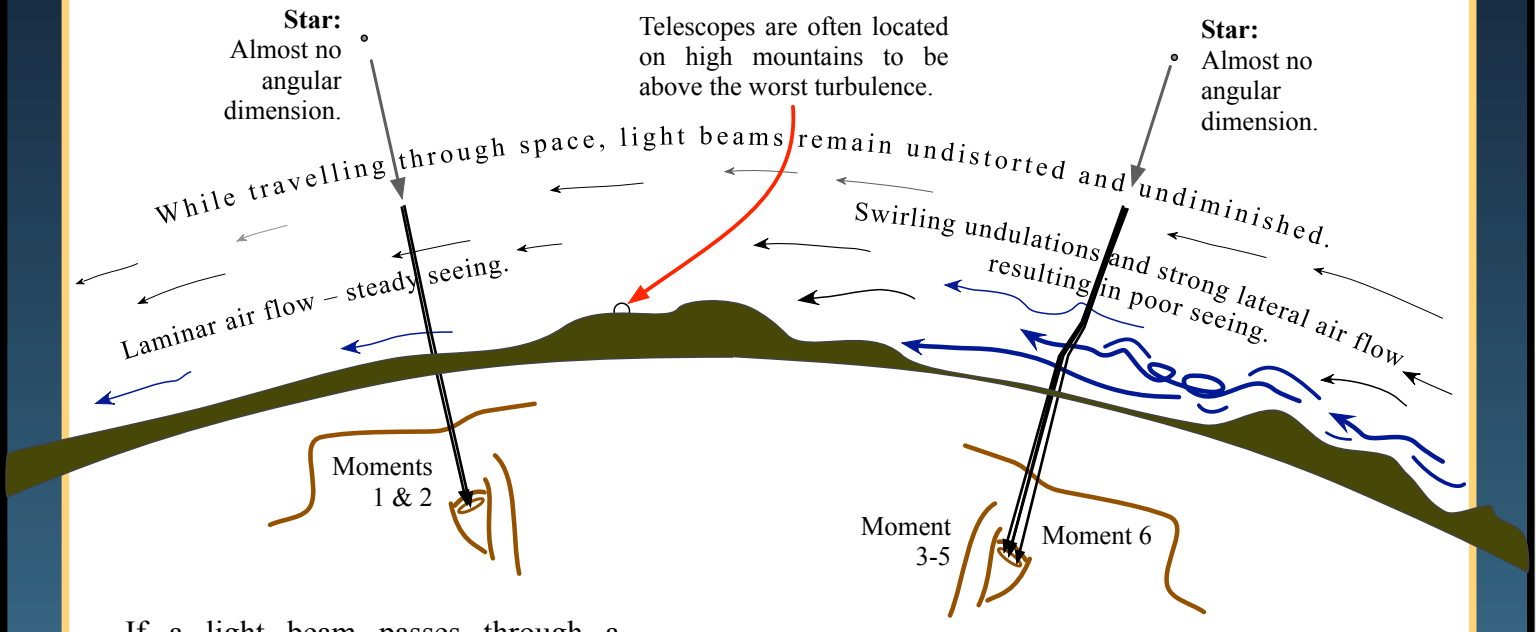
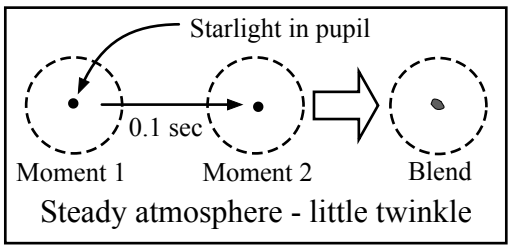
Why do stars twinkle?

Our planet's sometimes very turbulent atmosphere is the reason.

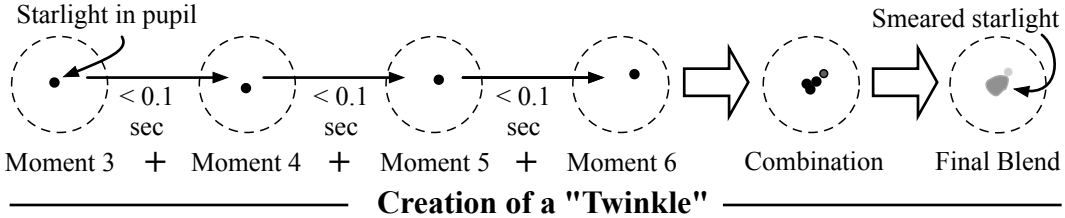
Twinkling is caused by light refracting through layers of turbulent atmosphere. The light path is slightly altered from moment to moment, resulting in the light beam slightly moving erratically when it enters the eye's pupil. The image, therefore, appears to "dance" slightly – i.e., twinkle. If no turbulence exists, the star's light path doesn't deviate, and the star doesn't twinkle. The seeing is then said to be excellent.



If a light beam passes through a steady atmosphere, little to no twinkle will be seen.



A light beam passes through turbulent atmospheric layers of varying densities, taking a slightly different path each moment. At moments 3, 4, and 5, the beam strikes close to the pupil's center, while at moment 6, it dances off to the side. The blended star's brightness, therefore, briefly diminishes. The erractic jumping of the beam is a continuous process requiring less than 0.1 seconds to notice a twinkle.



Planets don't twinkle under typical atmospheric conditions. Unlike the pinpoint of stars, planets exhibit a small angular area, which is large enough to overcome many typical distortions. However, if the atmosphere is turbulent enough, they can twinkle also.

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