



*More winter? Less winter? I can never remember.*

## ***The Aero Aerial***

The Newsletter of the Aero Amateur Radio Club  
Middle River, MD  
Volume 17, Issue 2  
February 2021

Editor Georgeann Vleck KB3PGN

### ***Officers***

President	Joe Miko WB3FMT	Repeater	Phil Hock W3VRD Jerry Cimildora N3VBJ Ken Erisman NE3A Dave Brunner AC3EO
Vice-President	Rob Ballou KC3ROB	VE Testing	Pat Stone AC3F
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Treasurer	Warren Hartman W3JDF	Trustee:	Dave Fredrick KB3KRV (W3PGA) Jim Marshalek KC3FBL (AE3RO)
Resource Coordinator	Ron Distler W3JEH	Club Nets	Joe Miko WB3FMT
		Contests	Bob Venanzi ND3D

Website: <http://w3pga.org>

Facebook: <https://www.facebook.com/pages/Aero-Amateur-Radio-Club/719248141439348>

# About the Aero Amateur Radio Club

## Meetings

The Aero Amateur Radio Club meets at 7:30 pm on the first and third Wednesdays of the month at Essex SkyPark, 1401 Diffendall Road, Essex. Meetings begin at 7:30 p.m. local time. Meetings are canceled if Baltimore County Public Schools are closed or dismiss early.

## Repeaters

**W3PGA**      **2 M :** INPUT : 147.84 MHz, OUTPUT : 147.24 MHz, PL 123.0  
**W3PGA**      **70 Cm:** INPUT : 444.575 MHz, OUTPUT : 449.575 MHz, PL123.0  
**W3JEH**      **1.25 M:** INPUT : 222.24 MHz, OUTPUT : 223.84 MHz

## Club Nets

Second Wednesday Net – 70 Centimeters (449.575 MHz Repeater) @ 8 p.m. Local Time

Fourth Wednesday Net – 2 Meters (147.24 MHz Repeater) @ 8 p.m. Local Time

Fifth Wednesday Net – 10 Meters (28.445 MHz) @ 8 p.m. Local Time

## Radio License Exams

The Aero Amateur Radio Club sponsors Amateur Radio License Exams with the ARRL VEC. Examination sessions are throughout the year. Walk-ins are welcome; arrive no later than 30 minutes after start time. \$15 charge.

### 2021 Examination Schedule DUE TO COVID-19 DATES May be Canceled!

Time:		1 pm	1 pm
Dates:		Sat., Mar. 20	Sat., May 22
Where:		American Legion, Rosedale	American Legion, Rosedale

American Legion Post 180, 1331 Seling Ave., Rosedale, MD 21237

Contact: Patricia Stone AC3F, email: [ac3f@juno.com](mailto:ac3f@juno.com), landline: 410-687-7209

## LOCAL AREA NETS

Day	Time	Freq. (MHz)	Net Name
Daily	9 – 10 am	145.330	Oriole Net
Daily	6 pm	3.820	Maryland Emergency Phone Net
Daily	6:30 – 7 pm	145.330 no PL	Balto. Traffic Net (b/u 146.670 PL 107.2)
Daily	7 pm & 10 pm	3.643	MD/DC/DE Traffic Net
2 <sup>nd</sup> Tue	7:30 pm	146.670	Baltimore County RACES Net
2 <sup>nd</sup> Wed	8 pm	449.575	Aero ARC Net
4 <sup>th</sup> Wed	8 pm	147.240	Aero ARC Net
5 <sup>th</sup> Wed	8 pm	28.445	Aero ARC Net
Fridays	7:30 pm	145.330	Back in the Day Net
When activated by NOAA		147.030	SkyWarn (primary)

## CLUB MEETINGS

### Aero ARC ZOOM Meeting - Jan. 6, 2021

Start Time: 07:00 pm; End time: 08:11 pm

**Members Present:** Rob AE3B, Don K3DON, Joe WB3FMT, Bob WA3SWA, Shane KC3PPM, Harry AC3EK, Gus AA3GG, Pat AC3F, Tom WA3QLY, Rich KB3VAE, Larry KB3QWC, George KB3TBH, Ray N3RES, Don N3FQC, Georgeann KB3PGN, Dave KA3SNY, Dave N3SOI  
17 members present

**Treasury Report:** Bank \$2,054.27 On Hand: \$0.00

**Repeater Report:** 2 mtrs: No Problems; 70 cm: No Problems

**Correspondence:** Email has been received by the club on next year's insurance.

**Public Service:** We still need for our members to continue checking in with and helping neighbors and your fellow hams if possible.

**EmCOM:** 30 Tropical Storms, 12 Hurricanes, and 6 Hurricanes made landfall in the US or US territories.

**SKYWARN Classes:** To check on or register for online classes, see SKYWARN website.

Basic 1 - Mon Jan. 25, 2021, 6-8 PM Baltimore City online

Basic 1 - Wed Feb. 10, 2021, 7-9 PM Anne Arundel County online

Basic 1 - Tue. Feb. 15, 2021, 6-8 PM Howard County online

**VE Testing:** The American Legion Hall in Rosedale is the new testing location and will be used for the near future. The AL Post it is located at 1331 Seling Ave. Rosedale 21237. The following testing dates have been scheduled: Jan 16, Mar 20, May 22, Sep 18, and Nov 20. Standard Covid-19 protocols will be followed.

**Old Business:** Trailer Info: Warren ordered tires from another distributor and two new bumper jacks to replace the broken ones. Marty picked up the tires and jacks on Monday Dec 21 and between the 22nd and 23rd all the work was completed.

**Dues:** I still have 9 members that still owe dues for this year! If you are in question, send me an email [joseph.miko@verizon.net](mailto:joseph.miko@verizon.net) or call me a 443-956-0197. Suggestion made by Bob WA3SWA to send an email to each of the 9 members to see if they have any records stating that they paid last year. And to ascertain if that want to stay in the club for 2021 that dues are due.

## **New Business:**

- 24 Repeater - Additional work needs to be done on the 24 repeater, the amplifier needs to be placed further from the Repeater. It needs to be the last device behind the duplexers. Phil suggested that we get a used Motorola or GE amplifier, increase the cable length to ~ 10 feet and use double shielded cables. Run the repeater at 5 watts and the amp at 60 to 100 watts. I will check with Jerry and Ken for additional info. Also, to make sure a Class C amp can run C4FM digital.
- An additional work group will be tasked with removing the old 440 and 24 repeaters later.
- Jon and Marty are members of the same AL Post, and this post is interested in starting and building a radio station, AERO ARC may be able to help them out?

## **New Ideas for Club Meetings:**

The following suggestions were made:

- During the Covid-19 plague, do we still want to have 2 meetings per month or have an extra radio net? Any changes to or for the monthly format.
- How about a presentation for the club via Zoom? If not how about sending an article to Georgeann for the Aerial!
- Anyone have a radio or astronomy topic that they would like to have explained? Send it to me and I will see who can answer it, either in writing or a Power Point presentation.
- Suggestion to have a Zoom Meeting on the 1st Wednesday of the month and have an additional radio net on the 3rd Wednesday of the Month. That would make at least 4 nets per month. What do you say?
- Use the second ZOOM meeting as a RAG CHEW event, no meeting, just Chew!
- Keep the same food menu for FD 21, use FD 20, we didn't use it.
- Keep the same proposed FD 20 plans for FD 21, less work.

Please look at the above suggestions, please to me telling me which ones you would like to do. Or, if you have any other ideas the club can use? You can reply to this email or send me a separate copy of your suggestions. Email to: [joseph.miko@verizon.net](mailto:joseph.miko@verizon.net)

- Use the second ZOOM meeting as a RAG CHEW event no meeting just Chew! Was the option chosen. "As it is written, so shall it be."

## **Aero ARC ZOOM Rag Chew – Jan. 20, 2021**

Start Time: 07:00 pm; End time: 08:36 pm

Members Present: Rob AE3B, Don K3DON, Joe WB3FMT, Bob WA3SWA, Harry AC3EK, Pat AC3F, Tom WA3QLY, Lou AB3QK, Rich KB3VAE, George KB3TBH, Dave KB3KRV, Jerry N3VBJ, Gus AA3GG, Larry KB3QWC, Dave N3SOI

15 members present

For this meeting there was a pair of "You Tube" presentations. The first one was "Civility in Ham Radio" and the second "Why 50 ohms?" Background: There is a HAM Dave Casler, KE0OG, who has a Thursday Night Q&A session from 9-10pm on You Tube.

"Civility in Ham Radio:" The Radio Amateur's Code

The Radio Amateur is...

CONSIDERATE... never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL... offers loyalty, encouragement, and support to other amateurs, local clubs, and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE... with knowledge abreast of science, a well-built and efficient station and operation above reproach.

FRIENDLY... slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for the interest of others. These are the hallmarks of the amateur service.

BALANCED... radio is an avocation, never interfering with duties owed to family, job, school or community.

PATRIOTIC... station and skill always ready for service to country and community.

-- The original Amateur's Code was written by Paul M. Segal, W9EEA, in 1928.

"Why 50 ohms?"

A story starting with telegraph and early phone lines to twisted pairs and finally coax. It seems that 50 ohms is a sweet spot between 30 and 70 ohms for power and attenuation properties.

Harry also sent me some additional links for other topics that I want to use in the upcoming second ZOOM RAG CHEW of the month. If you like the reports by Dave Casler let me know, and I will look for more of them!

Jerry N3VBJ is scheduled to be home by Monday the 25th. Repeater work is tentatively scheduled for next Thursday the 28th at 9:30 am Kenwood High School.

Topics discussed:

- The recent FCC Enforcement Advisory Not to use Radios in Crimes!
- Extra Class course Zoom Extra Class, 11 weeks, 6:30 pm on Thursday (3hrs) Starting on Jan, 28th. The course is free, but you need the Extra book and a note book.
- The Contest University will host "Propagation Summit " on Jan. 23. At 11 am EST. this is a Webinar presentation.

Stay Well and be Safe.

73,

Joe Miko

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## Net Reports

### 1-13-21: 440 net on 449.575r, 20:00 to 20:25 local.

W3PGA Joe Essex, N3RES Ray Carney, W3VRD Phil Essex, N2FQC Don Perry Hall, AC3F Pat Middle River, KC3AID Marty Rosedale, KB3VAE Richard Middle River, N7JKR Jon Rosedale 8 people on the net.

### 1-27-21: 2-meter net, 20:00 to 20:30 local.

W3PGA NCS Joe Essex, N3FQC Don Perry Hall, K3DON Don Joppatowne, AC3F Pat Middle River, N3VBJ Jerry Rosedale, KB3VAE Richard Middle River, KB3TBH George White Marsh, AC3EK Harry Overlea

8 Aero members on the net

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## VE CORNER

by Pat Stone, AC3F

The AERO VE Team held its first session for 2021 on Jan. 16th. We served 10 applicants. Congratulations to new Extra: Kim Shaffer KC3QPQ, new General: Ross Weinshenkee KO4LOA and also new Techs: Hubbert Sheppard KC3RBL, Chenbo Sun KC3RBM: Ron Connor KC3RBI, Joe Navalaney KC3RBJ, Yvonne Navalany KC3 RBK, Derek West KC3RBN, Mike Lovegrove KC3RBO.

Many thanks to VE's: WB3FMT, KB3VAE, N3FQC, N3RES and WA3QLY for assisting me with our first session of 2021. We couldn't do this without you. Hope to see you in March. It's always a joy working with you.

Our next test session will be held on Saturday, March 20th at 1PM in the American Legion Post 180 in Rosedale, Md. Hope to see you then.

Here are the 2021 test dates we have reserved at the American Legion Hall Post 180 in Rosedale, Md. All dates are Saturdays, and all tests will start at 1 pm.

**January 16, March 20, May 22, September 18, November 20**

We will also have our annual FD exam session at the Sky Park at noon on **June 26**.

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## **Aero ARC Members in Digital Mode**

*Some email chain material submitted to Joe Miko*

Last weekend's (12-5 & 6) **FT8 Roundup**. First, **what is it?** FT8 is one of the many digital modes often referred to as sound card modes (SCM) because they utilize a computer's sound card to bring in audio from your radio to be processed by software to decode the information embedded in the signal. Conversely, when you want to transmit, the software encodes your message into audio tones that are sent out via your sound card to your radio's audio or Mic input. Tech info @ On All BANDS

Both Bob WA3SWA and Harry AC3EK were both on the air. Bob and Harry are near by neighbors in Overlea (about 5 blocks). It's great to see members of the retired club can find something to do on the weekends Hi Hi. Glad to see the results.

*Rec'd 12-7-20*

HI Joe,

Thought I'd give you this contest report for the FT8 Roundup this past weekend. I know Harry, AC3EK was on as well. Not sure of any other club members.

I made 120 contacts with 33 states, 5 Canadian provinces, and 11 DX countries. Final score of 5880 points.

Feel free to use this as you feel fit.

"73"

*Bob*

*Rec'd 12/8/20*

Joe, Here is a revised score and equipment used for the FT8 Roundup. Please replace the first email with this.

Total stations worked: 62 (States: 42, Countries: 20, Canadian Provinces: 3)

Multipliers: 26 Score: 1610

Bands worked were 40 and 20.

Radio: ICOM 7300-Power 25 watts both bands. Hours of operation less than 6 hours total for both days.

Antenna: SuperAntenna Vertical-with tuned ground radials running North and South.

Solar Flux Index between 96 low and 106 high. Mag flux 0-2 indices.

It was fun. 73's *Harry*

Keep sending me your contest info and I will pass it on to Georgeann to post in the Aerial and don't forget the 25 day of Fun Contest starting on Jan 1<sup>st</sup>.

*Joe M*

## **FT Roundup results**

*Submitted Jan 22, 2021*

The results of the FT Roundup contest, which was held on Dec 5th & 6th, 2020 are in. This FT8/FT4 contest was sponsored by [rttycontesting.com](http://rttycontesting.com),

Out of 927 worldwide single operator results, I placed at #435. I logged 115 contacts with 48 multipliers for a total score of 5520 points. This score put me at #6 out of 10 entries for Maryland.

The number 1 spot for Maryland was taken by NA3M with 405 contacts and 82 multipliers for a score of 33210 points.

The number 1 spot worldwide was taken by N8OO with 1123 contacts and 105 multipliers for a score of 117915.

"73"

*Bob, WA3SWA*

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## ***In Case You Missed It***



**RadioShack® is back as an online retailer of electronics.** It is offering some parts in its inventory that largely consists of radios, batteries, telephone gear, drones, computer accessories, and even cameras. The iconic company was recently purchased from General Wireless by Retail Ecommerce Ventures (REV). No plans are in place to reopen **RadioShack** RadioShack-owned stores, although some 400 brick-and-mortar outlets are operated by franchisees.

*Source: The ARRL Letter for December 3, 2020*

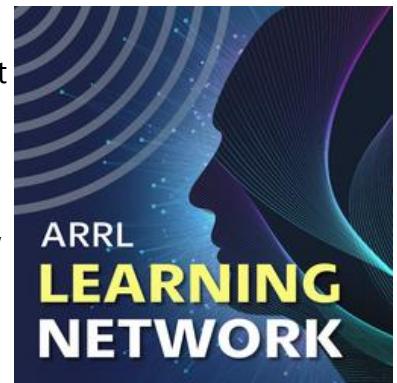
## **ARRL Learning Network Webinars**

Visit the [ARRL Learning Network](http://ARRL.org/learning) (a members-only benefit) to register, check on upcoming webinars, and view previously recorded sessions. The schedule is subject to change.

## **Easy Helical Copper Tape and PVC 2-Meter Vertical Antenna: John Portune, W6NBC**

Learn how to quickly build a tiny, 18-inch continuously loaded lightweight portable or base station 2-meter omnidirectional vertical with performance and efficiency comparable to a 5-foot J-pole. All you need is some hardware-store copper tape and PVC pipe, and the cost is roughly \$10. It's an easy afternoon's homebrew project, ideal for the new ham but equal to the experienced ham's needs. It is great for events like bike-a-thons. It also makes an excellent ham radio club hands-on building project, and the design is adaptable to other bands.

**Tuesday February 2, 2021 @ 1 PM EST (1800 UTC)**



## **Interesting Stories about Ham Radio & Weather Spotting: Rob Macedo, KD1CY**

One of the most critical ways amateur radio supports agencies such as the National Weather Service (NWS), National Hurricane Center, and emergency management is through weather spotting via the NWS SKYWARN program. This presentation reviews some interesting stories about how amateurs involved in SKYWARN have saved lives and property and why this is an important amateur radio activity.

**Thursday February 11, 2021 @ 8 PM EST (0100 UTC on Friday, February 12)**

## **Maxim Memorial Station W1AW Tour: Joe Garcia, NJ1Q, W1AW Station Manager**

Maxim Memorial Station W1AW, located in Newington, Connecticut, was established to honor the memory of ARRL's co-founder and first president, Hiram Percy Maxim. Although the first radio station of the ARRL was actually located in Hartford, Connecticut and active as W1MK, W1AW in Newington is known worldwide and considered the radio station most associated with Hiram Percy Maxim. Formally established in 1938, nearly 2 years after the death of Hiram Percy Maxim, W1AW has consistently been on the air, save for the time when the station was ordered off the air by the FCC due to World War II. This guided tour will provide an inside look at W1AW and will be led by Station Manager Joe Garcia, NJ1Q.

**Thursday February 18, 2021 @ 3:30 PM EST (2030 UTC)**

## **Talking to Astronauts: An Elementary School's Exciting ARISS Experience: Diane Warner, KE8HLD**

This is a story about Tallmadge Elementary School's participation in a once-in-a-lifetime ARISS (Amateur Radio on the International Space Station) school contact. You'll learn about their amazing journey leading up to the amateur radio contact with an astronaut on the International Space Station. The excitement of the entire experience was shared not just by the students, but included faculty, parents, the community, and local amateur radio operators. You will also learn how to begin the process of submitting your own ARISS contact proposal.

**Tuesday, March 2, 2021 @ 1 PM EST (1800 UTC)**

Visit the [ARRL Learning Network](#) for more information.

Source: *The ARRL Letter* for January 28, 2021

## HAM NEWS

### Arizona Congresswoman Introduces National Amateur Radio Operators Day Resolution

US Representative Debbie Lesko of Arizona has introduced a [resolution](#) to designate April 18, 2021, as National Amateur Radio Operators Day, to recognize the important contributions of amateur radio operators.



"Amateur radio operators are critical in times of crisis and our communities are safer thanks to their dedication to sharing important information with the public," Lesko said. She was approached to introduce the resolution by 12-year-old Raymond, N7KCB, from Peoria, Arizona.

"I started [Long Distance Responders](#) so I can help prepare the community for emergencies with amateur radio," said Raymond. "There might be a price for a radio, but the ability and knowledge to help someone is truly priceless."

As Lesko's resolution notes, World Amateur Radio Day (WARD) is celebrated annually on April 18 to commemorate the founding of the International Amateur Radio Union ([IARU](#)) in 1925, and she said her resolution recognizes the amateur radio community with a national day in the United States in 2021. The resolution cites the Amateur Radio Emergency Service (ARES<sup>®</sup>) for providing "invaluable emergency communications services following recent natural disasters, including but not limited to helping coordinate disaster relief efforts following Hurricanes Katrina, Wilma, and Maria and other extreme weather disasters."

Source: *The ARRL Letter* for November 19, 2020

### Eastern Iowans Rely On Ham Radio When Severe Weather Strikes

A derecho with winds of 80 to 100 MPH struck eastern Iowa last August, disrupting power and telecommunications for some 400,000 residents. But, as ARRL member and Amateur Radio Emergency Service (ARES<sup>®</sup>) volunteer Scott Haney, N0GUD, recently explained to *The Gazette* in Cedar Rapids, that's when amateur radio shines.

Haney, the president of the Cedar Valley Amateur Radio Club ([CVARC](#)), was the focus of the January 19 [feature](#), "2nd-largest per-capita group of amateur radio operators in the world calls Eastern Iowa home," by Molly Rossiter.



"For some people, [amateur radio is] merely a hobby, but for a lot of us, it's much more than that," Haney said. "Ham radio operators are involved in emergency management, in large event management, in a large variety of things. A lot of times people don't know we're there, but we're actually a large part of planning and carrying out many events and gatherings," he said. "People don't realize, especially in weather events like hurricanes, [that] amateur radio is a huge part of getting people in and out of dangerous areas. We've been doing that for decades."

As the article notes, the fact that Collins Aerospace (formerly Collins Radio and Rockwell Collins) calls Cedar Rapids home is believed to be the reason that the second-highest population density of hams in the world reside in Eastern Iowa.

Haney retired in 2019, after 30 years with Rockwell Collins and Collins Aerospace. He's been licensed for more than 40 years.

*Source: The ARRL Letter for January 21, 2021*

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## ***Hamfests***

### **CANCELED**

#### **Sunday, March 14, 2021: Winterfest, ARRL Virginia Section Convention 2021**

Location: Richard Ernst Community Center, Northern Virginia Community College, 8333 Little River Turnpike, Annandale, VA 22003

Website: <https://viennawireless.net/wp/events/winterfest/>

Sponsor: Vienna Wireless Society

Talk-In: 146.910 (no tone)

Public Contact: Harry Mamaux , K3NF, 8425 Peace Lily Ct Apt 316 Lorton, VA 22079, Phone: 703-395-6721, Email: [k3nf@cox.net](mailto:k3nf@cox.net)

### **NO NOTICE OF CANCELLATION AS OF 1/1/21**

#### **Sunday, June 20, 2021: Father's Day Hamfest at Arcadia**

Location: Arcadia Fairgrounds, 16920 Carnival Ave., Upperco, MD 21155

Website: <http://W3FT.com> [Facebook Baltimore Amateur Radio Club](#)

Sponsor: Baltimore Amateur Radio Club

Talk-In: 146.67 (PL 107.2)

Public Contact: David Shadwell , AB3TE, P.O. Box 120 Reisterstown, MD 21136, Phone: 410-252-2878, Email: [W3FT@yahoo.com](mailto:W3FT@yahoo.com)

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# From the Skies over Mt. Essex

## SKY Events for February 2021

Feb 4<sup>th</sup> - Last quarter Moon

Feb 6<sup>th</sup> - Venus is 0.4° S of Saturn 5UT, 00:00 EST.

Feb 8<sup>th</sup> - Mercury is inferior conjunction 14UT, 09:00 EST.

Feb 10<sup>th</sup> - Saturn 3° N. of the Moon 11UT, 06:00 EST; Venus is also 3° N of the Moon 20UT 15:00 EST.

Feb 11<sup>th</sup> - New Moon & Venus is 0.4° S of Jupiter 12UT, 07:00 EST.

Feb 15<sup>th</sup> - Galileo Galilei born in 1564.

Feb 17<sup>th</sup> - Uranus is 3.0° N of Moon 16UT, 11:00 EST.

Feb 18<sup>th</sup> - Mars is 4° N of M35 Open Cluster 23UT, 18:00 EST; Clyde Tombaugh discovers Pluto (9<sup>th</sup> Planet) in 1930.

Feb 19<sup>th</sup> - First Quarter Moon

Feb 27<sup>th</sup> - Full Moon, Traditional Trapper's Moon, Celtic Moon of Ice; James Hay first detects Radio waves emitted by the Sun in 1930.

## Planet Lookout at mid-Month EST

### Sunrise 06:50 EST and Sunset 17:42 EST

**Mercury -- Morning** Rises 05:57 Sets 16:34 Mag 1.9. 0 and Size 9.9 arc seconds

**Venus -- Morning** Rises 06:29, Sets 16:52 Mag -3.9 and 10.0 arc seconds.

**Mars -- Evening** Rises 10:25, Sets 17:29, Mag 0.7 and 7.0 arc seconds.

**Jupiter -- Morning** Rises 06:15 Sets: 16:31, Mag-2.0 size 32.6 arc seconds.

**Saturn -- Morning**, Rises 05:45 Sets 15:59, Mag 0.7 size 15.3 arc seconds.

**Uranus— Evening** Rises 09:54, Sets 23:21; Mag 5.8 size 3.4 arc seconds.

**Neptune -- Evening** Rises 07:55 Sets 19:29; Mag 8.0 size 2.3 arc seconds.

The Hunter knows the best...!

Orion is a hunter of Greek fame. He was killed by the sting of a Scorpion and he and the scorpion were placed in opposite parts of the heavens. Orion in the Winter sky and Scorpius in the Summer sky never to meet again.

According to the Naked Eye Stars by Richard Lampkin there are 77 stars visible in the Orion Constellation of the 77 stars 7 are greater than +2.4, 19 are greater than +4.4 the remaining 51 are between +4.5 and +5.5 magnitude. Of the 50 Brightest Stars (Observers Handbook 2021) 5 of these stars are found in Orion all being brighter than +1.74. The makes it the brightest constellation in the sky Ursa Major in the next brightest with 4 stars on the 50 Brightest list. The size in the sky makes Orion the 26 largest of the 88-constellations covering 594 square degrees the sky, which is 1.3% of the entire sky. Note There are 41,253 square degrees in the sky. The following objects can be found in Orion. 38 Astro Gems.

**Double Stars 8** - Rigel, Mintaka, Alnilam, Alnitak, Trapezium, Nair al Saif, 48/Sigma, Σ747,

**Carbon Stars 2** - W and BL

**Nebulae 15** - M42, M43, M78, NGC 1788, NGC 1973/5/7, NGC 1980, NGC 1981, NGC 1999, NGC 2023, NGC 2024, NGC 2071, NGC 2174, IC431/32, Sh 2-276, vdB 62/63

M = Messier, New General Catalog, IC Index Catalog, Sh Stewart Sharpless and vdB Sidney van den Bergh-Waterloo

**Open Clusters 11** - NGC 1662, NGC 19981, NGC 2112, NGC 2141, NGC 2169, NGC 2175S, NGC 2180, NGC 2186, NGC 2194, Cr 70, Basel 11B Basel- Univ of Basel, Switzerland

**Super Giant Stars 2** - Betelgeuse (Red) Rigel (Blue)

Grab yourself a copy of "Objects In the Heavens" by Peter Birren, A Sky & Telescope's "Pocket Sky Atlas" by Roger Sinnott, or the "Atlas of the Stars" published by Astronomy Magazine. With any one of these publications, you will find countless enjoyments looking at the best place in the sky!

The Orion can be seen in the February sky any time after evening twilight between 7 and 7:30 pm.