worse, they do provide a personal connection to the stars, especially a memorial star dedicated to a departed loved one. I remember wincing one summer evening when an elderly English lady brought me her ISR documents, but I let her down as gently as I could while conducting a lengthy search for the 7th magnitude star in Sagittarius (!) that commemorated her late husband. Her effusive thanks, accompanied by a tearful hug, confirmed I had done the right thing.

Our local science centre has a similar program, albeit they are upfront about its function as a fund-raiser that confers no real ownership. We often get requests from visitors to track down "their" star. On one memorable occasion, a young couple observed such a star at length and in complete silence, punctuated by long hugs. A discreet inquiry confirmed that they were honouring the tragic memory of a stillborn child.

Another more sociable occasion occurred last winter, when about 50 family members, friends, and classmates made a pilgrimage from central Alberta to Edmonton to see a star dedicated to a teenage girl lost to a car accident. With the star slowly rising in the southeast, Frank Florian of TWoSE arranged to show them its location in the planetarium theatre before they came out to look at the real thing. I swept it up fairly easily, but noticed that sky conditions were gradually worsening, so made the executive decision to have Frank bring the group out immediately. Sure enough, there was just enough time for all eyes to have a look, while I eavesdropped on a number of conversations about the girl who had made an impact on so many lives. After the group departed, I continued to observe alone as the star gradually faded into the mist. Unexpectedly, I was overcome with the symbolism of the moment that Katelyn's Star was extinguished, as a single tear rolled from my observing eye and froze on my cheek.

Moments such as this are just one of the reasons I am a committed Observatory "lifer." There are far too many anecdotes to share here — if you like this sort of thing, track me down in the common room at the GA. The opportunity to share the wonders of the Universe with whoever cares to drop in is a great privilege.

Bruce McCurdy recently marked his 20th year of volunteer service providing public education and outreach at the TWoSE Observatory.

Through My Eyepiece

Starting Out:
A Most Pleasant Way to Spend an Evening

by Geoff Gaherty, Toronto Centre (geoff@foxmead.ca)

Over the years, I have tried just about every form of astronomical observing there is. I've enjoyed almost all of them, with the possible exception of hunting down faint galaxies on bitterly cold winter nights. Almost any time spent under a night sky is a pleasure to me. But one form of observation stands out: timing central-meridian transits on Jupiter.

Central-meridian transits used to be a mainstay of anyone seriously interested in planetary observation, but strangely, they have become less popular in recent years. In my early years as an amateur astronomer, I devoted more time to transit observations than all my other observing combined. In the last year, they have again come to dominate my observing schedule.

The idea behind these observations is a simple one. Using a high-quality telescope and a reasonably high magnification (around 240× seems to work best for me), you simply sit and watch Jupiter. After a few minutes, your eye starts to notice finer detail in the cloud bands, and Jupiter's rapid rotation (once every ten hours) becomes obvious. As I have said before, I'm a sucker for astronomical phenomena that move and change, and Jupiter is the champion for these. As you watch the features of Jupiter's cloud tops stream past your eye, you try to decide when a particular feature is exactly central between the east and west limbs of the planet. No special equipment is needed, as the human brain and eye are pretty good at deciding when some image is symmetrical. When the feature is central, you note the time to the nearest minute, along with a brief description of the feature.

How can such a vague "measurement" be of any use? The secret lies in Jupiter's rapid rotation. Say your estimate is only good to plus or minus five minutes (with a bit of practice, most people can do much better than that). This time error converts to a longitude error of plus or minus three degrees, which is pretty darned good.

Such timings wouldn't be worth much, if they were performed for a planet much different from Jupiter. Unlike the clouds of Earth, the clouds of Jupiter have considerable persistence. We have all heard of the Great Red Spot, the gigantic anticyclone in Jupiter's atmosphere, which has persisted for *centuries*. Many other features of Jupiter's atmosphere have persisted for decades,

and even the most ephemeral are usually observable over a period of months. An atmospheric feature followed over a period of months with observations of plus or minus three degrees can result in a calculated rotation period accurate to a few seconds!

Members of the British Astronomical Society (BAA) started timing transits on Jupiter in the last decade of the 19th century. They immediately noticed some patterns in the rotation of Jupiter's atmosphere. We are looking at a gaseous body, so the planet doesn't rotate at a uniform rate. Instead, objects in the equatorial regions rotate noticeably faster than objects at more temperate latitudes. The Sun shows exactly the same behaviour. Objects close to Jupiter's equator have an average rotation period of 9 hours 50 minutes 30.0 seconds, while the Great Red Spot takes 9 hours 55 minutes 40.6 seconds. These rotation periods, measured by the BAA in 1895, were arbitrarily defined as Jupiter's main rotation periods, and designated System I and System II. Many years later, a third rotation period, based on radio-astronomical measurements, and perhaps more directly related to the rotation of Jupiter's core, was established, and named System III.

These rotation periods have no basis in reality, but are used as frames of reference to measure the longitudes of Jupiter's atmospheric features. Real features in Jupiter's atmosphere drift east or west relative to these reference systems, but that drift can be used to calculate the actual rotation periods of individual features. Carrying this one step further, it is possible to calculate the relative wind velocities in Jupiter's upper atmosphere —numbers studied and used by professional planetary scientists.

These ideas form part of the appeal of observing central-meridian transits. Simple observations with relatively low accuracy ultimately yield highly accurate data studied by professional astronomers. Neat!

Back in the 1950s and 1960s, when I first started making these observations, the recording and analysis of the observations was quite complex. Nowadays, it has become much simpler thanks to the work of Hans-Joerg Mettig and Grischa Hahn. They have developed a wonderful software program called WinJUPOS (Figure 1), which makes entry and analysis of Jovian transit data easy.

The manual that comes with the program is also an excellent introduction to the nomenclature used to describe the objects in Jupiter's atmosphere and their location. Everything you need is available on the JUPOS Web site: `http://jupos.privat.t-online.de`.

This program also enables imagers to measure their images of Jupiter for positional data in a straightforward graphical way. The only requirement is that the time the image was made must be known to the nearest minute.

Last summer I rediscovered the joys of timing central-meridian transits on Jupiter. It is a wonderfully relaxing activity, watching "old Jupe" slowly rotate, and pausing now and then to jot down a transit time. And, like variable-star observing, it is highly addictive. Jupiter is now coming into the evening sky and the nights are warm. Give it a try!

Geoff Gaherty started out as a teen when he joined the RASC in 1957. Now he's semi-retired but still enjoying his hobby in various ways — one is sharing his accumulated wisdom as a specialist for Starry Night Customer Support.

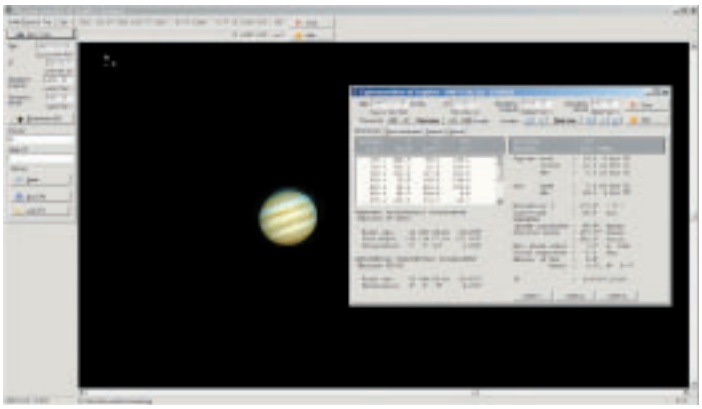

Figure 1