



# Laser Assisted Crescent Observation

(under-construction project)

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# Outlines

- ❖ Difficulties of Crescent Observations
- ❖ Examining the Situation
- ❖ Potential Techniques
- ❖ Spectral Analysis
- ❖ The Designing Process
- ❖ Enhancing the Contrast
- ❖ Limitation



# Difficulties of Crescent Observations

When the Crescent very close to the horizon

- ❖ The low light intensity of the very thin Crescent.
- ❖ The relatively high intensity of the twilight light.
- ❖ Not knowing exactly where to look.
- ❖ Every minute counts (short period before setting)
- ❖ The severe scattering from the dust layer



# Examining the Situation

- ❖ The larger the elongation, the better the contrast
- ❖ We need exact pointing device / indicator
- ❖ We need to illuminate unwanted lights:
  - ❖ Scattered light
  - ❖ Surrounding light



# Potential Techniques

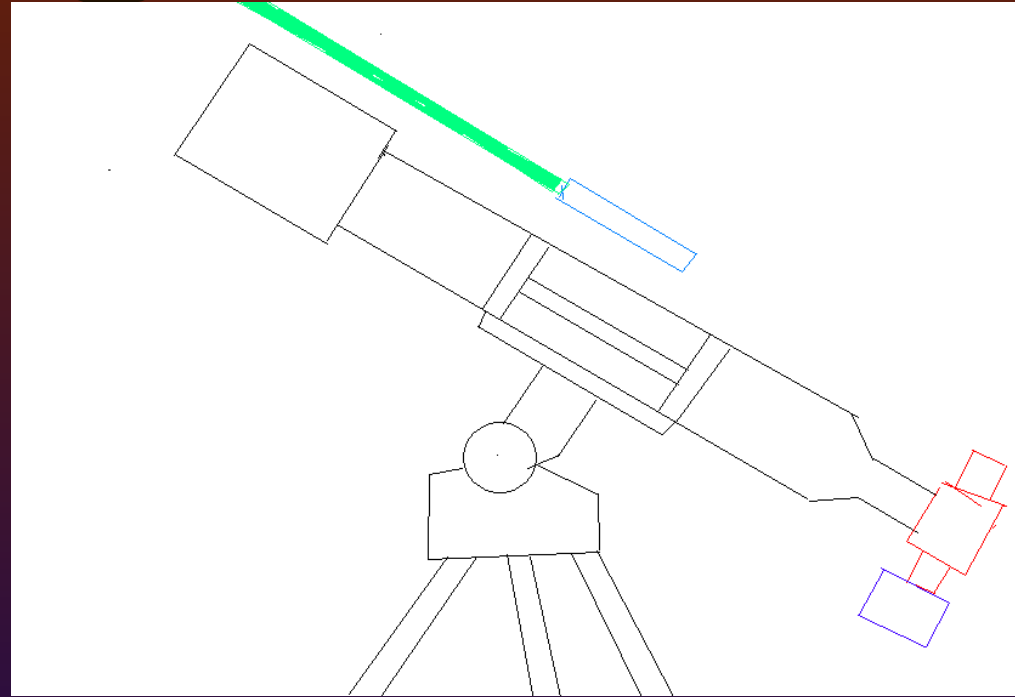
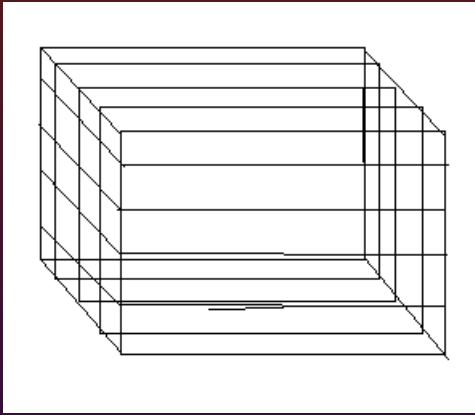
- ❖ Use powerful green laser pointer to direct people to the exact position on the western horizon
- ❖ Use Collimators to block unwanted light
- ❖ Use blue filter to reduce the twilight light and increase the contrast
- ❖ Use adaptive optical system guided by the laser spot

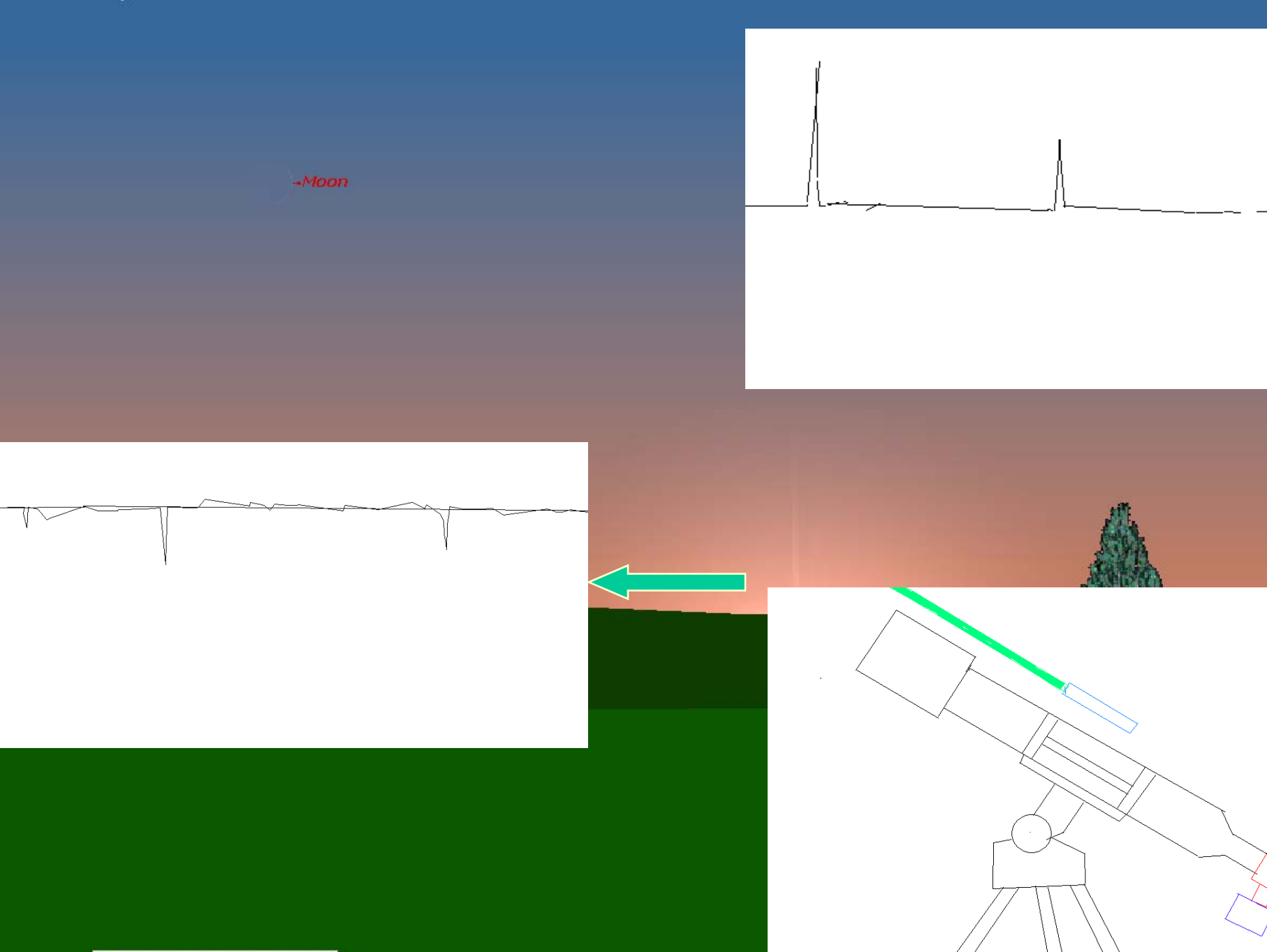


# Spectral Analysis

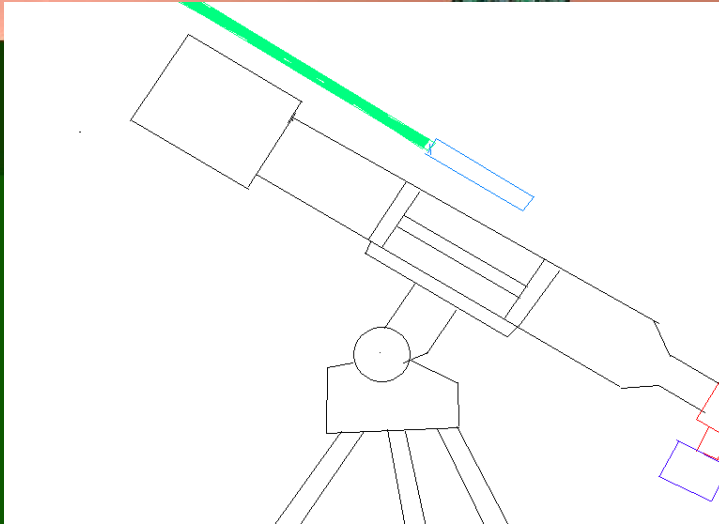
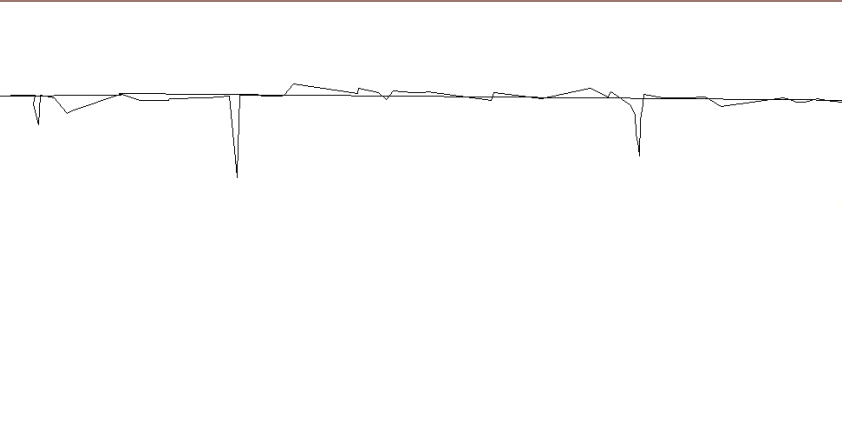
- ❖ Further improvement may be achieved through
  - ❖ Study the spectrum of the twilight light
  - ❖ Study the spectrum of the Crescent light
  - ❖ Look for any potential spectral window
  - ❖ Excite the atmospheric atoms by the additional lasers mounted in Doppler-driven mount
  - ❖ Restudy the spectrum light with the hope to find a new spectral window, if Yes then manufacture special filter to block most of the other wavelengths.

# The Designing Process





-Moon



# Limitation

- ❖ Laser range is limited
- ❖ Spectral window

