Observing Notes for the CTSP 2005 Small Scope Observing List

This list will take you for a summer's stroll up the spiral arms of the Milky Way. Its goal is to give you a feeling for where the objects you see are located within the Milky Way, how big they are, and how old. As you observe an object, pay attention to how far away it is and which spiral arm it is in. Try to locate it on the accompanying map to see where it is in relation to other well known objects.

All objects are listed in increasing Galactic Longitude. In this coordinate system, 0º looks straight into our galactic center. 180º looks in the opposite direction, directly outward from the center. 90º is looking in the direction of Cygnus and in the direction or galaxy is rotating. The Galactic Latitude shows how far above or below the object is from the plane of our galaxy.

M 6 This cluster, also known as the Butterfly Cluster, lies 2,000 light-years in the direction of the center of our galaxy. This distance puts it on the very inside edge of our own Orion spiral arm, or perhaps in the inter-arm "void" between our arm and the Sagittarius arm. The cluster is about 12 light-years across and approximately 75 million years old.

M 7 Ptolemy's Cluster consists of approximately 80 stars brighter than mag 10. It lies in a similar direction as M 6 but at half the distance. This places it firmly in our own Orion arm. It is believed to be about 220 million years old and spans 25 light-years across.

M 8 This is the famed Lagoon Nebula. It is an active stellar nursery filled with proto-stars and is 140 x 60 light-years across. The star cluster visible within the nebula is now believed to be a foreground object. Like the proceeding two clusters, M 8 is located in the direction of the galactic center. Its distance of 5,200 light-years places it firmly in the Sagittarius-Carina arm of our galaxy.

M 20 The Trifid Nebula and Star Cluster. The exact distance to M 20 is unclear, but an average value 5,200 light-years and its galactic coordinates places it very near M 8 in the Sagittarius arm. If so, it is probably be embedded in the same interstellar molecular cloud.

M 21 This cluster of around 57 stars is like M 20 in that it has an uncertain distance. It is believed to be about 1,000 light-years closer to us than either M 8 or M 20 but still far away enough to be in the Sagittarius arm. If we assume a distance of 4,250 light-years, then M 21 must have a true diameter of around 20 light-years. It is a relatively young cluster at around 4.6 million years old.

M 23 At only 2,150 light-years from us, this open cluster resides in our Orion arm. It contains approximately 150 stars and spans about 15 light-years in diameter. M 23 is an older cluster of around 220 million years old.

M 24 This is the Small Sagittarius Star Cloud and it is best seen in binoculars. Be sure to borrow a pair if you don't have any. This profusion of stars is a portion of the Inner arm (inward from the Sagittarius arm) of our Galaxy seen through a gap in the inter-stellar dust. Remarkable! As you study M 24, see if you can pick up the two circular dark nebulae along the cloud's northwest side.

M 25 Another cluster in our Orion arm, M 25 resides only 2,000 light-years away. Its true diameter is given as 20 light-years. Its age of around 90 million years old makes it a

medium age cluster. Its location in the galaxy places it nearby M 23.

M 18 Compared to M 23 and M 25, this cluster is much less impressive. There are only about 20 members in the grouping. Although it appears to reside nearby the other two clusters, its distance of 4,900 light-years places it in the more distant Sagittarius arm. M 18 has a true diameter of 10 light-years. An age of only 32 million years makes it a relatively young cluster.

M 17 M 17 is also known as the Swan Nebula or the Omega Nebula. It is an emission nebula, glowing from the light of newly formed stars inside it. These stars are still surrounded by dust and are not yet visible themselves. The nebula's full size is thought to be 27 x 60 light-years, although the body of the swan is only 12 light-years long. Its distance and direction place it firmly in the Sagittarius arm.

M 16 The Star Queen Nebula is another name for M 16. This is also an emission nebula which glows from the hot young stars inside it. These stars are only about 800,000 years old and star formation is probably continuing today. The true size of the nebula is about 70 light-years. At a distance of 7,000 light-years it is more deeply embedded in the Sagittarius arm than is M 17.

M 26 M 26 is a rather small open cluster around 4,900 light years away on the outer edge of the Sagittarius arm. It contains about 25 stars visible in small scopes and around 70 fainter members. It has a diameter of 22 light-years across and an estimated age of 89 million years.

M 11 Also known as the Wild Duck Cluster, M 11 is one of the finest open clusters in our galaxy. It has about 900 stars and has a stellar density that rivals some globular clusters. Like M 26, it is also located on the outer edge of the Sagittarius arm. Its size is around 20 light-years and is rather old at 220 million years.

M 27 When observing the Dumbbell Nebula M 27, we are back in our Orion arm. Its distance is only 1,250 light-years. This is a planetary nebula composed of glowing gas blown off by a star late in its life. This ejection shell is believed to be only 5,000 or 6,000 years old.

M 57 This is the famous Ring Nebula. At roughly twice the distance of M 27, this planetary nebula sits on the inner edge of our Orion arm. The nebula's shape is now believed to be cylindrical and we are fortunate to be looking down the long axis. It is estimated to be 8,000 to 10,000 years old.

M 29 This open cluster is around 6000 light-years away and firmly in the Orion arm. When we look in this part of the sky we are looking up the Orion arm in the direction in which it turns inward. This is also the direction in which the galaxy is rotating. M 29 is not an impressive Messier object. There are only a half dozen bright stars with maybe 10-20 fainter members.

M 39 At only 820 light-years, this is the nearest open cluster on the list. It is large and loose, with maybe 30 member stars. Its distance and direction place it nearby us in the Orion arm. The cluster is thought to be about 7 light years across and around 250 million years old.

M 52 With M 52 in Cassiopeia, we get our first look into the outer Perseus arm of our galaxy. This is made possible by a large gap in the dust clouds that allow us to see farther than usual in the direction of Cassiopeia. The whole Cassiopeia region is filled with these

distant star clusters. This clusters distance of 5,000 light-years implies it must lie on the inner edge of the Perseus arm. The cluster's true diameter is 20 light-years and contains about 200 stellar members. It has a young age of around 35 million years.

M 103 M 103 is one of the more remote open clusters in Messier's catalog. At a distance of 8,500 light-years, we are looking into the heart of the Perseus spiral arm. The cluster itself is rather sparse and course looking with about 172 members. You might have an easier time identifying it with binoculars than with a telescope. It is believed to be about 25 million years old and to have a true diameter of 15 light-years.

NGC 869
NGC 884 These two objects comprise the famous Double Cluster in Perseus. The clusters are situated near M103 in the Perseus arm at a distance of 7,100 and 7,400 light-years respectively. The clusters are beautiful in almost any instrument. They are both large clusters with diameters of 70 light-years. This makes them among the largest and most luminous clusters known in our galaxy. They are also quite young with an estimated age of only 3 million years.

M 34 This final cluster takes us as far around the Summer Milky Way as we will go. However, its distance of only 1,400 light-years means it resides back in our Orion arm. M 34 consists of around 100 stars spread over a volume 19 light-years in diameter. Its age has been estimated at 110 million years.

NOTE: Information for these notes was gleaned from "Star Clusters" by Archinal and Hynes, "Binocular Astronomy" by Crossen and Tirion, and the SEDS web site.