

AURORA



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The Royal Astronomical Society of Canada - Windsor Centre

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An Amateur Astronomer's Enduring Experience by C. Joady Ulrich

Resolution is probably the most important characteristic of vision related to amateur astronomy as well as everything else. We use resolution to determine how well we can see with our eyes, how well the optics in our telescopes reveal a planet in the sky and even to determine how steady the atmosphere is for viewing that planet. This attribute is described from two closely related words as noted from a dictionary. "Resolve To make distinguishable the structure or parts of, as in a microscope or telescope. ... Resolution The act of resolving" (Sidney I. Landau, editor in chief, *Funk and Wagnalls Standard Desk Dictionary*, 1979, pg. 567). The practical description for me concerning resolution is the ability to see details of an object with or without a telescope. For example, my 8-inch reflector has very good resolution, since it gives a fine view of Saturn and its rings. I also know from direct personal experience that resolution is profoundly affected by less than normal levels of eyesight.

Some years ago, I wrote an article for this newsletter titled "The Sky at the 10 Percent View" which included descriptions of what details I was able to perceive visually at that level of eyesight I then had of particular astronomical objects with various telescopes. The first table shows in comparison a sample of objects seen in different telescopes prior to 1994 and again viewed in the time period starting in 2009 is noted below.

<u>Object</u>	<u>Before 1994</u>	<u>From 2009 to 2014</u>
Epsilon Lyrae	2 "stars" steady	2 nd steady, 1 st in and out of view *
Double Cluster	2 clusters	Bright stars seen in larger one only
M11	Individual stars perceived	Nothing seen of the cluster
M13	Outer stars seen	Cluster as white round smudge
Mars	Dark patch, white polar cap	Red ball
Jupiter	4 belts observed	White ball
Saturn's Rings	Cassini's Division	This black circle not seen in rings

* Seen at the first "split" of this pair of double stars designated Epsilon 2 and Epsilon 1

Though improved sky conditions might have brought more detailed views of the objects noted in the second column, enough observations of them clearly indicate that my ability to observe details

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Calendar of Events

Our next meeting...

Tuesday April 21, 2015

7:30 p.m.

at

[Ojibway Park Nature Centre](#)

5200 Matchette Road

Main Speaker...

Michael Watson

Topic...

Astrophotography with Portable Mounts

Activities...

Spring Equinox: Spring officially begins in the Northern Hemisphere on Friday March 20th at 6:45 p.m..

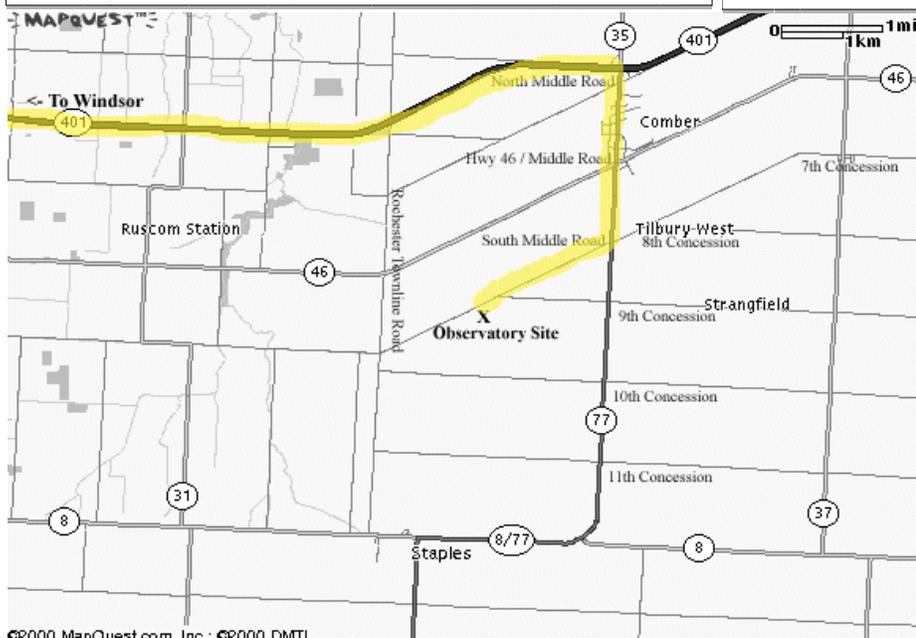
Conjunction: On Sunday March 22nd the crescent Moon will be 3.5 degrees from Venus.

Open House Night at Hallam: The next open house night at Hallam is on Saturday March 28th at 8:15 p.m..

Point Pelee Member Access Night: On Sunday March 22nd our members will have special all night access to the park for observing and chasing down Omega Centauri.

Lunar Eclipse: On Saturday April 4th in early morning a total lunar eclipse will be visible from Western Canada. Eastern Canada will see a partial lunar eclipse.

Moon, Mercury and Mars: will be close together in the evening sky on Sunday April 19th..



Hallam Observatory Site

Directions: The map at left shows the Comber area and it includes the major highways (401, 77, 8 and 46) that are in the area of the observatory.

The most direct route from Windsor is "highlighted" on the map which is to take Highway 401 East to Highway 77 South to South Middle Road. Turn right onto South Middle Road and go about 1 kilometer and just after the point where Concession 9 joins it (it is hard to see this intersection) you will find the observatory site on the South side (left) of the road. 3989 South Middle Road.

If you hit the Rochester Townline Road (you come to a stop sign) you have gone too far.

Submissions

Aurora is published monthly except for July, August and December. The September, October, January, March and May issues are full newsletters (usually 6 pages) with a number of member submitted articles. The November, February, April and June issues are short flyers (2 pages).

Submitted articles can be of any length from a paragraph to multiple pages. I can scan pictures and/or diagrams (both prints and film) to support your article and the originals will be returned to you.

Submission deadline is the 1st of the month.

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Membership

The Windsor Centre of The Royal Astronomical Society of Canada meets on the 3rd Tuesday of every month (except July and August) at the Ojibway Park Nature Centre. In addition to regular meetings the centre hosts a number of observing nights, a picnic and a December social. Members receive a copy of the Observer's Handbook, a subscription to SkyNews magazine and access to the Centre's library and telescopes. Optionally the RASC Journal is available in print form—online version free.

Annual Membership Fees: Please see the RASC website at www.rasc.ca for current rates.

Contact Greg Mockler at (519) 326-7255 or visit our website at <http://www.rascwindsor.com> for more information.

February 2015 Meeting Minutes by Steve Pellarin

The monthly meeting of the Royal Astronomical Society of Canada - Windsor Center was held at the Ojibway Park Nature Centre on February 17, 2015.

Windsor Centre **President, Randy Groundwater**, chaired the meeting. After some technical difficulties with the main presenter's equipment were worked out, Randy called the meeting to order at 7:45 p.m. and welcomed members and guests. Randy mentioned that it was 'Fat Tuesday' or Mardi Gras and noted that Tom Sobocan had provided many tasty treats for members to partake in at the mid-meeting break.

Randy then invited those in the audience to review the minutes of the January meeting which were printed in the monthly newsletter that was provided at the door. A motion to accept the minutes of the January 20, 2015 membership meeting was made by Art Rae, seconded by Mario Fabris. **MOTION CARRIED.**

Susan Sawyer-Beaulieu reminded Randy to have members and guests sign our monthly attendance book so that the Centre could keep better records of our monthly meetings - Randy concurred and pointed out the book's location.

Main Presentation

Randy introduced the **main speaker** for the evening, **Dr. Dale Partin**. Dale is a scientist with an M.S. degree in physics and a PhD in electrical engineering; having worked as an industrial scientist for 29 years. He is also the 1st vice-president of programming of the Warren Astronomical Society and in charge of programmes for the Ford Amateur Astronomy Group. He also currently serves as an adjunct professor teaching astronomy at Macomb Community College, is a fellow of the American Physical Society, a member of the Institute of Electrical and Electronics Engineers (IEEE) and has over 80 papers published in scientific literature. On top of all this, Dale is an inventor, with 38 U.S. patents. Dale's **presentation** was entitled, "Ultra Wide-Angle Binoculars".

Dale spoke about being introduced to a pair of 2X binoculars at a star party several years ago that provided a huge field of view, much larger than any through which he had previously observed. The ultrawide view combined with the slightly-better-than-naked-eye magnification provided stunning views of the Milky Way with the bonus of being able to see more stars (the binoculars would allow stars a full magnitude dimmer than naked eye limit that could be seen). Dale became fascinated by the more natural and comfortable viewing experience of these ultra-wide binoculars and undertook a scientific investigation of several models of these devices.

Dale went on to describe and explain the technical specifications and visual observing qualities of some examples of the ultra wide-angle binoculars (those having a field of view of 10 degrees and larger) and compared them with more common types, showing some of the advantages of the ultra-wide type. Dale went into great detail explaining how the size of the objective, magnification, exit pupil size, weight and various other factors are important when choosing the right pair of binoculars. He

also discussed the drawbacks and relative costs of different models. Dale explained how he carried out a rather rigorous scientific examination of the optical and mechanical characteristics of the ultra wide-angle binoculars that he had purchased and presented his conclusions as to the qualities and relative merits of each.

Dale pointed out that other than just scanning the Milky Way (a worthwhile pastime in and of itself), binoculars of this type could be used to observe other phenomena of the night sky, such as the aurora borealis, meteor showers, and even scanning for satellites. He went on to explain that new technological innovations, such as coupling miniaturized ccd cameras into the light path of this type of binocular might lead to a visual gain of up to five magnitudes of brightness in a field of view that at least somewhat resembles what the human eye naturally sees. There are even binocular contact lenses that are now available, although their application to night time observing has yet to be tested. He concluded by encouraging the audience members to experience the night sky in a new way, by using this new type of 'supervision' technology to revisit celestial objects without the sensation of having a chunk of technology (like a telescope) in the way.

After a few questions from the audience, Randy thanked Dr. Partin for his intriguing and informative presentation. He noted, "It's almost a new way of looking at the sky!"

Randy then reminded members that the club is still collecting **Canadian Tire money** from anyone wishing to donate it as it helps in deferring maintenance costs out at Hallam Observatory. Randy went on to ask **guests** new to the monthly meetings to introduce themselves so that others might have an opportunity to speak with them during the break. Several visitors did just that. Steve Mastellotto mentioned that the **10" f8 mirror** that had been previously donated to the club anonymously had been sold to new member Paul Powers.

Break and Fifty-Fifty Draw: Winner was Doug Bondy, who donated the winnings (\$4.50) back to the club.

Announcements

1. **Hallam Open House** takes place Saturday, **February 21st** at 7 p.m. at the observatory, weather permitting.
2. Matt McCall spoke of the **Mini-Messier Marathon** that club members are invited to participate in at **Point Pelee National Park** on **Saturday, March 14th**, setting up in the White Pines camping area of the park at dusk. Members will try to observe as many of the deep-sky objects in Messier's Catalogue as is possible in one observing session. Contact Matt McCall for more details.
3. Randy reminded people of the spectacular large framed **photographs** that member **Mike Pataky** shot and donated to the club. It was decided by the club council not to raffle them off at the February meeting, but instead to look into **raffling them off at the Science**

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At The Eyepiece: The Leo Triplet, Plus Two by Mike Ethier

For amateur astronomers, Spring is a celebration of all things Galaxy. After the hardships of winter observing, most of us are more than happy to welcome back warmer nights and the faint fuzzies. Leo is home to some of the finest galaxies that northern observers can see, and it is crowded with them. Leo has over 360 NGC objects alone, and all of them are galaxies. Five are on the Messier list. If I had the time and the space, I would tell you about all 364 of them.

There are any amount of double and triple galaxy systems to see, and they come in fours, fives and sixes, too. There is even a septuplet in Leo! However, the most famous group, for good reason, is known as the Leo Triplet. Consisting of M 65, M 66, and NGC 3628 (the "Hamburger" galaxy), it is a group I return to each and every Spring. I observe it nearly every Spring night that I am out with the scope. On exceptional nights, a wealth of detail can be seen in a 12" scope, making it an ideal target for the club's 14". I have yet to tire of any of the three objects.

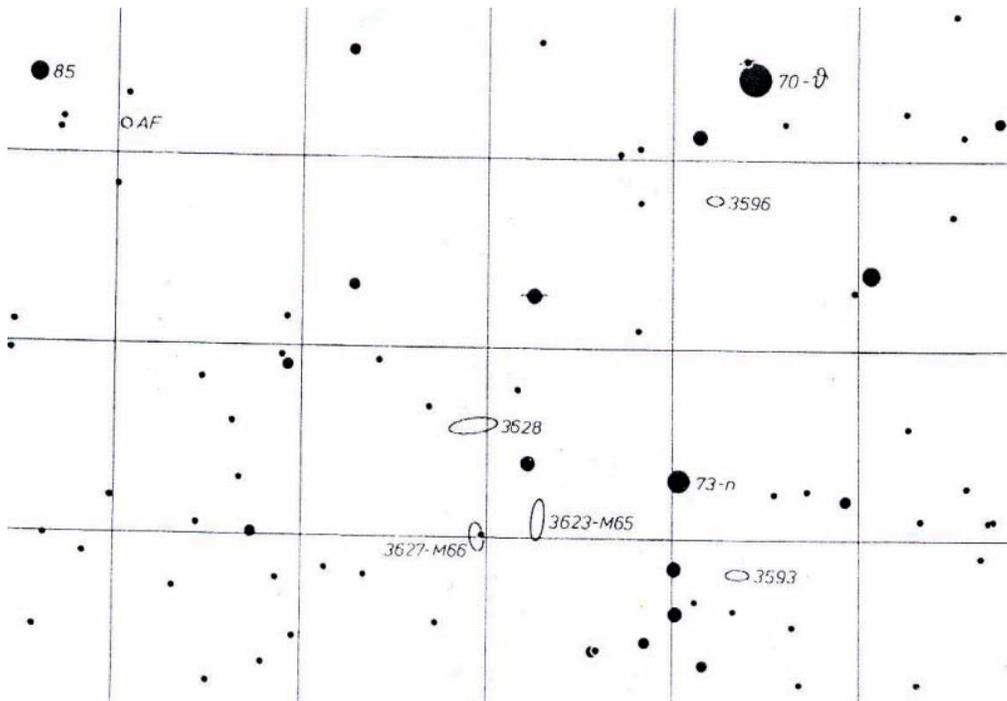
The two Messier galaxies will willingly take high powers, and at 200x and above these two fine objects really take on personality. Seen well in 6" scopes, the more aperture you throw at them the better they get. This remarkable pair of galaxies was not noticed by Messier when a comet passed through the field in 1773. According to Mechain, who did log them, the comet was probably too bright. Imagine a comet passing through this area that blotted out those two bright galaxies!

Noting the differences between the two Messier objects makes for good observational training. M 65 is more elongated, not quite as bright, and has a barely visible (in the 12") dark lane down its east edge. This is more an impression than an easily observable feature, but I have seen it more than once. M 66 is the brighter galaxy, slightly less elongated, and has a blazing core that lies not in the center, but just a bit to the north. This galaxy will take any magnification and still appear bright. They both fit into my 100x field, and I will continue returning to them throughout the season.

NGC 3628 is probably, after M31, one of the largest galaxies I have ever seen. It is viewed edge-on, and is extremely elon-

gated. Using averted vision and 100x or 120x, it just goes on and on and on, brightening near the middle. It makes a ghostly but wonderful site. The darker the sky, the better this one appears, but even through haze you can have decent views. In March 2014 I easily observed the dark lane running all across this galaxy. At 43x I can just squeeze the Triplet into my field of view.

Two other smaller galaxies appear near the triplet, and one of them is very much worth seeking out. Immediately preceding M 65 and M 66 are three brighter stars in a straight N/S line. Star 73 is the one in the north, with two slightly fainter ones south. NGC 3593 immediately precedes the middle star, and should be easily visible in an 8" scope. It is elongated E/W, and pops into view more readily than NGC 3628. It is about 1/3 the size of that galaxy, but is a very enjoyable sight in the 12", its bright core easily seen. With averted vision and 100x, the full extent of the arms can be seen. If I cannot see this galaxy on a given night, then I know the sky is a bad one. Lately it is my first test for a quality Spring galaxy sky.



A fifth galaxy is also nearby, and makes an excellent final test for good skies. NGC 3596 is the faintest of the five, lying north of the three stars just used to find NGC 3693. It is south of Theta, also called star 70. This, too, is a fairly big galaxy, oval but much harder to see than the others. If this one pops up right away at low power, I know I have an excellent night of galaxy

hunting ahead.

I hope you get a chance to come out to the observatory some fine Spring night to see these and other worthwhile objects in the Spring skies. If I am in the observatory parking lot set up with the 12", stop by for a look. I usually don't bite. Happy galaxy hunting!

Galaxy specs:

NGC 3623 (M 65): 9.8 x 2.9: Vis. 9.3; surf. br. 12.8

NGC 3627 (M 66): 9.1 x 4.2: Vis. 8.9; surf. br. 12.7

NGC 3628: 14.8 x 3: Vis. 9.5; surf. br. 13.4

NGC 3593: 5.2 x 1.9: Vis. 10.9; sur. Br. 13.3

NGC: 3596: 4 x 3.8: Vis. 11.3; surf. br. 14.1

February Meeting Minutes (continued)

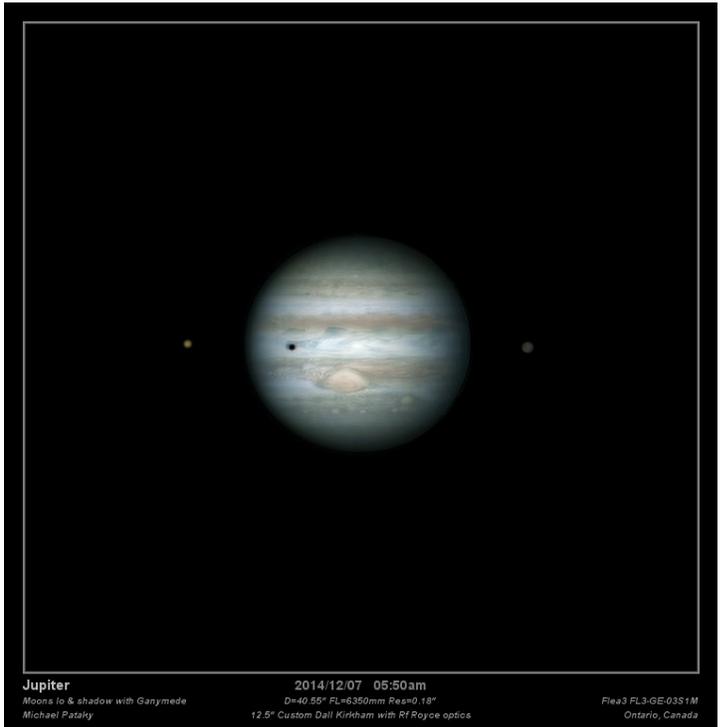
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Rendezvous Exhibition at the University of Windsor in May, where they might draw more exposure and revenue for the club's coffers. Randy is to look into the possibility and report back to the members. Art Rae asked about selling lottery tickets so that members not present at the Science Rendezvous might also be able to take part in the affair. Steve Mastellotto pointed out that holding a raffle with lottery tickets is difficult because of licensing issues with the government when holding raffles. Randy then suggested that we might only auction/raffle off one of the framed pictures at the University event and offer the other one to members.

Director of Observing Report, Steve Mastellotto: Steve began his presentation by talking about **comet Lovejoy and how it surprisingly is still a fairly bright object**, hovering just below naked-eye limit (~magnitude 6.8) even as it pulls out of the inner solar system. He also discussed the **triple shadow transit of Galilean moons across Jupiter** that took place on January 24th. Although cloudy/milky skies on and off through the evening threatened to ruin observing all around this area, members Brian Thomas and Mike Pataky managed to capture photos of the event which Steve showed. Steve also mentioned that the planet **Mercury was ending its conjunction period with the planet Venus** (which started January 21/22). He also described how on **January 26th, near-earth asteroid BL6 (8th mag.) passed close to the earth** and was visible in binoculars moving through the constellation Cancer in the late evening sky. The asteroid was so close that its motion was evident across the Prasepae cluster (M44) after even just 2-3 minutes! **Randy Groundwater along with Tom and Dave Sobocan observed** the event from Randy's backyard observatory and described the event to members present. Steve also pointed out that Jupiter was at opposition in the sky, the zodiacal light was now potentially visible in the evening sky from a very dark site and that a huge solar filament had been detected lifting off the solar surface on February 8th. The filament covered a distance of 3/4 of the visible solar disk! Steve also pointed out that on February 15th, two days before the meeting, the moon occulted many stars of the open cluster M25 just north of the Teapot of Sagittarius. Also, he showed amazing images posted by **Mike Pataky** that Mike had taken and processed, showing the **Galilean moon Io passing through the shadow of another Galilean moon, Callisto**.

Randy thanked Steve for his Director of Observing report and reminded the audience that the **next regular membership meeting** of the Windsor Centre RASC would take place on **Tuesday, March 17th at 7:30 p.m.** at the Ojibway Park Nature Centre.

Randy **adjourned the meeting at 10:12 p.m.**



At the January and February meetings Randy showed two prints that Mike Pataky has donated to the Windsor Centre. They represent the best planetary imaging that has been produced by a member of the Windsor Centre - one of the images is reproduced above. After some discussion we have decided to **raffle off** the images to the Windsor Centre membership. Tickets will be made available for purchase (1 ticket for \$1.00 and 10 tickets for \$5.00) at our regular monthly meetings (March, April, May and June) as well as at the picnic in June. The winners will be drawn during our regular June membership meeting on June 16th. Note that you **have to be present at the June meeting to claim your prize** and you **must present your portion of the ticket** to win so **hang on to those tickets**. The first number drawn will have their choice between the two prints. The prints will be available for viewing during the regular members meetings between now and June.



Leo Triplet by Scott Stuckless

An Amateur Astronomer's Enduring Experience (continued)

(Continued from page 1)

for those objects has definitely declined. 1994 was used as a reference year since it was that year when I had cataract surgery.

Another way to look at my vision history is to use the commonly used scale for measuring eyesight that centres on normal 20/20 vision. This means, according to one book about the eyes that "20/20 vision means that at 20 feet, a person sees the size letter on the examination chart that most people without (focusing problems) see at 20 feet. Another way to look at visual acuity is, if a person has 20/40 vision, they can see no better than the 40 foot line of the chart at 20 feet away." Someone with 20/20 vision can see the 40 foot line of the chart clearly at 40 feet away." (Thomas L. D'Alonzo, *Your Eyes!*, 1994, pg. 55). The second table compares normal and near normal vision levels with those that I have experienced as described below.

<u>Vision Level</u>	<u>Description of Visual Ability</u>
20/20	Normal vision
20/40	Limit to get a driver's license
20/200	"Legally blind" limit, my past usual visual level (1994)
20/400	My current visual level (2014)

Fortunately for me, certain night sky objects seem to have retained their ability to allow me to readily enjoy them visually. The picture at the beginning of this article is of the handle of the Big Dipper in Ursa Major. It is part of a photograph of that constellation taken by Randy Groundwater. The middle pair of stars shown therein, Mizar and Alcor, were just as wonderful to see in the 14-inch Lee Telescope at Hallam Observatory in August of 2014 as they were years ago in another telescope. Other delights such as the Lagoon Nebula (M8), the Dumbbell Nebula (M27), the Pleiades star cluster (M45), the Orion Nebula (M42) and the Moon also continue to be easily appreciated. The main reason for this is probably due to the brighter magnitudes of light for these objects.

You and I live in a truly incredible time where we seem to be continually impressed with the significant advances made in medical science which are of great benefit to humankind. All of this progress has directly encouraged me in believing that my present diminished ability to see will one day be significantly increased. A few years ago, while talking to my eye physician,

Dr. George Colev, who is highly skilled in his medical practice, he stated that in the future "with technology" I would definitely have improved eyesight.

My optimism for this positive outcome has been further boosted from reading recent articles describing the early successful application of relevant new technology. Recent research in Australia, Germany, Israel, the United Kingdom and the United States in these last two decades have brought about and/or tested the use of various types of electronic implants whose resulting capacity to help bring about vision has enabled persons who have suffered total loss of sight to regain some of it. Thereby, these devices have made it possible for them to function to some degree as sighted people do. From a clinical study in Germany, using such an implant, people who participated therein were "documented having the ability to read letters uninhibited, decipher different objects such as telephones, recognize faces, and read signs on doors." (Kelly Fitzgerald, "Electronic Eye Implant Gives Hope to the Blind (website article)," Feb. 20, 2013, pg. 1).

A fine example of a company developing their own type of light sensitive implant is Nano Retina in Israel. Their particular implant is described in one article "consists of photosensors, circuits, and 676 electrodes all small enough to fit onto a single implant the size of a child's fingernail." (Megan Scudellari, "Vision-Restoring Implants that Fit Inside the Eye (website article)," Dec. 4, 2012, pg. 2). The implant is designed to be attached inside the eye. An image of light is received by the implant and is converted to electrical energy. A CCD (charged couple device) camera also uses this type of energy conversion. The electrical impulses travel from the implant into the transmitter cells under the eye's retina. Then the electrical signals proceed by way of the optic nerve to the brain where the visual image is processed and seen. In the article referred to above, Nano Retina researchers obtained very positive results from testing a prototype. They are working on an implant with a greater number of improved electrodes. The company's managing director, Ra'anah Gefen said "Our target is to get to 20/20 (vision)." (Scudellari, 2012, pg. 2).

Perhaps with such an implant in, say, 10 to 20 years, I will be able to resolve with a good telescope, stars in the core of the great globular cluster M13. I sure do hope so.



Sunset and Moonrise panorama by Dan Taylor