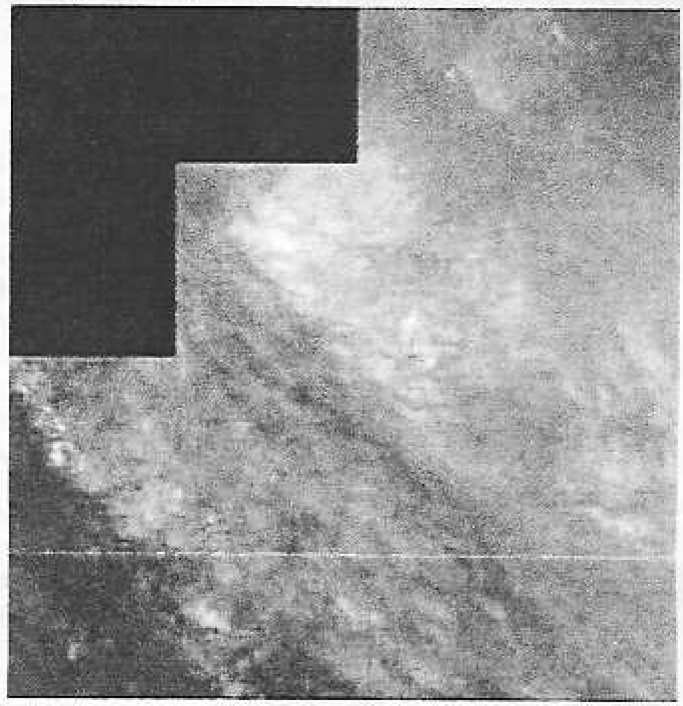
Reflections Refractions

of the University Lowbrow Astronomers

December, 1998

NGC 253: The Sculptor Galaxy
Credit: Photo and text - Hubble Heritage Team (AURA/ STScI/ NASA)
Explanation: NGC 253 is not only one of the brightest spiral galaxies visible, it is also one of the dustiest. Discovered in 1783 by Caroline Herschel in the constellation of Sculptor, NGC 253 lies only about ten million light-years distant. NGC 253 is the largest member of the Sculptor Group of Galaxies, the nearest group to our own Local Group of Galaxies. The dense dark dust accompanies a high star formation rate, giving NGC 253 the designation of starburst galaxy. Visible in the above photograph from the Hubble Space Telescope is the active central nucleus, also known to be a bright source of X-rays and gamma rays.



The University Lowbrow Astronomers

The University Lowbrow Astronomers is a club of Astronomy enthusiasts which meets on the third Friday of each month in the University of Michigan's Physics and Astronomy building (Dennison Hall, Room 807). Meetings begin at 7:30 pm and are open to the public. Public star parties are held twice a month at the University's Peach Mountain Observatory on North Territorial Road (1.1 miles west of Dexter-Pinkney Road; further directions at the end of the newsletter) on Saturdays before and after the new Moon. The party is canceled if it's cloudy or very cold at sunset. For further information call (313)480-4514.

This Month:

December 12 - Public Star Party at Peach Mountain Observatory - Watch for early Geminid meteors.
December 18 - Meeting at 807 Dennison - Former Lowbrow President Mark Vincent brings us up-to-date.
December 19 - Public Star Party at Peach Mountain Observatory - Comet C/1998 M5 Linear at 9.5 mag 18h52m +39degrees (due east of Vega +/- 2 degrees).
December 20 - ATM Group - Mtg time & location TBD.
December 21 - Winter Solstice 8:56 pm, shortest day of the year.

Next Month:

January 5 - Latest sunrise of the year. As the weather turns colder we are reminded summer is on it's way.
January 16 - Public Star Party at Peach Mountain Observatory - Will we freeze or will we seeze ???.
January 22 - Meeting at 807 Dennison - Our speaker tonight will be Old What's His Name. Jan 15
January 23 - Public Star Party at Peach Mountain Observatory - Check out the winter Milky Way - Can you see it?
January 24 - ATM Group - Mtg time & location TBD Jan 17

The History of the Detroit Observatory

by Dave Synder
Snyder

Most of the information came from The University of Michigan: An Encyclopedic Survey and from Dr. Patricia S. Whitesell's book A Creation of His Own: Tappan's Detroit Observatory (the complete bibliography is on our web site). This is a draft document. Dr. Whitesell has informed me there are a few typos, but I haven't received corrections yet.

Henry Tappan, the first president of the University of Michigan, wanted the University to have an observatory. He solicited funds from some citizens of Detroit and subsequently built an observatory just outside the city limits of Ann Arbor. It is now inside the city limits and is part of the University's main campus. Because of the generosity of the Detroit donors, it became known as the Detroit Observatory even though it is not located in Detroit.

The Detroit Observatory was used to conduct a variety of research including the following:

- Locating new asteroids and determining the orbits of existing asteroids.
- The discovery of two comets and the determination of the orbits of several other comets. When the Great Comet of 1882 appeared, no one was quite sure if this was the same comet as a previously known comet or if it was a new undiscovered comet. The observatory was used to help answer that question.
- Determining the longitude of the telescope, while we take such things for granted now, accurate determination of longitude was a non-trivial task at the time.
- Construction of lunar tables.
- The search for Vulcan. In the 1800's certain irregularities in the orbit of Mercury could not be explained by Newton's Law of Gravitation. Some years earlier similar irregularities in the orbit of Uranus had been resolved by assuming an unseen body was responsible for perturbations. Therefore astronomers speculated that another new planet must exist that would explain the orbit of Mercury and this planet was given the name Vulcan. The search for Vulcan became an obsession of Watson, one of the directors of the observatory. However, the real solution to Mercury's orbit would wait until 1915 when the Theory of General Relativity correctly predicts the orbit of Mercury without resorting to unseen planets. At present there is no evidence for Vulcan and it probably does not exist.
- Determination of the aberration constant.
- Obtaining the spectrographs of stars and other unspecified star observations.

In addition to astronomical observations, weather observations were made at the observatory and for a while the observatory was a station of the U. S. Weather Service. There are records of several expeditions conducted by different directors. These expeditions were to various locations in the U. S. and other countries, mainly to observe solar eclipses. Solar eclipses are only visible from specific locations so you need to travel in order to see the eclipse.

At the beginning, with occasional exceptions, students and the general public were denied access to the observatory. There were complaints. The complaints seem to end around 1878 with a change in directors and when a separate building, later known as the Student's Observatory, was constructed.

The observatory, now located between several dormitories and a block away from the University Medical Center, eventually became unsuitable for research. It is one of the oldest observatories in the United States that is still standing and is currently undergoing restoration.

An chronology of events follows:

1852 - Henry Philip Tappan was selected as the first president of the University of Michigan. He began his term with a vision of the University that included not only the traditional classical course but also a scientific course. Astronomy was needed to complete the scientific course, and to this end Tappan felt that an observatory was essential. Classes in astronomy had been taught prior to 1852, but they were limited and the University owned no telescopes or other equipment. He stated this vision and a request for help to achieve that vision in his inaugural address. One of people listening to this appeal was Henry S. Walker, a businessman from Detroit. Tappan and Walker began a discussion which resulted in a fundraising effort which lead to 29 donors. Most of these donors were businessmen, lawyers, bankers and politicians from Detroit. Walker was the most generous of this group. Part of their interest was the desire for an accurate time standard and an observatory could help create such a standard. Because of this generosity, the plans for the observatory extended past what had been envisioned by Tappan. In recognition of the role the city of Detroit played, the name "Detroit Observatory" was used for this building in honor of the donors. However this name was never officially adopted by the University. A 12" refractor was ordered, to be built by Henry N. Fitz, along with a sidereal clock and a meridian circle.

1853 - The original plan was for the observatory to be built in the center of campus, but finally a site was selected just outside the city limits on a hill a half mile from campus. Since then, both the city and the university have grown: this site is now inside the city limits and is part of the central campus. Many people, including Tappan, were unhappy with this site. In spite of numerous relocation attempts over the years, the observatory remains at the same location to this day. Later in the year construction was begun.

1854 - The first director of the observatory arrived, Franz F. E. Br¸nnow from Prussia. In addition to running the observatory, Br¸nnow also was responsible for teaching astronomy students and brought mathematical techniques into the study of astronomy. The number of students was small, in fact one class had a single student. This student, James Craig Watson, was an exceptional observer and would take more responsibility of the observatory in the next few years. Br¸nnow later wrote that it would have better if the building had been completed before he arrived.

1854 - The original building was completed including a 23 foot dome which would soon house the 12" refractor. This is the first observatory built in Michigan. The 12" refractor arrives, but is removed and a replacement is ordered. Another room housed the meridian circle. This telescope viewed the sky through panels in the roof, the north wall and the south wall. These panels could be opened and closed as needed. An additional funding drive was begun. With the exception of the 12" telescope itself, all the equipment had arrived including a meridian circle and a sidereal clock. The former was referred to as the "Walker meridian circle" after Henry S. Walker. A 4" comet seeker telescope was ordered.

1855 - Fitz acknowledged that the telescope would arrive late and loaned the University another telescope. The 12" telescope originally ordered arrived, but Br¸nnow did not find the mount acceptable.

1856 - Br¸nnow returns the unacceptable 12". The observatory was operational. There was still a debt, but Tappan raised enough additional funds to pay off the debt.

1857 - Fitz made another 12" telescope that was accepted. It was equipped with a variety of eyepieces, a 2" finder and had an equatorial mount. A road was built from the city of Ann Arbor to the observatory. This road still exists and is called Observatory Street.

1858 - The citizens of Detroit asked for information on how time signals could be transmitted from the observatory to the city of Detroit. Time signals probably were first transmitted by telegraph in the year 1861. The exact date is uncertain. Br¸nnow appoints Watson to Assistant Director.

1859 - Br¸nnow resigns and Watson was left in charge. The regents allow Br¸nnow to retain the title of Director of the Observatory but he is given no pay. Br¸nnow took the directorship of Dudley Observatory in New York.

1860 - An attempt is made to get Br¸nnow to return. He accepted, he received a significant increase in salary. A chronograph arrives. This is a device that records the position of stars as they cross the meridian.

1861 - The longitude of the observatory accurately determined.

1863 - Tappan is dismissed by the Regents. Shortly afterwords, Br¸nnow resigns and returns to Germany. Watson officially becomes director of the observatory. Watson announces a series of open houses, but only a few were held. Between 1863 and 1877, Watson discovers 22 asteroids, all but one of which were discovered using the telescope at the Detroit Observatory.

1868 - A large addition was added to the observatory. This was used as a residence for the observatory director. It was built in spite of a plan to relocate the observatory.

1869 - Watson travels to Iowa to view a solar eclipse.

1874 - Watson takes a year long leave of absence and travels to Asia, Europe and Egypt.

1878 - Watson took a trip to Wyoming to observe a solar eclipse. Watson took the opportunity to look for Vulcan, a planet that supposedly exists inside the orbit of Mercury. In the process he thought he discovered one and possibly two such planets. By all accounts Watson was a careful observer, but no one else was able to corroborate these observations. The scientific community was skeptical.

1878 - Watson resigns as director. A small building was constructed a hundred feet from the main building which was used by the U. S. Government to observe the transit of Mercury in 1879. This building was later remodeled and became the "Student's Observatory" as an attempt to end complaints about access to main telescope.

1879 - Mark Harrington accepts the position as director of the observatory. Much of Harrington's work involved meteorology, not astronomy. Courses in meteorology were offered.

1880 - A set of meteorological instruments were installed so that weather observations could be conducted at the observatory. A 6" equatorial refractor and a 3" transit were added to the equipment at the Student's Observatory. Comet Shaeberle II was discovered at the Detroit Observatory.

1881 - Comet Shaeberle IV was discovered at the Detroit Observatory.

1882 - The Great Comet of 1882 was observed and the orbit was determined to see if was the same comet as an earlier comet.

1891 - Harrington left on a leave of absence and Joseph Hussey was made acting director. The meteorology courses were dropped. Harrington never returned, but over the next eight years held other positions including president of the University of Washington and director of the Weather Bureau at San Juan, Puerto Rico.

1892 - Hussey resigns so he can go to Stanford University. Asaph Hall becomes director of the observatory. During Hall's directorship, a portion of the telescope time was given to ornithologists who were studying bird migration. Various equipment were refurbished.

1898 - Harrington retires due to failing health, both physical and mental.

1902 - A sextant was purchased.

1903 - A surveyor's transit was purchased.

1904 - Hall publishes Determination of Aberration Constant. The work related to this was done at the Detroit Observatory.

1905 - Hall resigns. Hussey returns to Ann Arbor to become director of the observatory. While he was gone Hussey had done work on a variety of subjects including double stars. Double stars would occupy much of Hussey's work. In the beginning Hussey was the only professor of astronomy but during Hussey's term of office, the size of the department grew dramatically. Directors residence was enlarged and the observatory shop was started.

1907 - The 12" refractor underwent extensive reconstruction. A 3Ω" finder, a new driving clock and other enhancements were added.

1907 - A 37Ω" mirror was acquired.

1908 - The Student's Observatory was moved three hundred feet to the west. This made room for improvements to the main building.

1908 - A new 4Ω" comet seeker was mounted on the observatory director's residence The original comet seeker was used as a finder for the 37Ω". Various improvements were made to the Student's Observatory.

1909 - An extension to the main building was completed except for the dome which was not completed until the next year. This included a classroom, a clock room and a photographic room. Various seismological equipment were installed in the basement.

1910 - A new 44 foot dome was completed to accommodate a new 37Ω" reflector.

1911 - Hussey sails to Argentina to discuss an offer of the directorship of La Plata Observatory. As a result he becomes the director of La Plata and continues as director of the Detroit Observatory. Hussey had a goal of setting up a new observatory in the southern hemisphere, and this was the first step. The 37Ω" telescope was installed in the dome constructed in 1910.

1912 - Expansion of the University began to encroach on the observatory. This encroachment included a proposed power plant. There was concern that smoke from the power plant would pass over the observatory. In addition heat from the plant could distort observations. The power plant was constructed sometime later.

1915 - A new hospital was to be built to the north of the observatory. Lights from this hospital might interfere with observations. The hospital was constructed sometime later.

1922 - There was a proposal to build a dormitory for nurses known as Couzen's Hall to the west of the observatory. The need to do something about these encroachments seemed "urgent", but no action was taken. Improvements were made to the 37Ω".

1923 - Couzen's Hall was constructed after the Student's Observatory, which was in the way, was torn down.

1923 - The 37Ω" reflector was overhauled and two new pieces of equipment were constructed: a spectrograph and a spectrocomparator.

1924 - Land near Portage Lake considered as a replacement for the observatory (see Portage Lake Observatory).

1925 - Hussey attempts to observe a solar eclipse in a balloon, but weather conditions prevent any observations (see the McMath-Hulbert Observatory). A 27" refractor was built in Ann Arbor. It was set up on the lawn of the observatory for testing and subsequently sent to a soon to be opened observatory in South Africa (see Lamont Hussey Observatory).

1926 - Harrington dies. Hussey unexpectedly becomes ill and dies. Ralph Hamilton Curtiss becomes acting director.

1927 - Curtiss becomes director of the observatory. The University opens an observatory to replace the Student's Observatory in a classroom building on the main campus (see the Angell Hall Observatory).

1928 - Hussey's goal to have an observatory in the southern hemisphere is finally realized after his death when the University opens a new observatory in South Africa (see the Lamont-Hussey Observatory). Between the Detroit Observatory and the Angell Hall Observatory there were 1,194 visitors during the school year. This compares with 2,606 visitors at the Lamont-Hussey Observatory the same year.

1929 - Curtiss died of a serious illness and Will Carl Rufus became acting director.

1930 - Heber Doust Curtis becomes director of the observatory.

1930 - Two businessmen and a judge open an observatory in Pontiac (see the McMath-Hulbert Observatory). Curtis develops a strong relationship with this new observatory.

1931 - The name "Detroit Observatory" gave the wrong impression about the location of the building, so the regents formally dropped the name, even though it had never been approved, and approved the name "Observatories of the University of Michigan." This includes what had been known as the Detroit Observatory, the Angell Hall Observatory, the Lamont-Hussey Observatory and the McMath-Hulbert Observatory. However most people still refer to the original observatory by the name Detroit Observatory.

1936 - The telescope mirror was aluminized, improving its efficiency.

1941 - W. Carl Rufus becomes director.

1945 - Alan D. Maxwell becomes acting director.

1946 - Leo Goldberg becomes director.

1946 - The residence was divided into three apartments.

1950 - The University opens a new observatory 15 miles northwest of Ann Arbor (see the Portage Lake Observatory).

1953 - Since the observatory is now in the middle of the city (and thus exposed to significant amounts of light pollution) and better observatories were available elsewhere, there was sentiment to close the observatory. This action was deferred.

1954 - The observatory residence, constructed in 1868, was torn down.

1955 - The University opens another observatory near the Portage Lake Observatory (see the Peach Mountain Observatory).

1960 - Freeman D. Miller becomes acting director.

1961 - Orren C. Mohler becomes director.

1963 - The observatory was now mostly unused. The University asked the Astronomy Department to move its offices and equipment out of the Detroit Observatory. Except for the telescope, which was not moved, the department complied with this request. The Astronomy Department made use of office space in the Dennison Building which had just opened. This building is also known as the Physics-Astronomy Building.

1970 - W. Albert Hiltner becomes director.

1976 - The 1908 addition had become unsafe and was torn down.

At this point the building was essentially the same as it was in 1854. All the additions made after 1854 had now been removed. However additional work would be needed to restore the building to its original condition. During the 1980's and 1990's the observatory was used by several groups, including a group of amateur astronomers, The University Lowbrow Astronomers who held monthly meetings at the observatory. This ended when the University indicated a desire to renovate the building. The restoration was begun in 1996. Over the next two years the building as well as many artifacts were restored. In particular, the Fitz 12" telescope was fully restored to its 1907 condition.

1001 Nights to Conquering the Cosmos (42 Years of Regular Attendance at Peach Mountain Open Houses)

by Lorna Simmons

I always get a laugh from books which claim that it will only take, for an example, 21 days to learn anything. When you begin to read these books, you realize that they are writing about 24-hour days! So I have simply selected 1001, an arbitrary number that Scheherazade would have understood, because, if she had not spun 1001 nights of magnificent tales for her Shah, her days would have been decidedly numbered. Period! On the other hand, you may have 1001 enchanted nights waiting for you!

In my case, I think that it takes a little time of real viewing at a dark site to get to know the constellations, let alone to learn the night sky. And when one realizes that the figure of twice each month, considering Michigan weather, is overly optimistic, you would be lucky to get only a little viewing in each year. So, even if you went out to Peach Mountain for every open house, it might take a little time to learn the night sky, so you should be patient. It could be much better to move to an out-of-the-way place and speed up the process. Dream on!

There are several books for beginning observers which are helpful in getting you over the difficulties of finding your way around the sky. One of these is 365 Starry Nights, by Chet Raymo, who is a Professor of Physics and Astronomy at Stonehill College in North Easton, Massachusetts. This book will give the rank newcomer an idea of how to find various important and easily-accessible astronomical objects, most of which can be viewed where there is a modest amount of light pollution. So one should not be eternally disappointed. What you do with this book is turn the pages until you arrive at the present date and begin the book there. Chet Raymo makes learning the sky a pleasant task and gives definite dates on which to look for definite objects. In this way, you will more easily learn the constellations and important objects so that when you want to find more difficult astronomical objects, you will be able to star hop (to be discussed in later issues) to them from the familiar places mentioned in this book.

Another book on a similar theme is The Sierra Club Guide to Sky Watching and Direction finding: Stars and Planets, by W. S. Kals. It is full of good advice for finding your way around the sky from the easily viewed brighter stars. There are great basic charts for learning the major star formations which can be easily seen in the Northern Hemisphere and from which you can star hop to other celestial delights. It is a good basic beginner's book for sky watching. I have one criticism of the book. There is a minor problem. The pictures are about a father and son. I feel that I was lucky to have had the kind of father that I had. One who introduced me to the Milky Way when I was three with a discussion of "infinity." The idea boggled my mind, the sky was magnificent, and I never forgot the event, down to the smallest detail. So you fathers who have girls. You never know how important this is! I know that the Lowbrow men have great daughter observers. Those lucky, lucky daughters and lucky sons, of course.

To the rescue comes another book. Discover Planet Watch, by Clint Hatchett, "A Year-Round Viewing Guide to the Night Sky with a Make-Your-Own Planetfinder" which has a father with his daughter on the cover (making my day [night?] when I saw it). It includes many projects for father and kids. There is a lot of information which might have been left out of some of the other books and, therefore, works well in conjunction with other skywatching books for beginners. There is a lot of good viewing advice about observing the objects in the Solar System, and there are a lot of informative charts. The book, itself, is not gender specific, and I would recommend it for all beginners, adult and child.

Now, we come to the book, 40 Nights to Knowing the Sky, "A Night-By-Night Skywatching Primer," by Fred Schaaf, a veteran astronomer and a well-known writer of books on astronomy. This book is recommended by *Sky and Telescope, Astronomy, Publishers Weekly* and by Chet Raymo, author of 365 Starry Nights, discussed above, so it should be a must-read for amateur astronomers. It is divided into 40 sections, one for each viewing night, and has useful Appendices giving important information and tables to help you get through your 40 nights successfully. Incidentally, at Peach Mountain, that would take about two years when it does not rain, or is not cloudy. I think that part of the "40 Nights" is to be spent reading and studying the book itself, helping the reader get through the book in a timely fashion.

A familiar problem; things look much different when you actually look at the night sky. The constellations are not those tiny little squiggles that you might see on a small planisphere, but are huge, gigantic, awesome. Also, there are other stars which confuse your viewing, and the constellations often seem to intermingle with each other so as to perplex the observer. When you think you know what you are doing, later on in the evening you will have quite a different view of the sky and will need to start all over again, looking for the original constellations with which you began the night. Many of them will have disappeared completely. Bummer! Do not give up. Success is just around the corner. Be thankful for small improvements.

These books are only a beginning. They are good for all neophytes and will help you learn how to find some of the things you are hankering for. Do not be discouraged; perhaps it will take less than 40 years (a little joke). If it does not take 1001 nights, then everything is a big plus. Soon you may be up and running, attending the Messier Marathons which challenge many an amateur astronomer. Or you might just wish to find all of the interesting deep-sky objects (a seemingly impossible dream). Or it might be planets. Some of you could hunt down asteroids and comets. Others might enjoy solar astronomy (with the right equipment). Whatever, find your astronomical niche.

Perhaps we could change the initial prescription to "1001 hours," or "1001 minutes," and make it an achievable goal. "1001 seconds," anyone? And then, if the challenge is too great, you might curl up with an astronomical tome, get into an imaginary mind-set, and forget all about the real night sky.

Or, in desperation, you could visit Peach Mountain and let our wonderful Lowbrow Astronomers, amateur astronomers "extraordinaire," find these objects for you, for free! However, to be truthful, it is much more exciting to find them yourselves. So, while you are at it, bring your binoculars and/or your telescope(s) and/or camera(s) along and join the crowd!

Extraterrestrial Civilizations: Coming of Age in the Milky Way

A press release form the Space Telescope Science Institute, dated December 10, 1998

If civilizations exist around other stars they are likely to be just emerging across our Galaxy right now: like an apple orchard suddenly maturing and ripening in the autumn sun. So concludes Space Telescope Science Institute theorist Mario Livio, in a paper to be published in the Astrophysical Journal.

Livio emphasizes that his theoretical work doesn't necessarily mean extraterrestrial civilizations really do exist, but it shows they cannot be dismissed either. We would be a lonely, isolated quirk of cosmic evolution if intelligent life forms appear on a planet at some random time in the parent star's life, say some theorists. Instead, Livio makes the case for a possible causal link between the sun's lifetime and the appearance of intelligent life on earth. This link should hold true for sun-like stars elsewhere in the universe: offering an equal opportunity for intelligent life to arise elsewhere in space.

The second part of his case is based on the possibility that carbon, the fundamental building block of life as we know it, may not have been widely available until the universe was about half its present age. This means that, given the added billions of years more required for biological evolution, intelligent carbon-based life didn't make an appearance any earlier than roughly three billion years ago.

He points out that before the universe could make life like us, it has to make carbon atoms. The carbon was created by nuclear fusion in the hearts of early stars, and then ejected when the stars lost their outer gas layers and left their cores behind as white dwarfs.

Livio calculates that carbon production may have peaked only two billion years before the Sun and Earth formed, based on estimates of the star formation rate made with Hubble Telescope and other ground-based telescopes. Though life first emerged on Earth a few hundred million years after its formation, it took a vastly longer time, nearly three billion years, for the first multi-celled organisms to appear. It took almost another billion years before life emerged from the sea onto the land. The earliest humans appeared less than four million years ago, at about the halfway point in our Sun's lifetime. If this were purely coincidental, other theoreticians have argued, then it would take much longer than the life of a star for most civilizations to arise. And so it would be unlikely extraterrestrial civilization would come about at all. We would be alone in the universe: reduced to a novelty, or accident, of the cosmos.

Because sunlight provides far more energy for life than other chemical processes, biological evolution is intimately linked to the Sun's behavior, Livio maintains. For example, the complex evolution of our atmosphere is interrelated with the Sun.

Our planet's atmosphere had to develop ozone to block out destructive UV radiation from the Sun before animals could emerge on the land. Likewise, he says, other civilizations should have emerged not much sooner or later than about halfway through their parent star's life cycle. That is, around stars like our Sun, or slightly cooler, that live healthy long stable lives and release enough energy to nurture life on accompanying planets.

If Livio is correct, and the Galaxy may be blooming with new civilizations, then where are they? Why haven't they visited us? Livio cautions that his work does not prove the existence of extraterrestrial civilizations, but points out that earlier conclusions that they do not exist may be premature.

He says that that it's also risky to think civilizations would colonize the Galaxy. "This assumes we have even the vaguest understanding of the psychology of extraterrestrial civilizations."

He adds "It's impossible to imagine the thinking of a civilization which might have evolved a million of years ahead of humans. We could be about as uninteresting to them as an amoeba is to us. Actual proof will have to await advances in biology and astronomy."

Looking for seasonal gifts?
See the next two pages:

- How about the gift of a dark sky - Subscribe to the International Dark-Sky Association
- Patricia S. Whitesell's book: <u>A Creation of His Own: Tappan's Detroit Observatory</u>

International Dark-Sky Association
3225 N. First Ave., Tucson, AZ 85719-2103 USA
ida@darksky.org http://www.darksky.org

Help Us Protect the Night Sky!

We are losing our heritage of starry night skies. Terrestrial lights shining inefficiently into the night sky threaten to destroy the spectacular views the heavens offer. Even worse, this "light pollution" wastes energy and provides no benefit to society.

City and suburban dwellers today (which is now most of us) have lost sight of most of the universe. The spectacular view of the sky offered our ancestors on dark clear nights no longer exists. The outdoor lighting accompanying urban population growth has overwhelmed the stars with its glow. The problem, however, is not the outdoor lighting, but rather the light sent needlessly upward into the night sky. This light pollution provides no useful benefit, wastes significant amounts of energy, and threatens astronomical research and everyone's enjoyment of the night sky.

The International Dark-Sky Association (IDA), a membership-based non-profit organization, serves the public and astronomy community through information, education, and research on outdoor lighting and related issues. IDA is active in sharing knowledge and facilitating communication at the local, national, and international level. While the IDA was organized to preserve dark skies for astronomy and the general public, solutions to the problem of light pollution will promote the best outdoor lighting designs, thus reducing energy use and helping preserve the Earth's natural resources. Visibility-impairing glare will also be minimized, resulting in a safer, more secure, and more aesthetically pleasing nighttime environment. Please help us as we work to protect the night sky both for ourselves and for future generations. Join the IDA!

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* Student or limited income individual membership is $15.
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Circle the appropriate category above, and mail this form and your check (in U.S. dollars), made payable to the International Dark-Sky Association (or IDA), to: **International Dark-Sky Association, 3225 N. First Ave., Tucson, AZ 85719-2103 USA**. If paying by VISA or MasterCard, you may fax this form to **(520) 293-3192**.

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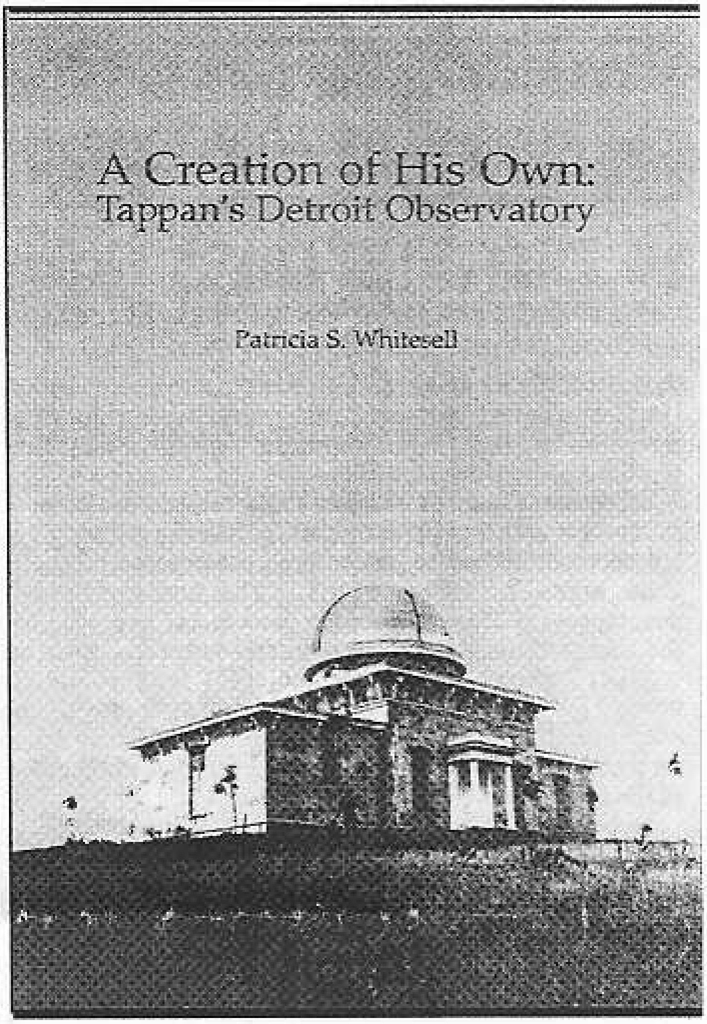
A Creation of His Own:
Tappan's Detroit Observatory

Patricia S. Whitesell

The year was 1852. The University of Michigan was about to embark upon an exciting period of its history, led by one of the most dynamic, visionary leaders in the history of higher education—and an observatory was one of his first orders of business. The Detroit Observatory was completed in 1854 and named to honor the city of its major benefactors. Reflecting back on his great achievement years later, President Henry Philip Tappan wrote: "I cannot speak of the Observatory without emotion. No one will deny that it was a creation of my own."

A Creation of His Own: Tappan's Detroit Observatory delves deeply into the Observatory's early biographical, architectural, and scientific history. It is a fascinating exploration of the historical context of Tappan's efforts to implement progressive educational ideas on the Michigan frontier. Tappan's success in building the Observatory would result from a magical matching of scientific and applied interests: Tappan would have his scientific research laboratory, and the Friends of Science in Detroit would benefit from the applied uses of astronomical science. The book provides significant new, previously unpublished information and over 100 photographs and illustrations that bring to life the fascinating story of this physical legacy of the University of Michigan's first President.

Today, the Detroit Observatory is one of the most perfectly preserved early observatories in the country. Its original 1854 Pistor & Martins meridian circle telescope and astronomical clock by Tiede, which were purchased by Tappan in Berlin, and the 1857 American-made Henry Fitz refracting telescope are all intact and operational. The 1997-98 historic restoration of the Observatory is also chronicled in the book, with photographs and descriptions of the painstaking work, including the restoration of the telescopes.



Patricia S. Whitesell, Ph.D., is Director and Curator of the Detroit Observatory. Dr. Whitesell is a historian of higher education, astronomy, and the evolution of the physical campus, and a specialist in historic preservation. Whitesell's family roots in Ann Arbor extend back to 1851.

Distributed for The Bentley Historical Library, University of Michigan

6 x 9, 250 pages, 100 illustrations
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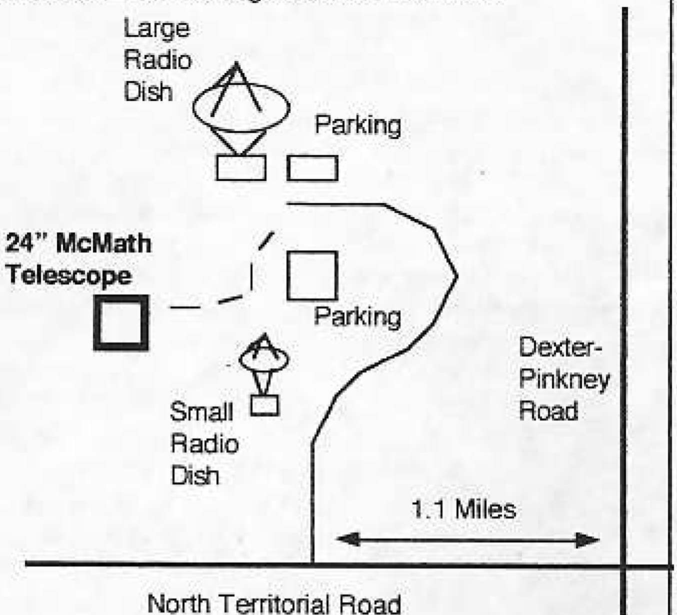
THE UNIVERSITY OF MICHIGAN PRESS
P. O. Box 1104
Ann Arbor MI 48106
(734) 764-4392

Places and Times:

Dennison Hall, also known as The University of Michigan's Physics and Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. It is found in Ann Arbor on Church Street about one block north of South University Avenue. The meeting is held in room 807.



Peach Mountain Observatory is the home of The University of Michigan's 25 meter radio telescope as well as the University's McMath 24 inch telescope which is maintained by the Lowbrows. The observatory is located northwest of Dexter. The entrance is on North Territorial Road, 1.1 miles west of Dexter-Pickney Road. A small maize-and-blue sign marks the gate. Follow the gravel road one mile to a parking area near the radio telescopes. Walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.

Monthly meetings of the Lowbrows are held on the 3rd Friday of each month at 7:30 PM in 807 Dennison Hall. During the summer months, and when weather permits, a club observing session at Peach Mountain will follow the meeting.

Public Open House/Star Parties are held on the Saturday before and after each new Moon at the Peach Mountain Observatory. Star Parties are canceled if the sky is cloudy at sunset or the temperature is below 10 degrees F. Call 480-4514 for a recorded message on the afternoon of a scheduled Star Party to check on the status. Many members bring their telescopes and visitors are welcome to do likewise. Peach Mountain is home to millions of hungry mosquitoes - bring insect repellent, and it does get cold at night so dress warmly !

Amateur Telescope Making Group meets monthly, with the location rotating among member's houses. See the calendar on the front cover page for the time and location of next meeting.

Dues:

Membership dues in the University Lowbrow Astronomers are $20 per year for individuals or families, and $12 per year for students and seniors (age 55/+). This entitles you to the monthly REFLECTIONS newsletter and the use of the 24" McMath telescope (after some training). Dues can be paid to the club treasurer Doug Scobel at the monthly meeting or by mail at this address:

1426 Wedgewood Drive
Saline, MI 48176

Magazines:

Members of the University Lowbrow Astronomers can get a discount on these magazine subscriptions:

Sky and Telescope: $27 / year
Astronomy: $24 / year
Odyssey: $16.95 / year

For more information contact the club Treasurer. Members renewing subscriptions are reminded to send your renewal notice along with your check when applying through the club Treasurer. Make the check payable to "University Lowbrow Astronomers".

Newsletter Contributions:

Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call or E-mail to Newsletter Editors at:
Bernard Friberg (743)761-1875 Bfriberg@aol.com
Chris Sarnecki (734)426-5772 chrisandi@aol.com
to discuss length and format. Announcements and articles are due by the first Friday of each month.

Telephone Numbers:

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	Dave Synder	(734)747-6537
	Paul Walkowski	(734)662-0145
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	Chris Sarnecki	(734)426-5772
Keyholders:	Fred Schebor	(734)426-2363
	Mark Deprest	(734)662-5719

Lowbrow's WWW Home Page:

http://www.astro.lsa.umich.edu/public lowbrows.html
Dave Synder, webmaster

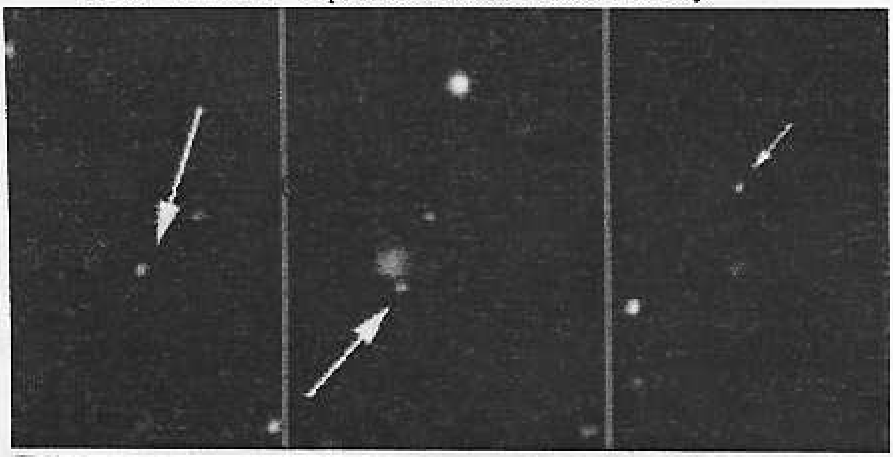
Monthly Meeting:

December 18, 1998 7:30 pm

Room 807 Dennison Hall
Physics & Astronomy Building
The University of Michigan

Mark Vincent

Former Lowbrow President
Brings us up-to-date
on his work at Apache Point Observatory



High Redshift Quasars

Credit: Pictures and text - Sloan Digital Sky Survey

Explanation: Each red speck indicated above is a powerful quasar estimated to be over 100 times brighter than a galaxy. Yet in these Sloan Digital Sky Survey discovery images the quasars appear faint because they are extremely distant. Their distances have been indirectly gauged by noting how much the light they emit has been stretched to longer wavelengths by the expansion of the Universe. Because red light has the longest wavelengths in the visible spectrum, this stretch has come to be called "redshift" - the greater the distance, the greater the redshift. Astronomers use a number known as "Z" to quantify this cosmological redshift and the quasar at the left, with a Z of 5, was just proclaimed the new quasar redshift champion (from left to right the measured Zs are 5.00, 4.90, 4.75). What's the actual distance to quasars with Zs of 5 or so? ... about 15 billion light-years, give or take a few billion light-years depending on your favorite cosmology!

University Lowbrow Astronomers
3684 Middleton drive
Ann Arbor, Michigan 48105

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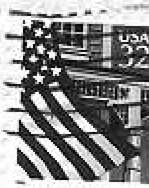

Check your membership expiration date on the mailing label !

/1999