture Area** |
| 2019-01-14-0223\_3-Moon\_807NIR.avi | 0.07 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0224\_8-Moon\_685NIR.avi | 0.07 | | | 50 | 50 | | 1 | | 640x480 |
| 2019-01-14-0231\_0-Moon\_685NIR.avi | 0.015 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0232\_9-Moon\_685NIR.avi | 0.015 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0234\_3-Moon\_685NIR.avi | 0.01 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0238\_2-Moon\_685NIR.avi | 0.01 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0240\_6-Moon\_685NIR.avi | 0.02 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0242\_9-Moon\_685NIR.avi | 0.03 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0246\_0-Moon\_685NIR.avi | 0.03 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0247\_6-Moon\_685NIR.avi | 0.03 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0249\_4-Moon\_685NIR.avi | 0.03 | | | 50 | 50 | | 2 | | 640x480 |
| 2019-01-14-0251\_7-FLAT2X\_685NIR.avi | | 0.03 | 50 | | | 50 | | 2 | 640x480 |
| 2019-01-14-0252\_3-FLAT1X\_685NIR.avi | | 0.12 | 50 | | | 50 | | 1 | 640x480 |
| 2019-01-14-0256\_0-Moon\_685NIR.avi | | 0.03 | 50 | | | 50 | | 2 | 640x480 |

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| RIMA HYGINUS  2019-01-14-0223\_3-Moon\_807NIR-Stack2102X-Wavelets1x20+2x10.png | RIMA HYGINUS  2019-01-14-0224\_8-Moon\_685NIR-Stack200-Wavelets1x10+2x5-Gam1.2.png |
|  |  |
| POSIDONIUS  2019-01-14-0231\_0-Moon\_685NIR-Stack8002X-Wavelets1x25+2x15.png | ENDYMION  2019-01-14-0234\_3-Moon\_685NIR-Stack8002X-Wavelets1x35+2x15.png |
|  |  |
| MARE HUMBOLDTIANUM  2019-01-14-0238\_2-Moon\_685NIR-Stack6752X-Wavelets1x30+2x15.png | ALPINE VALLEY  2019-01-14-0240\_6-Moon\_685NIR-Stack750-2X-Wavelets1x30+2x10.png |
|  |  |
| MONTES ALPES  2019-01-14-0246\_0-Moon\_685NIR-Stack5002X-Wavelets1x50-Gam.png | MONS PITON & PIAZZI SMYTH  2019-01-14-0247\_6-Moon\_685NIR-Stack5002X-Wavelets1x25+2x15-Gam.png |
|  |  |
| ARZACHEL & DELAUNAY  2019-01-14-0256\_0-Moon\_685NIR-Stack250-2X-Wavelets1x20+2x5.png |  |

THERE’S AT LEAST ONE MORE MOON VIDEO, I THINK OF THE FILLE.

**M42 – Bright Bar**

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| **Frame Directory** | **Temp (C)** | **Exposure** | **Gain** | **Gamma** | **Binning** | **Capture Area** |
| M42-650RED 2019-01-14T04\_59\_05Z | -4.0 | 2.0 | 100 | 50 | 2 | 1280x960 |
| M42-550GRN 2019-01-14T05\_21\_06Z | -3.2 | 2.0 | 100 | 50 | 2 | 1280x960 |
| M42-450BLU 2019-01-14T05\_33\_05Z | -3.2 | 2.0 | 100 | 50 | 2 | 1280x960 |
| Dark-2s 2019-01-14T05\_45\_21Z | -4.0 | 2.0 | 100 | 50 | 2 | 1280x960 |

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| M42-650RED-Stack254-sum08m28s.jpg | M42-550GRN-Stack253-sum08m26s.jpg |
|  |  |
| M42-650BLU-Stack272-sum09m04s.jpg | M42-20190114UT-RGB-Blur-ClrSmth-WhtBal.jpg |

### 2019-Jan-14 (Jan-15 UT): M42 Video (656HIA, 658NII, 672NII, 685NIR, 501OII)

Last Updated 1/7/2019

Moderate seeing 3/5, but very good transparency 4/5. I used my frost protection tube extension on the C8. It was rather windy also.

When I was taking videos at the red end (656HIA, 685NIR, 658NII, and 672SII) I was using my phone to control the laptop. I apparently didn’t hit “enter” when changing the names on the videos for each filter. I have three videos named “658NII”. I believe they are in fact, in chronological order: 685NII, 672SII?, and 685NIR.

Need to talk about synthesizing darks of the right temperature.

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| **Frame Directory** | **Temp (C)** | **Exposure** | **Gain** | **Gamma** | **Binning** | **Capture Area** |
| M42-650RED 2019-01-14T04\_59\_05Z | -4.0 | 2.0 | 100 | 50 | 2 | 1280x960 |
| M42-550GRN 2019-01-14T05\_21\_06Z | -3.2 | 2.0 | 100 | 50 | 2 | 1280x960 |
| M42-450BLU 2019-01-14T05\_33\_05Z | -3.2 | 2.0 | 100 | 50 | 2 | 1280x960 |
| Dark-2s 2019-01-14T05\_45\_21Z | -4.0 | 2.0 | 100 | 50 | 2 | 1280x960 |

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| M42-20190115UT-685NIR-sum08m42s.jpg | M42-20190115UT-672SII-sum05m18s.jpg |
|  |  |
| M42-20190115UT-658NII-sum06m50s.jpg | M42-20190115UT-656HIA-sum06m16s.jpg |
|  |  |
| M42-20190115UT-501OIII-sum05m30s.jpg | M42-20190115UT-XXX-RGB-NHO-WhtBal-Blur.jpg |

## References