

Theory

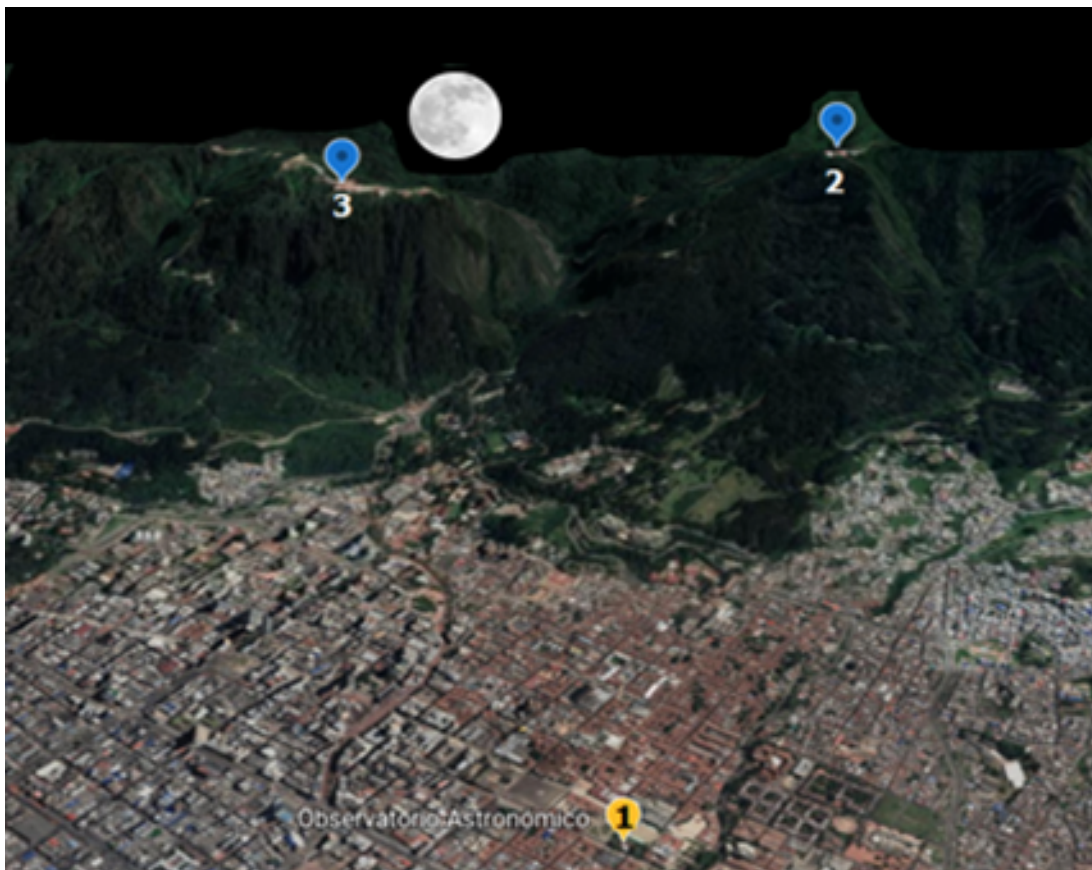


Q8-1

English (Official)

IOAA Logo (15 points).

The IOAA2021 logo is formed by the acronym IOAA, where the first letter is represented by the silhouette of the building of the National Astronomical Observatory (OAN) of Colombia, the oldest observatory in America. This observatory is located in Bogota, where it was founded in 1803. The capital city of Colombia is bordered by two famous hills, Monserrate and its neighbor Guadalupe, which are icons of Bogota's cityscape that decorate the logo's background.



Aerial view of Bogota City. Numbers show locations for the quoted places: 1 is for OAN; 2 is for Guadalupe; and 3 is for Monserrate.

Theory



Q8-2

English (Official)

Point	Latitude	Longitude	Elevation (m.a.s.l)
1	$4^{\circ} 35' 53'' N$	$74^{\circ} 04' 37'' W$	2607
2	$4^{\circ} 35' 30'' N$	$74^{\circ} 03' 15'' W$	3296
3	$4^{\circ} 36' 18'' N$	$74^{\circ} 03' 19'' W$	3100

8.1 Estimate the distance (in km), between points 2 (Guadalupe) and 3 (Montserrat). 3.0pt

8.2 Estimate the angular separation (in degrees) between Guadalupe (2) and Monserrate (3) as observed from the National Astronomical Observatory of Colombia (1). 6.0pt

8.3 From the OAN, on September 21 at 8:00 p.m. the Moon was observed towards the eastern hills (between Monserrate and Guadalupe). The measured ecliptic coordinates (longitude and latitude) of the Moon are shown in the table. Determine the equatorial coordinates of the Moon at the time of observation. 6.0pt



Theory



Q8-3

English (Official)

Local Time: 8:00 p.m.
$Az : +90^{\circ}42'59'' / Alt : +19^{\circ}01'42''$
$\lambda : +12^{\circ}20'16'' / \beta : -04^{\circ}24'14''$

Note: Azimuth measured from North to East.