

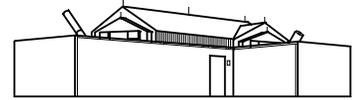
# The Guide Star

Newsletter of the Amateur Astronomers Association of Pittsburgh Inc.

A Section of the Academy of Science & Art of Pittsburgh

November, 2003

Vol. 37, No. 8



Nicholas E. Wagman Observatory

## See Best Digitals and Emulsives of the Year

### **Brunelle Contest At Nov. Meeting: It's Still Called "Astrophotography"**

It's time to take a stand on behalf of the word "Astrophotography", especially the "photography" part. With the digital/CCD revolution sweeping over our hobby, the term "Astro-Imaging" is gaining greater favor. Sorry, but "Imaging" is too broad a term. It can refer to anything observed in the EM spectrum (e.g. infra-red). "Photography", on the other hand, more closely relates to that precious commodity we seek: The visible light photon. Thus, when you attend the club's **November 7** meeting at the **Carnegie Science Center (7:30 PM)**, be mindful that we are staging the Kevin Brunelle Astrophotography Contest, which will include fine photo film-collected pictures as well as those that are electronically-collected. You may recognize some of the digital photos from member's personal web sites, but the traditional slides and prints may make their first public appearance. The annual contest is a definite "ooh-ahh" event when the audience responds to each new picture (sometimes an early giveaway to potential winners). Don't miss this opportunity to enjoy the talents of our many accomplished "Astrophotographers" (not Astroimagers ☺).

Note: Sorry, by the time you receive this Guide Star, the deadline (Oct. 29) for submission of contest entries will have passed. But be aware that you can start clicking away now for the 2004 contest.

#### About Kevin J. Brunelle

The AAAP's annual photo contest is named for the late Kevin J. Brunelle, an active and well-liked club member in the 1980's who co-founded Sulkosky-Brunelle Photographics Inc. Before his death in 1991, Kevin had helped sponsor public galleries of our members' astrophotography (such as Tom Reiland's on Pittsburgh's South Side). Contest first prize winners receive free photographic services from his company, including a variety of new digital processes.

#### "Why Can't They Schedule These for the Summer?"

### **Eclipse Party Prediction: Minor Cooling Trend Compared to the Moon**



**Gee whiz, are we spoiled!** When we experience the first frost or wet flakes of snow in the Fall, the local weather forecasters go bonkers....Children are overdressed for the school bus stop....People rush to buy more antifreeze....and so on. Think about what will happen on the Moon during the club's **November 8** Lunar Eclipse star party at **Wagman Observatory**. Imagine some poor, unsuspecting rock on the lunar surface: It's been soaking up unfiltered sunlight for two weeks straight, bringing it to steaming +200 deg. F. But in a short time span, the Earth's shadow sweeps over and the rock plunges\* to -200 deg. F!

*(continued on page 2, column 1)*



#### Other Action Items On-Track

### **Funding Delay Pushes Mingo Construction Until Early '04**

*by Dan McKeel (from AAAP List Server)*

Here's a quick update on the state of the Mingo Creek Park Observatory Project as of October 13: The paper plans are complete and the permits for building have been approved by all the necessary government bodies. As a group at the October 13 Observatory Committee meeting, we sadly came to the realization that the actual building construction would need to begin next year rather than this year to allow more time to raise sufficient funding for the complete observatory, rather than start just a small piece.

*(continued on page 2, column 1)*

### **Heads-Up for Holiday Party**

Oh well....if the department stores can start putting up Christmas decorations before Halloween, we can post an early note about the AAAP **Holiday Party** on **December 5** at the **Middle Road Fire Hall** in the North Hills. Members are once again encouraged to contribute door prizes and all manner of food and beverages for the occasion. As in recent years, contact our "Party Princess" **Emily Bell** (412-931-1530, emilymbell@yahoo.com) if you would like to contribute party edibles or otherwise help with kitchen prep and clean-up work.



## Lunar Eclipse the "Lowlight" of Year's Last NEWO Star Party

(continued from front page)



The November 8 event is our last star party of year and may bring a good size crowd since we won't be competing with high school football games. Thus, we need another high member turnout comparable to those of the past Summer. Just make sure to put on a few extra layers. We may have a coffee maker or hot chocolate dispenser running in the member's warm-up room.

(\*OK you physics and geology types: Maybe the rock would take some time to cool since there is no air to carry off the accumulated heat. What medium dissipates the heat anyway?).

### Wagman Scheduling Note

The observatory is now closed for the Winter, except for Wagman Winterfest in February. We will not be taking any more special group reservations until Spring. If you are contacted by such a group, ask them to schedule their group for starting next April and send them a 2004 star party brochure.

## Mingo Observatory Status Report

(continued from front page)

The road up the hill to the observatory should be in process, subject to weather and contractor availability in the next month so that will bear fruit before years end. The committee has begun the task of getting more formal bids from multiple construction firms. This is necessary for firming up the figures on the grants. There is also a need for more quotes on insurance and the above construction bids will allow finer resolution on that also.

The site will be open to members with combination locks for the gates and the group is working on the procedure to open and close the gates, which will be posted to the AAAP Listserv and in the Guide Star. This will be available "real soon now" honest!

### **Tip of the Month**

**Members who get Sky & Telescope or Astronomy Magazines: When renewing your AAAP membership, please send the magazine subscription notice you received in the mail to the Treasurer along with your dues. Do not send anything directly to the magazines themselves.**

## Solar S.I.G. Heating Up Again

by Larry McHenry (Chair)

It's been a couple of years since the Solar Special Interest Group (S.I.G.) has been active (see the AAAP website <http://www.3ap.org/> and click on 'SIG'). Now that I have a little bit of free club time, I would like to try and reactivate the group. I have a old list of members who were previously interested in solar astronomy, but many of the email address's are no longer valid. If any member is interested in participating in the solar interest group, please send me an e-mail and list of your solar equipment (my phone no. is 412-884-4924). Also, if anyone has any ideas or suggestions on activities for the SIG, send them in. (I have one idea in mind, but first want to see how many members are interested in the Solar S.I.G.).



### Thanks to All Helpers

## Like Other Astro Venues, A.O. Open House Victim of Foul Weather

by Lou Coban (from AAAP Listserv)

We had a rather low turnout at the Allegheny Observatory Open House on October 3 no doubt due to the crappy weather. Out of approximately 350 tickets sold, only 216 showed. I would like to thank everyone (listed below) for sacrificing their Friday night to help make the open house an excellent time for everyone!

Wade Barbin*	Janet Greenburg*	Richard Misura
David Burkhard*	Richard Griffiths	Takamitsu Miyaji
Rose Chavez*	George Guzik*	Jill Schaefer
Pat Clevenger	Bruce Howard*	Jeanette Sloan
Louis Coban*	Les Johnson*	Robert Snyder
Dennis Derda*	Bob Kalan*	Carl Stetar*
Bill Donohoe	Brenda Keeley	Flaccus Stifel*
Terry Finnegan*	Doc Keeley*	Rose Sullivan
Carolyn Gatewood	Kevin Kepes	Kavan Ratnatunga
George Gatewood	Edward Klein	Nancy Robinson
Chris Gazzo	Frederick Klein*	Ted Worek
Dave Gazzo	Kenneth Kobus*	Pete Zapadka*
Art Glaser*	Bob Kramer	
Jack Greenberg*	Susan Michael*	(*AAAP member)

### Appreciative Note From President George Guzik

I want to add my thanks to those from Lou Coban regarding AAAP assistance with the open house at Allegheny Observatory. Over the years I have had a number of conversations with people who say that they had heard of AO but had never visited it and really didn't know what went on there. The open house events give people a great opportunity to see the observatory and to learn about the work performed there. We had a brief opportunity to view Mars and the Moon using scopes that Fred Klein and I set up on the lawn. In spite of the clouds I still had about 140 visitors stop by. Once the heavenly objects went into hiding Fred and I concentrated on Downtown landmarks for the "architectural tour" of Pittsburgh. Thanks again to all who helped with the AO Open House!

## Running Out of "Thank-You's" For All The Wagman Helpers

From Flacc Stifel: "A big **THANK YOU** to those who helped evening of October 10 when we were visited by students, teachers and parents from Walnut Grove Christian School in West Mifflin. Scattered clouds and the full moon were problems, but everyone got to see a bunch of the late summer astronomical sights. Besides having to rent a school bus to make the trip, the group made a substantial donation to the Observatory."

From Terry and Joanne Trees: "I'm not sure, but we may have set an attendance record for a non-eclipse full moon night at Wagman on October 11. There were 8 Girl Scouts from Troop 88 + 4 siblings + 4 or 5 adult chaperones. There was a fellow who wants to join the AAAP. He came in his electrical company's van, get this: "Star Electric". **John Cheng** was there sketching the moon and Mars). And then there were those who officially volunteered: **Flacc Stifel** on the Brashear, **George Guzik**, **Bill Hayslip**, **John Diller**, **Frank Pastin** and **Mary DeV Vaughn**. If I missed anyone, please contact me so we can get them on Wayne and Mari Jo's list of special group volunteers. In fact, let's add John Cheng, because the girls mobbed him and his scope as well."

"The night was exceedingly transparent even if the seeing was a bit bumpy. The girls were enthusiastic and very appreciative. They saw the ISS, Mars, the moon, Uranus, the coat hanger, M-57, M-13, Alberio, "the Double Double", the Milky Way (visible in the full moon light) and Polaris amongst other items. They made their rounds as a group and also separately. Then when the leader said it was time to go, a number of them went around and thanked the volunteers for having them up to the observatory. A very refreshing experience. Thanks very much everyone, you made it fun."



By Tom Reiland – "Thanks go out to all who helped with the Wagman scout group visit on October 20: **Flacc Stifel**, **John Holtz**, **Bill Roemer**, **Bill Hayslip**, **Jeff Kearns**, **George Guzik** and **Bob Kalan**. We had enough clear weather to show them Mars, M57, M13, M31 and the Double-Double."

## November News Nutshell

⇒ Wagman keyholders take note: The annual observatory "Kee-Fee" has been upped from **\$10 to \$15**. Contact John Holtz if you have any questions about paying the fee. Speak with Flacc Stifel if you are interested in obtaining a key (training session required).

⇒ It's time to start thinking about your entry in the AAAP Membership Directory, which will be updated in the first quarter of next year. If you want to update your entry now, please contact Membership Secretary Brent Hudock (724-437-5990, HOOTY@charter.net).

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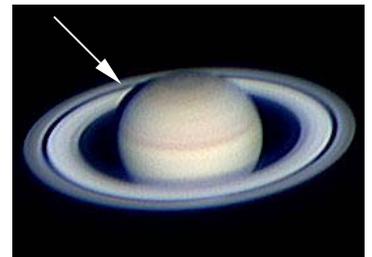
## Misc. News Items (Cont'd)

⇒ All our best wishes to **Bob and Barb Kepple** following their recent move to Arizona (where the night skies are a tad clearer and darker than here in the Pittsburgh area ☺) Bob has been active in both the AAAP and the Kiski club for many years and is well known as an accomplished deep sky observer. Several years ago, he co-authored what is considered the best deep sky observers book ("Night Sky Observer's Guide") since "Burnham's Celestial Handbook". He has also been a familiar sight at various public events such as Wagman star parties and Star Cruise, vending a variety of astronomy-related literature and items. Just watch out for those cactus needles as you make your way in the dark, Bob!!!!



⇒ Boatloads of thanks to **Tom Dobbins** for his vivid lecture at the Sept. meeting on observing craters and other "small" features on Mars. Tom and his colleagues have done a masterful job of collecting and analyzing hundreds of visual observation reports on Mars (current as well as historical), and determining which are bona fide accounts of actual features, and which are illusions caused by the atmospheres and lighting angles on both Earth and Mars.

Tom also reviewed other planets and their visual peculiarities such as a slight brightening of Saturn's rings where they go behind the planet, and false cratering on Mercury.



⇒ Yet another Wagman "thank-you" to the AAAP gang who missed the Sept. to stage a special group star party at the observatory: Flacc Stifel, Kenn Lippert, Bill Moutz, Christie Chojncki, Ed Kusemchak, Ron Ollack and Don Hoecker.

⇒ Truckloads of thanks to the SSP and **Dave Pensenstadler** for a superb program at the Joint AAAP/SSP meeting last month. Dr. Martin Weiskoff's talk on the orbiting Chandra X-Ray observatory was fascinating from beginning to end. On interesting point: How do you gather and focus a very high-energy "particle" such as an X or gamma ray? Have it strike the entry optics of the telescope at a very shallow angle, otherwise it dissipates or just passes through. Thus the long, slender shape of the Chandra satellite.

⇒ The AAAP extends a welcome to **Joanna Haas** as the new Director of the Carnegie Science Center (where we hold most of our monthly business meetings). Ms. Haas served in a similar role at the Henry Ford Museum in Dearborn Michigan; she replaces Seddon Bennington on November 1.

⇒ In conjunction with next year's AAAP 75th Anniversary celebrations, we're thinking of publishing a special Anniversary issue of the Guide Star to which any/all members may contribute. If you are interested in researching/writing any articles therein, please contact any of the GS staff (Eric Fischer, Ann Norman, Cathy Rivi). We're especially interested in articles about the very early years.

**Observer's Handbooks and Calendars****Get 'Em While They're Hot, Or Not***by Mari-Jo Meyers (from AAAP Listserver)*

Well, at the club meeting on October 10, some lucky AAAP members were the first ones to purchase their brand, spanky, new 2004 calendars and 2004 "Observers Handbooks. Don't let this parade pass you by - if you'd like me to reserve a copy of a RASC calendar, Astronomy calendar, a handbook or one of each just send me an e-mail (wmeyers1@comcast.net) or give me a call (724-339-3447). I will also be taking copies to next weeks star party and November's meeting (if there are any left by then). Items can be mailed to members if payment is made prior to shipment for the selling price + postage. As in past years both calendars are \$10.00 each and the handbooks are \$15.00 each. Supplies are limited so order early and order often.

PS - Remember the leaves are starting to change, can Santa be far behind? Think Christmas gifts !!! ☺

**Welcome Mat (Schrauder) and Others to the Club**

The following folks were voted into AAAP membership at the October meeting:

Walt Adkins  
Joseph Begandy  
Susan Brumbaugh  
Rose Chavez  
Chris D. Chojnicki  
William W. Frost III  
Harry F. Hudson  
Rolf Larsen  
Mike McGrady  
Linda Meadowcroft  
Michael E. Mermigao  
Al Paslow  
George J. Pilipovich

Matthew Schrauder  
Jorge Sepulveda  
Peggy Smyrnes Williams  
Steve Stangl  
Stuart M. Strickland

**White Board To Black Sky****Holtz' Astro Class Alumni Top 100 Mark***by Cathy Rivi*

Club Treasurer John Holtz can't always count on the stars showing up for class, but he can count on turning out a dozen or so more knowledgeable club members each year through his Astronomy for Beginners Class. Holtz, a mechanical engineer, began the class to help new members and to polish his presentations skills for a software class that he teaches for his employer. The tuition? Let's say it's a few magnitudes lower than your average course - just \$15 for five evenings of lecture and outdoor "lab," held on site at Wagman Observatory. Holtz stashes all the tuition in the club account and donates generously of his time, arriving directly from his RIDC job, sometimes grabbing Sheetz hoagies and eating dinner on a folding chair.

This past August, Holtz' course drew 17 students; the youngest was 10-year-old Michael Moody. That brought the total to 117 since Holtz began teaching it in 1998. On class evenings, the Wagman "foyer" turns into a lecture hall crowded with fold-out sports chairs. On especially hot nights, the lecture is moved outdoors. Holtz times the class so that the lecture is finished as the sky is getting dark. Therefore, the sun dictates that classes are held in April and August. April can be cold in the unheated observatory, and so all future classes will be held in August.

In early versions of the course, Holtz used loose-leaf hand-outs. This summer's class was treated to a full 1/2-inch thick spiral-bound collection of charts, tables, drawings, clear explanations, selected Sky and Telescope articles, and references. The content includes all the typical astronomical topics from moon phases to meteors, as well as practical introductions to and advice on equipment. Holtz makes extensive use of a white board and hauls in massive star atlases (hey, black dots on white paper can make interesting show-and-tell!). A big proponent of class participation, Holtz believes that he learns more from his audience than they do from him. Good questions are rewarded with "stars" next to the asker's name on the white board. He includes a segment, usually the last topic, on his own passion -

occultations and variable stars. Holtz was one of several amateurs who helped map asteroid 334 Chicago. Though it's not clear that he'd want his entire class to tag along on one of his forays in the boonies to track asteroids, he is most open to suggestions from the class for field trips.



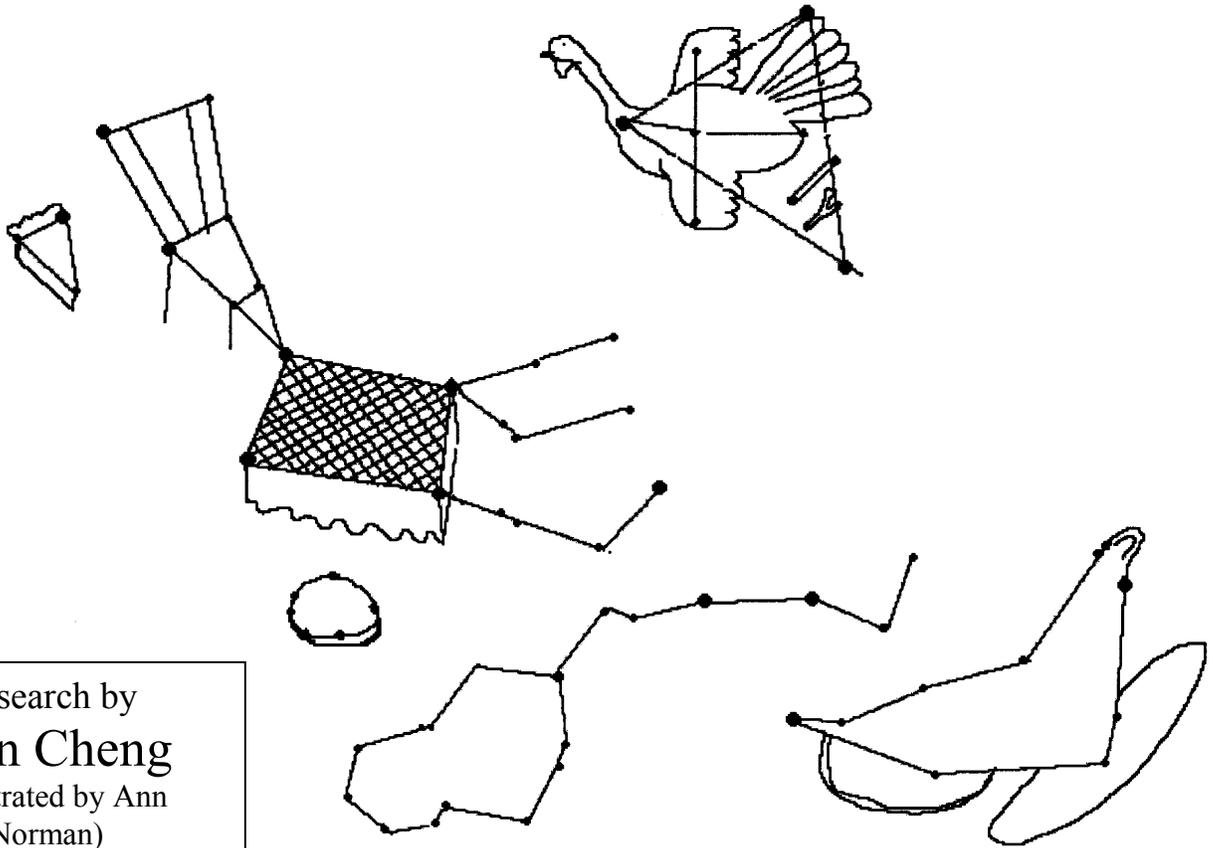
Because this year's class coincided with Mars mania, unannounced visits from Mars seekers made the class particularly challenging. The evening of Aug. 28 found John brandishing his laser pointer, maneuvering the Brashear, answering the phone ("Mars Central—May I help you?"), and entertaining the public. Other than the students, no other members had yet arrived to handle questions from the crowd.

Whether explaining finite element analysis or declination, a Holtz lecture is bound to be delivered with dry humor (what else from a guy whose every e-mail ends with the admonition "People who never look up avoid the cow manure, but that's all they ever get to see.") At times, the class can yield a few surprises for Holtz as well. Holtz remembers one night of group arachnophobia when the entire class jumped as a spider crossed the floor. In another class, a submarine veteran who had chosen Pittsburgh as his retirement home was asked why he preferred this location. Another student said it was because he was accustomed to being under water. Fortunately, this year's class was blessed with partly clear skies all nights except the first.

When it comes to giving back to the club, Holtz really does "give an iota" (his bad pun for his contributions to the International Occultation Timing Association). Look for announcements on next year's class in the summer issues of the Guide Star. The only thing that could possibly improve the class would be some of Holtz' famous homemade ice cream during break.

*(continued at right)*

# The Thanksgiving Constellations



Research by  
**John Cheng**  
 (Illustrated by Ann  
 Norman)

Flacc Stifel has referred to Cygnus as: "...Gob El Skwatto, Arabic for "the giant turkey," flung up into the sky for running from the Pilgrims...." I decided to search for the origin of his wonderful information.

It can be found in the extremely obscure and rare *Stargazer's After Dinner Handbook and Outhouse Companion*, an anonymous 17th century work that commemorates the "pleasures" of the holiday table in the night sky.

Other references that Flacc chose not to pass on:

Capricornus (Pilgrim name Creamcornus), also known as the **Gravy Boat**.

Triangulum, the **Pie Slice**.

Pegasus (Pilgrim spelling "Pea Gases") also known as the **Great Table Cloth**.

Aquarius, which is a partial Latinization of an early diner's, "Water!!!! Where is it?"

Pisces, whose "Circling" was known to early New Englanders as **The After Dinner Mint**.

Ursa Major and Ursa Minor suggested a **Sauce Pan and Ladle**.

Andromeda, was the Pilgrim **Aunt Dromeda**, chosen to symbolize the inevitable family members drawn to the holiday table. [Her empty chair is pictured above.]

Aquila and Sagitta were once called **The Big and Little Wish Bones** while the origin of Vulpecula's early identity as the **Meat Thermometer** is now unfortunately lost.

The book containing this information is extremely rare.... You won't even find it with a Google search...You're welcome to try if you don't believe me.



## The Protons are Coming! The Protons are Coming!

What to do if you hear a Big Coronal Mass Ejection is scheduled to hit Earth! —As was announced for Saturday, October 26, 2003.

### **Kenn Lippert:**

- ✓ Be on the look out.
- ✓ Wrap your satellites in lead foil.
- ✓ Don't be surprised at cell phone disruption.
- ✓ Don't trust your GPS.
- ✓ Stay away power transmission lines.
- ✓ Avoid foods heavy in saturated fats.
- ✓ Exercise regularly.
- ✓ Drink plenty of water.
- ✓ Vote for the candidate of your choice.
- ✓ And never put off until tomorrow what might be rendered moot by a world-destroying asteroid.

**Tom Reiland:** I just got interviewed by KDKA Radio about the [solar] flare and what it could do to us. I tried to emphasize the positive aspects of it: the Aurora Borealis. I'll be at Wagman Observatory tonight to try to observe anything that pops up.

## No Aurora, But not a Bad Night

**Tom Reiland:** Got to Wagman Observatory about 15 minutes after sunset. Set up my scope and prepared for a night of observing. No aurora. We missed it by several hours.

I did get to observe everything I hoped to see and a few more objects. I watched a bright meteor at 7:37 PM move from Draco to Camelopardalis and skip on the atmosphere twice and brighten to -2 mag. I observed a bright Hubble Space Telescope pass around 8:41 in the Southwest. I found Comet Linear C/2002 T7 and Comet Linear-Neat C/2001 HT50. The first was 10.5 mag and the second was 11.5 mag. I found the asteroid Hermes in Cetus and watched it move over a period of 45 minutes. This is one of the asteroids I always wanted to see. I've seen most the others on most list, including: Icarus, Eros, Pittsburghia, and the first twenty asteroids discovered. I also observed # 2 Pallas, #13 Egeria, the planets, Mars, Venus, Uranus, Neptune and Saturn and two of the largest moons in our solar system, Triton and Titan tonight.

Earlier in the afternoon I had used my 5 Inch Refractor to project the Sun onto my garage door. It's not often that we can see two Jupiter size sunspots at the same time. Spectacular!

I packed up and left Wagman just after 1 AM. High cirrus clouds were moving in and the wind was picking up out of the East. It was 37 deg. when I quit observing. Too uncomfortable for my old flesh and bones.

We don't get enough nights like this one. Looks like we won't get another one again for a while. I hope it's clear for Halloween so that I can set up my scope to show the Trick or Treaters the Moon and Mars. See yinz at the Lunar Eclipse on the 8th of November, weather permitting.

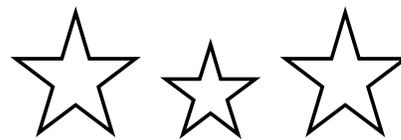
## Two Books by an Amazing Writer

*Ann Norman reviews*

*(Seeing in the Dark: How Backyard Stargazers Are Probing Deep Space and Guarding Earth from Interplanetary Peril by Timothy Ferris (2002) \$26.00, and*

*Coming of Age in the Milky Way by Timothy Ferris (1989, 2003) \$15.95)*

You may have heard the buzz about *Seeing in the Dark* (2002) by Timothy Ferris. (John Cheng reviewed it on the list and in *Guide Star* about a year ago.) *Seeing in the Dark* is a beautiful, meandering book about amateur astronomy and is most notable for Ferris's amazing writing skills. Whether Ferris is writing about something--the physical characteristics of Jupiter--or nothing--riding down the road at night with the radio blaring--it's immediate and leaves an impression. But the book isn't a page-turner. It isn't in a hurry; it doesn't have a thesis--as far as I can tell. It collects together random thoughts on the hobby of astronomy, sketches of notable amateur astronomers, and data on the planets. I took my time finishing it, but as I neared the end I stumbled onto a paragraph that actually moved me to tears. I give this book THREE STARS for some great moments.



A better book by the same author--in fact a perfect book-- is *Coming of Age in the Milky Way*, first published in 1988, and now re-released with a short addendum that brings the story up to date. It is about how humans pieced together their present understanding of the universe. The amazing writing is in evidence from the very start, but just as important, the book is going somewhere--fast!

*(continued on page 8)*

# NOVEMBER 2003

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					Birthday Edmond Halley Nov. 8, 1656	1
2	3	4	5	6	AAAP Business Meeting CSC 7:30 P.M.	 Lunar Eclipse – Star Party - Wagman
9 Birthday Carl Sagan 1934	10	11 Tycho Brahe sees a supernova in the sky 1572	12	13 Great Leonid Meteor Storm of 1833	14 Occultations of stars by Saturn Nov. 14 & 15	15 Birthday William Herschel 1738
16 	17 Leonids (Peak)	18 Leonids (Peak)	19 	20 Birthday Edwin Hubble 1889	21 Allegheny Observatory Lecture Nature of Stars 7 p.m. RSVP 412-321-2400	22 Comet 2P/Encke cuts the Coathanger
23 	24 Occultations of stars by Saturn Nov. 24 & 25	25 	26 	27 Thanksgiving Day	28 	29
30 						

Looking ahead: <b>December 5 Holiday Party</b> <b>Wagman Winterfest! 4 PM February 28, 2004 NEWO</b>	<u>AAAP Long-Range Meeting Schedule</u> Dec. 5 Holiday Party      Apr. 2, 2004 Jan. 9, 2004                  May 7, 2004 Feb. 6, 2004                  Summer Picnic Mar. 5, 2004                  Sep. 16, 2005
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## Two Superb Books by Timothy Ferris

(continued from page 6)

Here is the opening sentence:

*"The skies of our ancestors hung low overhead. When the ancient Sumerian, Chinese, and Korean astronomers trudged up the steps of their squat stone ziggurats to study the stars, they had reason to assume they obtained a better view that way . . ."*

Three hundred and eighty-eight pages later we have covered the "discovery of Earth", the Copernican revolution, Newton, Darwin, Einstein, calculation of the distance to the nearest stars, the "spiral nebulae" recognized as other galaxies, the expansion of the universe, our chemical understanding of the stars and the universe, symmetry and quantum theory, and the Big Bang.

Books have been written on some of these topics, and in several cases, I've read them. Still, Ferris adds fresh details and links it all together. This book is a real page-turner. I read the last third of it one afternoon at Sandcastle by the wave pool--jumping in only for the really high waves--reading during the wimpy waves. I don't know which was more exciting--crushing waves or this book!

I loved the surprising biographical tidbits about the genius, oddball scientists on whose shoulders we now stand. (Newton was so absent-minded he had to be reminded to eat and sleep, and apparently died a virgin; Galileo was mean to poor Kepler,

ignoring his pleas for a telescope; Darwin was a modest man who avoided controversy) I know some of you like "just the facts ma'am." To you, I wholeheartedly recommend this book, for its unrivaled information density and efficiency. There is even a timeline of the history of the universe--to keep all the important dates straight, from the first 10 to the negative 43rd power seconds after the beginning of time--when gravitational radiation comes out of thermal equilibrium with the rest of the universe--up to 2003--when a high-precision map of cosmic background radiation supports an age of 13.7 billion years for the universe. And don't worry about the recently discovered acceleration of the universe. It's covered in the new edition.

Wow! I give it FIVE STARS! 

**CLASSIFIEDS - FOR SALE:** New, unused, unopened Autostar No. 495 electronic controller for Meade DS series telescopes (ETX-60, 70, All DS Models, All DS-2000 Models, etc.) Good for visually impaired. Controller's easy-to-read 2-line display provides digital readouts of scope position (R.A. and declination), object description and other info. Additional features: 1,500 object database; 200 user-defined Objects; Go To button; 9-speed dual axis operation; guided tours; major Event Menu; interfaces with PC and Meade StarNavigator sky software(not included), and more. Currently selling for \$100 on Internet – Will sell for \$75 + shipping. Contact Gary Van Balen: 724-935-8642 or [pgk@fyi.net](mailto:pgk@fyi.net)

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