

What can we do with a small or old telescope?

(Alfred's Draft March 2013)

Many families and schools have old or small telescopes that are no longer used. But these telescopes can still give you excellent views of the Moon and other bright objects when mounted properly and used at low power (magnification). With experience you will be able to 'fine tune' your skills and the telescope and see even more.

Many such telescopes have decent lenses (refractors) or mirrors (reflectors), but they can be difficult to adjust and line up properly. The secrets of making them work are:

- (i) begin with the lowest power/magnification,
- (ii) make the mounting stable, and
- (iii) start by looking at fine detail on a first quarter Moon; then go on from there.

You prepare in the daytime from home by looking at a far away fixed item. Trees or birds are no good because they keep moving. Do this standing in the shade and NEVER look near the Sun because that will cause serious and permanent (NOTE Permanent) eye damage!

Use low power/magnification - you can see already lots of good stuff at 20x or 40x

Magnification is found from the objective focal length (f.l.) divided by the eyepiece focal length. If the objective f.l. is 1000 mm and the eyepiece f.l. is 25 mm, the magnification is 40x. When a telescope comes with a number of eyepiece lenses, start with the one with the longest focal length. For example: if you have two eyepieces, labelled "25 mm" and "8 mm", start with the 25 mm. This gives low power, wide views that make it easy to find things. (If there is a "Barlow lens" with your telescope, do not use it now; leave that for later.)

Check out the mounting and learn to use it

First learn (in the shade in daylight) how the mounting works, check that there are no loose screws and the telescope is balanced. Some tripods can be improved by hanging a heavy object (brick) from them. Then learn to point it at a far away object and how to move it slowly, in all four directions. Train in the daytime because it will be more difficult in the dark. If your telescope has an 'Equatorial' mounting, get advice or read a book on its use.

Start with very bright, easy naked eye objects

Small telescopes give lovely views of the Moon with craters and mountain ranges. Get a book from the library to learn what to look for. On the planet Jupiter you can see the two main cloud belts and the four Galilean moons. A bit harder are the rings of Saturn and the dark 'Cassini's division'. You can see many bright stars and will find that some are doubles. After more reading try to look for the larger globular star clusters and the brighter nebulae.

If your family or a friend has binoculars, also start with those

Many astronomers also use binoculars first. A dark location and in a low camping chair help. Focus the binoculars very carefully on the Moon or a bright star and hold them very steady. It helps to support them on a cushion on the garden fence. If you don't have binoculars, you can often get good old Japanese ones on Gumtree or eBay for under \$50. Any size binocular is useful, but astronomers often use the common 7x50, 10x50 or 8x40. Don't worry about these numbers; just use what you can get.

Some helpful information

- An excellent yearly guide is the book 'Astronomy 2015, 2016, 2017, 2018....' (there is a new edition each year). This is available by mail order or in person from a number of places. Mail order from the publishers: Quasar Publishing in Sydney will post it to you for about \$30. You can also buy it from Optics Central in Mitcham or order it from Bintel in Sydney and a few other shops. Use Google for their address and phone number and when you are on their web site type 'Astronomy 20.....' (enter the year you want) in the Search box. The large 'Planisphere' recommended in Astronomy 20..... is also excellent.
- There is a wealth of astronomical information on the Internet. For observational information (where to find things in the sky, etc.) note that much of it may be for the northern hemisphere. For our part of the world we need charts for "Australia" or for the "Southern Hemisphere".
- The web site www.skymaps.com by Kym Thalassoudis has small printable sky maps for each month for both hemispheres and they also show where to look for the planets in that month. On Kym's web site look for 'The Evening Sky Map', then click on 'Download the latest issue', go down and select the 'Southern Edition' for Australia, etc.
- Go to your local library (and ask at your school) for astronomy books and magazines. When reading these, again keep in mind that we are in the southern hemisphere.
- Some schools have their own telescope and take that on school camps as well. If your school does not have a telescope, tell the staff to get a 15 cm or 20 cm Dobsonian as they are easy to use. They cost about \$400 - \$500, the same as a basic laptop.
- Many local astronomical societies can give advice and have 'beginners' groups. The largest society in Victoria is the Astronomical Society of Victoria in Melbourne. There are many other societies in Frankston (Mornington Peninsula A.S.), the Latrobe Valley, Geelong, Ballarat, Bendigo, Benalla, Snake Valley, Albury-Wodonga and many more interstate. Most of these have excellent web sites with current information, observatories, contacts, etc.
- There is good astronomy information at Scienceworks Museum in Spotswood and at the Old Melbourne Observatory in the Botanic Gardens. Check on their programmes and public viewing nights. Scienceworks has a world class Planetarium.
- More info to be added.

Looking after your telescope

It pays to look after them. Keep them dry and let them dry properly inside the house or garage when they are cold after use outside. Take care not to clean too much. The only part of the telescope that needs cleaning often is the eyepiece lens close to your eye. In the dark people often touch that lens with their eyelashes so it will need cleaning. But do not clean anything else before you get good advice. Do not try to clean lenses and mirrors if you can see a bit of dust on them. You may try to blow it off with clean air but don't go any further. A bit of dust does not affect viewing very much. Get advice first and keep smiling!

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