**Telescope Observer’s Challenge:**

 If you came to the Table Mountain Star Party (TMSP) with your telescope or have access to a telescope while at the TMSP this program is for you. This program will give you an opportunity to observe 30 or more showcase objects under the ideal conditions of the pristine Eden Valley skies. It’s not super challenging this year, but will get progressively harder each year. You will get a button for finding just 25objects. All observations must be done during the TMSP. The “Fab Five” program consists of a list of objects in five categories; Galaxies, Open Clusters, Globular Clusters, Solar System Objects and Nebulae. You must observe and document five objects from each category. You must find the objects yourself, without help from anyone else. Enter the required information and for at least one of the objects in each of the five categories you must sketch what you see through the eyepiece. Any size telescope can be used. All objects are within range of small to medium sized telescopes, and are available for observation between 10:00PM and 4:00AM any time during the TMSP. All objects are listed in Right Ascension order so that you can observe them before they set in the West, or as they rise in the East.

 To receive your button, turn in you observations to ***Mark Simonson or Ron Mosher (Observation Challenge Coordinators)*** any time during the TMSP. If you finish the list the last night of TMSP, and we are not available to give you your button, just mail your observations to me at 1519 Ridge Dr., Camano Island, WA. 98282, or email your observations to me at marknilse@yahoo.com, and I will see that you get a button. The Novice Observer’s Challenge can only be earned once per person.

**Galaxies**

 **# Object R.A. Dec Con Size Mag Notes**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **T1** | **NGC 147** | **00 33.1** | **+48 30** | **Cas** | **13.2** | **10** | **Also Caldwell 17 Dwarf galaxy 2.5 million Ly** |
| **T2** | **NGC 205 M110** | **00 40.2** | **+41 41** | **And** | **21.9** | **8.9** | **Dwarf elliptical galaxy 2.6 million Ly** |
| **T3** | **NGC 224 M31** | **00 42.3** | **+41 16** | **And** | **192.4** | **3.4** | **The Andromeda Galaxy Spiral 2.5 million Ly** |
| **T4** | **NGC 598 M33** | **01 33.5** | **+30 39** | **Tri** | **70.0** | **5.7** | **The Triangulum Galaxy Spiral 3 million Ly** |
| **T5** | **IC 342** | **03 46.4** | **+68 05** | **Cam** | **21.4** | **9.1** | **Also Caldwell 5 Face on Spiral 10.7 million Ly** |
| **T6** | **NGC 3031 M81** | **09 55.3** | **+69 03** | **UMa** | **26.9** | **6.9** | **Bode’s Galaxy Spiral 12 million Ly** |
| **T7** | **NGC 3034 M82** | **09 55.8** | **+69 41** | **UMa** | **9.0** | **8.4** | **An irregular galaxy very close to M81 12 million Ly** |
| **T8** | **NGC 4258 M106** | **12 18.5** | **+47 18** | **CVn** | **18.6** | **9.1** | **Spiral 27.3 million Ly** |
| **T9** | **NGC 5194 M51** | **13 29.5** | **+47 11** | **CVn** | **11.2** | **8.4** | **Whirlpool galaxy spiral interacting 25 million Ly** |
| **T10** | **NGC 6207** | **16 43.0** | **+36 49** | **Her** | **3.0** | **11** | **Spiral galaxy 30 million Ly located next to M13** |
| **T11** | **NGC 6503** | **17 49.4** | **+70 09** | **Dra** | **6.0** | **10** | **Dwarf spiral galaxy 17 million Ly** |
| **T12** | **NGC 6946** | **20 34.5** | **+60 09** | **Cyg** | **11.5** | **9.6** | **Face on spiral galaxy 22.5 million Ly** |
| **T13** | **NGC 6951** | **20 37.0** | **+66 06** | **Cep** | **3.9** | **11** | **Face on spiral 75 million Ly** |
| **T14** | **NGC 7331** | **22 37.0** | **+34 24** | **Peg** | **10.5** | **10** | **Also Caldwell 30 unbarred spiral 40 million Ly** |
| **T15** | **NGC 7640** | **23 22.0** | **+40 50** | **And** | **10.5** | **11** | **A barred spiral edge on 29.7 million Ly** |

**Open Clusters**

 **# Object R.A. Dec Con Size Mag Notes**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **T16** | **NGC 663** | **01 46.0** | **+61 15** | **Cas** | **16.0** | **7.1** | **Also Caldwell 10 6800 Ly** |
| **T17** | **NGC 869/884 Double Cl** | **02 19.0** | **+57 08** | **Per** | **29.0** | **5.3** | **The Double Cluster also Caldwell 14 7500 Ly** |
| **T18** | **Mel 111 Coma Cluster** | **12 25.0** | **+26 00** | **Com** | **275.0** | **1.8** | **The Coma Star Cluster about 40 bright stars 280 Ly** |
| **T19** | **IC 4665** | **17 46.3** | **+05 43** | **Oph** | **70.0** | **4.2** | **OpCl 1400 Ly** |
| **T20** | **NGC 7789** | **18 27.7** | **+06 34** | **Oph** | **27.0** | **4.6** | **OpCl also Caroline’s Rose 7600 Ly** |
| **T21** | **NGC 6645** | **18 32.3** | **-16 53** | **Sgr** | **10.0** | **8.5** | **The Ringlet Cluster 26400 Ly** |
| **T22** | **NGC 6683** | **18 42.1** | **-06 12** | **Sct** | **11.0** | **9.4** | **OpCl 39000 Ly** |
| **T23** | **NGC 6738** | **19 01.1** | **+11 37** | **Aql** | **15.0** | **8.3** | **OpCl 2200 Ly** |
| **T24** | **NGC 6755** | **19 07.8** | **+04 14** | **Aql** | **15.0** | **7.5** | **OpCl 4600 Ly** |
| **T25** | **Cr399 Coathanger** | **19 25.4** | **+20 11** | **Vul** | **60.0** | **3.6** | **Asterism known also known as Brocchi’s Cluster** |
| **T26** | **NGC 6823** | **19 42.2** | **+23 05** | **Vul** | **40.0** | **7.1** | **OpCl with nebulosity 6000 Ly** |
| **T27** | **NGC 6910** | **20 23.1** | **+40 47** | **Cyg** | **80.0** | **7.4** | **The Rocking Horse Cluster 3700 Ly** |
| **T28** | **NGC 6913 M29** | **20 23.9** | **+38 32** | **Cyg** | **6.0** | **6.6** | **OpCl 6000 Ly** |
| **T29** | **NGC 6939** | **20 31.3** | **+60 39** | **Cyg** | **70.0** | **7.8** | **3860 Ly over 1 billion years old** |
| **T30** | **NGC 7092 M39** | **21 32.2** | **+48 26** | **Cyg** | **31.0** | **4.6** | **OpCl 824 Ly** |

 **Globular Clusters**

 **# Object R.A. Dec Con Size Mag Notes**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **T31** | **NGC 5272 M3** | **13 42.2** | **+28 23** | **CVn** | **16.0** | **5.9** | **1 of approx. 150 GbCl orbiting Milky way 3400 Ly**  |
| **T32** | **NGC 5904 M5** | **15 18.6** | **+02 05** | **SerCp** | **17.0** | **5.7** | **A Globular Cluster 24500 Ly** |
| **T33** | **NGC 6205 M13** | **16 41.7** | **+36 28** | **Her** | **17.0** | **5.7** | **The best GbCl northern hemisphere 22200 Ly** |
| **T34** | **NGC 6229** | **16 47.0** | **+47 32** | **Her** | **4.5** | **9.4** | **Another GbCl in Hercules 10000 Ly** |
| **T35** | **NGC 6218 M12** | **16 47.2** | **-01 57** | **Oph** | **15.0** | **6.8** | **GbCl 15700 Ly** |
| **T36** | **NGC 6254 M10** | **16 57.1** | **-04 06** | **Oph** | **15.0** | **6.6** | **GbCl 14300 Ly** |
| **T37** | **NGC 6341 M92** | **17 17.1** | **+43 08** | **Her** | **11.0** | **6.4** | **GbCl 26700 Ly** |
| **T38** | **NGC 6402 M14** | **17 37.3** | **-03 14** | **Oph** | **11.0** | **8.3** | **GbCl 30000 Ly** |
| **T39** | **NGC 6656 M22** | **18 36.2** | **-23 54** | **Sgr** | **32.0** | **5.1** | **GbCl near galactic bulge region 10000 Ly** |
| **T40** | **NGC 6712** | **18 53.0** | **-08 42** | **Scu** | **7.2** | **8.6** | **GbCl 22500 Ly** |
| **T41** | **NGC 6809 M55** | **19 39.5** | **-30 57** | **Sgr** | **19.0** | **7.4** | **GbCl 17600 Ly** |
| **T42** | **NGC 6838 M71** | **19 53.4** | **+18 46** | **Sge** | **7.2** | **6.1** | **GbCl 12000 Ly** |
| **T43** | **NGC 6934** | **20 34.1** | **+07 24** | **Del** | **8.4** | **8.8** | **Also Caldwell 47 50000 Ly** |
| **T44** | **NGC 7078 M15** | **21 30.0** | **+12 10** | **Peg** | **12.0** | **6.0** | **GbCl 33600 Ly** |
| **T45** | **NGC 7089 M2** | **21 33.2** | **-00 49** | **Aqu** | **16.0** | **6.3** | **GbCl largest known globular cluster 33000Ly** |

**Solar System Objects *Pla – Planet Ast – Asteroid Sat – Satellite***

 **# Object Type R.A. Dec Con Size Mag Notes**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T46** | **Uranus** | **Pla** | **02 01.1** | **+11 45** | **Ari** | **.14** | **5.7** | **Can you make out any moons? Color 1.8 billion miles** |
| **T47** | **Juno** | **Ast** | **03 13.3** | **+10 25** | **Ari** | **.01** | **8.6** | **Asteroid in the main belt 167.4 million miles** |
| **T48** | **Sun spots** | **Star** | **09 19.2** | **+15 36** | **Can** | **31’** | **-26** | **How many sunspots 93 million miles** |
| **T49** | **Solar prominences** | **Star** | **09 19.2** | **+15 36** | **Can** | **31’** | **-26** | **How many prominences 93 million miles** |
| **T50** | **Jupiter** | **Pla** | **14 47.4** | **-15 10** | **Lib** | **37.0** | **-2** | **Can you see the 4 Galilean Moons? 483.6 million miles** |
| **T51** | **Ganymede** | **Sat** | **14 48.5** | **-15 15** | **Lib** | **1.0** | **5.7** | **Largest satellite of Jupiter 483.6 million miles** |
| **T52** | **Great Red Spot Jupiter** | **Pla** | **14.47.4** | **-15 10** | **Lib** | **-** | **-2** | **Very large atmospheric storm on Jupiter** |
| **T53** | **Vesta** | **Ast** | **17 26.3** | **-23 23** | **Oph** | **-** | **5.8** | **2nd largest asteroid in the main belt 133 million miles** |
| **T54** | **Titan** | **Sat** | **18 12.1** | **-22 37** | **Sgr** | **1.0** | **9.9** | **Largest satellite of Saturn 855.6 million miles** |
| **T55** | **Saturn** | **Pla** | **18 13.1** | **-22 37** | **Sgr** | **42** | **1.1** | **Can you see the rings? Titan? 855.6 million miles** |
| **T56** | **Rings of Saturn** | **Pla** | **18 13.1** | **-22 37** | **Sgr** | **-** | **1.1** | **Can you make out the Cassini Division** |
| **T57** | **Mars** | **Pla** | **20 20.1** | **-26 17** | **Cap** | **24** | **-2** | **Can you make out any features? 35.3 million miles** |
| **T58** | **Neptune** | **Pla** | **23 08.2** | **-06 36** | **Aqr** | **.06** | **7.8** | **Can you make out any moons? Color? 2.6 billion miles** |
| **T59** | **Triton** | **Sat** | **23 08.2** | **-06 36** | **Aqr** | **-** | **14** | **Largest satellite of Neptune** |

**Nebulae *DNeb – Dark Nebulae ENeb – Emission Nebulae PNeb – Planetary Nebulae RNeb – Reflection Nebulae***

 **# Object Type R.A. Dec Con Size Mag Notes**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T60** | **NGC 1579** | **RNeb** | **04 30.0** | **+35 16** | **Per** | **12.0** | **-** | **The Northern Trifid 2000 Ly** |
| **T61** | **NGC 6210** | **PNeb** | **16 44.3** | **+23 49** | **Her** | **12** | **9.0** | **6500 Ly** |
| **T62** | **NGC 6523 M8** | **ENeb** | **18 03.3** | **-24 23** | **Sag** | **90** | **6.0** | **The Lagoon Nebula 4100 Ly** |
| **T63** | **NGC 6572** | **PNeb** | **18 12.6** | **+06 51** | **Oph** | **6.0** | **9.0** | **2400 Ly** |
| **T64** | **NGC 5720 M57** | **PNeb** | **18 53.3** | **+33 01** | **Lyr** | **86.0** | **8.8** | **PNeb also Ring Nebula 2300 Ly** |
| **T65** | **NGC 6826** | **PNeb** | **19 45.0** | **+50 34** | **Cyg** | **126.0** | **8.8** | **The “Blinking Planetary” also Caldwell 15, 2000 Ly** |
| **T66** | **NGC 6853 M27** | **PNeb** | **19 59.6** | **+22 43** | **Vul** | **8.0** | **7.3** | **The Dumbbell Nebula 1360 Ly** |
| **T67** | **NGC 6888** | **ENeb** | **20 12.7** | **+38 21** | **Cyg** | **18.0** | **7.4** | **The Crescent Nebula 5000 Ly** |
| **T68** | **NGC 6960 Veil West** | **ENeb** | **20 45.4** | **+30 43** | **Cyg** | **70.0** | **7.0** | **The west part of a supernova remnant 1470 Ly** |
| **T69** | **LDN 935** | **DNeb** | **20 56.4** | **+43 52** | **Cyg** | **90** | **-** | **Wide dark lane separating NGC 7000 and IC 5070** |
| **T70** | **NGC 7000** | **ENeb** | **20 59.1** | **+44 31** | **Cyg** | **120** | **4.0** | **The North American Nebula 1600 Ly** |
| **T71** | **NGC 7023** | **RNeb** | **21 00.3** | **+68 10** | **Cep** | **18.0** | **7.0** | **The Iris Nebula also Caldwell 4 1300 Ly** |
| **T72** | **NGC 7009** | **PNeb** | **21 04.1** | **-11 21** | **Aqu** | **1.4** | **8.0** | **The Saturn Nebula 2000 Ly** |
| **T73** | **NGC 7662** | **PNeb** | **23 25.5** | **+42 33** | **And** | **2’** | **9.0** | **The Blue Snowball 4000 Ly** |



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