香港普及天文先驅

A Pioneer of Astronomical Popularisation in Hong Kong

廖慶齊先生

Mr Joseph Liu

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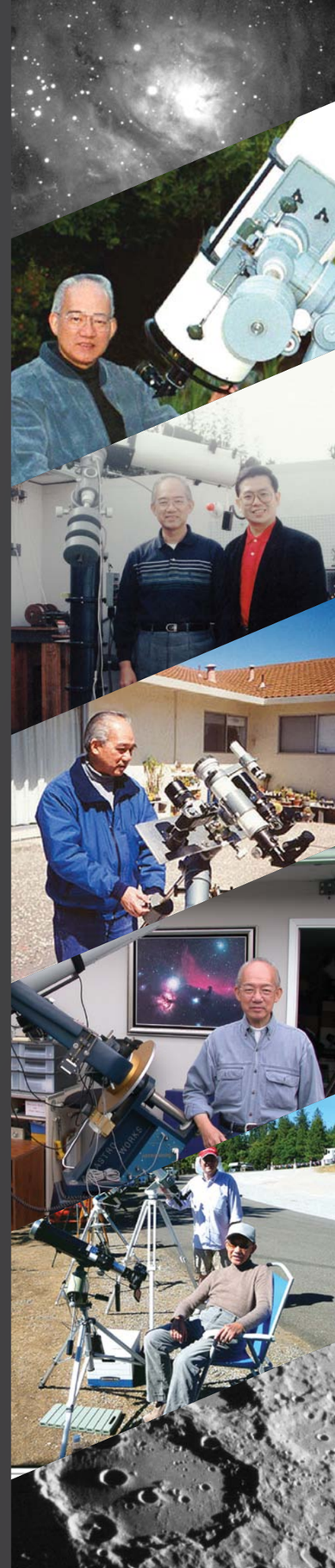


In Memoriam of Our Honorary Adviser Mr Joseph H. C. Liu

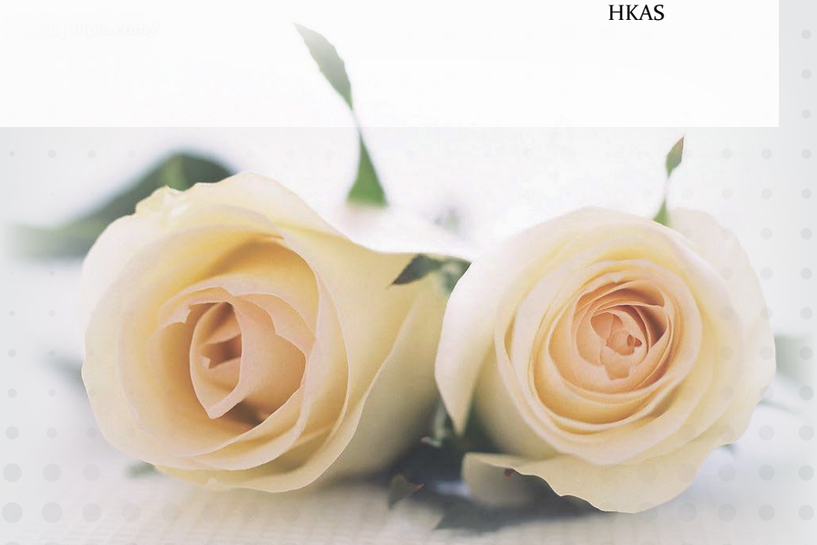
The eminent pioneer of the astronomical community, an honorary adviser of the Hong Kong Astronomical Society, the founding curator of the Hong Kong Space Museum—Mr Joseph H. C. Liu passed away peacefully on April 23rd, 2014, in California with family members next to him. He was 82. The funeral service took place at the Chapel of the Chimes, in Hayward, California, on May 3rd.

We at the HKAS are deeply saddened. We wish to express our condolences to his family.

Mr Liu's deep passion for astronomy started since his teenage years. He was renowned for his astrophotographic achievements, particularly with photographic emulsions which he gained world recognition. He advocated the popularisation of astronomy, bringing the splendours of the heavens to the populace and had a strong following. As a teacher at Queen's College, he helped set up the first astronomical society in secondary schools in Hong Kong. With his rich knowledge and experience, he was commissioned in the mid 70s to establish the Hong Kong Space Museum, and served as its founding curator in 1980. Our Society's founding members have all benefited from his guidance and inspiration. Mr Liu had been our honorary adviser since 1989; and had contributed greatly to our Society in our collection of astronomical equipment.

Mr Liu had always been a learned yet humble person. His incessant curiosity and keen passion for knowledge have become an inspirational drive for all of us. Although Mr Liu has now left us, his passion for the night sky and attentive care for our Society will forever remain in our hearts.

Bill Yeung
President
HKAS



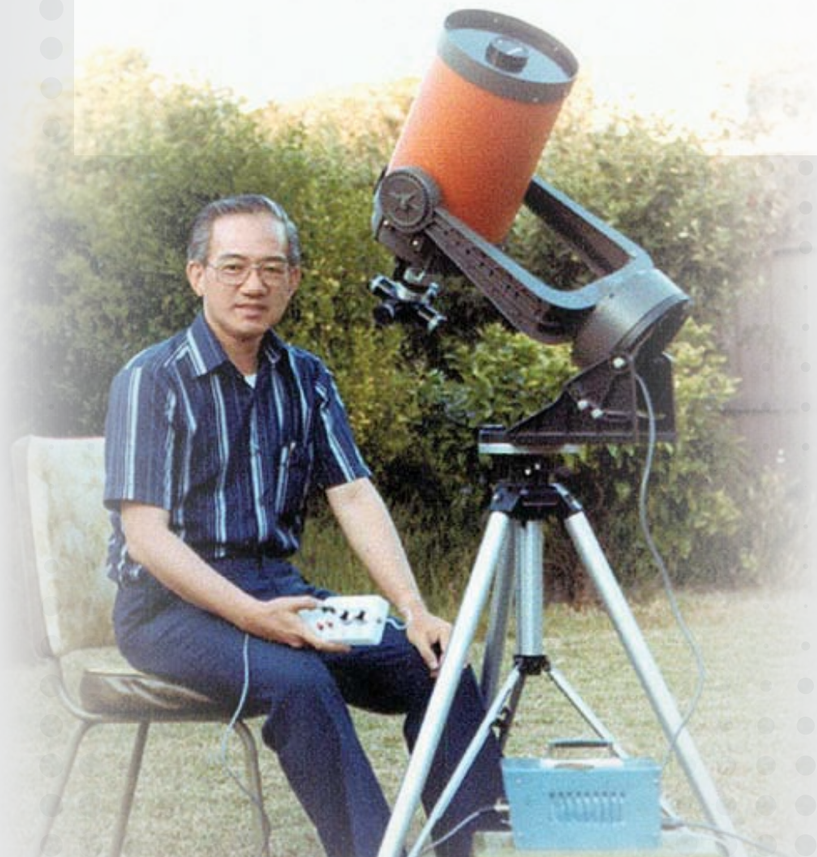
悼
香港天文先驅廖慶齊先生

香港天文界鼻祖、香港天文學會名譽顧問、香港太空館創館總館長廖慶齊先生，不幸於4月23日在美國加州病逝，享年82歲。喪禮5月3日已於美國加州希活鎮舉行。本會同人深表哀悼，並對廖先生家人致以最深切之慰問。

廖慶齊先生自幼已醉心天文，在菲林天文攝影方面造詣深湛，作品屢獲殊榮、成就斐然。廖先生對天文推廣普及更是不遺餘力，桃李滿門，任教皇仁書院期間，開辦了本港首個中學天文學會；更憑其豐富天文知識和經驗，在上世紀70年代初為市政局籌建香港太空館，並擔任總館長一職。本會一眾創會元老，均受益於廖生之天文教導。自1989年起，廖生一直義務擔任本會之名譽顧問，其寶貴意見對本會會務貢獻良多，更屢次慷慨捐助本會購置各種天文儀器。

在一眾朋友和學生心目中，廖生是位仁厚長者、謙謙君子，他好奇好學之心，是我等後輩之典範。今天廖生雖然離開了我們，但他熱愛星空的情懷和對本會的關愛之情，永遠會留在我們心中。

楊光宇
香港天文學會會長



Tribute to Dear Old Dad

The famous detective Sherlock Holmes and his sidekick Dr Watson went camping and after their dinner by the fireside they retired to their tent. In the middle of the night, Sherlock Holmes woke Watson up and asked him, "Watson, look up and tell me what you see." Watson looked up and told Sherlock Holmes, "Wow! So many stars!" "And what comes to mind when you see so many stars?" asked Sherlock Holmes. "Well, I can't help but think how beautiful the night sky is, that we are so small, and that the Universe is so big and mysterious", replied Watson. "Watson, you idiot! Somebody stole our tent!!" exclaimed Sherlock Holmes.

My father told us that when he was a child, the night sky in Sheung Shui village was full of stars. The Milky Way was a spectacular sight. Today, in Sheung Shui and in many parts of the urbanized world the night sky has been stolen from us. You are lucky if you can see just a few of the brightest stars. Today, we who are city dwellers can easily live a whole life without ever being exposed to the beauty and mystery of the night sky.

My father is no longer with us today, but I am grateful to him that while he lived he gave me and gave so many people the wonderful gift of the night sky. He changed the trajectory of so many lives, including my own.

Back a couple of months ago, knowing that my father may not be with me for too much longer, I wrote him a letter by email to thank him for all that he had done for me. I will share with you a few lines from that letter:

"Dear Old Dad, I am grateful for our time together and all that you have taught me and given me. Among the many things and experiences that you have taught and given me, perhaps the best of all is the Universe itself. Because of you the vastness of space and the immensity of time are not scary and abstract but sublime and tangible. Because of you, I may, in the words of Shakespeare, "be bound in a nutshell, but count myself the king of infinite space". Because of you, life as a citizen of the Cosmos is a joy."

Last night, when I looked at the date of that email, I noticed that it was, appropriately, Valentine's Day.

Shakespeare has another famous line from the same play Hamlet which will always remind me of my father, partly because of the reference to a mirror. As you may know, many telescopes have mirrors in them. In the play, Hamlet famously says that the purpose of plays is to hold a mirror up to Nature.

I think my father's legacy is not only that he held a mirror up to Nature for others, but more importantly, being the teacher that he was he taught others how to hold up a mirror to Nature themselves.

Give a man a fish and he will eat for a day. Teach a man to fish and he will eat for a life time.

Many in attendance today are former students of my father and I often heard them calling my father "Liu Sir" when they visited him in Salinas and more recently in Fremont. It has a wonderful ring to it, and I wished I could have called him by that name myself. But I do not have the privilege to do so since I never sat in a classroom of his. So, you guys and gals are luckier than me to have heard him lecture so often during the 1960s and 1970s.

Nevertheless, I can share with you three things my father taught me which I hold dear to my heart.

1. Stay curious; always expand your horizons and interests

2. Bookstores, bookstores, and more bookstores

3. When you are 17 you think you know everything. When you are 27 and you still think you know everything, then you are still 17. The beginning of wisdom is when you realize you don't know anything.

My father stayed curious to the end of his life. As recently as a year ago, he bought several microscopes – one for himself and two for my nieces and nephew. He had us go collect for him dirty water from fish tanks and lakes. The dirtier the better, he said. He then hooked up cameras to his microscope and took amazing pictures of life in a drop of water. During his last year, he continued to buy and enjoy telescopes, cameras, DVDs, music CDs, and books, lots of books. There was a bookstore in Fremont a few blocks from where I live. Whenever the storeowner saw him walk in she would have a smile on her face knowing she could ring the cash register many times that day.

Dad, you are definitely an inspiration. We will stay curious. We will cherish learning. We won't stay 17.

Lastly, I would like to embarrass myself in front of you all and sing a few lines of an old song for my dear old Dad. According to the *Guinness Book of World Records*, this song is the second-most popular song in the English language, following "Happy Birthday to You".

Here it is:

"For he's a jolly good fellow, for he's a jolly good fellow, for he's a jolly good fellow, which nobody can deny!"

James C F Liu

at the Memorial Service for his father, Mr Joseph H C Liu, at Hayward, California on 3 May 2014

James Liu is the second son of Joseph Liu and is also an avid amateur astronomer, who often accompanied his father to remote locations to carry out observations.

編者的話

劉佳能

緣起

年初知道廖慶齊先生病重，心情很是沉重。4月底噩耗傳來，學會同仁想到出版一本刊物，紀念這位為香港普及天文發展建樹良多、雖早已移居外地卻仍心繫香港的前輩。於是大家聯絡了廖先生的家人、好友、學生、舊同事等，盡量蒐集有關廖先生生平的資料和照片，加以整理，希望藉着一本刊物，重現廖先生和香港天文發展數十年間的一些片段。除了廖先生的傳記，各人亦以文章悼念和回顧與廖慶齊先生由相識到交往的事跡。最初這刊物只包括傳記和悼念文章，但廖先生多年來拍攝了大量精美的天文照片，惟終其一生，連一本著作也沒有留下來，實在非常可惜，於是我們在本書加入廖慶齊先生天文攝影集。最終這紀念刊物分為三部分：廖慶齊先生傳記、悼念文章、天文攝影集。刊物出版後，香港天文學會會向香港圖書館捐贈一批樣書，讓市民大眾能夠從圖書館借閱，讓這本刊物流傳下去。

製作規格

最初的規劃，這僅是一本加厚版的《會訊》特刊，但當齊集了所有稿件，我們知道這必須獨立成書了，而且當廖先生的天文攝影集修改至第六稿後，篇幅已經佔了全書120頁的一半，不但收錄了那些陪伴了廖先生大半生的天文儀器，還收錄了由他20多歲至人生最後歲月（2012年9月）所拍攝的天文照片，朱永鴻先生更為攝影集每張照片加上中英對照的文字介紹，有些甚至需要從十多年的電郵紀錄中抄寫整理而來，非常難得。具備這個分量的內容，我們認為必須把製作規格進一步提升為硬皮精裝才能匹配。

語言、資料查證、「上水村」

本書作者眾多，基於各人書寫習慣，文章分別以英文或中文寫成，插圖則大部分採用中英對照，以方便中外人士閱讀。書中大部分照片年代久遠，部分更翻拍自書刊、幻燈片，效果欠佳，需要做大量修葺及修復工作。在資料查證上，雖然我們已經力求準確、反覆核實，但相信本書仍不免有些錯漏，現在這個面貌已經是我們盡了最大努力的成果。本書的天文照片，不少拍攝地點為「上水村」，其實那只是通俗稱謂，地圖沒有標示。上世紀80年代以前，上水有廖姓大家族聚居在一處叫「廖廬」的地方，這是廖先生的故居，天文照片提到的拍攝地點Sheung Shui Village（直譯為上水村）便是這裏。

天文愛好、家國情懷

從廖先生寫給愛侶Julia（後來的廖太太）的兩頁情書，我們認識到廖先生自學天文、在香港做天文推廣的動力不僅來自興趣，原來深藏着一份國家民族的情懷；由他執筆的彗星觀測文章，他更親自告訴讀者，超過半世紀以前，從外國進口一枝天文望遠鏡是何等艱鉅的事情，會受到海關和警察的種種留難；文章《在羅師的日子》，廖先生在羅富國教育學院的舊同學口述：「考試中途，他（廖先生）向講師請求離場數分鐘，拍攝難得一見的日食，講師不允許，這同學說就算考試不合格也要離場……他對我說，他（指廖先生）選擇了孤寂的事業——深夜獨自觀看一顆幾十年甚至百年出現一次的星體。」文中那種對天文的狂熱與執着，表露無遺！

側寫出一頁香港天文歷史

包括廖先生兒子在內，本刊物共收錄了15位人士寫下的悼念文章，寄託哀思之餘，其實每位作者都為香港業餘天文發展史貢獻了一塊拼圖。讀者會看到廖先生從中學校長被借調到當時的市政局籌建香港太空館、看到香港業餘天文學會的創立、看到這新創立的學會與籌建中的太空館合作舉辦一系列大型天文推廣活動、看到港大校外課程部天文班的學員如何組成了坐井會，甚至連澳門業餘天文學會的創立，都與廖先生有着直接或間接的關係。在此，編者亦補上一張拼圖：上世紀70年代有一本雜誌名《科技世界》，香港業餘天文學會核心成員曾擔任該雜誌的天文顧問，1978年並協助該雜誌籌組天文小組，最終天文小組於1980年註冊成為本港第三個公開天文會社香港觀天會，編者正是其創會會員。閱畢本書，讀者大概會明白為甚麼廖先生擁有「香港天文之父」的稱譽。

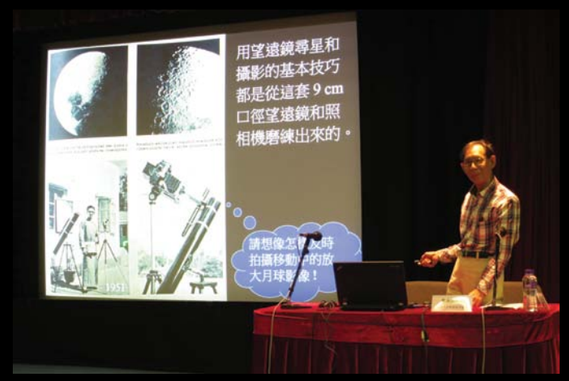
天文攝影集

本圖集分為儀器、彗星、月球、行星、太陽、深空天體、數碼天文攝影七大項，收錄了廖先生最為人認識的天文儀器，從1957至2012年拍攝的天文照片，照片大致上以時序排列。由於所有照片的菲林已經遺失，絕大部分菲林照片和數碼照片的檔案亦很細小，不適合印刷用途，在編排這圖集的過程遇到不少障礙，我們只能從種種限制中挑選出廖先生在各個範疇最具代表性的照片。為了忠於原作，除了因照片破舊、變色等原因需要用電腦修葺外，天文照片的方位、雜訊、光暗、反差、顏色、飽和度等等均沒有改動。部分照片更刻意保留邊框和上面的拍攝資料，以反映廖先生的個人風格。

孤獨的承擔

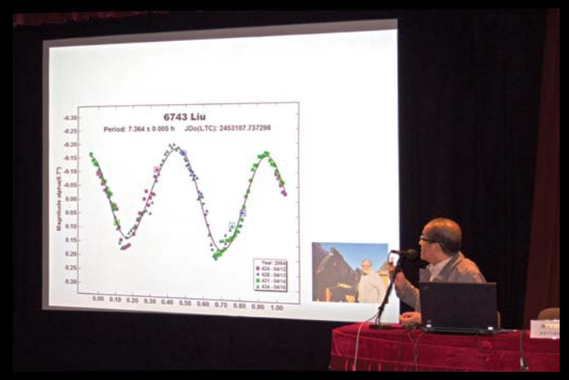
從無到有，開拓從來是困難的，廖先生「選擇了孤寂的事業」，不但追求個人的進步，在其影響下香港民間天文團體一個接一個出現，更為香港人建造了太空館。回想1982年9月，第二屆香港天文大會的一個籌備會在香港太空館演講廳舉行，廖先生時任太空館館長，以「香港天文界的回顧與前瞻」為題演講，當中有一句說話非常震撼：「……香港還有500萬人需要我們做天文普及工作！」這番說話一直影響着一個小朋友的成長。年紀漸長後編者才認識到這份過人的氣概便叫「承擔」！

編輯的理想，是所編輯的書籍能夠存世，毫無疑問，這便是一本存世的書籍。謹以此獻給天上的廖前輩！



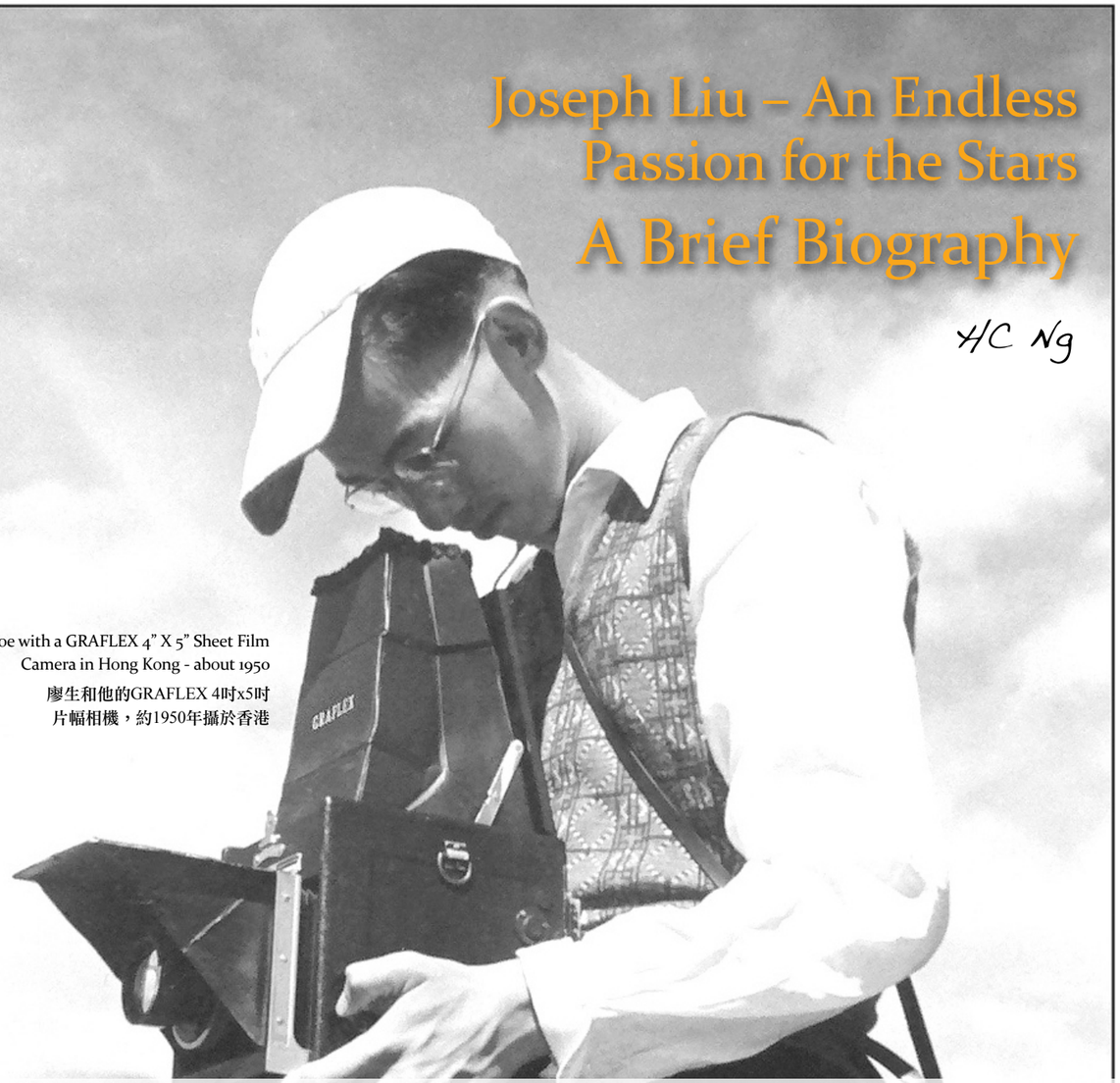
「星夢留痕 — 廖慶齊與香港的天文發展」座談會

座談會於2014年7月6日在香港太空館舉行，由香港天文學會資深會員吳鴻章主持，連同朱永鴻先生（香港天文學會資深會員）、葉賜權先生（前科學館總館長）、傅偉豪先生（坐井會會長）及楊光宇先生（香港天文學會會長），回顧廖慶齊先生生平及對香港天文發展的貢獻。多位廖先生好友及天文同好出席，分享與廖先生的生活點滴，一同緬懷這位香港天文界巨人。



Joseph Liu – An Endless Passion for the Stars
A Brief Biography

HC Ng



Joe with a GRAFLEX 4" X 5" Sheet Film Camera in Hong Kong - about 1950

廖生和他的GRAFLEX 4吋x5吋片幅相機，約1950年攝於香港

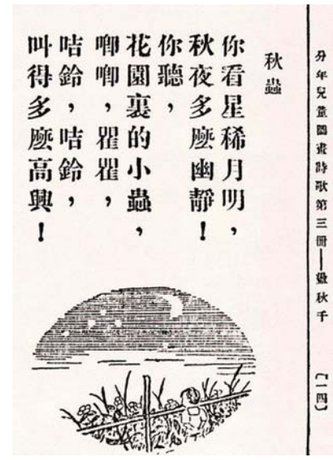
The Birth of a Stargazer

Joseph Hing-chai Liu (廖慶齊) was born in Hong Kong on 10 September 1931; the sixth child of eleven. Joe's life-long passion in astronomy started very early when he was only four and lived in Sheung Shui, a rural village, some 20 km (12 miles) north of urban Hong Kong. Before the rapid economic development of Hong Kong during the late 1960s, the rural areas of Hong Kong could provide for wonderful views of the night sky with stars littering the heavens and the Milky Way stretching from horizon to horizon. At an interview in 2001, Joe recalled how as a young boy he was fascinated by the Moon and the stars through a nursery rhyme he still remembered:

Joe witnessed his first celestial spectacle on 21 September 1941 when he watched his first partial solar eclipse. During the Japanese occupation of Hong Kong from December 1941 to August 1945, while the city was under stringent lighting curfew, Joe reaped the opportunity by learning the stars and the constellations from his mother. At the time, he also learnt Japanese as the language was taught in schools. Hence in addition to Chinese and English, Joe could master elementary Japanese which facilitated him in later making astronomical friends from Japan. After the end of the Pacific War in 1945, Joe continued his secondary education in La Salle College.

First Telescope

Joe's first astronomical telescope was a gift from his parents and was an American-made 9-cm (3.5-inch) f/11 Newtonian reflector which was advertised in Sky & Telescope. In the late 1940s in Hong Kong, subscribing foreign magazines and owning a telescope were both a luxury but Joe's incessant quest for astronomical knowledge persuaded his parents to give him their full support, in addition to meeting his growing interest in photography.



I learned this rhyme about 63 years ago, while I was in nursery. It was this lively rhyme that kindled my interest in the stars and the Moon. Throughout all these years, it has given me so much inspiration and often aroused my nostalgia. I am 69 years old now, and I still love this sweet little rhyme so dearly.

Joe in traditional costume with his first telescope (9-cm Newtonian). The picture was taken in 1951 in Joe's ancestral home in Sheung Shui Village, Hong Kong.

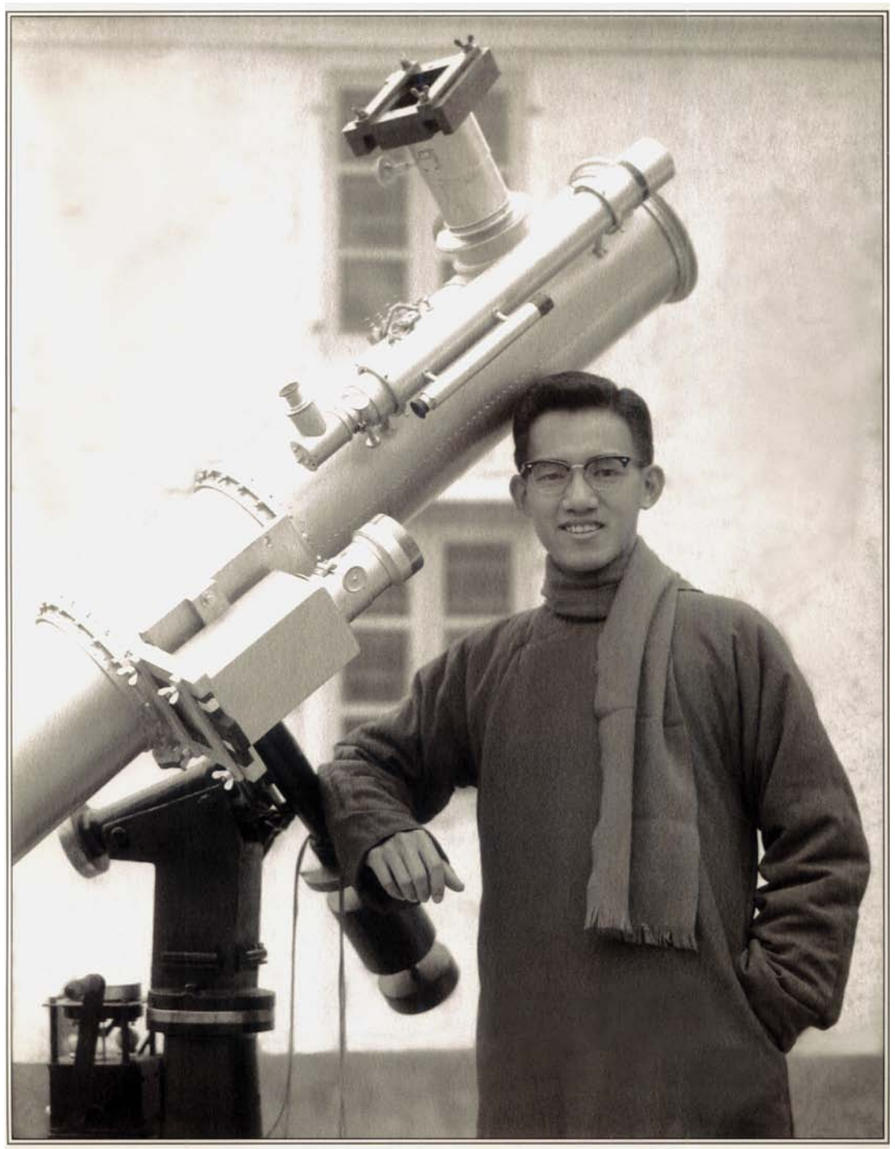
穿着傳統唐裝的廖慶齊先生和他的第一枝天文望遠鏡（3.5吋f/11反射鏡），攝於1951年香港上水村。

HC Ng is one of the founding members of the former Hong Kong Amateur Astronomical Society (the current Hong Kong Astronomical Society) and he knew Joseph Liu since the early 70s. Joseph Liu and Ng became close friends in the early 90s when Ng spent a year of study at UC Berkeley during which he paid frequent visits to Salinas where Joseph retired since 1985.

The 16.5-cm Newtonian

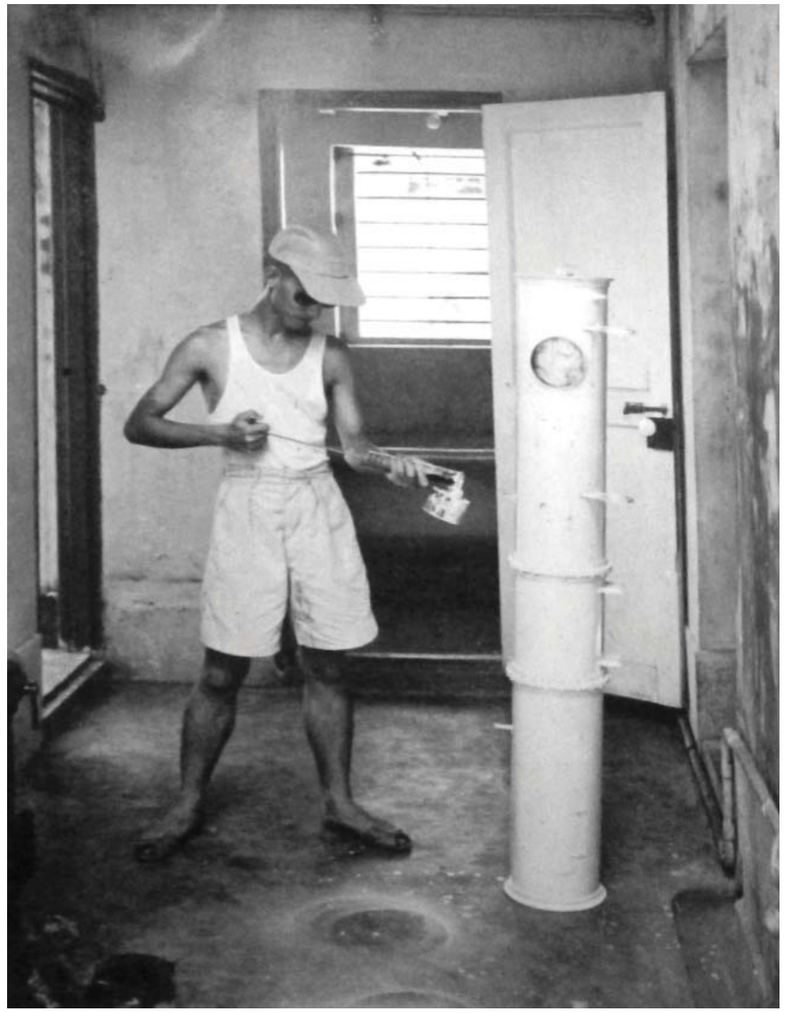
The 9-cm reflector naturally failed to satisfy the demanding appetite of the young observer and in 1953 Joe managed to get hold of a Newtonian reflector second-hand from England where the previous owner needed the money for marriage. From an email in March 2008, Joe recapped the delivery of the telescope to his home in Sheung Shui Village: ***"I can never forget the difficulties and numerous red tapes I had to overcome to import even a toy-like 9-cm Newtonian telescope from New York when I was a high school boy then in early 1953 when I imported a 16.5-cm f/10 clock-driven Newtonian reflector with setting circles from England, I was arrested by local policemen near the Shatin Police Station for being suspected of smuggling a weapon into Hong Kong!"***

The Newtonian had a mirror measuring 16.5-cm (6.5-inch f/10) in diameter with a small diagonal mirror and it became Joe's work horse in astronomical observation and photography before he switched to a much larger telescope in 1972. The 16.5-cm reflector was fully equipped with a German equatorial mount clock driven by weight, supplemented by an astrograph with an illuminated guiding telescope, and a Browning micrometer for measuring double stars. Through the superb optical quality of the telescope, Joe took many detailed photographs of the lunar surface and the planets, including that of Mars in its close apparition in 1971.



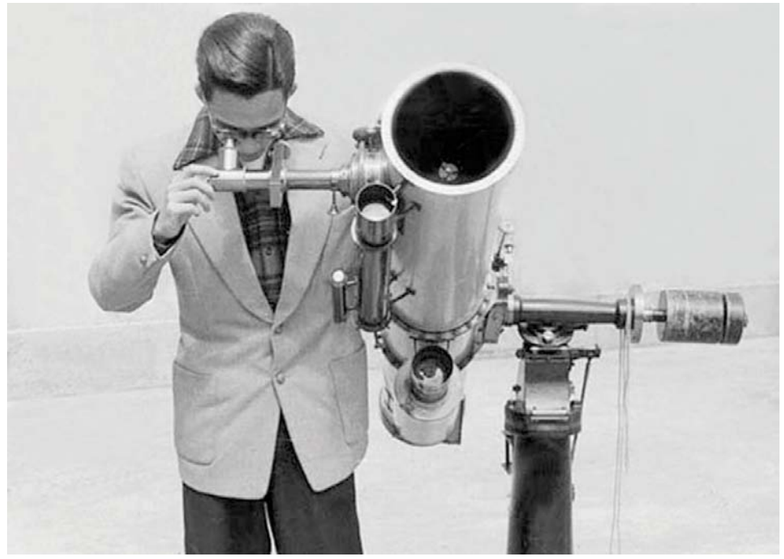
The young Joe with his 16.5-cm Newtonian. The rectangular box on the telescope is a camera with Ross Portrait 400mm focal length lens.

年輕時的廖生和他的16.5cm牛頓鏡，在鏡筒旁是盒式照相機連Ross Portrait 400 mm焦距鏡頭。



Joe refurbishing the metal tube of the 16.5-cm Newtonian.

廖生正在把二手的16.5cm牛頓鏡筒翻新。



Joe and his second telescope — the *Old Faithful* 16.5cm (6.5inch) f/10 Newtonian reflector. It came with a gravity-driving clock to turn the gears of the equatorial mount, an illuminated finderscope and a micrometer for double star measurement. The picture was taken in 1953, Hong Kong.

廖生的第二枝天文望遠鏡，也是他一位「忠實老朋友」。它是一枝英國二手的16.5cm（6.5吋）f/10牛頓反射鏡，配有照明的尋星鏡及量度雙星角距的測微器（廖生目視的部分），赤道儀極軸上有幾百個密齒的轉輪，轉速靠懸錘的重力調節。攝於1953年香港。

How Joe and Julia Met

In 1952, Joe was admitted into the Northcote Teachers' College (NTC) where he met his future wife Julia Iu Suk-yin (姚淑嫣) , a sophomore though a year younger than Joe. Despite being a freshman, Joe courted Julia and was able to impress onto her that he was the one she had been waiting for among all her many suitors. Although Julia was not as keen about astronomy as Joe, her unfailing support to her husband by taking care of a growing family had been instrumental in allowing Joe to devote his full efforts in pursuing his astronomical interests, founding the Hong Kong Space Museum, and popularizing astronomy in Hong Kong for the next 60 years!

After obtaining a Teacher's Certificate from NTC in 1955, Joe taught in Fung Kai Public School (鳳溪公立學校) for three years. Julia became a teacher at the St. Mary's Canossian School (嘉諾撒聖瑪利學校) in 1954 where she taught English and Art until she emigrated to the States in 1983 some ten years after she was promoted to Senior Teacher.

The young couple, Joe at 24 and Julia at 23, decided to get married and on 14 December 1955 obtained their marriage licence right after which Joe headed for the southern part of the Hong Kong island where he observed the partially eclipsed oval solar disk disappearing into the western horizon, fully demonstrating the devotion to astronomy by an infatuated amateur astronomer.

Joe and Julia tied the knot on 15 January 1956. The following January, they became parents with the birth of their first child, a boy also called Joseph. There were in fact complications during the pregnancy and caesarean section had to be used for the delivery and the doctor warned that the number of children would have to be limited. Probably with the same vigour in pursuing his hobby, Joe and Julia eventually had a total of five children, namely Joseph, Christina, James, Josephine and Julian. It was indeed a miracle according to Joe.

Joe and Julia saw their first comet in April 1957 from their home in Sheung Shui Village. It was Comet Arend-Roland (C/1956 R1) and a photograph of the comet was taken by them with the 4-inch Ross astrograph. The occasion was particularly memorable as the photo of the comet and a photo of the couple with the 16.5-cm Newtonian appeared in a number of dailies. From then onwards, Joe was widely recognized by the local press as the astronomer who could readily provide them with astonishing photographs of the heavenly bodies. As a result, local readers could occasionally see Joe's photos of major astronomical events, including the annular eclipse observable from Hong Kong on 19 April 1958.

Joe as a school teacher in the 1950's
為人師表的廖慶齊先生

Studying in HKU

Although already a father, Joe, on the advice of his father-in-law, further his studies in the University of Hong Kong (HKU) in 1958 where he studied Chinese archeology. As he lived in Sheung Shui Village far away from the university which was located at Pokfulam on Hong Kong island, Joe was given residency in one of the dormitories. He thus made weekend trips back to Sheung Shui Village to see Julia and their children. Unlike other university students at the time, not only was Joe married, he was already a father. He was thus considered very unique among his envious and curious peers. Recalling his days at the dormitory, Joe, as a senior, once challenged a freshman to eat an orange, like him, in full with the rind and seeds and both did. That freshman was subsequently the popular lyricist James Wong (黃霑 1941–2004).

Joe graduated from HKU in 1961 with a Bachelor of Arts degree. As he was the first from the Liu clan to be awarded with a bachelor's degree, the Sheung Shui Village elders organised a big celebration to commemorate the event with Joe's name inscribed onto the archival tablets for display at the Liu clan's ancestral hall.

These photographs of the partial stages were taken by H. C. Liu from a point about 20 miles north of the central line of the eclipse. The times were, respectively, 11:25 a.m., 11:53 a.m., and 12:23 p.m. A solar diagonal was used to reduce the amount of sunlight gathered by the 2-inch guide telescope.

1958年4月19日在香港上水出現的日食，食甚時間在上午11時53分。（廖慶齊攝）

Joe and his 1972 astronomy class, taken in Sha Tau Kok Government Secondary School. Liu stood at fourth left of the back row, others were students and their friends who joined the sky observation practice.

廖生與他的1972年天文班，攝於沙頭角官立中學，廖生在後排左四，其餘是參與觀天實習的學生及其朋友。

Teaching in Queen's College

After graduation, Joe joined the Education Department of the Hong Kong Government and started his teaching career in Queen's College (QC, 皇仁書院), a government secondary school which is the oldest and one of the most prestigious local schools. He taught Chinese literature and Chinese history and was subsequently promoted to the rank of Vice Principal until he was transferred to head another school in 1971. During his first year in QC, Joe helped established the Astronomers' Club, the first of its kind in secondary schools in Hong Kong, a trend which later spread to many other schools.

Heading the Sha Tau Kok Government Secondary School

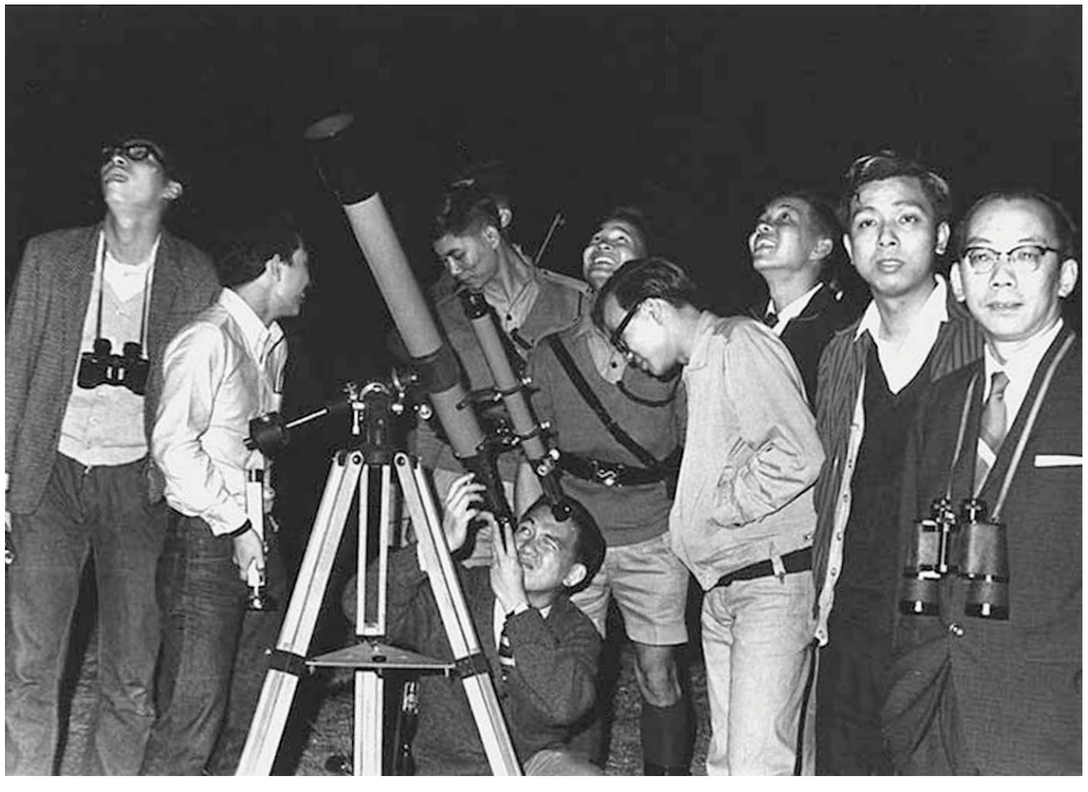
Joe was posted out of QC in 1971 and became the Principal of the Sha Tau Kok Government Secondary School (STKGSS, 沙頭角官立中學) located next to the border between Hong Kong and Mainland China. According to Joe, his posting was politically motivated by the Government as it was thought that his indigenous background would be useful in easing the tension between the locals and the Government.

Teaching Astronomy Classes at the HKU Extra-Mural Studies

Other than his full time teaching career, Joe served as a part-time lecturer at the Department of Extra-Mural Studies of HKU where he taught observational astronomy from 1966 to 1977. As then neither HKU nor any other tertiary education institutions run astronomy degree programme, Joe being the only lecturer in the field of astronomy was naturally regarded by many as the local astronomical authority. Recalling those teaching days at HKU, Joe said he organised two-year astronomy non-degree courses each with four semesters in addition to specific courses on selected topics, like Mars when the planet was favourable for observation.

Without resorting to any textbooks or course notes, Joe simply referred to the few points he jotted down on a note card and talked about them for an hour and a half supplemented with numerous slides. At the top of his astronomical teaching career, Joe taught three classes, two in Cantonese and one in English, and lectured from 6pm till 11pm, each with some forty students! Many local active stargazers had been his students. Nonetheless, Joe's astronomical teaching had to stop in 1977 when he was fully engaged in the planning and building of the Hong Kong Space Museum. A number of his students formed the Sky Observers' Association (坐井會) in 1972 to continue Joe's popularisation of astronomy in Hong Kong.

During the 1960s and 70s, Joe organised countless observing sessions at his backyard or the STKGSS to allow his students and budding stargazers to have their first close-up look of the Moon and the planets through his 16.5-cm telescope and later the 32-cm telescope. In 1967 when Hong Kong had sporadic riots, a spill-over from the Cultural Revolution on the Mainland, Joe continued to organise field observations for his students. Joe in particular remembered the night of 25 November 1967. When he and his students were immersed in observation with a few portable telescopes, they were suddenly surrounded by a troop of policemen with powerful flashlights, guns and rifles! After some questioning and a peep through the telescope then showing the ringed planet Saturn, the Police officers were convinced that they were not troublemakers. They even requested Joe to let them and their other colleagues to have a second look of the celestial objects when they again patrolled the same area later into the night. Joe hence exclaimed that astronomy was not only a useful and entertaining science, it also helped make peace and open other peoples' mind!



Even the officers in patrol stopped for a peep of Saturn!
巡警也忍不住要看一看土星！

Joe's Many Local Astronomical Friends

With numerous students who had attended his classes, Joe had made a lot of friends too numerous to mention. As examples drawn from his email of July 2002, Joe recalled TS Poon, then a teenager, who sometimes appeared at the front gate of his home in Sheung Shui during mid-night without any prior notification, and cried aloud Joe's name while the latter would probably be submerged in observation at the backyard. Before Poon woke up half of the village, Joe would have let him join in the observation. As both were crazy stargazers they enjoyed the mutual company and had much to talk and brag mostly about telescopes and astrophotography. Poon often appeared in Joe's observational sessions, held on Saturday nights, and always had the loudest voice among the course members. Eventually, Poon became Joe's best assistant in guiding the course members in observations who happened to be much older than him!

Another young enthusiast, WH Wong, a neighbour and good friend of Poon, who attended Joe's astronomy course was so indulged in observation that Joe once found him hiding in his backyard long after the observing session was over and other course members had left by train for the city. Joe recapped the episode when it was around midnight when Julia and him went to the backyard to put the cover over the 16.5-cm Newtonian when Wong gave them a startled surprise because, in the dark, he resembled a spirit observing the heavens with the telescope!

In 1971, a young man by the name of Alan WH Chu (朱永鴻, one of the co-authors of the The Cambridge Photographic Moon Atlas), an electronics engineer, who was so eager to observe Mars when it came so very close to Earth in the summer of 1971, that he, on seeing Joe's photographs of Mars in the local newspapers, tried to locate Joe. After much effort, Chu successfully located Joe's home and finally appeared before him with a large water melon! It was a timely present and the water melon was quickly consumed in the warm and humid evening by the two. It was indeed a fine first meeting of two enthusiasts that took place more than 40 years ago. With Alan's expertise in electronics, Joe later sought his help in refining his telescope drives both in Hong Kong and in California.

Joe at the observatory of Dr. Hans Vehrenberg, 1968.
廖生探訪漢斯・費倫貝格的留影（1968）

Joe's Many Worldwide Astronomical Friends

Throughout his long astronomical career, Joe had met and known many renowned professional and amateur astronomers from many parts of the world. His amiable character, exceptional enthusiasm in observational astronomy and a meticulous and uncompromising attitude in recording his observations, impressed many and allowed Joe to be respected by those who happened to have crossed paths with him. The following are a few examples of the friends he made.

In August 1968, Joe paid a visit to Dr. Hans Vehrenberg (1910–1991), at his private observatory in the Black Forest in southern Germany. Dr. Vehrenberg was famous for using various astrographs to produce some famous star atlases extensively used by both professional and serious amateur astronomers worldwide. During World War II, Dr. Vehrenberg was captured by the Soviet forces and became a prisoner of war and after his release, he produced all his great astrophotographic atlases, including Atlas Stellarum, the first massive 3-volume photographic star atlas, down to magnitude 14, available to stargazers at a relatively affordable price.

In the summer of 1968 during his trip to Italy, Joe paid a visit to the Vatican Observatory which was located at the Pope's summer palace. He was welcomed by the then Observatory Director, Father and Dr. Daniel O'Connell, S.J. (1896-1982) who gave Joe a personal tour of the observatory located next to a beautiful lake which was the caldera of an extinct volcano. The observatory was full of large equipment but Joe was particularly interested in the Carte du Ciel astrograph with large twin objectives that used to map the heavens.

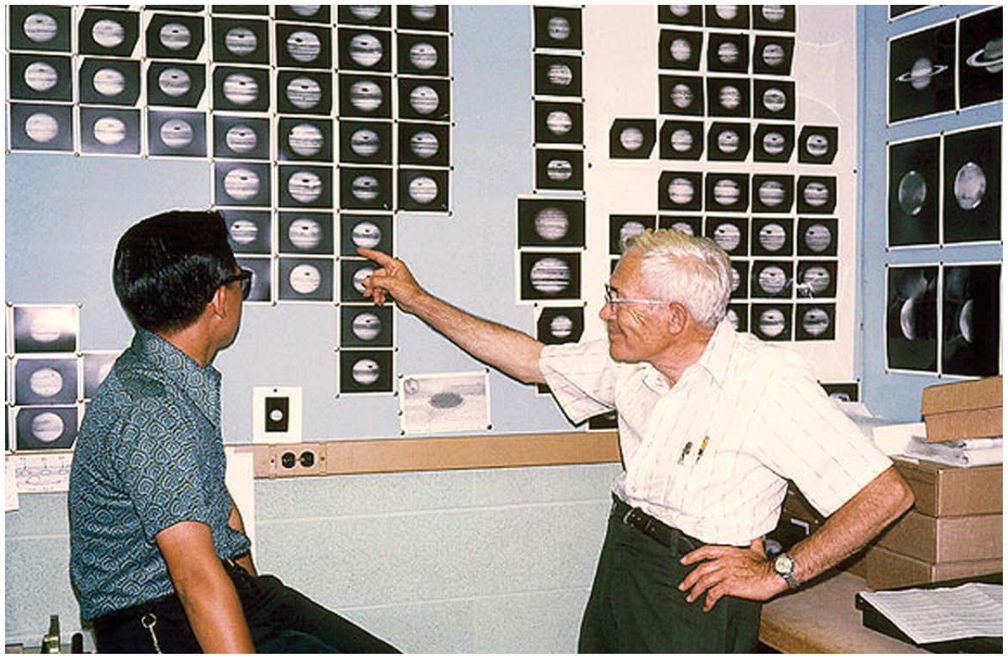
In the spring of 1969, Joe and Julia visited Professor Shotaro Miyamoto (宮本正太郎教授，1912-1992), Head of the Astronomy Department of the University of Kyoto (京都大學), and the Director of the department's Kwasan Observatory (花山天文台). Professor Miyamoto was a world-famous planetary astronomer who specialized in planetary atmospheres. The Martian crater Miyamoto is named after him.

Joe and Julia visiting Professor Shotaro Miyamoto in 1969.
宮本正太郎教授與廖生廖太（1969）

In the early 70s, Joe received sponsorship from the US Government to visit academic institutions in the States. After he asked for visits to astronomical-related institutions, the US Government suggested University of Washington. Knowing that the State of Oregon is famous for its rain, Joe put forward his own proposed itinerary which was finally accepted after much persuasion. Joe then started his exploratory trip in the US, learning and making friends along the way, all of which greatly influenced him in building his own observatory in Hong Kong and with hindsight, the Hong Kong Space Museum. During his visit to the Harvard College Observatory, Joe was offered a position as an observer and although he was interested in the job the corresponding stipend would be unable to meet the increasing expense of his family and hence he had to reluctantly turn down the job. Had Joe taken up the offer, Hong Kong might not have a planetarium.

Joe had visited the Lowell observatory (羅威爾天文台) four times and on the third occasion during the summer of 1973, Joe spent a week at Flagstaff, Arizona, making daily visits to the observatory's library and exhibition hall until the sun set, only to return after midnight to observe Mars with Charles Capen (1926–1986), a famous Mars observer and astronomer, with the 61-cm (24-inch) Alvan Clark refractor till daybreak. During his brief stay at Lowell Observatory, Joe met Robert Burnham Junior (1931 - 1993), the author of the classic 3-volume Burnham's Celestial Handbook. Having discovered his first comet in 1957, Burnham Junior was hired by Lowell Observatory to work on a survey of stellar proper motion using a blink comparator. Being a shy person, Burnham Junior had few friends and he was happy to have met Joe, who was also a keen amateur astronomer like him.

After his week-long stay at the Lowell Observatory, Joe went to Las Cruses, New Mexico to visit Professor Clyde Tombaugh (1906-1997), the discoverer of the dwarf planet Pluto in 1930. During his stay in New Mexico State University, Joe used the Astronomy Department's 61-cm (24-inch) very long focus Cassegrain planetary telescope to photograph Jupiter. Joe received praise from the planetary astronomers there as his 1971 series of Mars' photos, taken with his 16.5-cm Newtonian, compared very well against those taken with the 61-cm! Joe also had the privilege to observe Jupiter visually with Tombaugh and his wife Patsy through their self-made 40-cm (16-inch) Newtonian erected at the backyard of their home. In an email in July 2000, Joe said he had a most pleasant and memorable evening with the Tombaughs under the starry sky.



Prof. Tombaugh and Joe in 1973.
湯博與廖生（1973）

The 32-cm Newtonian Cassegrain Reflector

In 1972, Joe built a sliding roof observatory at his backyard of his ancestral home and housed the 32-cm (12.5-inch) Optical Craftsmen Newtonian-Cassegrain (f/5 and f/19) reflector riding on a cross-axis mount, built in Hong Kong, with an oversized 40-cm (16-inch) Byers worm-gear assembly. Joe and his observatory were featured on the cover of the April 1974 issue of Sky & Telescope and the highly detailed lunar surface and planetary photos made many readers wondered where Hong Kong was located with such superb seeing!

The 32-cm telescope old drive corrector was replaced by a hi-tech drive corrector made by Chu which could provide for highly accurate tracking for the two-ton instrument. Joe could make exposures of up to 12 seconds for large scale images of Jupiter and Saturn using less sensitive but finer grain photographic emulsions. With the 32-cm reflector, Joe obtained highly detailed lunar and planetary images for which he was awarded in 1977 the first and third prizes in the astrophotographic competition organised by the Astronomical League (consisting of two hundred local amateur astronomical societies from across the States).

Joe recalled that on the evening of the Mid-Autumn festival in 1975, Chu, his wife and Poon had installed the new drive corrector to the 32-cm telescope and was having it tested. When they pointed the 32-cm telescope to Jupiter, Poon found that Jupiter was oscillating in the east-west direction in the field which was subsequently found to be caused by the worm. As a result, Joe had to limit his exposures within a slot of time not critically affected by the periodic oscillation, in addition to the mercy of atmospheric seeing.

In 1980, Joe donated the entire 32-cm telescope setup to the Physics Department of HKU. The telescope was re-erected at the rooftop of the Physics Department towards the late 1990s for teaching purpose when astronomy classes were finally offered. Some years later, following refurbishment, the 32-cm reflector was replaced by a 40-cm RC reflector and HKU passed the 32-cm optical tube assembly to the Hong Kong Space Museum.

32-cm (12.5-inch) Newtonian-Cassegrain. Taken in 1976 Sheung Shui Village, Hong Kong and posted at the request of a reporter of the Sing Tao Evening Newsweek. Joe is holding the control box of the clock drive designed by Alan Chu.
廖生和他的32cm（12.5吋）牛頓－卡塞格林反射鏡，攝於1976年，原載於隨香港《星島晚報》發行的《新聞周刊》。其手持的控制器由朱永鴻設計和製作。

Joe and his 32-cm (12.5-inch) reflector in his home backyard observatory, Sheung Shui Village, Hong Kong. The reflector had a f/5 Newtonian focus and a f/19 Cassegrain focus. The mount was a home-built English equatorial type. Photograph taken in 1974.

廖生和他在香港上水村家中後院設置的32cm（12.5吋）反射望遠鏡，可使用 f/5 牛頓焦點或主鏡後的 f/19卡塞格林焦點，負載平台是廖生自行建造的英國式赤道儀。照片攝於1974年。

This electronic clockdrive, built by Chu for Joe in 1975, offers sidereal, lunar and solar tracking rates apart from the regular Fast / Slow buttons. Its short-term stability is ten-folds better than old designs which suffer from temperature drift.

除了標準的恒星速、月速、日速及快慢控制外，這個為廖生而造的電子轉儀鐘有溫度補償的優點，短期穩定度比舊式設計優勝。

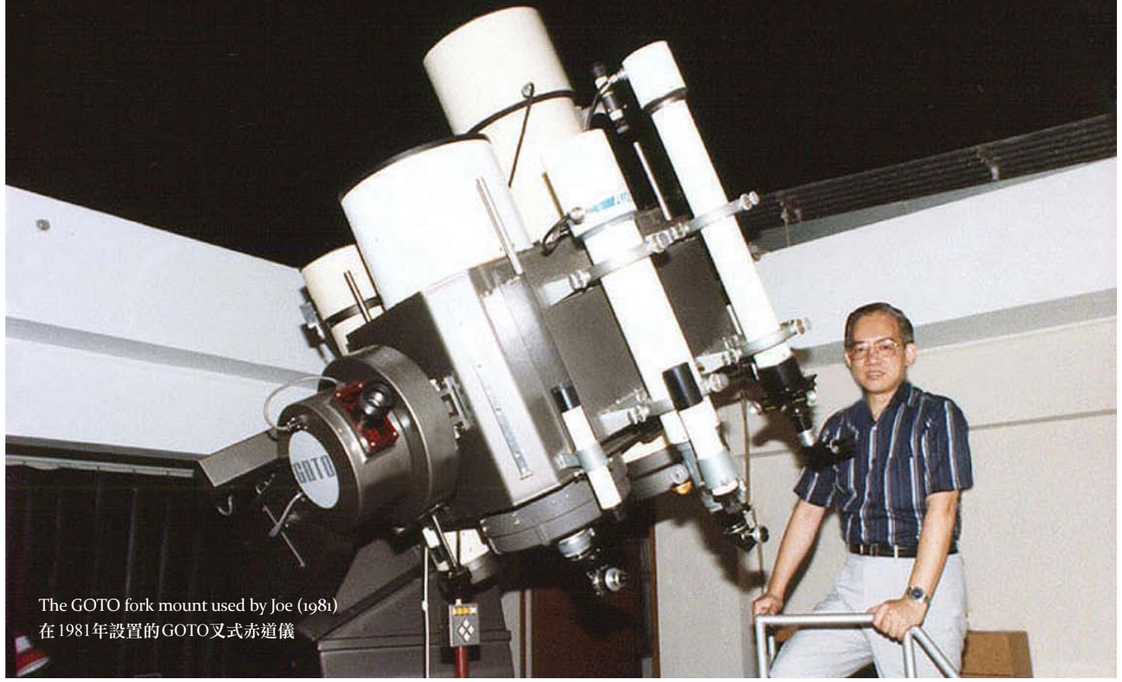
The Twin Catadioptrics

In 1981, Joe rebuilt his ancestral home along with his sliding roof observatory which was moved from ground level to the first floor. His new telescopes were a pair of catadioptrics, consisting a Celestron 14" Schmidt Cassegrain telescope and a Japan Special Optics 25-cm Wright Schmidt camera, riding side by side on a GOTO fork mount of Joe's design. Before he retired to California in 1985, the whole set of telescope found a new home in an education centre in Guangzhou which had a similar latitude for the fork mount.

The Hong Kong Space Museum

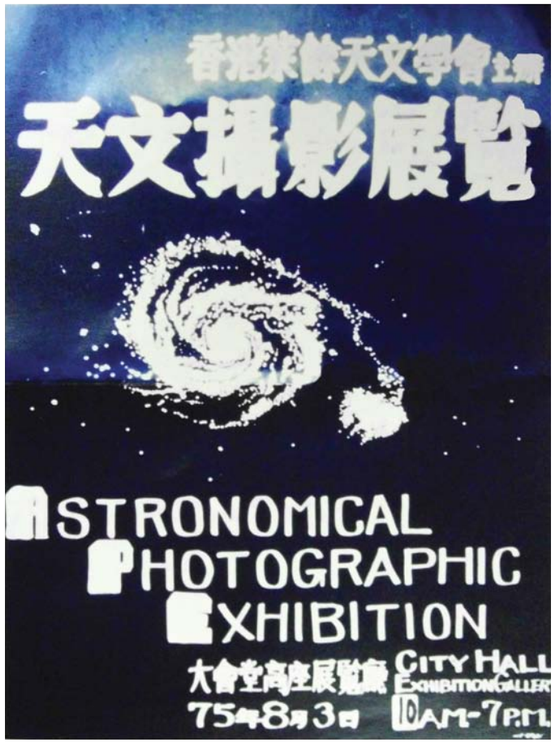
With a healthy surplus from government rates, the then Urban Council (市政局) contemplated in the early 70s to build a planetarium as many world class cities had their own planetariums. Knowing Joe's astronomical background, they sought his assistance as an adviser in 1974 for the establishment of a planetarium, which later became the Hong Kong Space Museum (HKSM 香港太空館). From 1974, Joe was on secondment from the Education Department to the Urban Council for the planning and building of the HKSM. During the early planning stage, Joe made numerous overseas visits to other world class planetariums to appreciate first hand the pitfalls of operating and sustaining a planetarium. He then compiled reports to justify the design and operation of the future planetarium before the Urban Council which funded the project. That was not an easy task as a number of Urban Councillors had very limited knowledge about astronomy not to mention planetariums.

Joe's major challenge was to make sure that the Urban Councillors would not treat the future planetarium simply as a specialised movie house. What Joe would like to establish was more than a planetarium but a centre for the popularisation of astronomy, encompassing not only leisure but also an educational platform so that the younger generation would have the opportunity to learn astronomy. In Joe's grand design, there should also be a small observatory to allow visitors to have actual sights of the brighter celestial objects through a telescope but this could not materialise because of site and other constraints.

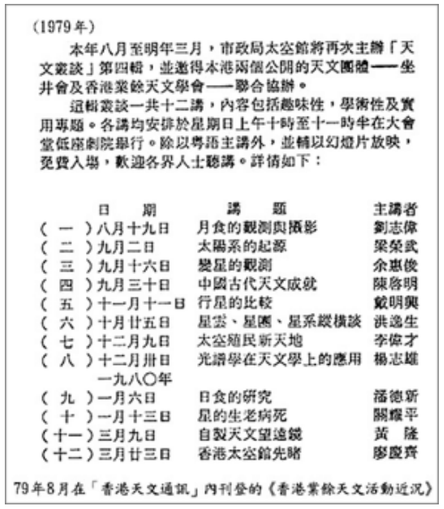


The GOTO fork mount used by Joe (1981)
在1981年設置的GOTO叉式赤道儀

The HKSM was eventually opened on 8 October 1980 and became the first fully automated planetarium in the world. Joe was appointed as HKSM's first Chief Curator when at the time he was already planning for the Hong Kong Science Museum (香港科學館). Joe remained with the HKSM until 1985 when he retired and settled in California. As a gesture for his retirement and being the founder and the first curator of the HKSM, Joe was given a unique permanent HKSM pass which allowed him free access for life. Reportedly Joe did use his unique museum pass when he periodically returned to Hong Kong from the States in the 90s to the bewilderment of some new HKSM staff members who did not recognise him!



1975 年天文攝影展覽的海報



(1979年)

本年八月至明年三月，市政局太空館將再次主辦「天文叢談」第四輯，並邀得本港兩個公開的天文團體——坐井會及香港業餘天文學會——聯合協辦。

這輯叢談一共十二講，內容包括趣味性，學術性及實用專題。各講均安排於星期日上午十時至十一時半在大會堂低座劇院舉行。除以粵語主講外，並輔以幻燈片放映，免費入場，歡迎各界人士聽講。詳情如下：

日　期	講　題	主講者
(一)八月十九日	月食的觀測與攝影	劉志偉
(二)九月二日	太陽系的起源	梁榮武
(三)九月十六日	變星的觀測	余惠俊
(四)九月三十日	中國古代天文成就	陳啓明
(五)十一月十一日	行星的比較	鍼明輿
(六)十月廿五日	星雲、星團、星系縱橫談	洪逸生
(七)十二月九日	太空殖民新天地	李偉才
(八)十二月卅日	光譜學在天文學上的應用	楊志雄
一九八〇年		
(九)一月六日	日食的研究	潘德新
(十)一月十三日	星的生老病死	關耀平
(十一)三月九日	自製天文望遠鏡	黃　隆
(十二)三月廿三日	香港太空館先睹	廖慶齊

79年8月在「香港天文通訊」內刊登的《香港業餘天文活動近況》

The content of "Astronomy Talks" Series 4 initiated in 1979 by Hong Kong Urban Council. Joe took his part "A Preview of Hong Kong Space Museum".
1979 年香港市政局續辦「天文叢談」第4輯，其中一講由廖慶齊主講「香港太空館先睹」。

Popularisation of Astronomy prior to HKSM

Prior to the opening of the HKSM in 1980, Joe would like to draw people's attention about the HKSM then under construction as well as to raise their interest in astronomy. In 1976, with the help of local veteran stargazers of the Hong Kong Amateur Astronomical Society (HKAAS, later called the Hong Kong Astronomical Society "HKAS, 香港天文學會") as speakers, Joe organised successive series of popular lectures on a variety of astronomical topics at the City Hall Theatre which were often filled to capacity, attracting hundreds of people queuing up for the lectures. Moreover, jointly with the HKAAS, two astrophotographic and other related competitions were organised respectively in 1977 and 1979 and corresponding exhibitions held at the City Hall with record breaking number of visitors.

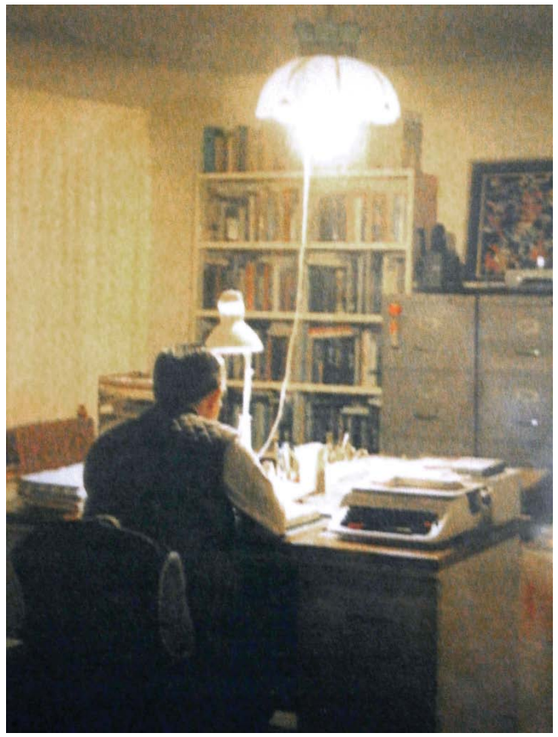
Joe elaborating to international guests in the Solar Science Hall of Hong Kong Space Museum.
廖生在太空館太陽科學展覽廳內向來賓講解展品。

Joe in a public lecture at the City Hall prior to the opening of the Hong Kong Space Museum.
在香港太空館建造期間，廖生不時邀請一些天文會社在大會堂主持公開的天文講座。

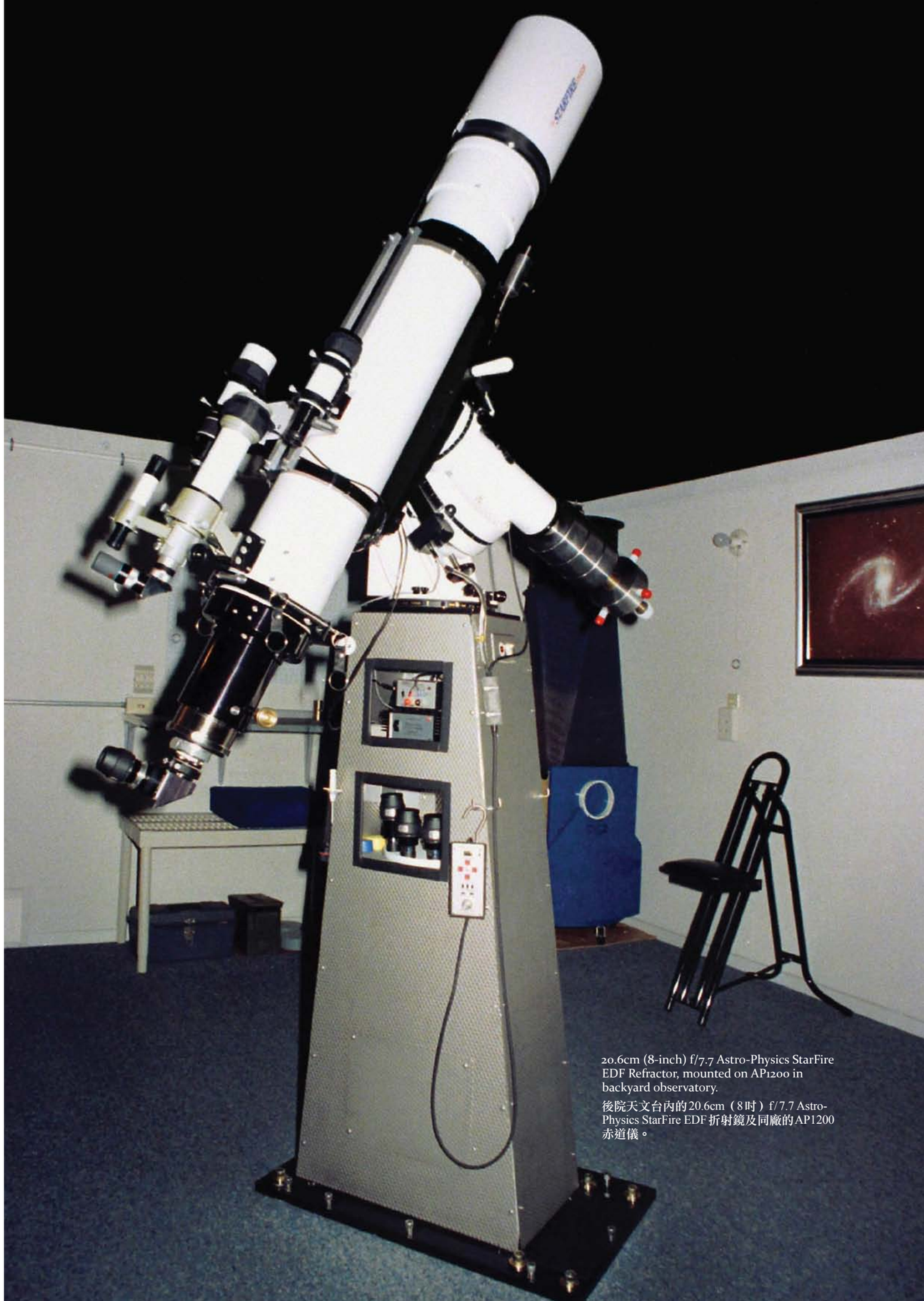
Retirement in California

Following Julia who left for the States in 1983, Joe decided to rejoin her and their family and hence retired at the age of 54 in 1985. They settled in Salinas, an agricultural community 160 km (100 miles) south of San Francisco. At the backyard of his home, Joe built a sliding roof observatory which housed a 30-cm (12-inch) f/5 Astromak astrograph and an Astro-Physics 20-cm (8-inch) apochromatic refractor. His major astronomical interest, apart from lunar and planetary photography, remained to be the observation of variable and double stars. As Salinas developed gradually with a growing population and light pollution, Joe had to make an hour's drive to Fremont Peak, at an elevation of 850 metres (2,800 feet), to a much darker site for deep sky observation and photography as well as to meet with other stargazers there.

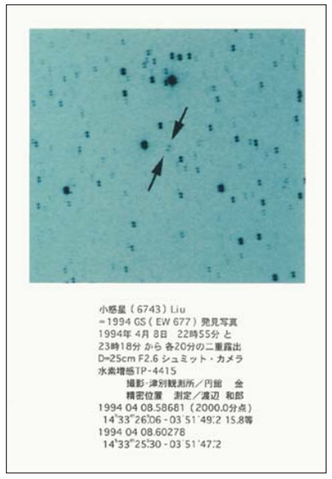
Joe receiving a permanent museum pass at his retirement reception in honour of his contributions to the Hong Kong Space museum.
廖生在太空館榮休晚會上攝。



Joe in the study room at his home in Salinas.
退休後移居加州莎蓮娜市的廖生。



20.6cm (8-inch) f/7.7 Astro-Physics StarFire EDF Refractor, mounted on AP1200 in backyard observatory.
後院天文台內的20.6cm（8吋）f/7.7 Astro-Physics StarFire EDF折射鏡及同廠的AP1200赤道儀。



The image when Asteroid 6743 Liu was discovered. It was discovered by Kin Endate and Kazuro Watanabe at Kitami, Japan on 8 April 1994.

小行星6743（廖慶齊星）發現時的影像

發現日期：1994年4月8日

發現地點：日本北見市

發現者：円 館金（Kin Endate）、
渡辺 和郎（Kazuro Watanabe）

Joe's Last Astronomical Observation

Joe and occasionally Julia made periodic returns to Hong Kong since the late 80s as Joe was appointed as an adviser to the HKSM. His last return to Hong Kong was in early 2010 with the opening of the Astro Park. His health gradually declined and he became seriously ill in late 2013. Before he passed away peacefully on 23 April 2014, aged 82, with family beside him, Joe watched the total lunar eclipse on 15 April. As reported by James, Joe's second son who is also a stargazer: *"We wheeled our father out to the backyard around midnight for about half an hour to watch the eclipse when he put on his astronomy educator hat for the very last time and wrote on his note pad, explaining to his two helpers what they were seeing. It was wonderful to see a smile on his face when we wheeled him back into the house. It was a memorable night."*

Public Recognition

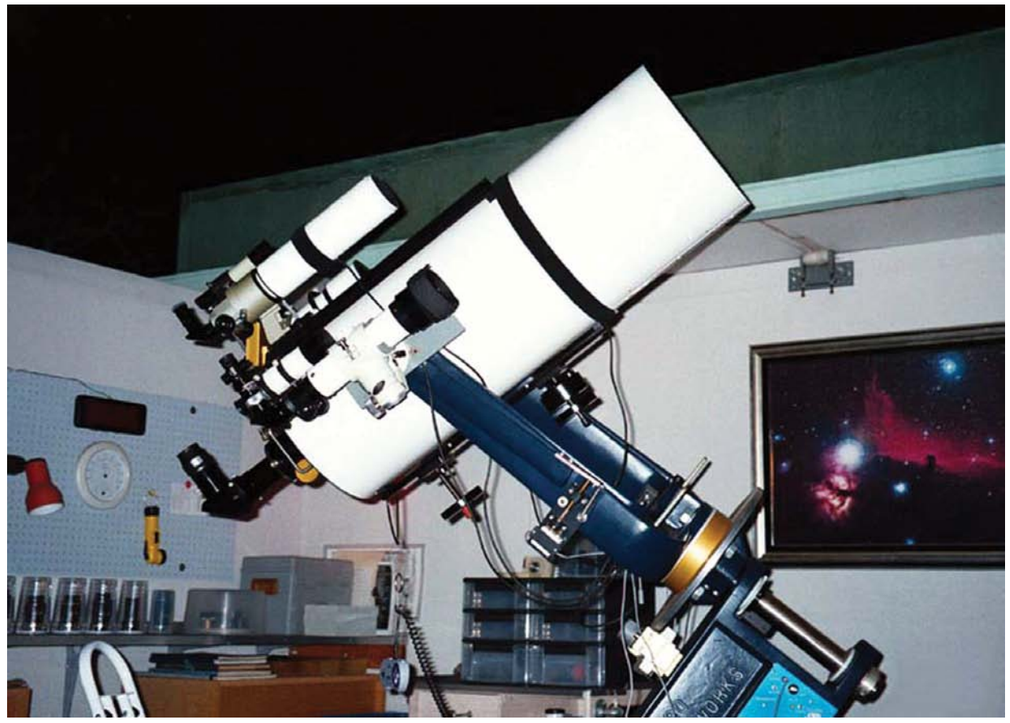
In respect of Joe's contributions to astronomy and its popularisation, he had received a number of awards. In 1982, Joe was given the Chiro Astronomical Award in Japan in recognition of his contribution to the promotion of astronomy. In 1984, he was bestowed with an MBE (Most Excellent Order of the British Empire) honour for his efforts in planning and building the HKSM. In April 1998, the International Astronomical Union approved naming minor planet 6743 Liu (1994 GS) as proposed by the discoverers K Endate and K Wantanabe following a suggestion by A Fujii (藤井 旭) and T Sato.

Forever Remembered

Apart from the public recognition Joe received, he will be forever remembered by those who had the fortune to have known him in person, or had attended his astronomy classes or even not knowing him but awed by the blanket of stars under HKSM's dome. With or without our conscious knowing, Joe had successfully touched everyone and made us a better person through our appreciation of the grandeur of the heavens. We all owe a lot to Joe and he will continue to live in all our hearts.

HC Ng

May 2014
Hong Kong



The 30-cm "ASTROMAK" astrograph in the backyard observatory.
同時置於後院天文台的ASTROMAK照相儀。

With a change to the smaller Celestron-11 telescope and automated mount, the old respective Joe was still active to enjoy astronomical observations (March 2013)
在晚年的廖生仍然不忘天文觀測，但要改用口徑較小的 Celestron 11吋折反射鏡及自動赤道儀。（2013年3月攝）

The Comet Story

BY JOSEPH LIU

I am not a comet hunter or not even an experienced comet observer. I just have a casual interest to watch or attracted by the sights of such celestial wanderers or sudden visitors whenever they happened to be around or were on their way coming towards our Mother Earth.

During my 50 or more years of sky watching, I have seen several bright and famous comets, plus quite a few of the less significant ones. Of all these visitors, perhaps three of them have given me (to myself at least) either sweet memory or some quite amusing and unique experiences.

Comet Arend-Roland in 1957

When I was young (in my teen), I often heard or read about comets but without having seen one or knew what they really were. About a year after I got married, my dear wife Julia and I heard that a new comet was discovered in Belgium by two professional astronomers Arend and Roland. The month of May in Hong Kong, as you may expect, is often cloudy, and sometimes with heavy rain. We tried to search the sky with a pair of 8x30 binoculars for several evenings, and finally caught sight of it in Camelopardalis. That was the first comet we had ever seen. In the '50s, we didn't have light pollution problem, especially in the New Territories (Sheung Shui Village) where we lived. Comet Arend-Roland was fairly bright, between magnitude 2.5 and 3 which was "bright" in the evening sky in the rural area. The "young couple" (aged 25 & 24) were so excited that they set up their telescope on the roof to photograph the celestial visitor. As I said earlier, it was the first comet we saw, and it was also the very first comet that we successfully recorded on film. The pictures of the Comet and the "Young Couple" are attached herewith for sharing. These pictures had also appeared in the South China Morning Post, Sing Tao Evening News and I think also Wah Kiu Yat Poa. The telescope was a 16.5-cm (6.5-inch) f/10 Newtonian, and the camera had a lens of 10-cm (4-inch) aperture. By the way, the telescope was equatorially mounted and equipped with a "driving-clock" which was not run by electricity but by gravity with the help of two fly-balls and pulled by heavy lead weights. We had to wind the "clock" about every 10 minutes in order to keep the telescope running (tracking), so our 50-minute exposure of the comet photo required at least to be wound five or six times, and before each new winding, we had to cover the camera lens, and after each winding, we had to check the position of the comet on the cross-hair of the guiding eyepiece before we removed the lens cover. Despite all these tedious "formalities" we got the picture, and it was a pretty good one. We doubt if we, the old couple, could do it again now, but we were young in 1957!

Comet Arend-Roland (C/1956 R1)
1957 May 03
Lens: Ross Portrait 400mm f/4 (4-inch aperture)
Film: Kodak Royal Pan 3¼" x 4¼" sheet film
Exposure: 50 min.
Observing site: Sheung Shui Village, Hong Kong.

阿倫德－羅蘭彗星（C/1956 R1）
1957年5月3日
Ross Portrait 400 mm f/4鏡頭（4吋口徑）
柯達Royal Pan 3¼" x 4¼"單張菲林
曝光50分鐘
攝於香港上水村

Comet Bennett in 1970

The second comet I wish to narrate here is Comet Bennett in 1970. From 1961 to 1971, I taught at Queen's College, Hong Kong. At the latter part of my teaching career at Queen's College, I was the school's Second Master (Vice-Principal). Due to heavy school duties, I spent my observing time more in the urban area rather than my home in Sheung Shui Village. So when the news of the discovery of a bright comet by John C. Bennett, and amateur comet hunter in South Africa reached Hong Kong, I wanted to be first one in town to capture the spectacle (See, I was then still quite "young" and ambitious!). The next early morning, therefore, you found me roaming in the huge lawn of the Kowloon Hospital because I could have a wide open sky there without any soul to disturb me at about 4 a.m.. I brought along with me a pair of 7x50 binoculars (already up-graded from the old

The Young Couple (1957)

Joe and his wife Julia got ready to observe Comet Arend-Roland with their 16.5cm f/10 Newtonian telescope, and prayed for clear sky. The camera behind Julia had a 400mm focal length f/4 lens with which they took photos of Comet Arend-Roland in May 1957, Comet Mrkos in August 1957, Comet Bennett in April 1970 and other comets in the '60s and '70s.

廖生與太太Julia在16.5 cm f/10牛頓鏡前的留影，攝於1957年5月香港上水村。當時大家準備就緒期望看見阿倫德－羅蘭彗星，但天陰。Julia後面是一部相機連400mm焦距f/4鏡頭，後來他們以此相機成功拍攝了1957年5月的阿倫德－羅蘭彗星、1957年8月的姆爾科斯彗星、1970年4月的班尼特彗星及其他60至70年代的彗星。

8x30!), Norton's Star Atlas, finder charts, a flash-light with a cover in red, a note-pad and other gadgets. It was the first day of April, the early morning sky was unusually clear and tranquil. What a wonderful environment to look for the comet, and it was very convenient for me to go there as my quarters (a flat) was right opposite the hospital. It took me less than 10 minutes to walk across the street and strolled up to the hospital's big lawn which was about 50 feet above Argyle Street. All the way, I was looking up and enjoying the beautiful sky without paying attention to things around or near me. Then all of a sudden, I felt a sharp pain on my back, plus a blinding flashlight shinning on my face. There were two men who seemed to come out from nowhere and who actually had followed me all the way once I entered the hospital compound. While one of these strong men was still pointing my back with a wooden pole that had, I later found out, a sharp metal head; the other stronger fellow caught my arms and shouted at me saying that I was under arrest. They said they FINALLY caught me because there had been many burglaries in the doctors' living quarters, and I must be the guy responsible for that! They also mentioned that what a fool I was, because they had followed me all the way and I didn't even notice that they were behind me. Of course, I was hardly aware of them as I was paying full attention to the starry sky and was anxious to locate the new comet. It took more than half an hour for me to explain my purpose to be on the government property, and told them that I was also a civil servant like themselves. They then searched me, kept on questioning me and looked at my Norton Star Atlas (I wished they could understand the contents!), yet I had a hard time to convince them the flashlight with the red cover. Since they failed to find any suspicious items on me, they let me go very reluctantly, while the real burglar was still on the loose. What a BIG "APRIL FOOL" I was. Well, as I was not welcome in the city, I went back to my home in Sheung Shui Village (of the Liu clan) where I had my faithful 4-inch astrograph with which I took this picture.

Comet Hyakutake in 1996

Comet Bennett (C/1969 Y1)
1970 April 03 21:08 ~ 21:20 UT
Lens: Ross Portrait 400mm f/4
(same lens asComet Arend-Roland was shot)
Film: Kodak Tri-X Professional (ASA 320)
Exposure: 12 min.
Observing site: Sheung Shui Village, Hong Kong.

班尼特彗星（C/1969 Y1）
1970年4月3日 21:08 ~ 21:20 UT
Ross Portrait 400mm f/4鏡頭
柯達Tri-X Professional, ASA 320菲林
曝光12分鐘
攝於香港上水村

My other favorite comet is a comet of recent years: Comet Hyakutake. I understand that not too many people in Hong Kong saw this beautiful intruder owing to the unfavorable sky condition during its appearance. I was fortunate enough to witness it in the more transparent and drier sky in California, although end of March is normally the last part of the rainy season here, and the weather is usually still quite unstable. I packed my instruments which consisted of a 300mm f/4.5 Nikkor telephoto lens and a Takahashi Epsilon-160 f/3.3 astrograph together with a Takahashi T-90 equatorial mount and headed my way to Fremont Peak (only 2800 ft elevation) which is one-hour drive from my home in Salinas, a small farming community, about 100 miles south of San Francisco. Frankly speaking, I was too ambitious as far as equipment is concerned. Comet Hyakutake was actually not a big comet, but it was very close to us, it appeared to be long, very long, and it moved fast. I spent two nights in the mountain, it was cold and at times humid. Although I was well dressed for the weather and for this pretty visitor, it was not really that comfortable to observe and to spend the nights on top of a cold mountain or peak. Yet, it was a very worthy trip. Well worth for all the preparation and to carry the rather heavy gear there and to tolerate the cold. All these for what?

i) Comet Hyakutake was the longest, although not the brightest comet I have ever encountered. I estimated its length to be about 30~35 degrees visually, yet other amateurs that night claimed that their estimates were 40 degrees or longer. One younger astrophotographer who set up near me told me his measurement was 60 degrees or a little more! Most likely, my own estimate was somewhat too conservative because of my aged eyesight, but I just want to be honest, for this is science.

ii) Comet Hyakutake was the bluest comet I have ever seen. The blue color was so subtly beautiful that it was beyond my ability to give a faithful description.

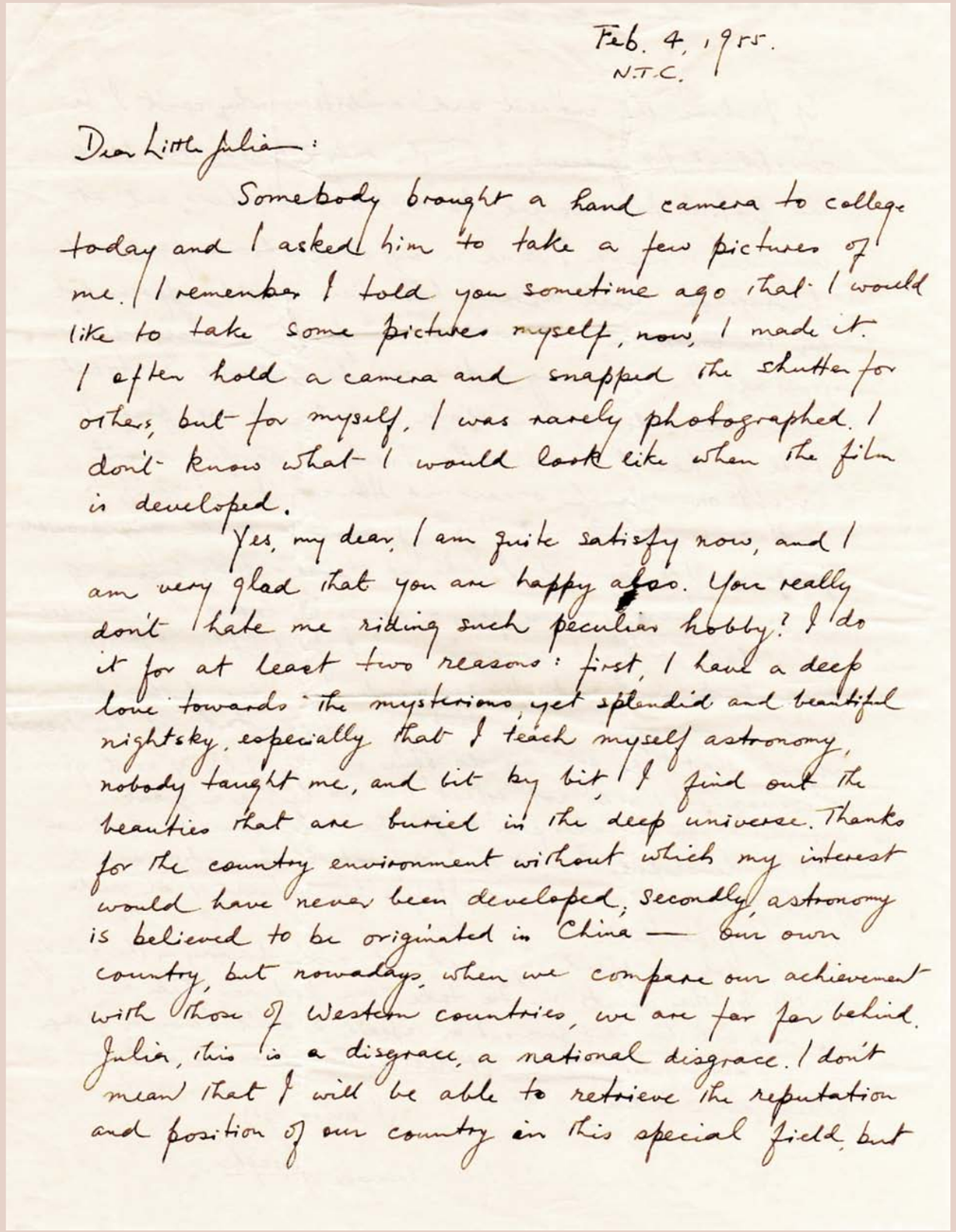
iii) On March 24, 25 when I spent the nights in the mountain, Comet Hyakutake made her appearance on the meridian and near the zenith around or after mid-night. To me that was rare, and because of its high elevation, it helped to "open" itself fully and grandly. The comet was blue, bright, thin, long and tenuous. Again, the beauty is beyond my description. What a WONDERFUL sight, and a sight never to be forgotten!

iv) On the first night, while I was doing the final check up on my equipment for the job, two young men appeared. They were CHINESE! Who could they be? When they looked at me, I heard they said: "Ha! Another CHINESE?!" Then they called aloud: "Liu Sir!" Guess what? They were Queen's College old boys, and I could hardly recognize them!!! They just completed their graduate studies on computer from Stanford University, one was a Ph.D., the other was a Master. See, for astronomers, the Earth is really a very small world. On top of this big surprise, they had a whole range of lenses with them, and they lent me one of their shorter focal length (wide-angle) lenses for me to get a more complete picture of the Comet. Without their kind help, the picture of Comet Hyakutake would not be shown here. And it was wonderful that the Comet brought the teacher and the old boys together again!

To sum up, I think Comet Arend-Roland was the comet that brought me the sweetest memory, because my beloved wife, Julia was with me to catch our first comet. The "Comet Bennett Incident" was something hard to forget. Comet Hyakutake was the most beautiful comet that I have ever witnessed in my life. It was not the brightest. I love it because of its subtle beauty.

Comet Hyakutake
(with 5-day Moon in the sky)
1996 March 24 08:15 ~ 08:25 UT
Lens: 35mm f/4
Film: Kodak Royal Gold 1000
Exposure: 10 min.
Observing site: Fremont Peak, California.

百武彗星
1996年3月24日08:15 ~ 08:25 UT
35mm f/4鏡頭
柯達Royal Gold 1000菲林
曝光10分鐘
攝於加州Fremont Peak，拍攝時見5天月齡的月球。



Feb. 4, 1955.
N.T.C.

Dear Little Julia:

Somebody brought a hand camera to college today and I asked him to take a few pictures of me. I remember I told you sometime ago that I would like to take some pictures myself, now, I made it. I often hold a camera and snapped the shutter for others, but for myself, I was rarely photographed. I don't know what I would look like when the film is developed.

Yes, my dear, I am quite satisfy now, and I am very glad that you are happy also. You really don't hate me riding such peculiar hobby? I do it for at least two reasons: first, I have a deep love towards the mysterious, yet splendid and beautiful nightsky, especially that I teach myself astronomy, nobody taught me, and bit by bit, I find out the beauties that are buried in the deep universe. Thanks for the country environment without which my interest would have never been developed; secondly, astronomy is believed to be originated in China — our own country, but nowadays, when we compare our achievement with those of Western countries, we are far far behind. Julia, this is a disgrace, a national disgrace. I don't mean that I will be able to retrieve the reputation and position of our country in this special field, but

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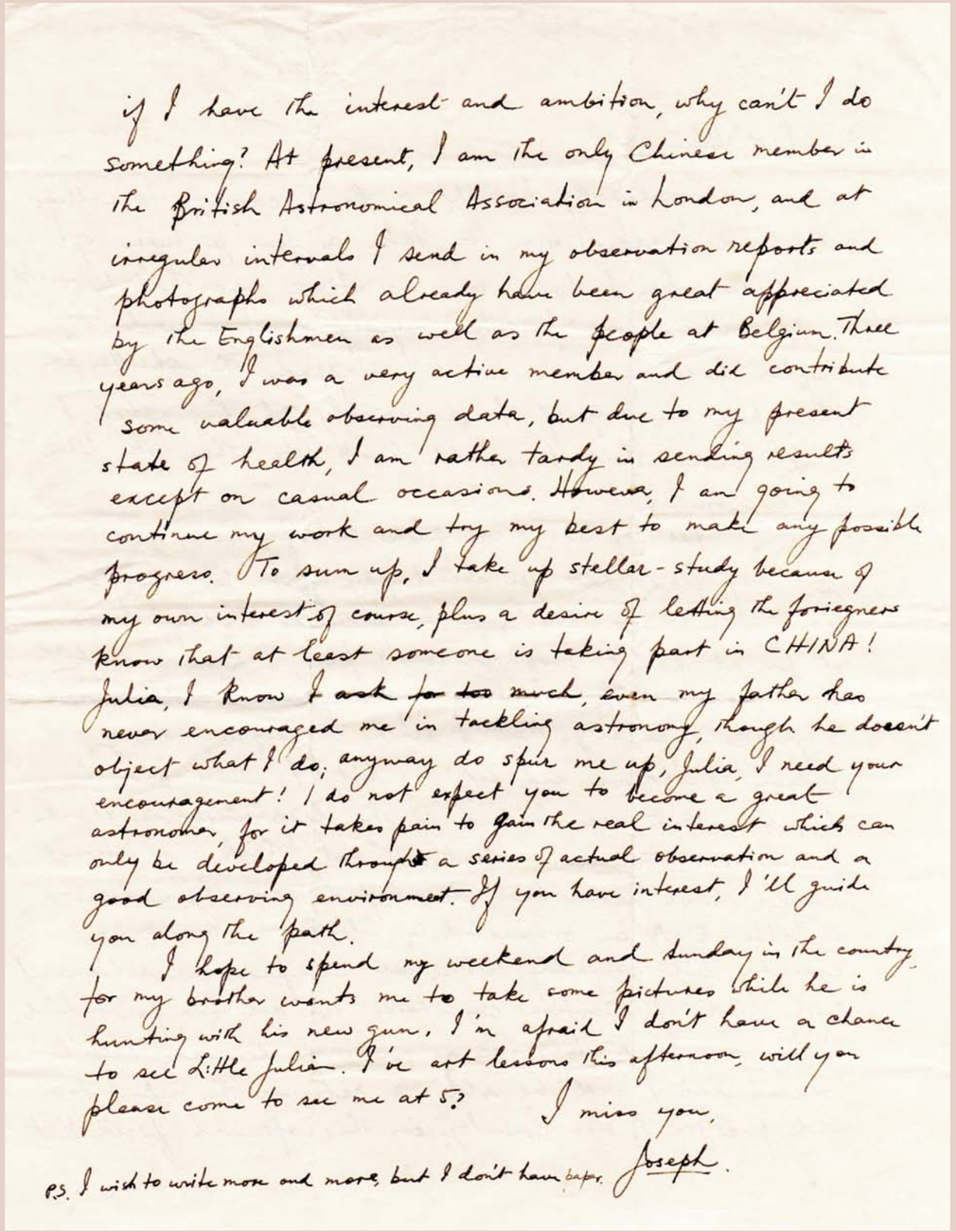

if I have the interest and ambition, why can't I do something? At present, I am the only Chinese member in the British Astronomical Association in London, and at irregular intervals I send in my observation reports and photographs which already have been great appreciated by the Englishmen as well as the people at Belgium. Three years ago, I was a very active member and did contribute some valuable observing data, but due to my present state of health, I am rather tardy in sending results except on casual occasions. However, I am going to continue my work and try my best to make any possible progress. To sum up, I take up stellar-study because of my own interest of course, plus a desire of letting the foreigners know that at least someone is taking part in CHINA! Julia, I know I ask for too much, even my father has never encouraged me in tackling astronomy, though he doesn't object what I do; anyway do spur me up, Julia, I need your encouragement! I do not expect you to become a great astronomer, for it takes pain to gain the real interest which can only be developed through a series of actual observation and a good observing environment. If you have interest, I'll guide you along the path.

I hope to spend my weekend and Sunday in the country, for my brother wants me to take some pictures while he is hunting with his new gun. I'm afraid I don't have a chance to see Little Julia. I've art lesson this afternoon, will you please come to see me at 5?

I miss you.

Joseph.

P.S. I wish to write more and more, but I don't have paper.

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記念廖慶齊先生

廖慶齊——香港天文界的宗師——首次聽到他的名字大概是在高小，那時我的長兄是港大校外天文課程的學員，從他口中得悉這位唸考古學又熱衷天文的校長，可算是知天曉地的奇人。20年後，在墨西哥一次日食觀測旅程中遇上廖先生，想不到他也是首次觀看日全食，聽他侃侃而談昔日的天文趣事，叫人不亦樂乎。

香港太空館是尖沙嘴的地標。不論市民是否喜愛天文，這座蛋形建築已深入民心，而認識太空館發展的人尤感到它非凡之處。早在1961年，當時香港的市政局倡議在維園興建一所天文館。到了1973年，局方終於決定在尖沙嘴建設一所現代化太空館，並且力邀當時已享譽國際天文界的廖慶齊先生為計劃獻策。1974年，他由教育署調任市政總署，出任太空館參事，負責領導籌劃興建太空館之重任。他走訪世界各大天文館取經，汲取各館的運作經驗，也洞察電腦化是未來的發展方向，決心要建立一所設備先進的電腦化天文館。他向市政局推介其雄心構想，並廣獲支持。太空館終於在1977年開始動工興建。

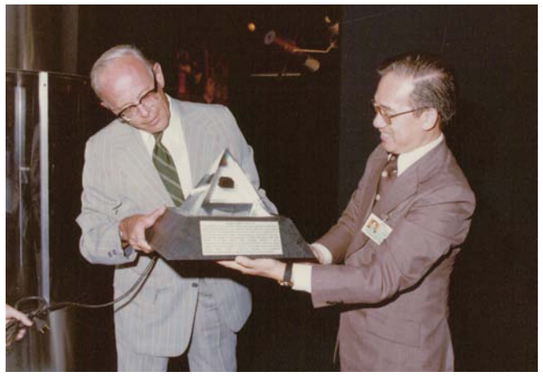
廖先生建設太空館的構思進取且具前瞻性，從館內的先進設施及完善設計可見一斑。當年天象廳的星象投影儀是西德蔡司光學公司的最新產品，製作精密，能將數千顆恆星及太陽系天體的影像準確地投射到天幕上，而星象儀更可由電腦控制升降停留在不同高低位置上放映，以發揮最佳效果。此外，太空館裝設的全天域放映機在當時世上只有7部，能以超廣角魚眼鏡將非常清晰的影像投射到圓頂天幕上。至於放映天象節目，則是透過自行發展的控制影音的電腦系統，使用程式控制包括星象儀、數百部特技效果放映機、音響及燈光系統等器材，使之依時序運作，令不同的視覺、音響效果及旁述互相配合。1980年10月，太空館開幕，廖慶齊成功啟動第一場全電腦化天象節目。廖慶齊先生說：「香港太空館是全世界第一間擁有全電腦化天象廳的天文館」。耗資六千多萬港元建成的太空館正式啟用，廖先生成為香港太空館首任總館長。

及後，太陽科學廳及其太陽望遠鏡相繼啟用，而天象廳首次安裝的多語言系統可為節目同時提供4種語言旁述。在任期間，廖慶齊先生與同事合作無間，建樹良多，直至1985年退休離任。在歡送會上，他獲贈一張永久通用的太空館入場證作為紀念。廖先生移居美國後仍關注館務發展。他曾親筆來鴻問候同事，細說退休生活，表示希望能繼續收取太空館的資訊。退休後，廖先生仍長期擔任太空館顧問，多年來為太空館的發展提供了不少寶貴意見。廖先生也不時返港回太空館聚舊，新同事也許不認識他。有同事憶述在十多年前某天早上未開館時，見一位長者步進館內，他告知長者展館仍未對外開放，只見長者聽罷徐徐步出館外，致電同事前來接待進入館中，並親切跟新同事招呼問候。廖先生的謙厚風度令人難忘。他深受同事尊敬愛戴，與他共事者均獲益良多，廖先生的風範就如他的天文攝影作品般永存我們心間。

梁偉明
香港太空館館長

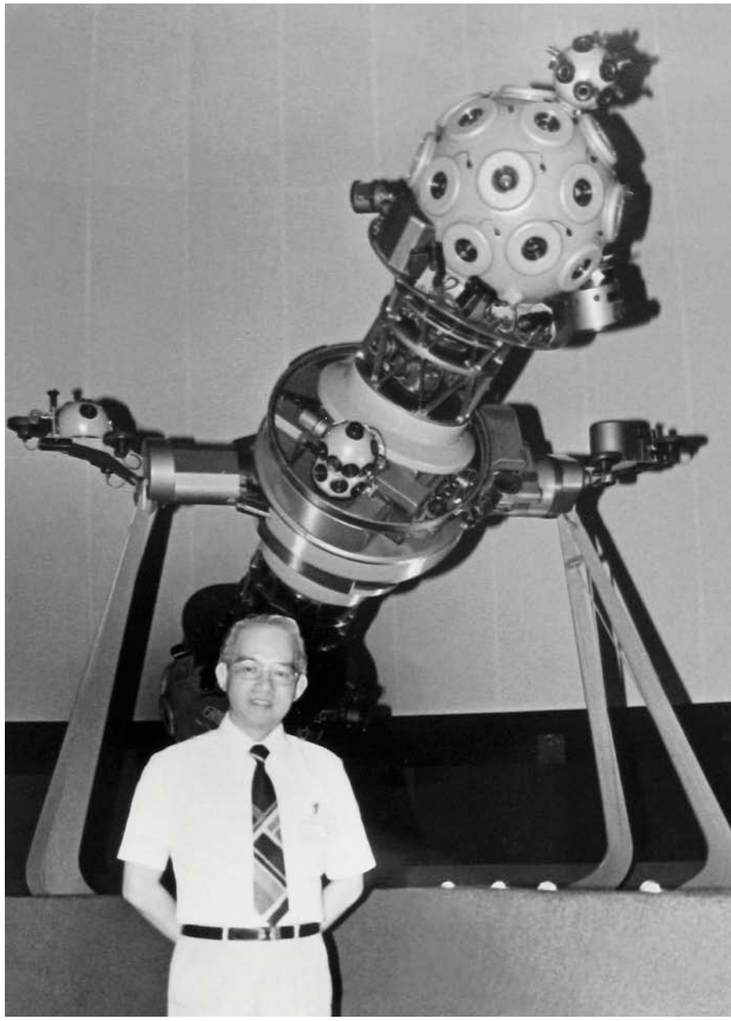
2010年廖生最後一次回港，攝於天文公園開幕禮。
Mr Liu's last return to Hong Kong was in 2010 for the opening of the AstroPark.

太空館建築期間攝於工地範圍。
Photo taken during Mr Liu's visit to the construction site of the future Hong Kong Space Museum



檢查展品。
Inspecting one of the exhibits.

廖生攝於天象廳控制台前。
Mr Liu at the planetarium's control console.



廖生和蔡司星象儀合攝。
Mr Liu and the Zeiss projector.

Opening of HK Space Museum

Space Museum 1982 Xmas party

Space Museum First Anniversary

Joseph Liu and the Hong Kong Space Museum

It had long been a puzzle to me why Hong Kong had to have a Space Museum. Of course we know that in 1974 the then Urban Council decided to build a Space Museum. They later found Mr Liu to do the job. The rest is history that many of us know. To me it is just like knowing that from the Big Bang onward, we have the Universe. But why is there a Big Bang? Why did the Urban Council decide to build a Space Museum in the first instance?

Hong Kong Space Museum (HKSM) was opened in 1980. By that time there were already colleagues working for the Hong Kong Museum of Art and the Hong Kong Museum of History. So HKSM was not the first museum of the Urban Council. But in 1980 the Hong Kong Museum of Art was still operating in a rented commercial building called Star House, and the Museum of History was temporarily situated in Kowloon Park. HKSM was the first purpose-built museum under Urban Council with a permanent location. This was my first HKSM puzzle.

If you look at the current administrative structure of HKSM, it is under the management of the Chief Curator of the Hong Kong Science Museum. But the Science Museum actually opened only in 1991. The Chief Curator of Hong Kong Science Museum is under the Assistant Director (Heritage & Museums), who reports to the Deputy Curator (Culture), who in turn looks after the Performing Arts Branch, the Libraries & Development Branch in addition to the Heritage & Museums Branch. The department is called the Leisure and Cultural Services Department. It will not be difficult to realize that HKSM is very low at the departmental policy level. How could HKSM then get the support from the Urban Council to have a permanent museum venue well ahead of all other museums?

From a policy point of view, the work of HKSM is more closely associated with education. There was no obvious reason why the then Urban Council should support a permanent space museum. In particular the Urban Council in the 70s consisted mainly elite members of the community who considered art fashionable, viewed history important for Hong Kong, but then why astronomy and space science? Hong Kong did not have any significant achievement in space science or astronomy. In the 70s there was obvious no space policy in Hong Kong which could have driven the creation of a HKSM. Even in the universities in Hong Kong there was no formal undergraduate study in astronomy.

There was also a second puzzle: why Joseph Liu? Ironically after more than 30 years since the opening of HKSM, should Joseph Liu apply for an Assistant Curator post (the most junior rank of the Curatorial Grade) at HKSM, he would not have been shortlisted, not to mention given the job! His academic degree was not related to science, technology or museology. His application would have certainly been put aside in the first round of selection.

Nor did he has any experience of working in a planetarium.

It is common in many places for senior management or board members to look for experts internationally to take up such a project. From a management point of view, it is easy to think that when an overseas expert with good experience is employed, should there be any problems, the management could reason that they have already tried their best. But when this happens with a local candidate not having any proven experience, any mistake could readily become a management disaster.

I can easily name at least a dozen science centre or planetarium experts who moved from one place to another to head a science centre or a planetarium project. So how did the Council had so much trust on Joseph Liu for him to head the HKSM project?

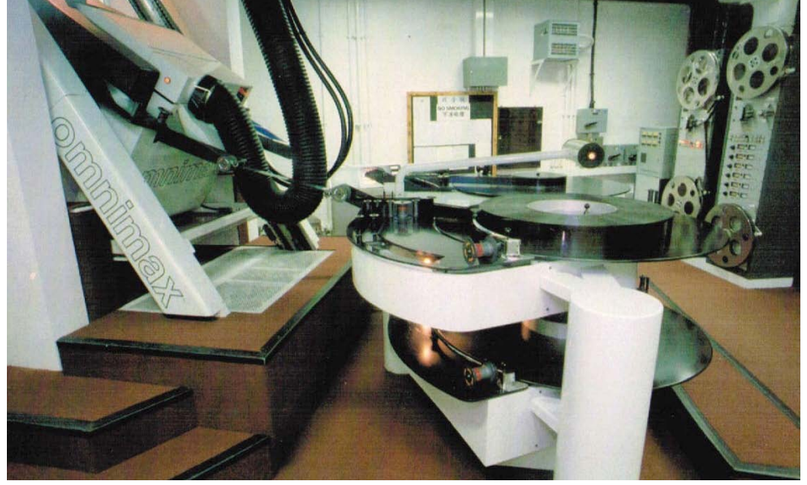
I could not figure out the answer even when I became the Chief Curator looking after both the Hong Kong Science Museum and HKSM. I knew that I could only seek the answers to my puzzles from Joseph Liu directly. I asked these questions during one of his trips back to Hong Kong about 10 years ago.

In the 60s and early 70s, Joseph Liu had already had many occasions of overseas visit. He had definitely spent lots of his personal time visiting the planetariums whenever there was one in the cities he visited and made friends with the planetarium directors. It was through the numerous discussions that he acquired sufficient knowledge on how a planetarium should be planned and operated.

With his work in promoting astronomy he got the attention of a person in the Rotary Club in Hong Kong, who subsequently invited him to present a talk to the club members in 1972. Joseph Liu decided to present his experience of visiting planetariums in the world and also the importance of having a planetarium in Hong Kong. The Rotary Club was an elite group and they arranged media coverage of the talk, as a result, the message could be found in the newspapers afterwards.

The Urban Council of Hong Kong had a new Chairman Mr Arnaldo de Oliveira Sales (沙利士b. 1920) on 1 April 1973. Joseph Liu's talk at the Rotary Club definitely created an impact on Sales. As a new Chairman Sales was eager to start an important project of his own, and he decided to build a planetarium in Hong Kong. He sought for advices from many people, including overseas planetarium experts. Joseph Liu told me that his planetarium friends were contacted by the Hong Kong search team, but they responded that Hong Kong already had an expert to do the job. The rest is history.

Retirement dinner



Omnimax Projector

Joseph Liu's contributions to HKSM are more than just initiating and completing it. He did also play tricks with influences that remained even after his retirement.

He was commissioned to build a planetarium. He selected the Zeiss Mark VI that I considered to be the best planetarium projector in the world at that time. Interestingly to me Zeiss Mark VI also represented the most beautiful planetarium projector that had been made with its streamline shape and impressive mechanical structure. I still remember when I was doing star show programming, in many occasions I liked to start with the projector being raised from the well at the start of the show. Wows from the audience could be heard. But Joseph Liu did not stop there with the technologies.

The first IMAX projector for flat screen was installed in the EXPO in Japan in 1970. In 1973 the dome version of IMAX, later renamed as OMNIMAX or IMAX Dome, was created and installed in the San Diego Hall of Science. In the first ten years of IMAX the total number of permanent installations was still small, but Joseph Liu was already able to envision its future in HKSM. He knew that the star projector and OMNIMAX projector were two different types of instruments with complementary advantages which he considered Hong Kong should have both.

According to the financial autonomy given to the Urban Council, the Council could determine the use of any surplus. The growing economy in Hong Kong in the 70s provided the Council with extra money for what could be invested. So Joseph needed only to persuade the Urban Council on items he considered necessary. However, the building was under a different arrangement, and as it was funded as a government project, the involvement of the government architect was compulsory.

The Council had decided to have a star projector for the HKSM initially. So the architect would plan a theatre for housing the star projector only. However during Joseph Liu's overseas visits, he was already impressed by the capabilities of OMNIMAX, and he knew how much room was required to have it installed. The challenge was then on how to make sure a building constructed for a star projector could also house another instrument which would compete for space.

He had told this story to us many times. He informed the architect that as a planetarium there was a need for certain space to store some equipment. A window between the storage area, which is a floor below the theatre, and the theatre was required for moving the equipment from time to time. Later he put up the proposal for the purchase of an OMNIMAX projector. When asked where that could be installed, he said that the storage space was just sufficient for its installation without affecting the other projector.

I must say that Joseph Liu's passion in astronomy and perfection definitely helped a lot in the development of HKSM. By the time HKSM was opened with both projectors, Hong Kong was the first place in the eastern hemisphere, and the sixth location in the world, to have installed a permanent OMNIMAX projector. With so many countries in the world and so many cities, it is not easy to imagine how Hong Kong could be that advance in the planetarium field.

For over a quarter of a century, HKSM has been benefited from the installation of two different projection systems under one dome. The Zeiss star projector was a good piece of educational tool and the star shows were always of high educational value. However the visual effects were in general static or slow moving because of the many limitations in traditional planetarium special effect projectors. The OMNIMAX had better visual effects, but many of the films were more entertaining than educational. The combination of the two provided a better and balanced mix of programmes that gave different visitors something suited to them. These resulted in HKSM having a very steady stream of visitors, with the highest annual revenue for many years.

Joseph Liu's contribution did not stop here. In 1994 when I attended an international conference related to the giant screen industry in France, I had the pleasure of filling an empty seat in a table at an evening dinner. The guests round the table knew each other well including some from US and some from Europe, and I was the only Asian that they did not know. When I introduced myself I suddenly found that some in the table were talking about the equipment of the Hong Kong Space Museum. They knew Hong Kong!

They were talking about the automation system of the equipment of HKSM. By the end of the 70s the key planetarium equipment was of course the star projector. But to create a good story you need to have a lot of other visual effects to supplement the star field. The effect could not be complicated as they needed to be controlled manually. Some people had attempted to use computers to control them but did not succeed. By that time HKSM decided to go for automation and so employed a company rather famous in the field to do the work. This would be the first automation project, and a number of theatres were planning to do the same if this one was successful. But with the worst of luck the company gave up eventually.

Joseph Liu knew that work should continue and so he sought help from the head of a local company Cable and Wireless that had been providing technical support services to the government for a long time. One of the senior staff of the company decided to provide full support to help the Hong Kong system become automatic and it was a success. The guest who talked about HKSM automation at the Paris table was Mr George Moynihan, Executive Director of the Pacific Science Center. That encounter triggered an international exchange programme between HKSM and the Pacific Science Center.

With a full passion in the work he loved, Joseph Liu was always heading for perfection to the extent he could, and would learn as much as he could. He demonstrated his work not by his authority, but by his vision and passion. After his retirement in US, every time when he came back to Hong Kong his former colleagues were eager to have lunch or dinner with him. Although Salinas is not a major city in US, many colleagues paid visits to Joseph Liu and stayed in his home when they were there. His legacy for passion, dedication and perfection continues.

YIP Chee Kuen

Ex-Chief Curator
Hong Kong Science Museum
May 2014

Yip Chee-kuen is the former Curator of the Hong Kong Space Museum, the former Chief Curator of the Hong Kong Science Museum, as well as the former Executive Director cum Chief Curator of the Macao Science Center. Yip was Joseph Liu's co-worker when he worked for the Hong Kong Space Museum. Although retired, Yip is very active in promoting planetarium science.

廖生在「1977 天文展覽」前的留影，左一是梁淦章，左二為筆者。
Mr Liu, KC Leung (first to the left) and Eddy (second to the left) in a photo taken at the 1977 Astronomy Exhibition.

敬愛的廖生：

很久沒有給您寫信，歉甚！（吳鴻章會向您解釋原因……）

得悉您正受疾病煎熬，心情十分沉重。想摯誠的告訴您，中六（1974年）跟皇仁天文學會的同學前往您位於上水的府上，是我第一次遇見您並看到當時全港最大的天文望遠鏡，興奮的心情雖隔多年仍是記憶猶新！（您對當時的我應該沒有留下任何印象。）

大學畢業後能在香港太空館籌備開館期間與您共事，並親炙您待人處事的風範，雖然時間不足兩年，卻是我畢生的榮幸。1993年與太太前往您於Salinas的府上探訪，更是令人難忘的時刻。（不知您是否記得，我們臨別時您和廖太更送了我們一大袋剛從樹上摘下來的紅蘋果！）

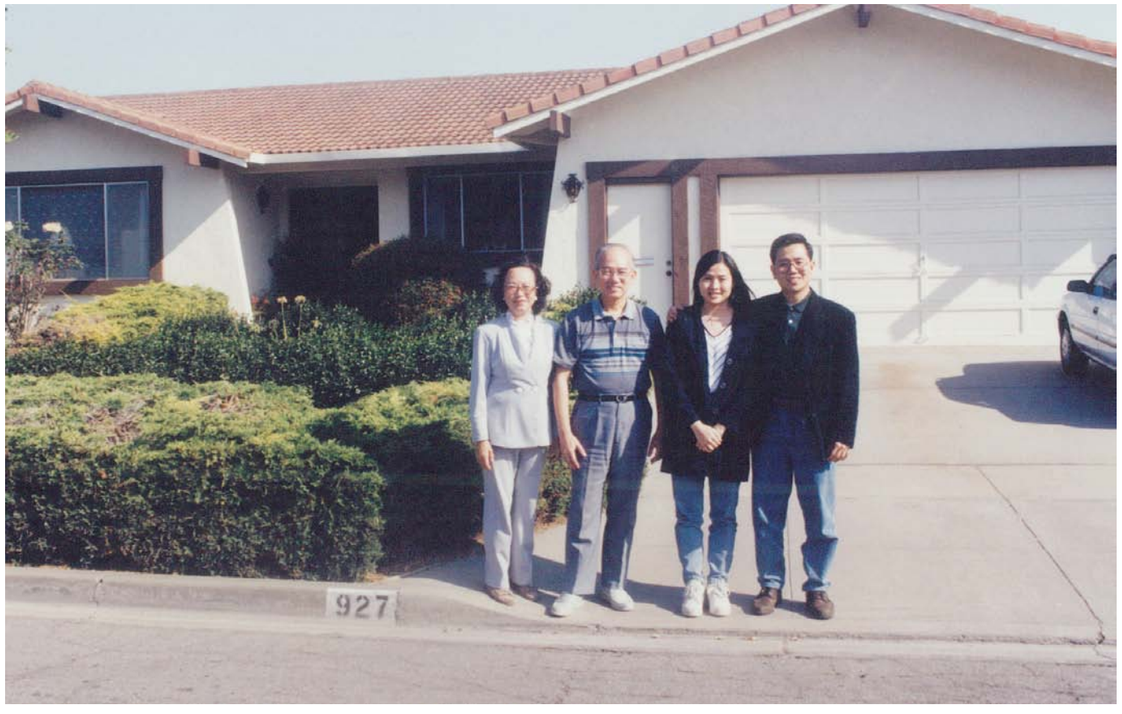
記得我當時為您的超級私人天文台拍了大量照片，打算94年移民澳洲悉尼後「照板煮碗」，卻因種種原因最終沒有實現（雖然已經買了一枝Astrophysics的7吋折射鏡）。作為天文發燒友的我，對此實在感到遺憾和慚愧。

最想您知道的是，此時此刻，每一個認識您的人、每一個在香港發燒天文的人，都惦念着您並為您祝福！

學生
偉才上
2014年4月4日

李偉才（EDDY LEE）於香港大學物理系甲級榮譽畢業，並於1999年在澳洲獲取博士榮銜。他於80年初在太空館工作與廖慶齊先生共事。李偉才著作甚豐、課題遍及科普、哲學、科幻、經濟等領域。亦因李偉才在科普推廣工作方面成績卓越，廖先生於1985年推薦李偉才為香港十大傑出青年。

1980年大年初一，太空館一眾人員在廖生的領導下，在香港太平山頂觀看了一次「帶食而沒」的日偏食。
On the first day of the lunar new year in 1980, Mr Liu led a team of Hong Kong Space Museum staff to watch the partially eclipsed sun sinking into the western horizon from the Peak on Hong Kong island.



筆者與妻子1993年到莎蓮娜市探訪廖生夫婦時攝。
Eddy and his wife Iris visiting Mr and Mrs Liu at their Salinas home in 1993.

在羅師的日子

黃耀華

廖先生在50年代就讀羅富國教育學院（羅師）時已醉心天文，從學院的舊刊物中，可知廖先生自那時代開始，已熱愛和推廣天文，筆者有幸探訪廖先生年青時的鄰居、小學及羅師同學馮源先生，從訪談與舊刊物中，為廖先生在師範的日子整理出一鱗半爪逸事：

「……一天，學院考試，一位同學在草地上架了三腳架、天文望遠鏡、攝影機。考試中途，他向講師請求離場數分鐘，拍攝難得一見的日食，講師不允許，這同學說就算考試不合格也要離場。這故事結果如何無關重要，故事主角是第十一屆校友廖慶齊，日後本港第一位天文學家。」（編者按：說廖生是業餘天文學家，相信沒有人會異議，但廖生本業並不是「天文學家」。）

筆者翻查日食紀錄，這次應該是1955年6月20日在香港可見的日偏食，廖先生利用這次天文現象作日食攝影測試和實習，為半年後於同年12月14日在香港可見的日環食作準備。

「……我和他自幼是鄰居及小學同學。這位學弟，教給我不少東西。中學時代他愛好攝影，在家中一角設黑房，我未學攝影先跟他學沖曬菲林。到他購望遠鏡開始天文觀測時，我知這是昂貴的興趣。他對我說，他選擇了孤寂的事業——深夜獨自觀看一顆幾十年甚至百年出現一次的星體，參考的是百多年前天文學者寫下的資料，而自己記下的數據也是供下一代後人使用。我說天文學者都是偉大忘己的。」

「……1957年他請校友到他家中觀星。下午他先給大家介紹天體拍攝原理，也提及當年的新話題人造衛星。他那著名巨型月球攝影望遠鏡裝在天台上，入夜後在天井架起四台小望遠鏡供廿多人觀看……」

「……在新界上水家中天台，設立私人天文台，從一枝小望遠鏡開始，陸續增置大小不同的望遠鏡——自己磨鏡頭，購零件裝配攝影機在望遠鏡上。早年的本港天文愛好者有誰未曾在他家天台渡過多少個不眠之夜？」

「廖慶齊謙謙君子，對人對事，誠懇認真。他熱愛天文、攝影、書法，造詣甚深。」

半世紀過去，2006年廖生和一眾羅富國教育學院舊同學同遊新疆時攝。
In 2006, after half a century Mr Liu and a group of his former course mates of Northcote Teachers' College visiting Xinjiang.

黃耀華（Y W Wong）現任科學館助理館長，於80年代與廖慶齊先生於太空館共事。

我與香港天文之父
廖慶齊先生認識的故事

李志輝

被譽為香港天文之父的廖慶齊先生，於2014年4月23日，在美國加州逝世，他一生在天文推廣普及工作不遺餘力、成就卓越、貢獻良多。若沒有他，我也未必成為天文愛好者。

大家曾否記得，1978年初本澳某報章的頭版，大篇幅刊出本澳嘉樂庇大橋晚上的天空出現大面積UFO現象？但奇怪的是，這麼驚人的景象竟然沒有人發現，而只被一個名「阿丁」的葡國人所拍攝到，並投稿到某報章刊出。由於當年戲院正上映荷李活電影「第三類接觸」，內容是講及外星人乘飛碟來到地球，故此報章的UFO消息引起社會很大的迴響，竟然令很多市民相信本澳曾經出現UFO，一時間弄得滿城風雨，議論紛紛。

澳門有一位對UFO有相當心得的朋友名潘崙山，我本來並不認識他，可是因他知我是天文愛好者，故主動找上我來，目的是想我和他一同去解構阿丁在報章上的UFO照片，為此我和潘先生成為了朋友。為了可以看到阿丁更多的UFO照片，潘先生主動找阿丁約見，初時他並不肯見，幾經邀約才應允。此人十分警覺，生怕我們有所圖謀，初時只展示一些不太清楚的照片，經多次約會後才拿出他的驚人之作。

在赴港前我先以電話與太空館聯絡，為了出師有名，更使用了一個名為「澳門UFO探討會」的名義。可是這個電話可真不好打，幾經艱難才能與當時的太空館臨時館長廖慶齊先生直接通話，這陣子真是心慌不已，懼怕對方會不多理睬已掛斷，可是一把聲調禮貌慈祥的聲音把我的恐懼一掃而空，廖先生詳細詢問我來電的意思和要求，我便說明來意和希望能親身到訪，廖先生即時應允。

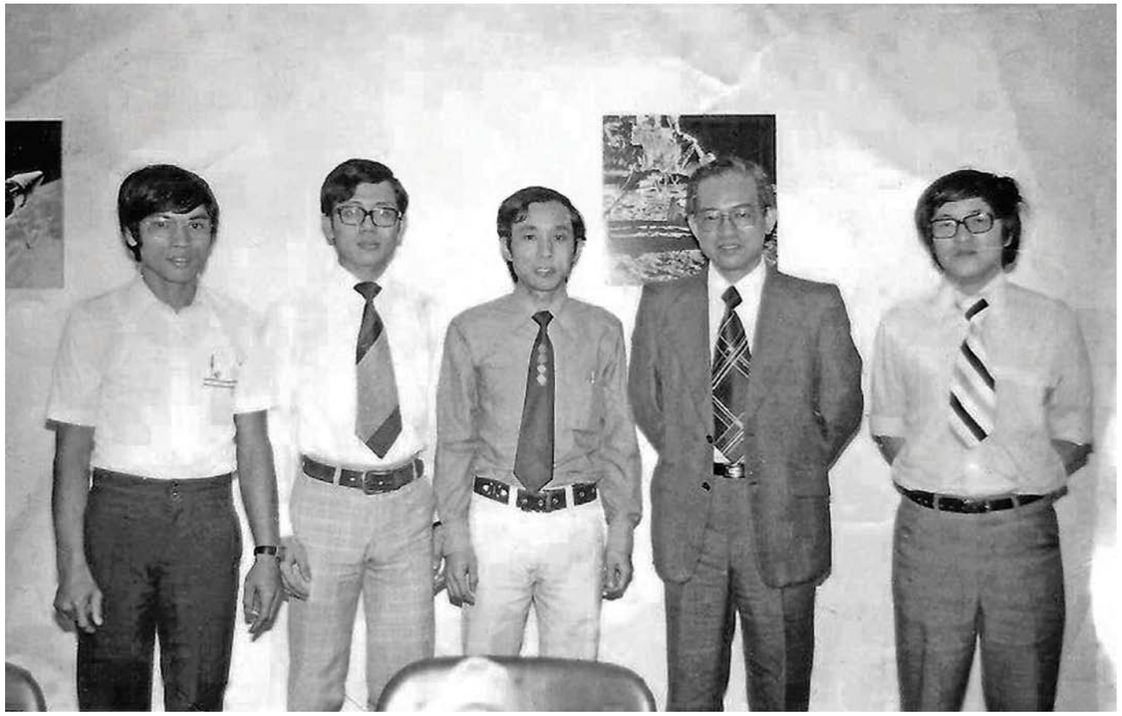
1978年的10月初，我和潘崙山、陳麗容和阿丁一行4人赴港拜訪。當進入辦公室時，廖先生和他的同事已經在等候，分別是李偉才先生和長於紅外天文學的戴明興博士。首先是放映我在澳門西灣岸邊拍到的UFO八米厘片（我是用此影片來取得阿丁的信任，使他相信我也是UFO愛好者），經大家分析後認定那所謂UFO只是在大嶼山上空輪候降落的客機，只是視線方向的巧合所做成的假像。

接着是觀看阿丁的UFO幻燈片，初始放映的沒有甚麼明顯的影像，這是阿丁試圖取得大家相信的策略，接下來的愈來愈令人覺得不可能，當UFO出現時竟然連光線都可偏離原來位置，三四十幅都是這樣。為甚麼出現這麼的現象？為何只有阿丁才見到？根據阿丁的解釋是因為當他看到遠方有UFO出現時，便立即用相機拍攝，由於菲林感光的光線波長只有菲林才可記錄到，所以人們便看不到。廖先生和各人都認為他的解釋十分牽強，這時阿丁開始面有難色，便再拿出當日在報章頭版刊出的「驚人之作」來辯解，當時戴明興博士解釋，這影像是在長時間曝光之際，用發光體在鏡頭前移動，留下一道像飄蕩的光跡，而且由於鏡頭景深的關係，這光跡有點失焦，這一下便拆穿了阿丁的西洋鏡。此間阿丁便憤然而去，我們亦終於證實澳門當年出現的所謂UFO，原來是這個葡人為了賣錢而做的騙局。

真想不到，當年我還只是個黃毛小子，為了拆解澳門當年的UFO事件，因而認識了香港天文之父，然而廖先生為人和藹謙遜，對後輩的扶提從沒架子，至今仍在腦海中迴蕩。或許若當年我沒有認識他，我亦未必有創立澳門業餘天文學會（現已改名為澳門天文學會）的念頭呢。

廖公，感謝你！

李志輝（Lei Chi-Fai）先生是現任澳門業餘天文學會會長，於1978年認識廖慶齊先生。



由左至右是李志輝、助理館長李偉才先生、潘崙山、香港太空館臨時館長廖慶齊先生、副館長戴明興博士，拍攝地點在大會堂低座。

From Left to right: Lei, Mr Eddy Lee (Assistant Curator), Mr LS Poon, Mr Liu, and Dr MH Tai (Curator) taken at the temporary office for the building of the Hong Kong Space Museum at the lower block of City Hall.

1993年筆者、廖生、李治路易拍攝於太空館門外。

Photo taken in 1993 in front of the Hong Kong Space Museum with Lei (to the left), Mr Liu and Luciano Jorge Ritchie (to the right).

青少年天文台內的望遠鏡設施。
The astronomical telescope at the Youth Observatory in Bradbury Camp.

永遠懷念廖慶齊先生

廖慶齊先生於本年4月底於美國離世，本會深表哀悼，並對廖先生的家人致以深切慰問。

香港小童群益會位於西貢黃宜洲的白普理營，於1985年啟用，而營地最大特色為建設一推動天文知識及活動的「青少年天文台」。本會亦自1985年開始，邀得廖慶齊先生擔任本會營舍委員會的顧問，廖先生對營地天文設施及發展一直給予寶貴的意見及建議，而營地天文活動廣受學校及團體的歡迎，廖先生的指導實居功至偉。白普理營亦藉廖先生的連繫，多年來獲得香港天文學會的支持和協助，包括提昇天文台天文設施的質素及合辦天文活動，讓營地在推廣天文方面與時並進。

本會將永遠懷念廖慶齊先生對本會白普理營的貢獻。

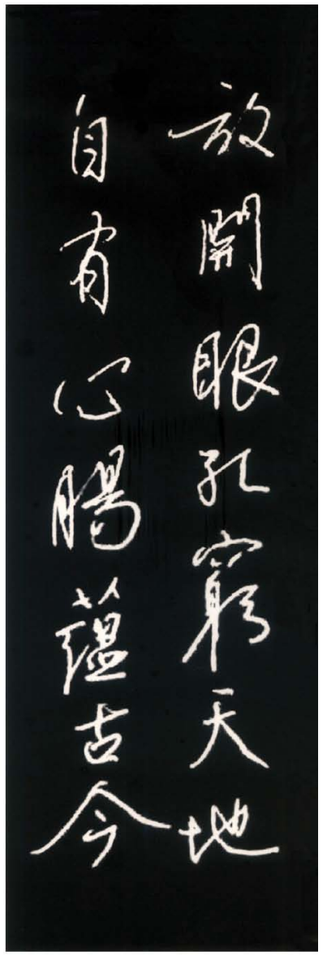
香港小童群益會

2014年5月

青少年天文台的外觀。
The Youth Observatory at Bradbury Camp.

勇者廖慶齊先生

楊光宇



吾生也晚，然而香港天文界先驅、香港太空館創館總館長廖慶齊先生的事蹟和對天文普及教育的貢獻，仍是膾炙人口，令人難忘。

60年代的香港，天文仍未普及，就如廖生所言，是從美國買一枝望遠鏡入境，途經日本都會被海關扣留，在香港運送，又會被警員當是迫擊炮細心檢查的年代，當年香港天文情況就如兩位皮鞋推銷員去到非洲，廖生是位勇者，他不會覺得非洲人不會穿鞋，也不聽從他老師（大意）：「廖慶齊，地球咁多嘢你唔學，個天咁遠，有甚麼好學！」的訓誨，他勇於選擇自己的道路，到他成為老師，教化出無數喜愛天文的學生。

及後因緣際會，在70年代初，廖生對天文的學養、熱情和參觀世界各地天文館的閱歷，令這匹千里馬成為替香港建設太空館的最佳人選。事非經過不知難，開創先河從來不易，雖然「經費不是問題」，但原來為了要全面電腦化，當年廖生要求全自動用電腦控制幾百部幻燈投影機一齊操作，去輔助館中最先進的星像投影儀放映天象節目，須知這是30多年前，困難程度可想而知！然而迎難而上，正是勇者的本色！

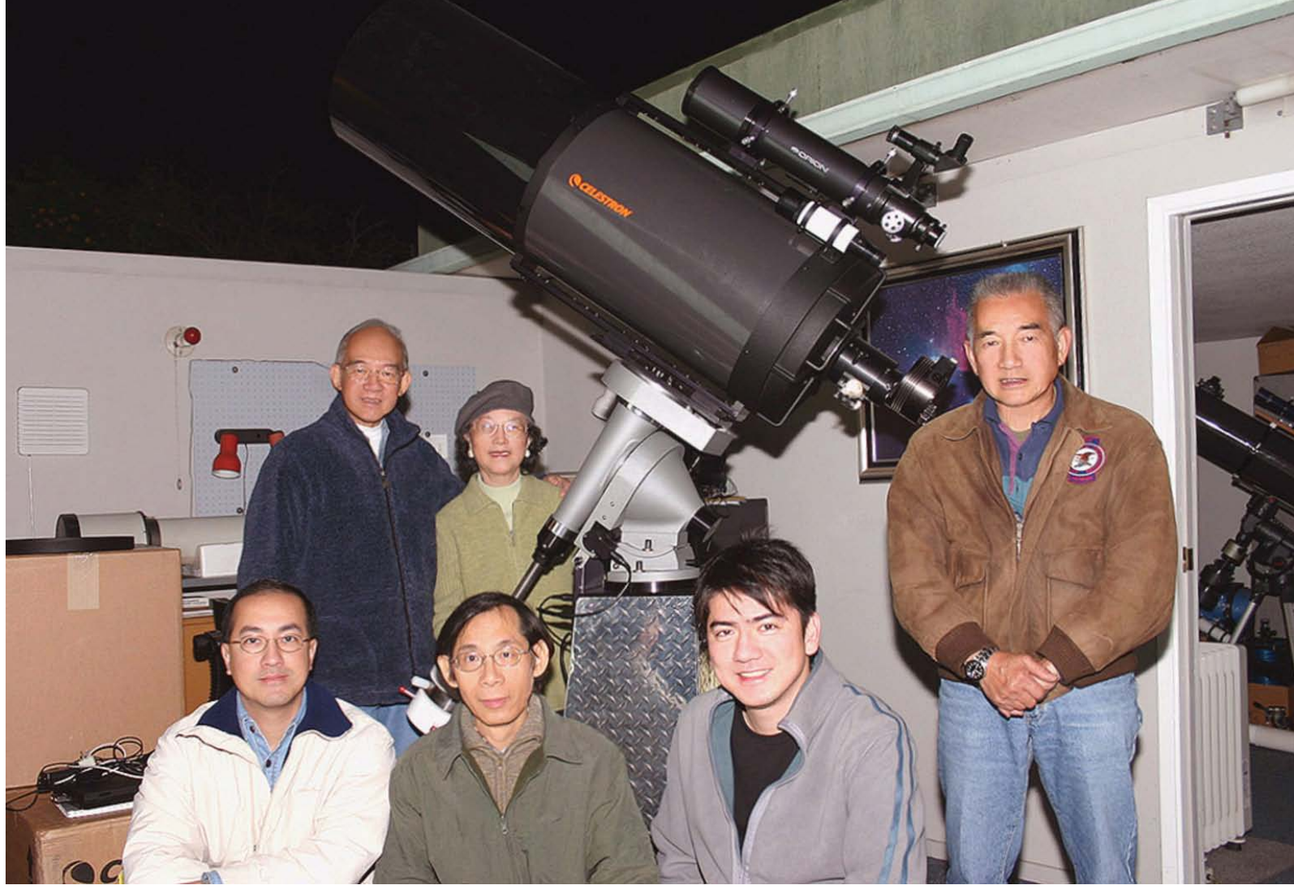
人老了，最怕是不肯去學習新事物，然而在2005年，年屆70多歲的廖生，仍然勇於添置和學習使用電腦赤道儀去觀星。那次幾位天文同好歡聚加州廖生家中（右圖），享受著名的「廖記奶茶」，廖生是謙謙君子，也是仁厚的長者，「放開眼孔窮天地，自有心腸蘊古今」（左圖），這副廖生親題的對聯，正好是他人生哲學的寫照。以下一套情迷博物館：當你見不到天上星星（http://goo.gl/1xwCwi），對廖生有頗詳盡介紹。

曾經在飛機上看過一套電影，其中一句對白大意是：「人生的意義，有時可以從過身後，朋友的反應看到。」這幾天與一位天文朋友分享，他說人老了，有以下的感慨：*"I've seen a lot of interesting things and met lots of notable people. One of the things that provides me lots of satisfaction is when I meet someone younger and they tell me that something I did or said inspired them to do something. I'm really not all that notable a person but it's nice to have contributed in some small way to somebody else deciding to do something notable."*

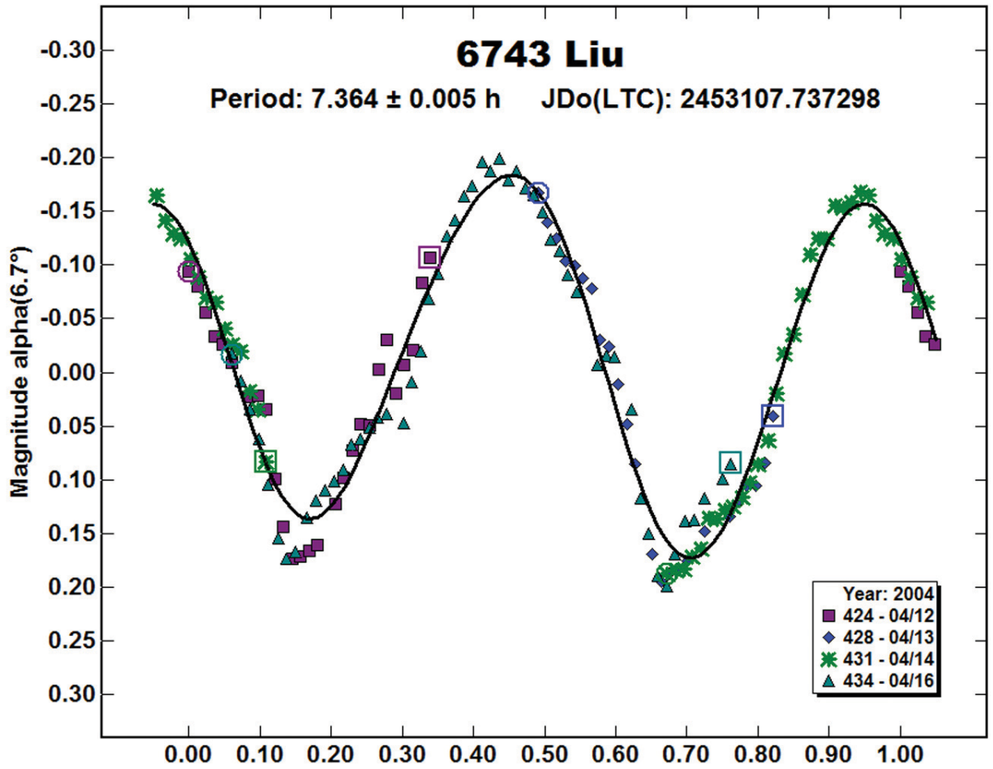
不論是新知舊雨，大概也能從這本紀念特刊和其中一眾文章，體會到廖生的不朽和貢獻。

執筆之時，找到一張久違了的照片，測量以廖生命名的6743號小行星的自轉周期，觀測照片由筆者拍攝，由Brian Warner先生分析出7.364小時的周期。但願廖生不朽的情懷，仍在天上照耀人間。

楊光宇（BILL YEUNG）自2009年成為香港天文學會會長至今，雖然認識廖慶齊先生時間不長，但十分敬佩廖先生對天文學的熱愛及就觀測方面一絲不苟的精神。楊光宇個人熱衷尋找小行星，個人發現了逾1900顆小行星，為全球發現最多小行星的第二人。



2005年朱永鴻、吳偉堅偕筆者造訪廖生，攝於其天文台，右一為廖生的弟弟（Lum Gor）。
Bill Yeung, Alan Chu and Eric Ng visiting Mr and Mrs Liu in 2005. The man to the right is Mr M L Liu, the younger brother of Mr Joseph Liu.

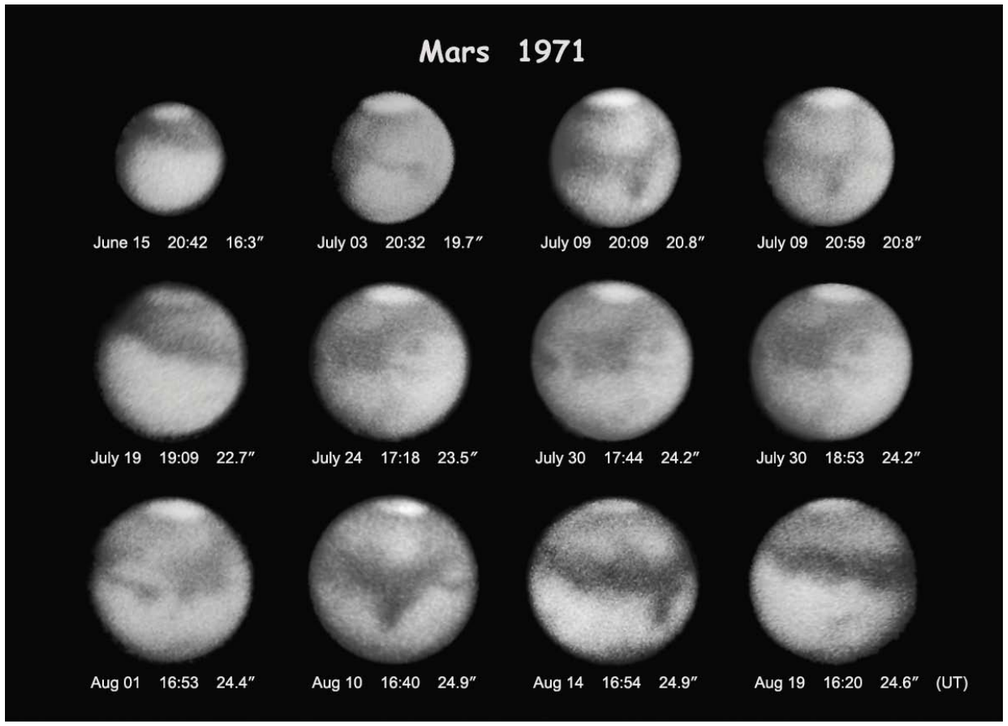


廖慶齊先生的一些往事

朱永鴻

人生中總有一些事永留記憶。廖生與我亦師亦友，退休後我曾到加州莎蓮娜市廖生自稱的「廖記客棧」小住三次，每次大家都在星月下暢談古今，但印象最深的仍然是1971年在香港初見的一次。在此之前，我和其他市民都從報章略知香港有兩位「通天」才人，一位是編纂《通勝》（通書）的蔡伯勵，另一位就是用望遠鏡睇天的廖慶齊。我和廖生未見過面，只知報章登過他的天文相，71年夏天趁着美國探月熱潮和火星臨近大衝的消息，南華早報還率先刊出廖生在香港首次拍攝的火星，那時我初出茅廬，僅有一「不足秤」的小型望遠鏡，心中不免想認識這位資深前輩，多方打聽下才查得上水差館（警局）附近有幾戶人家合稱「廖廬」的，我終於鼓起勇氣在8月夜訪上水，順道買了一個冰凍西瓜作見面禮（傳統禮儀，初次拜訪長輩不能兩手空空），就這樣邊行邊問「摸」進廖生祖屋的後院，初見時廖生正準備用6吋牛頓鏡拍攝火星，那有時間招呼一個唐突小子？寒暄過後他又回復工作，好不容易才等到他歇息，大家就在客廳開始吃那個西瓜，傾談中我恍如茅塞頓開，不過我總算「識做」，不敢久留便告辭了，歸途中，我仍然開心地幻想這位前輩繼續在後院拍攝高升中的火星，又或者在黑房內沖曬剛才曝光菲林的情景。

1972年，廖生在他的天文班談及火星，我是其中一位學生，他向每人派一份十多張親手拍攝的火星衝照片連火星地圖，這時我才認識火星上沒有傳說中的人工運河，但有大流沙、太陽湖、珍珠灣這回事，這一年我很幸運得到意外的收穫，原因是授課後廖生和我總是乘搭同一班的中環至佐敦渡輪，在20分鐘的航程上他往往忍不住「encore」，再談他的觀星體驗，這都不是靠死讀書得到的。無獨有偶，33年後香港太空館主辦「情繫穹蒼——廖慶齊先生的星路歷程」展覽，廖生向我訴說71火星大衝的底片不知何故遺失了，幸好我重拍當年在天文班獲得的火星照片，作為該次展覽的補充。細心看這輯照片（附圖），這絕對不是靠錄像疊加的數碼相，它們都是廖生經歷多次深夜或黎明，用6吋牛頓鏡高倍放大（f/175！），以Tri-X黑白菲林曝光數秒（感光度只有ISO400兼且粗微粒），不時加插濾鏡增強反差而拍攝下來的多張



158mm f/10 Newtonian + 6mm eyepiece at combined f/175, R-60,Y-52 or O-56 filter, Tri-X ASA400 film, exposure 1.5~6s. Joseph H. C. Liu

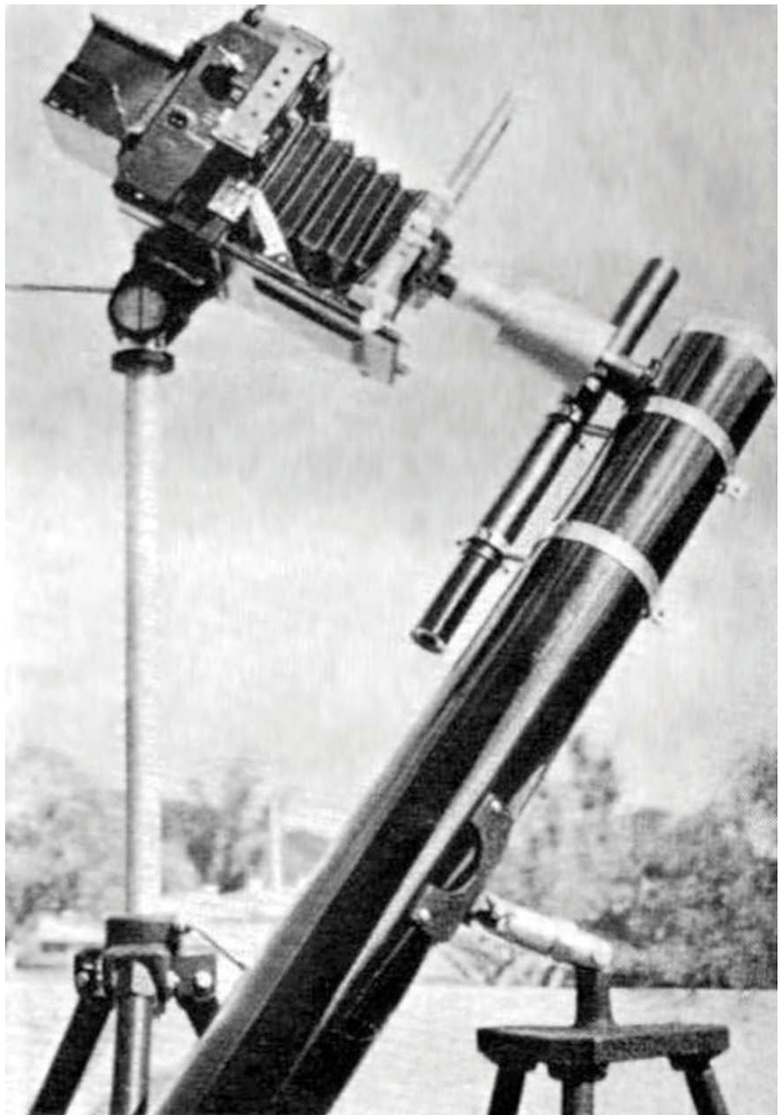
朱永鴻（ALAN CHU）是香港業餘天文學會（香港天文學會前身）創會會員之一。在1971年火星大衝認識廖慶齊先生並是廖先生在港大校外進修課程的天文班學員。兩人相識逾40載，亦師亦友。身為電子工程師，朱永鴻協助廖先生改善其32cm反射鏡的電子追蹤裝置。朱永鴻自行進修天文學並獲得碩士榮銜。他熱愛月面高倍攝影並是 The Cambridge Photographic Moon Atlas 作者之一。

傑作，從照片上我們可辨認到火星視直徑和南極冠的大小變化，最顯眼的大流沙和十多個主要的表面特徵，43年前有此成績實在不易為，廖生常說——「It is the man behind the telescope, not the telescope, that wins.」正是這輯天文相的寫照。

拍攝火星的6吋鏡是廖生的第二枝天文望遠鏡，但讓他走上天文觀測之路卻是一枝美製3.5吋 f/11 Skyscope（也就是擺放在靈堂上的一枝），那時他還有一部父親送作生日禮物的 Speed Graflex 相機（見下圖），這套入門組合使廖生學懂尋星和天文攝影技巧。上次探訪廖生時他樂意讓我玩過 Skyscope 一陣子，它的副鏡頗大，要用手推拉目鏡對焦，當年廣告更妙稱腳架是「equatorial-mounted」，但你又不能說不是，因為它有對着北極星的斜軸，也可以手推鏡筒模擬近似赤道儀的轉向，我玩過後不禁體會到一個道理——基本觀星技巧往往來自不完美設備的磨練，過度倚賴自動化反而得益少。

另一往事是廖生的弟弟，我稱他「Lum Gor」，2003及2005年在「廖記客棧」時大家混熟了，他的車床工藝甚佳，不時為廖生的後院天文台改良機械裝置，他還送我一套調校望遠鏡光軸的小工具。有一晚我單獨和 Lum Gor 到他的深山別墅觀星，奇怪得很，深山的天氣條件比48英哩外的莎蓮娜市好，那晚真正興奮極了，滿天的星星多得要命，整道夏季銀河幾乎橫跨180度，我敢說不知情者會以為是薄雲，這亦是30年來我目視看見最多星星的晚上。Lum Gor 也談到廖家的軼事，廖生知道後微笑不已。

2012年尾收到廖太80歲生辰的照片，在旁的廖生看來精神尚好，想不到10多個月後廖生便離世了。多年來通訊分享過他的幾百幅天文作品，也保存了一枝在美相贈的高質素 Orion 15cm f/8 牛頓鏡，每當拿它來觀賞月球，故友情懷依然瀝瀝在目。



廖生在1951年使用的3.5吋 Skyscope 和 Speed Graflex 相機。

In 1951, the Speed Graflex camera and the 9-cm Newtonian used by Mr Liu.

從生活點滴追憶廖慶齊先生

潘德新

校外課程、球場觀星

首次認識廖慶齊先生大約是念中一那年，學校的天文學會邀請廖先生主持講座。由於學校的物理老師與廖先生是好朋友，邀請他只須撥一個電話，十分方便。

1966年開始，廖先生在香港大學校外課程部開班，教授天文觀測，我的好友黃運雄報讀了數班。除了課堂講授外，課程也包括實習。1967年11月我跟隨黃運雄參加實習班，地點是粉嶺火車站旁的球場。那晚天氣十分好，一位學員帶來一台3吋折射鏡，以高倍觀測土星，廖先生則帶來5吋RFT（Rich field telescope，廣視場反射鏡），各人正看得興高采烈，突然兩輛警察衝鋒車駛進球場，數名荷槍警察下車，將我們包圍，並喝問我們在做甚麼。當廖先生向他們解釋時，我靈機一觸，邀請他們觀看土星，看過土星後他們表示嘆為觀止，不久亦收隊離去。那晚稍後他們再來時，已自發熄滅車頭燈。那晚的經驗十分寶貴，但對一個靠補習每月賺取30元生活費的我，一晚用去15元作宵夜費是太奢侈了。

程門立雪、夜訪上水觀測站

那時，我心中十分矛盾，一方面希望藉參加這些實習班向廖先生學習，但奈何囊中羞澀，不能經常參加，而且班員眾多，很難跟廖先生作深度討論。經多番思量，決定冒昧「打擾」廖先生的觀測工作。那時，廖先生住在亞皆老街，卻在皇仁授課，實不知晚上他會否回上水觀測。一天晚飯後見天色甚佳，我便致電廖先生，但接電話的是廖太，她說廖先生回了上水，我便說想到上水跟廖先生觀測，她說沒問題。當我再致電上水廖宅，很久也沒人接聽，考慮到廖先生可能正在進行攝影觀測，便決定先到上水敲門。這便是廖先生多年來常談到我「弄醒半條村」的逸事。那次之後，我只按門鈴兩次，便站在門外耐心等候。等候時間不定，端視乎廖先生攝影進度，一般為20至40分鐘。

當廖先生調任沙頭角中學後，他多住在上水，那數年是廖先生勤於觀測的時期，只要天氣許可，天文台的可移動頂蓋於日落後便打開，準備觀測。我也多次不管翌日還須工作，於周日跑到上水觀測，翌日清晨乘首班巴士回赤柱。那時，廖先生的父母也間中走到天文台，或觀看，或交談。到半夜時，我們會稍為休息，廖先生便拿出廖老太製作的炒米餅，再泡一壺鐵觀音，作為宵夜。這些都是令人難忘的事。

至1974年，廖先生被借調至市政局，負責太空館的建設，由於工作繁重，觀測機會不多。我最後一次到上水已是1980年，應港大物理系邀請，協助拆卸及搬遷12.5吋望遠鏡。回想那數年，從廖先生處獲益良多，除了天文觀測的技巧外，更重要的是見識到廖先生對天文工作的認真和一絲不苟，以及感受到他對年輕一輩的提攜及照顧。

廖先生每次將菲林放入相機，必反覆將相機內部及外露的菲林清理，一般須時5分鐘。而完成拍攝後，便立即將菲林沖出來，待菲林乾了，再用放大鏡檢查。至於放曬照片，則多留待在不能進行觀測的晚上才做。

廖先生戒煙的逸事

在上世紀六、七十年代，吸煙十分普遍，即使在學校內，也有老師吸煙。有一次，廖先生到學校主持講座，一位老師拿出香煙，正想點火時，冷不防廖先生說：「吸煙影響視力，不利天文觀測。」那位老師立即停止點火，並收起香煙。至講座完畢，幾位老師和天文學會委員們留下來與廖先生閒談，那位老師再拿出香煙，並遞給廖先生，但廖先生卻拿出小雪茄！後來，我才知廖先生的煙癮不小，但他在進行觀測時，不會吸煙。

當廖先生被借調至市政局，籌建太空館後，經常在大會堂的臨時辦公室商議推廣天文的活動。一天，我發覺整個下午未見廖先生吸煙，便婉轉問他，他答得很簡單：「我戒了。」再問他如何戒煙，他說：「去年到美國考察，在阿里桑拿州停留，早上起床時發覺口氣很臭，便戒了。」

潘德新（T S POON）是香港業餘天文學會（香港天文學會前身）創會會員之一。
他於60年代末認識廖慶齊先生並經常於廖先生的天文班的學員實測提供即場協助，實為廖先生天文班的最佳助手導師。他本人熱衷於太陽觀測、對太陽活動最感興趣。

廖先生對朋友的情義一例

很多天文愛好者都需要各式各樣的連接環，以應付不同的觀測項目。廖先生的各類連接環，都是自行設計，再交徠卡相機修理部何義任加工製作。約在1970年，我認識了在中環一後巷梯間代人製作各式相機接環的吳兆康先生，便將所有這類零件都交他製作。後來與他談到廖先生請何義任造接環，吳兆康竟說，何義任所有的接環，都是外判給他加工。我將此事告知廖先生，他立即與我走訪吳兆康，此後並將所有零件交給他製作。

後來，吳兆康患上小腸疝氣，須做手術，由於吳獨自居住，廖先生便駕車把吳送到醫院，當吳在手術後在醫院休養時，廖先生亦去探望，又安排接吳出院。對此，吳兆康非常感動。

廖先生遇到的尷尬事件

1976年，英皇書院天文學會邀得廖先生主持講座，一位從未在這個講座出現的郭全本老師走進講堂，並對廖先生說：「我今日特意來聽聽，天文是甚麼一回事，事因犬兒太不生性，又不聽我勸，堅持要讀天文。」

後來，廖先生每談到此事，都不勝唏噓。郭全本老師是羅富國師範學院首屆畢業生，是廖先生的大師兄，所以不方便直斥其非，但心中戚戚。直至80年代初期，郭老師的兒子郭新教授回港探親，並應邀在太空館主持講座，期間郭老師老懷安慰，那次尷尬事件，終於消弭。

1977年天文儀器製作比賽，潘德新是其中一位得獎者，圖中他正向市政局主席沙利士介紹該儀器的功用。左一是廖先生，右二是黃衍蕃。

At the 1977 astronomical equipment competition, TS Poon (the one in the red shirt) was one of the award winners and he was explaining to the Urban Council Chairman the use of the award-winning equipment. Mr Liu was at far left and HF Wong was standing next to Poon.

永遠懷念廖慶齊先生

梁淦章

廖先生的離去，香港、澳門、國內以至世界各地天文界的朋友無不感到惋惜。對於香港天文學會來說，更是失去了一直鼓勵我們，在背後默默支持學會40載的天文前輩。

看着學會的孕育

廖生自1989年開始，一直擔任學會的名譽顧問。學會能有今天的發展及成就，少不了廖生在背後不斷的關懷、提點與鼓勵。其實廖生與學會的淵源甚深，早於1970年AAU年代（註），大部分天文學會創會元老都曾師承廖生，拜為廖生的天文學門生。AAU醞釀註冊為公開會社之時，亦曾向廖生多番請教。

1979年攝於大會堂，最後排中間偏左為廖生和廖太。

Photo taken at the City Hall for the 1979 Astronomy Exhibition. Mr and Mrs Liu were at the centre of the last row.

看着學會的成長

1974年學會註冊後不久，當時的市政局決定了興建香港太空館，特意邀請廖生由教育署轉到市政局擔任太空館參事，專責籌劃及興建香港太空館。在廖生的倡導下，天文學會與當時尚未有館址的太空館已緊密合作推動本港的天文教育工作及普及活動，計有由1976年至1982年7年內合辦的公開天文講座——天文叢談。還記得當時在大會堂演講廳舉行時，由廖生主持，聽講的人非常踴躍，經常有不得其門而入的景象。在太空館未開幕前的1977年及1979年，天文學會與太空館合辦了「天文創作比賽及展覽」和「天文攝影比賽及展覽」兩個大型天文展覽會，兩次均在大會堂低座展覽廳舉行，每次都有近4萬名市民參觀。透過這些活動，不單提升了市民的天文知識，也鍛煉了學會裏一群熱心辦會務的會員。廖生令人敬佩的地方是不會把自己看作高高在上的領導，而是與共事者一起並肩奮進。回想1976年本港首次進行的「全港光害調查」，研究城市燈光對本港夜空的影響，為日後大型望遠鏡選址及觀星活動作準備。在一個無月的晴夜，廖生特意充當司機，載着調查隊成員走遍香港、九龍及新界多處地方實地拍攝夜空光度，那團隊合作精神及毅力，深深感染了我們。

太空館在1980年開幕後，廖生轉任為總館長，在他主理下的太空館繼續與學會合作舉辦更多樣化的天文活動，共同推動市民大眾及學界的天文項目。

1976年本港首次進行的全港光害調查。

The first light pollution survey in Hong Kong undertaken in 1976.

2004年9月10日，乘廖生回港，一眾天文學會朋友為其慶祝73歲生日。

A birthday party for Mr Liu's 73rd birthday on 10 September 2004 attended by members of the Hong Kong Astronomical Society.

學會名譽顧問

1985年廖生提早退休，移居美國，但仍經常回港，對學會關顧之情不減。很多會員常藉旅遊之便，專程探訪，在加州的星空下與廖生共享觀星之樂。

為了配合學會在天文教育、觀測研究及交流等多方面的發展，天文學會於1989年邀請了5位專業人士擔任學會的名譽顧問。除了廖慶齊先生外，其餘4位是周威彥教授，馮戡雲教授，冼定國博士及戴明興博士。

1990年廖生回港時我與學會一些委員曾專程到他上水祖居探訪，向廖生求教辦學會之道。廖生非常熟悉各地天文組織的運作，結織眾多專業和業餘的天文學家，並深得他們的敬重。廖先生整晚悉心教導，無所保留闡述他對辦會社的獨有心得。隨後學會發展能系統地訓練接班人，透過多辦活動提升組織能力和天文知識，積極接觸國內外天文組織及參與國際性天文交流活動，擴闊視野，把合適及多樣化的天文項目介紹給會員及市民大眾，使香港的天文教育及普及工作辦得更好，能有今天的成績，除了委員及工作人員的努力外，實有賴廖生40年來在背後的悉心教導和默默的支持。

深得會員愛戴

廖生深受會員愛戴。他每次回港，百忙中也盡量抽空與會員一聚，以行動支持學會，出席期間所舉行的天文活動。廖生是一位非常慈祥、關心及提攜後輩的天文前輩。相信不少會員仍記得我們為廖生在港辦生日會時他那燦爛的笑容。

天文以外的得着

我在天文學上的成長沒有像一些人那樣有機會上廖生的天文課程，但在另一方面我卻比他們幸運，能在大專畢業後不久就加入太空館，在他領導下參與建設太空館的工作。從1978年至1983年近5年裏在太空館工作上得到他的親自指導。從廖生身上領悟到一生受用的做人處世的大道理。他追求卓越、凡事求進、毅力無比、創意無窮、心思細密、計劃周詳、關懷別人、提攜後輩，這些素質都成為我往後做人的座右銘。相信很多人都像我一樣深深感受到廖生那無窮的「正能量」。

永遠懷念您

最後我用廖生在天文學會25周年紀念時（1999年）所錄影的一段說話作結。「……我已年紀大……見到你們一路成長，後起之秀愈來愈多……更上一層樓，未來的10年，25年的進步以幾何級數發展，希望天文學會的會務日隆。」

——謝謝您的教導，我們永遠懷念您——

註：香港天文學會（HKAS）的前身香港業餘天文學會於1974年正式註冊成為公開天文會社HKAAS，在未正式註冊時，於1970年開始以非公開會社AAU（Amateur Astronomers' Union）形式開辦活動。

梁淦章（K C LEUNG）歷任香港業餘天文學會（香港天文學會前身）的會長，於80年代曾於太空館任職與廖慶齊先生共事。梁淦章自行進修天文學並獲得碩士榮銜。

廖先生和早期的香港業餘天文學會二三事

陳鑄略

一. 大力支持舉辦全港首個「天文攝影比賽及展覽」

香港業餘天文學會是現在香港天文學會的前身，是由十多個年青的業餘天文愛好者於1970年組成的，經3年多的籌備，並與社團註冊處協商及修改學會的會章後，終於在1974年9月15日獲社團註冊處批准，正式成為全港首個公開讓市民參加的天文團體。

為了向社會打響新成立的學會的名堂，首任會長向委員會提出舉辦全港首個「天文攝影比賽及展覽」，但正如一些新生事物所遇到的情況一樣，學會中部分委員不支持這項活動，擔心人力及物力未能配合，希望遲些年才舉辦。會長無法說服他們，在這一籌莫展的時刻，這些反對舉辦活動的委員一起去拜訪廖先生，徵求廖生的意見，誰知廖生大力支持舉辦有關活動，還就各方面的具體事務提供了不少寶貴的意見，例如參賽作品的大小、如何裝裱相片來展出等等，令委員們增加了舉辦這個活動的信心，廖生還立即向這個活動捐助了經費。正是廖生一錘定音，玉成了全港首個「天文攝影比賽及展覽」。大家還邀請廖生提供他高質素的天文照片，放在大會堂高座展覽廳的「天文攝影展覽」的入口最當眼處，以壯聲勢。這次活動有幾十位會員及其他朋友參與了籌備及展出工作，令學會鍛煉了參與者的各項工作能力，對學會將來的成長有着非常重要的意義。這個天文展覽有近萬名市民參觀，並且各大報章都有報導，令市民認識了天文學會、帶動了本港天文攝影的風氣、也為本會建立了良好的社會形象。

二. 廖生的香港大學校外課程學生組成坐井會

廖生由1967年起已在香港大學校外課程部開辦天文課程，在1972至74年間，香港業餘天文學會應邀攜帶天文望遠鏡，支援校外課程天文班舉辦的多次觀星活動。受到香港業餘天文學會成立的啟發，廖生於1972年任教校外課程天文班的舊生籌辦了坐井會，並於1976年正式註冊成為本港第二個公開天文會社，初期的會員大部分都是廖生的港大校外課程天文班的學生，他們還捐助經費給香港業餘天文學會1975年的天文攝影展覽。坐井會是近年香港普及天文學的事業中一股強大的力量。足見廖生為本港業餘天文界播下的種子，早已開花結果。

廖生為1975年全港首個「天文攝影展覽」致開幕辭，背景為廖生的高質素天文照片。

Mr Liu officiated the 1975 Astrophotographic Exhibition; his high quality astronomical photos were on display.

三. 廖生舉辦「天文叢談」系列講座

從1976年太空館籌備到1982年太空館成立後兩年的7年間，為了向香港市民推廣天文知識，廖生提出每年都和香港業餘天文學會合辦「天文叢談」系列講座，每個系列有8至10個講座，由廖生和天文學會的會員每人分別主持一講，前5年的場地為大會堂低座演奏廳（500座位），及後兩年改於太空館演講廳（192座位）舉行，這些天文講座掀起了市民及年青人學習天文學的風氣，聽講的人非常踴躍，經常有不得其門而入的景象。

四. 太空館未建成已舉辦兩個大型的天文展覽

廖生重大成就之一是為香港籌建太空館，他告訴我們，當時他是太空館唯一的職員，只有幾個由市政局借調來的職員與他一起工作。在籌建香港太空館的繁忙及繁多的工作中，廖生不怕辛勞，提出在1977年及1979年於大會堂低座展覽廳舉辦兩項大型活動，分別是「天文創作比賽及展覽」及「天文攝影比賽及展覽」，目的是向香港市民介紹將會建成的太空館，及向市民推廣各項天文知識，對於這種極有意義的天文活動，香港業餘天文學會一於大力支持，政府出錢及借出工作間，天文學會出力，號召數十會員參加了這兩個盛大展覽的籌備及展出工作。每次展覽均超過4萬名市民參觀，不單市民了解到太空館的進展及其他天文知識，也提升了本會的社會地位，更鍛煉了會員的各項工作能力，增加了會員的歸屬感，對學會的未來及成長有着良好及深遠的影響。

五. 觀測——不要觀而不測、測而不錄

和廖生一起觀星時，他多次教導我們：「觀測一定要做好詳細記錄。」他說一張具備詳細記錄的天文相片，是張具有重要科學價值的美麗相片，而沒有記錄的相片只是一張相片罷了，不知是何時何地和如何攝得的。在本港很多天文同好在進行天文觀測時都銘記廖生的教導，做好詳細的數據記錄，大家都覺得他的教導真是一世受用。

綜觀上述各項事件，可看到廖生對早期的香港業餘天文事業有着積極的影響，為兩個天文會社的發展或成立有着重要的貢獻。

廖生經常教導我們做好觀測記錄。

In his regular returns to Hong Kong from Salinas, Mr Liu always stressed the importance of keeping detailed observational records.

1972年廖生任沙頭角中學校長時，香港業餘天文學會支援港大校外課程天文班在沙頭角中學觀星，後排中央站立於望遠鏡旁者為廖生。

When Mr Liu was the principal of the Shataukok Government Secondary School, members of the then Hong Kong Amateur Astronomical Union often assisted Mr liu's HKU extra-mural astronomy courses' members at their observational practices.

陳鑄略（C L CHAN）是香港業餘天文學會（香港天文學會前身）的創會會長。於70年代認識廖慶齊先生，並得廖先生的支持於1975年舉辦香港首屆天文攝影比賽及展覽。

偶想廖慶齊老師

潘昭強

大概是在皇仁書院讀中一或中二的時候，那時的我，不知天高地厚。一天午飯時間，走到副校長廖老師的辦公室，談到當職業天文學家的事。副校長室在教員室翼二樓盡頭，午飯時間很寧靜。

多虧老師指點，當時已對天文學產生濃厚興趣，但當天文學家是甚麼一回事、學歷要求怎樣等，仍是一無所知。老師都一一解釋。少不更事的我，又竟會回應說，天文學未必如其他專業吃香，父母會有意見。老師即說，有需要大可以和家長見面，圓釋他們的疑團。老師的親和與客氣、對天文的熱衷、對學生的照顧，盡在這番話裏。

事隔多年，有幸再得老師眷顧，參與當時市政局太空館的後期建設。期間亦有在市政局主辦的天文叢談系列講座中主講。畢業之後，因緣際會又主持了天文學電台節目「宇宙行」。此後開始客串播音，人生路向和宇宙之行分道揚鑣。今日回首，又已數十寒暑。

人道老師啟蒙。我未能當上天文學家，卻從天文引申其他事業。老師多年前午飯時間的一番話，對我人生和事業的影響，着實不可思議。

潘昭強（C K Poon）於初中時就讀皇仁書院，其時的副校長正是廖慶齊先生。潘昭強的雄辯才華，甚得廖先生欣賞，及後潘昭強在香港電台主持幾輯推廣天文的節目甚受廣大聽眾歡迎。

香港業餘天文事業早期發展中漸被遺忘的一頁
— 廖慶齊先生與我1971-1979

黃衍蕃

廖慶齊老師 — 我天文興趣的啟蒙者

廖慶齊先生是我天文興趣的啟蒙者。1971年暑假我在夜攀鳳凰山時被那璀璨的星空吸引，頓時像開了竅似的，立即想了解我們頭頂上的星空。

兩個月後我參加了香港大學校外課程部由廖慶齊先生主講的天文課程。最使我懷念的是廖先生的溫文爾雅與風度翩翩，及講解時的抑揚頓挫與生動幽默。1971年底廖老師組織了同學到新界一所中學進行觀星活動。這是我人生中第一次觀賞星空，這晚真的令我茅塞頓開，從此觸發我踏上愛好天文觀測的不歸路。

在參加了廖老師的天文攝影課程後，亦引發了我對拍攝星空的興趣。醞釀十多年，我終於在1986年完成了一個宏願，編著了一本《天文攝影入門》，以推廣天文攝影的興趣。

坐井會的締造者及積極支持者

當時天文班同學中有幾位是香港唯一一個公開天文會社「香港業餘天文學會」的會員。我和其他同學都很想加入這個成立於1970年的前輩組織學藝。很可惜因為我們沒有所須的3年觀星經驗及沒有望遠鏡而被拒諸門外。

1972年底在一次天文班同學組織的觀星營中，在說得興起時有同學提出「自立門戶」、「另起爐灶」……香港第二個公開天文會社「坐井會」就在當晚誕生。同學們議決用「坐井觀天」的前兩個字來作為會名，是因為從字面上說「坐井」就必然令人想起「觀天」；另一方面其字底含義亦勉勵我們不要夜郎自大，要虛心學習及將天文興趣推廣開去。

廖老師對坐井會由天文班同學會的轉型成立十分支持。他曾說過坐井會能為剛踏入天文門檻的天文愛好者服務，以普及天文知識及提倡天文研究為宗旨，可以彌補香港業餘天文學會以推廣天文學術研究為宗旨的不足。兩會可以互補長短，大家一同推廣香港未來的天文事業。

身兼兩會，無分彼此，積極推廣香港的天文活動

坐井會每年的重點節目是各同學相約於冬季某個晚上，一起到上水去拜訪廖老師。最令我們印象深刻的不是巨型望遠鏡下的景象，反而是老師於課堂外的風趣幽默與對很多同學名字身份及興趣的認知，當然還有廖師母的熱情款待與糖水小食！

1975年8月某天是我天文人生中的轉捩點，那天香港業餘天文學會第一任會長陳鑄略先生約我茶敍，席間他說他很賞識我對天文推廣工作的熱誠，又說他給父母催婚，來年將會無法擔任會長的重任，他希望我來屆能擔任學會的委員。9月在香港業餘天文學會第二屆會員大會中，我順利被選為委員，之後更被選為學會的第二任會長（我當時仍為坐井會的會長）。

我曾經與廖先生談及我們兩個會社的工作目標，他認為各有特色，可說殊途同歸，只要是推廣本地的天文興趣，並無不可。從欣賞瑰麗星空的角度入手，可以吸引更多人士認識天文學；不過要維繫長久的興趣，最好還是多觀測、多實習、多交流及有系統地進行學術研究。

黃衍蕃（H F Wong）是坐井會創會會長，亦曾擔任香港業餘天文學會會長。黃衍蕃於1971年在港大校外課程的天文班認識廖慶齊先生。多年來兩者在天文攝影方面相互交流心得經驗。黃衍蕃亦為《華僑日報》天文版的主編，從1977年12月至1991年12月出版了14年共169期，在香港推動業餘天文學居功至偉。

1977年大會堂低座展覽廳展出天文創作比賽的作品。

The 1977 Astronomy Exhibition at the lower hall of City Hall.

1977年天文展覽的海報。

The poster for the 1977 Astronomy Exhibition.

那時我正是20多歲年少氣盛的年代，雖然我經常須為兩會會務分身不暇，但在推廣香港整個天文事業的大前提下，天天無分彼此，盡力而為。儘管終日營營役役，但每當想起文天祥《正氣歌》中的「時窮節乃見，一一垂丹青」時，竟然不以為苦。

當然有此雙重身份，對外聯絡時常感不便。1976年暑假後我不再擔任坐井會的會長，自此我才可以全心全意，以香港業餘天文學會會長的身份，繼續推廣香港的業餘天文事業。

與香港太空館廖慶齊參事共商推廣香港天文事業的大計

1976年廖先生正式成為香港太空館參事，由於籌備中的太空館只有幾位文職人員，因此與廖參事商討合作的重點，在人手上自然落在天文學會的身上，太空館只能負責財政上及行政上的支援。

最後兩方面決定於1977年舉辦一系列大型天文推廣活動。活動由市政局太空館主辦，香港業餘天文學會贊助，包括：

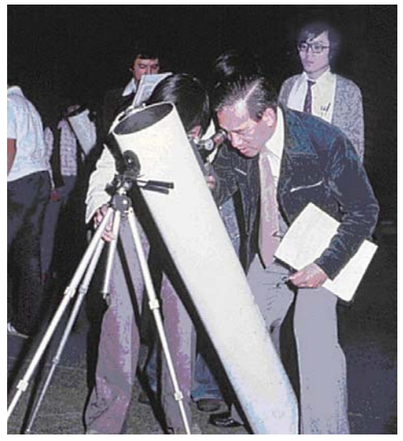
（A）天文創作比賽——包括論文創作比賽、天文攝影比賽及天文儀器製作比賽。

（B）天文展覽——於復活節假期一連5天在大會堂低座展覽廳舉行，展品包括太空館介紹、各項比賽得獎作品展出、天文學會學術計劃展出及香港業餘天文活動介紹等。

不過原來舉辦一次大型展覽，人力方面實在不容忽視，天文學會近30位會員於工餘或課餘後用了幾個月去製作展品。每一位均心力交瘁，但換來的是5天的展出及近17000位參觀的市民的大開眼界。他們為香港的天文事業所付出的血汗一點也沒有白費。

展覽後幾個月廖參事約我與《華僑日報》的何總編輯茶敘。何老總說《華僑日報》樂意撥出半版篇幅，給天文學會每月出版一份天文月刊，但只能給與二、三百元的象徵式稿費，當作贊助學會的經費。我當然「義不容辭」，立即一口答應。

《華僑日報》的《天文月刊》——即我們習慣稱為的《華僑日報天文版》——遂於1977年12月的第4個星期5順利創刊，由我擔任主編。由第6期開始我刻意「霸佔」了全版。《華僑日報天文版》一直毫無間斷，每月定期出版，至1991年12月出版了14年共169期（因報社易主才結束）。在廖參事的引薦下，我在香港天文教育史中總算曾略盡過一點綿力。



廖生正在測試天文儀器製作比賽的參賽作品。

Mr Liu inspecting the entries for the astronomical equipment competition.

《華僑日報》天文版。

The monthly astronomy columns at Wah Kiu Daily.

再接再厲，與廖慶齊館長大力推廣香港天文事業

展覽過後，各委員均如釋重負。1978年天文學會委員會原意與太空館合辦一些較為輕巧的活動。但在我與廖館長的商討期間，雙方都雄心萬丈，最後決定於1979年舉辦一系列更大規模的推廣活動。整個活動包括多項天文比賽，以及一個於復活節假期一連6日在大會堂低座展覽廳舉行的更大型更深入的天文展覽。

展覽可說空前成功，共有41000多人參觀。香港太空館有效地向本港市民介紹了將於翌年落成的太空館規模。香港業餘天文學會得以再向市民推廣天文知識及介紹其活動與研究成果，建立了不錯的社會及學術形象。可惜由於在兩年內連續舉辦了兩次曠日持久的天文展覽，各工作人員總覺元氣大傷，極須休養生息。

由於香港業餘天文學會成立的宗旨主要為「加強天文研究」，所以對於是否舉辦太多的普及天文活動，時有爭論。展覽後的天文學會第6屆會員大會中，我亦結束了我的4年香港業餘天文學會會長生涯，與廖慶齊館長的「職業聯繫」正式結束。

後記

時光荏苒，轉瞬間我踏入天文學這個殿堂及認識廖慶齊前輩已經43年了。

我有幸在我的青壯年時期能受教於廖先生，學習他對觀測攝影及對推廣工作的嚴謹要求而終身受益。我很多謝他使我明白天文教育的重要性，使我能在此後30多年間在港大、理大、太空館、學校、社團及中心等主持無數天文課程及活動；又不斷在報章及雜誌撰寫天文專欄，回饋社會。我有幸曾與廖先生以天文同好身份共事，在不同工作崗位上一齊推動香港早期天文事業的發展。

廖慶齊前輩開創及推動香港天文事業的熱誠與無私奉獻，值得香港每位天文愛好者去學習及追隨。

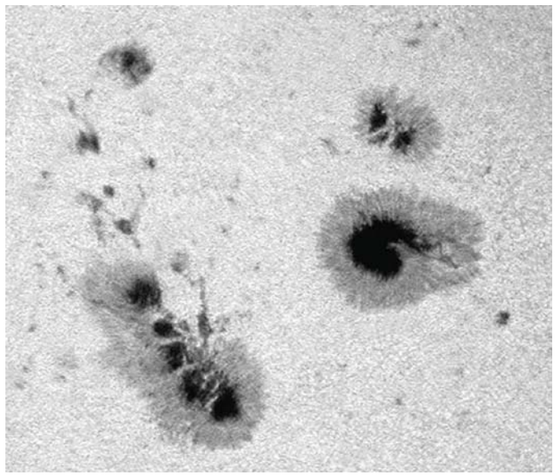
為天文終身學習的廖慶齊先生

吳偉堅

與廖慶齊先生首次見面是於1993年學會前壁屋天文教育中心開幕禮，當日還是初哥的我帶了一枝 Intes 15 厘米口徑的馬蘇托夫折反射式望遠鏡出席活動，在開幕禮未開始前，有一位外表慈祥的長者走到我面前，很客氣地對望遠鏡作出評價及鼓勵我多作觀測，甚至進行天文攝影。直至開幕禮開始時，看到這位長者發言，才知道原來他就是香港太空館創館館長廖慶齊先生，而更吸引我的是他的發言，全是從業餘天文愛好者的角度出發，很到位、很實在，頓時內心泛起莫名敬意。

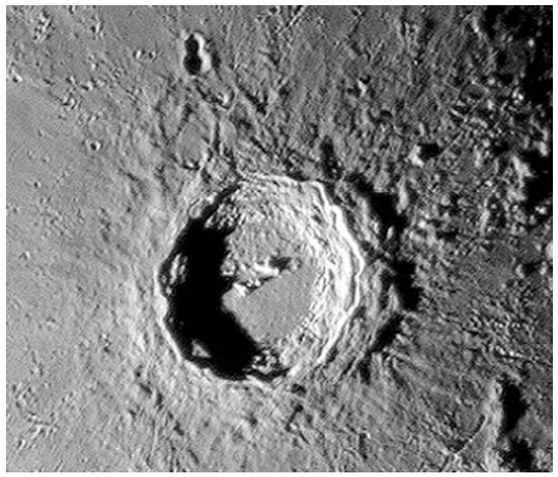
直至2000年初，數碼天文攝影在香港興起，我亦加入數碼高倍月球行星攝影的行列，且幾近瘋狂的程度，而為了得到最清晰的影像，同時亦須磨練圖像處理的技巧。在一次偶然的機會下，廖生透過電郵與吳鴻章（章伯）分享了一張太陽黑子的照片，章伯隨後轉發了這張照片給我。廖先生在電郵中向章伯提到影像清晰度未達理想，而我從拍攝資料得知，巧合地他是使用馬蘇托夫折反射式望遠鏡拍攝，但更重要的是，這黑子群並非用菲林拍攝，而是使用數碼單鏡反光相機拍攝。我從照片看出，這張照片應是原圖像，未進行圖像處理，故此「膽粗粗」為照片進行 unsharp masking（模糊遮罩）及 Guassian Blur（高斯模糊）等處理來提高反差、銳度及減噪，帶出太陽面的米粒組織及黑子半影纖維細節，然後寄回給章伯作分享。

誰知數天後廖先生直接發了一個電郵給我，原來章伯把處理後的照片寄回給他，從電郵能感受到廖生對照片的細節改善感到很雀躍（對我來說是一件極榮幸的事），提及到很多圖像處理的相關問題，由於內容太廣，最後我們決定相約長途電話詳談，首次通電話已長達數小時，作為後輩的我，內心確實戰戰兢兢，但廖生的語氣十分詳和客氣，令我輕鬆了不少，不過每當內容稍為涉及技術層面時，去到一些他認為未夠清楚的地方，往往會要求我在電話裏把處理的每一個細節的先後次序及參數巨細無遺地作詳細反覆闡述，而他即時做筆記及在電腦前跟着做，他那股「完美主義者」的氣息表露無遺，要知道當時他已接近70歲之齡，為了天文觀測及攝影，廖先生完全沒因年齡或輩份的差距（我和他是同月同日出生，剛剛相差42年）而拒絕交流，及後我和朱永鴻更與廖先生分享了使用普通 DC 數碼相機接駁望遠鏡進行 afocal imaging（無焦點拍攝法）拍攝高倍月球行星的方法，由於他身負數十年使用菲林拍攝高倍月球行星的堅實底子及無人所及的「內功」，得以在短時間內極速掌握，通過20厘米APO折射鏡，拍攝了不少極高解像度的天文照片。廖生那種終身好學不倦的態度，亦令我深明為何40年前他的天文照片能拋離外國其他天文同好，成為世界冠軍。



太陽黑子群，5吋馬克蘇托夫-卡塞格林式望遠鏡加數碼相機拍攝，2001年9月3日。

A Group of sunspots taken on 3rd September 2001 with a 5-inch Maksutov Cassegrain and a digital camera.



廖生使用20.6厘米APO折射鏡及 Coolpix 990 數碼相機拍攝，解像度極高的哥白尼隕坑。

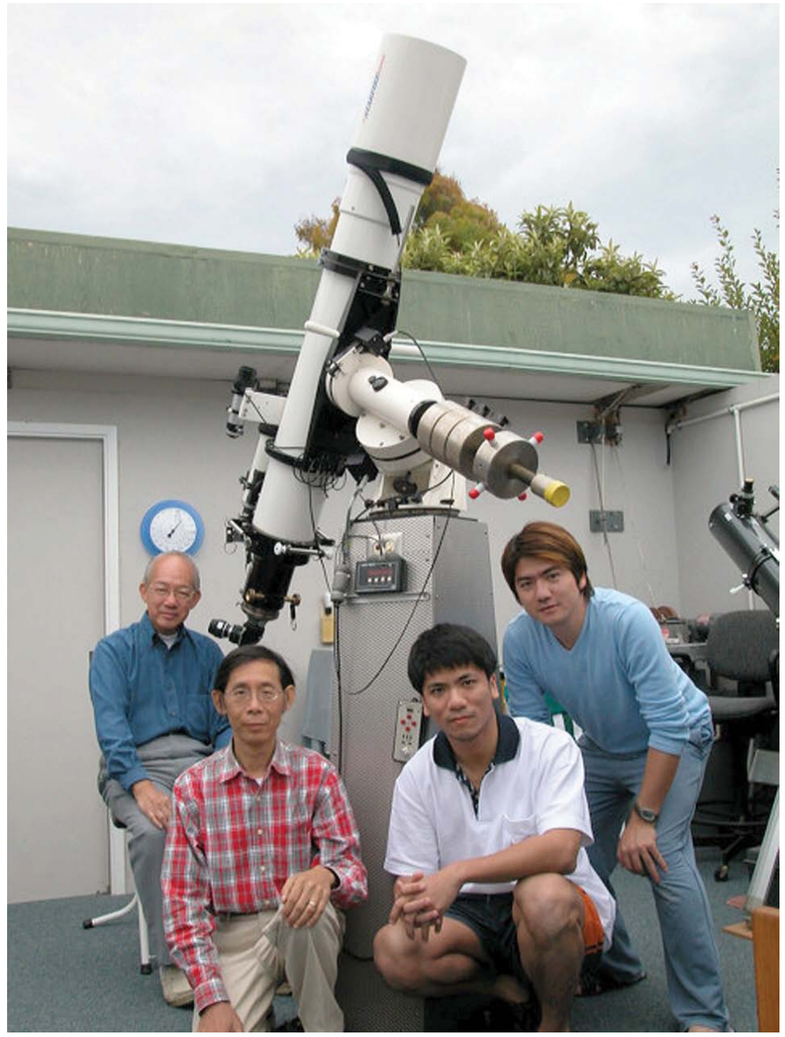
Copernicus taken by Mr Liu with the 20.6-cm apo refractor and Coolpix 990 digital camera.

吳偉堅（Eric Ng）歷任香港天文學會副會長，於90年代認識廖慶齊先生，並與他交流把數碼攝影技術應用於天文攝影。

廖生曾向我提及有一次他探訪 Lick Observatory 時，向當時的台長展示他使用12.5吋牛頓卡塞格林式望遠鏡拍攝的月球照片，那台長完全不相信是他拍攝，還說：「Mr Liu, are you kidding?」因為照片質素比他們用米級的望遠鏡所拍得的還要好。

自此之後，在他身體未轉差前，我會定期和他通電話和電郵，期間數次他回港我都會抽時間親自駕車為他接機。2003年及2005年我和朱永鴻很榮幸應他邀請到他美國三藩市的家作客，期間無所不談，通宵達旦，廖先生毫不吝嗇地分享他的天文觀測及攝影技巧，還可以享受着他親自泡製及命名的「廖記奶茶」。最記得在他的後園天文台一同觀測的時候（有幸可親睹他的20.6厘米APO折射鏡），我們提到拍攝時對焦的情況，大家發覺對焦點的要求如出一轍，談到如果不能達到一個有信心的影像焦點，怎樣也不肯按相機快門，他還打趣道：「現在用數碼相機都好些，以前我用菲林影的，張張都係錢，唔對好焦，真係會影到窮！」認識廖生久了，時常能感受到他這份幽默感。

雖然和廖生相交的日子只有十數載，不算長，但他曾和我分享了很多做人的道理及他如何把天文、信仰融會他的人生，如何不斷掏空自己，容納新知識，不斷求進。透過他由天文到人生所學習得到的哲理實在太豐富了，礙於篇幅所限，未能一一盡錄分享。願大家透過浩瀚的星空，與廖慶齊先生繼續交往，延續他對天文的無償付出，無私分享及終身學習的崇高精神。



廖慶齊先生（左一）的私人天文台，同行還有朱永鴻（左二），新加坡同好 Tan Weileong（右二）。

Eric Ng, Alan Chu and Tan Weileong from Singapore paying a visit to Mr Liu's observatory in Salinas in 2003.

珍貴觀測手稿
Observational Records

儀器
Equipment

彗星
Comet

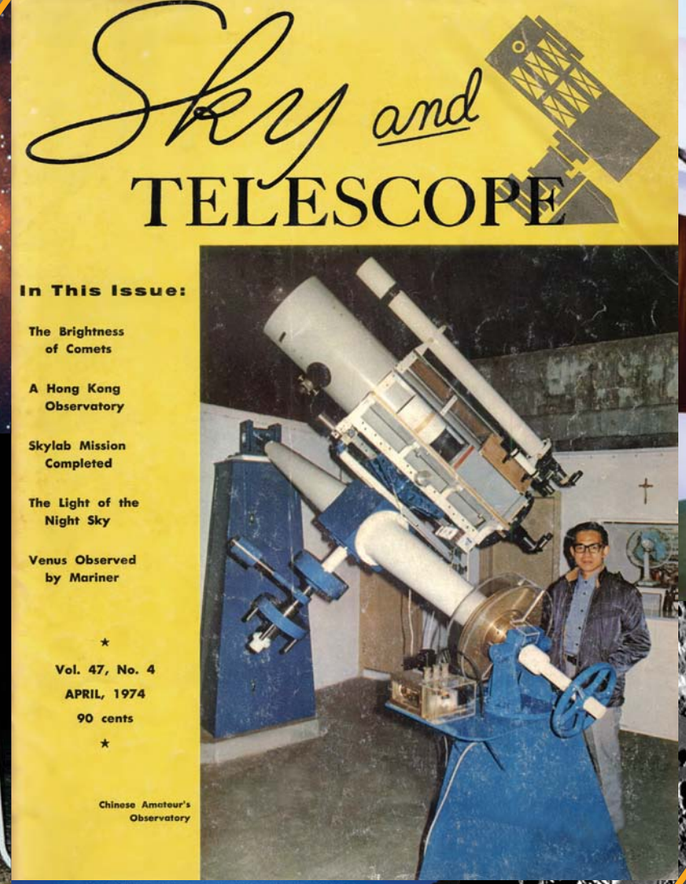
月球
Moon

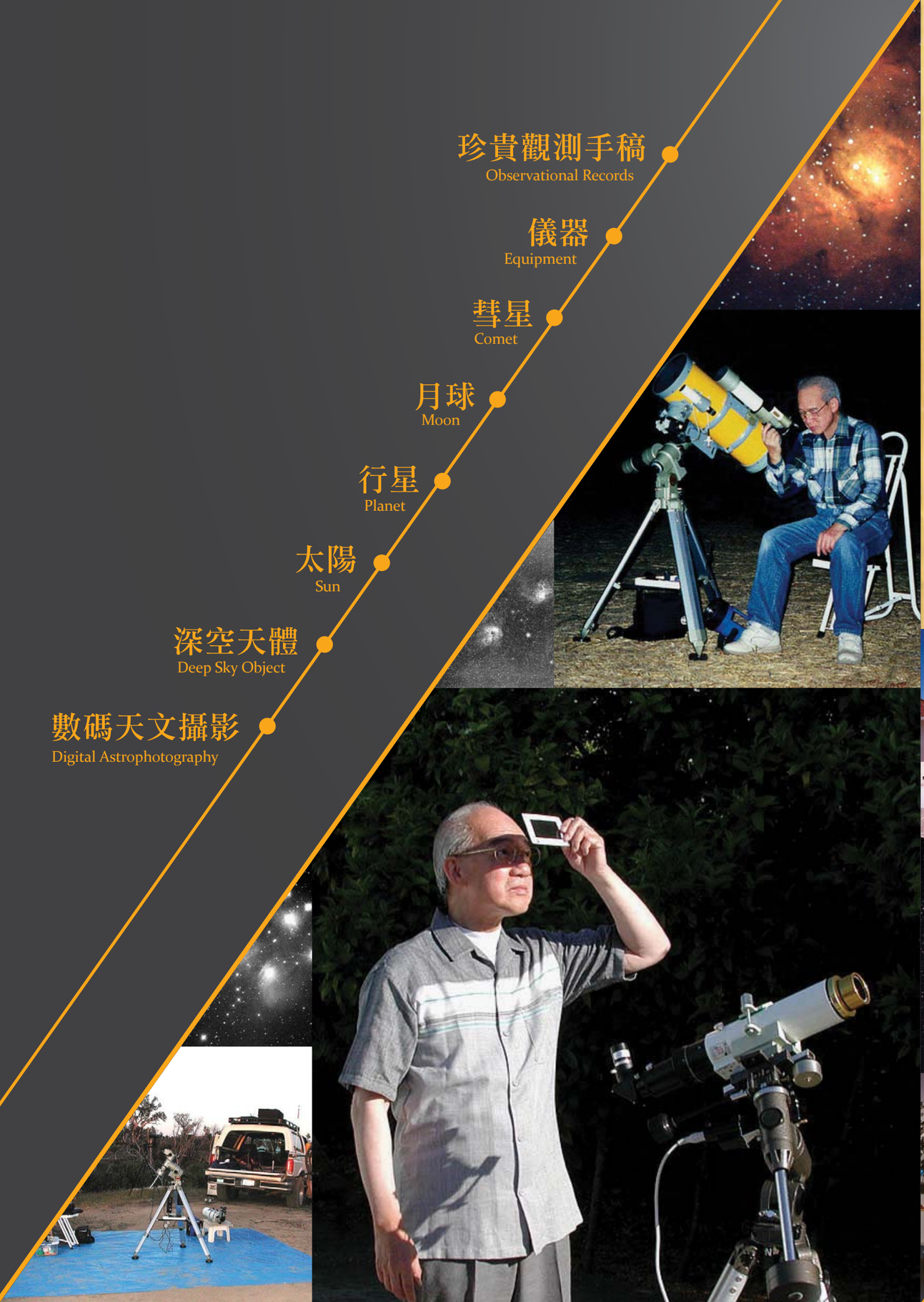
行星
Planet

太陽
Sun

深空天體
Deep Sky Object

數碼天文攝影
Digital Astrophotography





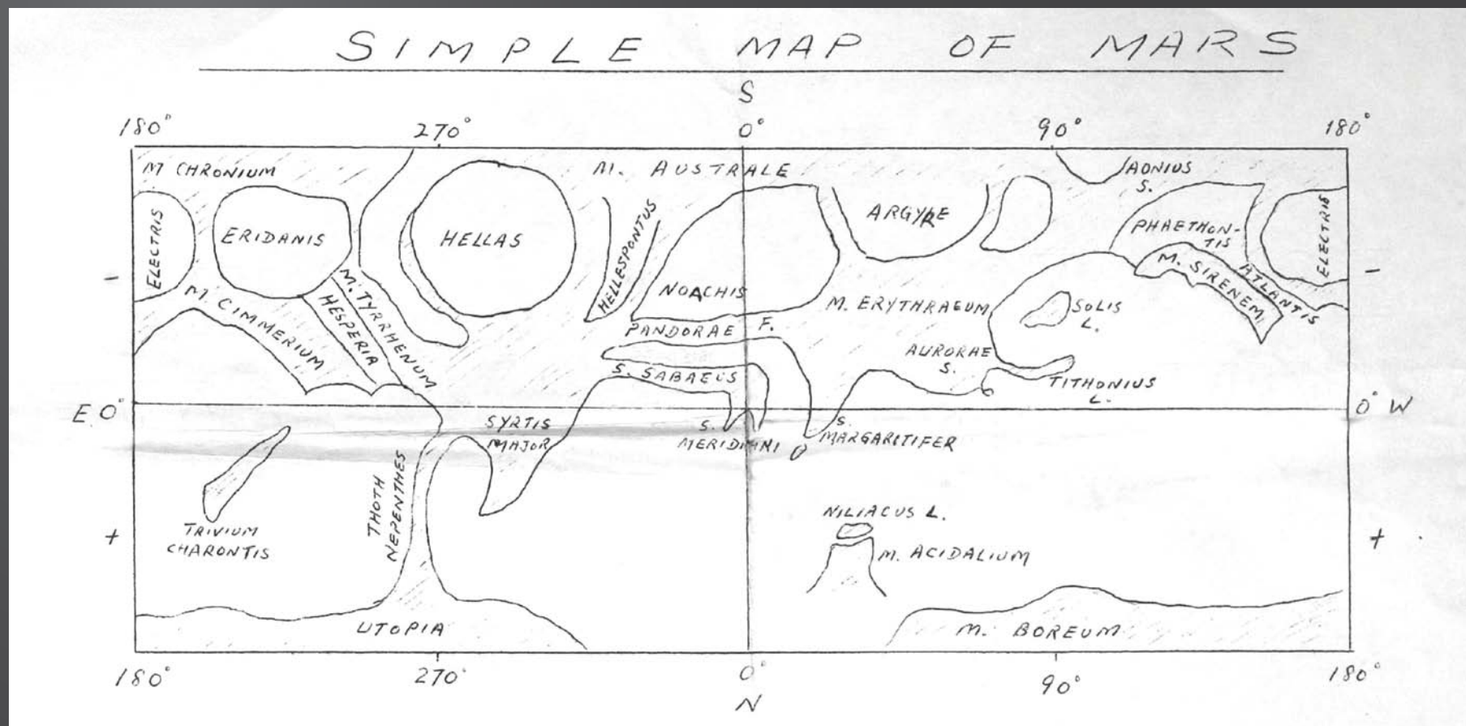
天文攝影集
Astrophotography

朱永鴻、吳偉堅、劉佳能

COMET HALE/BOPP

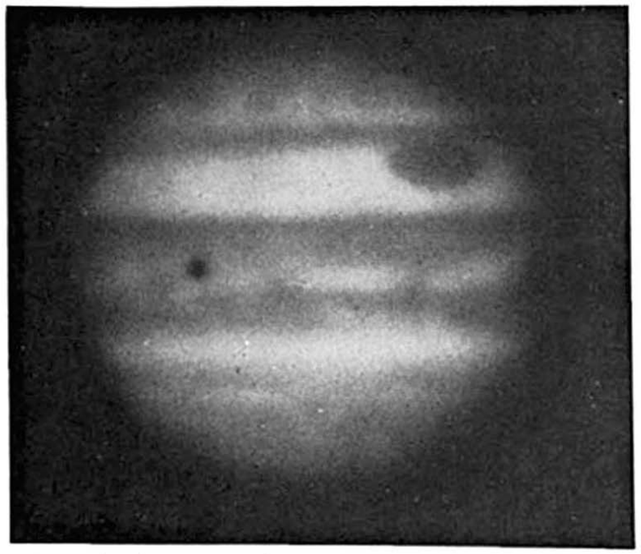
Date: 1997 IV 10
Time: 04:10 ~ 04:17 U.T
T: 8~9/10, S: 5/10, 4°C No Dewing
Lens: Nikkor 300mm, f 4.5
Film: Kodak PJM Multi-Speed 640
Exposure: 7 minutes
Enlargement: 5.8x
Photographed by: JOSEPH H.C. LIU

廖慶齊
1997 IV 14



LUNAR & PLANETARY

Object: JUPITER	
Date: 1973 IX 29	Time: 14:36 U.T
Central Meridian:	Cent. Latitude:
Transparency: 6/10	Steadiness: 9/10
Telescope Type: Cass.	Maker: Optical Craftsmen
Aperture: 320 mm.	F.L. 6070 mm. (f/19)
Eyepiece: Plossl 16 mm.	Magnification: 380 X
Diaphragmed to: mm	Combined f/
Camera: Nikon F body	Lens: —
Emulsion: Kodak Tri-X	ASA Set: 400
Filter(s): Nikkor X1 (Green)	Exposure: 3½ Seconds
Developer: Kodak Microdol-X	Dilution: —
Temperature: 23°C	Develop. Time: 7½ Mins
Paper: TURA BROM II PE (W)	Enlargement: 8 X
Observer: H.C. LIU	Place: Hong Kong



The Hong Kong amateur documents his photographs completely, as seen for this picture of Jupiter on September 29, 1973. At that time the Red Spot had entered fully onto the disk but was still near the eastern limb. The shadow of satellite Io is in the equatorial zone, which was marked by a number of irregular festoons that spread from the North Equatorial Belt. Though the log gives the enlargement as eight times, this reproduction is about seven.

April, 1974, SKY AND TELESCOPE 225

(Jupiter image & data chart owned by Joseph Liu.)

Negative No. 94-10-8.12
Object PLANET SATURN
Date 1994 8 8 U.T. 07:38
Cen.M. 1 Cen.Lat.
2
Trans. 8/10 Stead. 7/10
Temp. 13 °C R.H. 83 %
Telescope / ~~Lens~~ ASTROPHYSICS STARFIRE EDF
Aperture 20.6 cm F.L. 1586 mm f/ 7.7
Projection Lens PENTAX XP-8mm
Stopped to — mm Combined f/ 130
Camera MIRANDA LABOREC Lens —
Emulsion KONICA SUPER-XG (ISO ~~ASA~~ 400)
Filter — Exp. 4 Sec.
Developed BY ONE-HOUR PHOTO SHOP
— mins. at — °C
Enlarged 6 X Paper KONICA LF-100
Observer Joseph H.C.Liu (廖慶齊)

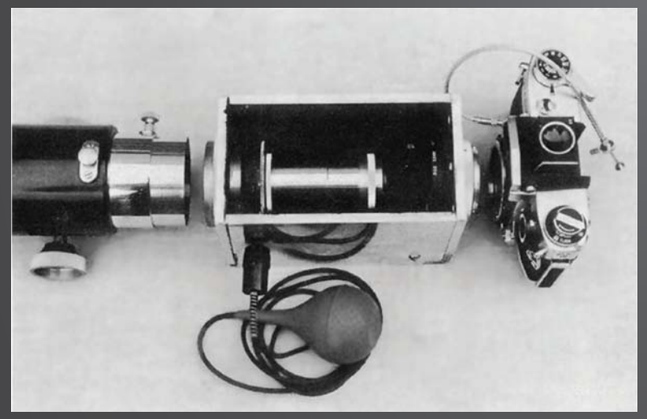
儀器
Equipment

廖生在香港上水村家中後院設置的32cm（12.5吋）反射望遠鏡，可使用f/5牛頓焦點或主鏡後的f/19卡塞格林焦點，原鏡由美國加州的Optical Craftsmen製造，負載平台是廖生自行建造的英國式赤道儀，白色的重型極軸由16¾吋大的Byers齒輪驅動，小圖是天文台的滑動頂蓋。照片攝於1974年。

The 32-cm (12.5-inch) reflector in Mr Liu's home backyard observatory, Sheung Shui Village, Hong Kong. The reflector has a f/5 Newtonian focus and a f/19 Cassegrain focus. It was made in California by the Optical Craftsmen. The mount is a home-built English equatorial type with a strong white polar axis, driven by a Byers-made 16¾ -inch worm gear system. The smaller insert shows the sliding roof of the observatory. Pictures taken in 1974.

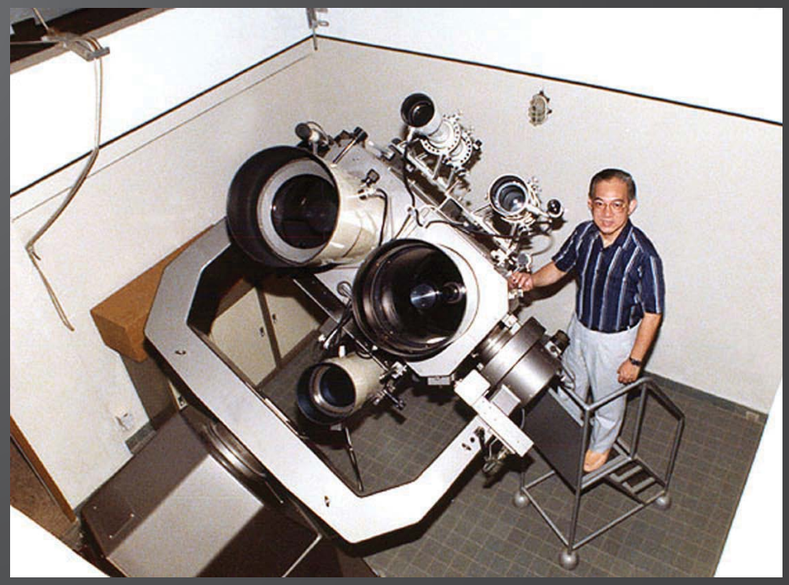
廖生的第二枝天文望遠鏡，可以進行有效的天文觀測。它是一枝英國二手的16.5cm（6.5吋）f/10牛頓反射鏡，以懸錘的重力調節轉速，後來改用電子控制（見柱身的鋁箱）。由於主鏡邊緣破裂，它的口徑實得16cm左右。從1953年起，此鏡一直是廖生的忠實老伴直至1972年退讓給後來的32cm反射鏡。照片攝於1966年香港上水村。

Mr Liu's second astronomical telescope from which serious observations commenced. It was a British second-handed 16.5-cm (6.5-inch) f/10 Newtonian reflector, originally driven by gravity-clockdrive but later replaced by electronics (the box at the pillar). The edge of the primary mirror was broken giving an effective aperture of about 16 cm. Since 1953, this telescope was Mr Liu's *Old Faithful* until it was succeeded by a 32-cm reflector in 1972. Photograph taken in 1966, Sheung Shui Village, Hong Kong.



裝在32cm反射鏡卡氏焦點的鋼葉相機快門，由手動氣泵操作。早期單鏡反光相機的快門震動頗大，為此廖生自行設計這個避震組件，適合高倍放大的月球行星攝影。

At the Cassegrain focus of the 32-cm reflector is a leaf shutter for high power lunar and planetary photography. The shutter is triggered by an air bulb. Mr Liu designed this to minimize shutter vibration of SLR cameras in those days.



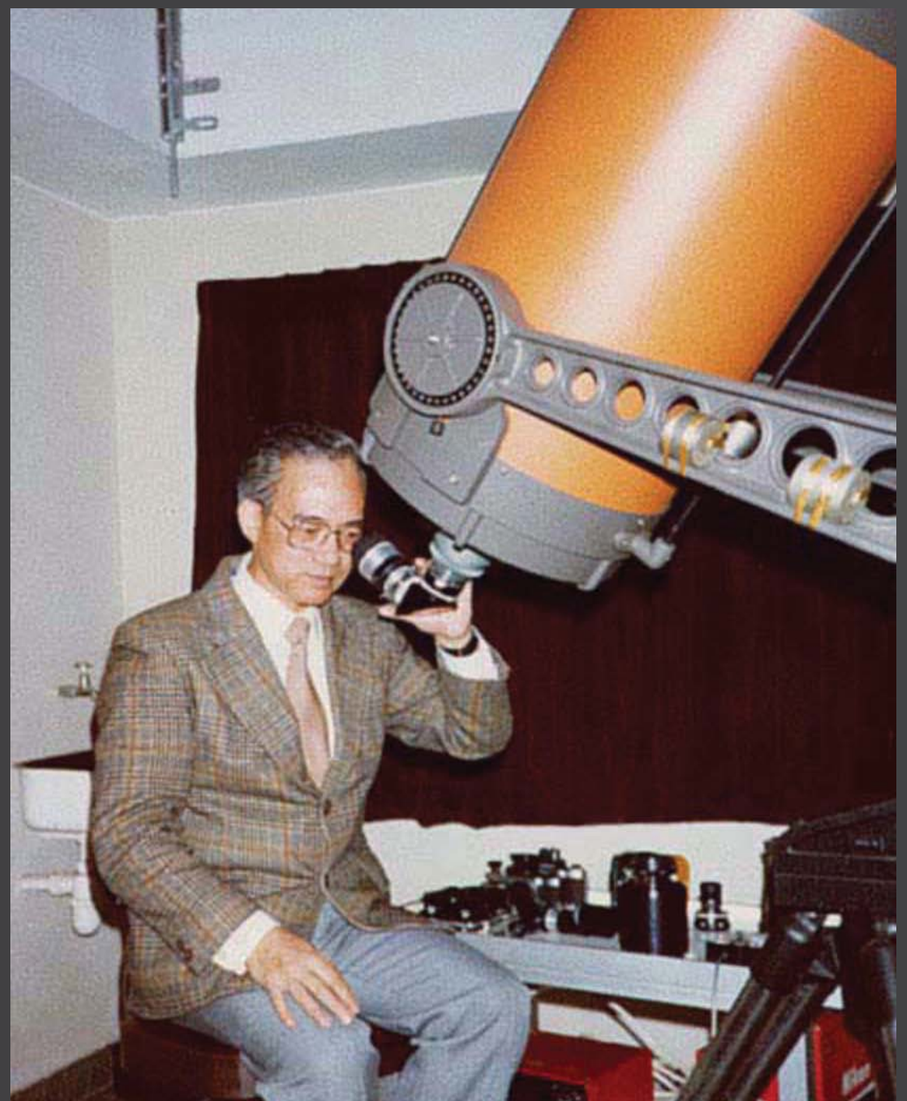
1981年間，廖生改建上水家中的天文台，採用由日本GOTO公司建造的叉式赤道平台，上置C14 f/11施密特－卡塞格林折反射鏡、25cm f/4.2韋特－施密特天文照相儀、16cm f/2.5施密特相機、高橋10cm f/8螢石折射鏡及8cm f/12導星折射鏡等。1985年廖生移居美國前把整台設備賣給廣州一個科學館。

TELESCOPE COMPLEX & FORK MOUNT

This telescope system was mounted in Mr Liu's second observatory in his home in Sheung Shui Village, Hong Kong during 1981 ~ 1985. The OTAs included:

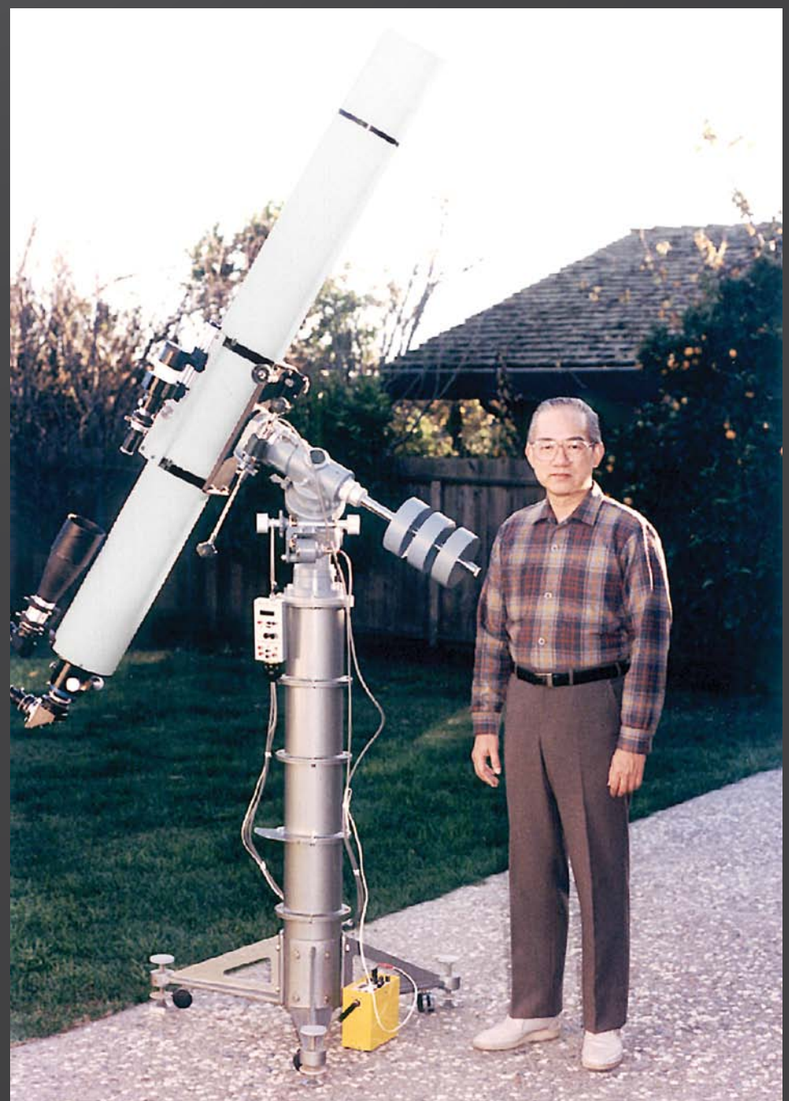
- 35-cm Schmidt Cassegrain (Celestron C14)
- 25-cm f/4.2 Wright-Schmidt Astrograph
- 16-cm f/2.5 Schmidt Camera
- 10-cm f/8 Takahashi FC Refractor
- 8-cm f/12 Guiding Refractor

The fork mount was custom-built by GOTO Co. of Japan. In 1985 before Mr Liu moved to USA, the whole system was sold to a science hall in Guangzhou, China.



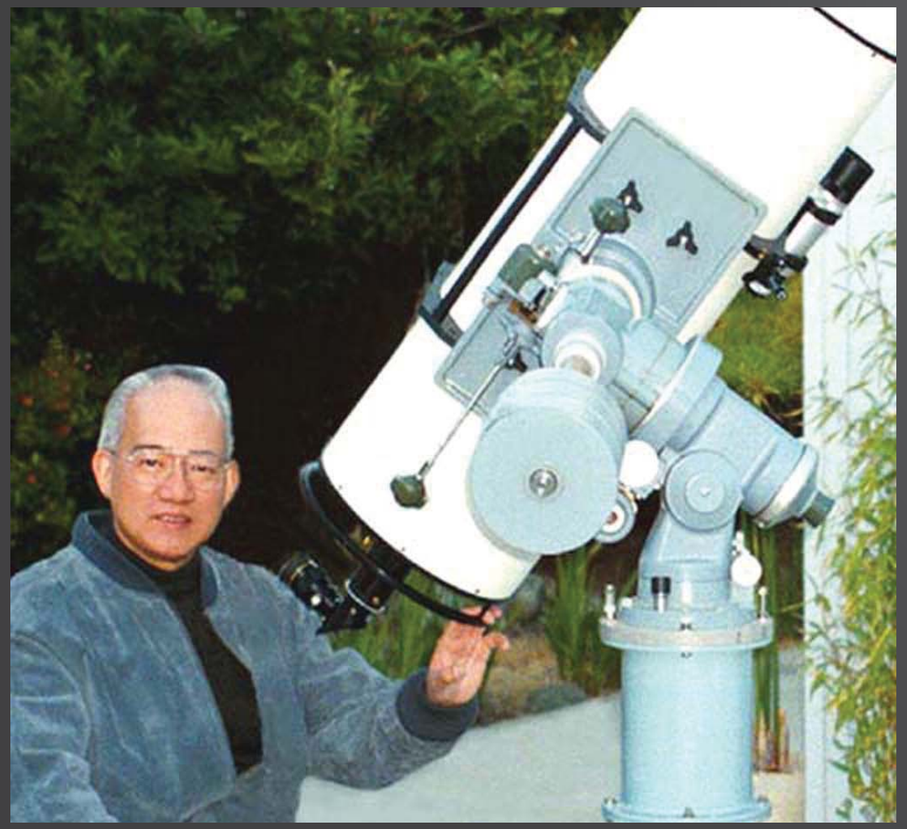
1981年購入及置於上水家中天文台的C14（Celestron 14吋f/11施密特－卡塞格林折反射鏡）。

Celestron 14-inch f/11 Schmidt-Cassegrain (C14) bought in 1981 and installed in Sheung Shui Village, Hong Kong.



廖生退休後移居美國加州莎蓮娜市，未有後院天文台前就使用這枝15cm f/12複消色差折射鏡了。攝於1987年。

Mr Liu retired at a home in Salinas, California. Before he built his home backyard observatory, he used this telescope which is a 15-cm f/12 APO refractor. Photograph taken in 1987.

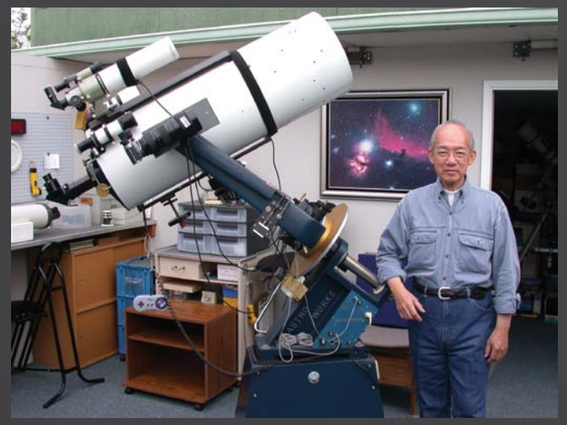


廖生在加州家中後院天文台設置的25cm f/20馬克蘇托夫長焦望遠鏡及高橋160-P赤道儀，主要用來觀測雙星。

Mr Liu and his 25-cm f/20 Maksutov long focus telescope, mounted on Takahashi 160-P outside the home backyard observatory in Salinas, California. Used primarily for double star studies.

廖生正在檢查他的20.6cm折射鏡焦點，攝於2003年7月。廖生的觀測態度一向嚴謹，對焦時都十分認真。

Mr Liu is checking the back focus of his 20.6-cm refractor. He always demanded precise focusing during an observation. Photographed in July 2003.



廖生與他的30cm f/4.9天文照相儀

型號：ASTROMAK（12吋馬克蘇托夫連叉式赤道儀）
視場：可覆蓋35mm至4吋 x 5吋（10cm x 12.5cm）菲林
製造者：美國新墨西哥州ASTRO WORKS
攝於2003年7月。

Mr Liu and his 30-cm f/4.9 astrograph

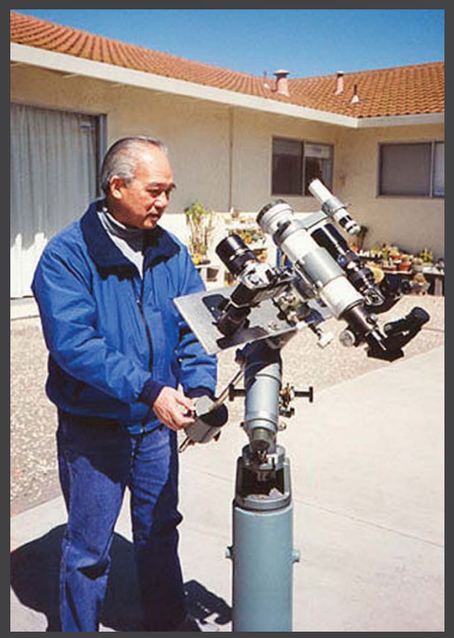
Model: ASTROMAK (12-inch Maksutov on fork equatorial mount)
Film Coverage: 35mm ~ 4" x 5" (10cm x 12.5cm)
Manufacturer: ASTRO WORKS, New Mexico, USA.
Picture taken in July, 2003.

廖生家中後院天文台的一角，右邊是Astro-Physics 20.6 cm f/7.7折射鏡，左邊是30cm f/4.9天文照相儀。（2006 莎蓮娜市）

A corner of Mr Liu's home backyard observatory. At the right is the Astro-Physics 20.6 cm f/7.7 refractor. The left is the 30-cm f/4.9 astrograph. (2006, Salinas.)

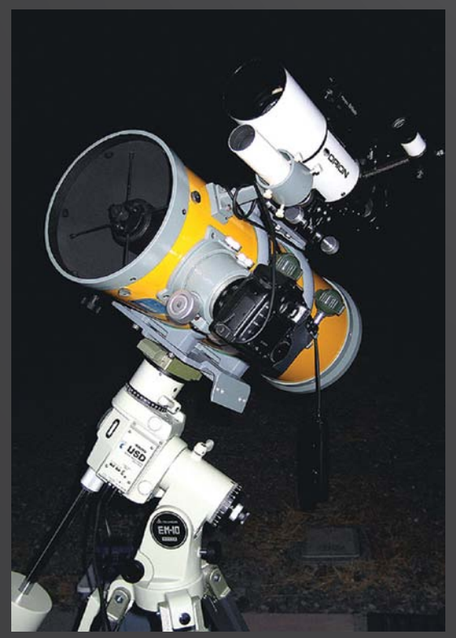
設在後院天文台外的13cm f/8 Astro-Physics EDT折射鏡，以太陽觀測為主，也用於教育到訪的朋友及子女。

The 13-cm f/8 Astro-Physics EDT refractor outside the home backyard observatory, mainly for solar observation and sharing educational funs with visiting children and friends.



廖生準備驅車到郊外觀測1997年的海爾－博普彗星。出發前，他總是小心檢查各項便攜儀器確保不失

Mr Liu is preparing a drive to observe Comet Hale-Bopp in 1997. He always inspected the portable equipment before going.



高橋Epsilon-160 f/3.3天文照相儀和EM-10赤道儀，主鏡採用高精度的雙曲面，特大對焦器可容納直徑大至49 mm的影像。廖生在1980年購買此鏡，這一直都是他的戶外觀測至愛。

The Takahashi Epsilon-160 f/3.3 Astrograph on EM-10 mount. It employs a precise hyperboloidal primary mirror and an oversized focuser to allow an image circle as large as 49 mm. It was bought by Mr Liu in 1980 and was his outdoor favorite for a lifetime.

在晚年設置的C11（Celestron 11吋施密特－卡塞格林折反射鏡）及其國產goto赤道儀，藍色底座和鏡身的金屬附件都是廖生親弟「Lum Gor」造的，Lum Gor的車床工藝甚佳，不時為廖生改良天文台的機械設備。攝於2011年10月。

The C11 (Celestron 11-inch Schmidt-Cassegrain) with its China-made goto equatorial mount. The blue platform and metallic accessories on the telescope were made by Mr Liu's younger brother "Lum Gor" who excels in machining. (October 2011)

The new CELESTRON 28 cm f/10 Edge HD Schmidt - Cassegrain Telescope in my backyard.

2011 October 16

彗星 Comet

海爾－普博彗星與M34疏散星團
1997年4月5日 03:55~03:59 UT

奧林匹斯 OM-1 相機連 135mm f/2.8 鏡頭
柯達 PPF 400菲林
曝光 4 分鐘
攝於加州 Panoche Hills

這時彗星距日 0.92 個天文單位，太陽紫外線把彗髮外層的氣體電離，形成另一條顯眼的藍色離子尾。M34 在照片左邊。

COMET HALE-BOPP & STAR CLUSTER M34
1997 April 5 03:55~03:59 UT

Lens: Olympus Zuiko 135-mm f/2.8, OM-1 camera body
Film: Kodak PPF 400
Exposure: 4 min.
Observing Site: Panoche Hills, California

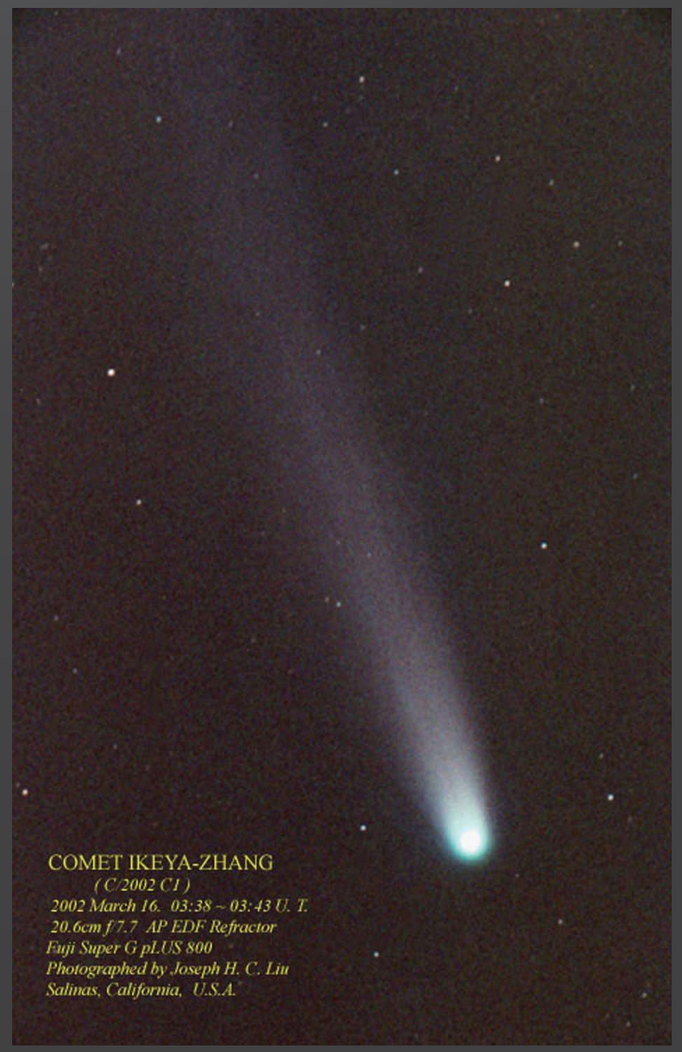
Remark: The comet was 0.92 AU from the Sun at this time. The solar ultraviolet rays ionized the outer gas of the coma, producing a prominent blue ion tail beside the dust tail. M34 is located near the left edge of the picture.

海爾－博普彗星核及其震波狀彗髮
1997年4月25日 03:56 UT

Astro-Physics 20.6cm f/7.7 EDF折射鏡，3X增距鏡
柯達PPF 400菲林
曝光30秒
攝於加州莎蓮娜市

NUCLEUS & SHOCK-WAVE OF COMET HALE-BOPP
1997 April 25 03:56 UT

Telescope: Astro-Physics 20.6cm f/7.7 EDF refractor
Projection Lens: 3X Teleconverter
Film: Kodak PPF 400
Exposure: 30 sec.
Observing Site: Salinas, California.



池谷－張彗星
2002年3月16日 03:38~03:43 UT

Astro-Physics 20.6cm f/7.7 EDF 折射鏡
富士Super-G Plus 800菲林
曝光5分鐘
攝於加州莎蓮娜市

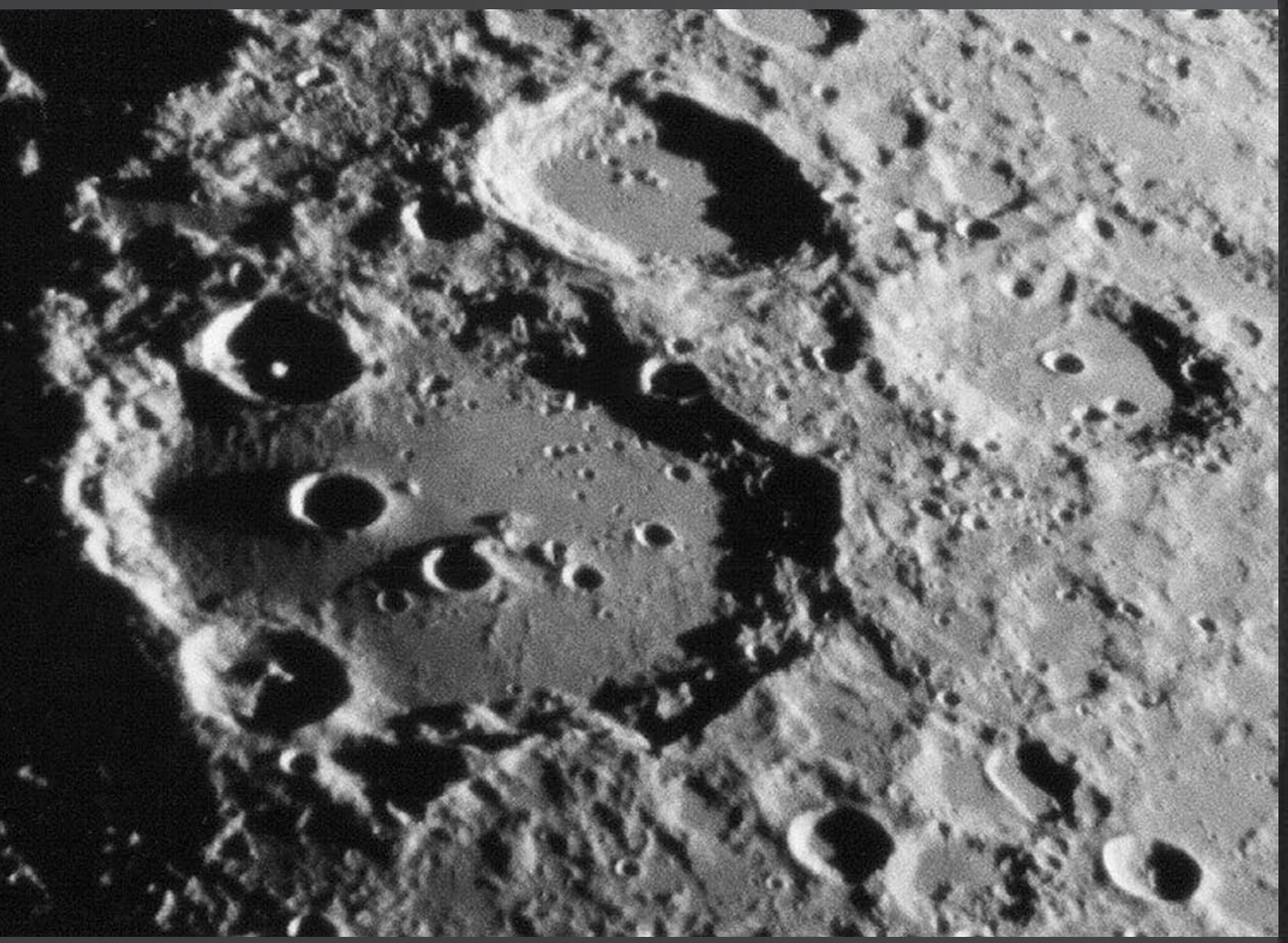
COMET IKEYA-ZHANG
2002 March 16 03:38 ~ 03:43 UT

Astro-Physics 20.6 cm f/7.7 EDF refractor
Film: Fuji Super-G Plus 800
Exposure: 5 min.
Observing Site: Salinas, California

百武彗星（彗頭部分）
1996年3月24日 11:10~11:30 UT
高橋Epsilon-160 f/3.3反射鏡
柯達Ektachrome 400菲林
曝光20分鐘
攝於加州Fremont Peak

COMET HYAKUTAKE (Close Up)
1996 March 24 11:10–11:30 UT
Telescope: Takahashi Epsilon-160 f/3.3
Film: Kodak Ektachrome 400
Exposure: 20 min.
Observing Site: Fremont Peak, California

月球
Moon



克拉維環形山
1972年8月2日 20:39 UT

32 cm f/19卡塞格林反射鏡
Clave Plössl 25mm 投射目鏡
有效焦比 f/43
柯達 Tri-X 400菲林
曝光 1/2秒
柯達 Microdol X顯影液
攝於香港上水村（5"x 7"相片掃描）

Walled Plain CLAVIUS
1972 August 2 20:39 UT

Telescope: 32-cm f/19 Cassegrain
Projection Eyepiece: Clave Plössl 25-mm
Effective Focal Ratio: f/43
Film: Kodak Tri-X 400
Exposure: 1/2 sec.
Film Developer: Kodak Microdol X
Observing Site: Sheung Shui Village, Hong Kong
Remark: Image scanned from old 5" x 7" print

直壁
1972年8月2日 20:25 UT

32cm f/5 & f/19 牛頓－卡塞格林反射鏡
Clave Plössl 25mm投射目鏡，有效焦比f/43
柯達Plus-X 125菲林
曝光 1 秒
攝於香港上水村
這張照片曾獲美國天文聯盟，1977天文攝影比賽黑白普通組冠軍

THE STRAIGHT WALL
1972 August 2 20:25 UT

Telescope: 32-cm f/5 & f/19 Newtonian-Cassegrain
Clave Plössl 25mm eyepiece for projection
Effective Focal Ratio: f/43
Film: Kodak Plus-X 125
Exposure: 1 sec.
Observing Site: Sheung Shui Village, Hong Kong
This photograph was the B&W (general) first-price winner in the Astronomical League's 1977 astrophotography competition, USA.

亞平寧山脈與阿基米德環形山

1996年1月29日

Astro-Physics 20.6cm f/7.7 EDF 折射鏡

高橋NP-12mm投射目鏡，有效焦比f/88

柯達T-MAX 400菲林， 柯達T-MAX顯影液

曝光1/4秒，攝於加州莎蓮娜市

阿基米德是被隕星碰撞而成的月坑，
直徑82公里，碰撞後大量岩漿從
月球內部流出把坑底填平成現在的樣子。

APENNINUS and CRATOR ARCHIMEDES

1996 January 29

Astro-Physics 20.6cm f/7.7 EDF refractor

Takahashi NP-12mm projection eyepiece at EFR = 88

Film: Kodak T-MAX, T-MAX Developer

Exposure: 1/4 sec.

Observing Site: Salinas, California

Remark: Archimedes is a large impact crater, diameter 82 km. Its floor is heavily flooded by lava leaked from the interior of the Moon.

華爾頓環形山
（環形山底有中央峰投影）

1998年1月6日 02:02 UT

大氣透明度8~9/10 寧穩度6/10

Astro-Physics 20.6 cm f/7.7 EDF 折射鏡

高橋NP-12mm投射目鏡，有效焦比f/88

富士Super-G Plus 400菲林

曝光1/2秒

攝於加州莎蓮娜市

CRATER WALTHER (with shadow of its peak near the center of its floor)

1998 January 6 02:02 UT

Trans: 8~9/10 Stead: 6/10

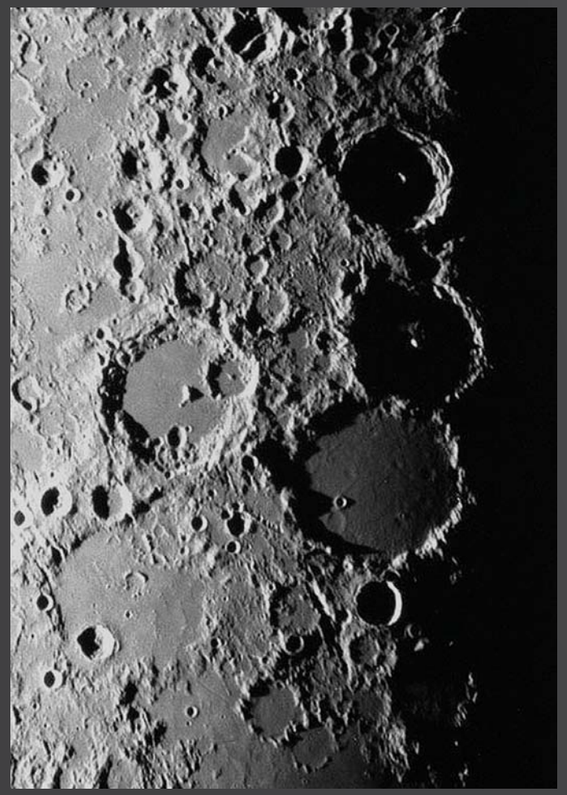
Astro-Physics 20.6cm f/7.7 EDF refractor

Takahashi NP12mm projection eyepiece at EFR = 88

Film: Fuji Super-G Plus 400

Exposure: 1/2 sec.

Observing Site: Salinas, California



托勒玫環形山與附近區域
1998年1月6日

大氣透明度7~8/10，寧穩度6~7/10

Astro-Physics 20.6cm f/7.7 EDF 折射鏡

高橋 NP-12mm投射目鏡，有效焦比f/88

富士 Super-G Plus 400菲林

曝光1/3 秒

攝於加州莎蓮娜市

在陰影中3個大環形山是相當聞名的，由上至下分別稱為阿爾扎赫、阿方索、托勒玫。托勒玫的直徑寬達164公里，相當於香港至廣州的車程距離。

CRATOR PTOLEMAEUS & THE NEARBY REGION
1998 January 6

Trans: 7~8/10 Stead: 6~7/10

Astro-Physics 20.6cm f/7.7 EDF refractor

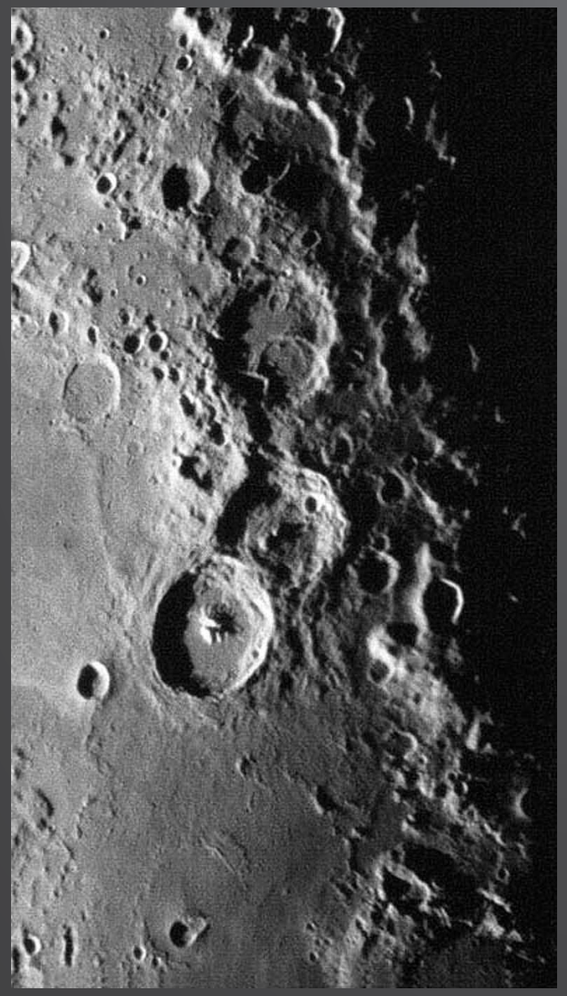
Takahashi NP-12mm projection eyepiece at EFR = 88

Film: Fuji Super-G Plus 400

Exposure: 1/3 sec.

Observing Site: Salinas, California

Remark: The three large shadowed craters is a well-known “trio” on the Moon. Their names from top to bottom are Arzachel, Alphonsus & Ptolemaeus. Ptolemaeus is 164 km in diameter, equivalent to the driving distance between Hong Kong and Guangzhou.



菲奧費勒環形山與附近區域
2000年4月10日 03:41 UT

大氣透明度8~9/10，寧穩度4~5/10

Astro-Physics 20.6cm f/7.7 EDF 折射鏡

高橋NP-12mm投射目鏡，有效焦比f/88

Kirkland（Agfa）ISO 400彩色菲林

曝光1/4秒

攝於加州莎蓮娜市

那3個連接的環形山也是相當聞名的，由上至下稱為凱瑟琳娜、西里勒斯、菲奧費勒 。

CRATER THEOPHILUS AND THE NEARBY REGION
2000 April 10 03:41 UT

Trans: 8~9/10 Stead: 4~5/10

Astro-Physics 20.6cm f/7.7 EDF refractor

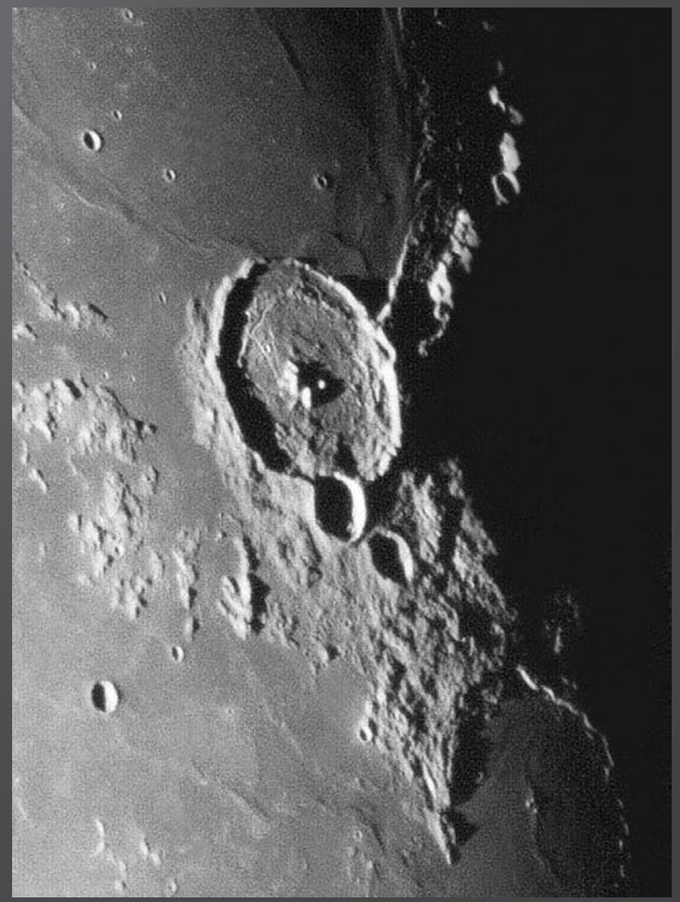
Takahashi NP-12mm projection eyepiece at EFR = 88

Kirkland (Agfa) Color Print Film ISO 400

Exposure: 1/4 sec.

Observing Site: Salinas, California

Remark: The crater trio from top to bottom are respectively called Catharina, Cyrillus & Theophilus.



加桑廸環形山以及附近區域
2000年4月15日 06:35 UT

大氣透明度4/10，寧穩度8/10

Astro-Physics 20.6cm f/7.7 EDF 折射鏡

高橋NP-12mm 投射目鏡，有效焦比f/88

柯達PJM-640菲林（已過使用期限兩年）

曝光1/2~1/3秒

攝於加州莎蓮娜市

加桑廸寬約100公里，
在環形山邊的三角形是由山崩造成的。

GASSENDI & ITS VICINITY
2000 April 15 06:35 UT

Trans: 4/10 Stead: 8/10

Astro-Physics 20.6cm f/7.7 EDF refractor

Takahashi NP-12mm projection eyepiece at EFR = 88

Film: Kodak PJM-640 (Expiration date: 1998)

Exposure: 1/2~1/3 sec.

Observing Site: Salinas, California

Remark: Gassendi is about 100 km in diameter. Its western rim is interupted by a triangular landslide.

The Poor Single-eyed Kitty

Ha! Ha! She’s back to normal

亞里斯塔克地區的兩個情景：「可憐的單眼貓」及「回復正常的雙眼貓」
以Astro-Physics 20.6cm f/7.7 EDF 折射鏡拍攝

有效焦比f/88，ISO400菲林，曝光1/3秒

Aristarchus region

taken through Astro-Physics 20.6cm f/7.7 EDF refractor, 1/3 sec. exposure at f/88 on ISO400 film

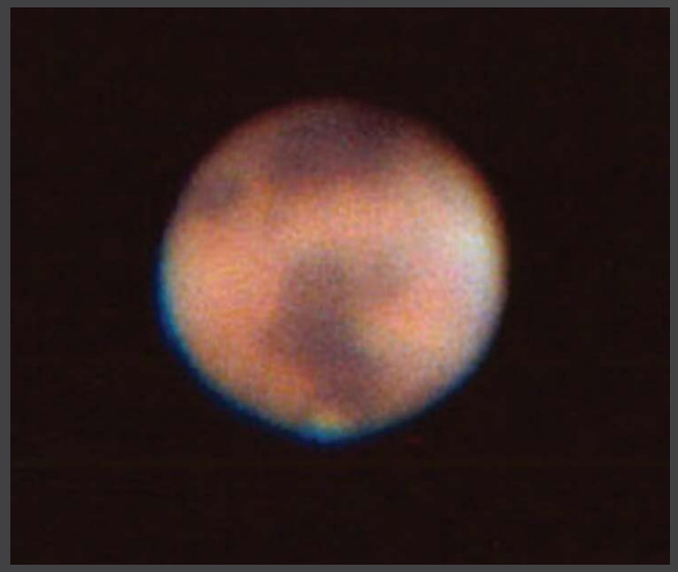
行星 Planet

土星與全開的光環

攝於 1973 年左右，香港上水村
32cm 牛頓－卡塞格林反射鏡，有效焦比不少於 f/100
柯達 Tri-X 400 菲林
曝光 4 秒
柯達 Microdol-X 顯影液
黑白着色相

SATURN with the ring system"fully open"

Taken in about 1973, Sheung Shui Village, Hong Kong
32-cm Newtonian-Cassegrain at EFR above f/100
Film: Kodak Tri-X 400
Exposure: About 4 sec.
Developer: Kodak Microdol-X
Remark: Original in B&W



火星

1997 年 3 月 22 日 07:16 UT

大氣透明度 6~7/10，寧穩度 7/10
Astro-Physics 20.6 cm f/7.7 EDF 折射鏡
賓得 5 mm Orthoscopic 投射目鏡
柯達 PJM Multi-speed 640 菲林
曝光 3/4 秒
攝於加州莎蓮娜市，當時火星的視直徑只有 14 角秒

MARS

1997 March 22 07:16 UT

Trans: 6~7/10 Stead: 7/10
Telescope: Astro-Physics 20.6cm f/7.7 EDF refractor
Projection eyepiece: Pentax 5mm Orthoscopic
Film: Kodak PJM Multi-speed 640
Exposure: 3/4 sec.
Observing Site: Salinas, California
Remark: Angular diameter of Mars = 14 arcseconds

木星與木衛一的投影

1998 年 9 月 13 日 09:07 UT

大氣透明度 7/10 寧穩度 7/10
Astro-Physics 20.6cm f/7.7 EDF 折射鏡
賓得 7 mm Orthoscopic 投射目鏡，有效焦比 f/131
富士 Super-G Plus 400 菲林
曝光 1/2 秒
攝於加州莎蓮娜市
木星南極向上

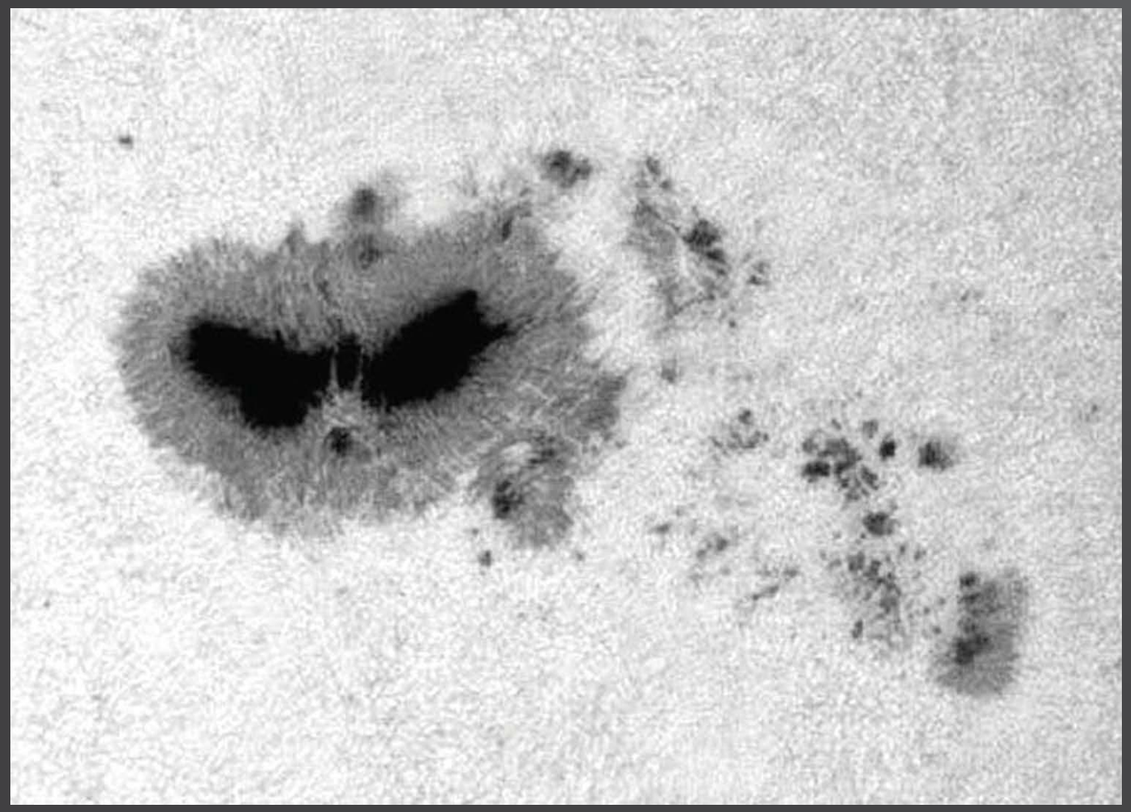
JUPITER and the shadow of its Satellite IO

1998 September 13 09:07 UT

Trans: 7/10 Stead: 7/10
Telescope: Astro-Physics 20.6cm f/7.7 EDF refractor
Pentax 7mm Orthoscopic projection eyepiece at EFR = 131
Film: Fuji Super-G Plus 400
Exposure: 1/2 sec.
Observing Site: Salinas, California
Remark: Image south-up

在同一天稍後時間（1998 年 9 月 13 日約 10:30 UT）拍攝的木星，大紅斑已在木星圓面，木衛一正走到木星圓面的邊緣。

JUPITER and its Giant Red Spot. Satellite IO is just at the planet's limb. Taken at about 10:30 UT on the same day as picture above.



巨型太陽黑子群

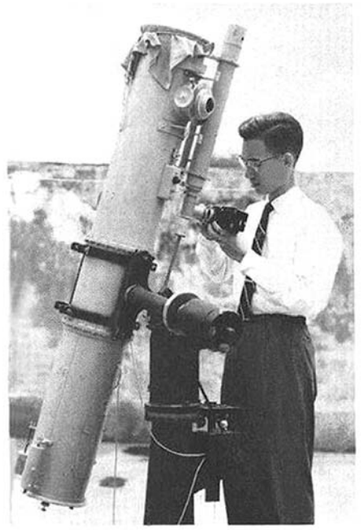
(在日面中心的SOHO #8970，寬度佔10%太陽直徑)
2000年4月26日 17:44 UT

大氣透明度7~8/10，寧穩度7/10
Astro-Physics 13cm f/8 EDT 折射鏡
高橋 9mm Orthoscopic 投射目鏡，有效焦比f/117
Thousand Oaks Type III 濾鏡
柯達 Tech Pan 2415 菲林
曝光 1/250 秒
攝於加州莎蓮娜市
最大的黑子好像狐狸臉。

HUGE SUNSPOT GROUP

(SOHO #8970, located near the sun disk's center. Full span of the Group ≈140,000 km or 10% of the sun's diameter)
2000 April 26 17:44 UT

Trans: 7~8/10 Stead: 7/10
Telescope: Astro-Physics 13cm f/8 EDT refractor
Projection eyepiece: Takahashi 9mm Orthoscopic at EFR = 117
Filter: Thousand Oaks Type III
Film: Kodak Tech Pan 2415
Exposure: 1/250 sec.
Observing Site: Salinas, California
Remark: The big sunspot looks like the face of a fox.



Hing-Chai Liu with the equipment he used to photograph the April eclipse.
(1958 April 19)
Hong Kong

香港報章刊出的1958.04.19日食新聞，左圖是廖生準備拍攝該次日食的情景，右圖是廖太觀看日食的情景，周邊繪圖是日食過程的記錄。這次本來是日環食，但觀測地點（香港上水）不在食帶內，只能看見食分甚大的日偏食。

The news of 1958.04.19 solar eclipse posted by Hong Kong media. The left shows Mr Liu preparing his photographic observation. The right shows Mrs Liu's visual observation with a sequence of eclipsing records. Intrinsically this solar eclipse was annular, but the observation site (Sheung Shui, Hong Kong) was outside the eclipse path and hence only a partial eclipse was seen.

日全食及其「鑽石環」

1991年7月11日

300mm f/4.5 攝影鏡頭連2X增距鏡及ND濾鏡，普通三腳架。
攝於墨西哥Baja區，當時天色極佳，日全食正在天頂。1991是太陽活動盛極的一年，因此日冕特別大和壯觀。

TOTAL SOLAR ECLIPSE and its DIAMOND RING

1991 July 11

Equipment: 300mm f/4.5 telephoto lens plus a 2X converter and a ND filter, ordinary camera tripod

Both photos were taken in Baja, Mexico under very ideal sky. The totally eclipsed phase occurs right at the zenith. The 1991 is a year of very active solar activities, thus producing a spectacular corona as large as 4 times the Sun diameter.

深空天體
Deep Sky Object

噘鈴星雲M27（在狐狸座的NGC 6853）
1983年8月29日 15:10~15:40 UT

大氣透明度6/10，寧穩度5/10，溫度30°C

35.5cm f/11施密特－卡塞格林（C14），減距至f/7，無濾鏡

柯達Tech Pan 2415菲林（經冷凍增感處理），曝光30分鐘

攝於香港上水村，當時很潮濕使菲林起霧，下弦月在東地平上約8度。

THE DUMBBELL NEBULA M27 (NGC 6853) in Vulpecula
1983 August 29 15:10~15:40 UT

Trans: 6/10 Stead: 5/10 Temperature: 30°C

35.5cm f/11 Schmidt-Cass. (C14), compressed to f/7, No Filter

Kodak Tech Pan 2415 (Hypered), Exposure: 30 min.

Observing Site: Sheung Shui Village, Hong Kong

Remark: Film was heavily fogged due to high humidity during exposure. Also the last quarter Moon was about 8 degrees above the eastern horizon when the exposure ended.

天鵝星雲M17（在人馬座的NGC 6618）
1984年7月22日 14:42~15:42 UT

大氣透明度6/10，寧穩度5/10，溫度31°C

35.5cm f/11施密特－卡塞格林（C14），減距至f/7

Lumicon深空濾鏡

柯達Tech Pan 2415菲林（經冷凍增感處理）

曝光60分鐘

柯達D-19顯影液

攝於香港上水村

THE SWAN NEBULA M17 (NGC 6618) in Sagittarius
1984 July 22 14:42~15:42 UT

Trans: 6/10 Stead: 5/10 Temperature: 31°C

35.5-cm f/11 Schmidt-Cassegrain (C14), compressed to f/7

Lumicon Deep-Sky Filter

Film: Kodak Tech Pan 2415 (Hypered)

Exposure: 60 min.

Development: Kodak D-19

Observing Site: Sheung Shui Village, Hong Kong

礁湖星雲M8（在人馬座的NGC 6523）
1984年7月28日 14:23~15:25 UT

大氣透明度8/10，寧穩度4~5/10，溫度30°C

35.5cm f/11施密特－卡塞格林（C14），減距至f/7

Lumicon深空濾鏡

柯達TP 2415菲林（經冷凍增感處理）

曝光62分鐘

攝於香港上水村，當時無數白雲飄過視場。

THE LAGOON NEBULA M8 (NGC 6523) in Sagittarius
1984 July 28 14:23~15:25 UT

Trans: 8/10 Stead: 4~5 /10 Temperature: 30°C

35.5-cm f/11 Schmidt-Cass. (C14), compressed to f/7

Lumicon Deep-Sky Filter

Film: Kodak TP 2415 (Hypered)

Exposure: 62 min.

Observing Site: Sheung Shui Village, Hong Kong

Remark: Numerous bright clouds drifting across the field during exposure.

加州星雲 (在英仙座的 NGC 1499)
1990年11月24日 09:10~09:50 UT

大氣透明度9/10，寧穩度3/10

高橋Epsilon-160 f/3.3天文照相儀，Lumicon 深空濾鏡

柯達Tech Pan 2415菲林（經冷凍增感處理）

曝光40分鐘

D-19顯影液

攝於加州莎蓮娜市

THE CALIFORNIA NEBULA (NGC 1499) in Perseus
1990 November 24 09:10~09:50 UT

Trans: 9/10 Stead: 3/10

Takahashi Epsilon-160 f/3.3 Astrograph

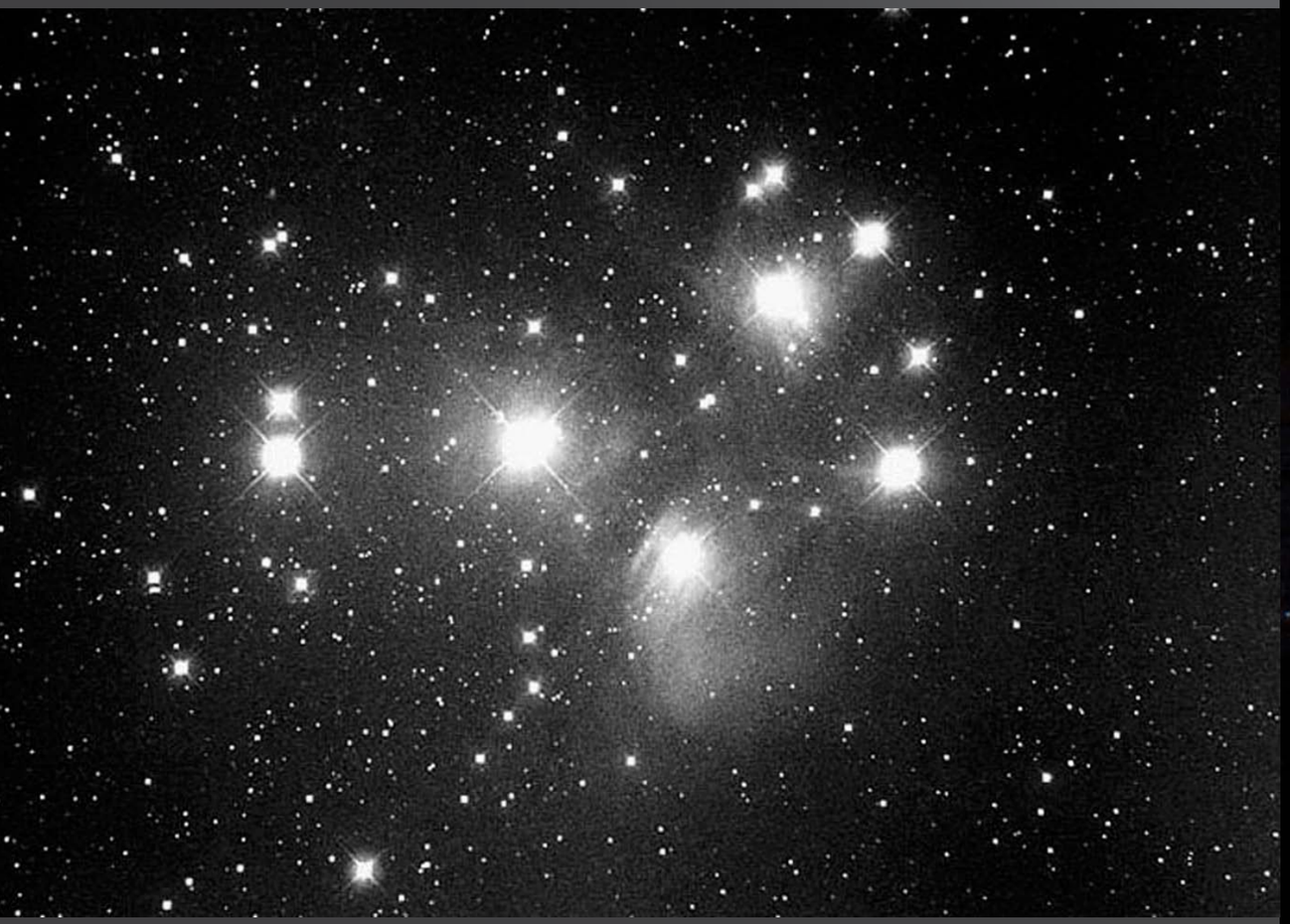
Lumicon Deep-Sky Filter

Film: Kodak Tech Pan 2415 (Hypered)

Exposure: 40 min.

Development: D-19

Observing Site: Salinas, California



昴星團M45（在金牛座，又稱「七姊妹」星團）

1990年11月24日 07:40~07:55 UT

大氣透明度8-9/10，寧穩度6/10

高橋Epsilon-160 f/3.3天文照相儀

柯達TP 2415菲林（經冷凍增感處理）

曝光15分鐘

攝於加州莎蓮娜市

M45是肉眼可辨的疏散星團，位於中國古天文稱的「昴宿」天區，距離地球約400光年。

THE PLEIADES M45 (The"Seven Sisters"in Taurus)

1990 November 24 07:40~07:55 UT

Trans: 8~9/10 Stead: 6/10

Takahashi Epsilon-160 f/3.3 Astrograph

Film: Kodak TP 2415 (Hypered)

Exposure: 15 min.

Observing Site: Salinas, California

Remark: Pleiades is a naked eye visible open cluster, though more prominent in telescopes. It is about 400 light years from Earth.

獵戶大星雲M42

1992年1月2日 06:49~08:09 UT

大氣透明度8/10，寧穩度4/10，溫度5°C，很濕

30cm f/4.9馬克蘇托夫連Lumicon深空濾鏡

柯達Ektar 1000菲林

曝光80分鐘

攝於加州莎蓮娜市

M42距離地球只有1300光年，寬約25光年，鄰近的小星雲稱M43，兩者組合如展開雙翼的鵬鳥。

THE GREAT ORION NEBULA (M42) in Orion

1992 January 2 06:49~08:09 UT

Trans: 8/10 Stead: 4/10 Temperature: 5°C Very humid

30-cm f/4.9 Maksutov with Lumicon Deep-Sky Filter

Film: Kodak Ektar 1000

Exposure: 80 min.

Observing Site: Salinas, California

Remark: M42 is 1300 light years away, roughly 25 light years across. The small close nebula is M43. Both combine to appear as if a flying eagle.

海鷗星雲IC 2177（在麒麟座）照片上還有NGC 2327、NGC 2335、Gum 1、Cederblad 90

1993年1月26日 07:20 ~ 08:20 UT

大氣透明度6/10，寧穩度3/10

騰龍300mm f/2.8攝影鏡頭連R-64紅濾鏡

柯達Tech Pan 2415菲林（經冷凍增感處理）

曝光60分鐘

攝於加州莎蓮娜市

SEAGULL NEBULA (IC 2177) in Monoceros Also with NGC 2327, NGC 2335, Gum 1, Cederblad 90

1993 January 26 07:20 ~ 08:20 UT

Trans: 6/10 Stead: 3/10

Lens: Tamron 300mm f/2.8 with R-64 red filter

Film: Kodak Tech Pan 2415 (Hypered)

Exposure: 60 min.

Observing Site: Salinas, California

NGC 4631星系（在獵犬座）

1993年6月17日 06:17~06:37 UT

大氣透明度7~8/10，寧穩度 3~4/10

30cm f/4.9馬克蘇托夫（ASTROMAK）

柯達Tech Pan 2415菲林（經冷凍增感處理）

曝光20分鐘

攝於加州莎蓮娜市

NGC 4631是一個旋渦星系的側面，暱稱「鯨魚星系」，距離地球2千萬多光年。

GALAXY NGC 4631 in Canes Venatici

1993 June 17 06:17 ~ 06:37 UT

Trans: 7~8/10 Stead: 3~4/10

30-cm f/4.9 Maksutov (ASTROMAK)

Film: Kodak Tech Pan 2415 (Hypered)

Exposure: 20 min.

Observing Site: Salinas, California

Remark: NGC 4631 is the edge-on view of a spiral galaxy some 25 million light years away, nicknamed “the Whale Galaxy”.

馬頭星雲（背景亮星雲是獵戶座的IC 434）

35.5cm f/11施密特－卡塞格林（C14），減距至f/7

Lumicon深空濾鏡

柯達Tech Pan 2415菲林（經冷凍增感處理）

曝光60分鐘

攝於香港上水村，天空被光污染。

THE HORESHEAD NEBULA (Background is IC 434 in Orion)

35.5-cm f/11 Schmidt-Cassegrain (C14) compressed to f/7

Lumicon Deep-Sky Filter

Film: Kodak Tech Pan 2415 (Hypered)

Exposure: 60 min.

Observing Site: Sheung Shui Village, Hong Kong

Remarks: Sky light polluted.

馬頭星雲（在獵戶座的Barnard 33）

1993年1月26日 06:03~07:03 UT

大氣透明度6/10，寧穩度4/10

騰龍300mm f2.8攝影鏡頭，收細光圈至 f/4

Kenko R-64紅濾鏡

柯達TP 2415菲林（經冷凍增感處理）

曝光60分鐘

攝於加州莎蓮娜市

THE HORSEHEAD NEBULA (Barnard 33 in Orion)

1993 January 26 06:03 ~ 07:03 UT

Trans: 6/10 Stead: 4/10

Tamron 300mm f/2.8 at f/4

Kenko R-64 Red Filter

Film: Kodak TP 2415 (Hypered)

Exposure: 60 min.

Observing Site: Salinas, California

在御夫座的IC405、IC410、NGC1931及其他

1993年1月25日 05:15~06:15 UT

大氣透明度6~7/10，寧穩度4/10

騰龍300mm f/2.8 攝影鏡頭，收細光圈至f/4

Kenko R-64紅濾鏡

柯達TP 2415菲林（經冷凍增感處理）

曝光60分鐘

攝於加州莎蓮娜市

IC405, IC410, NGC1931 & Others in Auriga

1993 January 25 05:15~06:15 UT

Trans: 6~7/10 Stead: 4/10

Tamron 300mm f/2.8 stopped to f/4

Kenko R-64 Red Filter

Film: Kodak TP 2415 (Hypered)

Exposure: 60 min.

Observing Site: Salinas, California

天鵝星雲M17（在人馬座的NGC 6618）

1992年7月23日 07:10~08:10 UT

大氣透明度7/10，寧穩度6/10，大風

30cm f/4.9馬克蘇托夫（ASTROMAK）

Lumicon深空濾鏡，Nikon F-1相機身

柯達Ektar 1000菲林 ，曝光60分鐘

攝於加州莎蓮娜市

照片南向上，頂邊有一對視線貼近的8等星，相距1.1角分。

THE SWAN NEBULA M17 (NGC 6618) in Sagittarius

1992 July 23 07:10~08:10 UT

Trans: 7/10 Stead: 6/10 Windy

30-cm f/4.9 Makustov (ASTROMAK)

Lumicon Deep-Sky Filter, Nikon F-1 camera body

Film: Kodak Ektar 1000, Exposure: 60 min.

Observing Site: Salinas, California

Remark : The picture is south-up. There is a pair of apparently close stars, each magnitude 8, separation 1.1 arcminutes.

啞鈴星雲M27（在狐狸座）

1993年6月25日 11:08~12:08 UT

大氣透明度8~9/10，寧穩度 6/10

30cm f/4.9馬克蘇托夫（ASTROMAK）

ATM 深空濾鏡

柯達 Ektar 1000菲林

曝光60分鐘

攝於加州莎蓮娜市

THE DUMBBELL NEBULA (M27) in Vulpecula

1993 June 25 11:08~12:08 UT

Trans: 8~9/10 Stead: 6/10

30-cm f/4.9 Maksutov (ASTROMAK)

ATM Deep-Sky Filter

Film: Kodak Ektar 1000

Exposure: 60 min.

Observing Site: Salinas, California

礁湖星雲 M8（在人馬座的 NGC 6523）

1993年6月25日 09:25~10:23 UT

大氣透明度8~9/10，寧穩度5/10

30cm f/4.9馬克蘇托夫（ASTROMAK）連ATM星雲濾鏡

柯達Ektar Color 1000菲林

曝光58分鐘

攝於加州莎蓮娜市

THE LAGOON NEBULA M8 (NGC 6523) in Sagittarius

1993 June 25 09:25 ~ 10:23 UT

Trans: 8~9/10 Stead: 5/10

30-cm f/4.9 Maksutov (ASTROMAK) with Nebula Filter (ATM)

Film: Kodak Ektar Color 1000

Exposure: 58 min.

Observing Site: Salinas, California

黑眼星系 M64（在后髮座）

1993年6月17日 06:48 ~ 07:06 UT

大氣透明度7~8/10，寧穩度3/10

30cm f/4.9馬克蘇托夫（ASTROMAK）

柯達Tech Pan 2415菲林（經冷凍增感處理）

曝光18分鐘

攝於加州莎蓮娜市

THE BLACK-EYE GALAXY M64 in Coma Berenices

1993 June 17 06:48 ~ 07:06 UT

Trans: 7~8/10 Stead: 3/10

30-cm f/4.9 Maksutov (ASTROMAK)

Film: Kodak Tech Pan 2415 (Hypered)

Exposure: 18 min.

Observing Site: Salinas, California

M46疏散星團與 NGC 2438 行星狀星雲（在船尾座）

1995年3月27日 05:05~05:35 UT

大氣透明度8~9/10，寧穩度3~4/10

Astro-Physics 20.6cm f/7.7 EDF折射鏡

減距至 f/6.3

ATM 星雲濾鏡

柯達 Gold 1000 菲林

曝光30分鐘

攝於加州莎蓮娜市

M46距離地球5400光年，NGC 2438約3000光年。

M46 Open Cluster with NGC 2438 Planetary Nebula in Puppis

1995 March 27 05:05~05:35 UT

Trans: 8~9/10 Stead: 3~4/10

Astro-Physics 20.6cm f/7.7 EDF refractor compressed to f/6.3

ATM Nebula Filter

Film: Kodak Gold 1000

Exposure: 30 min.

Observing Site: Salinas, California

Remark: M46 is 5400 light years from Earth while NGC 2438 is some 3000 light years away.

三葉星雲 M20（在人馬座）

1996年6月19日 09:39~10:39 UT

大氣透明度7~8/10，寧穩度6/10

30cm f/4.9馬克蘇托夫（ASTROMAK）

Lumicon深空濾鏡

富士 Super-G Plus 400 菲林

曝光60分鐘

攝於加州莎蓮娜市

M20又稱三裂星雲，分為兩部分，藍色部分是反射星雲，紅色部分是發射星雲。

THE TRIFID NEBULA (M20) in Sagittarius

1996 June 19 09:39 ~ 10:39 UT

Trans: 7~8/10 Stead: 6/10

30-cm f/4.9 Maksutov (ASTROMAK)

Lumicon Deep-Sky Filter

Film: Fuji Super-G Plus 400

Exposure: 60 min.

Observing Site: Salinas, California

Remark : M20 is composed of two parts. The blue part is a reflection nebula, the red part is an emission nebula.

M22球狀星團（在人馬座的NGC 6656）

1996年9月5日 04:42~04:52 UT

大氣透明度8~9/10，寧穩度4/10，大風

30cm f/4.9馬克蘇托夫（ASTROMAK）

富士 Super-G 800 菲林

曝光 10 分鐘

攝於加州莎蓮娜市

THE GLOBULAR CLUSTER M22 (NGC 6656) in Sagittarius

1996 September 5 04:42~04:52 UT

Trans: 8~9/10 Stead: 4/10 windy!

30-cm f/4.9 Maksutov (ASTROMAK)

Film: Fuji Super-G 800

Exposure: 10 min.

Observing Site: Salinas, California

M82星系（在大熊座）
2000年5月1日 05:16~05:36 UT

大氣透明度8~9/10，寧穩度3~4/10
Astro-Physics 20.6cm f/7.7 EDF 折射鏡
在主焦點拍攝，無濾鏡
Kirkland（Agfa）ISO 400彩色菲林
曝光20分鐘
攝於加州莎蓮娜市
M82又稱「雪茄星系」，距離約1千萬光年。

GALAXY M82 in Ursa Major
2000 May 1 05:16~05:36 UT

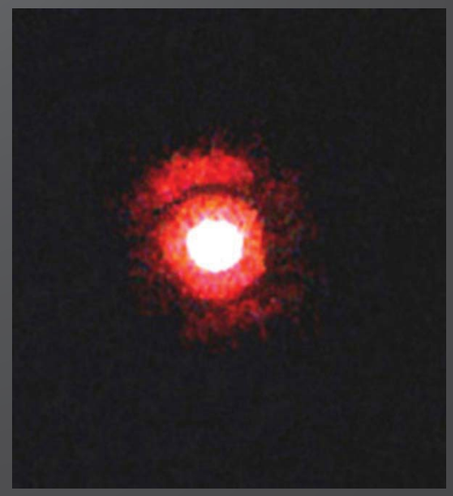
Trans: 8~9/10 Stead: 3~4/10
Astro-Physics 20.6cm f/7.7 EDF refractor at prime focus, no filter
Kirkland (Agfa) Color Print Film ISO 400
Exposure: 20 min.
Observing Site: Salinas, California
Remark: M82 is also known as "the Cigar Galaxy", distance about 10 million light years.

夏季銀河
(包括在人馬座的梅西爾天體M8、M17、 M18、M20、M21、M22、M23、M24)
1997年4月6日 12:40~12:50 UT

大氣透明度7/10 寧穩度5~6/10
奧林匹斯OM-1相機連135mm f/2.8鏡頭
柯達 PPF-2 ISO 400 菲林
曝光10分鐘
攝於加州Panoche Hills

SUMMER MILKY WAY
(in Sagittarius with Messier Objects M8, M17, M18, M20, M21, M22, M23, M24)
1997 April 6 12:40 ~ 12:50 UT

Trans: 7/10 Stead: 5~6/10
Lens: Olympus Zuiko 135mm f/2.8
Camera Body: OM-1
Film: Kodak PPF-2 ISO 400
Exposure: 10 min.
Observing Site: Panoche Hills, California

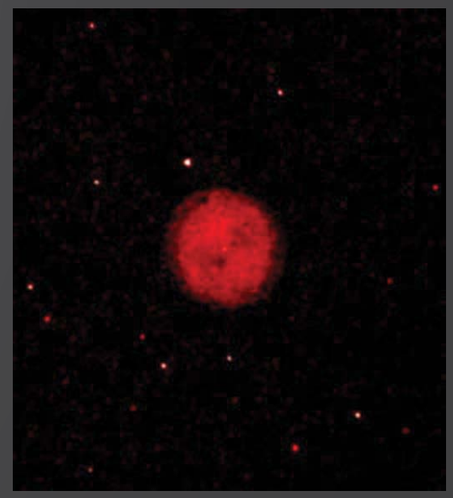


愛斯基摩星雲NGC 2392
(在雙子座)
2000年3月31日 05:45~05:50 UT

大氣透明度7~8/10，寧穩度 3~4/10
Astro-Physics 20.6cm f/7.7 EDF 折射鏡，2X 增距鏡
Kirkland（Agfa）ISO 400彩色菲林
曝光5分鐘
攝於加州莎蓮娜市

THE ESKIMO NEBULA
(NGC 2392) in Gemini
2000 March 31 05:45~05:50 UT

Trans: 7~8/10 Stead: 3~4/10
Astro-Physics 20.6cm f/7.7 EDF refractor with 2X teleconverter
Kirkland (Agfa) Color Print Film ISO 400
Exposure: 5 min.
Observing Site: Salinas, California



貓頭鷹星雲M97（在大熊座）
2000年5月1日 06:10~06:52 UT

大氣透明度8/10 寧穩度3~4/10
Astro-Physics 20.6cm f/7.7 EDF 折射鏡，在主焦點拍攝
Lumicon 深空濾鏡
Kirkland（Agfa）400彩色菲林
曝光42分鐘
攝於加州莎蓮娜市

THE OWL NEBULA (M97) in Ursa Major
2000 May 1 06:10 ~ 06:52 UT

Trans: 8/10 Stead: 3~4/10
Astro-Physics 20.6cm f/7.7 EDF refractor at prime focus
Lumicon Deep-Sky Filter
Kirkland (Agfa) Color Print Film 400
Exposure: 42 min.
Observing Site: Salinas, California

數碼天文攝影
Digital Astrophotography

土星
2001年12月

Astro-Physics 20.6cm f/7.7 EDF 折射鏡
Nikon Coolpix 990 數碼相機
Afocal 攝影法
每隔14.7 年，土星環以最大視面對着地球，
這照片的土星環十分接近最大視面。

SATURN
2001 December

Astro-Physics 20.6cm f/7.7 EDF refractor
Nikon Coolpix 990 digital camera
Afocal imaging method
Remark: Saturn's ring gives its maximum view every 14.7 years.
The ring in this image is almost at maximum view.

木星與木衛一
2002年2月7日

Astro-Physics 20.6cm f/7.7 EDF 折射鏡
攝於加州莎蓮娜市

JUPITER and its Satellite IO
2002 February 7

Astro-Physics 20.6cm f/7.7 EDF refractor
Observing Site: Salinas, California

哥白尼環形山與附近區域
2002年4月22日

以Nikon Coolpix 990數碼相機經Astro-Physics 20.6cm f/7.7 EDF 折射鏡的目鏡拍攝

哥白尼是一個很大的碰撞環形山，在八億年前形成，深3700米，直徑93公里，闊度是香港島東西兩端的6倍，這裏有許多次級碰撞坑，它們都是由哥白尼拋出的碎塊跌返月面而造成的。

COPERNICUS AND VICINITY >
2002 April 22

Afocal imaging with Nikon Coolpix 990 digital camera through Astro-Physics 20.6cm f/7.7 EDF refractor

Remark: Copernicus is a large impact crater formed 800 million years ago, depth 3700m, diameter 93km or 6 times the span of Hong Kong Island. There are many secondary craters in this region, produced by ejected debris during the Copernicus impact.

英仙座雙星團
2003年9月6日 11:13:39 UT

30cm f/4.9馬克蘇托夫（ASTROMAK），在主焦點拍攝，無濾鏡

Canon EOS 10D相機

曝光1分鐘 @ ISO 800

攝於加州莎蓮娜市

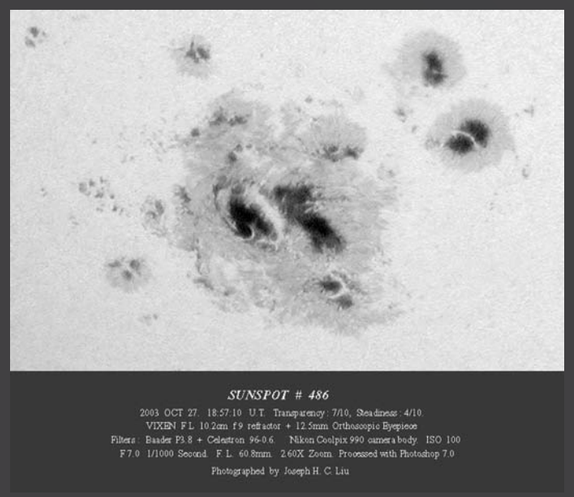
Double Cluster in Perseus
2003 September 6 11:13:39 UT

30-cm f/4.9 Maksutov (ASTROMAK) at prime focus, no filter

Camera: Canon EOS 10D

Exposure: 1 min. @ ISO 800

Observing Site: Salinas, California



太陽黑子 #486
2003年10月27日 18:57:10 UT

Vixen FL 10.2cm f/9 折射鏡 + 12.5mm Orthoscopic 目鏡

濾鏡: Baader P3.8 + Celestron 96-0.6

Nikon Coolpix 990 數碼相機，有效焦距 60.8mm

Afocal投影 1/1000秒 f/7.0 ISO 100

Photoshop 7.0處理

Sunspot # 486
2003 October 27 18:57:10 UT

Trans: 7/10 Stead: 4/10

Vixen FL 10.2-cm f/9 refractor + 12.5mm Orthoscopic eyepiece

Filters: Baader P3.8 + Celestron 96-0.6

Nikon Coolpix 990 digital camera, EFL 60.8mm

Afocal projection 1/1000 sec. f/7.0 ISO 100

Processed with Photoshop 7.0

NEAT彗星（C/2001 Q4）
2004年5月8日 04:13 UT

30cm f/4.9馬克蘇托夫（ASTROMAK）在主焦點拍攝，無濾鏡

Canon EOS 10D相機

曝光40秒@ ISO 800

攝於加州莎蓮娜市

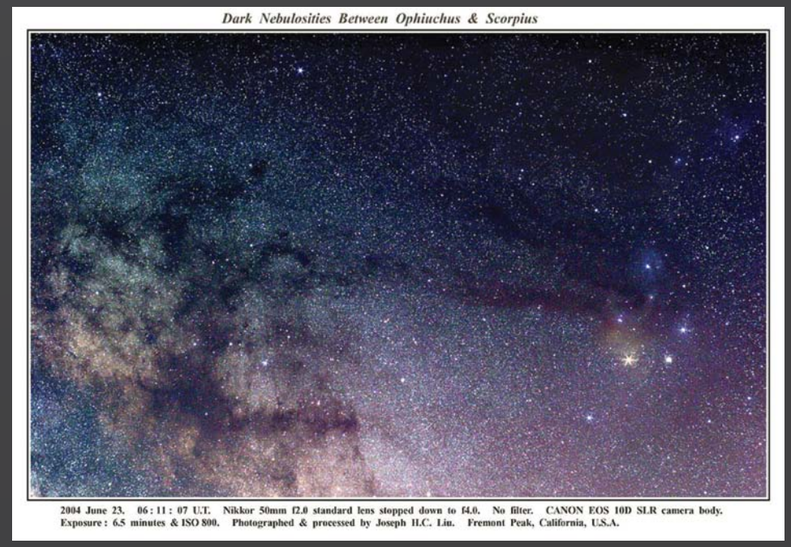
Comet NEAT (C/2001 Q4)
2004 May 8 04:13 UT

30-cm f/4.9 Maksutov (ASTROMAK) at prime focus, no filter

Camera: Canon EOS 10D

Exposure: 40 sec. @ ISO 800

Observing Site: Salinas, California



在人馬座和蛇夫座之間的暗塵氣
2004年6月23日 06:11 UT

Nikkor 50 mm f/2 標準鏡頭，收細光圈至f/4

無濾鏡，Canon EOS 10D相機機身

曝光6.5分鐘@ ISO 800

攝於Fremont Peak, California

左面的暗塵雲暱稱「黑馬星雲」，右面的亮星是在天蠍座的心宿二，對上有藍氣的星是蛇夫Rho

Dark nebulosities between Scorpius and Ophiuchus
2004 June 23 06:11 UT

Nikkor 50 mm f/2 standard lens stopped down to f/4, no filter

Canon EOS 10D camera body

Exposure: 6.5 min. @ ISO 800

Observing Site: Fremont Peak, California.

Remark: The dust and nebulosity at left is nicknamed Dark Horse Nebula, the bright star at right is Antares, the upper star with bluish nebulosity is Rho Ophiuchi.

晶星團M45（在金牛座，又稱「七姊妹」星團）

2004年8月13日

高橋Epsilon-160 f/3.3天文照相儀＋Canon EOS 10D相機，無濾鏡

曝光約5分鐘@ ISO 800

單張，Photoshop處理

攝於加州莎蓮娜市

照片中藍氣都是星際氣體和塵埃反射來自M45亮星的星光。

THE PLEIADES M45 (The “Seven Sisters” In Taurus)

2004 August 13

Takahashi Epsilon-160 f/3.3 Astrograph +
Canon EOS 10D camera, no filter

Exposure: About 5 min. @ ISO 800

Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: The blue nebulosity is a reflection of starlight from interstellar gas and dust.

仙女星系
(在仙女座的M31旋渦星系)
2004年8月12日

高橋Epsilon-160 f/3.3天文照相儀 + Canon EOS 10D相機，無濾鏡

曝光約5分鐘@ ISO 800

單張，Photoshop處理

攝於加州莎蓮娜市

M31距離地球250萬光年，比銀河系稍大，鄰近還有兩個細小的伴星系：近照片中心的M32和近照片下邊的M110 。

ANDROMEDA GALAXY
(The spiral galaxy M31 in Andromeda)
2004 August 12

Takahashi Epsilon-160 f/3.3 Astrograph + Canon EOS 10D camera, no filter

Exposure: About 5 min. @ ISO 800

Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: M31 is 2.5 million light years away and slightly bigger than our Galaxy. It has several small galaxy companions including M32 at the disk rim of M31 and M110 slightly further from M31.

三角星系
(在三角座的M33旋渦星系)
2004年8月13日

高橋Epsilon-160 f/3.3天文照相儀 + Canon EOS 10D相機，無濾鏡

曝光約5分鐘@ ISO 800

單張，Photoshop處理

攝於加州莎蓮娜市

TRIANGULUM GALAXY (The spiral galaxy M33 in Triangulum)
2004 August 13

Takahashi Epsilon-160 f/3.3 Astrograph + Canon EOS 10D camera, no filter

Exposure: About 5 min. @ ISO 800

Single frame, processed with Photoshop

Observing Site: Salinas, California

渦狀星系M51（在獵犬座）
2006年5月20日 06:43 UT

35.5cm f/11 施密特－卡塞格林（C14），減距至f/7，無濾鏡

Canon EOS 20Da 相機機身

曝光91秒@ ISO 1600

單張，Photosho處理

攝於加州莎蓮娜市

由於星系間的引力作用，鄰近M51的伴星系NGC 5195已變成模糊形狀，M51的一道旋臂也被拉長與NGC 5195連接 。

The Whirlpool Galaxy M51 (in Canes Venatici)
2006 May 20 06:43 UT

35.5-cm f/11 Schmidt-Cassegrain (C14) compressed to f/7, no filter

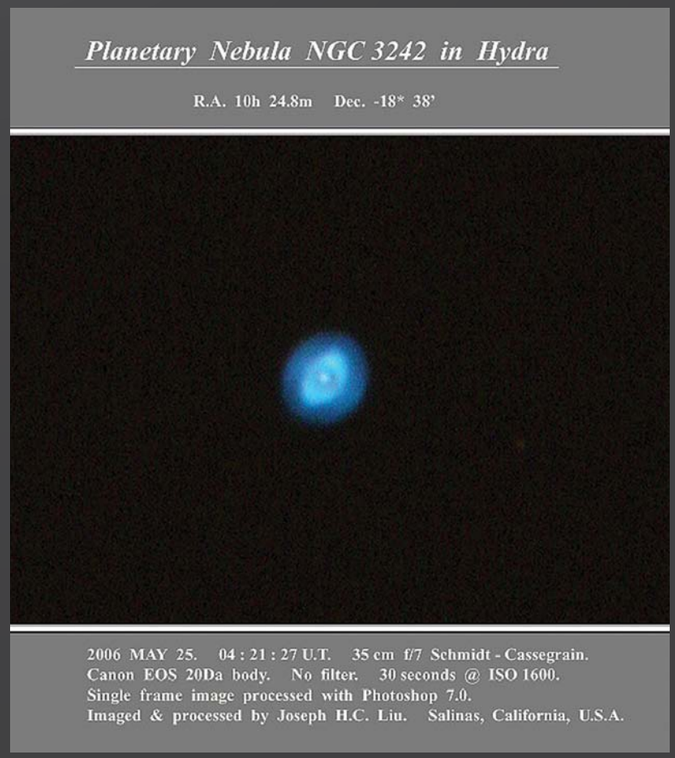
Canon EOS 20Da camera body

Exposure: 91 sec. @ ISO 1600

Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: Due to intergalactic gravity interaction, the smaller galaxy companion NGC 5195 becomes blurred. One spiral arm of M51 is also elongated to connect with NGC 5195.



行星狀星雲NGC 3242（在長蛇座）
2006年5月25日 04:21 UT

35.5cm f/11 施密特－卡塞格林（C14），減距至f/7，無濾鏡

Canon EOS 20Da 相機機身

曝光30秒@ ISO 1600

單張，Photoshop處理

攝於加州莎蓮娜市

在星雲氣殼中心是一顆高溫的白矮星 。

Planetary Nebula NGC 3242 (in Hydra)
2006 May 25 04:21 UT

35-cm f/11 Schmidt-Cass. (C14), compressed to f/7, no filter

Canon EOS 20Da camera body

Exposure: 30 sec. @ ISO 1600

Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: Inside the gaseous shell of the nebula is a hot white dwarf star.

水星凌日
2006年11月8日 23:44:48 UT

Astro-Physics 13cm f/8 EDT 折射鏡 + 12.5mm Orthoscopic 目鏡

Nikon Coolpix 995 數碼相機，afocal投影

曝光：1/2325 秒@ ISO 200，單張，攝於加州莎蓮娜市

21 世紀共有14次水星凌日，這是第二次，其後三次在2016/5月、2019/11月及2032/11月。凌日時，水星只像小黑點，視直徑低於 13 角秒。

Transit of Mercury
2006 November 8 23:44:48 UT

Astro-Physics 13cm f/8 EDT refractor + 12.5mm Orthoscopic eyepiece

Nikon Coolpix 995 digital camera, afocal projection

Exposure: 1/2325 sec. @ ISO 200, single frame

Observing Site: Salinas, California

Remark: There are totally 14 transits of Mercury in the 21st century. This is the second time. The next forecast will be May 2016, November 2019 and November 2032. Mercury will appear as a small dot no bigger than 13 arcseconds during a transit.

球狀星團M13（在武仙座）
2007年7月13日 06:03 UT

35.5cm f/11 施密特－卡塞格林（C14），減距至f/7，無濾鏡

Canon EOS 20Da 相機機身

曝光 2 分鐘@ ISO 1600

單張，Photoshop 處理

攝於加州莎蓮娜市

M13 是銀河系中最大的球狀星團之一，距離 2 萬多光年，直徑約 150 光年，估計含星 30 萬顆。

Globular Cluster M13 in Hercules
2007 July 13 06:03 UT

35.5-cm f/11 Schmidt-Cass. (C14), compressed to f/7, no filter

Canon EOS 20Da camera body

Exposure: 2 min. @ ISO 1600

Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: M13 is one of the largest globular clusters in our Galaxy. It is some 25000 light years away, diameter about 150 light years and contains an estimated 300 thousand stars.

啞鈴星雲M27（在狐狸座）
2007年6月22日 10:51 UT

35.5cm f/11施密特－卡塞格林（C14），減距至 f/7，無濾鏡

Canon EOS 20Da 相機機身

曝光111秒@ ISO 1600，無導星跟蹤

單張，Photoshop 處理，攝於加州莎蓮娜市

M27 只有 8.0 x 5.6 角分，但已是行星狀星雲中視面最大之一 。

The Dumbbell Nebula M27 (in Vulpecula)
2007 June 22 10:51 UT

35.5-cm f/11 Schmidt-Cass. (C14), compressed to f/7, no filter

Canon EOS 20Da camera body

Exposure: 111 sec. @ ISO 1600, unguided

Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: M27 is as small as 8.0 x 5.6 arcminutes, yet it is one of the largest angular sizes among all known planetary nebulae.

月全食
2007年8月28日

加州莎蓮娜市

照片取自廖生的2007聖誕卡。

Total Moon Eclipse
2007 August 28

Observing Site: Salinas, California

Remark: Extracted from Mr Liu's 2007 Christmas card.

靜海西邊
2007年9月2日 12:21 UT

Astro-Physics 20.6cm f/7.7 EDF 折射鏡 + 12.5mm Orthoscopic 目鏡 + Nikon Coolpix 995 數碼相機，afocal 投影

曝光 1/8 秒@ ISO 200

單張，Photoshop 處理

攝於加州莎蓮娜市

在照片左邊皺脊群附近有一對拱山，
它們都是20~30億年前從月海凸起的火山遺跡。

Around the Western Section of Mare Tranquillitatis
2007 September 2 12:21 UT

Astro-Physics 20.6cm f/7.7 EDF refractor + 12.5mm Orthoscopic eyepiece + Nikon Coolpix 995 digital camera for afocal projection

Exposure 1/8 sec. @ ISO 200

Single frame, Processed with Photoshop

Observing Site: Salinas, California

Remark: Note the two dome hills near the wrinkle ridges at left of the picture. Dome hills are remnants of active volcanoes swelling up from the "lunar seas" 2~3 billion years ago.

赫姆斯彗星（17P/Holmes）
2007年11月19日 05:31 UT

Astro-Physics 20.6cm f/7.7 EDF折射鏡 @ f/5.8 + Canon EOS 20Da 相機

曝光30秒@ ISO 1600，無導星跟蹤

單張，經 Photoshop 處理

攝於加州莎蓮娜市

彗星頭部幾乎面向地球，看起來像水母。

Comet 17P / Holmes
2007 November 19 05:31 UT

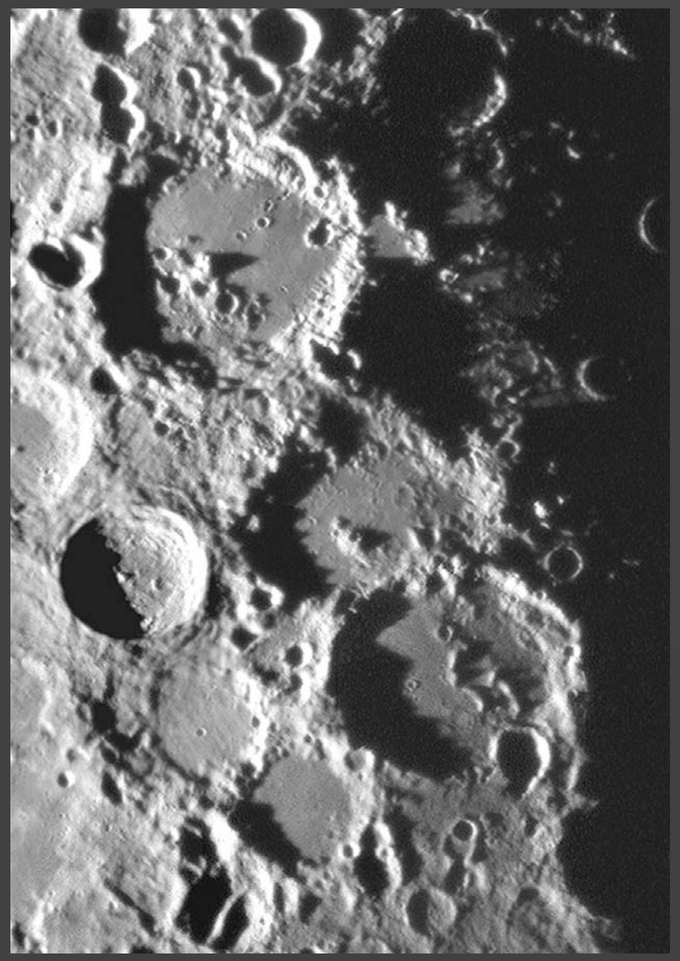
Astro-Physics 20.6cm f/7.7 EDF refractor @ f/5.8 + Canon EOS 20Da camera

Exposure: 30 sec. @ ISO 1600 unguided

Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: The head of the comet is almost facing Earth, giving a tailless view like a jellyfish.



華爾頓、勒吉奧芒坦、普爾巴赫（環形山）
2008年3月15日 04:08 UT

Astro-Physics 20.6cm f/7.7 EDF折射鏡 + 12.5mm Orthoscopic目鏡 + Nikon Coolpix 995 數碼相機，afocal 投影

曝光1/15秒@ ISO 200

單張，Photoshop處理

攝於加州莎蓮娜市

Walther, Regiomontanus and Purbach（Craters）
2008 March 15 04:08 UT

Astro-Physics 20.6cm f/7.7 EDF refractor + 12.5mm Orthoscopic eyepiece + Nikon Coolpix 995 digital camera for afocal projection

Exposure 1/15 sec.@ ISO 200

Single frame, processed with Photoshop

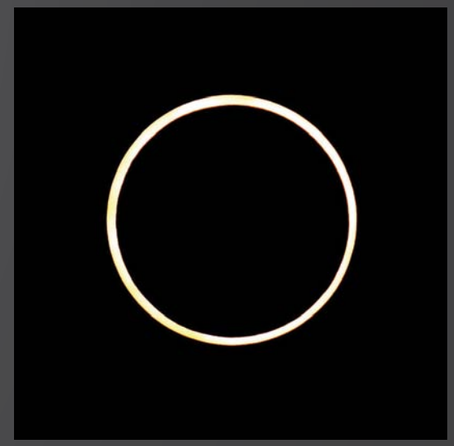
Observing Site: Salinas, California

中秋滿月
2008年9月14日（美國西岸時間）

以輕便數碼相機經19cm f/5.3馬克蘇托夫－牛頓望遠鏡拍攝。有明亮輻射光紋的環形山稱第谷。

The Moon at Mid-Autumn Festival
2008 September 14 (Salinas time)

Shot from 19-cm f/5.3 Maksutov-Newtonian with compact digital camera. The crater with bright radiate streaks is Tycho.



日環食
2012年5月20日下午5:37 pm美國西岸時間

Orion 8cm f/7.5 ED折射鏡 + Canon EOS 60D相機

Thousand Oak太陽濾鏡

曝光1/1000秒@ ISO 200，單張

攝於北加州Shasta Lake

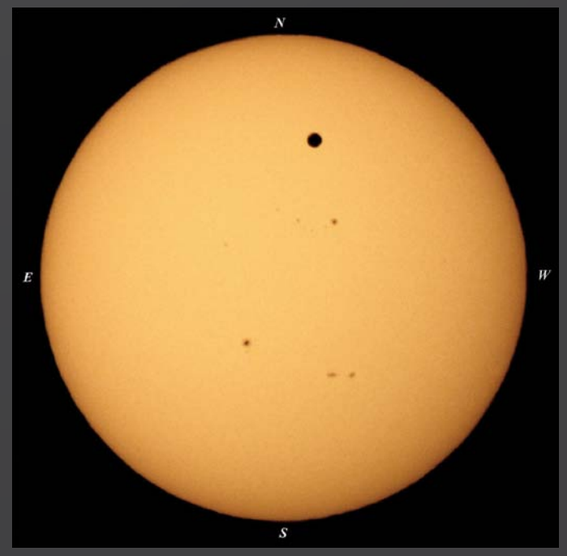
Annular Solar Eclipse
2012 May 20 5:37 pm PST

Orion 8-cm f/7.5 ED refractor + Canon EOS 60D camera

Thousand Oak solar filter

Exposure: 1/1000 sec. @ ISO 200, single frame

Observing Site: Shasta Lake, Northern California



金星凌日
2012年6月5日 01:30 UT

Orion 8cm f/7.5 ED折射鏡 + Canon EOS 60D相機

Thousand Oak + ND 8 + 淺黃濾鏡

曝光1/4000秒@ ISO 200

單張，Photoshop 處理

攝於加州莎蓮娜市

21世紀只有兩次金星凌日，這是本世紀的第二次，亦是最後的一次。

Transit of Venus
2012 June 5 01:30 UT

Orion 8-cm f/7.5 ED refractor + Canon EOS 60D camera

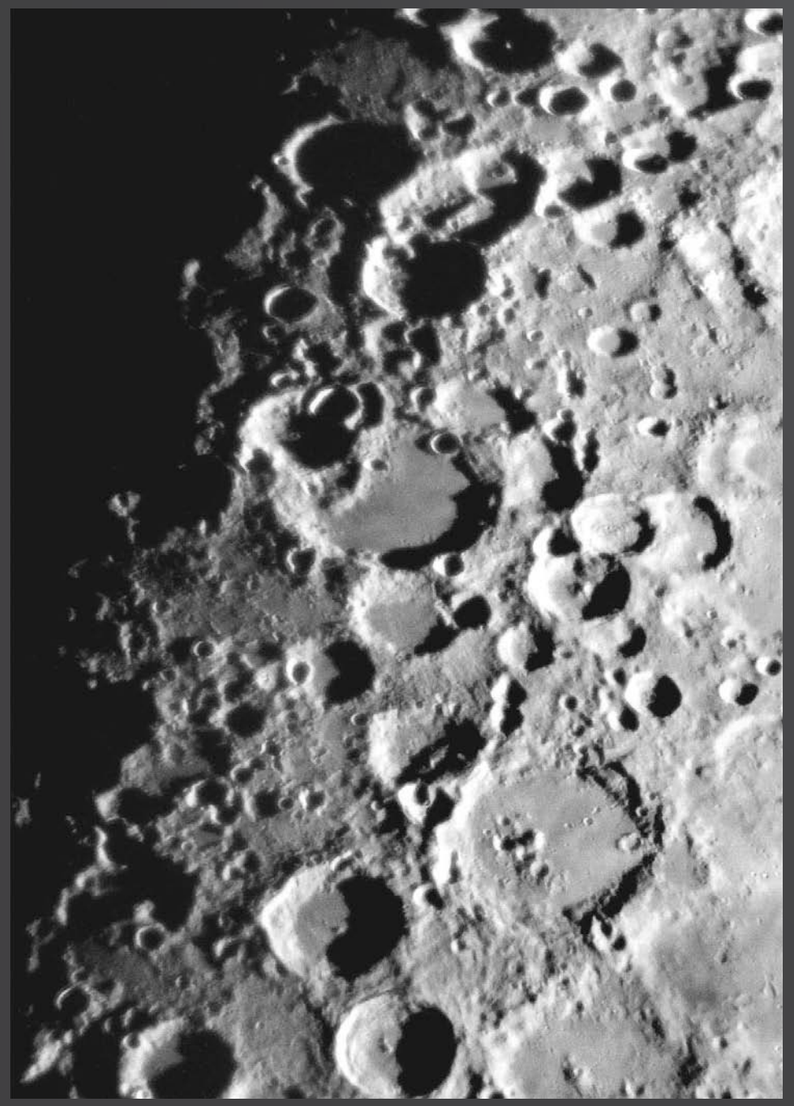
Filters: Thousand Oak + ND 8 + light yellow

Exposure: 1/4000 sec.@ ISO 200

Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: There are only two events of Venus transit in front of the Sun in the 21st century. This is the second and also the last event in the century.



史托夫勒、華爾頓及附近區域
2012年9月7日

Celestron Omni XLT 15cm f/5牛頓反射鏡 + 4mm Orthoscopic目鏡 + Canon EOS Rebel T3i 相機機身，無濾鏡

Afocal投影

曝光1/21秒@ ISO 1600

單張，Photoshop處理

攝於加州莎蓮娜市

Stöfler and Walther and their vicinity
2012 September 7

Celestron Omni XLT 15-cm f/5 Newtonian reflector + 4mm Orthoscopic eyepiece + Canon EOS Rebel T3i camera body, no filter

Afocal projection

Exposure 1/21 sec.@ ISO 1600

Single frame, processed with Photoshop

Observing Site: Salinas, California

托勒玫瑰形山及附近區域
2012年10月7日

Celestron Omni XLT 15cm f/5牛頓反射鏡 + 4mm Orthoscopic目鏡 + Canon EOS 60Da相機機身

無濾鏡

Afocal投影

曝光1/6秒@ ISO 1600

單張，Photoshop處理

攝於加州莎蓮娜市

這張月相代表了廖生最後期的天文攝影作品。

Ptolemaeus and Vicinity >
2012 October 7

Celestron Omni XLT 15-cm f/5 Newtonian reflector + 4mm Orthoscopic eyepiece + Canon EOS 60Da camera body

no filter

Afocal projection

Exposure 1/6 sec.@ ISO 1600

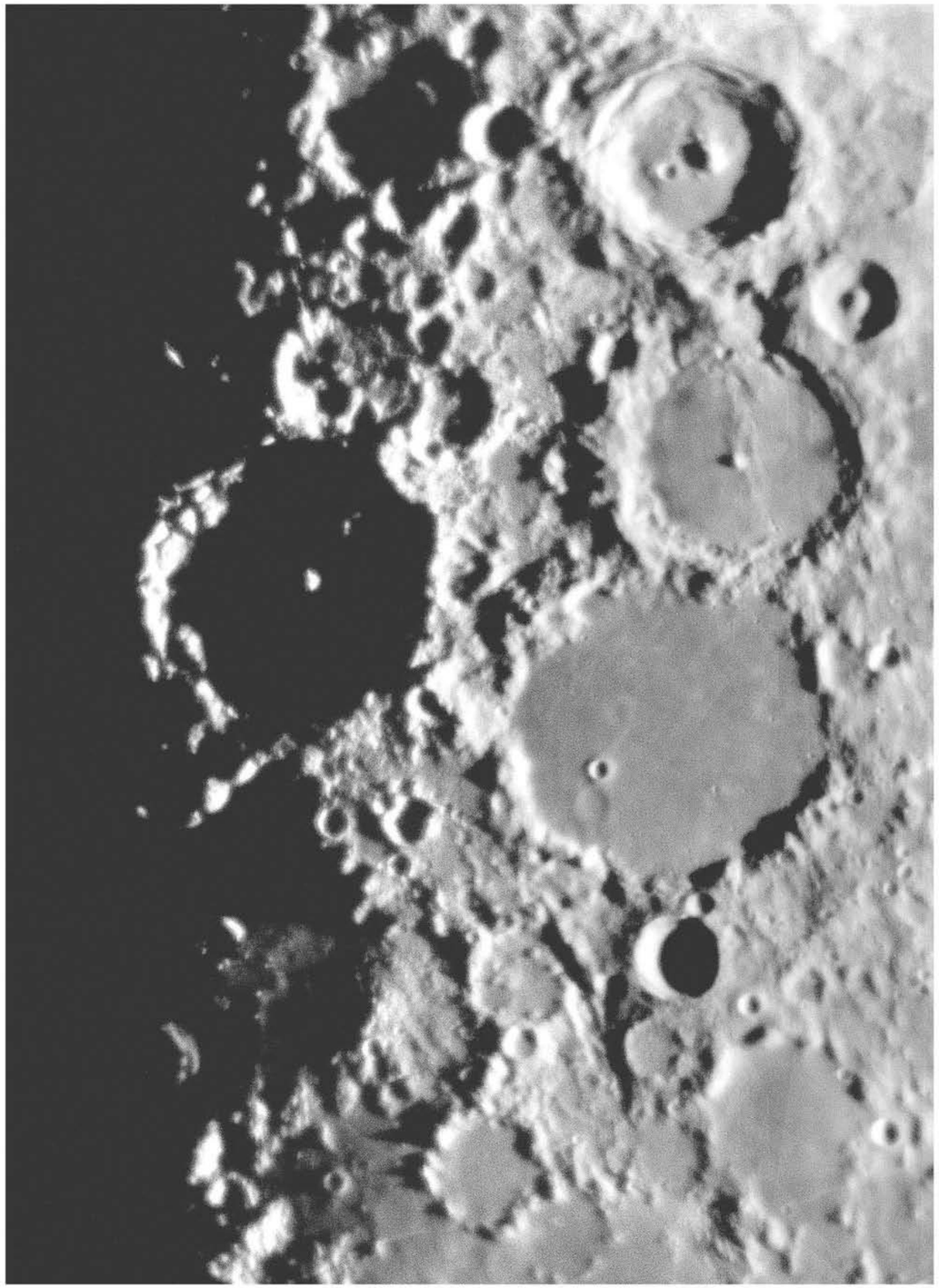
Single frame, processed with Photoshop

Observing Site: Salinas, California

Remark: This lunar image represents the last batch of astrophotography by Mr Liu.

Crater Ptolemaeus and Its Vicinity

This last batch of astronomical photographs taken by Mr Liu at age 80



2012 October 07. CELESTRON Omni XLT 15 cm (6-inch) f/ 5.0 Newtonian reflector with a 4 mm Orthoscopic eyepiece for projection. CANON EOS 60Da SLR digital camera body. No filter. Exposure : 1/6 second @ ISO 1600. Processed from a single RAW image with Photoshop 7. Imaged, processed and printed by Joseph H. C. Liu. Salinas, CA, U. S. A.

香港普及天文先驅

A Pioneer of Astronomical Popularisation in Hong Kong

廖慶齊先生

Mr Joseph Liu

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訃聞翻譯 | 鄧文正博士

美術設計、排版 | 陳琬內

出版 | 香港天文學會

地址 | 九龍牛頭角創業街36號華基中心610室

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印刷 | 美雅印刷製本有限公司

地址 | 香港九龍觀塘榮業街6號海濱工業大廈4樓A座

出版日期 | 2014年9月

國際書號 | 978-962-85170-6-0

Published and printed in Hong Kong

鳴謝 Acknowledgements

James CF Liu
Hong Kong Space Museum
Sky & Telescope
Boys & Girls Clubs Association
Sky Observers' Association of Hong Kong