Laser Assisted Crescent Observation
(under-construction project)

Saleh Al-Shidhani
Physics Dept, SQU, OMAN
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
Limitation

- Laser range is limited
- Spectral window