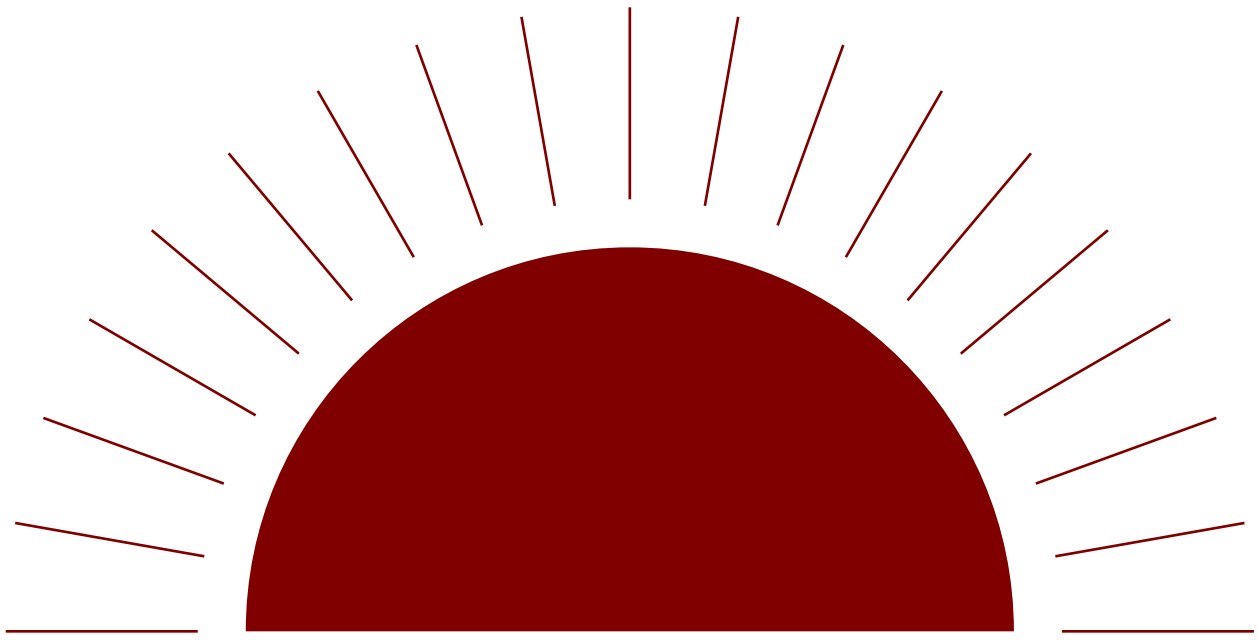
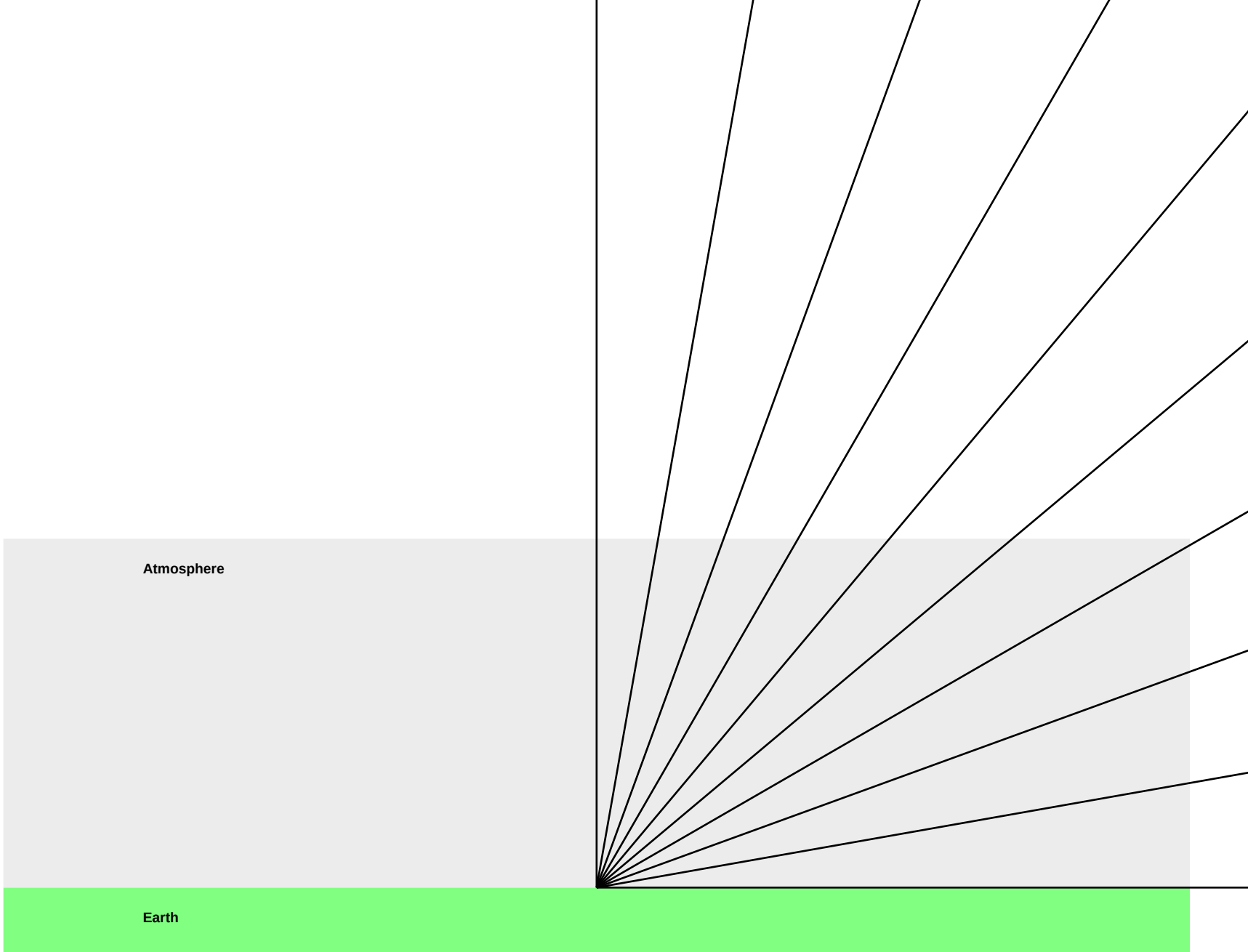


"Red Sky at night, sailor’s delight"

Why a sunset makes the horizon red as it sets.

David McLean
54047022

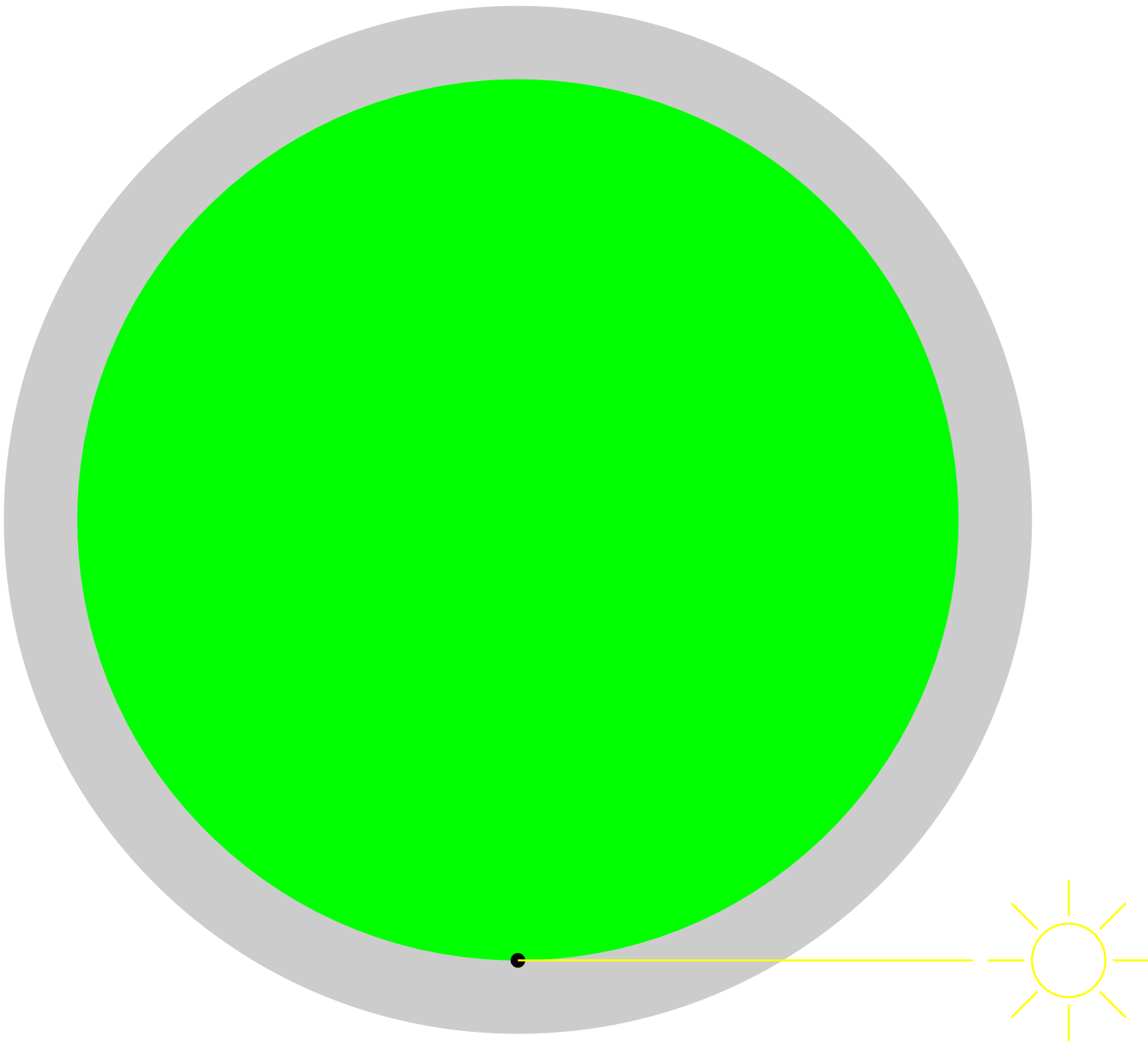


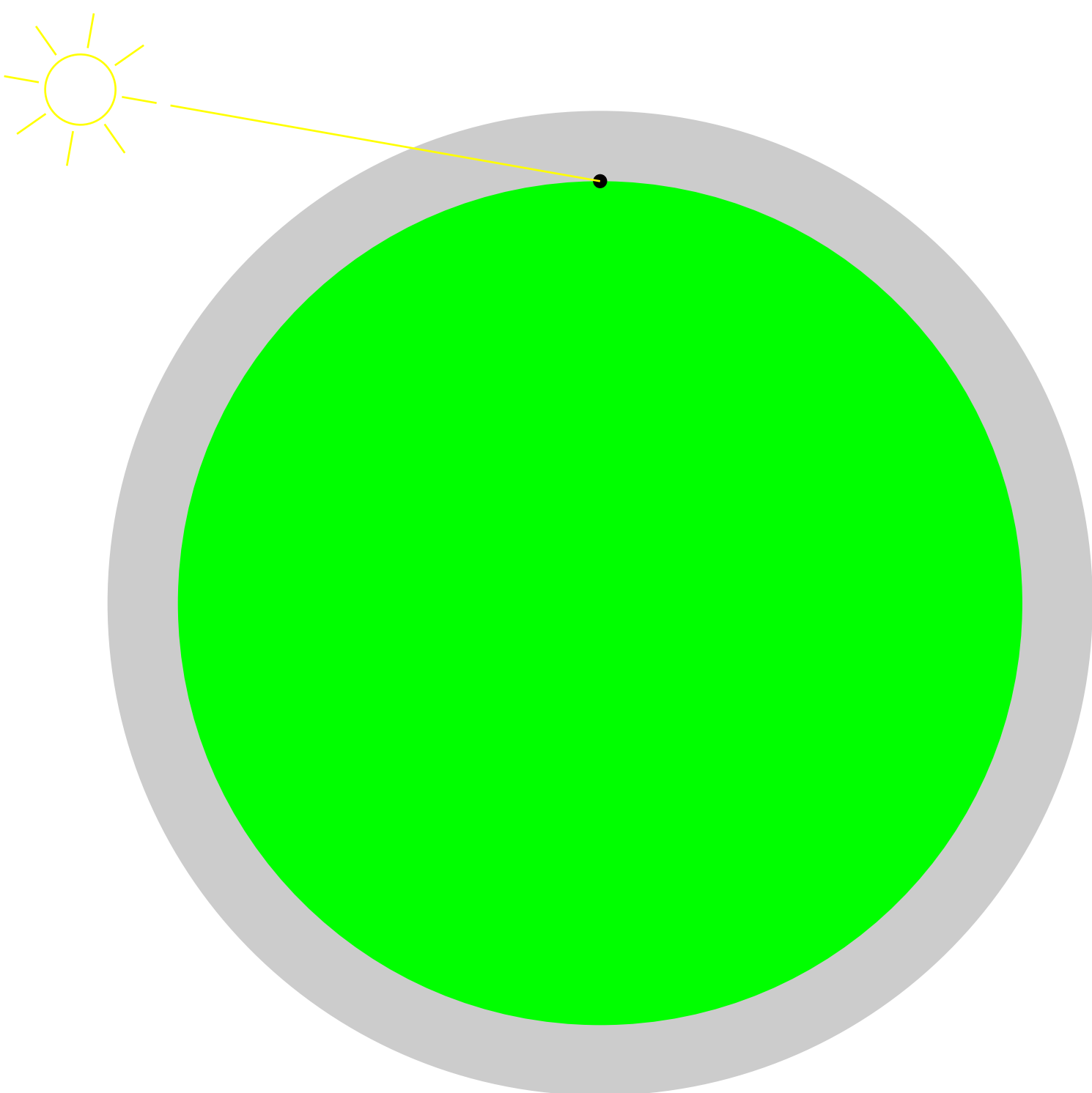
The sun’s rays have the least amount of distance to travel to reach the surface of the Earth during the afternoon hours.

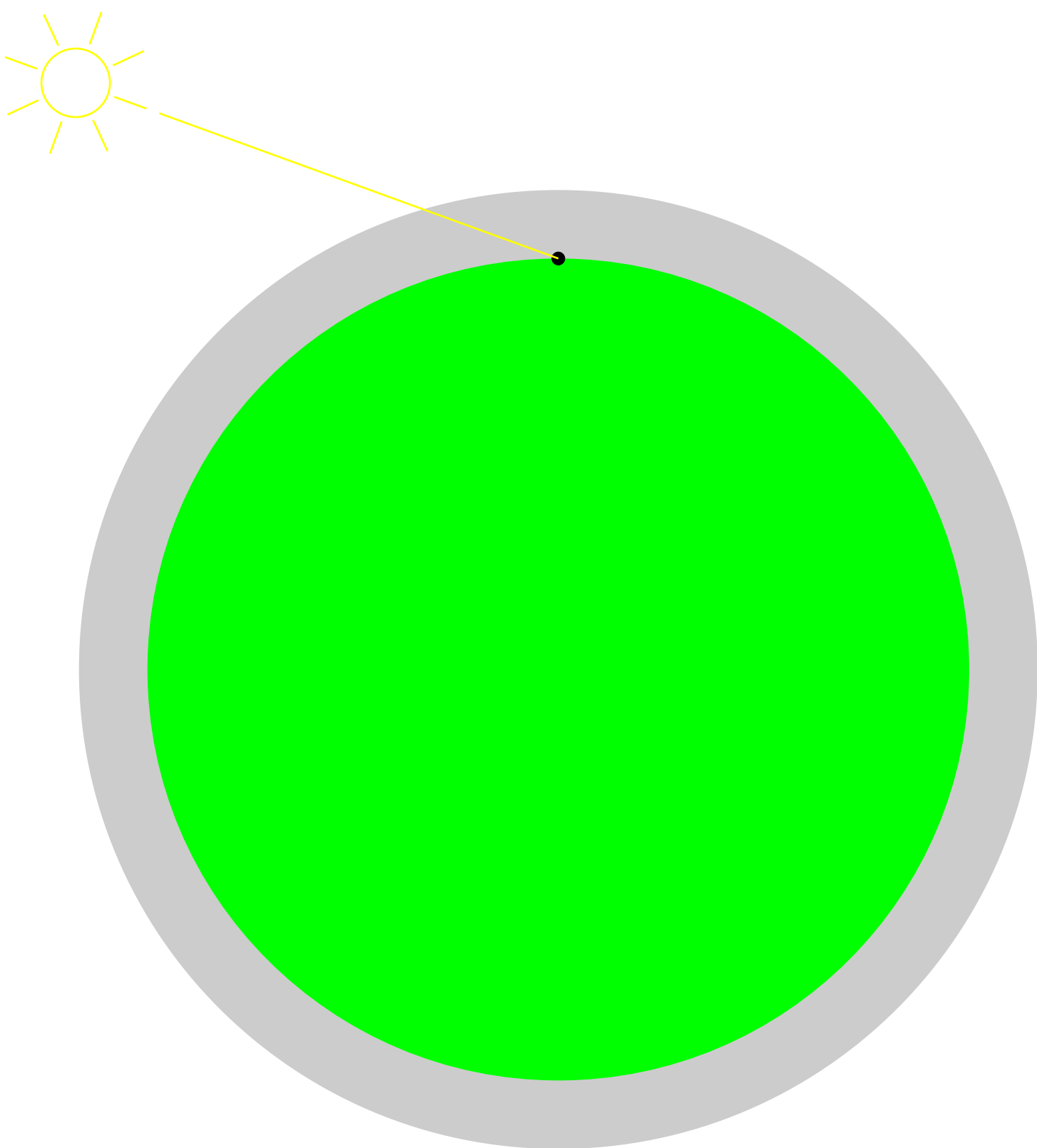
As the sun sets (and rises too!) the pathlength of the rays increase.

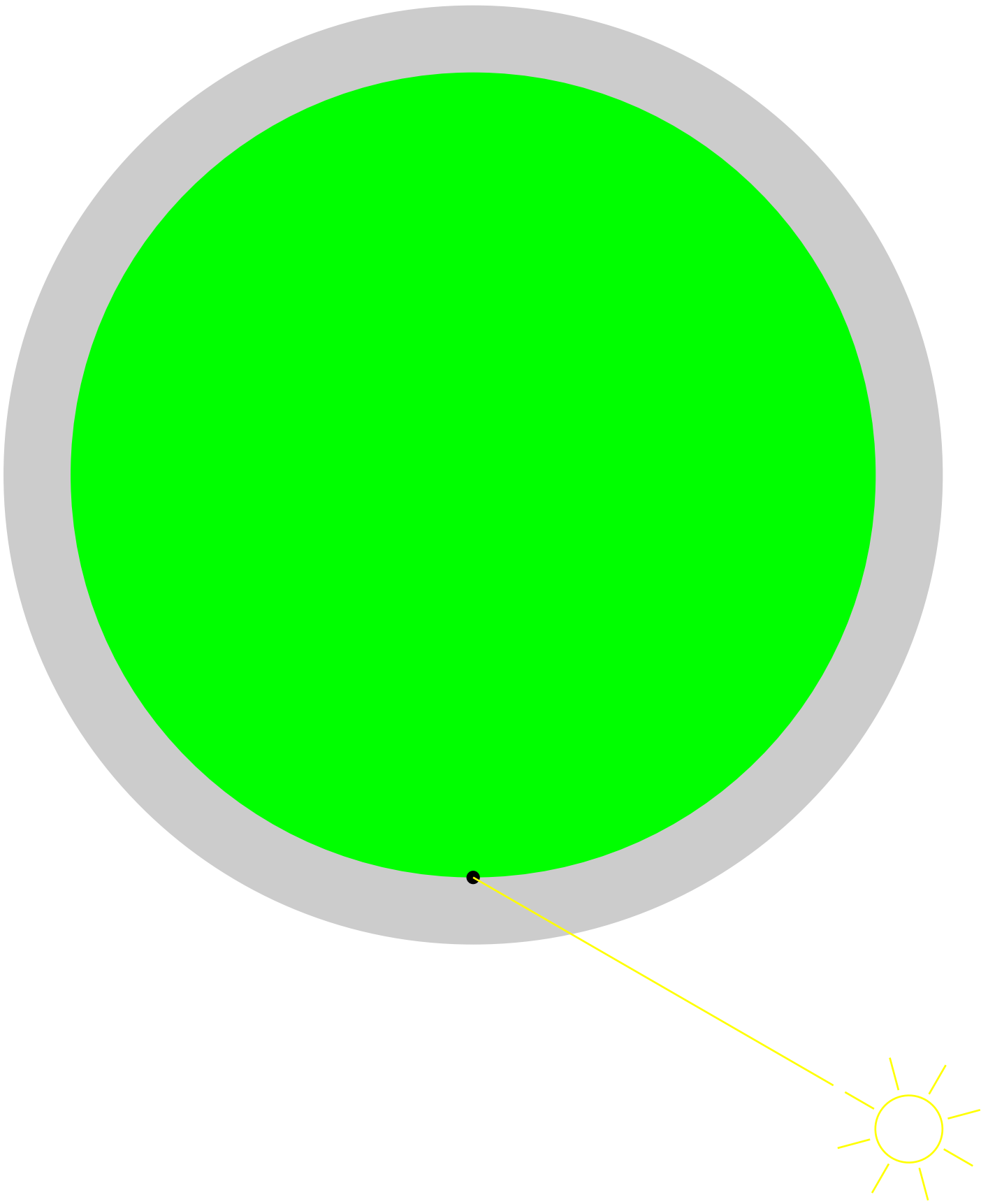
This increase in pathlength means more atmosphere to travel through.

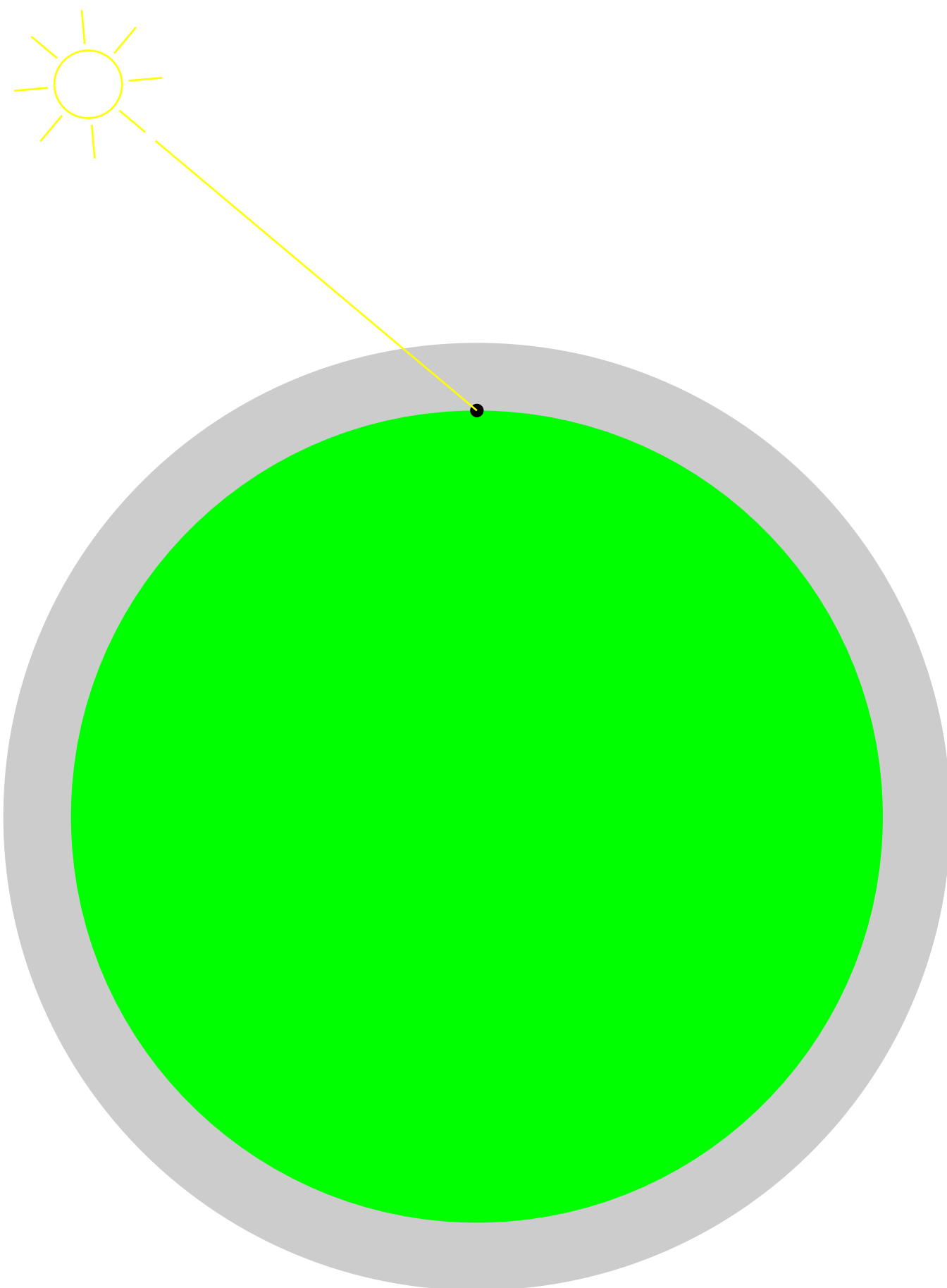
Longer pathlength = more interaction with atmospheric particles.

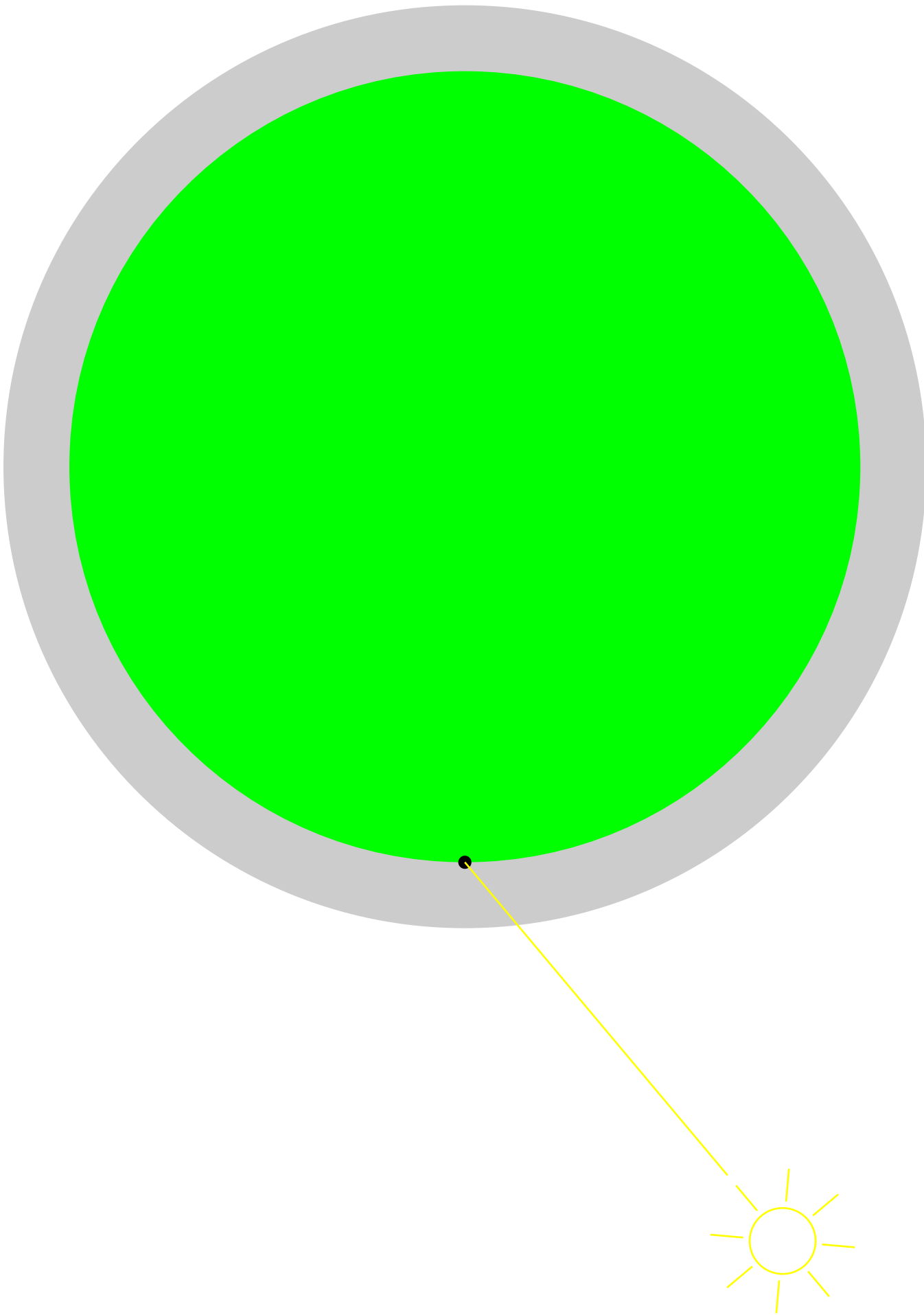


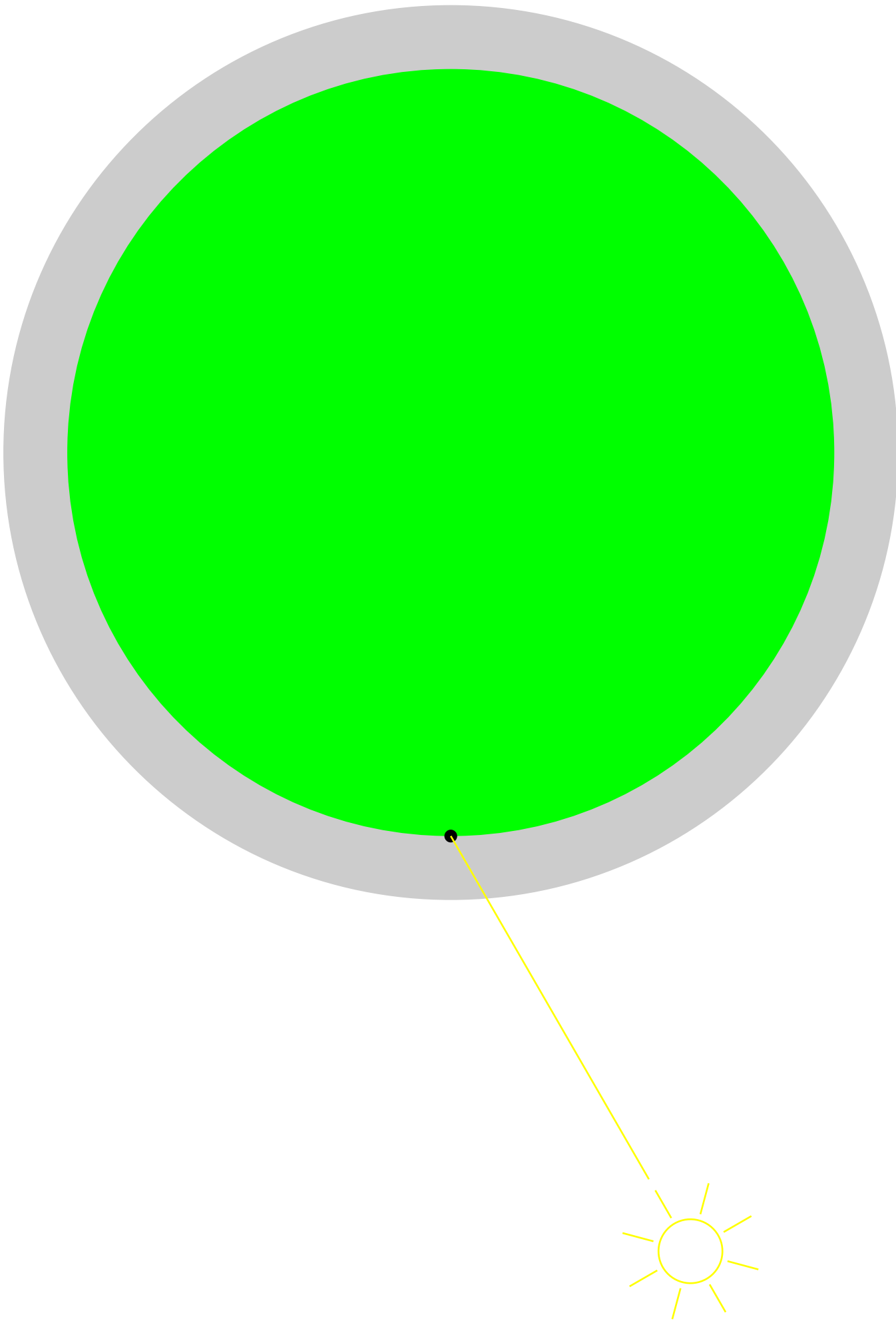


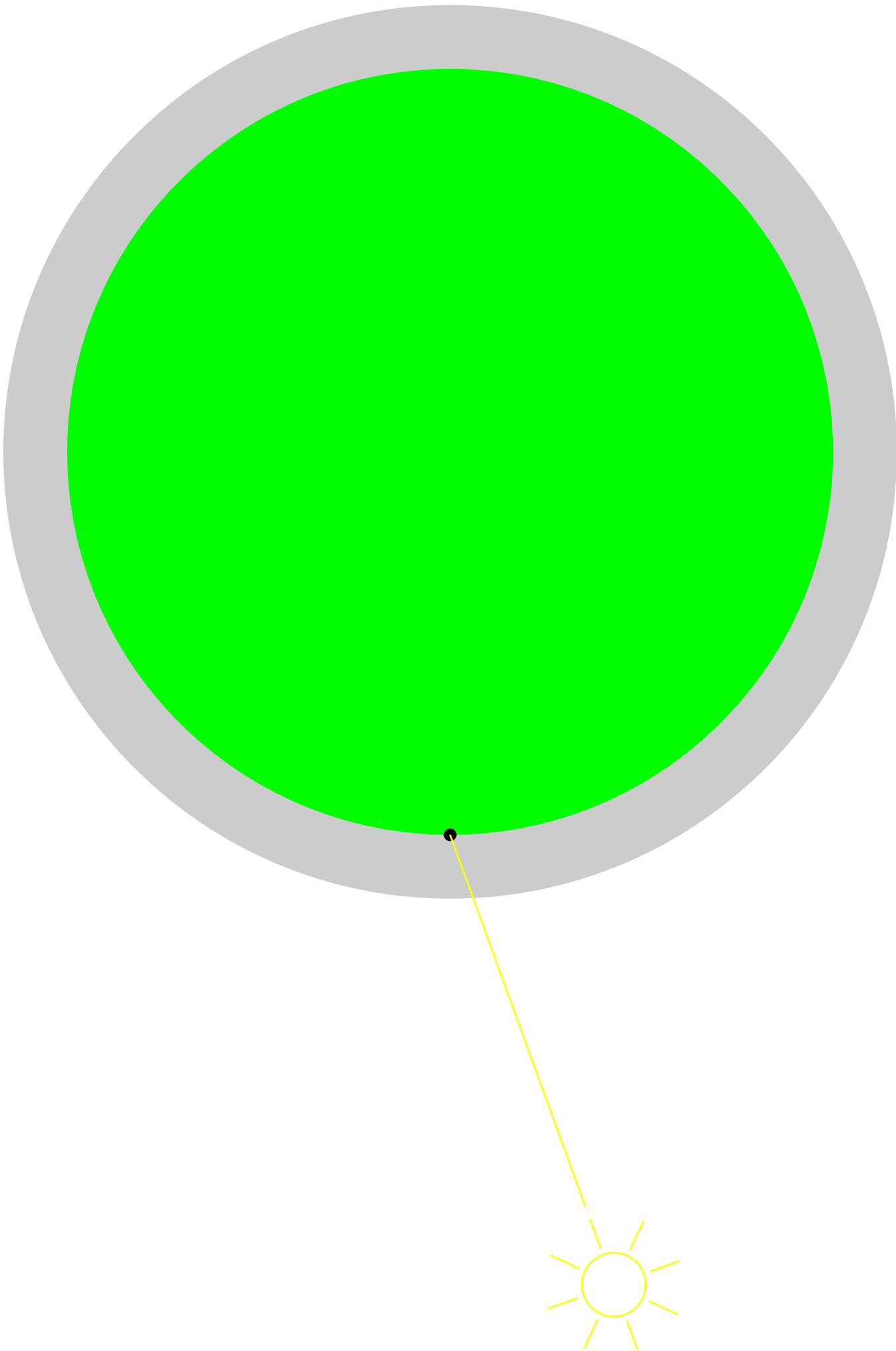


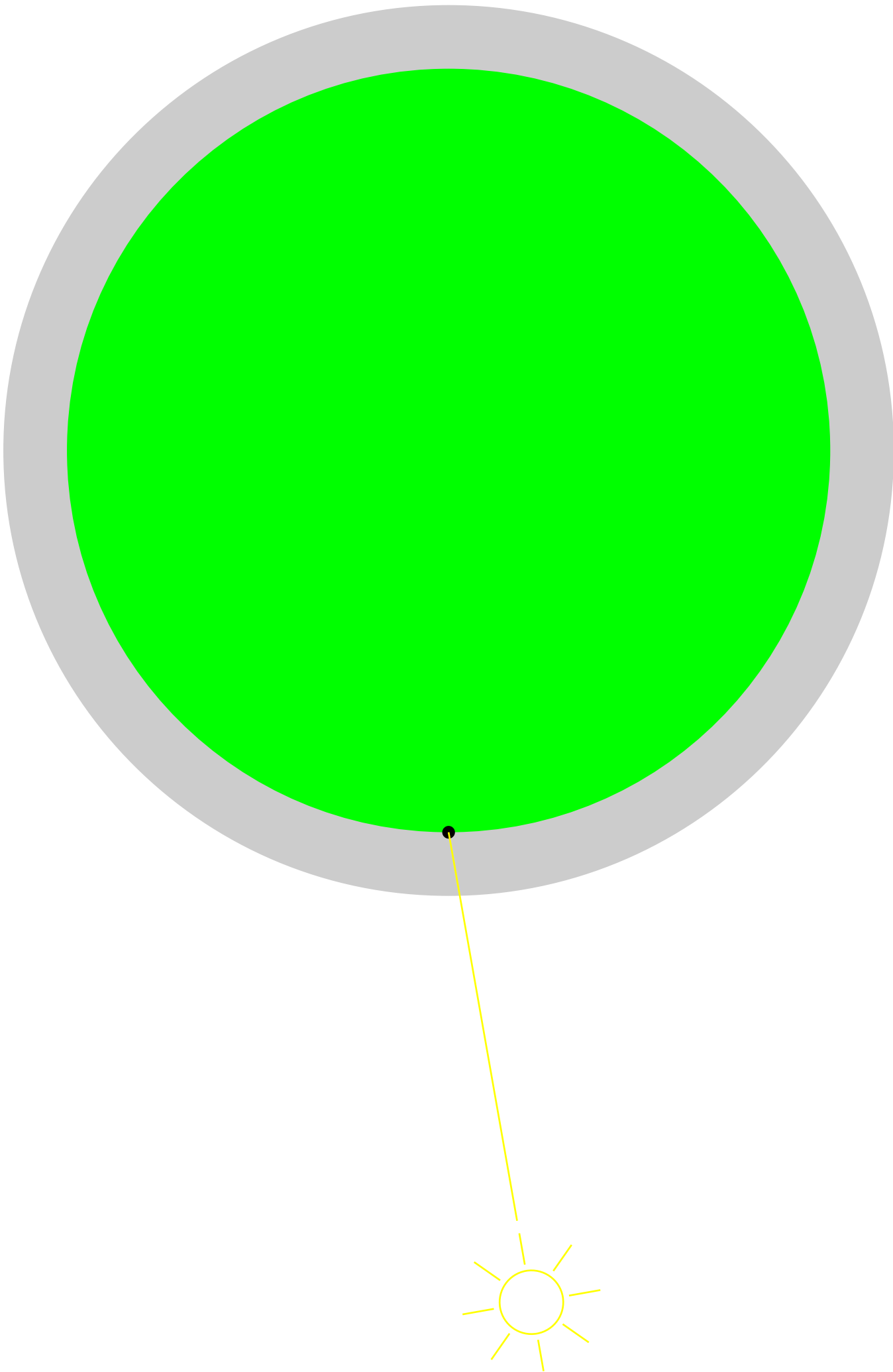


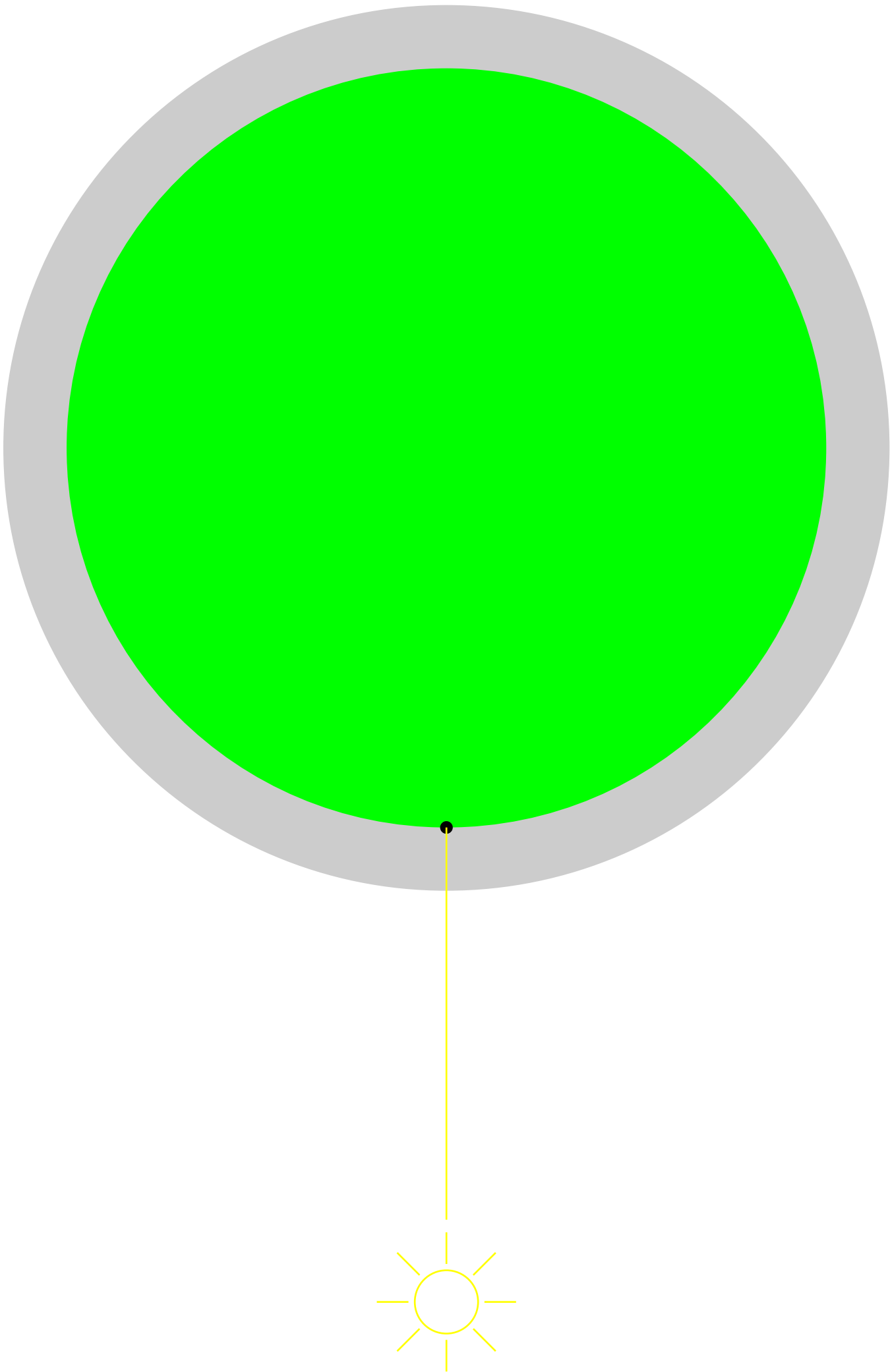


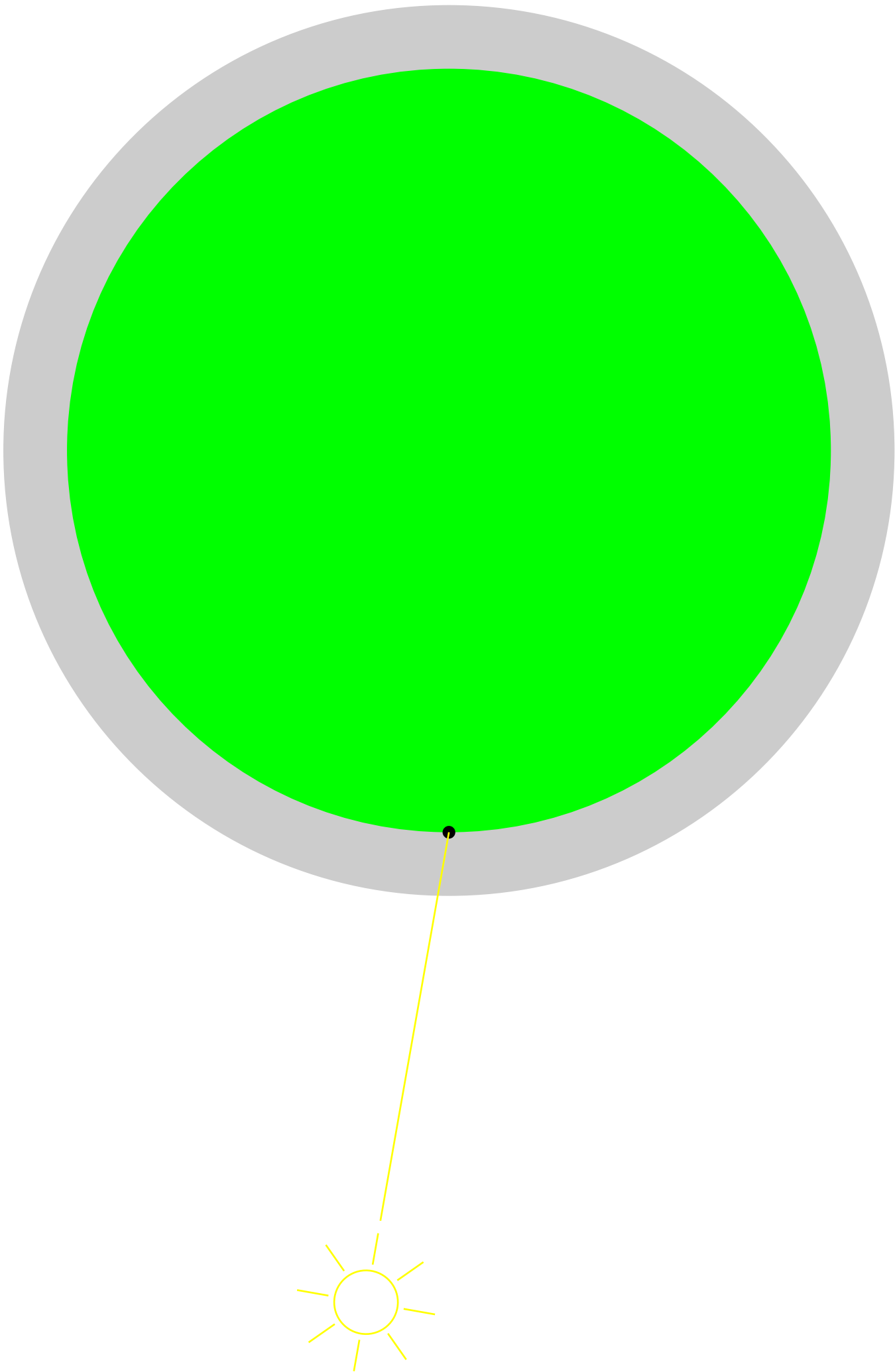


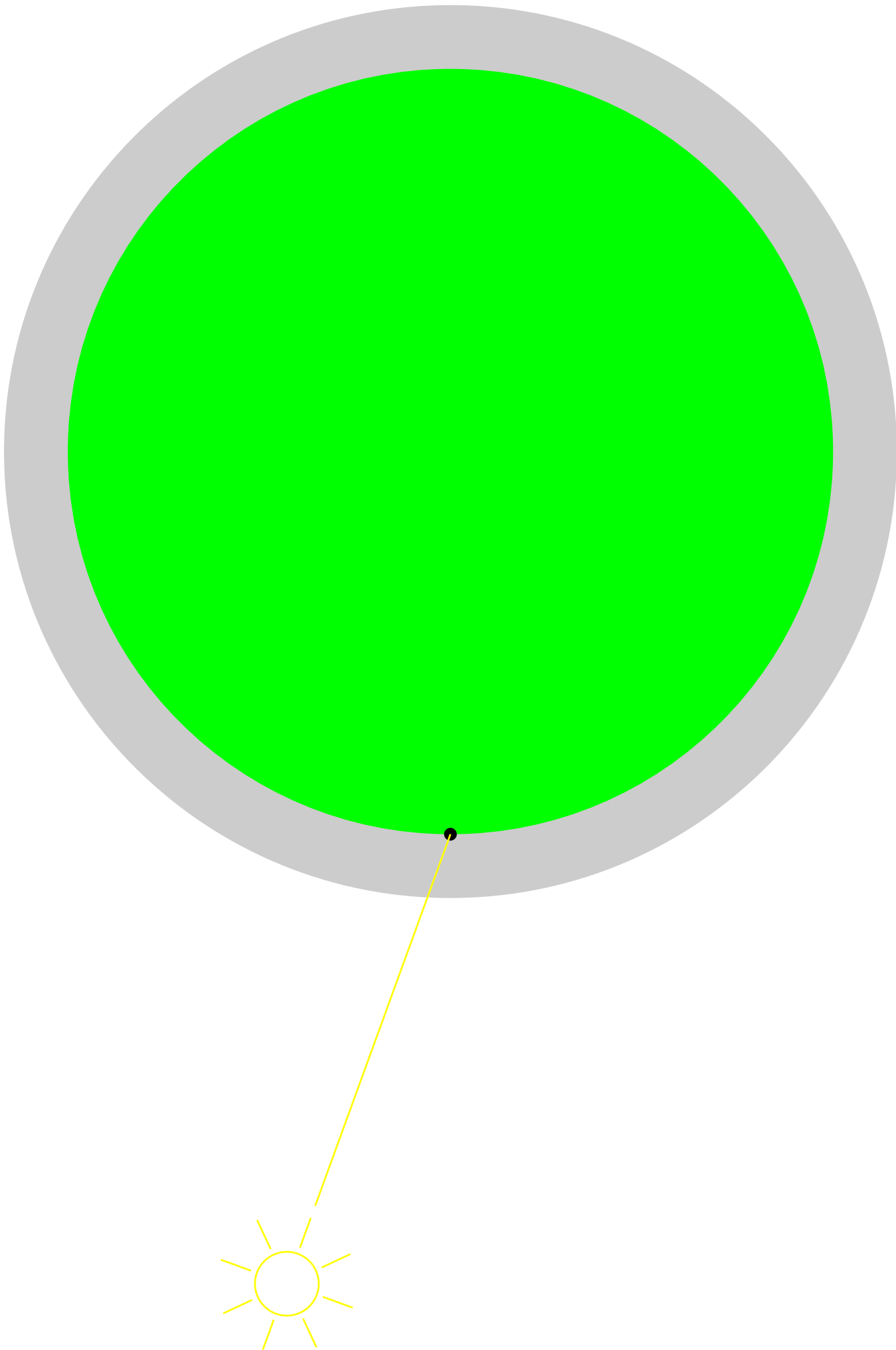


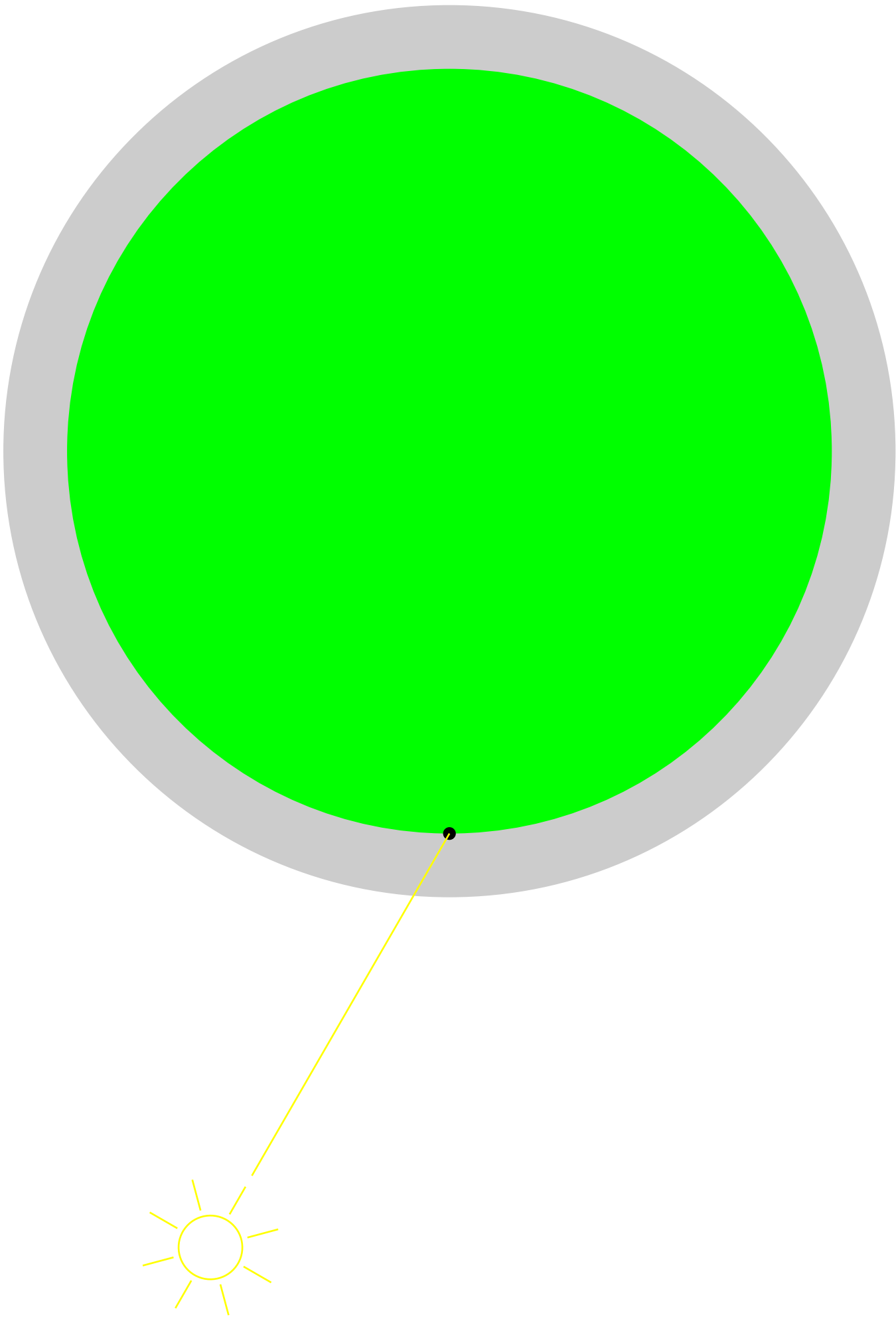


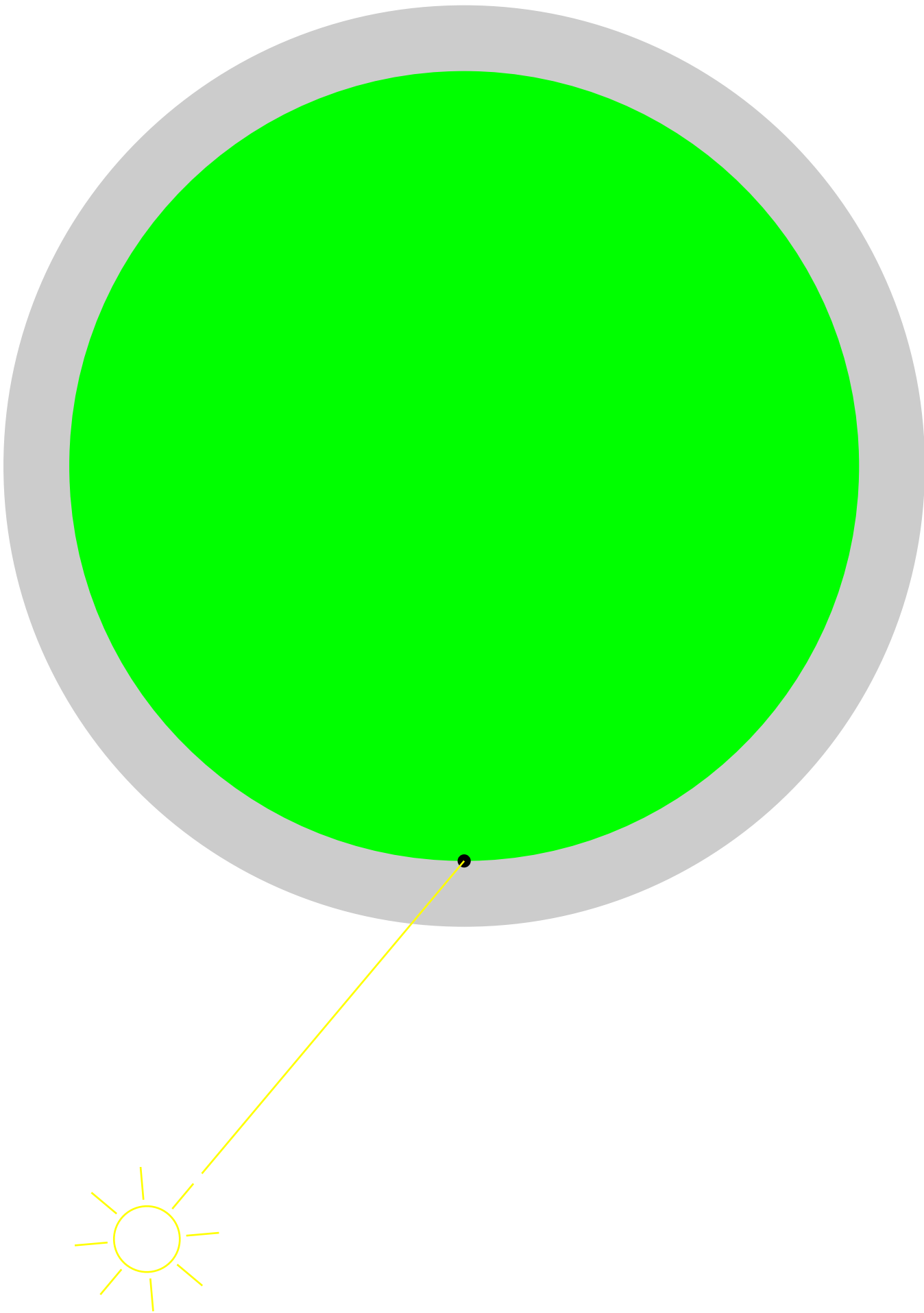


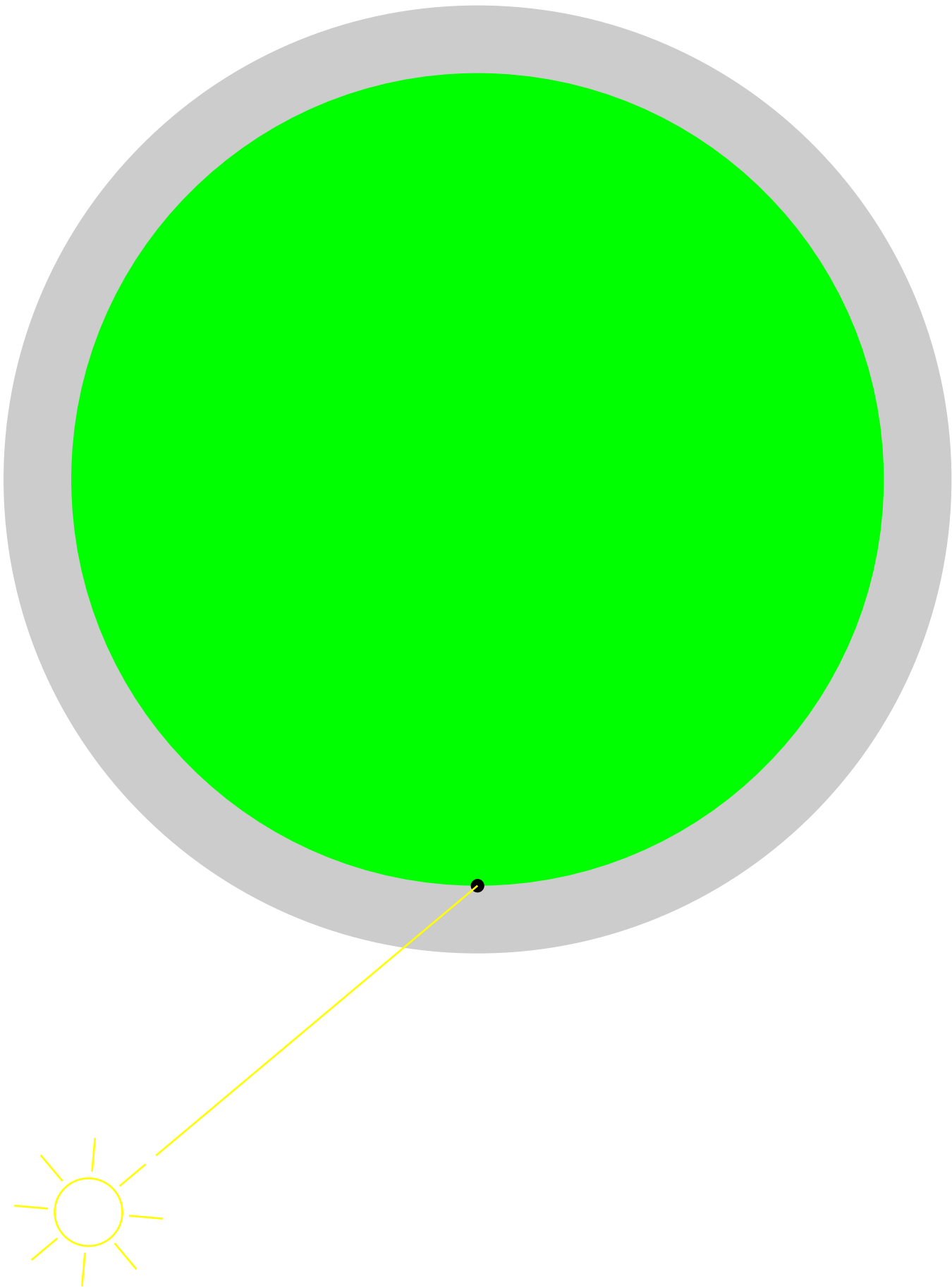


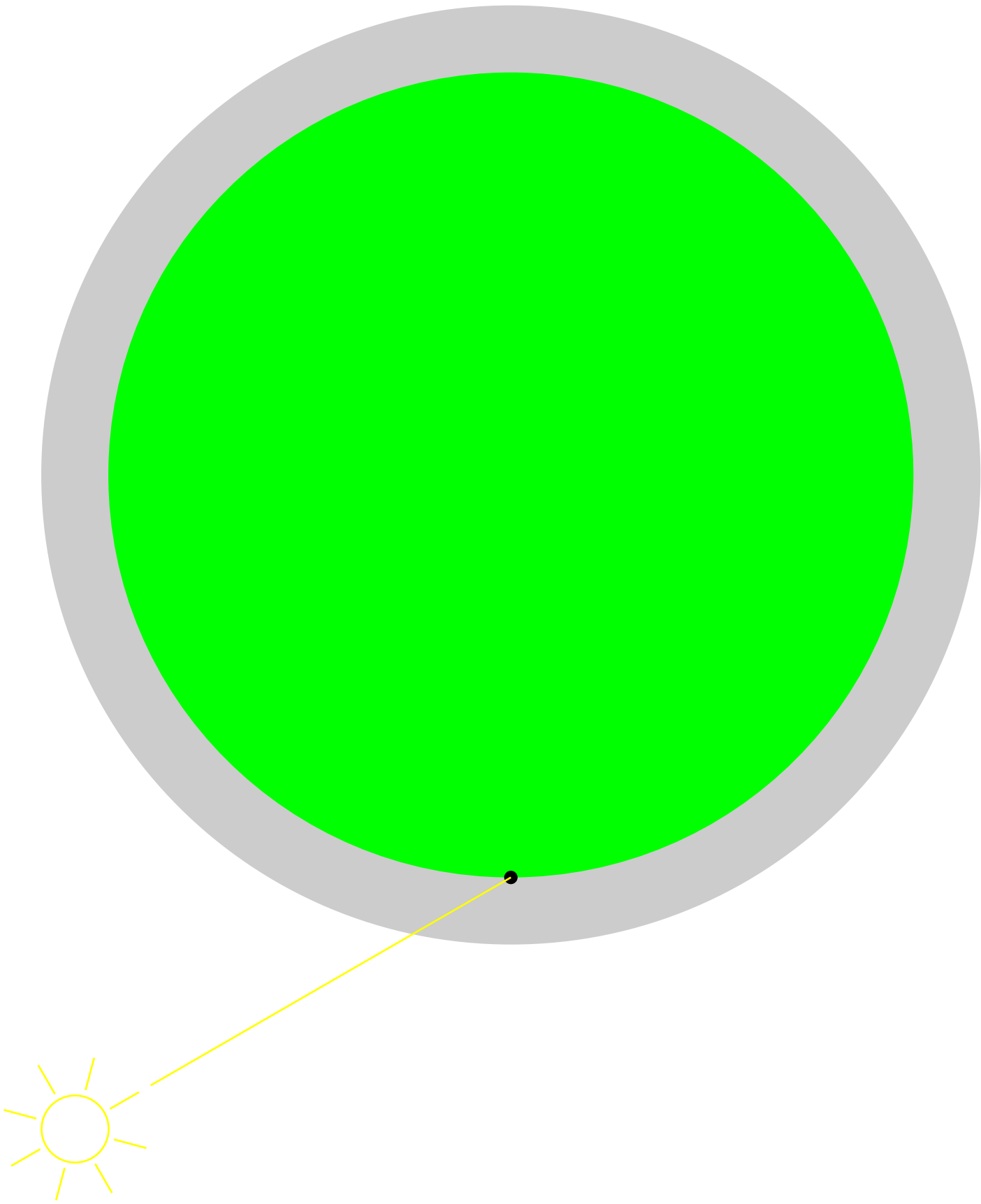


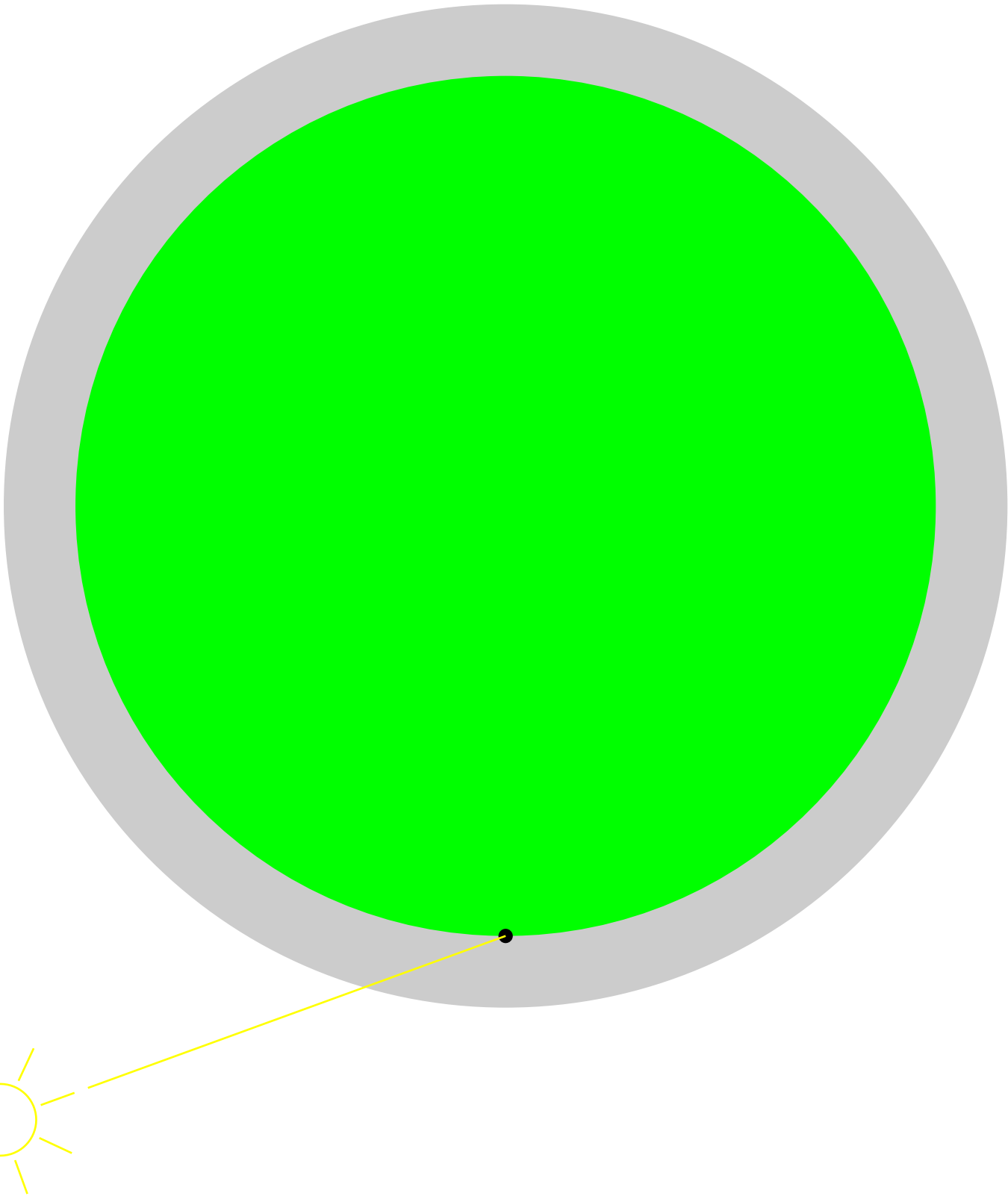


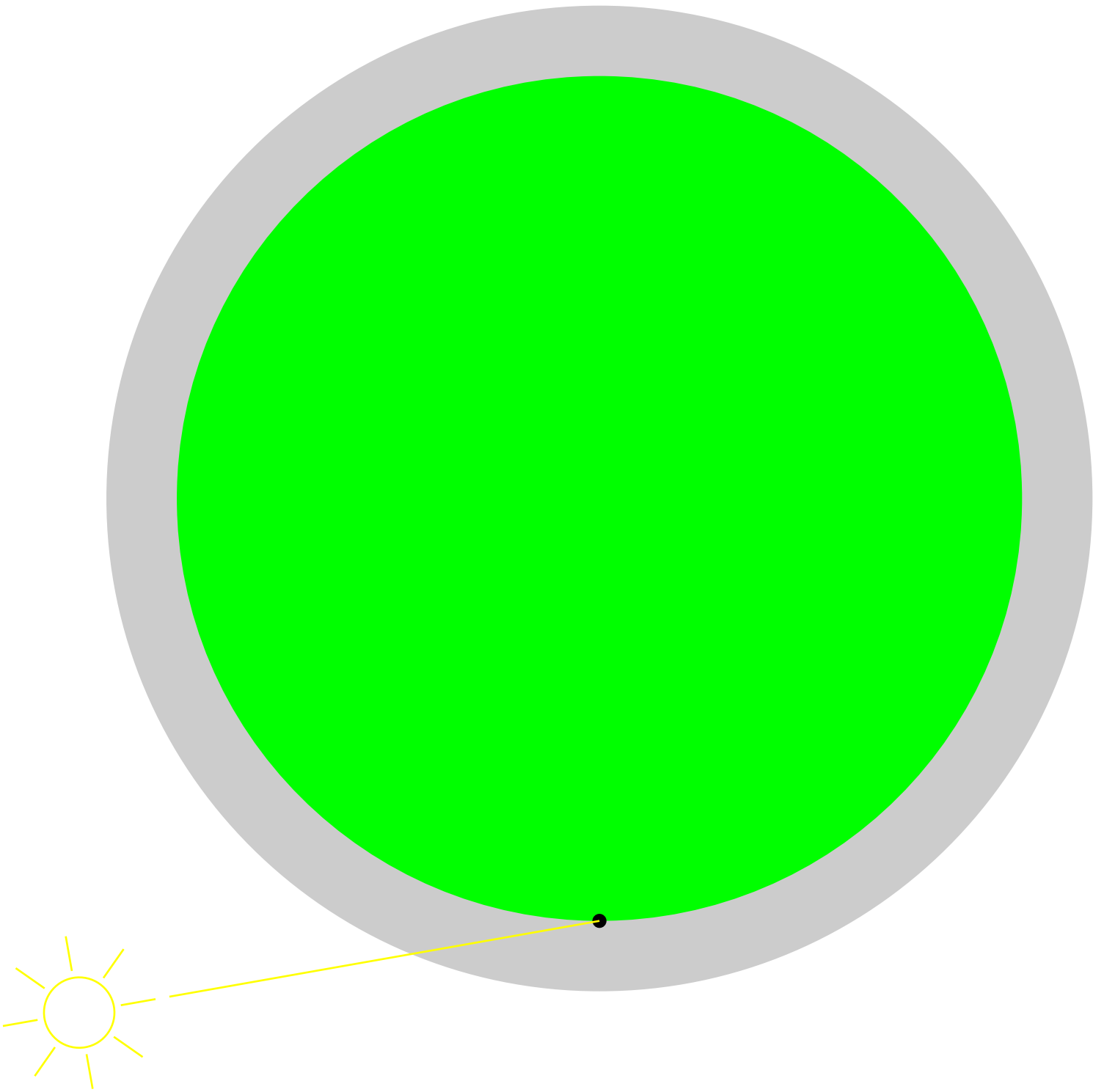


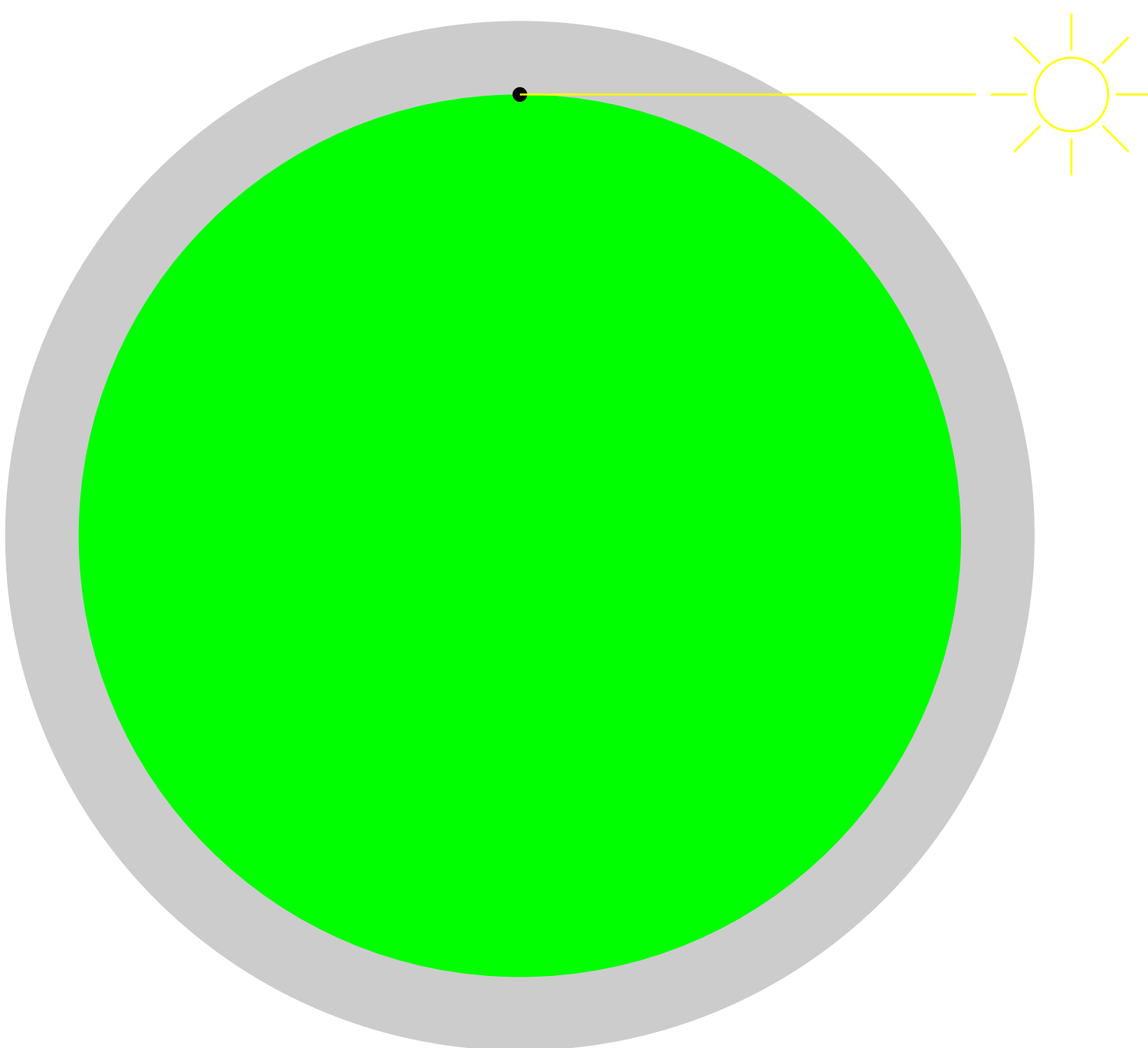










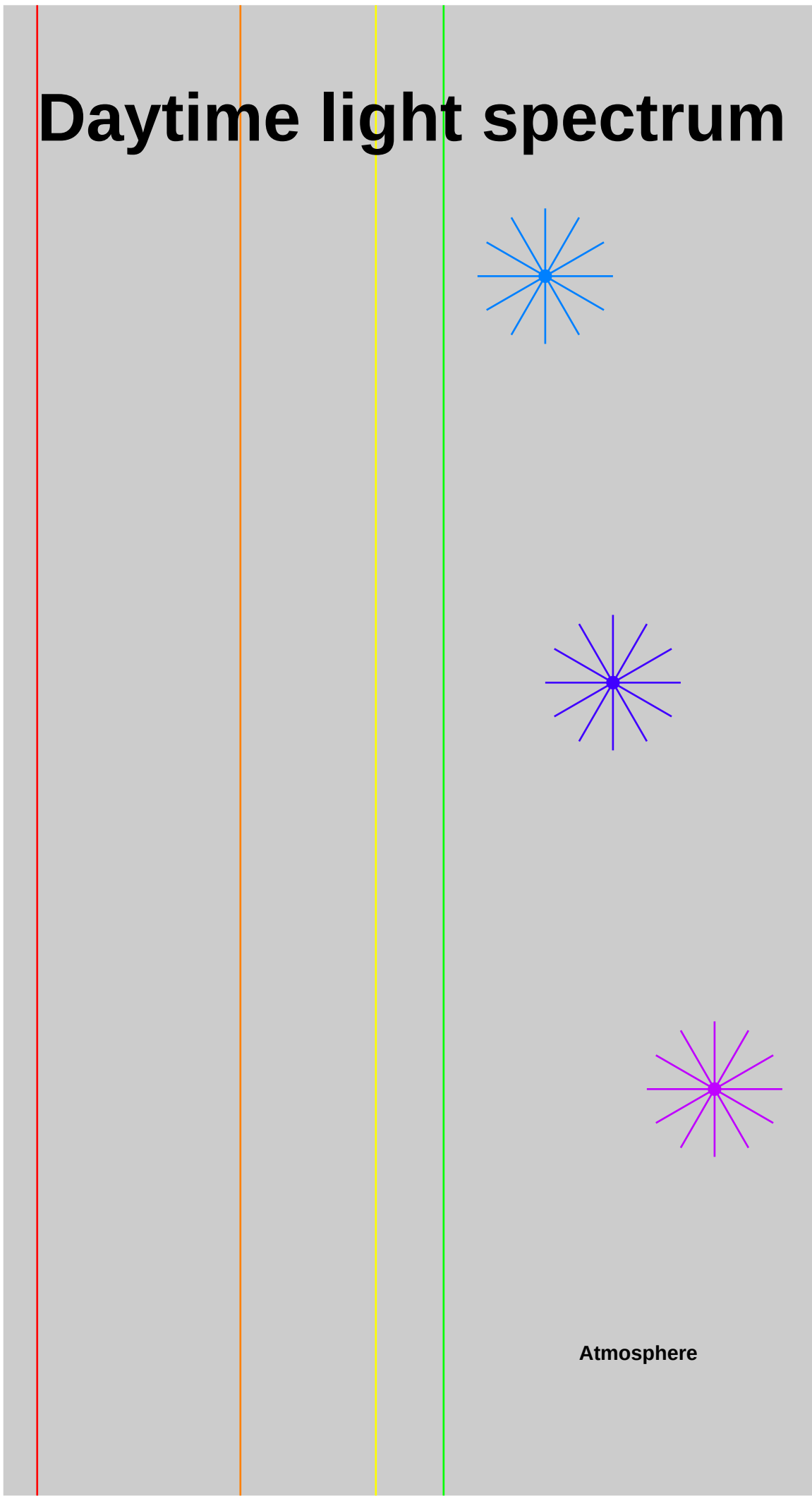


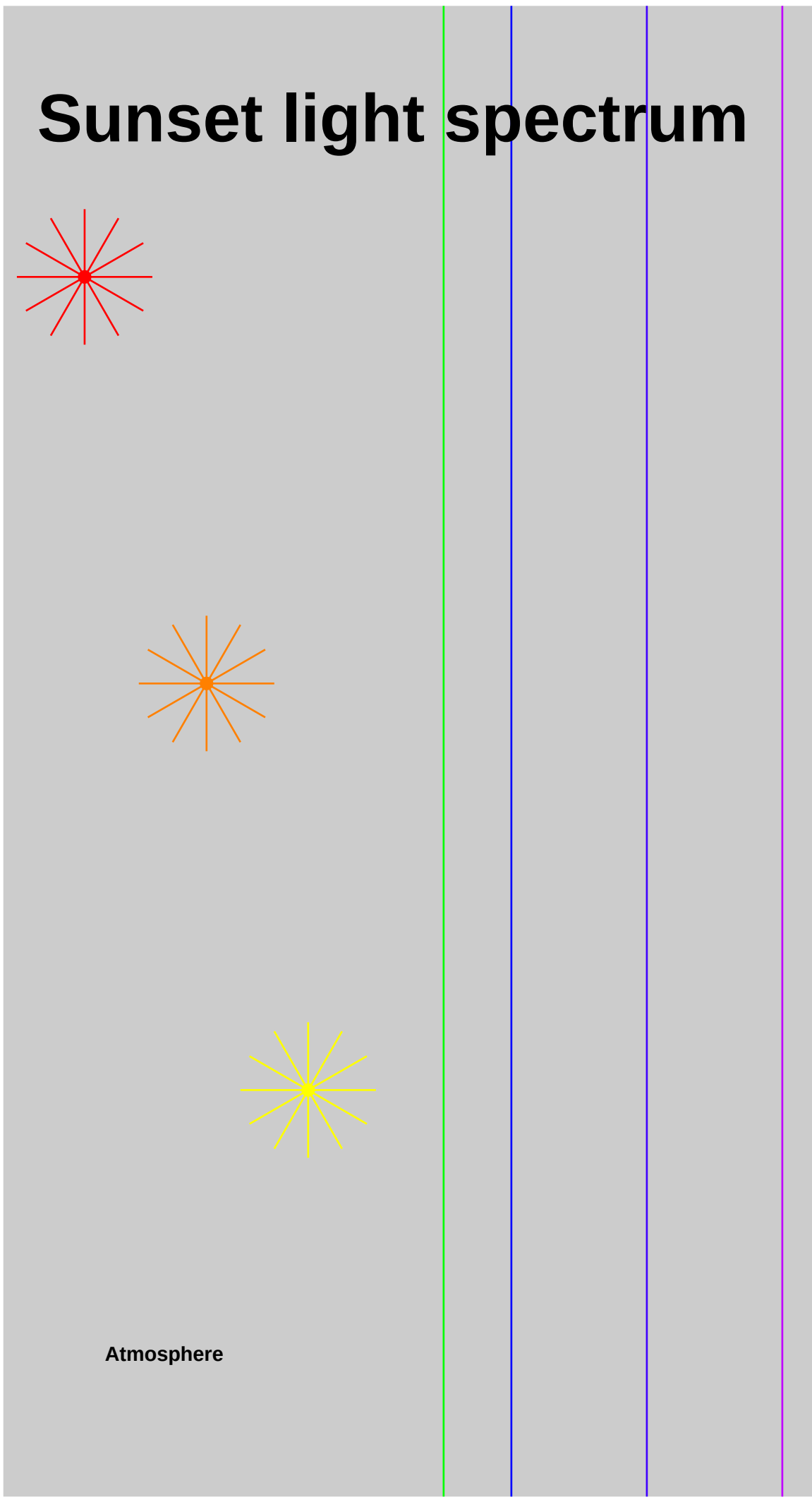
So....does that mean there is only scattering at sunrise and sunset?

NO!

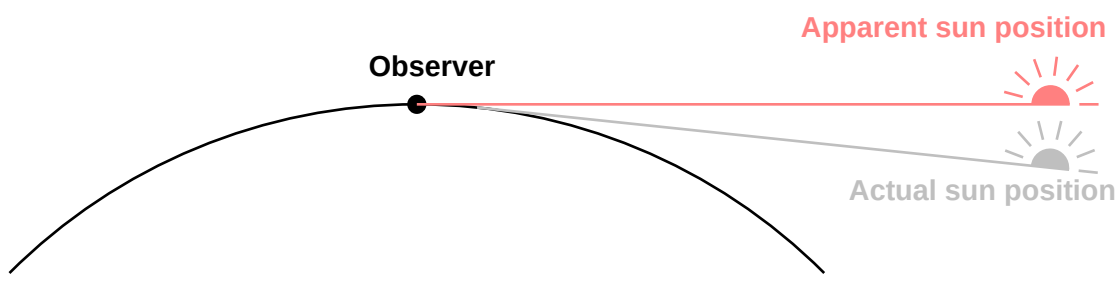
Actually, scattering always occurs. Its just that the BIV (Blue, Indigo, Violet) wavelengths scatter for shorter pathlengths, and the ROY (Red, Orange, Yellow) wavelengths scatter at longer pathlengths. That is why the sky is bluish during the day, and redish (or orangish) at sun rise and sun set.

The cause of this scatter is oxygen, nitrogen and water vapour in the atmosphere. The presence of pollutants play a role too. Sulphur aerosols in the atmosphere can make some magnificent sunsets.


Daytime light spectrum
Atmosphere


Sunset light spectrum
Atmosphere

Another reason for a red sunset.....



The bending of light!

As the pathlength gets longer and the light travels through more thicker air, it bends due to refraction.

The light from the sun bends approximately 0.6 degrees. This means that the sun has already set, and that it is just over one sun diameter below the horizon when we see the end of the sunset.

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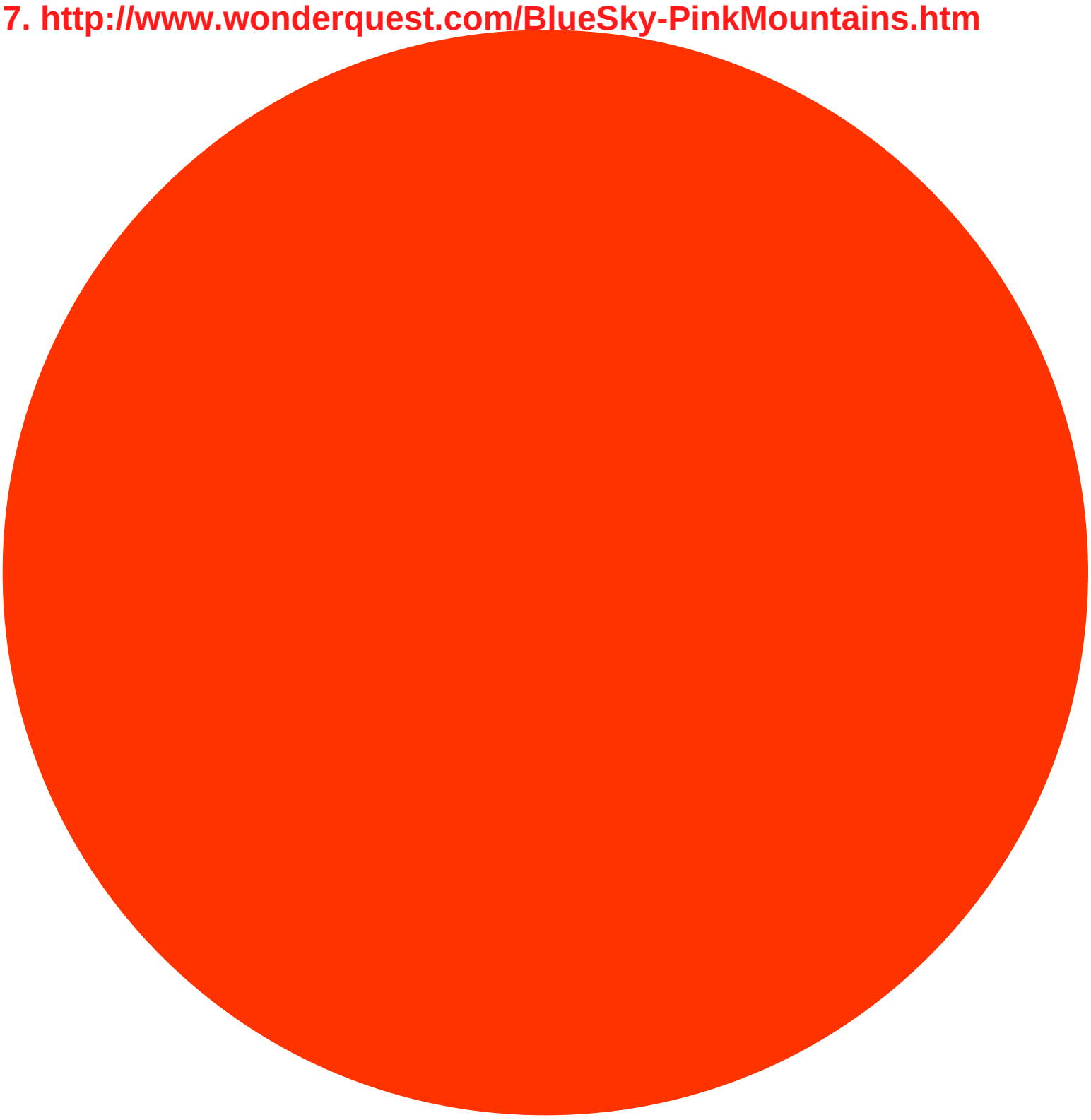

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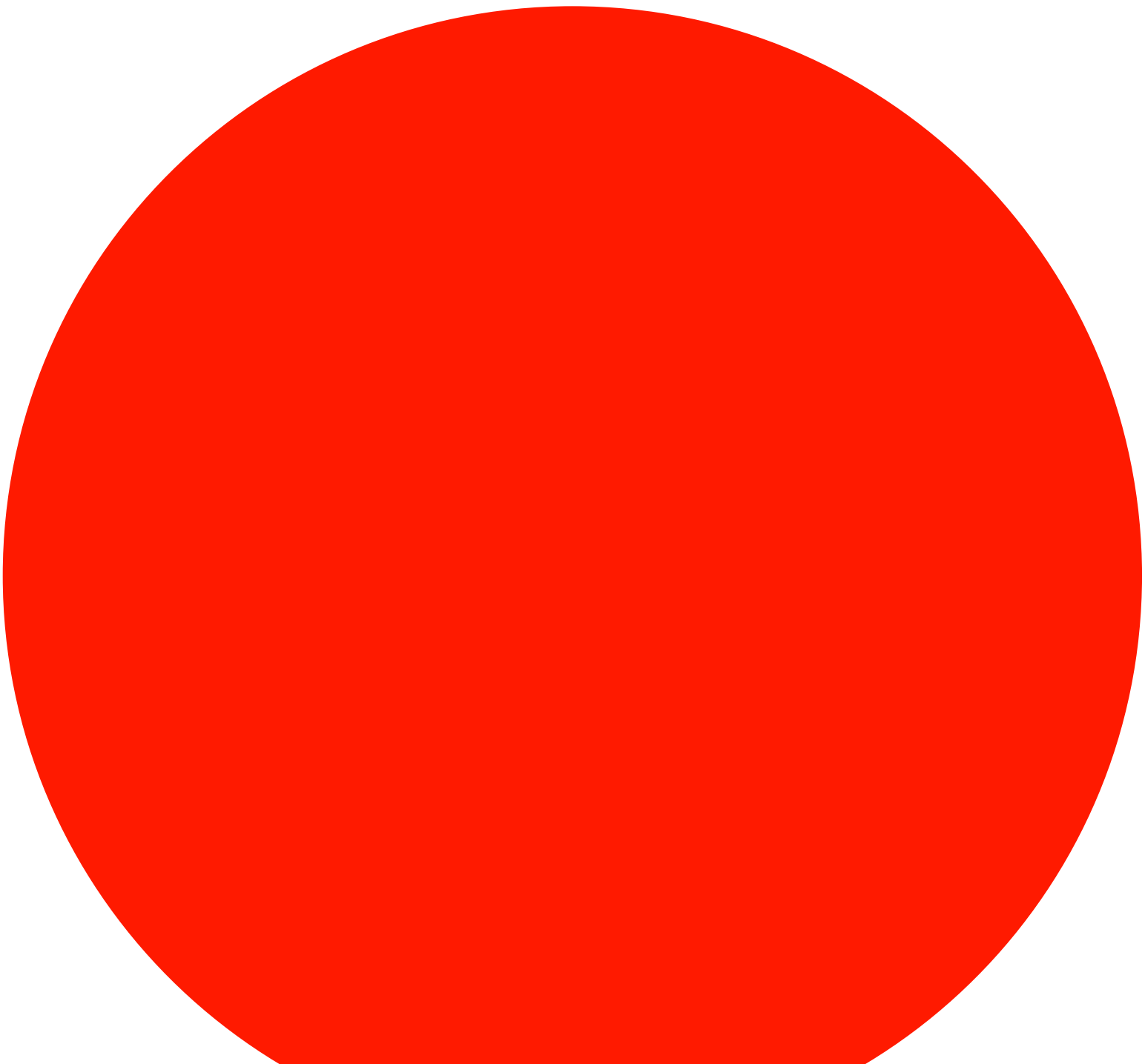

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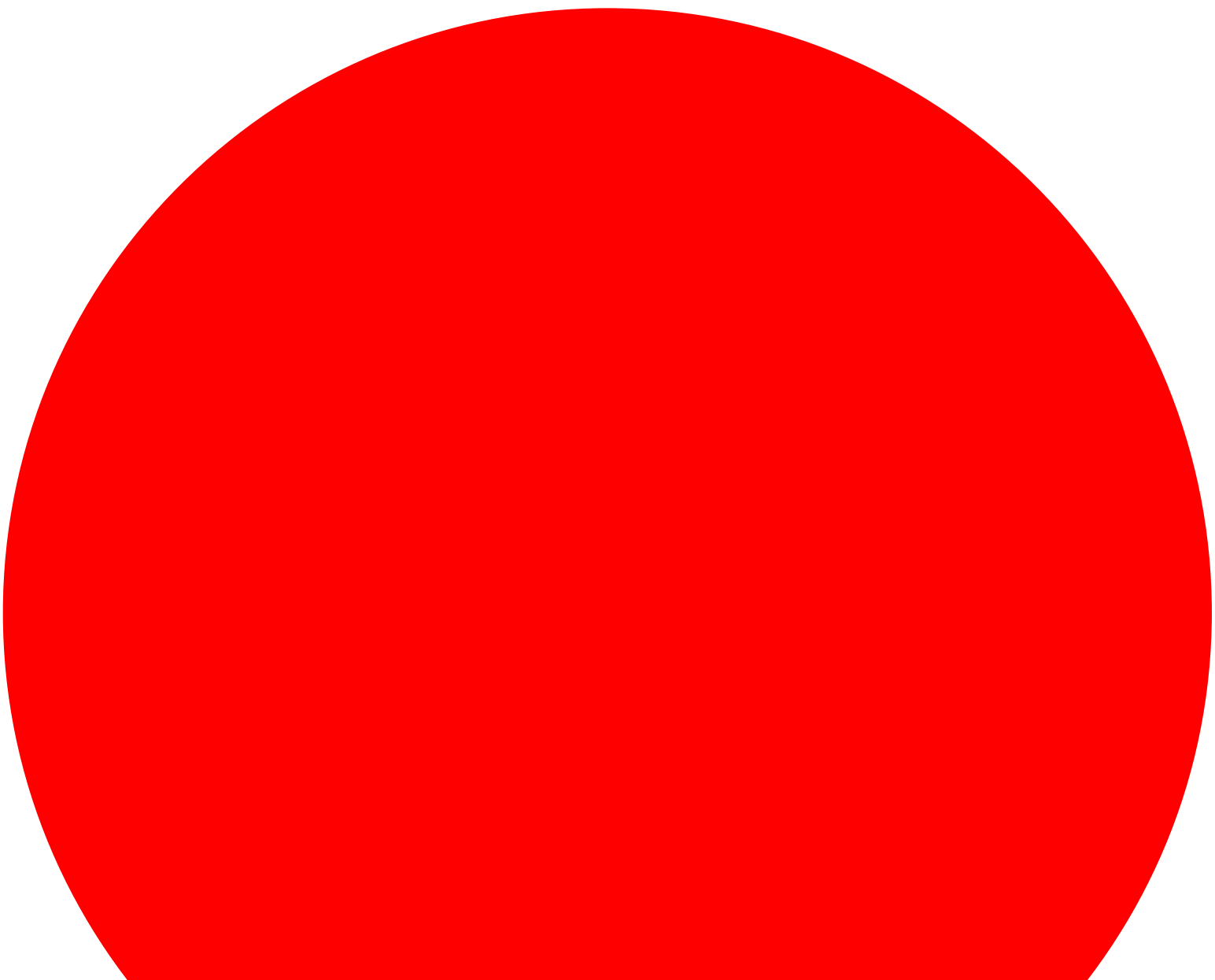

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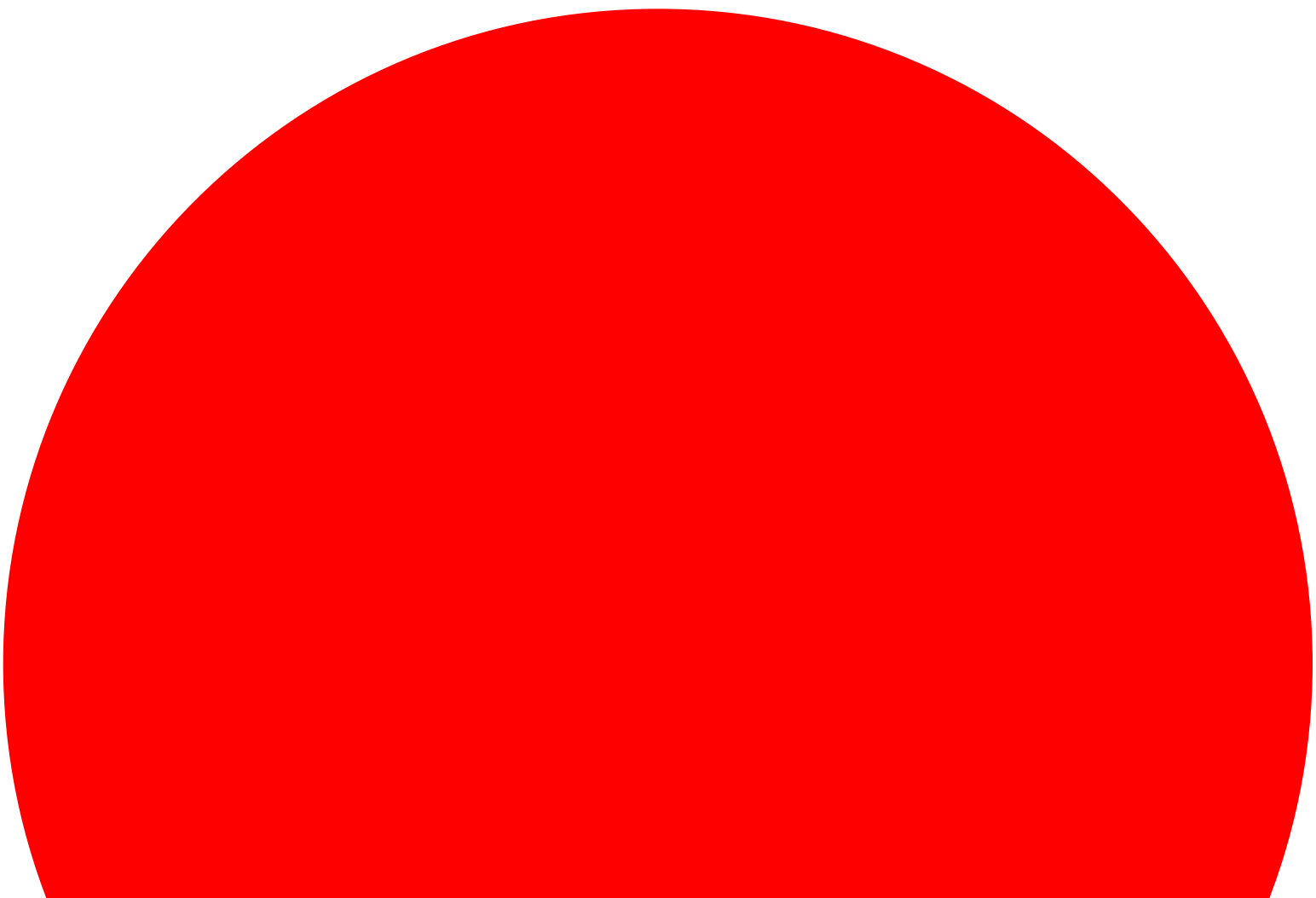
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