OPTICS TRADE

Achromat Telescopes

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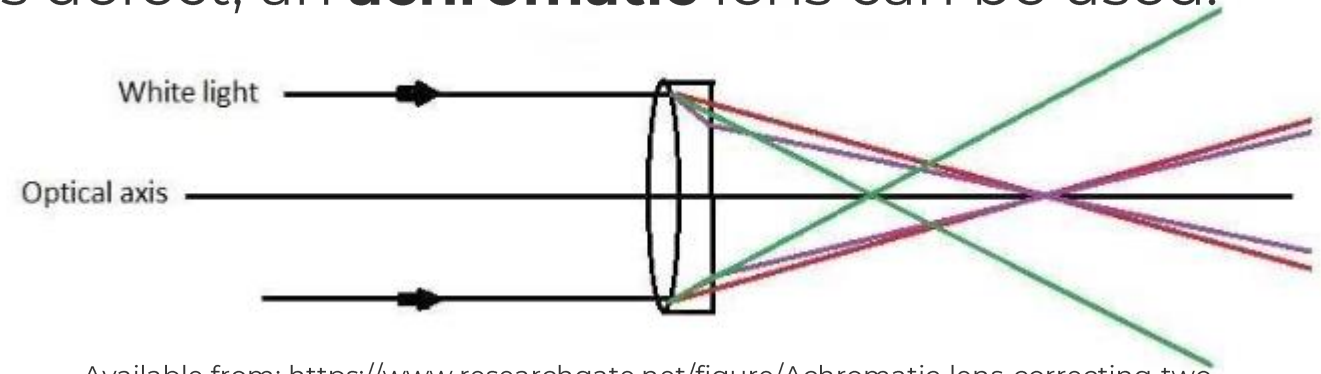
GENERAL FEATURES

- These are great telescopes → **affordable** price
- **Not** completely chromatic aberration-free → still provide good images of the **moon** and **planets**
- Usually quite small in size → very **portable**
- Achromat is a special lens used in a **refracting** telescope to correct **chromatic** and **spherical** aberration
- An achromatic lens has a unique design that helps two colors (red and blue) reach the same focus
- The problem occurs because the **green** color focuses on a **different point** → This is the reason why refracting telescope using the achromat lens is **not** utterly chromatic aberration-free

LIGHT PASSING THROUGH THE LENS

- With refracting telescope, light passes through a lens
- Visible light consists of different colors with a different **wavelength**
- When passing through a lens, each color focuses at a different point → seen as a **fringe of color** around bright objects
- To fight this defect, an **achromatic** lens can be used.



Available from: https://www.researchgate.net/figure/Achromatic-lens-correcting-two-wavelengths_fig3_321017277 [accessed 28 Oct, 2019]

ACHROMAT LENS

- An achromat lens is usually made of two components
- Each component is made of **different glass**:
  - one is **concave**,
  - and the other is **convex**.
- There is an **air gap** between them, or they are **cemented** together
- The concave glass has a **high** dispersion, while convex glass has **low** dispersion
- Together they bring red and blue light to the **same focus**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