

Deep Sky Pleasure

M Streicher

magda@pixie.co.za

Foreword

At the 2002 symposium I was blessed with a new friendship. Janet Mattei with her warm and outgoing personality made an impression on me and confirmed the fact that women can make a difference.

I'm thankful for the wonderful astronomy friends I have made, and for my teacher Auke Slotegraaf. With these thoughts in mind I consider my involvement in astronomy as a challenge and a privilege.

Introduction

The development of new technology has slowly but surely also spilled over into the world of the amateur astronomer. But, let's also look at the night sky with its multitude of interesting objects that can be observed, discovered and appreciated through your telescope. It is very important to document and save the data of the observations made of various deep sky objects.

Observing guidelines

Things to keep in mind when observing:

1. It is important to document and save your observations. Make use of sketching and a tape recorder. Believe me, when deep-sky objects are studied at a later stage this information will be of great value. Include a limiting magnitude estimate, using a star count as done during meteor shower observing.

2. Date and time (UT) should be documented for each observation.
3. Telescope particulars - size, type and focal length, etc.
4. Eyepiece details and size of the field of view.
5. Details of any filters used.
6. Plan your observations with the aid of charts and get to know the night skies.
7. Describe and sketch objects with the aid of a magnifying lens as it is observed.
8. Averted vision is sometimes the road to a positive observation.
9. Observe objects when they are at its highest in the sky.
10. Be patient, relaxed, clothed warmly and keep something to eat and drink at hand.

To estimate the transparency of the sky, use the following scale (1–10, excellent to bad):

1. The most crystal clear sky possible.
2. The sky is clean.
3. Haziness only visible on the horizon.
4. Haziness visible at the horizon as well as the upper sky.
5. Hazy sky although faint stars are still visible.
6. Noticeable fleecy clouds appear.
7. General normal sight is hindered.
8. Mist, smoke and clouds cause reflection.
9. General vision is reduced.
10. Observation impossible.

The darkness of the sky can be rated on a scale 1 – 10 (pitch black to light):

1. Dark Moon and stars magnitude 6 and fainter are visible with the naked eye.
2. Whole Milky Way is visible.
3. Same brightness as a night with a three-day-old Moon.
4. The fainter parts of the Milky Way are barely visible.
5. Only the brightest Milky Way parts are visible.
6. The sky overhead is still dark but with a brightened horizon.
7. The sky appears as bright as with a seven-day-old Moon.
8. The sky is brightened by light pollution.
9. Stars are scarcely visible.
10. Overwhelmingly brightened as with a Full Moon.

Seeing can be measured on a scale 1 – 10 (excellent to bad):

1. Excellent clean sky, limited star flickering and brilliant objects.
2. Atmosphere stable with little interference at high magnitude.
3. Atmosphere is stable and temporary turbulence might be observed.
4. Only at high magnification fine detail might be lost.
5. Clarity in object start to disappear.
6. With medium magnification partial star flickering can be seen and greater detail is lost.
7. Stars appear round and flat and flicker uncontrollably.
8. At low magnification parts of the object is out of focus.
9. Brightness is unstable and object alternately in and out of focus.
10. Atmosphere shows “heat waves”, totally unstable and observation lost.

Other things to keep in mind:

- Provide enough time for an observation.
- Let your eyes dark-adapt.
- Know your telescope.
- Control pesky insects!

Observing open clusters

As our skies are increasingly becoming more and more polluted I have been looking at open star clusters in a different way. Boring it certainly is not as the star groups each have different characteristic and form unbelievably beautiful compositions. Seven points are of great importance when summarizing and observing open star clusters.

1. Degree to which the cluster stands out against the background star field, as well as the general impression.
2. Form and size - round, oval, rectangular, etc. (indicates PA where relevant).
3. Star magnitudes - equal brightness, or a mixture of bright and fainter stars.
4. Concentration - weak, relative, rich or extremely rich.
5. Stars in strings, colour variations, double or outstanding stars.
6. Visible open parts, as well as haze or nebulosity inside the cluster.
7. Supply character and describe the star cluster and star-field until a complete picture is created.

[Sample descriptions of NGC 2409, NGC 2323 (M50) & NGC 6705 (M11) are given in the electronic version of this contribution]

Observing globular clusters

Of the most beautiful and enriching objects in the sky are the globular clusters, tightly packed with thousands of stars, located on the outskirts of our Milky Way. Most of the clusters are indeed very faint, though

the brighter ones are exciting and reveal a feeling of being three-dimensional. Globular clusters are challenging objects to study and very satisfying. The more one observes them the more they become familiar objects to describe. Six points are of great importance when summarizing and observing globular clusters:

1. Inner core - the size in arc minutes and magnitude of the core measured with regard to the cluster. Star field impression.
2. General impression - soft periphery with possible visible star points.
3. Shape: round or elliptic (if so, also PA)
4. Establish size of cluster as well as the spread of loose stars in the periphery.
5. Star strings - innumerable of these features can be noted.
6. Dark areas/open spaces in the cluster.

[Sample descriptions of NGC 1783, NGC 288 & NGC 7099 (M30) are given in the electronic version of this contribution]

Observing planetary nebulae

The most delicate objects in the sky are surely the planetary nebulae. Beautiful, subtle features can be observed in these stellar death shrouds. A few examples of just how unique and intricate planetary nebulae can be are given. Take up the challenge and discover these soft jewels of deep space. Five points are important when describing a planetary nebula:

1. Central star? If so, note magnitude.
2. Form and Size - round or elliptic.
3. Periphery - sharply edged or hazy.
4. Colour - smoked white, light grey, grey, light blue, to blue green.
5. General appearance - indicate shape, size, direction and surface details.

[Sample descriptions of NGC 1535, NGC 5189 & NGC 2371-2 are given in the elec-

tronic version of this contribution]

Galaxies

Take a moment and consider the immeasurable universe filled with a multitude of galaxies. The secret of galaxy observing is to devote time and patience at the eyepiece in order to unravel these untold wonders. Consider the following seven points when observing galaxies:

1. General impression - outstanding stars situated close by or included in the galaxy. Possible supernova?
2. Form - round, elliptic or linear appearance (estimate PA where relevant).
3. Size - establish size in arc minute. How?
4. Varying parts inside the object.
5. Distribution and grading in brightness over the galaxy's surface.
6. Appearance - dark lines or patches.
7. Visibility of satellite galaxies.

[Sample descriptions of NGC 253, NGC 7410, NGC 5128, NGC 6754, NGC 5194-5 (M50), NGC 7232 & NGC 7233 are given in the electronic version of this contribution]

Bright nebulae

I conclude with two breathtaking southern objects: the Tarantula and Eta Carina nebulae. To sketch these two objects appears to be difficult but be sure that it is not and the rewards are numerous.

[Descriptions of NGC 2070 & NGC 3372 are given in the electronic version of this contribution]

Conclusion

I hope that not only did my humble contribution unlock a world of wonder, but also motivated some of you to study and appreciate deep sky objects. What an exceptional privilege.