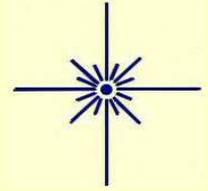




# The Guide Star

Newsletter of the Amateur Astronomers Association of Pittsburgh Inc  
Founded June 9, 1929 by Chester B. Roe and Leo J. Scanlon  
Website: 3ap.org



November 2011

Volume 45, No.11

## November 11<sup>th</sup> : AAAP General Meeting

### **2011 Kevin Brunelle Astrophotography Contest Carnegie Science Center 7:30 pm**

Come out and join fellow AAAP members at one of the year's best attended club events, the Brunelle Astrophotography Contest at the November general meeting.

Members get to sit back and enjoy the sky as seen and captured over the past year through the efforts of enthusiastic and talented imagers within the club, some of whose efforts have been published and recognized nationally.

Images will be presented in three categories - those taken with optics whose focal lengths are no greater than 300mm, images taken with optics with focal lengths greater than 300mm and images of atmospheric phenomena.

Members in attendance get to choose their favorites from among the entries and cast votes ranking their preferences. The ballots are tallied and the results are announced at the meeting. It's an enjoyable evening and a great way "to entertain the eye".

Over the past decade or so, spurred by the advent of digital technology, astrophotography has become a major part of the amateur astronomy hobby.

Today the best lunar and planetary images are often produced by amateurs and their efforts are routinely surpassed only by the images obtained from space-based systems.

The appreciation of the aesthetics of the sky, both deep and shallow, has been increased immeasurably by the efforts of today's amateur astronomers. It's fair to say that right now astro-imagers are probably the most effective ambassadors for the astronomy hobby, capturing the majesty of the universe which attracts so many.

By the way, it's not well known, but the word "photography" was first used by an astronomer. Sources disagree, but it was either Sir John Herschel, who pioneered southern hemisphere astronomy, or the celebrated lunar cartographer, Johann Madler who gets the honor.

- GS Editor

## December Reminder : AAAP Annual Holiday Party

This year's Holiday Party will officially begin at 7:30 pm on Friday December, 9<sup>th</sup>.

The venue is the Shaler Villa Volunteer Fire Department Hall off of Route 8 on Saxonburg Boulevard less than a quarter mile from the Eat N' Park Restaurant and within six miles of downtown Pittsburgh.

More information in next month's Guide Star.

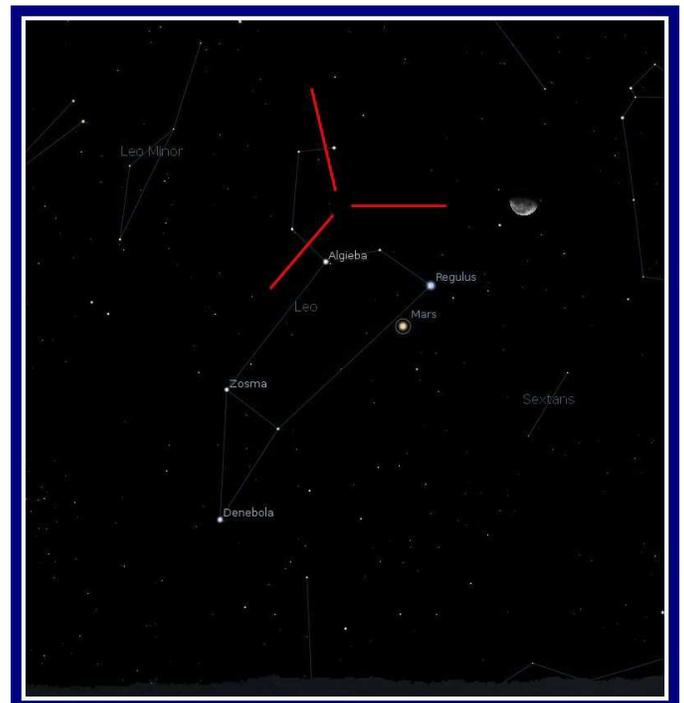
## November's Leonid Meteor Shower

Since the 1998 approach of comet 55P/Tempel-Tuttle, the progenitor of the Leonids, the shower's intensity has fluctuated each year and the various predictions for annual activity never agree in details, but also include some hedging of bets. This year, it's more of the same.

The International Meteor Organization cites 22:40 local on November 17 as time of maximum activity. Another IMO source mentions the possibility of two peak periods, November 17 around 16:00 local and November 18 around 18:00 local. Expected zenith hourly rates (ZHR) may be a bit more than 20.

All of these times finds the Leo radiant below our horizon and our Moon, progressing from full to third quarter and in the sky near the radiant during the critical late hours following local midnight when Leo is actually visible.

Also, while our calendar lists Leonid activity as beginning on the 10th and running to the 23rd, yet another source mentions that the period of activity will run from November 6th to November 30th.



*The proximity of our waning Moon nearing third quarter will affect Leonid viewing. The radiant at 02:00 on November 18<sup>th</sup>.*

- GS Editor

## Two Messier Books

Doing the Messiers is a rite of passage for amateur astronomers and there's good reason. While trying to list objects that might confuse a comet hunter, Charles Messier inadvertently managed to catalogue most of the deep sky showpieces visible from northern latitudes. Perched atop the Hotel de Cluny on the left bank of the Seine, under the polluted skies of 18<sup>th</sup> century Paris, using optics inferior to just about everything we use today, he authored an observing list that would task future generations of astronomers.



*Charles Messier 1730-1817  
Comet Hunter and member  
of the French Academy of  
Sciences*

Patience and a decent star atlas will suffice to locate most of the catalogue's 110 objects, and observing guides like Pennington's Year-Round Messier Marathon Field Guide or the Thompson's Illustrated Guide to Astronomical Wonders can make the job easier. Books like these contain finder charts and helpful locating hints.

But they're a bit short on astrophysical descriptions of the objects themselves – what we think they are, how they may have originated and what part they've played in our continuing quest for understanding the physical universe. They also don't go into much detail about Messier and the catalogue itself.

And for some, observing the Messiers isn't to be finished with them. It's just where the questions really begin.

For example, how did a 9<sup>th</sup> magnitude double star, Winnecke 4, become M40. Or how did the Pleiades – which no one would ever mistake for a comet - make the list while the Perseus Double Cluster, a celestial showpiece of the first order, get ignored?

Why was the very existence of four entries, M47, M48, M91 and M102 still questioned into the 20<sup>th</sup> century? Also Messier actually listed only 103 objects. Seven more objects have been added, the last as late as 1966. Who made these additions and why were they accepted?

And then there's Charles Messier himself. It's ironic that one of the most celebrated comet hunters of all time - he discovered 21 comets – is most famous for a list of things he tried to avoid. Born into a modest family, he learned his astronomy from a thoroughly unsuitable teacher, but eventually became a member of the Legion of Honour. Messier seems to have thrived in troubled times, continuing to observe through the reign of terror, while the close friend who supplied some of his telescopes, Jean Baptiste de Saron, was imprisoned, condemned and actually calculated a cometary orbit for Messier shortly before being guillotined.

What telescopes did Messier use?

Messier had the use of some imposing Gregorian reflectors made by James Short who was based in London, a 190mm (7.5 in.) and a 310mm (12in.). But their metal mirrors – glass mirrors weren't in common use until the middle of the 19<sup>th</sup> century – greatly reduced their effectiveness.

Messier recognized the superior optical characteristics of the achromatic refractors being introduced by John Dolland, and he favored a 90mm (3.5 in.) later in his career. He said, "(I wish) that astronomers, concerned in observations, might be accommodated with achromatic telescopes ... as such are the only instruments whereby a great knowledge of the celestial bodies can be acquired."

Finally, observing objects like the Whirlpool (M51), the Crab (M1), the Ring (M57) or the Great Nebula in Orion (M42) is a direct invitation to examine the astrophysics of the deep sky. There are still many unanswered questions about galaxies, supernova remnants, planetary, emission and reflection nebulae. The Messiers are more than targets on a chart; they're the most conspicuous examples of the types of objects that populate the universe but continue to baffle us.

Two comprehensive treatments of Messier, his catalogue and the objects themselves are currently available. They offer biography, history and astrophysics and frankly are aimed at readers whose astronomy interest could be described as intermediate to advanced.

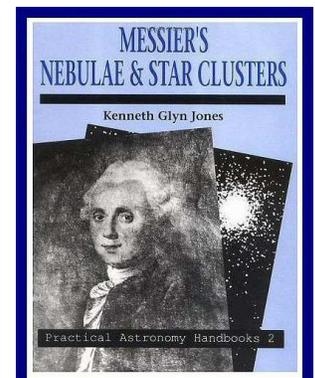
*Messier's Nebulae & Star Clusters* by Kenneth Glyn Jones is an acknowledged classic. It was first published in 1968, revised in a second edition in 1991 and reissued at 448 pages in 2008, it seems to be cited in every Messier book I've ever examined.

It features extensive historical coverage of the catalogue and includes a 28 page biography of Messier. There are 35 pages of biographical information on his contemporaries. Until a few years ago, this book was simply unrivalled as an authority on Messier and his catalogue.



*A 7.5 inch Gregorian  
built by James Short of  
London, possibly similar  
to that used by Messier.*

*This particular  
instrument was  
commissioned by  
Ben Franklin*



*Kenneth Glyn Jones'  
reissued 1968 Messier book.  
An "Old School" text that's  
still a classic.*

Each Messier object gets its own section which includes historical drawings, discussions of physical properties and cosmological significance, a small chart, a drawing of the object as it might appear in the eyepiece and a “to observe” section describing appearance, hints on locating and observing the object. It also contains quotations from classic observers such as William Herschel, John Herschel, Lord Rosse, Thomas Webb, Admiral Smyth and others. For me, this is a highlight of the book. When an observer looks at an object s/he stands in an exact line with other astronomers, both amateur and professional. It's a pleasure to know what they thought or felt at a similar moment.

As a rough guide, Glyn Jones' M42 entry is 8 pages long, includes 10 historical drawings and quotations from 15 famous astronomers.

This is an “old school” book with lots of text and tables, very well organized. It concludes with small, seasonal charts, a guide to the Messier traffic jam in Virgo and a black and white photo album of each Messier object. It cannot take the place of an atlas or field guide.

But, it's a good place to research the history of the catalogue and early observations. Even though small bits are dated, it's worth remembering that the 110<sup>th</sup> Messier object was identified and added by Glyn Jones in 1966. Both the author and his book hold a unique place in astronomy.

**Atlas of the Messier Objects:**  
**High-lights of the Deep Sky**

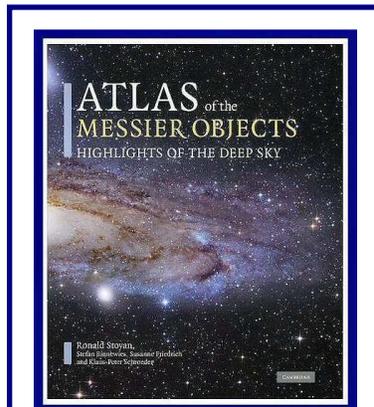
by Ronald Stoyan is among the most attractive “serious” astronomy books I've ever seen. Published in German in 2006 it was translated into English and published in 2008.

It's a 370 page 12.5 by 10.5 inch hardback and at first glance looks it looks like a coffee table dust collector, but it's an solid reference that just happens to have some of the most beautiful images of the Messiers to be found in one place.

And those images aren't just eye-candy. Examples, the half-page color image of M1, while

striking, is actually used to identify CM Tau, the optical pulsar at the heart of the Crab, the M87 image is used to identify the well-known jet near its nucleus, the M67 image includes pointers to the interesting AH Cancri, a variable with a period of about a third of a day.

The layout is thoroughly modern, less “text book” than Glyn Jones. The historical sections, while not as talky, include all the pertinent facts and where Glyn Jones may only write about a topic, Stoyan is apt to include pictures and illustrations. For example, Stoyan's observer biographies are brief but he includes a portrait for each..



**Ronald Stoyan 's Messier Atlas.**

***Attractive, well-researched, up-to-date and maybe a new classic.***

Stoyan also includes his own drawings of some objects, made with a 355mm (14 in) reflector. A nice touch.

The object entries are similar to Glyn Jones. But while the quotes from the famous visual observers of the past are missed, Stoyan fills his pages with modern imagery. For comparison, Stoyan's M42 entry is 9 pages, including eight photographic images, and 11 drawings by historical and contemporary observers.

Being published later, Stoyan's book enjoys a distinct advantage. Examples. When Glyn Jones wrote, the jury was out on M73, the tight grouping of four 10<sup>th</sup> to 11<sup>th</sup> magnitude stars in Aquarius. At that time, probability suggested a 75% chance that the stars were related. Stoyan, benefiting from later spectroscopic work on proper motion can now say that they're probably just a chance grouping. Another example, Stoyan's M78 coverage shows McNeil's Nebula, only discovered in 2004.

Neither of these books would recommend themselves for a beginning observer. They might better serve someone who's at the point of taking stock of what s/he's seen through a telescope. Also neither of these books is inexpensive. At this writing (mid-October 2011), Stoyan's book, hard cover only, is listed at \$56.00 at Amazon while Glyn Jones is \$58.00 for the paperback edition. Unfortunately, only the Glyn Jones book is in the Carnegie Library system and it's non-circulating.

If I had to choose only one, it would easily be the later Stoyan book. It's more up to date, has beautiful images and it's probably well on its way to becoming a classic. But the Glyn Jones is my own well-paged reminder that the Messier catalog is more than just an observing list.

By the way, both of these books include pictures of the Hotel de Cluny which is located on the left bank in Paris. Today it houses the National Museum of the Middle Ages.

The museum is noted for the excavated Roman ruins nearby, an extensive collection of religious statuary mutilated during the revolution and, its main attraction, a medieval tapestry series depicting ladies with unicorns.



Charles Messier resided and spent most of his astronomical career in this building. He observed from atop the octagonal tower which once supported a wood and glass enclosure.

A modern visitor finds nothing to indicate the significant role that this building played in the history of astronomy.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
<p>"...I still believe in the potential of a focussed and well equipped individual. If s/he knows how to utilize and explore existing voids in scientific fields, s/he will have major advantages over professionals...."</p>	<p>...As amateur astronomers, we have the privilege of an exciting and unlimited hobby, which will always distinguish us from 'normal people'..."</p> <p>- Berto Monard [Supernova Hunter]</p>	<p><b>1</b></p> <p>Mercury and Venus 2° Apart</p> <p>SR:07:49 SS:18:17 MR:13:35 MS:23:57 PI:33%</p>	<p><b>2</b></p>  <p>SR:07:50 SS:18:16 MR:14:08 MS:**** PI:43%</p>	<p><b>3</b></p> <p>SR:07:52 SS:18:15 MR:14:38 MS:01:00 PI:53%</p>	<p><b>4</b></p> <p>SR:07:53 SS:18:13 MR:15:05 MS:02:01 PI:63%</p>	<p><b>5</b></p> <p>Fred Whipple born 1906</p> <p>SR:07:54 SS:18:12 MR:15:30 MS:03:01 PI:72%</p>
<p><b>6</b></p> <p>Daylight Saving Time Ends</p> <p>SR:06:55 SS:17:11 MR:14:55 MS:02:59 PI:80%</p>	<p><b>7</b></p> <p>SR:06:56 SS:17:10 MR:15:21 MS:03:57 PI:87%</p>	<p><b>8</b></p> <p>Edmund Halley born 1656</p> <p>SR:06:57 SS:17:09 MR:15:48 MS:04:54 PI:93%</p>	<p><b>9</b></p> <p>SR:06:59 SS:17:08 MR:16:19 MS:05:53 PI:97%</p>	<p><b>10</b></p>  <p>Leonid Activity Begins 10 to 23 November</p> <p>SR:07:00 SS:17:07 MR:16:54 MS:06:51 PI:99%</p>	<p><b>11</b></p> <p>AAAP General Meeting 7:30 Carnegie Science Center</p> <p>SR:07:01 SS:17:06 MR:17:34 MS:07:48 PI:100%</p>	<p><b>12</b></p> <p>SR:07:02 SS:17:05 MR:18:20 MS:08:43 PI:99%</p>
<p><b>13</b></p> <p>Mercury and Venus 2° Apart</p> <p>SR:07:03 SS:17:04 MR:19:12 MS:09:35 PI:96%</p>	<p><b>14</b></p> <p>Mercury Greatest Eastern Elongation 23°</p> <p>SR:07:04 SS:17:03 MR:20:09 MS:10:22 PI:91%</p>	<p><b>15</b></p> <p>SR:07:06 SS:17:03 MR:21:10 MS:11:04 PI:85%</p>	<p><b>16</b></p> <p>SR:07:07 SS:17:02 MR:22:14 MS:11:42 PI:77%</p>	<p><b>17</b></p> <p>Leonid Maximum 22:40 Possible ZHR 20+</p> <p>SR:07:08 SS:17:01 MR:23:20 MS:12:16 PI:67%</p>	<p><b>18</b></p>  <p>SR:07:09 SS:17:00 MR:**** MS:12:47 PI:57%</p>	<p><b>19</b></p> <p>SR:07:10 SS:17:00 MR:00:28 MS:13:17 PI:46%</p>
<p><b>20</b></p> <p>SR:07:11 SS:16:59 MR:01:37 MS:13:48 PI:35%</p>	<p><b>21</b></p> <p>SR:07:12 SS:16:58 MR:02:48 MS:14:20 PI:25%</p>	<p><b>22</b></p> <p>SR:07:14 SS:16:58 MR:04:02 MS:14:56 PI:15%</p>	<p><b>23</b></p> <p>SR:07:15 SS:16:57 MR:05:17 MS:15:38 PI:8%</p>	<p><b>24</b></p> <p>SR:07:16 SS:16:57 MR:06:33 MS:16:26 PI:2%</p>	<p><b>25</b></p>  <p>SR:07:17 SS:16:56 MR:07:44 MS:17:23 PI:0%</p>	<p><b>26</b></p> <p>SR:07:18 SS:16:56 MR:08:48 MS:18:26 PI:1%</p>
<p><b>27</b></p> <p>SR:07:19 SS:16:55 MR:09:43 MS:19:33 PI:4%</p>	<p><b>28</b></p> <p>SR:07:20 SS:16:55 MR:10:28 MS:20:41 PI:10%</p>	<p><b>29</b></p> <p>SR:07:21 SS:16:54 MR:11:06 MS:21:47 PI:18%</p>	<p><b>30</b></p> <p>SR:07:22 SS:16:54 MR:11:38 MS:22:50 PI:27%</p>	<p>All times given are local.</p> <p>Legend: SR = Sunrise, SS = Sunset, MR = Moonrise, MS = Moonset, PI = Approximate Percentage Visible Lunar Surface Illuminated Local Midnight</p> <p>Details for AAAP Events can be found at:  <a href="https://nightsky.jpl.nasa.gov/event-list.cfm?Club_ID=675&amp;EventEra=Future">https://nightsky.jpl.nasa.gov/event-list.cfm?Club_ID=675&amp;EventEra=Future</a></p>		

## Some Celestial Highlights for November

**Mercury** is low in evening twilight early in the month and sits close to Venus. It will disappear into the evening twilight toward month's end. Greatest eastern elongation is achieved on the 14<sup>th</sup>.

**Venus** is low in the southwestern evening twilight all month. On the 26<sup>th</sup> a grouping of Mercury, one-day old Moon and Venus, close to sunset and quite low in the southwest, may be worth a look.

**Mars** in Leo, rising about an hour and a half after midnight before the time change. It will rise a bit before midnight by month's end. On the 10<sup>th</sup> Mars will pass 1.4° N of Regulus. It will increase slightly in both angular diameter and magnitude over the course of the month.

**Jupiter** in Aries all month and well placed for observation and continues to subtend a large angle of almost 49 arc seconds. It also continues in its retrograde loop (east to west) begun in August. It will resume direct or prograde motion a bit after Christmas.

**Saturn** is in Virgo, quite low morning sky to begin the month. By month's end it will rise 03:45.

**Uranus** in Pisces, is well placed for evening observation. By month's end it will set before midnight.

**Neptune** in Aquarius, is available for observation in the early evening. By month's end, it will set an hour before midnight.

Leonid Meteor Shower activity begins on the 10<sup>th</sup> and runs to the 23<sup>rd</sup>. Please see earlier article above.

For those using programs to predict **GRS** transits, **Jupiter's System II longitude** is 172°. **Selenographic Colongitude** is 319.83° at 0h UT at beginning of the month. Add 12.2° each day.

6<sup>th</sup> 02:00 **Daylight Saving Time ends**

3 <sup>rd</sup>	18:57	<b>Great Red Spot (GRS)</b> : crosses central meridian
4 <sup>th</sup>	01:05	<b>Io</b> : transit begins
	01:15	<b>Io</b> : shadow transit begins
	03:14	<b>Io</b> : transit ends
	03:14	<b>Ganymede</b> disappears into occultation
	03:25	<b>Io</b> : shadow transit ends
	04:52	<b>GRS</b> : crosses central meridian
	05:36	<b>Ganymede</b> reappears from eclipse
11 <sup>th</sup>	17:15	<b>Europa</b> : transit begins
	17:57	<b>Europa</b> : shadow transit begins
	19:38	<b>Europa</b> : transit ends
	20:24	<b>Europa</b> : shadow transit ends
	23:08	<b>Io</b> : disappears into occultation
12 <sup>th</sup>	00:29	<b>GRS</b> : crosses central meridian
	01:39	<b>Io</b> : Reappears from Eclipse
21 <sup>st</sup>	17:03	<b>Io</b> : shadow transit begins
	18:36	<b>Io</b> : transit ends
	19:13	<b>Io</b> : shadow transit ends
	22:31	<b>Ganymede</b> : transit begins
	22:44	<b>GRS</b> : crosses central meridian
22 <sup>nd</sup>	00:10	<b>Ganymede</b> : transit ends
	00:54	<b>Ganymede</b> : shadow transit begins
	02:48	<b>Ganymede</b> : shadow transit ends

## A Welcome to Our New Members



**Jody Farr**  
**Mark Henderson**  
**Jules H. Hilliard**  
**Max Pastor**  
**Houston Westfall**

## Treasurer's Report (3rd Quarter Summary)

The following is a summary of our account balances and income and expenses for the 3rd quarter of this year. We have a net income / expense for this quarter of -5939.15. For the year to date we are -9215.61. We had two major expenses this quarter, our Insurance payment of \$3705.00, and painting of the siding at Mingo of \$2550.00. In the 4th quarter we will be collecting dues and donations, which should offset most of the expenses we have incurred during the first three quarters.

Account Balances (as of 10/15/2011)	
Cash	\$50.00
Checking	\$2066.23
Savings	\$2124.20
USXCD	\$100,178.09
USX MM	\$25,707.31

Summary Report	
Income:	
50/50	\$16.00
Donations	\$334.00
Interest	\$1398.88
Memberships	\$712.00
Total Income	\$2460.88

Expenses:	
Equipment / Repairs	\$2550.00
Food (picnics)	\$142.63
Printing	\$181.90
Postage	\$282.61
Officers Expenses	\$179.95
Supplies	\$48.85
Insurance	\$3705.00
Utilities:	
Electric	\$106.54
Phones	\$150.78
Grass Cutting	\$640.00
Porta-Jon	\$279.27
Security	\$64.50
Misc.	\$68.00
Total Exp.	\$8400.03

## *Membership Renewals*

It is time again to renew your memberships for 2012.

Attached is a renewal form that has two parts. The first part is your personal information that we need to make sure our database is up to date and accurate. The second part is the billing information. Please fill in both parts of the form completely.

The basic membership is still \$24.00. We also have a student membership for \$16.00. This is for any K-12 and full-time college student. We also have a family membership (\$40.00) that includes anyone living in the same household. The family membership need only include the basic primary members contact information and then list the remaining family members names. All correspondence, Guide Star, and mailings will be sent to the family members through the primary member's contact information. This will reduce printing and mailing costs and redundancy.

A reminder, the AAAP no longer processes Sky and Telescope subscriptions. If you want S&T magazine for the first time, use the enclosed form to get your club subscription rate. If you are a current subscriber, use your renewal notice you receive from S&T. It should have the \$32.95 club rate on the renewal notice.

***Send new and renewal subscriptions for S&T magazine directly to SKY PUBLISHING!  
Do not mail them to us.***

Subscriptions to Astronomy magazine are still handled through the club. Please send these in ASAP so there is no lapse in your subscription. The lead-time on magazines is three months.

Current building key holders need to pay their key fees at this time. To get a building key for the first time, you must first be trained by an observatory director.

If you have any questions, you can contact Michael Meteney, treasurer, or Don Hoecker, membership secretary. Thank you.

# AAAP Membership Renewal Form – 2012

Please fill in this single form for anyone in your household who wishes to be a member of the AAAP. We are now offering adult, student, and family memberships. All family members must share the same residence. Student memberships have now replaced junior memberships.

To be a student member, you must be a K-12 or fulltime college student. As in the past, you may receive a discounted subscription to Astronomy Magazine through the AAAP. The subscription must be included with your membership dues payment. There is a separate form to receive a discount subscription to Sky and Telescope Magazine. This is to be sent directly to Sky Publishing. **Do not send any Sky and Telescope subscriptions to the AAAP!**

Completely fill in the following information on this form (please print):

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ 9-Digit Zip \_\_\_\_\_ - \_\_\_\_\_

Phone (Home) \_\_\_\_\_ (Work) \_\_\_\_\_

E-mail \_\_\_\_\_

How do you want your "Guide Star" Delivered? Online (\_\_\_\_) Snail Mail (\_\_\_\_)

**Optional:** Do you have a telescope(s) or other special equipment, or special areas of interest in astronomy, that you would like listed under your name in our membership directory? If so, please describe them below:.

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Additional Family Members:

Name \_\_\_\_\_ Relationship \_\_\_\_\_

(over)

## *AAAP Membership Renewal Form – 2012*

<i>Item</i>	<i>Price</i>	<i>Enclosed Payment</i>
AAAP Adult Membership (January 1 to December 31, 2012)	\$24.00	
AAAP Student Membership (covers all students K-12 and <u>fulltime</u> college students)	\$16.00	
Family Membership (covers the adult membership and all family members that live with the adult member. Please list all family members to be included on the attached form)	\$40.00	
“Astronomy” Magazine Subscription (12 issues per year) Both new and renewals are processed through the AAAP. Do not renew your subscription directly with Astronomy Magazine; you won’t get your discount.	US \$34.00 Can \$40.25 Int \$50.00	
Key Fee – Only current key holders Check appropriate observatory: Mingo ___ Wagman ___	\$15.00 each	
Tax Deductible Donation	- - - -	
<i>Total Payment</i>	- - - -	

It is very important that all payments be received by **12/15/2011** so that magazine subscriptions can be processed in a timely manner.

Prices are subject to change without notice. Payments must accompany this application.

Make checks payable to: **AAAP, Inc.**

Send this form with payments to:

**Michael Meteney – Treasurer, AAAP**  
**1070 Sugar Run Road**  
**Venetia, PA 15367-1514**

Membership questions?

E-mail: [MembershipSecretary@3ap.org](mailto:MembershipSecretary@3ap.org)

Phone: 412-243-8298

Billing questions?

E-mail: [Treasurer@3ap.org](mailto:Treasurer@3ap.org)

Phone: 724-348-9087

# Astronomy Club Subscription Form

Sky Publishing Corp. P.O. Box 171 Winterset, IA 50273

CLUB NUMBER: <b>270</b>	
CLUB NAME <b>Amateur Astronomers Association of Pittsburgh</b>	Sky & Telescope (S&T)
TREASURER'S NAME <b>Mike Meteney - Treasurer</b> Date _____	(1 year/12 issues) Club Rate
MAILING ADDRESS <b>1070 Sugar Run Rd</b>	United States \$32.95
CITY <b>Venetia</b> STATE <b>PA</b> ZIP CODE <b>15367</b>	Canada \$39.95
COUNTRY (IF NOT U.S.A.) _____	International \$50.00
DAYTIME PHONE <b>724-348-9087</b> FAX _____	
E-MAIL ADDRESS <b>Treasurer@3ap.org</b>	

## SUBSCRIPTION INFORMATION

MEMBER'S NAME \_\_\_\_\_

MAILING ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

DAYTIME PHONE ( ) \_\_\_\_\_ FAX ( ) \_\_\_\_\_ E-MAIL \_\_\_\_\_

MEMBER'S NAME \_\_\_\_\_

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