WE OBSERVE

The Early Years of the Chagrin Valley Astronomical Society

Written by Anthony Mallama
Edited by Bruce Krobusek

Fiftieth Anniversary Edition

WE OBSERVE

The Early Years of the Chagrin Valley Astronomical Society

Anthony Mallama
Bruce Krobusek, editor

This history is dedicated to our mentors and teachers
Larry Lovell, Arthur Stokes, George Diedrich and Vivian Starr

"First I prepared a tube… at the ends of which I fitted two glass lenses…"
Galileo Galilei, Starry Messenger, 1610

"… it's full of stars!"
Arthur C. Clarke, 2001: A Space Odyssey, 1968

Front cover: The Sombrero Galaxy is the symbol of the Chagrin Valley Astronomical Society. NASA image.

Back cover: Halley's Comet has traversed nearly the entire length of its orbit since the CVAS was established in 1963.

Table of Contents

Preface to the 50th Anniversary Edition

The Chagrin Valley Astronomical Society has paused to commemorate the anniversary of our founding two times in its history. In 1973 we marked our 10th year with a star party at my parents' house in Solon. Ian Cooper, Bruce Krobusek, Dan Rehner, Denny Jefferson, and Tom Quesinberry were there, along with other club members and a few guests from the neighborhood. Someone brought a large jug of dandelion wine and, as we were still a junior club back then, you can imagine the celebration! Our astronomy mentor, Larry Lovell, joked "I'm sure you guys had a party but I'm not so sure about the stars."

By the 25th anniversary we had grown up quite a bit and realized that the CVAS had its own history, most of it good. Indian Hill Observatory was already on the map, several members held jobs in scientific and technical fields, and some of us even had children of our own. So I decided to interview the club's leaders and ask them to recall the events of our first quarter-century before that information was lost to time. In addition to those people mentioned above, co-founder George Gliba, IHO designers and builders Dan Rothstein and Doug Caprette plus several other members talked with me about the early years. Material from the recorded conversations then formed the basis for writing *We Observe*.

Now in our 50th year, the oldest members are passing from middle-age into geezer-age and the star parties are more about stars and less about partying. To help us remember the days of yore, Bruce has made this PDF version of the club's history complete with images taken from the CVAS web site. At my request he also added some of his own pictures from the 1970s. Many people have expressed their gratitude for *We Observe* over the years and I, in turn, want to thank Bruce for reissuing it. We both thank Bruce's wife, Susan, who graciously offered to proofread the text.

Together with the new version of *We Observe*, Bruce and I are also releasing the recorded interviews in MP3 format for the first time. There are lots of terrific memories, some told in a lively manner, by our earliest club members. I hope you will enjoy the new oral history of our club as well as the re-issue of this written version.

Anthony Mallama

May 2013

Preface

Last summer, as the Chagrin Valley Astronomical Society entered its twenty-fifth year, I recommended that the club set down two records of its history. The first record is a series of audio taped interviews with some of the club's most historically influential members. In order to encourage candidness, I offered each interviewee ten years of privacy before the tapes might be replayed in public. The interviews with Kim Aebi, Doug Caprette, Ian Cooper, George Gliba, Al Havrilla, Dennis Jefferson, Bruce Krobusek, Tom Quesinberry, Dan Reiner, and Dan Rothstein may be of interest to future club members during the thirty-fifth anniversary year and beyond.

The information from these interviews was crucial to the second record of the club's history, which is this text. I recall the first few years of the club's existence from my own participation. However, there have been many years between then and now when I have been out of the Cleveland area and only remained in contact by letters, telephone calls, and visits. Thus, the information in the interviews filled in long gaps.

I found the historical research for this book to be an adventure. I read as many old *Valley Skywatcher* articles as I could find. I played and re-played the tapes, searching for threads that tied the little club of 1963 to the larger one of 1988.

I think I have succeeded in that, and I believe the book is an accurate portrayal of the process by which the club came to be what it is today.

This volume was created primarily for entertainment. However, it may also be useful as a source book or idea book. Someone who desires to improve the club or to try a new project may find a few good ideas on these pages.

The club history was written in a way that I hope will please the people who are in it. I have concentrated on the many club achievements and downplayed the mistakes. I adopted the adage that "If you can't say anything nice, don't say anything at all." I've left out anything I considered unscrupulous. What is left is the good stuff of amateur astronomy.

Tom Quesinberry reviewed and proofread the text. Kim Aebi did the drafting.

Anthony Mallama

January 1988

YOUTHFUL ENTHUSIASM

In the early 1960's, the Heavens and the Earth were filled with wonders. In February 1961, Jupiter and Saturn climaxed a beautiful conjunction by passing within about ten arc minutes of each other. In September 1962, Saturn was again at the center of attention when it was occulted by the dark limb of a ten day-old moon near the meridian. The immersion lasted over two minutes. On Saturday afternoon July 20, 1963, a long awaited solar eclipse was visible. About eighty percent of the Sun was eclipsed in the Chagrin Valley.

In our United States, a country that had never lost a war, President Eisenhower was followed into office by a charismatic young Democrat, named Kennedy, who promoted space exploration. We all cheered when a Jupiter-C rocket blasted our first satellite, Explorer I, into orbit. Manned spaceflight transformed the space age into a personal experience. From the rocket powered X-15 space plane through Project Mercury, we developed boyhood idols such as Alan Shepard and John Glenn.

No Chance Encounter

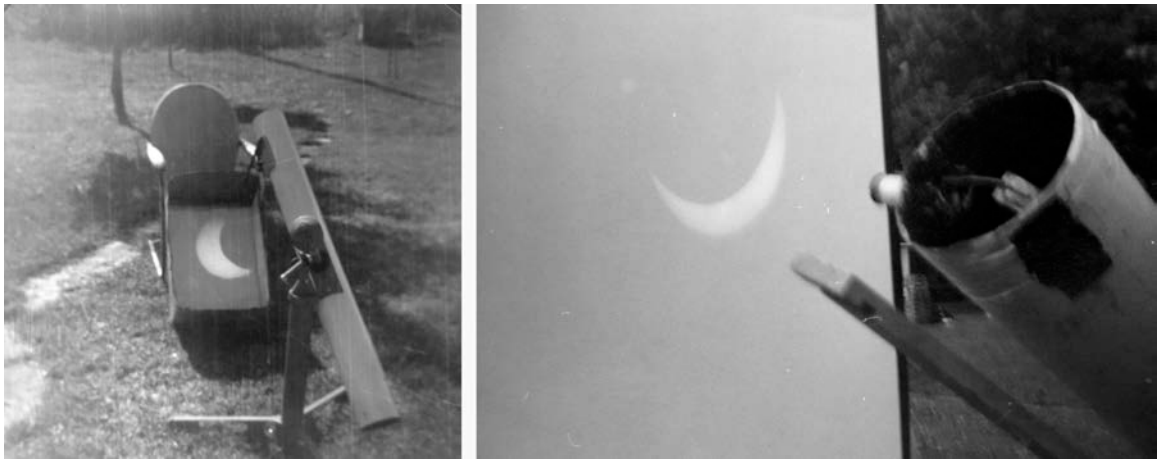
None of the events of this historic period were missed by two grade school boys, one from Chagrin Falls and one from Solon. The experiences of the early sixties shaped George Gliba and me. Our first face-to-face meeting followed several phone conversations in which we discussed our astronomical interests. We arranged to meet at my house on a certain Saturday in January 1963. Despite a heavy snowfall, George walked seven miles from his house to mine. He was numbed by the cold when he arrived but we enjoyed our visit anyway, and it was the beginning of a long friendship.

As winter gave way to summer, George and I explored the Warner and Swasey Observatory, the Cuyahoga Astronomy Club and other avenues in search of more amateur astronomers. With summer in full swing and the big solar eclipse fresh in our minds, we attended a meeting of the Ohio Turnpike Astronomers Association (OTAA), and that is where the idea for the Chagrin Valley Astronomical Society jelled. The OTAA is an organization made up of local clubs mostly from northern Ohio.

We saw many different groups at the meeting, but the ones we noticed most were the junior clubs composed of young people just like ourselves.

In September 1963, we convened the first meeting of the CVAS, with a total of four members. The other members were Don Tuson and Rick Wilkins. We had little idea of what we wanted to do, but we knew that every club had a treasury, so we began collecting 25 cents per month dues.

Our club grew rapidly, at least in people if not in money. We were joined by Bill Gebhardt later that year. In 1964 we added Dennis Jefferson, Clif DeMaskey, the Sabec brothers, Mark Pribanic, and Don Henning. The year 1965 brought in Tom Quesinberry, Andy Jackson, and Billy and Marty Edwards.



The solar eclipse of 1963 as projected by Tony Mallama's Palomar Jr 4.25-inch (left) and George Gliba's stovepipe 6-inch.

Many Interests, Few Resources

As the membership grew, the variety of interests and ideas multiplied. We had meteor observers, planetary observers and deep sky specialists. We ground telescope mirrors, had fights with optical rouge, and built pipe-fitting mounts. We attended our first out-of-town convention in Buffalo, after Billy and Marty Edwards moved there. We dreamed of having a club observatory, though no one imagined one on the scale of Indian Hill. One member even proposed building a 12-foot radio-controlled rocket.

Only the simpler plans and activities succeeded though. The average age by the mid-1960's was still only about 15 years, so most of us were dependent on our parents to get a ride to meetings and star parties, and on our paper routes for money to buy telescopes. One of the first good commercial telescopes was my 4 1/4-inch Palomar Junior; it was soon surpassed by George's homebuilt 6-inch f/12 reflector; but young Dennis Jefferson would surpass both of us by building a high quality 8-inch.

Our meeting place rotated among members' homes. I remember how my own parents looked forward to hosting the meetings. As I was their only kid, they always enjoyed having a few extra boys around.

Our first star party was at the baseball field on Portage Street in Solon. We did not have to go out in the country for dark skies in those days, as 6th magnitude stars were still visible from Solon and Chagrin. This particular date (believed to be June 14, 1964) was chosen because of the occultation of a 7th magnitude star by a 3.9 day-old moon. It may not sound like much, but to judge from our excitement you would think that we had witnessed a meteor crash to earth.

The club newsletter first appeared in September 1964, under the title *Official CVAS Bulletine* (sic). This was a one-page editorial marvel that was typed and re-typed with two carbons until there were enough copies for all the members. George wrote the feature article entitled "Comet Fear?" for issue number 2 in October. Then we combined on a five-page extravaganza Christmas issue, and changed the name to the *Valley Skywatcher*. In January 1965, Don Henning's older sister began mimeographing the *Skywatcher*, and it jumped to 14 pages in length.

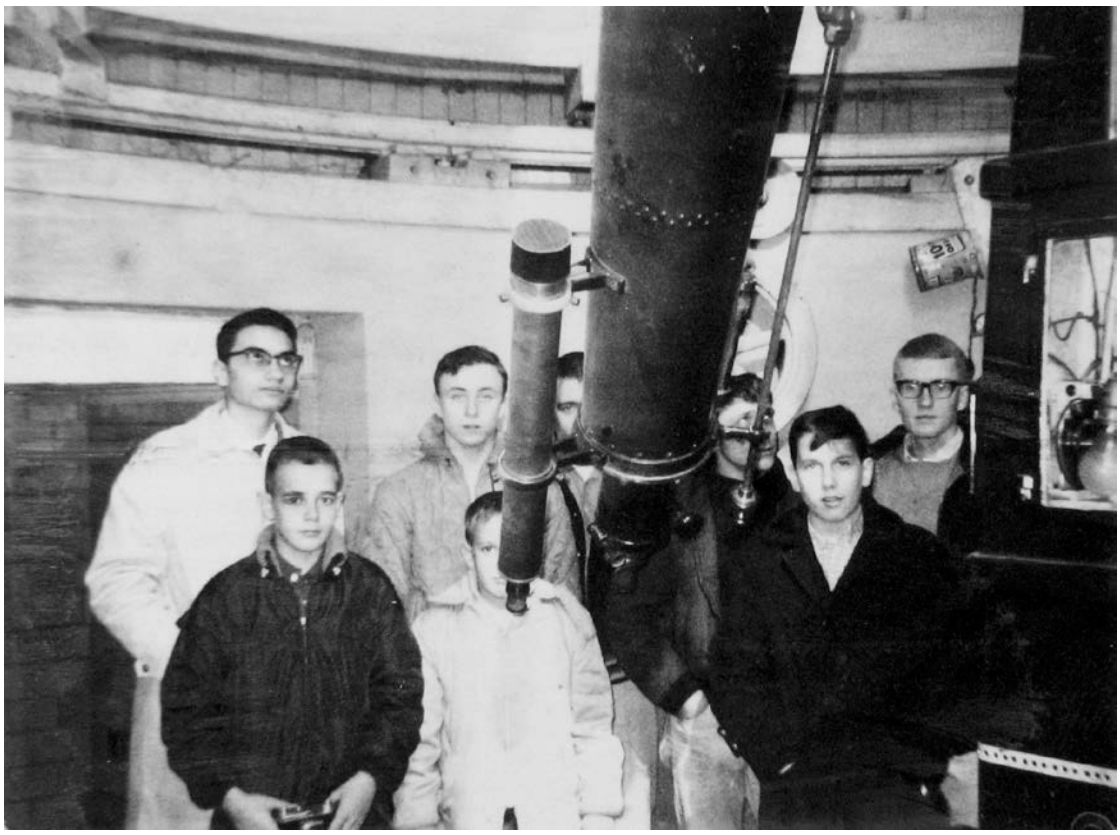
A CVAS monthly meeting held at the Mallama's home in 1965. The club members present, and shown here from left to right, were: Denny Jefferson, Bill Edwards, Tom Quesinberry, Marty Edwards, and Tony Mallama.

Service and Science

The early club was interested in education as well as observation. We were well received by the local newspapers when we announced a public star party. There was one classic picture of Don and Denny in the Herald trying not to giggle at the reporter, and one article said something about a little club with a big name. The first of at least 11 annual star parties was held in Riverside Park in Chagrin in 1966.

The Great Comet of 1965, Ikeya-Seki, as seen from Solon before sunrise on November 3. We used fast but grainy Tri-X film for astrophotography back then. Hyper-development made it faster, but also grainier!

In 1967, the more serious minded concentrated on club observing projects such as measuring meteor rates, and measuring the phase of Venus (Project Dicot). Two years earlier, the club neophyte observers were cutting their teeth on the long-tailed comet Ikeya-Seki, which grazed the sun and emerged as a splendid pre-dawn object. The biggest observing controversy I can recall happened all the way back in 1964. On Friday evening, December 18, the moon was to be totally eclipsed, and Sky & Telescope's faithful readers were told to rate the darkness of the eclipse on the Danjon scale where L = 0 was the darkest and L = 4 was the brightest. This was very important they said, and pointed out that the previous two eclipsed moons (December 30, 1963 and June 24, 1964) had faded from naked-eye visibility entirely. I am sure S&T meant well, but in effect they started a war. On the morning of December 19, when we compared observing notes, it turned out that all three members from Solon had gotten L = 1, while all four from Chagrin had gotten L = 2. (Actually, it could have been the other way around, we don't even remember any more.) All sorts of accusations, including collusion, faking the data, and ordinary blindness, were hurled between the two villages. The matter was not finally settled until the February issue of S&T stated that the average reported value was about 1 1/2, which satisfied everyone.



An early CVAS field trip. Left to right in the back row: Tony Mallama, Denny Jefferson, probably Tom Quesinberry, probably George Gliba and Andy Jackson. Front row: Billy Edwards, Marty Edwards and Don Henning.

Mr. Lovell's Observatory

In 1966, several of the club's main observers became involved with the photoelectric photometry program at Larry Lovell's observatory in Auburn. Thanks to the electrical engineering of Art Stokes, in Hudson, Larry was one of the first amateur astronomers in the country to observe photoelectrically. The club members refined their observing skill and data analysis practices at Larry's observatory. During the next couple of years, we observed Beta Lyrae, Algol, and other variable stars. The one that stole the show, though, was Nova Delphini, which flared up to 5th magnitude in the summer of 1967. By December, it reached 4th magnitude.

The slow Nova Del was still above 6th magnitude the following June when Larry and his late wife, Elizabeth, took Don, George and me to the American Association of Variable Star Observers (AAVSO) meeting in Lima, Ohio. This event was being held to honor Leslie Peltier (1900-1980) on the occasion of his 50th year of uninterrupted variable star

observing. He had made over 100,000 estimates. We met Mr. Peltier and he signed copies of his book Starlight Nights for us. Don Henning delivered a paper at this meeting on the subject of photoelectric observations of Beta Lyrae.

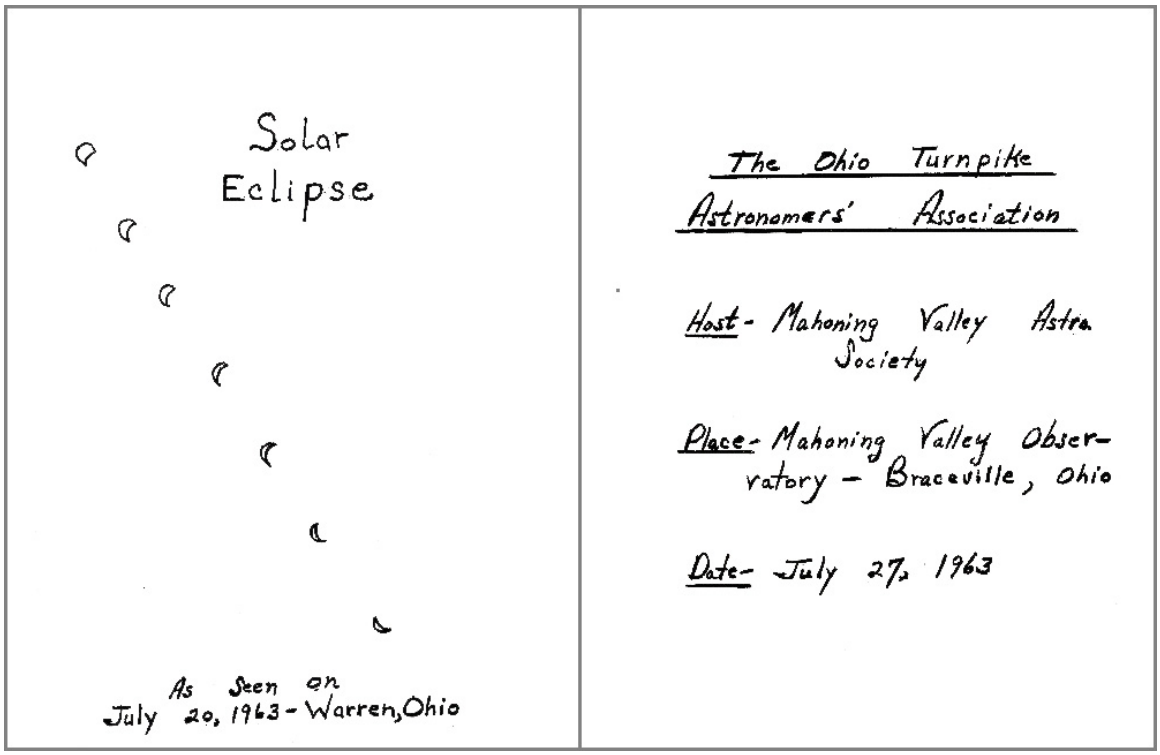
Larry Lovell's observatory with a precision 10" reflector became the focus of CVAS activities around 1966. Shown here from left to right are Denny Jefferson, Larry Lovell, Tony Mallama, Elizabeth Lovell, and Don Henning. The Latin inscription over the door reads "Observo Ergo Sum", which means "I Observe Therefore I Am".

The Pooh Bear President

Don was an outstanding member of the early club. He was friendly, intelligent, and always willing to help. Don served two successive terms as president and the club flourished under his care. We were happy and carefree. The meetings still rotated among the members' homes, Denny delighted in humorously insulting Don as he conducted business and frequently had us all rolling on the floor with laughter. We passed our fifth year as an organization, but we were enjoying ourselves too much to stop and celebrate the occasion.

Left: In the age of analog electronics, Tony Mallama is reading the wavering needle of a voltmeter connected to the photometer amplifier. One person in the warm-up room transcribed the meter readings onto paper, while the observer operated the telescope and the photometer in the dome.

Right: The warm-up room at Lovell's observatory had fine furniture, a small library, and even a crystal chandelier. Here Denny Jefferson has tuned the shortwave radio to WWV while Larry sets a clock. Exact timing was important to our program of photoelectric photometry of eclipsing binary stars.



The birth of the CVAS was inspired by this OTAA convention.

THE MOON AND VIETNAM

By the end of the 1960's, America had changed entirely. On one hand, it had climaxed its space program with the manned Apollo expeditions to the Moon. But on the other hand, it had reach an all time low in the black ghettos of the States and in the rice paddies of Vietnam. The greatness of Apollo was blemished for those of us who followed it. The view of the Moon was superb, but the view of the Earth was dismal. While our astronauts were exploring the Sea of Tranquility, our cities erupted in blazing and deadly race riots. While our scientists explored Hadley Rille, our soldiers were dying by the tens of thousands in a war that no one wanted.

Away From Home

George Gliba was away in the Air Force, and I was away at Vanderbilt University by 1970. Scarcely any of the other early members were active in the club. Looking back, we were lucky that the Riverside Park star parties and other club activities had brought in several new members including Bruce Krobusek, Dan Rothstein, John Schlessman, Rich Matyi, Ian Cooper, and Bruce Kermode.

The Orange Shift

Krobusek and the rest were part of the gradual shift of the membership away from Solon and Chagrin to Bainbridge and Orange. During this period, the club established relations with the Orange school system, and there was some talk of building an observatory in conjunction with Orange.

Now, it is hard to see why the club slumped so badly at about this time. Krobusek followed Schlessman as president, serving during 1972 and cannot account for the poor showing, but he remembers it well. There were meetings with only two members in attendance, and, as a rule, most of the elected officers would not show up at all. Perhaps it was the disarray of society: the after-shock of the riots, the intense pain of the war. Perhaps it was due to poor public relations. No one can really say.

Still Some Fun

The club appeared small and fragile at this time; however, no one ever considered dissolving it. As long as there were at least two members who enjoyed astronomy, it seemed worthwhile to go on. And the members did enjoy astronomy. The meetings seemed to please those who attended, last-minute backyard star parties were popular, and there were field trips to OTAA functions such as the ones at Hiram and Hudson. Trips to Lovell's observatory and the Nassau station near Chardon occurred during these years. There were also memorable stories such as the "infamous lawn-chair incident", the kind of story where you had to be there to really appreciate it. The way I hear it from Bruce Krobusek, this was the night of May 16, 1971. John, Ian and Rich had gathered at Bruce's house to observe an occultation of Mars by the Moon. Bruce's parents had the old fashioned lawn-chairs, which were wooden. When Ian sat down in one, he went right through the bottom of it. A short while later, when John sat down in another one, it

collapsed. The night was clear though and shortly before morning twilight the tired but happy members observed the rare occultation.

Riverside Star Party, July 1972 – Left to Right: Bruce Krobusek, Dan Rehner, Gary Yanulaitis, Dan Rothstein, Ian Cooper, Denny Jefferson. The telescope is believed to be Carl Saintignan's 4" Unitron.

Lingering Pain

The club recovered from its low period, yet the legacy of the Vietnam era would continue to haunt us in unexpected ways for many years. In the mid-1970's, a leading club member who had fought in Vietnam ended his own life. It was symptomatic of the times.

THE OBSERVING DYNASTY

The experiences gained from meteor observing, photometry at Larry Lovell's observatory, and visual estimates of Nova Delphini prepared the club for its major foray into the world of serious scientific research. Even during the low period around 1970, the potential was developing, as Bruce Krobusek and new member Chris Stephan were finding their way around the night sky.

Dr. Hall

A little-known influence on the club was a young college professor on the staff of Dyer Observatory at Vanderbilt University in Nashville. Dr. Douglas Hall was special because of his involvement with amateurs. I'm not sure whether I was the cause or the effect of this interaction, but I am sure that he has since then become one of the most important professionals who involves amateurs in his research on a regular basis.

Dr. Hall's specialty was variable stars, eclipsing binaries in particular. His technique was photometry, a field ideally suited to amateurs because it is not too costly. One of the first stars that I helped Doug with during my student days at Vanderbilt was BS Scuti, a 10th magnitude eclipser in the same field as M-11. Not only was it a treat to observe at the telescope, but some of the other data we were using was made visually! I could hardly believe it, here we were preparing an article for a professional journal, and we were basing part of it on visual observations made by a group of Swiss amateurs who were timing the eclipses of this star with small telescopes and their eyes.

In science you do not pick and choose your data, you use ALL the available data that is good. In the field of astronomy where there are many more stars than there are scientists, amateurs with or without photometers are providing good data.

The Start of Something Big

When I was elected Director of Observations for 1973, I was already making visual observations of eclipsing binaries on my own. It only remained to impart that knowledge and enthusiasm to a few others in the club and we were on our way to an observing dynasty. My method was to provide personal or group instruction in variable star observing to anyone who would listen. Some of the members took right to it, and others did not. The fastest learners were Bruce and Chris. Both were already avid observers when I met them and needed only a gentle shove in the right direction. In fact, within just a few years both of them were publishing their own observations in professional journals. All of us were very good at making observations of long period variables for the AAVSO, but our specialty was eclipsing binaries. During an eclipse, a practiced visual observer can make observations at ten-minute intervals and record the 'light curve'. At a later time, the observed light curve can be plotted on paper and the time of minimum light or mid-eclipse can be determined with good accuracy. These timings are important because the orbital periods of many binaries are unstable, and the only way to track and understand the dynamics of these stars is to time the minima.

Comet Kohoutek

The news media made Comet Kohoutek into a front-page story because it was predicted to be bright enough to be seen in broad daylight. It did not live up to its expectations, but it did provide another object for eager club observers to focus on.

One of the fascinating things about comets is their unpredictable brightness. Undoubtedly, it is related to the vaporization of cometary ices and the subsequent chemical changes. This process was not well understood at the time and is still not completely known.

By late in 1973, I was a graduate student at Toledo University. I met Dr. Armand Delsemme, an internationally known comet expert, and had an experience that was almost a repeat of the one with Dr. Hall. Specifically, Dr. Delsemme was very interested in amateur visual magnitude estimates of comets. He did not collect them himself; however, he was firm in his conviction that such observations were of great scientific value. He encouraged me, and I in turn encouraged the club to observe.

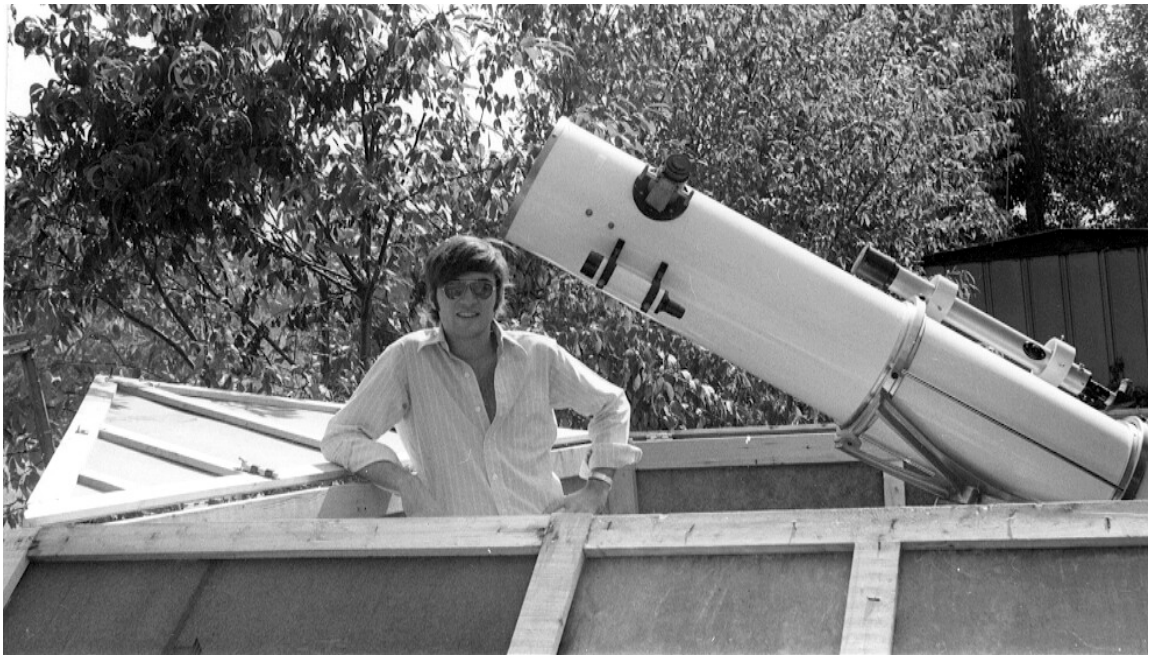
George Gliba using his Celestron 8

As Director, I made charts of the path of Comet Kohoutek, which included stars with known magnitudes plotted alongside. The variable star observers were thus able to find the comet in their telescopes, throw it out of focus and compare it to the stars in order to make brightness estimates. Many other detailed observations of the comet, such as tail length and orientation, size of coma, brightness of nucleus, and description of the overall appearance were recorded and submitted to the Association of Lunar and Planetary Observers (ALPO).

Observation of the planets was nothing new to club observers. Jupiter had been the favorite over the years, because it is so large, and its features change so markedly. Likewise, meteor observing went back to the club's beginning. The new emphasis on variable stars focused attention on the sky and swept along planetary, meteor, and even solar observers, in a coattail effect. These observations were eagerly collected at the meetings and sent into the appropriate organizations.

More Power

Bigger telescopes were also a factor at this time. We were no longer little boys who were impressed by 6-inch 'scopes. I rebuilt Don Henning's original 10-inch in 1971 making it the biggest telescope in the club. George Gliba came home from the Air Force in 1973 with a brand new Celestron 8, our most sophisticated instrument.



In 1976, Chris Stephan helped Bruce Krobusek construct a fold-down roof observatory for Bruce’s 10” Cave Astrola Deluxe reflector and photoelectric photometry equipment.

Soon afterward, Denny Jefferson built the club's largest instrument, for the second time. This time it was a 12 1/2-inch. Shortly thereafter, Chris Stephan built a 14-inch RFT. We

were deeply impressed by the Pioneer-10 and 11 flybys of Jupiter; however, we knew we had a very fine view ourselves from Earth.

Observer's Round-Up and Calendar

Another factor that aided in club observing was the regular reporting of results in the *Valley Skywatcher*, which was published religiously every second month in those days. There was a friendly rivalry among observers, and you could follow the races between Krobusek, Stephan, Gliba, Mallama, Rehner, Jefferson, Szeczak, Yanulaitus, Quesinberry, Mallion and others to see who could report the most variable estimates or planetary drawings. The Observer's Round-Up and Calendar gave the observer's totals every issue and a special summary at the end of each year. In 1975, when I stepped down as Director because of my move to Maryland, Bruce stepped in for the next three years. Tom and George followed Bruce, and Dan served in the post for 1979 and 1980. Each of these Directors continued to publish the Round-Up and Calendar. These articles provide documentation of our activities at that time. The club totals are still interesting too, and should serve as an example of what can be done:

Year	AAVSO Estimates	Binary Minima	Meteor Hours	Planetary Drawings
1973	601	81	14:30	25
1974	776	59	32:29	30
1975	223	58	28:48	19
1976	239	85	2:19	35
1977	58	8	15:00	71
1979	134	0	11:14	13

More Spectaculars

Club members were primed for observing by the mid-1970's, and were treated to three of the finest sights of the past several decades. The first appeared on a warm summer evening in 1975. I found out about it through an urgent phone call from a local AAVSO amateur in Maryland. It was a new second magnitude star in Cygnus, Nova Cygni 1975. When it peaked at magnitude 1.9, it became the brightest nova in 33 years. Nova Cygni faded quickly, but will be long remembered.

Comet West burst into the morning sky during March 1976. With a first magnitude head and a pair of 25-30 degree tails waving toward zenith, Comet West looked bigger than life for the first few days of the month. The intensely bright coma bore magnification well, and revealed prominent concentric bow-shock-like features. The nucleus was even brighter, and telescopic followers were startled to see it fragment into 3 large pieces and 1 small one during the second week of March.

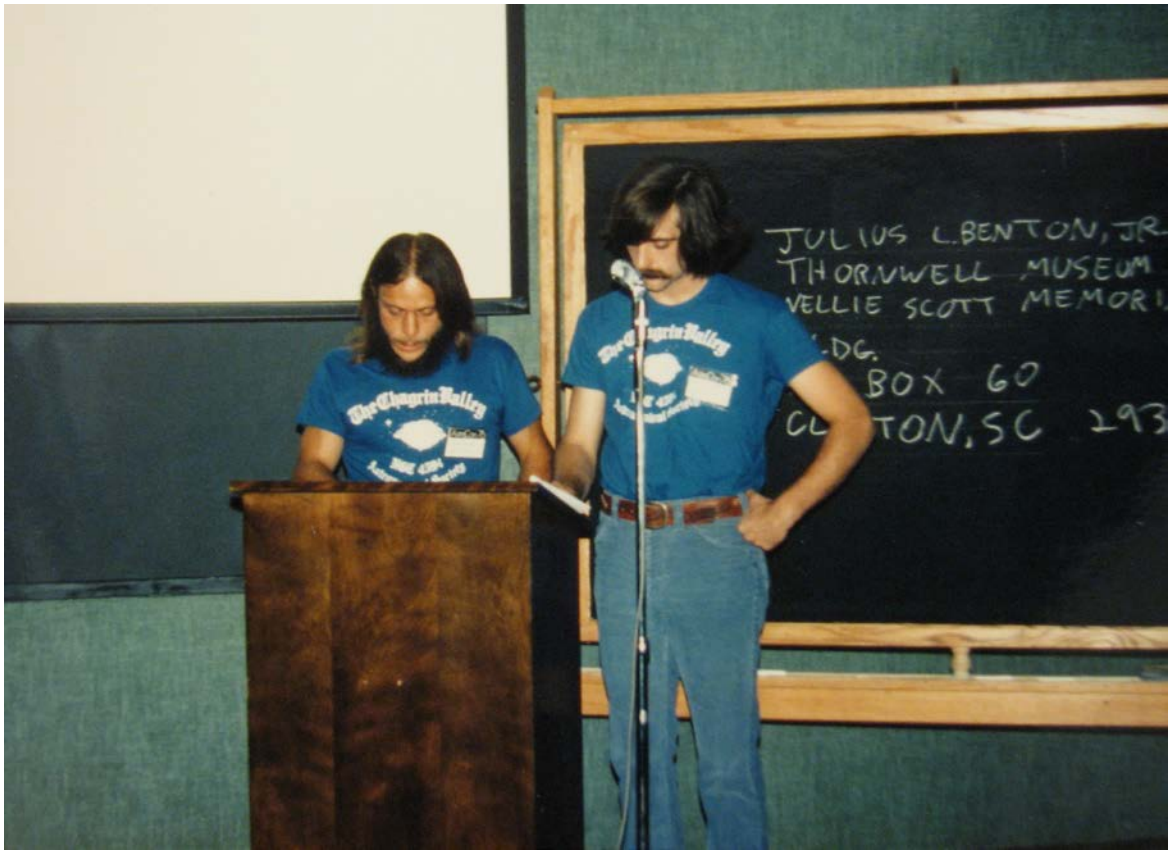
The third spectacular was discovered by an amateur viewing M-100 on the night of April 18, 1979. It was one of the brightest supernovae in recent years, and was widely observed by club members including Director Dan Rehner who saw it in his 6-inch.

Chartmaker

As the main observers of the 1970's moved on to other locales and other interests, the observing dynasty waned. A leader emerged briefly in 1982 when Randy Phelps became Director of Observations. Randy made some excellent star charts for observing variables. However the momentum had already been lost and no one took up his call to observe. A great era in the club history had ended.

PUBLIC AWARENESS

During the mid 1970's, the explosive growth in observing was paralleled by extraordinary civic involvement. A large number of members participated in these activities, which included public star parties, slide shows, public awareness campaigns, television and radio appearances, and formal classroom instruction. Most of this outpouring of public interest occurred from 1974 through 1978 during the presidencies of George Gliba, Chris Stephan, Tom Quesinberry and Dan Rothstein. In no small measure those same members led the campaign, since the club has never had a separate public relations officer.



George Gliba and Tom Quesinberry read from their speech at the Astronomical League convention at Kutztown, PA in 1976.

The best historical document concerning this period was written by Tom and George for a talk at the national Astronomical League convention in 1976. It was reprinted in the *Valley Skywatcher* in 1976, and it is reproduced below in its entirety.

A Civic Involvement

"Shortly after the election of 1975, Tom Muggleton, George, and myself began to review our club's role in civic activities.

“Our club was growing larger each month, and we felt the CVAS should expand itself to better serve our membership and contribute more to the cultural development of our community.

"With NASA and America's space program generating large amounts of interest in space, we realized that many others wanted to know more about amateur astronomy. We felt we should offer to share our knowledge and club activities with the public.

"This effort, at first, was tagged the CVAS Public Education Project, but that was short-lived.

The Bumper Stickers

"Our dark pollution awareness campaign had started during the spring of 1974, when we decided to do something to combat dark pollution. After much discussion, we decided to have anti-dark pollution bumper stickers printed. After considering various slogans from members during our regular monthly meetings, the slogan 'Would you rather see streetlights or starlight' was adopted. Our first initial 1,000 bumper stickers were ordered from Mars Printing Company during early summer of that year, and were ready by August.

"Pledges and donations paid for the first batch, which cost about a hundred dollars. They were given out free first, to CVAS members; then at the annual Ohio Turnpike Astronomers Association meeting at Mahoning Valley Observatory, at Warner and Swasey Observatory lectures, to the 9th grade earth science class at Kenston High School, at CVAS Public Star Parties, and to friends and associates. The first supply of bumper stickers was exhausted in a mere three months.

“Before we ordered the second printing from the Mars Printing Company, we decided to make two design changes. First, to change the slogan to 'I would rather see starlight than streetlights'; second, to have the next batch of 1,000 printed on sturdier weather resistant paper.

"In late 1975 we decided to accelerate our bumper sticker campaign against dark pollution. We gave numerous public lectures on amateur astronomy and sold our bumper stickers afterwards. We decided that the modest profits would all go towards printing up more stickers. Then we sent letters to Popular Astronomy and Sky & Telescope magazines and hoped for some results.

"To our astonishment, our dark pollution bumper sticker was published on 1/4 page in the Club News section, in the fifth issue of Popular Astronomy. This assured us that several tens of thousands would see our bumper sticker; if they ever received the fifth issue. At about the same time, we advertised our 'anti-light pollution' bumper sticker in the STAR GAZERS Exchange of Sky & Telescope magazine.

"Besides being sold at our Public Awareness lectures and through STAR GAZERS Exchange, they were sold locally at star parties, astronomical conventions, and to numerous friends and associates.

"The response is being felt more each week as more people learn about our campaign and bumper stickers. Several professional astronomers have them on their cars. Perhaps our greatest thrill came when Mt. Wilson of Hale Observatories ordered twenty stickers.

"We're now at the end of our third batch of a thousand and ready to order our 4,000th dark pollution sticker printed up. We see no time in the future we'll stop our campaign unless the majority of society realizes the value of the natural nighttime environment.

A Star Party

"Our first public awareness event was on the night of the November Total Lunar Eclipse. We had a Star Party at the Woodside Farm, a 100 acre farm with a good observing environment located only 2 miles from Chagrin Falls. Several friends and associates were invited to attend. About two dozen persons showed up. Five telescopes were set up in a pasture behind the barn.

"That night was super clear and we all agreed the weather couldn't have been better. The rising totally eclipsed moon was spotted during dusk with a Celestron 8-inch. It was soon after found by other telescopes. We all watched the moon's exit from the earth's shadow as it rose high with great delight. Several bumper stickers were given to everyone before they left.

"The second event of our Public Awareness Project is one most people will find of interest. Dr. Burger, a Physical Science professor at Cuyahoga Community College, asked us if several members of our club would be interested in coming to his class and talk about our science. During the same class, one of Cleveland's most famous astrologers also spoke.

"The class was two hours long, with the astrologer having the first sixty minutes. Our sixty minutes was spent talking about comets, telescopes, Viking to Mars, and answering many questions concerning astronomy.

"It was our suggestion that we debate the merits of astronomy vs. astrology, but noting that we had only two hours, Dr. Burger felt that such an encounter should be left for a future date, which we are looking forward to.

Elementary Schools

"Our first Public Awareness lecture and second Star Party was at Mrs. Lois Place's fifth grade class at Lewis Sands School in December 1975. About 50 students and parents attended. Seven CVAS members brought six telescopes, including an 8-inch Celestron, 8-inch Newtonian, 6-inch RFT reflector, 5-inch RFT refractor, 4-inch Unitron, and a 3-inch RFT refractor. The telescopes were used to show the moon, Jupiter, double stars, and various deep sky objects. This was followed by a short lecture and astronomical slide narration. The dark pollution stickers were given to everyone present. We've been asked by the school board to do this again next year.

"Shortly after our star-party for the 5th graders at Lewis Sands school, Mrs. Jane Harder, a third grade teacher asked if one of our members would be willing to come talk to her class. I gave an hour slide narration for forty students, followed by a half hour question and answer period on the relevance of astronomy, which would have gone longer had time allowed.

“This also has become a yearly club activity.

A Window Display

"In January 1978 one of our members suggested that we put together a window display, and show it wherever possible.

"In January, Tom contacted the Fireside Book Store in Chagrin Falls concerning us having a window display in their front window. The owner liked our idea, and encouraged us to have it ready for their next display. After some time, planning and running around for props, we assembled the display in plenty of time to be installed.

"The display, we felt, exhibited not only some of the efforts of our club, but dealt with amateur astronomy in general.

"We used two bulletin boards as the main backdrop. Posted on the boards were our CVAS membership cards, our AAVSO membership, and numerous charts, several planetary drawings by our more skilled members and pictures of various astronomical objects taken by our membership.

"The floor of the display was covered with our bound Skalnate-Pleso charts. Placed on the charts were other astronomical instruments including: a 3-inch refracting objective with cell, an antique 1-inch Mossburg spotting scope, a six and an eight-inch reflecting mirrors, a Norton's Star Atlas, three or four Patrick Moore books, AAVSO charts, eyepieces, a red flashlight, our bumper stickers, plus other things used by our membership.

"The display was for two weeks and seeing where it's pretty hard to walk through Chagrin Falls without passing the Fireside, we felt the maximum number of people viewed our display.

"We received many compliments on this display, and seeing where we felt it was an excellent effort at public education, we arranged for the display to be moved from Fireside to the Student Union at Kent State University.

"Being a Kent State student I allowed a little time to observe our display twice, and both times I noticed it attracted a lot of attention.

"After a week at Kent State University, the display was disassembled, then reassembled shortly thereafter to be exhibited at Lakeland Community College for a week. We have brought the display with us, and it can be seen at our exhibit here.

"On January 31st the Chagrin Valley Astronomical Society attended the Parmatown Telescope Fair, held in the main entrance to the Parmatown Shopping Center. This event was sponsored by the Ohio Turnpike Astronomers Association, of which we are members. Four of us were there for about eight hours. We had several exhibits on display, including amateur-made telescopes, and two bulletin boards about our organization and amateur astronomy in general. We also gave 2 lengthy slide show talks to many hundreds of people waiting in line to see a movie, or strolling by the telescope exhibits. We sold several dark pollution bumper stickers, and most importantly, talked to folks about the beauty of the natural nighttime environment.

Paul Cochran, Denny Jefferson, Dan Rothstein, George Gliba, Tom Quesinberry and Ian Cooper at Randall Park Mall.

Teaching College

"In November of 1975, the public relations committee contacted the Eastern Campus of Cuyahoga Community College about our club teaching a non-credit class on astronomy.

"At our December meeting it was announced that our application had been accepted and we were to start on January 7, 1976.

"The first session of the classes were designed by George and myself. It consisted of six classroom meetings and a star party. Each class was taught by a different club member, and the weekly topics were: the history of astronomy, the planets and our solar system, galaxies (ours and others), telescopes, optics, observatories, variable stars and constellations. The first session had ten students enrolled in it, and was attended by our membership as well as our students.

"The club was paid fifteen dollars an hour for our efforts. The class met once a week, on Tuesday nights from 8:00 to 10:00. Two weeks after winter's session, the club received a check for $209.76 in the mail, with an invitation to teach the next quarter.

"After the first session ended, and we'd received the check, two questions arose within the club. First, what do we do with the money, and second, how can we improve our class for the spring quarter?

"Our membership concluded it would be fair to allow each teacher $10.00 credit in the CVAS treasury. The speakers donated the money to the club, or used it to pay dues, buy bumper stickers or T-shirts. The first check nearly doubled our treasury.

A Teaching Committee

"The first session had been headed by myself, but halfway through the class I found myself moved to 3:00 to 11:00 shift, and always on Tuesday night. I felt that a committee should control the class, and our most capable teacher should chair the committee. At our March meeting I proposed this committee and suggested Dan Rothstein, our treasurer, be chairman. I felt that Dan was an excellent choice not only because he was an outstanding member, but he has a masters degree in astrophysics and had taught two classes in astronomy at Kent State University.

"Dan did not change the format much, but began having several members teach certain classes in order to make things run more smoothly. This approach worked very well, and classroom work became informative and less a burden on an individual speaker.

"We feel our Tri-C classes were a complete success. We offered our students and members useful information sources on practical amateur astronomy. We offered our members a chance to become active in teaching astronomy to those who wanted to learn, thus becoming more involved in our hobby.

"August 5th, I was again contacted by Tri-C concerning teaching our class for the third time. It would seem we've become part of their staff!

More Lectures

"In March the CVAS gave a talk on amateur astronomy and dark pollution to about 30 girls in the Earth Science Class at Beaumont High School. The use of an equatorial telescope was demonstrated with a Celestron 8. Amateur telescope making was demonstrated to the students. The amateur astronomer's contribution in variable star, cometary, and meteoritic astronomy was discussed. An astronomical slide show was narrated; followed by a question and answer period. The students were given dark pollution stickers, planispheres, and an ephemeris for Comet West. The faculty has asked us to give the program again sometime.

"Our third public awareness lecture and Star Party was given in February 1975 to the Metropark naturalist group at the North Chagrin Reservation Trailside Interpretive Center. An astronomical slide show talk was given to 35 naturalists that were present. This was followed by a demonstration on observing with an equatorially mounted telescope, and a discussion about the growing deterioration of the natural nighttime environment. Bumper stickers were sold to most participants. The Star Party was not held because the northeastern Ohio weather did not cooperate.

Kent State

"On the night of May 10th the CVAS held its 2nd annual Kent State University Public Star Party, sponsored by the Physics department. It was held at Smythe Hall on the main campus. Six telescopes were on the scene. Two 10-inch Newtonians, one 8-inch Celestron, a 6-inch RFT, and a 2.4-inch Unitron. A talk on occultations was given by Gary Ringler of the International Occultation Timing Association. The excellent film 'Stars, Galaxies, and Southern Skies' from AURA was shown to those present. Displays on basic telescope optics were set up in the main hallway entrance. Coffee and bakery was sold.

"About 40 people attended the program. Several dark pollution bumper stickers were sold to activists. One to a news reporter for the Geauga Times Leader who subsequently wrote an article about the KSU star party and our dark pollution campaign.

"The final event in our public awareness project was the eleventh annual Public Star Party at Riverside Park in Chagrin Falls. It was a great success. The skies were super clear and an estimated 150-200 people came and went during the course of this event. An astronomical slide show was given. Refreshments were sold as were several of our dark pollution bumper stickers. A dozen telescopes ranging in size from a 2-inch refractor to a 12 1/2-inch Newtonian reflector were set up for viewing the starry domain. The crowd was shown the Moon, nebulae, double stars, star clusters, and Comet d' Arrest. The Public Star Party broke up at 11:00 PM. The remaining CVAS members retreated with their 'scopes to the country's unspoiled dark environment.

In Summary

"Now in August of 1976 the Chagrin Valley Astronomical Society's public awareness project is far from over. As a matter of fact, we feel it should be expanded far beyond

what it has been. By giving this paper here today, we hope other members of the Astronomical League will become interested in starting a similar project.

"Our club, by making speakers available to the public, and by sponsoring our own events, has reached thousands of people in our area in only seven months.

"We feel that our club has made steps forward in public education. We feel that a good way to become involved is to contact the educational institutions in our area. Naturally, we are limited in how many of these institutions we can talk to. Therefore, we feel it important that other astronomy clubs realize their opportunity to become active in public education.

"From our own personal experience with the growing deterioration of the night skies, we've lost a full magnitude in a decade. We're sure other astronomers share our problem.

"Won't you join us in our fight to help save the night? We are giving this paper today because we knew we'd be reaching other astronomers throughout the country.

"We feel that the Astronomical League could help to coordinate a national awareness program. We've proven that an average amateur club can reach many people in its area and have a good time being activists.

"We are sure that folks would rather see starlight than streetlights!"

Additional notes

Similar public activities were sponsored by the club before and after the Public Awareness Campaign. However, the campaign seems to represent a high water mark brought about largely through the efforts of Tom Quesinberry, George Gliba, and the support of Dan Rothstein and other members. The club is indebted to them for their efforts and fortunate that these efforts were so clearly documented.

INDIAN HILL

The public awareness efforts of the mid 1970's led to the project to build Indian Hill Observatory as discussed below. The observatory project is described in a *Valley Skywatcher* article by Bob Petti. As secretary during those years, Bob did an excellent job of recording progress on the Hill. His article is reproduced below up to the point where actual construction of the building began.

Secretary's Notebook

"Looking back over the past year of activity in C.V.A.S., it's easy to note that the most significant event of 1983 was the official opening of the observatory at Indian Hill, home of the club's gargantuan 16-inch F7 Newtonian reflector...

"The dedication of Indian Hill Observatory on September 10, 1983 at the Ohio Turnpike Astronomers Association (O.T.A.A.) convention hosted by C.V.A.S., showed all interested that years of promises, planning and effort paid off in the long run.

1978

"It all began in May 1978 at a local Camp Burton star party where dreams were discussed and a surprise offer of acreage for lease was proposed by Mr. Keith Richards, an acquaintance. In August and September 1978, an amendment to the club constitution was

Stokes Observatory before the telescope was moved to Indian Hill. Standing left to right are George Gliba, Tony Mallama, Dan Rothstein, and Art Stokes. In the foreground are Ian Cooper (left) and Dan Rehner.

passed creating the office of Observatory Director, to which Tony Mallama was elected, with Ian Cooper assisting. Previously in August at the Mahoning Valley O.T.A.A. convention, C.V.A.S. failed in its final bidding on a Draper 6 inch F15 retractor planned for the first observatory instrument. This led to the purchase of Mr. Stokes' homemade 16-inch Newtonian previously used in photometric applications, another rare opportunity. In October, a volunteer Observatory Committee was formed to assist the Director.

"By year's end, clearing the woods for a driveway and parking lot was the first order of business. The driveway, once part of a cliff, was then formed with earthmoving equipment, the first large expense paid for by generous donations by the serious membership. A tree cutting and brush clearing project was initiated at the hilltop of what came to be known as Indian Hill, named after the suspected Indian fire pits found around the site. Cut and split wood was sold as firewood logs for fund raising in support of the project. Designs were considered for the observatory building, roll-off roof design being the preferred type.

1979

"The 16-inch mounting and mirror cell underwent repair, cleaning and sandblasting. The mirror was sent to Tony Mallama in Maryland for inspection and re-aluminizing.

The 16-inch mirror before aluminizing by NASA.

Monthly work sessions at the site were now commonplace. First observations with portable telescopes were made. Angle-iron roof rails for the sliding roof were acquired and an additional building was proposed for the natural sciences center by Keith Richards... The Committee hired Mr. Adams to bulldoze the hilltop level, and remove stumps and debris. Log cutting and sales continued successfully. Gravel was delivered and laid along the driveway and parking lot. Drainage trenches were dug preserving the road. The first C.V.A.S. picnic was held at the site June 23-24, 1979. Geauga County approved the ecosystem for building. Optical components (the main nearly finished mirror) for a second club observatory Cassegrain type telescope of 12 1/2-inch aperture

were donated by members. During autumn and winter, a survey of the area was completed and title transfer was discussed. Roll-off shed designs were still in vogue, a north-south building orientation preferred. Steel shafts and bearings were donated for the 12 1/2-inch companion Cassegrain and a retaining wall consisting of discarded rock debris was built surrounding the hilltop to prevent soil runoff. A building permit was acquired from the county.

1980

"Under the direction of Director Doug Caprette, logs were now obtained from the backwoods area of the Richards property, which members were permitted to thin. Proceeds went to the club. Building dimensions were decided, and the cement pier was planned (designed after Stokes' original) and laid in August. Norm Oberle, well-known area optical designer and A.T.M. visited, suggesting his 31-inch Newtonian reflector could be installed at the observatory site as the primary instrument, yielding many times the light gathering efficiency of the 16-inch. His proposal failed, due to perceived space limitations... Autumn and winter marked the first fund raising raffle, and provisions were made preparing the motor clockdrive, which turned into a bigger project than originally thought."

Addenda to Bob's Notes

I would only add the following to the secretary's notes. Dan Rothstein did a tremendous amount of work from the beginning until the end of the project. Indeed Dan also served as self-described "slave driver" threatening, coercing, and shaming other members into doing their share of work. Secondly, Ian Cooper was more than just an assistant director, and went on to be Director himself. Lastly, the choice of the Stokes telescope seems correct in hindsight. A 6-inch F15 refractor would have been too small since almost everyone in the club had a 6-inch or larger telescope by this time. A 31-inch probably would have stretched the resources of the club beyond the breaking point.

A New Member Steps Forward

In 1974, the annual Riverside Star party attracted Doug Caprette. He was deeply impressed with the view of M13 through Denny Jefferson's 12 1/2 inch as well as other sights, and soon joined the club. For the first few years, his participation was limited because he was a student at Bowling Green University; however, in 1980 he became a leader in the Indian Hill project. The following information is from the interview tape I made with Doug, and has been paraphrased slightly to convert from conversation style to written style. We pick up the narrative with Doug, starting with the construction of the pier.

"We wanted to finish the pier as a landmark accomplishment for the OTAA meeting. There was a disagreement between me and Dan Rothstein over where exactly to locate the pier and building. I wanted it about ten feet further south, but Dan was concerned that the dirt there had been disturbed by the bulldozer. I knew about the dirt but I also knew that it was only two feet deep whereas we were going nearly four feet deep for the foundation. Dan and others had already begun digging the previous week. I spent about

45 minutes preparing myself to argue with Dan about moving the building. I won the fight, and as a result we now have a better view to the north.

"We started the hole for the pier the week-end before the meeting. We dug it by hand and carried up sand, gravel and water from below by hand. Keith had found someone who donated the sand and gravel. Dan and I had made the forms for the pier at my house, based on the dimensions of the pier at Stokes' observatory, and scaled down slightly. We built the pier in two stages. We put a 3 x 3 x 3 foot block totally underground, and left the reinforcement bar sticking up from that. We finished up the next Tuesday night. Earl Paulin was up there; he was more active in the early stages. Earl figured out how to hold the forms together, and nailed them. We got up near the top of the forms and ran out of cement. I reached in and removed a bucket of cement. We stuck in a big rock, then replaced the cement up to the top. I estimate that the pier weighs about 6000 pounds, and it was all carried up the Hill by hand.

George Gliba, Doug Caprette and Denny Jefferson with the pier for the Stokes telescope.

1981

"We had a trench dug for the foundation by Harold Adams, who has done all the bulldozer and heavy work like that. Then we had cement delivered for the footer. It was a

hot day, over 90 degrees, and humid. The cement truck driver suggested mixing extra water with the cement so that it would flow better. This would help because he was not able to reach all parts of the trench with his truck. The problem, which we didn't realize at that time, was that it also caused the cement to harden faster. Dan, Bob Petti and I tried to level it by pushing it along with our shovels. We were working like crazy trying to get the cement leveled before it set. It was starting to set up on us, and I remember looking up from where I was working.

“Dan was losing his senses from the heat. I asked him where Bob was. Dan replied that Bob was leaned up against a tree recovering from heat exhaustion. Bob is someone who will work himself to death, putting so much effort into it.

"We got the cement pretty level before it set up on us. It was kind of disappointing though. You could tell there were obvious low spots. Later we bought some cement block shards to level it. Steve Fishman arranged for some masons to come out to install the cement blocks, which we had delivered to the Hill in station wagons and a pickup truck. The mason put in three tiers of blocks, and we finished by putting on the fourth tier.

1982

"At this point, we were ready to carry out construction of the building from designs we had prepared. My grandfather's business associate, George Englehart, helped with the plans. The club had decided from the start to make a roll-off roof observatory, and I spent two evenings working with George Englehart on the details. I drew up the actual plans from sketches we did together. I stayed up all night for two nights drawing the detailed plans. Around this time, I visited Norm Oberle's observatory, which was of a similar construction, having the roll-off roof sliding over another room. It helped to see an actual finished building of this design that had worked out successfully.

"Ian's carpenter friend, Bernie, came out the day we put up the frame walls. He showed us how to put the stud walls together on the ground. We finished them and lifted them into place. The long wall with no doorways was so heavy that it took all 12 of the people working on the Hill that day to lift it into place, and we just barely got it up. That first day, we had all the walls up, and it gave us a great sense of accomplishment. That was a Saturday, on the next day we built the roof of the warm-up room, and then we all got up on the roof to have our meeting.

"The next week-end, we put up the rails which were angle-iron welded to steel plates. We left the lag bolts for the rails loose until we had a chassis built for the roll-off roof. Then we rolled the chassis on and off once to align the rails and then tightened the lag bolts.

"Building the roll-off roof took a couple of weekends because the hips were complicated by lots of odd angles. My sketches of that part were crude, and in fact what we built was not exactly what our plans showed. The second hip was different than the first because we learned from building the first.

"Ed Winslow had been working with us throughout all the carpentry. He had carpentry experience. (Bernie was only with us the first day because he had other paying jobs, and I can't fault him for that.) Without Ed we would have probably never have gotten the rest of the building finished. He knew the right way to do everything, including roofing and flashing. We owe a lot to Ed. The building is a lot sounder than it would have been without him.

"We finished the floors during the winter.

Indian Hill showing the observatory for the 16-inch just after it was completed.

1983

"Not long before the dedication, we were ready to mount the equatorial head on the pier. We put a block and tackle on the roll-off roof and used it as a crane. The telescope tube was painted by Earl, and then it was bolted to its saddle on the ground. Several people picked it up and put it on the equatorial head. We finished the telescope, except putting in the mirror, the week before the dedication.

"During that week, Bob Petti, Denny Jefferson, Dave Radcliff, and I put the mirror in its cell, and put the cell in the tube. That night was clear and Bob, Dave and I decided to get 'first light'. It took all three of us because the telescope was not well balanced. One person had to hold the counterweight, the second had to hold the mirror end of the tube, and the third had to stack up cement blocks to get to the eyepiece. In order to take turns looking through the eyepiece, we had to plan ahead and walk our way around the telescope, so that it would not get away from us.

"We looked at Jupiter first, and it was disappointing because the night was a little turbulent. Next we looked at M-11. We had to observe objects that were not too high because we didn't want to pile the cement blocks up too high. M-11 convinced us that it was worth all the effort. There was no doubt after that. M-22 was also most impressive. Keith and his daughter, Kim, joined us later that night.

"The morning of the dedication Ed was out there and he fixed the clutches on the right ascension and declination axes. We adjusted the weighting so that it was possible to observe using the clutches. I brought my father's aluminum step-ladder.

“We used my Sky Micro Regular focuser on the side of the tube, since we did not have the 2-inch focuser yet. It made access to some positions of the sky easier. For example, zenith was easier then, but it was more difficult in other parts.

"That night was incredible. It was late in the year (September). We had a warm, steady breeze blowing all night, so it was T-shirt weather. The air was very steady. We had some very, very good views. We had a case of champagne. Just about everybody in the club was there. We had a whole assembly of people out on the lawn for the dedication speeches. Of course, Art Stokes was there, and we had a wonderful star party that night."

NASA/Goddard Space Flight Center

The club has been a major influence in the lives of many of us. An important change in my life happened when Larry Lovell encouraged me to study astronomy in college. I did so and later went on to obtain a Master's degree. My degrees enabled me to get my foot in the door with a NASA contractor in 1975. Since that time, I have been at NASA's Goddard Space Flight Center (GSFC) in Greenbelt, Maryland. This in turn affected the lives of many other members who have also chosen to come here. Now 6 of us have put in a total of 32 man-years of work supporting NASA. The story of our lives in Maryland and our work at NASA is told in this chapter.

I arrived at GSFC during the final days of Apollo. In fact, the last Saturn rocket put the last Apollo command module into earth orbit for a rendezvous with a Russian Soyuz crew just one week after I started work. My first assignment was to write a data processing program for a scientific instrument on the Atmosphere Explorer-C satellite. I started work in July and the Explorer was to be launched in October, so I had to work long and hard to finish in time. When the launch date arrived, my program was ready. I produced plots of upper atmospheric densities, fully calibrated for instrumental effects. About this time, I learned that the instrument on the Explorer was a prototype for one being developed for Pioneer Venus. My next assignment was to develop a program to simulate the impact of the Venusian atmosphere on the instrument to aid engineers in their design.

Tony Mallama at the controls of the 36-inch telescope at Goddard Spaceflight Center. The photoelectric photometer at the Coudè focus was used to record light curves of eclipsing binary light stars.

Early in 1976, I transferred to the astronomy section, which was preparing for two orbiting telescope missions. The first one, the International Ultraviolet Explorer (IUE), was only two years away from launch. Among other things NASA needed was a model of ultraviolet stellar flux for selecting exposure times. I was one of the astronomers who created the model. The second mission was still in its infancy, but I knew that it would one day far overshadow IUE. This project was the Space Telescope (ST, later renamed the Hubble Space Telescope). At that time, it was still just an idea with no hardware and practically no money. ST is now a 2.4 meter instrument of incredible potential. It should routinely resolve one-tenth of a second of arc and reach 30th magnitude stars when it is launched.

Along Comes Tom

In 1978, I was visited by Tom Quesinberry. He was impressed by NASA and inquired about the possibility of working there. IUE had just been launched earlier that year, and there was an opening for a new person in the photographic darkroom. Tom had some experience so I was able to have him hired. It was a great feeling to have another club member working with me at NASA's space observatory ground station. After work, Tom and I frequently used the 12-inch amateur telescopes and refined our astrophotography skills. Tom proved to be a fast learner and had an aptitude for computer operations so promotions came fast for him.

In 1980 Tom returned to Cleveland to finish his Associate's degree and then returned to GSFC in 1981. This time he took a position on the Landsat project, operating their VAX computers. Next he transferred to the ST project. He remained in that position until 1986, when he returned to Chagrin Falls, the place where it had all started.

About Six Months

George Gliba was recruited by Tom in the autumn of 1979. Tom had heard about a job making computerized finder charts for IUE. He felt George would enjoy the work and he could apply his astronomy background. George got a haircut, came down for the interview, and was hired. We had a good time working together. In fact, Tom had entered a softball team in the Goddard Softball Association in 1979, so we played together in addition to working together. It was reminiscent of the old days when the club had put together a softball team to play on the Portage Street fields in Solon.

George became active in the Goddard astronomy club where he has been an officer and a leader. He has participated in many observing trips and other activities. One of his most treasured memories must be the time he joined a group of space activists from the University of Maryland on a trip to Kennedy Space Center. They saw the first launch of the Space Shuttle. George, Tom and a Maryland amateur they met combined to build a 12 1/2-inch telescope some years ago. This 'scope is F8 and, under the right conditions, gave dramatic views of the planets.

George followed Tom to the Landsat project, where he gained valuable VAX experience. This experience would come in handy a few years later when George also joined the ST

project. George has been at GSFC for over 8 years now, though when he arrived, he said he thought he'd stay about six months.

Family Man

The club's membership at Goddard stabilized at 3 for the next 5 years. Then Ian Cooper joined Tom and George at Landsat in 1984. Like George, Ian benefited from his association with the VAX computer and, like George, he transferred to ST. Ian and George are patiently waiting for the ST launch. Originally scheduled for 1983, the launch had to be delayed due to slippage in the telescope construction, then the Shuttle Challenger accident of 1986 delayed it even further. The best bet is that ST will be launched in 1989 or 1990.

Ian moved to Maryland from Ohio with his family. Ian's children Ian Thomas and Jessica are older than my daughters Halley and Celeste, but they show an interest in one another. Ian's wife Sherri and my wife Jeanne have become friends.

The Captain

Dan Rehner visited us in 1985. He was in the middle of a backpacking adventure on the Appalachian Trail that had already taken him from Georgia to Virginia. Tom drove out to get him and showed Dan NASA and Washington. We had a star party for Dan at my house. The atmosphere was calm that night and we had a superb view of Saturn in my 6-inch F15 refractor. The following year, Tom, George and Ian identified another job opportunity and made it possible for Dan to join us.

There are few people I know who enjoy their job so much as Dan. His current assignment may be the most purely astronomical of all our jobs. Dan works at the ST Science Institute in Baltimore. He works on the Guide Star Catalog, which is by far the most ambitious star catalog ever created. Most catalogs have a few thousand stars. This one has to support ST, so it will have 20,000,000 stars! The monumental project is being accomplished by digitizing Schmidt survey plates that cover the entire sky. Among other things, Dan views the plates in detail while they are being scanned, and helps prepare the charts of photoelectrically observed stars from each plate. These stars are used to calibrate magnitudes. Dan and I always have something of interest to discuss, since I did a lot of the photoelectric photometry.

Very Long Baseline Interferometry

By 1983, I had been working on ST for 7 years. My last job was to plan and help execute the photometric calibration of the Guide Star Catalog. It took about 3 years and, during that time, I traveled to Cerro Tololo Observatory in Chile 7 times. On most nights, I carried out the photometry program. On nights that I was unable to do photometry for one reason or another, I was free to explore the southern sky for my own pleasure from the 7,000 foot mountaintop in the most arid desert in the world. Views of Omega Centauri, Eta Carina, and the Magellanic Clouds through 16, 24, and 36-inch telescopes doubled the pleasure of astronomy that I had known in the north.

In addition, these finely figured and collimated instruments gave spectacular views of Jupiter and Saturn. On several nights, I spotted Neptune's moon Triton and, one night, I observed all of the planets in the solar system.

I had finished my part in the photometry program and, with the launch of ST still years away, I decided to make a change. I switched to a radio astronomy technique known as Very Long Baseline Interferometry (VLBI). By correlating the signal from two or more telescopes thousands of miles apart, scientists have been able to achieve resolving power in the radio spectrum that is measured in units of 0.0001 arcsecond. NASA is applying this technique to studies in astrometry, nutation, plate tectonics (continental drift), and in the study of the Earth's core. Radio astronomy was new to me and I've been making my way up the learning curve since 1983. In the meantime, all the data is at my disposal and I've sure enjoyed playing with it.

Engineer

VLBI is one of the few NASA science projects that was not devastated by the Shuttle Challenger accident. In fact, we have grown slightly. In August 1987, we identified the need for a new person on the project, someone with computer ability as well as mechanical engineering experience. I recommended Doug Caprette for the job and he was hired in October.

Most of us came from Ohio to Maryland with very few belongings. I started out here with only a sleeping bag and a lamp. Doug, however, came with a fleet of telescopes including a 12 1/2-inch. Doug and I are both building 17-inch 'scopes now.
Doug has a high aptitude for technical work and his degree in Physics will be a benefit in his career at NASA. He is currently working on a report of VLBI observational results, and his next job will be to study the flexure of the giant radio antenna dishes due to gravitation and wind loading.

Space to Grow

Our experiences at GSFC have been good for most of us. We have been able to participate in the activities that we dreamed about when we were kids, and we are doing something that we believe in for a living. We are all looking forward to the time when NASA will have its full launch capability again. In the next decade, we expect to be a part of the team that launches Space Telescope, Ulysses, Galileo, Mars Observer, Cosmic Background Explorer, and other scientific missions. The more distant future will bring even more exciting science projects, as well as the possibility of a manned expedition to Mars and a permanent colony on the Moon.

EXPEDITIONS

If you learn nothing else from astronomy, you should learn that your hometown is not the center of the Universe. Meetings with other first rate amateur and professional astronomers seldom occur in your hometown, total solar eclipses seldom pass over your house, and, of course, Halley's Comet was best seen in the southern hemisphere.

Buffalo, 1967

Our first out of state trip was to an Astronomical League convention in Buffalo. We were so young we had to get a ride from Don Henning's older sister. We were invited by our former members Billy and Marty Edwards who had moved there with their parents. We attended a star party given by the host club, heard talks on meteor observing and variable star observing, and saw a demonstration of solar observations made with a spectrohelioscope. The most important result of this trip was that one of the League officers gave Tom Quesinberry a "model" constitution, which would serve as the basis for the club's constitution.

North Carolina, 1970

The club discussed plans to observe the total eclipse of the sun from the east coast in 1970. It was during the low period, of course, and as far as I can tell the trip never happened. I was attending Vanderbilt at the time, however, and a friend and I made an all-night drive from Nashville to La Grange, North Carolina to see it. I can tell you from experience that your first total solar eclipse is like your first love, you'll never forget it. As totality approached, wild birds disappeared from the sky, and chickens at a nearby farm roosted. When darkness fell, Mercury, Venus and the brighter stars of Orion appeared in the sky. The pearly-white solar corona dazzled our amazed eyes for a few precious, and awe-struck minutes. For a few tens of seconds after third contact, fleeting shadow bands raced by, then the birds re-awakened in a wild cacophony of avian confusion. Finally, it was over and our senses returned to normal.

Winnipeg, 1979

The first successful total solar eclipse expedition by a group from the club was in Winnipeg, Manitoba in the dead of winter. Most of the members, including Keith Richards, Dan Rothstein, Doug Caprette, and Steve Fishman drove up in a rented motor home. This intrepid group had to bear sub-freezing temperatures along the way because the propane heater in their mobile home froze.

On reaching Manitoba, they were treated to a spectacular auroral display on the night before the eclipse with streamers stretching from the north horizon all the way to the south. A friend of mine from graduate school and I met up with the group briefly in Winnipeg, but we traveled to different sites to view the eclipse. Both groups had good skies. Once again, the corona was dazzling and, this time, we were treated to a view of several large prominences. An enormous one on the southeast limb of the Sun was conspicuous to the naked eye. Minutes before and after totality, the sky turned a violet hue and shadows on the snow were razor sharp.


Left: Winnipeg motor home. Right: Doug's flat tire.

The Carolinas, 1984

Another east coast eclipse passed through the Carolinas in 1984. This one was so near the boundary between total and annular that authorities were debating exactly what solar phenomena observers would see.

Dan, Doug and Steve once again chased this eclipse, and were joined by Bob Modic, Bob Petti and Al Havrilla. Several of this group stayed with the NASA/GSFC group on the way south. At the last minute, I teamed up with a friend from Maryland and chased the eclipse too. The group from Ohio camped out the night before the eclipse on the Virginia-North Carolina border. They had problems with heavy rain, collapsing tents, etc., reminiscent of the freezing propane of 1979. Rain continued through the early morning before the clouds began to break. A missed left turn split their group into two, Steve and Doug going one direction, and the others going another way. Still on their way to the centerline at about 80 miles per hour and with time running out, Doug's car had a flat tire.

He and Steve dumped out all the equipment from the trunk, changed the tire, and loaded back up in record time. The eclipse started while they were still driving, but they managed to reach the centerline and set up in time to watch totality. They also had three shadow band detectors, two visible light detectors and one microwave. The two visible light detectors registered the bands but the microwave device did not. Doug proposes that this is evidence that the shadow bands are an atmospheric phenomenon.

The group that had turned left also made it to the centerline just in time. The place happened to be a rest stop on Interstate 77. Truck drivers and curious passers-by observed along with the group. Al took a photograph at mid-eclipse that was published in Astronomy magazine.

My friend and I made it all the way to Greenville, South Carolina in a single overnight push from Maryland. The weather was good, and we were treated to the shortest eclipse I'll probably ever see. I can attest to the fact that the predictions were generally too conservative. The chromosphere and inner corona were easily visible, and a little of the

outer corona could be glimpsed too. Of course, they were only seen for a matter of seconds. The category total-annular seemed to fit.

Stellafane

On Breezy Hill, in Vermont, there is a telescope convention every summer that is the Mecca for Amateur Telescope Makers (ATMs) all over the eastern United States and Canada. It is a lovely, dark-sky site, with perhaps the richest ATM history of anywhere in this country. This is Stellafane, the shrine to the stars. When you see the picturesque clubhouse on the summit with the inscription "The Heavens Declare the Glory of God" in bold letters across the eaves, you get religion. In addition to the clubhouse, there is the Turret Telescope, so named because it is in a revolving dome, which is sealed around the telescope in order to keep out bitter winter weather. There is also an underground ATM museum containing mementos of Russell Porter, one of the principals of Stellafane. Porter was the editor of the original Amateur Telescope Making volumes that have become legend over the years. He was an amateur, however, he was called on by the big boys more than once because of his intimate knowledge of telescopes and his expertise as a draftsman. His most famous work is the cut-away drawing of the 200-inch telescope.
I visited Stellafane about 1976 for the first time. In the years to follow, it has become a regular pilgrimage for many other groups from the club. My first visit was my best. I had just come off a long hike on the Appalachian Trail in Massachusetts and southern Vermont. I arrived late in the afternoon just in time for the cookout, heard some excellent evening-time talks, and observed through a huge array of large and small telescopes of unique designs. Since I was self-contained, with only my backpack, the organizers permitted me to stow my pack in the clubhouse and to sleep out under the stars on the Hill once the crowds had retreated late in the night.

It is not a short drive from Ohio, but it is worth every mile. One ATM who can attest to that is Denny Jefferson. While the club has had ATM's over the years, Denny was the first to perfect the fine art of parabolizing a mirror. In 1983, Denny made his first trip to Stellafane along with Doug Caprette. He brought along a 6-inch F8 mirror that he had figured and mounted in a Newtonian configuration. Denny was impressed with the quality of all the other 'scopes and figured that he had no real chance to win. He remembers hearing an announcement on the loud speaker saying that the judging was over and that the winners would be announced in ten minutes. He disassembled the 'scope and began walking back to his campsite with Doug; then, on the loud speaker, he heard that he was wanted at the clubhouse. Still not believing he had won, Denny returned to the clubhouse to find Walter Scott Houston and Dennis di Cicco waiting for him and two others. When all three had arrived, they were told that they were the three winners. First place had gone to a refractor, second to an 18-inch, and third to Denny's 6-inch F8.

Kutztown, l976

A large group led by Tom Quesinberry attended the national Astronomical League convention in Kutztown, Pennsylvania in August 1976. It was the largest League convention ever with 667 people in attendance. The meeting featured a national astrophotography contest and talks by many notable amateurs. Tom and George Gliba presented their public awareness talk, reproduced in chapter four of this volume. An

article about the convention appeared several months later in Sky & Telescope (November 1976 issue, page 339), and it included a paragraph and two pictures describing Tom and George's talk and the bumper stickers.

Halley's Comet

The 1985-86 apparition of Halley's Comet was the worst in 2000 years, yet we had all been waiting for it since the time we first saw its name in our grade school science books. The fame of it, and the flotilla of spacecraft that would meet it this time, thrust it into front-page news and made up for the poor apparition in the sky. Of course, to get the best view you had to go south as far as possible.

Dan Rothstein and Steve Fishman were the first voyagers. They traveled to Florida in December 1985 for a look. Battling mosquitoes all the way, they did find warm weather, had a good view and came away satisfied. George Gliba and Denny Jefferson traveled to the mountains of Georgia for a better look the following spring. They had good weather and dark skies, and were treated to an excellent view of Omega Centauri as well as the Comet.

My wife and I and our new daughter, Halley, flew to the Island of Bonaire, at five degrees north latitude in the Caribbean Sea for our view and for a vacation.

The big trip, though, was a three-week excursion at the end of March by Al Havrilla, Steve Fishman, Bob Modic, and Dan Rothstein. The first major stop was the Very Large Array in New Mexico, followed by Lowell Observatory in Flagstaff, Arizona. Then they went to the U.S. Naval Observatory where they saw photos of the Comet from the 60-inch telescope. After that they visited the Grand Canyon, followed by Kitt Peak Observatory in Tucson.

Hiking at the Grand Canyon

Proceeding into Texas, they visited McDonald Observatory and Big Bend National Park, where they stayed one week.

Steve Fishman and Al Havrilla on the big expedition out west

That was the main point for observing the Comet and Omega Centauri. It was so dark there that the Milky Way cast a shadow on the ground. To climax the great observing session, they witnessed a bolide of magnitude -9. At first it looked like a flare going up, it started out white, turned green, and exploded as it went down. It lit up the entire landscape. Al says he was unable to speak for five minutes. I can believe it.

WHAT NOW?

The club is in its twenty-fifth year. In September, we will hold our 300th consecutive monthly meeting. We have a fine observatory, we have provided education to the community, and we have contributed significantly to basic astronomical research. Now is an opportune time to observe the club as it is today, and to look toward the future.

The Hub of the Club

There is perhaps no one individual that has worked harder than Dan Rothstein to make the club what it is now. Astronomy is Dan's only hobby and he has spent innumerable hours at it, working on Indian Hill, helping people build telescopes, giving slide shows to the public, and serving in a wide variety of important club offices. Dan is a twenty-year member of the club, but now that he has his PhD in physics, he might leave the club to take a position out of town. If this happens, the club will have a big pair of shoes to fill.

Denny Jefferson has been with the club almost since the beginning. He is active in many club activities, is recognized as the club's leading mirror maker, and is an inspiration to younger members. I believe Denny will be active in the club for many years to come, partly because he loves the Chagrin area too much to ever be away for long. If I am right, the club will benefit from his long presence.

Steve Fishman is a long time member and has contributed extensively to Indian Hill and other club activities over the years. He was president for two years and served as the club treasurer eight out of the last nine years. He has won notoriety for the club with his astrophotography. Steve is a good, steady force in the club.

Al Havrilla is president during the twenty-fifth year. He is a good team player and has held a wide variety of offices over the last six years. Al has real enthusiasm that rubs off on people and, like Steve, has brought honor to the club lately with his excellent Schmidt camera astrophotography. We hope Steve and Al will continue to lead the club in astrophotography and in important offices.

Bob Modic has come to prominence as the club's Director of Observations. Bob is an avid comet observer and provides up to date information to the members on astronomical phenomena they can look for. Bob should continue to grow in this role and encourage more members to make useful observations.

A relatively new member, Kim Aebi was elected as the first woman president of the club last year. She has great enthusiasm, very good public relations ideas, and an interest in working with students. These qualities will be vital to the club if it is to continue to grow and prosper.

Bob Petti has returned to the club after a few years away. He is the Editor and has recently put out the best issue of the *Valley Skywatcher* that I have seen in years. Bob is a never-ending source of novel ideas and I believe he has found his niche as Editor.

Someone needs to nurture the club's communications vehicle, which has languished for so long and I can think of no one better than Bob.

Don Himes is a recent recruit to amateur astronomy, having been initially attracted by Halley's Comet. He has been secretary for the last two years and contributed some material to the writing of the club's history.

I have never met or spoken to Shirley Flugan, the club's librarian for the past two years. However, I am familiar with some of her work and I hear good things about her.

Likewise, I regret that I have yet to meet Rick Trembour, the current Observatory director. I understand that he has very relevant experience in construction and that should bode well for Indian Hill.

Observatory Maintenance

Part of the job of the Observatory Director is to keep Indian Hill in shape and to upgrade it. There is still more tree clearing to do, electric power has just reached the Observatory, and some of the floor is being replaced because of mildew and rot.

Observatory maintenance has become a continuing source of disagreement in the club, just as was the building of it. Some people say "I don't use it; therefore I shouldn't have to maintain it". Others with more club spirit look upon the observatory as a great club achievement and are happy to help out with whatever work is needed. The dissenters complain that it is too far away, and that they have their own telescopes at home, so it is useless to them. They are right that it is a long drive for most people. The argument about telescopes is wrong though, since the Stokes reflector makes any other telescope in the club puny by comparison.

The approach to observatory maintenance was recently changed so that Director Trembour has a committee composed of Steve Fishman, Dan Rothstein, and Brick Bates, plus a continuous cash fund to work with. This new approach may solve some of the old problems, and quiet some of the arguments.

The Big Eye on Indian Hill

Few club members are fully aware of the potential of our 16-inch F7, precision mounted reflector. Under dark skies on Indian Hill we have seen the central star in M-57, and traced out the individual spiral arms of M-51. The possibilities for observing with this telescope are unlimited and a person's life could be substantially enriched by exploring the night sky in more detail with it.

Backyard telescopes are nice, but the 16-inch has twice the light grasp of a 12-inch and three times that of a 10-inch. Furthermore the 122-inch focal length surpasses anyone's backyard telescope to date.

Astronomical Research

The 16-inch Stokes reflector naturally leads into the question of amateurs making valuable observations. Thousands of dollars have been spent sending astronomers to Cerro Tololo Observatory in Chile to observe with a 16-inch telescope there. There is no question about the usefulness of a precision 16-inch telescope to do research. Of course, a 16-inch is not required. Meteor observing for the American Meteor Society can be done with no more equipment than a lawn chair, a wristwatch, and a means of keeping count of the meteors seen. The dark skies at Indian Hill are an ideal place to do meteor observing either in groups or individually.

The AAVSO is always in need of data on their long list of program stars. This activity takes a little practice, but it is rewarding as you follow your favorite stars through their light curves. The AAVSO and the BBSAG in Switzerland have special sections for eclipsing binary observers.

Observations of the planets and comets should be sent to the ALPO. These observations are fun. You can study Jupiter as its cloud features change over the weeks and months, estimate the brightness of comets, and even chart the unstudied poles of the Moon, which were missed by all the spacecraft. They will send information to interested members.

If photoelectric equipment becomes available to Indian Hill, interested observers should contact International Amateur-Professional Photoelectric Photometry for information on how to get started. This would be a fitting project since the Stokes reflector was one of the first amateur telescopes in the world to be outfitted and used for photoelectric observing.

By-Laws

The observatory maintenance issue once caused Dan Rothstein to attempt to amend the Constitution to require participation in maintenance of Indian Hill in order to maintain active membership in the club. These attempts failed.

In fact, the attempted amendment has spotlighted the question of amendments in general. There is a feeling in the club that amendments are not the way to go. The Constitution is meant to be strong and hard to amend. The idea of using by-laws to govern the day-to-day activities of the club seems to be gaining support.

Something We Agree On

All the principal members of the club agree that we should be doing more in the community. We have a responsibility to educate and share the wonders of astronomy with the public. Whether this means teaching more classes, having more window displays, having public star parties at Riverside Park again, or running buses from the inner city out to Indian Hill, it has to be done.

In addition to fulfilling our civic duty, we will insure that the club continues to grow, especially from the influx of high school aged students. If you are not growing, you are dying. The club has to be careful not to lose touch with young potential members.

In addition to public relations, the club has to do more to let the young members develop once they find us. One idea is to start a junior section in the club. They could have a Chairman who interacts with the senior officers, but they should retain some autonomy and meet separately. Let them have fun as we did when we were young, but give them guidance so they can avoid some of the pitfalls.

A Ph.D. Astronomer

My own pet peeve is that the club has not produced a single member who has gone on to attain a doctoral degree in Astronomy. That is amazing to me considering all the members we've had. Perhaps it is because intelligence is not sufficiently valued and respected by the club. Perhaps brainy kids elect not to join the club. Perhaps they are not encouraged to pursue Astronomy as a profession. In any case, there is a lot of interest in recruiting younger members at this time. I hope that in addition to general recruiting, the bright kids will be looked after and encouraged to develop all their potential.

One of our neighboring clubs in Ohio has an emeritus member Ph.D. who will ride the Space Shuttle and operate an ultraviolet telescope from space next November. Our club needs people of that caliber. A sober-minded Ph.D. astronomer would bring us great honor. Striving for excellence and the attainment of starry goals is the mark of a first class organization.

Ninety-Nine Years

This is the end of the story of the Chagrin Valley Astronomical Society up to 1988. After twenty-five years, we are going stronger than ever. Some say that the upcoming silver anniversary celebration has sparked new enthusiasm. With this enthusiasm, with the Observatory, with the great members and with the dedication of your emeritus members, the future looks bright.

This story has been about men and the stars. It began with little boys and little telescopes, and developed into a beautiful extended family of men and women. This family has worked, played, laughed, and cried together. We have made horrible mistakes, and celebrated great achievements. We have cared for and helped one-another. Together, we have appreciated and loved the stars.

The club's co-founder, George Gliba, recently reminded me that we will still have the lease for Indian Hill when Halley's Comet returns again in 2061. We won't be there to see it, of course, but maybe some of our children and grandchildren will be. Indeed, our lease on Indian Hill lasts for ninety-nine years. Our principal members believe the Society will live for ages to come.

EPILOG - What Happened Next

'What Now?' was the final chapter in the first edition of *We Observe* and it summarized the key aspirations of the Chagrin Valley Astronomical Society as expressed by leading club members 25 years ago. Looking back on the period from 1988 until the present it is gratifying to see how many of these goals were actually achieved. This is a very brief update on the numerous successes.

The issue of observatory maintenance which was so divisive during the 25th anniversary year was successfully addressed and the facility has flourished. Indian Hill is not just one Observatory anymore but a complex of several domed and roll-off roof structures each hosting unique instrumentation. These telescopes facilitate the full spectrum of astronomical observation. The club is even now undertaking construction of a deck and shelter for an 18-inch reflector which was donated by Ian Cooper. The current Observatory Director, Ken Fisher, has done a very able job with help from Tom Puklavec, Mike Prochaska, Marty Mullet, Russ Swaney and others. The late Marty Niemi was an extremely skilled contributor to a host of IHO projects over many years and the club has established a memorial fund in his honor. To this Ian adds, "Indian Hill would not be the facility it is today without Marty. In addition, how many astronomy clubs OWN, free and clear, the land on which their observatory sits? It's CVAS and <expletive deleted> debris!"

The 16-inch Stokes telescope has been used to great advantage for astronomical research. In 2007 one of the first ever eclipses of a satellite of Uranus was recorded with a CCD camera and became the subject of an important research article in the professional journal *Icarus*. Additionally, the 12-inch telescope is now being used extensively to measure the positions and magnitudes of asteroids, and to time eclipses of the satellites of Jupiter. These data are used by NASA/JPL and the astronomical community at large. Bob Modic made the historic Uranus observation and Ron Baker is the observer of asteroids and Galilean satellites. Bruce Krobusek also contributes to the satellite eclipse program from his home in upstate New York.

In its 30th anniversary year the CVAS could finally boast a PhD astronomer. Randy Phelps, who was the club's Director of Observations and attended Case Western Reserve University in the 1980s, attained his doctoral degree in Astronomy and Physics from Boston University in 1993. His post-doctoral research involved using the Hubble Space Telescope in the Extragalactic Distance Scale Project. Dr. Phelps has served as a program director for the National Science Foundation and became a full professor of Physics and Astronomy at California State University.

No achievement looms larger during the club's second quarter century than its partnership with the Geauga Park District. The CVAS has played an important part in the development of Observatory Park in Montville Township which includes the 25-inch Oberle telescope. In addition to star gazing with the mammoth reflector, park naturalists offer weekly planetarium programs at the Robert McCullough Science Center. If there was a better way to address 'fulfilling our civic duty' as stated in *We Observe* it is

difficult to imagine. Besides the CVAS members as a group, Ian Cooper, Russ Swaney and Dan Rothstein were club leaders on this project and they are cited by the Park District for their special involvement. Tom Quesinberry played a major role in the Park District receiving its International Dark Sky Association Silver Tier status. George Gliba donated a museum quality meteorite collection to the CVAS and the club, in turn, donated it to the park. In a *Skywatcher* article Russ Swaney mentioned additional support by our talented CVAS members and friends Larry Boros, Ken Smith, Ken Zwolinski, John Augustine and Ron Pellettiere.

Those are just a few of the major accomplishments of the CVAS between 1988 and 2013. In addition, Ron Baker is editor of the *The Valley Skywatcher* and Russ Swaney is the club's webmaster. They are expertly handling the club's electronic communications media. Astrophotographers Sam Bennici, David Mihalic, Aaron Worley, Mike Hambrecht, Steve Kainec and Steve Fishman have amply contributed their fine images to the newsletter and web site. Likewise, photojournalism by Tom Quesinberry, autobiographical pieces by George Gliba and crossword puzzles by Dan Rothstein have rounded out the *Skywatcher* . The officers serving during the fiftieth anniversary year but who were not mentioned above include president Gus Saikaly and secretary Roseanne Radgowski. The late John Gorka was an activist in the fight against light pollution.

There is no doubt that a great many more achievements could be recounted, fascinating stories told and memories revived. The second 25 years of the Chagrin Valley Astronomical Society must have been just as vivid for those who lived them as were the first 25 to the early members. A sequel to *We Observe* would be most appropriate and welcomed, but that is a history for someone else to write. Any volunteers?

Anthony Mallama

June 2013

APPENDICES

Club Members

1963: Date of Founding	1968: 5th Anniversary	1988: 25th Anniversary
George Gliba	Tony Mallama	Kim Aebi
Tony Mallama	George Gliba	Ken Alperin
Don Tuson	Denny Jefferson	Brick Bates
Rick Wilkens	Don Henning	Sam Benici
	Tom Quesinberry	Bob Bennett
	Andy Jackson	Jay Brindo
	Bruce Dissette	Doug Caprette
	Craig Farnsworth	Ian Cooper
	Roby Hern	Steve Fishman
	Mark Metzger	Shirley Flugan
	Richard Matyi	Kevin Funk
	John Schlessman	George Gliba
	Ian Cooper	Earl Green
	Bruce Kermode	Alan Havrilla
	Jim Smith	Don Himes
	Bruce Krobusek	Matt Heino
	Dan Rothstein	Denny Jefferson
	Dave Sholle	Dave Kujanpaa
	Dan Rondini	Larry Lovell
	Terry Musgrove	Tony Mallama
	Nancy Long	Bob Manecke
	George Childress	Mark Marlowe
	Tamma Wright	John Mast
		Bob Modic
		Matt Mount
		Earl Paulin
		Bob Petti
		Mark Pleatman
		Tom Quesinberry
		Dan Rehner
		Keith Richards
		Dan Rothstein
		Gus Saikaly
		Greg Selker
		Jack Smith
		Art Stokes
		Doug Their
		Mario Tonkli
		Rick Trembour
		Skip Westfall
		Alex Zoltai

Club Officers

	President	Editor	Director of Observations	Observatory Director
1964	Gliba	Mallama & Gliba		
1965	Gliba / Mallama	Henning		
66	Mallama	Henning		
67	Henning	Henning	Mallama	
68	Henning	Gliba & Henning	Matyi	
69	Jackson	Gliba & Henning	Gliba	
1970	Schlessman	Cooper	Rothstein	
71	Schlessman	Krobusek	Krobusek	
72	Krobusek	Forbes	Rothstein	
73	Cooper	Stephan	Mallama	
74	Gliba	Yanulaitus	Mallama	
1975	Stephan	Gliba & Stephan	Krobusek	
76	Quesinberry	Stephan & Krobusek	Krobusek	
77	Quesinberry / Cooper	Cooper & Gliba	Krobusek	
78	Cooper	various	Quesinberry & Gliba	
79	Rothstein	Gliba	Rehner	Mallama & Cooper
1980	Rothstein	Cooper & Rehner	Rehner	Caprette
81	Fishman	Quesinberry / Colin	Jefferson	Cooper
82	Fishman	Rothstein	Phelps	Caprette
83	Paulin	Rothstein	Benici	Caprette
84	Caprette	Westphal	Benici	Cooper / Winslow
1985	Caprette	Westphal	Havrilla	Winslow
86	Rothstein	Westphal	Jefferson	Winslow
87	Aebi	Westphal	Modic	Rothstein
88	Havrilla	Petti	Modic	Trembour

Year refers to main year of presiding; election occurred in previous year
'&' symbol means "and"; '/' symbol means "followed by"

Club Backbones

The club has awarded six 'Backbone' awards to outstanding leaders during its twenty-five years, and will be giving its seventh award this year.

The term "backbone" comes from a very old *Valley Skywatcher* article which described the various type of club "bones". Jawbones talk about doing things; wishbones wish they could do more; hambones draw attention to themselves; but backbones are the real leaders and workers. The club will always need backbones.

Tony Mallama, 1967
Club co-founder; first Director of Observations; two-term President; leader of Observing Dynasty in 1970's; first Observatory Director; first member employed at NASA/GSFC.

Bruce Krobusek, 1972
Kept the club alive during the 'low period'; President; leading observer during the Dynasty years; Director of Observations three consecutive years during the Dynasty.

Ian Cooper, 1973
Primary factor in getting Indian Hill for the club; three-term President; leader in a wide range of club activities; employed at NASA/GSFC.

George Gliba, 1976
Club co-founder; three-term President; leader in Public Awareness and the Observing Dynasty; worked extensively on Indian Hill; prolific ATM; employed at NASA/GSFC.

Dan Rothstein, 1976
Driving force in building Indian Hill Observatory; three-term President; leader in a wide variety of club activities; enthusiastic ATM.

Earl Paulin, 1978
First adult member; President; worked extensively on Indian Hill; amateur telescope business.

Doug Caprette, 1988
Designed and supervised construction of Indian Hill Observatory; two-term President; prolific ATM; employed at NASA/GSFC.

Celestial Events Chronology

1963 July solar eclipse in Maine; December lunar eclipse
64 June and December lunar eclipses
65 Comet Ikeya-Seki, sungrazer
66 Saturn's rings edgewise
67 Nova Delphini
68 April lunar eclipse
69 Favorable Mars opposition
1970 Solar eclipse on east coast; Comet Bennett
71 February lunar eclipse; favorable Mars opposition
72 January pre-dawn lunar eclipse; Canadian solar eclipse
73 Favorable Mars opposition; Comet Kohoutek
74 Comet Kohoutek; Venus occultation
75 May lunar eclipse; Nova Cygni
76 Comets West and d'Arrest
79 Canadian solar eclipse; supernova in M100
1980 Solar maximum
81 Jupiter – Saturn three conjunctions
82 July and December lunar eclipses
83 Comet IRAS-Iraki-Alcock
84 Annular total eclipse
85 Comet Halley
86 Comet Halley; favorable Mars opposition, Solis Lacus dark
87 Supernova in the Large Magellanic Cloud
88 Favorable Mars Opposition

Note: All eclipses are total unless otherwise stated

Spaceflight Chronology

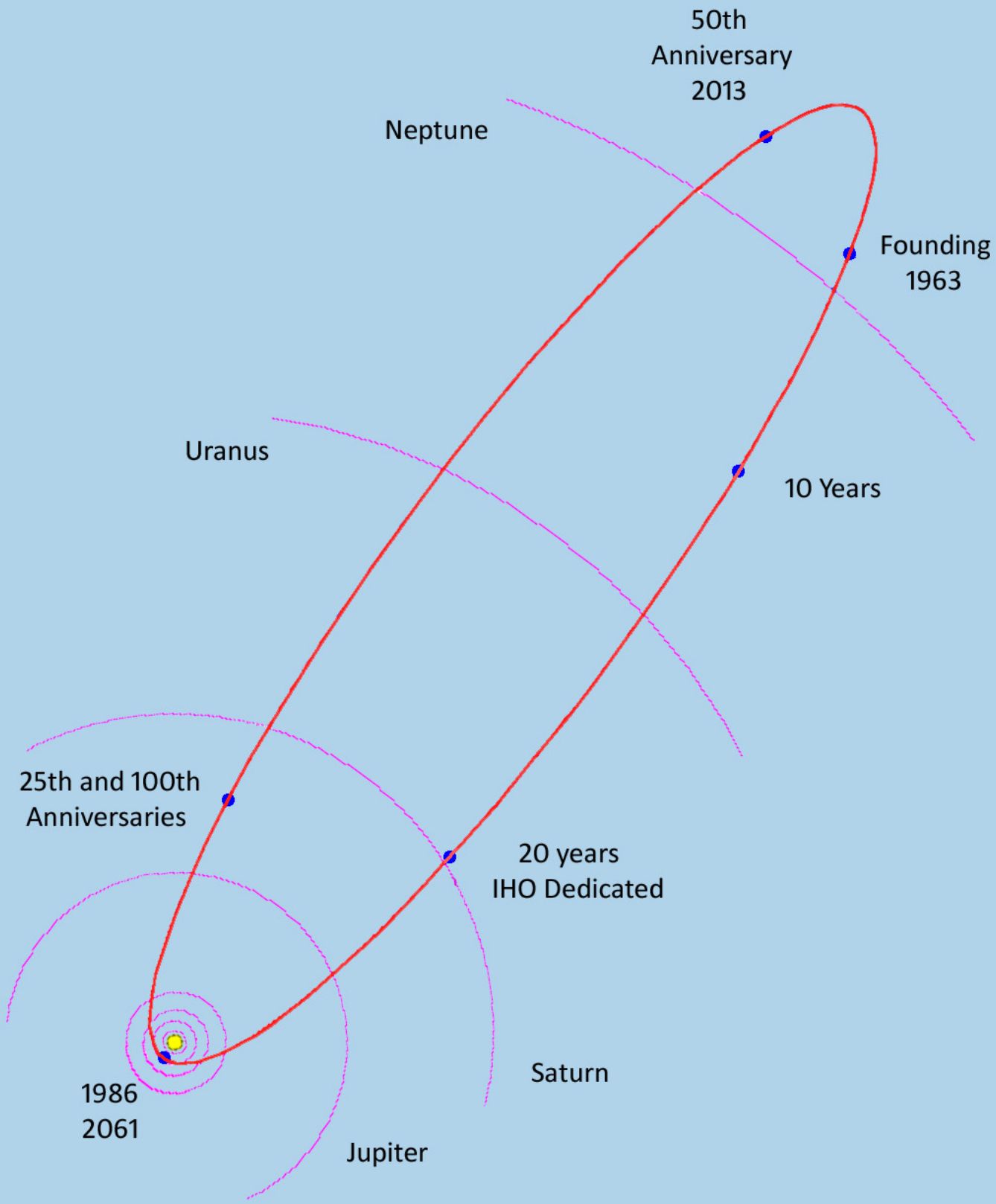
1962 John Glenn orbits earth; Mariner 2 flies by Venus
63 Gordon Cooper makes last Mercury flight
64 Ranger 7 encounters the Moon, returning photos
65 Mariner 4 sends Mars photos; first American EVA and rendezvous
66 Surveyor 1 lands softly on the Moon; OAO-1 launched
67 Grissom, Chaffee and White die in Apollo module during test
68 Apollo 8 orbits the Moon
69 Apollo 11 lands on the Moon; Mariner 6 and 7 flyby Mars
1970 Apollo 13 accident in space; Uhuru X-Ray satellite launched
71 Mariner 9 orbits Mars; astronauts visit Hadley Rille
72 Satellites Copernicus and Landsat launched; final Apollo moon landing
73 Pioneer 10 flies by Jupiter; Skylab missions launched
74 Mariner 10 flies by Venus and Mercury
75 Apollo rendezvous with Soyuz; Venera 9 photographs Venus rocks
76 Viking 1 and 2 land on Mars, send pictures and perform biology tests
77 HEAO-1 launched
78 IUE launched; Pioneer orbiter and probe encounter Venus
79 Voyager 1 and 2 flyby Jupiter; Pioneer flies by Saturn
1980 Solar Maximum Mission launched; Voyager 1 flies by Saturn
81 First space shuttle launched; Voyager 2 flies by Saturn
83 Infrared Astronomy Satellite launched
86 Shuttle Challenger tragedy; Voyager 2 flies by Uranus; Giotto at Halley's
89 ST (HST), Magellan and Galileo launches scheduled; Voyager at Neptune
1990 Ulysses launch scheduled; Magellan at Venus
92 Mars Observer launch scheduled
93 Comet rendezvous Asteroid Flyby launch scheduled; Mars Observer at Mars
94 Ulysses over the Sun's pole
95 Galileo satellite at Jupiter
96 Comet Rendezvous Asteroid Flyby encounters

Author

I've enjoyed observing with my good old Unitron since high school. Hey, it's easier than getting time on HST.

Editor

The 6" Dynascope continues to be my favorite telescope for visual use. A wee dram of Scotch improves the observing experience



CVAS and Comet Halley Timelines