percent greater than at its poles. This explains the anomalous diameter measured some years ago, as well as the excess brightness — Vega has a larger radiating area than previously thought, so it is emitting more light in the polar direction.

Because the equatorial gas is further from the centre, it is much cooler (7500 K) than the polar gas (10,000 K). This complicates calculations of its composition, which in turn feeds into uncertainties about its age. Vega was discovered by the IRAS satellite to be surrounded by a disk of dust where asteroids get ground up through collisions to produce something like the material that gives the Solar System its zodiacal light. Peterson estimates Vega's new age to be in the range of 400-600 million years, far older than previously thought, which will affect models that describe how long dust can survive around stars before being blown out (or replenished).

I met Deane on my first day as a graduate student at Stony Brook, where his kindness to the new students is legendary. The world of astronomy is very small, but even so it gives me great pleasure to be able to write about the person who was so welcoming to me in the fall of 1983.

Leslie J. Sage is Senior Editor, Physical Sciences, for Nature Magazine *and a Research Associate in the Astronomy Department at the University of Maryland. He grew up in Burlington, Ontario, where even the bright lights of Toronto did not dim his enthusiasm for astronomy. Currently he studies molecular gas and star formation in galaxies, particularly interacting ones, but is not above looking at a humble planetary object.*

Through My Eyepiece

A Tale of Two Eclipses

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

I'm not what you could call an eclipse chaser. In fact I've only ever seen two total solar eclipses in my life: July 20, 1963 and March 29, 2006.

My first eclipse observation, and one of the earliest memories in my life, was the partial solar eclipse of November 23, 1946, which I observed from my front yard in Montreal at the tender age of five.

Isabel Williamson of the Montreal Centre organized the expedition to the 1963 total solar eclipse. The track crossed the St. Lawrence Valley east of Montreal, passing through the towns of Grandmère on the north shore and Plessisville on the south shore. The Montreal Centre maximized its chances by setting up scientific eclipse stations near both towns, in fenced transformer stations belonging to Hydro-Québec. This was to guarantee that we wouldn't be swarmed by the general public. The Centre also operated an "eclipse special" train from Montreal to Grandmère, mainly for the public.

I was assigned to the Victoriaville site, along with most of my regular observing buddies, including Klaus Brasch and Constantine Papacosmas. There was also a young kid from New Brunswick named Alan Whitman at our site. The eclipse was late in the afternoon, and the weather, which had been promising all day, started to turn cloudy as totality approached. I used a Jaegers 52-mm f/25 achromatic refractor to observe, with a pinhole cap during partial phases (no front-end solar filters in those days) that I removed at totality. I concentrated on photography at totality but, because of passing clouds, only managed three images, each of which showed a "different" corona because of the clouds. Because of my concentration on photography, and the meteorological interference, I don't remember much about totality other than a pearly-grey corona and a few bright pink prominences. I do have a vivid memory of partying late into the night (the eclipse was on a Saturday) and being awakened at 6 a.m. by the pealing of the Victoriaville church bells.

In the intervening years I observed various partial eclipses, plus the annular eclipse of May 10, 1994 that I watched from my back yard in Toronto. I planned to go on a couple of eclipse expeditions, but either the timing or the state of my bank account prevented it. When I heard that Ralph Chou was organizing an expedition to the solar eclipse this year to Libya, followed by a week in Italy, Louise and I decided to go for it, since our son David was finally of an age where we could safely leave him home while we both travelled. Interestingly enough, two other members of the Montreal Centre's 1963 expedition were also in Ralph's group: Jim Low and Dave Zackon; both had been at the Grandmère station.

The internal air flight from Tripoli to Benghazi dictated travelling very lightly, so I decided to take my Coronado Personal Solar Telescope for the partial phases. Because of my experience in 1963, I decided not to attempt photography at totality, but to sit back and enjoy the view visually, knowing that many fine

photographers would be capturing images far better than I could manage. I brought my 10 × 50 binoculars to aid in observing details of the corona.

In Libya the church bells of Victoriaville were replaced by Muslim calls to prayer, amplified by huge speakers from every mosque. Our eclipse site was in the middle of the Libyan Sahara, a six-hour drive south of Benghazi. We drove through ever-more-barren desert, finally leaving the highway for the eclipse camp. There we found a tent city with thousands of inhabitants, purpose-built by the Libyan government. We went to bed early on the eve of the eclipse, only to be rudely awakened a few minutes later by the first of what seemed like an endless series of fireworks displays that continued long past midnight!

Eclipse morning dawned perfectly clear, and remained so all day. I set up my PST and observed no less than eight prominences around the Sun's limb. As the Moon covered the Sun's face, the solar surface detail seemed to grow more intense. We shared the Hα view with others in our group and many local people who had driven down for the day to see the eclipse. Finally, only a fine sliver of the Sun remained, and I had a memorable view of Baily's Beads as the total phase began. Then I kicked back, grabbed my binoculars, and simply enjoyed the spectacle of the eclipsed Sun hanging high in a deep blue sky, surrounded by a compact but very complex corona. Unlike my experience in 1963, totality seemed to go on forever, and I felt filled up with the wonder of this great natural phenomenon.

Geoff Gaherty was very active in the Montreal Centre back in the'50s and '60s until he got a life. After thirty years he returned to the fold, this time with the Toronto Centre. At an age when most people are retiring, he's suddenly become gainfully employed working for the Royal Ontario Museum and Starry Night Software.

Deep-Sky Contemplations

by Warren Finlay (warren.finlay@interbaun.com) and Doug Hube (jdhube@telus.net)

Summer and vacation are two words that conjure pleasant images of lakes, loons, and lazy afternoons. In our northern country, however, deep-sky observing wanes in early summer because even at midnight, twilight refuses to let night have its due. Avid deep-sky lovers are known to plan on spending part of their summer in more southerly latitudes to solve this problem. An alternative approach is to observe brighter objects that do not lose their lustre in deep twilight. One such object is NGC 6543 [RA(2000) = 17^h 58.6^m, DEC(2000) = +66° 38′], a planetary nebula in Draco that sits a little over 3000 light-years from us.

As with all planetary nebula, this object is a relative newcomer to the sky, being but a few thousand years old. Before taking on its current dying-ember status, the central star sputtered off the clouds of gas that now surround it. That gas is now being lit up by ionizing radiation emitted by the hot (50,000 K) 11th magnitude central star that can be seen shining like a summer firefly in the nucleus of the much cooler (7000-9000 K) nebula. Professional telescopic images reveal a series of ring-like structures outside the central region that are actually spherical shells, each with a thickness of about 1000 AU. These shells formed when the progenitor star had a many-thousand-year coughing fit, emitting bursts of mass roughly every 1500 years. These shells are expected to merge within a thousand years, highlighting the transient structure of planetary nebulae.

The central region of the nebula (about 20″) appears as a small bright disk in the eyepiece. Professional telescopes reveal that this bright core region consists of two overlapping ellipsoids

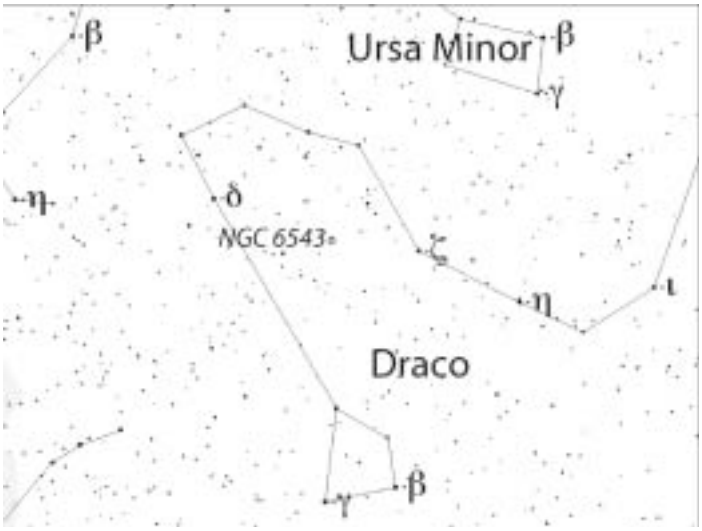

Figure 1 — Position of NGC 6543 in Draco.

with major axes at PA 25° and 115°. The PA 25° ellipse is thought to be the result of a fast wind from the central star slamming into slower-moving gas ejected earlier. It formed a little over 1000 years ago. The PA 115° ellipse may be an earlier ballistic ejection. Near the ends of the PA 25° ellipse are small jet-like protrusions that are just visible in large amateur telescopes. These jets are about 2000 years old, being intermediate in age between the inner core and surrounding rings.

About 100″ west of the nucleus, far out in the 330″ diameter halo, is a bright knot visible in professional telescopic images.