

Night Sky

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Tele Vue
ETHOS
100°
amazing!

SECOND IN A CONTINUING SERIES: AMATEUR ASTRONOMERS WHO MAKE A DIFFERENCE AL NAGLER

THE AMATEUR ASTRONOMER
WHO CHANGED THE WAY WE
SEE THE UNIVERSE.

Al Nagler was born at a very young age in New York in 1935. His family lived in the Bronx and by the time he was of high school age Al had started to become interested in science. When he was eleven, his father took him to the famous Hayden Planetarium at the New York Museum of Natural History, where he watched enthralled as the stars traced their way across the dome. Al bought his first telescope, a 76mm Newtonian reflector and joined the Junior Astronomy Club at the Planetarium. His high school years were spent at the Bronx High School of Science where Al decided to build his own telescope. Using information supplied from ama-

teur telescope making books, he bought a mirror grinding kit from Precision Optics, an optician also in the Bronx. He ground and polished the 8" mirror, producing an f6.5 with a focal length of 52-inches. Under the guidance of the school shop teacher, Al built a hexagonal wooden tube which was attached to a massive iron-pipe equatorial stand for the mirror. The school awarded Al a prize for his work on the telescope. When he graduated from High School in 1953, his intention was to become a machinist. That telescope, which was refined and im-

proved over subsequent years, was instrumental in shaping Al's future.

Al bought an old car to carry the scope and soon after he was nearly arrested by the police for carrying a dead body in his car when patrolmen mistook the telescope for a coffin! With his friends, he would travel about forty kilometres north of New York City to do some observing near Mt. Kisco, NY. It was near there that another brush with the law occurred when he was almost shot by trigger-happy police who glimpsed him walking on a country road on a

foggy midwinter night wearing a shaggy coat. They thought he was a dangerous brown bear on the loose! His untrusty car had broken down and he was walking to the next town.

In 1958, he won 3rd prize at Stellafane, the most famous 'starparty' in America, for 'Mechanical Excellence' with the scope. Al still attends Stellafane every year to meet and mingle with fellow amateur astronomers.

Al wrote an article for 'Mechanix Illustrated' magazine about the building of his telescope. This paid the handsome sum of \$80, a lot of money in those days! The article paved the way to a job at Farrand Optical Company, where he worked from 1957 to 1973. All the while attending City College of New York at night, where he earned a degree in Physics.

Whilst at Farrand he was associated with Martin Shenker, Earle Brown and also met Albrecht Tronnier, who had worked for the Schneider company in Germany. Al became senior Optical Designer at Farrand and was instrumental in the design of wide-angle projection systems used by NASA for the Apollo moon-landing simulators. The ability to simulate everything from

accurate star-fields to lunar touchdowns was work that gave him immense satisfaction. The star fields were precise enough that the astronauts used them to train on. The views, as seen through the windows of the lander simulator were equivalent to an amateur astronomer using an eyepiece with a 110° apparent field of view with a 300mm eye-relief and a 300mm exit pupil!

Al moved on to Keystone Camera company which had produced a long line of 16mm and 8mm movie cameras. He was involved in designing lenses for the new range of 'Instamatic' cameras that were becoming popular.

In 1977 he decided to go into business himself and set up Tele Vue Optics to design and market lenses for television projection. By 1979 he was designing a telescope eyepiece that would eventually revolutionise amateur astronomy.

The complex design of what became known as the Nagler eyepiece was expensive to produce and far more costly than amateur astronomers were prepared to pay. Al decided to introduce amateurs to a less expensive, but still high quality eyepiece by producing a range of Plossl eyepieces that had been adapted and

Right: The Nagler family: Al and Judi with son David and daughter-in-law Sandy



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optimised to produce the best possible results at a reasonable price. At the time, most amateur astronomers were using eyepieces that had their design origins in the nineteenth century. Only a few had been designed in the early twentieth century and these were more suited to military applications than use in astronomical telescopes. The Tele Vue Plossl eyepieces were introduced to the public and sold by mail-order for \$45 each. They were parfocal, had edge-blackened, multi-coated lens elements in a matte black barrel to give maximum contrast and reduce stray reflections. The 26mm Plossl was so well received that it pretty much became the standard focal



The Nagler 13mm

length that shipped, and still ships, with new telescopes produced by many companies.

Eyepieces could be designed and produced that would give a very wide field-of-view, but there was usually unacceptable astigmatism at the edges of the field. This was not so important for military use but was unacceptable in astronomy where stars are meant to look like stars, not

like seagulls. To produce an eyepiece with a wide field and acceptable sharpness, contrast, no astigmatism and a flat field of view had been considered virtually impossible. By employing a negative lens ahead of the focal plane and matching it to the precise requirements of the upper section, Al was able to design an eyepiece of 13mm focal length with an eye relief of 18mm that worked well with telescopes from long focal ratios all the way down to $f/4$. Its field of view was almost thrice that of the popular Orthoscopic eyepiece. The eyepiece design was patented with the title "Ultra Wide-Angle Flat Field Eyepiece." Not a very commercially acceptable name, so Nagler simply called it "Nagler" since eyepiece designs were often traditionally named for the designer.

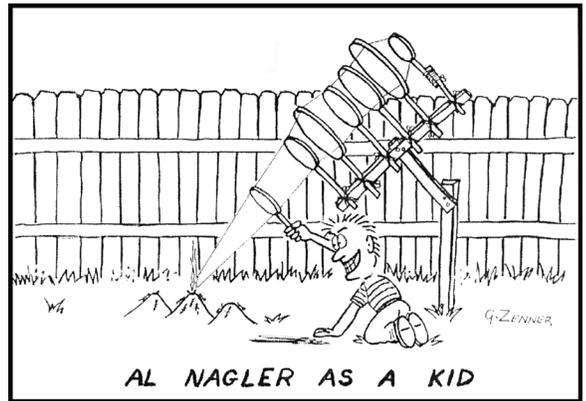
The Nagler was released in 1982 and cost five times the price of a Plossl eyepiece, but was received with acclaim by those who looked through it and marveled at the extraordinary view. More Nagler eyepieces were released, ranging from a high powered 4.8mm to the 13mm. Modifications to the design have been made over the years to improve different aspects. Nagler 2, -4, -5, and -6 series each feature different traits to suit an observer's particular needs; the Type 2 extended the focal length and true field boundary with up to a 20mm focal length while keeping size

and weight manageable. The Type 4 gives longer eye-relief for a given focal length. The Type 5 pushed the boundaries with the widest true fields in both 1.25" and 2" models. Finally, the Type 6 reworked and expanded the focal length choices of the original Nagler series and in a smaller package.

Other designs have been released, the Panoptic in the early 1990's, an eyepiece range that has endured till today. They are generally lower powered than the Nagler range and have become firm favourites with many observers.

The Radian eyepiece range was introduced in 1998 and was an instant success with those people who didn't need a particularly wide field of view but who wanted longer eye-relief and were favoured by planetary viewers.

The news, in 2007 that Tele Vue was to release a new eyepiece with an extraordinary 100 degree field of view, was received with excitement by amateur astronomers around the world. This time it wasn't Al however. Al's son David, whose career at Tele Vue began in April of 1988, outlined the performance requirements for this as yet unnamed project to Al's protégé and longest standing Tele Vue employee Paul Dellechiaie. The result was the Ethos eyepiece series. Later, with Al's encouragement, Paul pushed to reach 110 degrees in some models. This was the same



AL NAGLER AS A KID

Geoff-Zenner's wry cartoon graces Al's office wall

field of view the astronauts saw 40-years+ earlier. Hence the designation as the Ethos-SX for "simulator experience."

For some purposes such a large field of view isn't necessary, so Paul followed up in 2011 by designing the first of a new group of eyepieces called the Delos. The field of view is modest 72 degrees but the eye relief is a more comfortable 20mm, a boon for veteran sky observers.

The Tele Vue trademarks of sharpness, contrast and colour fidelity have been retained. To check eyepiece quality, Al also developed and patented a fast, 4-element, Petzval type refractor which ultimately led to today's NP series (Nagler-Petzval) of apochromatic telescopes for visual and imaging use. Other useful and unique accessories such as the Starbeam unit power finder, Paracorr Newtonian coma corrector, and the amazing Dioptrex eyesight astigmatism corrector, increased the enjoyment of amateur astronomers in their pursuit.

Al Nagler's family is important to the business of Tele Vue. His wife Judi joined in

starting the company and managed the office affairs until her retirement in 2009. David, now President, is joined by his wife Sandy who also started at Tele Vue in 1988. Sandy became Vice President and Office Manager upon Judi's retirement.

Where would we be without Al Nagler and Tele Vue? Whilst there have been a number of other eyepiece designs produced over the years none has been as successful in the field as the range of designs that have emanated from Al Nagler and Tele Vue. None has consistently produced the high quality that astronomers have come to know with Tele Vue.

Al Nagler has been a keen amateur astronomer for about sixty years and an eyepiece manufacturer for about half that period. His dedication to dramatically improving eyepiece design has ensured that amateur astronomers get the best possible view. This perseverance places him in the front row of people who have changed the way we see the universe.

Mike Smith