Department of Earth and Space Sciences

Astronomical Optics

Below is a listing of the various astronomical optics of Rizal Technological University's Department of Earth and Space Sciences as well as their specifications and analysis for ideal usage.

Telescopes	
Sky-Watcher SkyLiner 300P	Celestron NexStar SE 8
Sky-Watcher SkyLiner 250P	Celestron NexStar SE 6
Sky-Watcher SkyLiner 200P	Celestron NexStar 102 SLT
Sky-Watcher Explorer 200	Celestron NexStar 127 SLT
Sky-Watcher Explorer 150	Celestron Astromaster 130EQ
Sky-Watcher Explorer 90	Meade LX850

Binoculars	
Celestron UpClose 10x50	Celestron SkyMaster 15x70

Specifications	
Aperture	Aperture is the most important specification of a telescope. The aperture refers to the diameter of the objective lens/mirror. A telescope's aperture defines its light gathering power, resolving power, and magnification.`
f-number	The aperture size and the focal length specifies what particular targets are most suitable. The f-number has 3 focal ranges: deep-sky [f/1 - f/5], mid-range [f/6 - f/8], and terrestrial [f/9 - f/11]. It is computed by dividing the focal length by the aperture
Maximum useful magnification	This specifies the highest allowable magnification for a given telescope. For each inch of aperture there is an allowable magnification of 50x.
Magnification	The magnification is computed by dividing the focal length of the objective over the focal length of the eyepiece. By using the determination of the maximum useful magnification we can determine the focal limit for the eyepiece to be used in taking the highest allowable magnification.
Resolving Power	The ability of a telescope to resolve fine detail is described by its resolving power. The measurement of resolving power specifies the smallest distance (in arc seconds) that can be separated by a telescope. The empirical measurement of Dawe's Limit for resolving power is used. R=4.56/D (in inches)

Sky-Watcher SkyLiner Series

Manufacturer	Sky-Watcher
Series	SkyLiner Series
Type (s)	Newtonian Reflector
Mount	Dobsonian
Finderscope	Optical

	SkyLiner 300P	SkyLiner 250P	SkyLiner 200P
Aperture	305 mm (12 in)	254 mm (10 in)	200 mm (8 in)
Focal Length	1500	1200	1200
f-num	4.92 [Deep-Sky]	4.72 [Deep-Sky]	6 [Mid-Range]
Maximum Useful Magnification	600 x	500 x	400 x
Eyepiece for max. M	2.5 mm	2.4 mm	3 mm
Resolving Power [Dawes]	0.3797 arc seconds	0.4559 arc seconds	0.5790 arc seconds

Sky-Watcher Explorer Series

Manufacturer	Sky-Watcher
Series	Explorer
Finderscope	Optical

	Explorer 200	Explorer 150	Explorer 90
Type	Newtonian Reflector	Newtonian Reflector	Refractor
Aperture	200 mm (8 in)	150 mm (6 in)	90 mm (3.5 in)
Focal Length	1000	750	910
f-num	5 [Deep-sky]	5 [Deep-sky]	10 [Terrestrial]
Maximum Useful Magnification	400 x	300 x	175 x
Eyepiece for max. M	2.5	2.5	5.2
Resolving Power [Dawes]	0.579 arc seconds	0.772 arc seconds	1.2867 arc seconds
Mount	Equatorial	N/A	Equatorial

Celestron Nexstar SE Computerized Telescope Series

Manufacturer	Celestron
Series	Nexstar SE
Finderscope	Red dot finder
Type	Schmidt-Cassegrain
Color	Orange
Body	Aluminum
Tripod	Steel

	NexStar SE 8	NexStar SE 6
Aperture	203.2 mm (8 in)	150 mm (6 in)
Focal Length	2032	1500
f-num	10 [Terrestriall]	10 [Terrestrial]
Maximum Useful Magnification	400 x	300 x
Eyepiece for max. M	2.5	2.5
Resolving Power [Dawes]	0.5699 arc seconds	0.772 arc seconds
Mount	Single Fork Arm Altazimuth [NexStar computer control technology]	
Optical Coating	Starbright XLT	

Celestron NexStar SLT Series

Manufacturer	Celestron
Series	Nexstar SLT
Finderscope	Red dot finder
Tripod	Stainless Steel
Mount	Single Fork Motorized Altazimuth Mount [GoTo]

	NexStar 102SLT	NexStar 127SLT
Type	Refractor	Maksutov-Cassegrain
Aperture	102 mm (4 in)	127 mm (5 in)
Focal Length	660	1500
f-num	6 [Deep-sky]	12 [Terrestrial]
Maximum Useful Magnification	260 x	600 x
Eyepiece for max. M	2.5	2.5
Resolving Power [Dawes]	1.1353 arc seconds	0.9118 arc seconds
Optical Coating	Multi-Coated	Fully-Coated

Celestron Astromaster 130

Manufacturer	Celestron
Series	Astromaster
Type (s)	Reflector
Aperture	130 mm (5 in)
Focal Length	650
f-num	5 [Deep-sky]
Maximum Useful Magnification	250 x
Eyepiece for max. M	2.6
Finderscope	Fixed Red Dot
Mount	Equatorial
Resolving Power [Dawes]	0.8908 arc seconds

Meade LX850

Manufacturer	Meade
Series	LX850
Type (s)	Schmidt-Cassegrain [Advanced Coma-Free]
Aperture	355.6 mm (14 in)
Focal Length	2845 mm
f-num	8 [with focal reducer for f/5]
Maximum Useful Magnification	700 x
Eyepiece for max. M	4.06 mm
Finderscope	Optical [8 x 50]
Mount	Equatorial
Resolving Power [Dawes]	0.3257 arc seconds
Optical Coating	UHTC [Ultra High Transmission Coatings]

Mount	German Equatorial [AutoStar II go-to GPS mount]
Auto-Guider	StarLock [automatic integrated photo-guider system]
Payload Capacity	41 kg (90 pounds)
Counterweight	4 pieces each at 8.16 kg
Tripod	Giant field tripod (16 kg)

Celestron UpClose Series

Manufacturer	Celestron
Series	UpClose
Size	10 X 50
Type	Porro
Prism	Bk-7
Coating	Fully Coated
Angular Field of View	7 degrees
Eye Relief	11 mm
Tripod adaptability	Yes

Celestron SkyMaster Series

Manufacturer	Celestron
Series	SkyMaster
Size	15 X 70
Type	Porro
Prism	Bak-4
Coating	Multi-Coated
Angular Field of View	4.4 degrees
Eye Relief	18 mm
Tripod adaptability	Yes [adapter included]

Listed here by rank (top 5) are the ideal telescopes to be used for the different types of observations based on their specifications.

Terrestrial [Lunar and Planetary Observations]
The following are ranked primarily according to their focal ranges and secondarily for their light grasp.

1. NexStar 127SLT (f/12)
2. NexStar SE8 (f/10)
3. NexStar SE6 (f/10)
4. Explorer 90 (f/10)
5. LX850 (f/8)

Double-Star Observations

The following are ranked for their resolving power.

1. LX850 (0.3257)
2. SkyLiner 300P (0.3797)
3. SkyLiner 250P (0.4559)
4. NexStar SE8 (0.5699)
5. Explorer 200 & SkyLiner 200P (0.579)

Deep-Sky Observations

The following are ranked on the basis of their focal range and light grasp.

1. LX850 with focal reducer for f/5
2. SkyLiner 300P
3. SkyLiner 250P
4. Explorer 200
5. Explorer 150