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Philippine Journal of Astronomy

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Messier Objects: Charting the Sky and Beyond

In this issue:

- Sweeping the Night Sky
- Messier Marathon: Tools and Techniques
- Of Star Clusters, Nebulae and Galaxies

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Philippine Journal of Astronomy

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pjastro@astroleaguephils.org
john.cabrera@physicist.net

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Sweeping the Night Sky

By John Ray Cabrera

Mankind has always been fascinated by the heaven. When it's bright, we were so enthralled by the largest illuminating body of our Solar System. When it's dark, we gaze out to our amazement, the sheer content yet the elaborate vastness of the entire cosmos.

And if you peer far enough, you'd be in for a surprise of a distant, exotic, and visually arresting clusters of light. Without you knowing it, you may just be staring at one of the Messier objects in temporal suspended animation.

Messier objects are astronomical bodies tediously and systematically grouped by a French astronomer Charles Messier in 1771, shelving them according to its innate characteristics.

Messier used to be a comet hunter and along the way, he was humstrung by the different light sources that resembled like comets but are actually not, so he came to the concept of cataloguing them in collaboration with another French astronomer Pierre Francois Andre Mechain.

From another nook of the world, a similar list was compiled by an Italian astronomer Giovanni Battista Hodierna. It was found out though that Hodierna's list has no research and academic reference to Messier's work, and was probably not known to him.

Messier was able to chart 45 clusters, thus his first edition, which ultimately grow into 103 clusters. However, the list, as it is exposed to the entire scientific community, was augmented by the additional contributions of other astronomers, thus making the list of having a life of its own and is perennially evolving in terms of number.

Additions came into fruition by some renowned astronomers such as French astronomer Camille Flammarion, American astronomer Owen Gingerich and another American astronomer Helen Sawyer Hogg, to name a few.

The Messier catalogue comprises nearly all spectacular examples of deep sky objects such as diffuse nebulae, planetary nebulae, open clusters, globular clusters and galaxies. All glorious 110 of them.

That you can say that at the very least, the night sky within our close proximity is carefully swept and studied by professional class instruments that are able to resolve any formation and light detail issues in the Messier catalogue.

The objects can also be captured by small aperture refracting telescopes, making them among the brightest in our neighborhood.

All images featured in the article are derived from www.tejraj.com and 3.bp.blogspot.com.

Featured Article:

Messier Marathon: Tools and Techniques

By John Ray Cabrera

Messier Marathon is a regular marathon, a cause for a reason, a crusade for a purpose, a race against time, except that it's done while you are physically fixated and only your eyes wandered. It's generally an attempt to find as many Messier objects in one night.

And depending on the location of the observer, and the season, there are several factors that affect the visibility of the object, from the heavily crowded region in the Virgo Cluster and around the galactic center and to the virtually empty spot.

That is why for a marathoner, it takes not only the right techniques but the well-equipped tools.

From the time it was first conceptualized and invented way back during the Spanish 1970s era and to the time it was first institutionalized by the American astronomers Tom Hoffelder, Tom Reiland and Dan Machholz, the exercise has developed a science in the observational dynamics and the participants doing it had grown their own methodologies.

Given all the the pleasant sky and environmental conditions, it is best to observe them during the vernal equinox, when night and day are cut evenly 12 hours each.

Peter Tubalinal, an ALP Messier Masterhunter, had this to say "because these objects vary in brightness and the time of appearance, a good strategy is needed to successfully find them. One must have a sequenced plan. It lists the order of finding them primarily based on time. This comes with a good star chart which contains the location of the Messier objects. Any chart can be used, from the most rudimentary local chart to the encompassing star atlas to the most sophisticated, interactive star chart software like Starry Night, Sky Map, etc."

But how else can you find the objects spot on. The list may come a long way but the most essential ones are listed as:

- **Websites** – For beginners, a Messier-induced website comes in handy as they most likely contain tips from seasoned astronomers as to how their beginnings are when they first started hunting the Messier objects.
- **Books** – some techniques may not have been published online so it would be a good route to check on library books as well, one of which is a The Year-Round Messier Marathon Field Guide by H.C Pennington. It contains not only maps, charts and tips to guide you to enjoy finding the deep sky objects but as well as geometric estimation on how to locate them.
- **Charts** – it's a must-have weapon, even for non-Messier-related events. It a map that will guide you through the axis of the sky. You can print a pdf version right before heading to your place of observation.
- **Logbook** – this is where you can log all your objects so you would know which ones are spotted and will tell you how many yet you have to scour.
- **Checklist** – it could be a simple as a requite or preparatory checklists like what to bring, what to do, what to wear, where to find a spot, and what time to start.

Not only are you heavily relying on technologies, there are techniques that should compliment them as well:

- **Search Sequence** - It's really important to have a "search sequence" since the Earth constantly rotates and the Messier will eventually set off out from the horizon. Thus you have to find one which sets out first before they disappear and spoil your happy night.
- **Weather condition** – you would have to consider meteorologic factors too, because at times those easily visible Messiers will be blocked by thick approaches of cloud formation. In that case, you would have to find the next one from your search sequence. You need not waste time for the cloud to go away and wait for that obstructed Messier object to reappear, every tick of time is precious.
- **Blending of scope-vis-à-vis ye pieces** - Messier objects vary in terms of their degree of illumination, thus eye pieces will vary at that degree. If you are bringing Binoculars, it would have been better if you're bringing different sets with different magnifications since binocular lenses are not user-replaceable.
- **Star hopping** - The biggest concern would be how to spot them. It's not an issue for the bright objects, however it would soon become once you're dealing with really faint ones. But using a star chart, you can identify a bright star as your visual landmark on where to start, then proceed unto the next star until you reach the faintest Messier object.
- **Averted Vision Method** – At times, the objects is too dim to be spotted directly into the eye piece. This method makes use of the most sensitive part of our eyes, the retinal outskirts, or that away from the retina, you don't look directly at the faint subject. Instead, lock your eyes 16-18 degrees at the peripherals of the object. Look left of the Messier object if you are using your left eye, and right if you are using the right one. If you are using binoculars, both eyes must look upwards for you to see it.

The activity isn't just what will count. The week prior is also as essential. A good, 8 hour sleep, a balanced meal, a good exercise, they would naturally help as they keep the body and mind balance.

Hunting Messier is not a walk in the park. There are challenges of circadian body clock disorientation, there are temperature gradient that your body must have to adhere too, and the long 12-hour night to endure without digestive hurdles.

All images featured in the article are derived from www.getaway.co.za, m1.behance.net, and Astronomical League of the Philippines.

Stargazing Session:

Caliraya Stargazing

by James Kevin Ty

Last May 31, members of the Astronomical League of the Philippines(ALP) proceeded to Caliraya, Laguna to do some observation and imaging under dark skies. Members who were present were ALP President James Kevin Ty, wife Charito and son Kendrick Cole KC Ty, PRO Gary Andreassen, directors Arnel Campos, Mike Enage, Armando Lee, wife Mia, son Jason Lee and friends, Nathaniel Custodio and family, Val Villanueva and friends, and Manuel Goseco.

Along the way, James was able to see a double rainbow along Calamba area but the secondary raibow didn't last long but the primary rainbow was visible more than an hour. They arrive at the site at around 5:00pm and set up their equipment after having dinner. ALP President James Kevin Ty brought along his modified Canon EOS 1000D camera with Canon EF100-400mm L lens on Kenko Sky Memo-R mount, director Mike Enage with his ATIK 314L CCD camera and modded Canon EOS 350D DSLR with TMB 92 refractor on Vixen GP-DX mount, Nataniel Custodio brought along his SBIG STF8300 CCD camera on Canon EF 200mm f /2.8 lens on Vixen GP-DX mount, Val Villanueva with his Nikon DSLRs and Lenses on Vixen Polarie mount, Arnel Campos with his Explore Scientific AR102 refractor with Skywatcher HEQ-5 mount, Manuel Goseco with his Celestron C6N on EQ-5 mount.

The sky was clear most of the evening except for a few small patches of clouds and some short burst of light drizzles that dissipated quickly. The entire stretch of Milky Way from Crux to Cygnus was visible. James image Cat's Paw and Lobster Nebula in Scorpius, Nathaniel Custodio imaged IC Elephant Trunk Nebula in Cepheus, Val Villanueva image Milky Way, Gary Andreassen image the Milky Way as well as Sadr Region, Manuel Goseco imaged Milky Way and Lagoon Nebula.

The group unfortunately was not able to get a traditional big group photo before leaving Caliraya in the morning as some had left early in the morning as the rest were sleeping. Nevertheless, the remaining members and guests had a quick group shot along the road overlooking Caliraya Lake. The session is still quite ok and looking forward for another good stargazing session in end of the month of June weather permitting!

ALP Astro Parents and Kids

ALPer Mike Enage beside his TMB92 refractor on Vixen GP-DX moun

ALPer James Kevin Ty beside his Canon EF100-400mm f/4.5-5.6 IS L lens on Kenko Sky Memo-R star tracker mount.

ALPer Arnel Campos beside his Explore Scientific AR102 refractor on Skywatcher HEQ5 mount.

ALPer Gary Andreassen beside his Canon EFS55-250mm f/5.6 lens on Vixen Polarie mount.

ALPer Manuel Goseco beside his Celestron C6N on EQ-5 mount.

ALP Astro Kids Kendrick Cole KC Ty & Jason Lee

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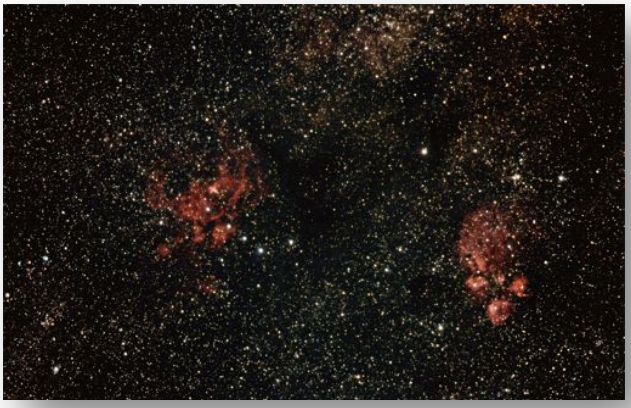
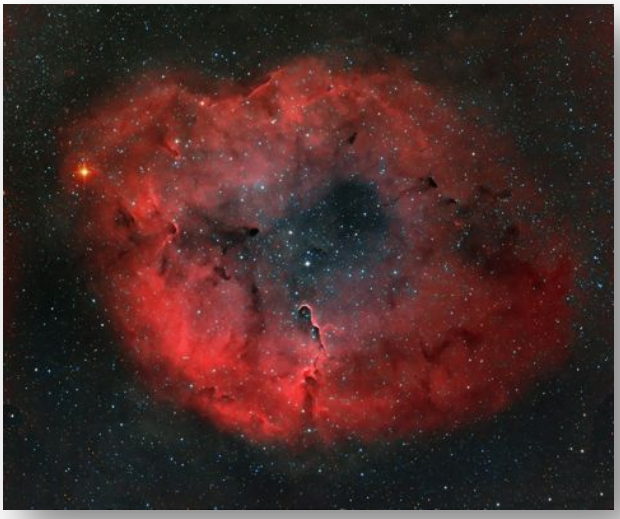


NGC6334 Cat's Paw & NGC6357 Lobster Nebula in Scorpius by James Kevin Ty



IC1396 Elephant Trunk Nebula in Cepheus by Nathaniel Custodio

Milky Way by Val Villanueva

M8 Lagoon Nebula in Sagittarius by Manuel Goseco.

Rho Ophiuchi Region by Gary Andreassen

All images featured in the article are owned by Astronomical League of the Philippines.

Abstract:

Sunspot Data Extraction Using 3D Isophote Rendering

By Reuel Norman Marigza Jr.

Abstract:

The paper explores the use of three-dimensional isophote rendering from ImageJ to be used to analyze sunspot groups and extract sunspot count data and structural features. This technique allows increased accuracy in acquiring the Wolf number even with the use of low-resolution image data.

Introduction

The relative sunspot number (Wolf number) is one measure of determining the solar activity. It was established by Rudolf Wolf over 150 years ago. The relative sunspot number *R* is computed by identifying the number of visible sunspot groups *g* and the net sunspot count from all groups *s*.
For periods when the Sun is active (approaching maxima) there is a rise in the frequency of sunspot groups, and the reverse for periods when the Sun is inactive (minima).

The difficulty of sunspot counting, however, lies in the difference of each individual's independent count. A number of factors increase the amount of uncertainty in one's data: experience, seeing conditions, 24-hour counting period, equipment, resolution, pore-spot distinction, ranges in tonal gradation.

With the onset of the digital photography it is now possible to limit the difficulties of making sunspot counts. One such photographic technique is the creation of isophotal images. Isophote rendering is a useful tool in extracting undiscernable sunspot features in which areas are separated by density.

ImageJ

The software ImageJ was developed by Wayne Rasband of the National Institutes of Health, USA. It is an open source program used in different science fields and can be downloaded on the internet at http://imagej.nih.gov/ij. The program runs on a java platform and can be used to process and analyze images. It has a wide range of extensible plugin features, including the rendering of a 3D plot from the image data.

Sample Observation

This image analysis form is supplemental to regular sunspot observations. Here is a whole-disk image of the Sun taken on April 17, 2014 showing 10 active regions. The image is taken using a Nikon D3100 mounted on a 6-inch Newtonian reflector (Sky-Watcher Explorer 150PL) at prime focus and with a full-aperture Baader AstroSolar Safety Film.

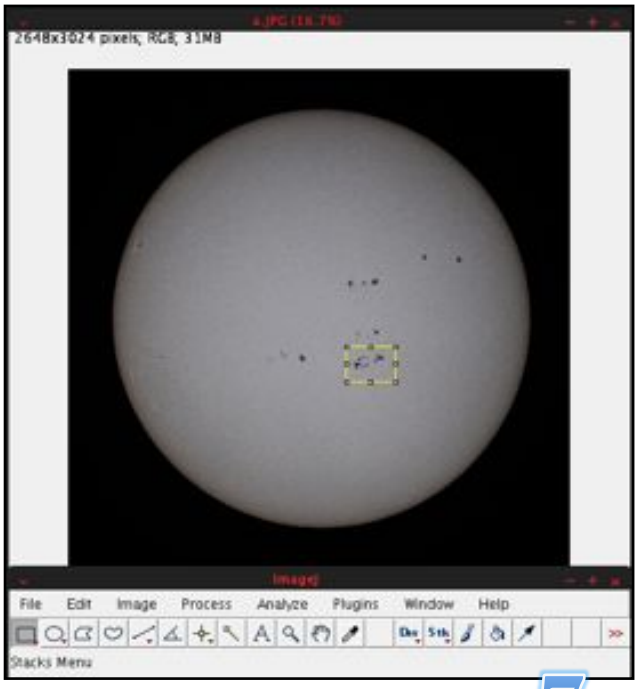
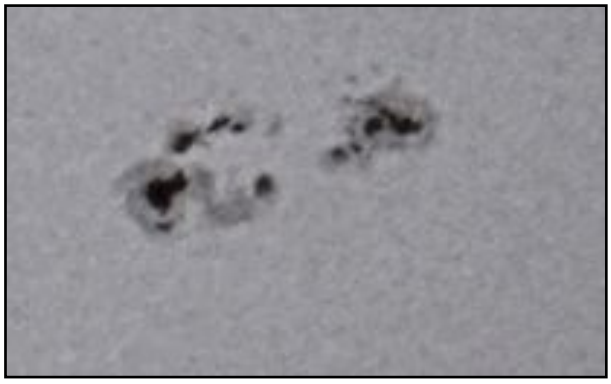


Figure 1. Solar Image | 17 April 2014



AR 2036 selected from a whole-disk image in ImageJ; and AR 2036 cropped

We select a particular active region for analysis (AR 2036). From the Plugins tab you can access the interactive 3D surface plot to do your isophotal analysis. There are a number of features in the plot that allows you to see your image isophote differently. To give it a solar surface look I set the plot to Filled and Fire LUT.

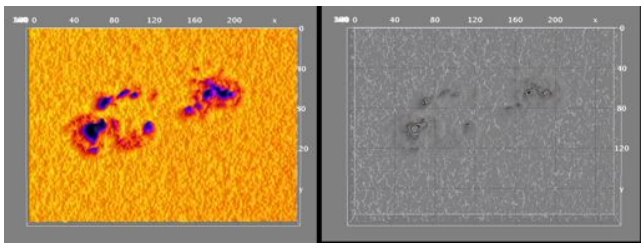


Figure 2. Interactive 3D Surface Plot

Different looks that can be rendered from the image plot. The left in Filled and Fire LUT, right in Isolines and Original colors.

The plot brings out details that are hard to detect from the original image such as better contrast to granular cells as well as faint spot features. The plot can be fully rotated and the depths of the different density areas changed to bring out other detail (Figure 3).

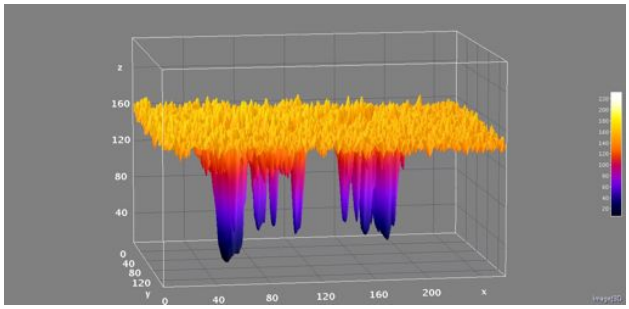


Figure 3. Rotated Surface Plot of AR 2036

The sunspot count of AR 2036 from the original image is 42 but using the 3D surface plot and tweaking the density levels revealed 14 more spots making the count 56. The counting is also made easier since the image has better contrast from the original.

Other photographic methods rely on image processing to enhance light features but the risk is that the darker umbral features are lost. The interactive 3D surface plot allows both the dark and light features to be made out without loosing image data. This tool's ability to make out features also allows for better estimation of sunspot activity even for low-resolution images (Figure 4).

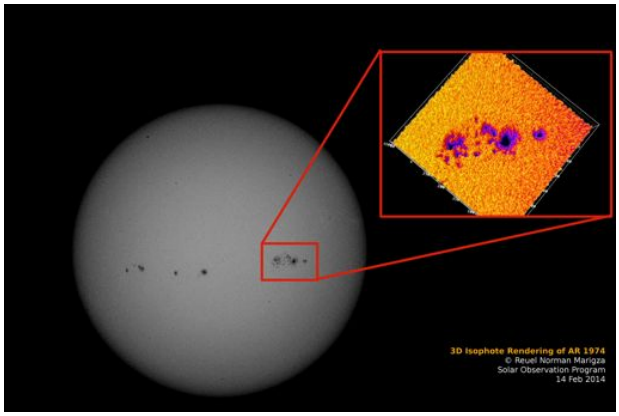


Figure 4. 3D Isophote Rendering of AR 1974 from Low-Res Image

Whole disk image taken with a Nikon D3100 and Baader filter on the aperture stopper of a Sky-Watcher Explorer 150 PL.

Conclusion

The interactive 3D surface plot function of ImageJ is a useful isophotal tool in discerning sunspot features that are usually hard to see or bring out through conventional image processing methods. The availability of this software makes this image analysis tool accessible to everyone who wishes to improve their sunspot data.

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Bray, R. J. & Loughhead, R. E. (1962). Isophotal Contour Maps of Sunspots. Australian Journal of Physics. 15(4) 482-489.

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Stargazing Session:

Global Astronomy Month: Mars Watch

by Christopher Louie Lu

The Astronomical League Of The Philippines, Inc.(ALP) led by ALP Secretary Christopher Louie Lu, in participation for this years Global Astronomy Month with association with Astronomers Without Borders conducted a Free Public Viewing of the planet Mars. Viewing started at around 8pm till 10:45pm, during that time at least 60 - 70 people had seen the Red Planet through a Celestron Powerseeker 80EQ.

ALP GAM Mars Watch Banner

Wow! Mars is reddish orange in color!

More than 65+ people got to view Mars in real time!

Great job Louie!

All images featured in the article are owned by Astronomical League of the Philippines.

Featured Article

Of Star Clusters, Nebulae and Galaxies

By John Ray Cabrera

As a reference to the Messier hunting season, a beginner would wonder as to what would be the difference between a Star Cluster, Nebulae and a Galaxy.

Here's a guide that would dispel one's shrouded understanding on these group or celestial bodies.

Star Cluster – it's essential a grouping of stars that share a common origin and are gravitationally bound for some length of time. They have been particularly useful in the science of astronomy as they pave way to our understanding about stellar formation and evolution model, as well as understanding its age.

The star cluster is divided into two categories:

- Open Cluster(also known as Galactic Cluster)
- Globular Cluster

Open Cluster – they are named as such because the individual component stars are easily resolved through a telescope. They are also called Galactic Clusters because of their location in the spiral arms on the plane of spiral galaxies. Stars in this cluster have common origin, they formed from the same initial giant molecular cloud. They contain few hundred stars up to a thousand.

Globular Cluster – it contains several thousand to one million stars in spherical, gravitationally bound system. Located mostly in the halo surrounding the galactic plane, they are are forefather of the stellar family as they comprise the oldest stars in a galactic order.

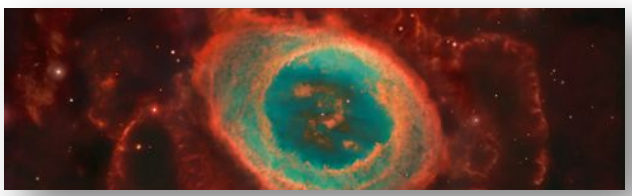
Nebulae – the etymological root of "nebulae" is derived from a Latin word which means cloud. And true as they are, the Nebulae is a cosmic cloud of dust and gas floating in the vastness of space. They are the basic building blocs of the universe as they contain elements from which stars and planetary systems are built. They are also the most visually captivating objects of the universe, glowing with rich colors and swirls of light. Stars inside these clouds caused them to glow, with spectral intensity that depends on the abundance of elements such as Hydrogen, Helium, heavy elements like Carbon, Nitrogen, Magnesium, Potassium, Calcium and Iron. The types of nebulae are:

- Emission Nebulae – cloud of high temperature gas. Within this type of nebulae, the star energizes the atoms of the cloud with ultraviolet radiation. As these atoms fall back to the lower energy states, they emit radiation. The process is quite similar to that of a Neon light. This causes the nebulae to glow. This type of nebulae tend to be red because of the abundance of the Hydrogen.

- Reflection Nebulae – contrary to the Emission Nebulae, the Reflection Nebulae does not emit radiation of its own. It is a cloud of dust and gas that reflects the light energy from a nearby individual or group of stars. Reflection Nebulae are sort of a stellar nursery as stellar formation frequently happens here. They tend to be blue in colors because of the way the lights are scattered.

- Dark Nebulae – cloud of dust that blocks the light from objects behind it, hence the word "dark". They are similar to Reflection Nebulae in terms of their composition but differ in terms of the placement of the light source. Dark Nebulae are usually seen together with Reflection and Emission Nebulae.

- Planetary Nebulae – it's a shell of gas produced by a star as it nears the end towards its lifecycle. The name is a bit misleading as they don't have anything to do with planets. The nomenclature had that origin that they were initially thought of as planets due to their round shape. The outer shell of gas is usually illuminated by the remains of the star at its center.



- Supernova Remnant – created when star is at its terminal point of its lifecycle and ended up in a massive explosion known as Supernova. The explosion spews a large amount of star's matter into space. This cloud of matter glows with the remains of the star that created it.

Galaxies – defined as large groupings of stars, dust and gas held together by gravity. They vary greatly in size and shape. Most of the objects we know of in space, from comets to meteors, asteroid to stars, planets to moon, nebulae to dust and black holes to tiny cosmic particles, are contained in a galaxy.

There are four types of galaxies:

- Spiral Galaxy – distinct flattened spiral disk with a bight center called nucleus.
- Barred Spiral Galaxy – similar to the Spiral Galaxy, except for one notable difference, the arms spiraled out from a straight bar of stars instead of from its center. About one third of the Spiral Galaxies are barred spiral; in shape.
- Elliptical Galaxy – They vary in shape from a completely round to adversely and extremely elongated ovals. Unlike the Spiral Galaxies, they have no bright nucleus at its center.
- Irregular Galaxy – a type of galactic formation with no discernable shape or structure.

Astronomers have been pouring resources in the study to hopefully plot millions of galaxies in the universe. The sheer size alone is almost unspeakably impossible to execute such endeavor.

Some galaxies are even a member of an even massive cluster of galaxies with over 2,000 member galaxies. Galaxies seemed to be grouped in a sponge-like pattern, where large galactic super clusters are gathered around what appears to be voids or bubbles. Nobody knows why this structure exists, and nobody knows what might exist into these voids, whether they're empty space or they could be filled by the exotic dark matter.

All images featured in the article are derived from www.cosmotography.com, wikimedia.org, www.gemini.edu, deviantart.net and nasa.gov.

List of Messier Objects

#	RA (YEAR 2000 COORDINATES)	Dec	Const.	Object	Mag.	Arc Size	Name
M1	5h 34.5m	+22° 01'	Tau	Supernova Remnant	8	6' x 4'	Crab Nebula
M2	21h 33.5m	−0° 49'	Aqr	Globular Cluster	6.5	13'	
M3	13h 42.2m	+28° 23'	CVn	Globular Cluster	6.2	16'	
M4	16h 23.6m	−26° 32'	Sco	Globular Cluster	5.9	26'	Cat's Eye
M5	15h 18.6m	+2° 05'	Ser	Globular Cluster	5.7	17'	
M6	17h 40.1m	−32° 13'	Sco	Open Cluster	4.2	15'	Butterfly Cluster
M7	17h 53.9m	−34° 49'	Sco	Open Cluster	3.3	80'	
M8	18h 03.8m	−24° 23'	Sgr	Nebula	6	90' x 40'	Lagoon Nebula
M9	17h 19.2m	−18° 31'	Oph	Globular Cluster	7.7	9'	
M10	16h 57.1m	−4° 06'	Oph	Globular Cluster	6.6	15'	
M11	18h 51.1m	−6° 16'	Sct	Open Cluster	5.8	14'	Wild Duck Cluster
M12	16h 47.2m	−1° 57'	Oph	Globular Cluster	6.7	15'	
M13	16h 41.7m	+36° 28'	Her	Globular Cluster	5.8	17'	Great Hercules Cluster
M14	17h 37.6m	−3° 15'	Oph	Globular Cluster	7.6	12'	
M15	21h 30.0m	+12° 10'	Peg	Globular Cluster	6.2	12'	Great Pegasus Cluster
M16	18h 18.8m	−13° 47'	Ser	Nebula/Open Cluster	6	7'	Eagle Nebula
M17	18h 20.8m	−16° 11'	Sgr	Nebula/Open Cluster	7	46' x 37'	Omega Nebula
M18	18h 19.9m	−17° 08'	Sgr	Open Cluster	6.9	9'	Black Swan
M19	17h 02.6m	−26° 16'	Oph	Globular Cluster	6.8	14'	
M20	18h 02.6m	−23° 02'	Sgr	Nebula/Open Cluster	8	28' x 28'	Trifid Nebula
M21	18h 04.6m	−22° 30'	Sgr	Open Cluster	5.9	13'	
M22	18h 36.4m	−23° 54'	Sgr	Globular Cluster	5.1	24'	Great Sagittarius Cluster
M23	17h 56.8m	−19° 01'	Sgr	Open Cluster	5.5	27'	
M24	18h 16.9m	−18° 29'	Sgr	Thick Milky Way Patch	4	90' x 60'	
M25	18h 31.6m	−19° 15'	Sgr	Open Cluster	4.6	32'	
M26	18h 45.2m	−9° 24'	Sct	Open Cluster	8.0	15'	
M27	19h 59.6m	+22° 43'	Vul	Planetary Nebula	8	8' x 4'	Dumbbell Nebula
M28	18h 24.5m	−24° 52'	Sgr	Globular Cluster	6.8	11'	

#	RA (YEAR 2000 COORDINATES)	Dec	Const.	Object	Mag.	Arc Size	Name
M29	20h 23.9m	+38° 32'	Cyg	Open Cluster	6.6	7'	
M30	21h 40.4m	−23° 11'	Cap	Globular Cluster	7.2	11'	
M31	0h 42.7m	+41° 16'	And	Spiral Galaxy	3.5	178' x 63'	Andromeda Galaxy
M32	0h 42.7m	+40° 52'	And	Elliptical Galaxy	8.2	8' x 6'	
M33	1h 33.9m	+30° 39'	Tri	Spiral Galaxy	5.7	62' x 39'	Pinwheel Galaxy
M34	2h 42.0m	+42° 47'	Per	Open Cluster	5.2	35'	
M35	6h 08.9m	+24° 20'	Gem	Open Cluster	5.1	28'	
M36	5h 36.1m	+34° 08'	Aur	Open Cluser	6.0	12'	
M37	5h 52.4m	+32° 33'	Aur	Open Cluster	5.6	24'	
M38	5h 28.7m	+35° 50'	Aur	Open Cluster	6.4	21'	
M39	21h 32.2m	+48° 26'	Cyg	Open Cluster	4.6	32'	
M40	12h 22.4m	+58° 05'	UMa	Double Star	9.6/10.1	1'	
M41	6h 46.0m	−20° 44'	CMa	Open Cluster	4.5	38'	Little Beehive
M42	5h 35.4m	−5° 27'	Ori	Nebula	4	66' x 60'	The Great Orion Nebula
M43	5h 35.6m	−5° 16'	Ori	Nebula	9	20' x 15'	
M44	8h 40.1m	+19° 59'	Cnc	Open Cluster	3.1	95'	Praesepe
M45	3h 47.0m	+24° 07'	Tau	Open Cluster	1.2	110'	Pleiades
M46	7h 41.8m	−14° 49'	Pup	Open Cluster	6.1	27'	
M47	7h 36.6m	−14° 30'	Pup	Open Cluster	4.4	30'	
M48	8h 13.8m	−5° 48'	Hya	Open Cluster	5.8	54'	
M49	12h 29.8m	+8° 00'	Vir	Elliptical Galaxy	8.4	9' x 7'	
M50	7h 02.8m	−8° 23'	Mon	Open Cluster	5.9	16'	
M51	13h 29.9m	+47° 12'	CVn	Spiral Galaxy	8.1	11' x 8'	Whirlpool Galaxy
M52	23h 24.2m	+61° 35'	Cas	Open Cluster	6.9	13'	The Scorpion
M53	13h 12.9m	+18° 10'	Com	Globular Cluster	7.6	13'	
M54	18h 55.1m	−30° 29'	Sgr	Globular Cluster	7.6	9'	
M55	19h 40.0m	−30° 58'	Sgr	Globular Cluster	7.0	19'	The Spectre
M56	19h 16.6m	+30° 11'	Lyr	Globular Cluster	8.3	7'	
M57	18h 53.6m	+33° 02'	Lyr	Planetary Nebula	9	1.3'	Ring Nebula
M58	12h 37.7m	+11° 49'	Vir	Spiral Galaxy	9.8	5' x 4'	
M59	12h 42.0m	+11° 39'	Vir	Elliptical Galaxy	9.8	5' x 3'	
M60	12h 43.7m	+11° 33'	Vir	Elliptical Galaxy	8.8	7' x 6'	

Excerpt from the book,
The Next Step: Finding & Viewing Messier's Objects by Ken Graun

#	RA (YEAR 2000 COORDINATES)	Dec	Const.	Object	Mag.	Arc Size	Name
M61	12h 21.9m	+4° 28'	Vir	Spiral Galaxy	9.7	6' x 5'	Swelling Spiral
M62	17h 01.2m	−30° 07'	Oph	Globular Cluster	6.5	14'	Flickering Globular
M63	13h 15.8m	+42° 02'	CVn	Spiral Galaxy	8.6	12' x 8'	Sunflower Galaxy
M64	12h 56.7m	+21° 41'	Com	Spiral Galaxy	8.5	9' x 5'	Black Eye Galaxy
M65	11h 18.9m	+13° 05'	Leo	Spiral Galaxy	9.3	10' x 3'	
M66	11h 20.2m	+12° 59'	Leo	Spiral Galaxy	9.0	9' x 4'	
M67	8h 51.4m	+11° 49'	Cnc	Open Cluster	6.9	30'	King Cobra
M68	12h 39.5m	−26° 45'	Hya	Globular Cluster	8.2	12'	
M69	18h 31.4m	−32° 21'	Sgr	Globular Cluster	7.6	7'	
M70	18h 43.2m	−32° 18'	Sgr	Globular Cluster	8.1	8'	
M71	19h 53.8m	+18° 47'	Sge	Globular Cluster	8.2	7'	
M72	20h 53.5m	−12° 32'	Aqr	Globular Cluster	9.3	6'	
M73	20h 58.9m	−12° 38'	Aqr	4-Star Asterism	10.5 (Brightest)	1'	
M74	1h 36.7m	+15° 47'	Psc	Spiral Galaxy	9.2	10' x 9'	The Phantom
M75	20h 06.1m	−21° 55'	Sgr	Globular Cluster	8.5	6'	
M76	1h 42.4m	+51° 34'	Per	Planetary Nebula	11	2' x 1'	Little Dumbbell
M77	2h 42.7m	−0° 01'	Cet	Spiral Galaxy	8.8	7' x 6'	
M78	5h 46.7m	+0° 03'	Ori	Nebula	8	8' x 6'	
M79	5h 24.5m	−24° 33'	Lep	Globular Cluster	7.7	9'	
M80	16h 17.0m	−22° 59'	Sco	Globular Cluster	7.3	9'	
M81	9h 55.6m	+69° 04'	UMa	Spiral Galaxy	6.8	26' x 14'	
M82	9h 55.8m	+69° 41'	UMa	Irregular Galaxy	8.4	11' x 5'	Cigar Galaxy
M83	13h 37.0m	−29° 52'	Hya	Spiral Galaxy	8	11' x 10'	
M84	12h 25.1m	+12° 53'	Vir	Elliptical Galaxy	9.3	5' x 4'	
M85	12h 25.4m	+18° 11'	Com	Elliptical Galaxy	9.2	7' x 5'	
M86	12h 26.2m	+12° 57'	Vir	Elliptical Galaxy	9.2	7' x 5'	
M87	12h 30.8m	+12° 24'	Vir	Elliptical Galaxy	8.6	7'	Virgo A
M88	12h 32.0m	+14° 25'	Com	Spiral Galaxy	9.5	7' x 4'	
M89	12h 35.7m	+12° 33'	Vir	Elliptical Galaxy	9.8	4'	
M90	12h 36.8m	+13° 10'	Vir	Spiral Galaxy	9.5	10' x 5'	
M91	12h 35.4m	+14° 30'	Com	Spiral Galaxy	10.2	5' x 4'	
M92	17h 17.1m	+43° 08'	Her	Globular Cluster	6.4	11'	

#	RA	Dec	Const.	Object	Mag.	Arc Size	Name
	YEAR 2000 COORDINATES						
M93	7h 44.6m	−23° 52'	Pup	Open Cluster	6	22'	
M94	12h 50.9m	+41° 07'	CVn	Spiral Galaxy	8.1	11' x 9'	Croc's Eye
M95	10h 44.0m	+11° 42'	Leo	Spiral Galaxy	9.7	7' x 5'	
M96	10h 46.8m	+11° 49'	Leo	Spiral Galaxy	9.2	7' x 5'	
M97	11h 14.8m	+55° 01'	UMa	Planetary Nebula	11	3'	Owl Nebula
M98	12h 13.8m	+14° 54'	Com	Spiral Galaxy	10.1	10' x 3'	
M99	12h 18.8m	+14° 25'	Com	Spiral Galaxy	9.8	5'	
M100	12h 22.9m	+15° 49'	Com	Spiral Galaxy	9.4	7' x 6'	The Mirror
M101	14h 03.2m	+54° 21'	UMa	Spiral Galaxy	7.7	27' x 26'	Pinwheel Galaxy
M102	15h 06.5m	+55° 46'	Dra	Elliptical Galaxy	9.9	6' x 3'	Méchain's Lost Galaxy
M103	1h 33.2m	+60° 42'	Cas	Open Cluster	7	6'	
M104	12h 40.0m	−11° 37'	Vir	Spiral Galaxy	8.3	9' x 4'	Sombrero Galaxy
M105	10h 47.8m	+12° 35'	Leo	Elliptical Galaxy	9.3	5' x 4'	
M106	12h 19.0m	+47° 18'	CVn	Spiral Galaxy	8.3	18' x 8'	
M107	16h 32.5m	−13° 03'	Oph	Globular Cluster	8.1	10'	
M108	11h 11.5m	+55° 40'	UMa	Spiral Galaxy	10.0	8' x 2'	
M109	11h 57.6m	+53° 23'	UMa	Spiral Galaxy	9.8	8' x 5'	
M110	0h 40.4m	+41° 41'	And	Elliptical Galaxy	8.0	17' x 10'	
M111	2h 19.0m	+57° 09'	Per	Open Cluster	4.5	30'	West Part of Double Cluster
M112	2h 22.4m	+57° 07'	Per	Open Cluster	4.5	30'	East Part of Double Cluster

ASTRO Gallery

A Photo Exhibition of the Men and Women of the Astronomical League of the Philippines

M42 Orion Nebula by Mike Enage

M8 Lagoon Nebula in Sagittarius by Manuel Goseco

M17 Omega or Swan Nebula by James Kevin Ty

M81 / M82 Galaxy Pair by Ronald Sison

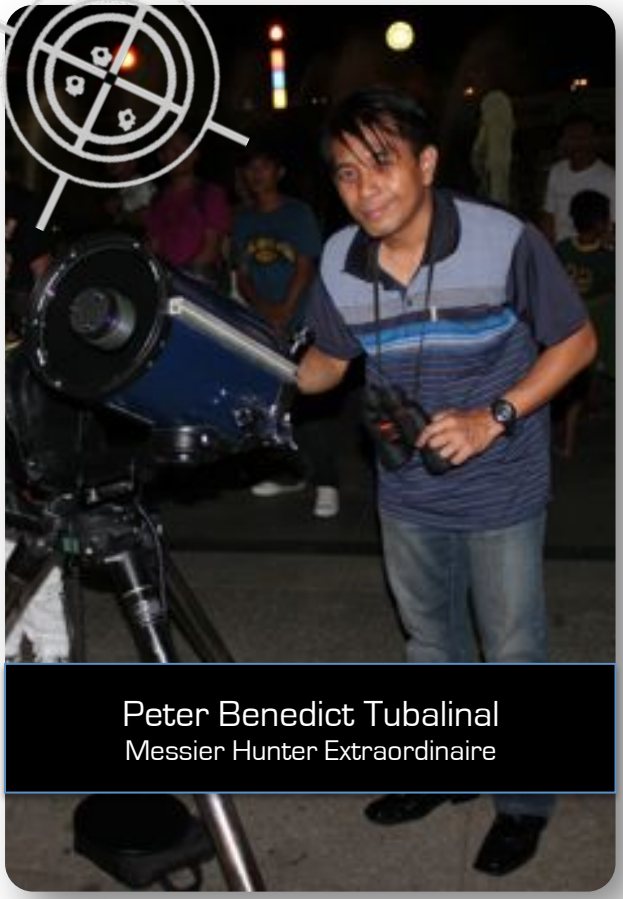
M45 Pleiades star cluster in Taurus by Andrew Ian Chan

Caliraya Southern Sky by ALPer Mike Enage

Gazers and Go Getters:

Interview with a Messier Masterhunter

by John Ray Cabrera



Peter Benedict Tubalinal
Messier Hunter Extraordinaire

Known as the glitters in the sky, Messier objects are carefully compiled with the essential criteria in mind which is its uniqueness to one another under an ensemble resemblances. The composition of what has become a Messier Catalogue includes diffuse nebulae, planetary nebulae, open clusters, globular clusters and galaxies.

As diverse form being able to be seen from the naked eye to using the professional class instruments, they offer not only the best deep sky photographic images but the resiliency of astronomers taking the shots.

This issue, we tap the help of our Messier hunter extraordinaire, **Peter Benedict Tubinal**, a long time chairman of ALP Messier Marathon, to share his profound thoughts about the objects and its ranking impact on our daily life as an astronomer and as an ordinary individual.

PJA: ***What ignites your passion into this type of astronomical observation. What started it all. Can you share a bit of history about it?***

PBT: *I have always loved stargazing. Since I was 5 years old, I would sneak out of the bedroom around midnight carrying a piece of an encyclopedia that has a star map in it. I would stay at the garden for around 2 hours, "hunting" the stars from the night sky as they are plotted on the star map. Eventually I would end up spotting constellations and that pushed me to get interested more into astronomy. Hunting on what is up there has always been awesome for me. So when I had no telescope nor binoculars, I was into meteor-watching, then comet re-discovering. But as I mature in the field, I suddenly got interested with messier objects. As I joined the Astronomical League of the Philippines, I tried joining my fellow members for a stargazing session in Caliraya, Laguna. Being so amazed with the quality of the night sky and the very low obstruction at its surroundings, this triggered me to push on organizing a messier marathon event. With such a fantastic site, hunting messier object was so amazing. There would be a moment that I need to pause for a moment to view what I never had seen in the polluted lights of Metro Manila. With that enjoyment, the Messier Marathon event was hot!*

PJA: ***Describe your first race in the Messier marathon. Is it just a race against time? Against excellent execution? Against observational patience?***

Against hunting technique? And why.

PBT: *When I was planning of doing a Messier Marathon, I really could not describe the excitement as everything was astronomically thrilling! Imagine spending the whole 12 hours with the heavens as the messier objects play hide and seek with me. Then you have to move fast in spotting them and proceed with the next as time moves so quickly. It was heart-pounding every time you encounter moments that clouds would step in and you have to change strategies from your sequence list. The most challenging part is running through the Virgo cluster, where most of my energy gets drained. I remember experiencing a migraine attack during that time and had to sleep it out for 2 hours after that. As soon as the event was over, I tried to recall the successful and failed occurrences and written them down as a lesson for me to be more prepared and matured next time, so I can beat my previous record.*

PJA: ***As a long time chairman, how has been from an organizer's point of view. How is the response rate of the participants and what can we expect for this year's Messier Marathon.***

PBT: *Well, I've repeatedly have seen them all, and seen participants not always exactly the same ones who does the marathon every year as I do. Perhaps they always bring the thought of not having even a binoculars which is their ticket in joining in. Secondly, the feeling that they do not know much about messier objects and the messier marathon itself. From their point of view, it seems like the event are only for amateurs. If we can possibly find a way to get prospective participants to do their mini-marathon by themselves, they can at least get an early feel of what to expect in the real messier marathon, and possibly get more to participate.*

PJA: ***If you have not been a Messier hunter, what type of astronomer you would have been, and why.***

PBT: *I have always loved meteor-observing and comet-hunting even before going into messier-hunting. So perhaps it'll be that which I would be doing as meteors and comets have always fascinated me. I've seen meteor showers and meteors storms -- where there were a lot of fireballs, meteors with different colors that tell their composition, meteors that split into 2-3 parts, bolides (some were accompanied by sonic booms), meteors with trails, fast and slow ones; comets that were once faint but brightens significantly in a span of days/ weeks such as Hyakutake and Hale-Bopp. Both these astronomical highlights (meteors and comets) never fails to excite me as they bring unexpected surprises.*

PJA: ***What social impact will the Messier marathon bring in terms of enriching the science of astronomy, and subsequently developing the scientific literacy.***

PBT: I want to share this feeling of excitement to all curious beginners who seem to feel anxious in joining the messier marathon because they think they are not prepared for it. With the lectures I give, I want to encourage and build confidence in them that one does not need to be an amateur astronomer to fulfill this feat. I always make it a point to stress out that it is only but natural for beginners not to get high scores during their first time on the event, and that every marathon builds better skills, patience, maturity, strategy, and appreciation, which will prepare them for the next marathon. The learning experience that equip them from the previous messier marathon will psychologically challenge themselves in beating their own record. Eventually, it'll only be a matter of time when they will realize how much they have achieved from something they thought was impossible. And this will push them to share the experience and bring out the confidence to other people -- that because of the messier marathon, they become better citizens scientifically, and at the same time learning to appreciate the beauty of the heavens.

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