

DDO Doings

The Doings of the David Dunlap Observatory

July 2009 ■ Volume 36, #1 ■ ISSN 1920-3063

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for the Royal Astronomical Society of Canada, Toronto Centre

<http://www.theddo.ca>



Welcome to the next phase in the evolution of the David Dunlap Observatory.

Thanks to Metrus Development Inc.'s commitment to ensuring the Observatory's ongoing contribution to community life in Richmond Hill, the DDO is back in business.

The Royal Astronomical Society of Canada, Toronto Centre, is looking forward to providing a host of education and public outreach activities at the Observatory. Everything from public viewing nights to special events, teacher training workshops and collaborative research projects will be part of the DDO experience.

The Toronto Centre has been scrubbing, painting and generally tidying the place up to prepare for you, our visitors. If you're familiar with the Observatory viewing floor, where the great telescope is housed, you'll notice that each paint colour has been computer-matched to the original colour to honour the heritage of the facility. Our preparatory work was almost entirely done by hand to ensure the safety of the telescope and related equipment.

We hope you'll come back often to see the stars and enjoy this wonderful part of Canadian astronomical history. **Thanks for joining us in honouring our past and looking toward the future at the DDO.**

Paul Mortfield

Chair, Observatory Committee

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Here are four objects that you may find yourself looking at through the 74" telescope at the DDO this season. If you don't get the chance, they're visible through smaller telescopes as well.

On the back of this issue is a reprint from a May 1969 issue of the *David Dunlap Doings*, and later from the *Journal of the Royal Astronomical Society of Canada*, 73 (1979): 62-63.

NGC 6210 – Planetary Nebula. 16h 44.5m, +23° 49' (2000.0)

Discovered by F.G.W. von Struvé in 1825, "The Turtle Nebula" is a tiny bright blue spot only 8 arc-seconds across (1/1000th the width of the Full Moon). Heinrich Louis D'Arrest, a 19th-Century German astronomer, noted it was as bright as 8th Magnitude, exactly like a star out of focus.

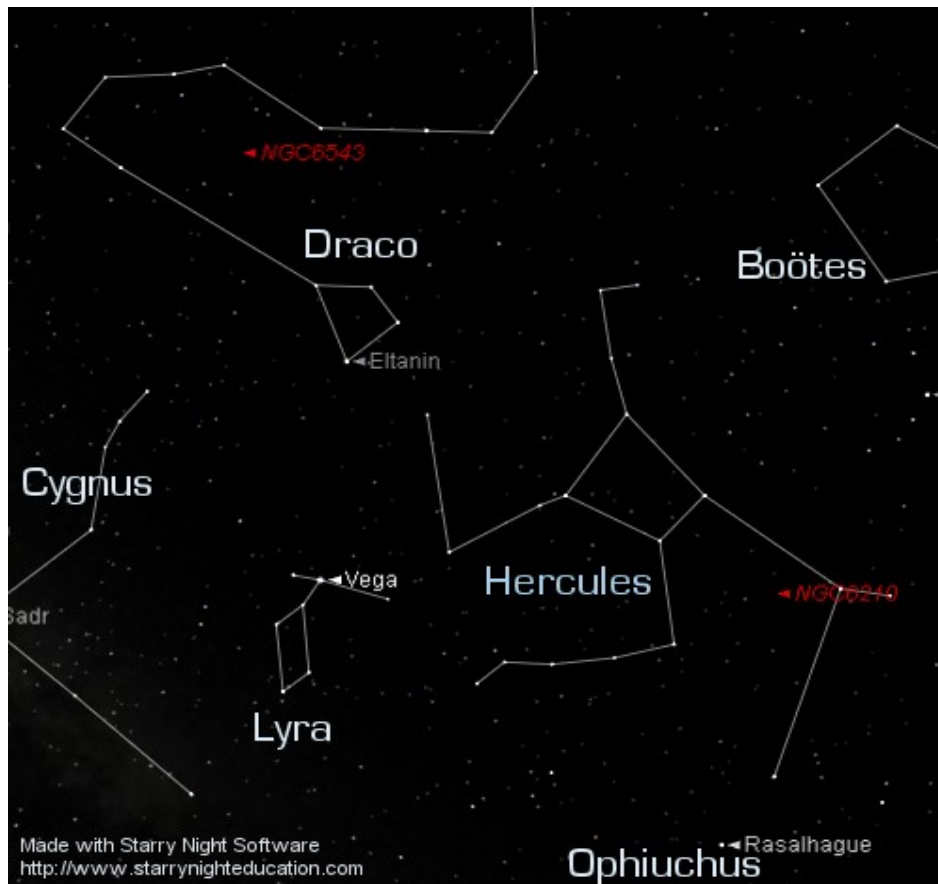
A planetary nebula is a cloud of gas shed from an old star, but still lit up from the inside by its parent. The Turtle Nebula is about 3600 light-years away in the constellation Hercules. Star-hop to it by narrowing the Keystone of Hercules 7.5° southwards to a point.

NGC 6543 – Planetary Nebula. 17h 58.6m, +66° 38' (2000.0)

Known as the Cat's Eye Nebula, this object was discovered by William Herschel in 1786. Like the Turtle, the Cat's Eye appears like a defocused star, coloured blue. Herschel found it to be 35 arc-seconds across, larger than the Turtle.

In 1864 the English astronomer William Huggins used a spectroscope to split up light from NGC 6543 into a rainbow and discovered the light was coming from a rarefied gas, not a cluster of stars: so the Cat's Eye was the first confirmed nebula discovery.

The Cat's Eye Nebula is about 3000 light-years away: star-hop to find it in the crook of the constellation Draco's neck.



Xi Boötis – Double Star. 14h 51.0m, +19° 06' (2000.0)

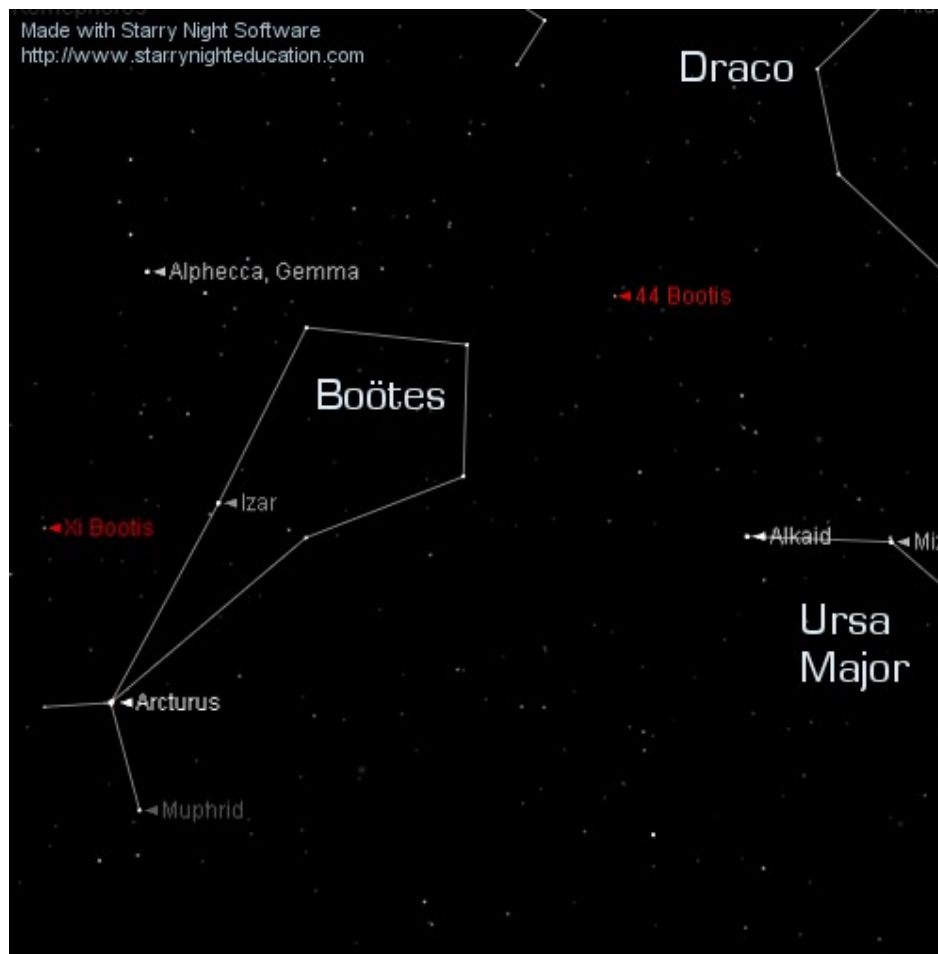
In double star systems, two stars orbit around each other. It can take centuries for a single orbit to complete, but during that time we can see the changing angles of the pair. Xi Boötis' duplicity was discovered by Otto Wilhelm von Struvé – the son of F.G.W. von Struvé – in 1888 at Pulkovo Observatory, Russia. The two stars are Magnitudes 4.8 and 6.9 and are coloured yellow and purplish-red respectively: a beautiful contrast! The system is only 22 light-years away, and the angle between the two stars this year is 7 arc-seconds.

The pair take 150 years to orbit around each other. In the next thirty years, Xi Boötis will rotate 1/7th of its orbit, and its separation will be only 4 arc-seconds. True separation between the two stars is about 33 times the distance between the Earth and the Sun. The brighter star of the pair is a Type G like the Sun. The dimmer one is a Type K dwarf. Star-hop to Xi Boötis 8.5° due west of Arcturus in the constellation Boötes.

44 Boötis – Triple Star. 15h 03.9m, +47° 39.3' (2000.0)

The primary star in 44 Boötis is being orbited by a pair of stars too close to each other to resolve. F.G.W von Struvé discovered the duplicity of the system in 1832. In 1926 Jan Schilt discovered the dimmer star was a contact pair of stars that eclipse each other, dimming by half a magnitude every 6 hours. The two visible stars are Magnitude 5.2 and 6.2, coloured yellow and purplish.

The apparent orbit is a long ellipse: the stars were separated by 4.7 arc-seconds in 1880 but less than 0.4 arc-seconds in 1969. A whole orbit takes 225 years. Current separation is about 2 arc-seconds, but declining again to *periastron* in 2021. The average true separation of the two visible stars is 45 times the distance from the Earth to the Sun, but the contact binary is separated by only 1.2 million km, less than twice the diameter of the Moon's orbit around the Earth. The distance to 44 Boötis is about 40 light years. The brightest star is very similar to the Sun in its size, luminosity and type. All three stars are Type G, similar to the Sun. Star-hop to 44 Boötis 7° due north of Beta, the top star in Boötes.



David Dunlap

When we are showing people through the Observatory we are often asked who David Dunlap was, where his wealth came from and how the family came to give the Observatory to the University.

At the time of the building of the Ontario Northland Railroad (1906) a labourer named La Rose idly kicked at a shiny rock as he walked through the cut which had just been blasted out of the hillside at the site of the little town of Cobalt. He nearly broke his foot and, puzzled, he picked up the very heavy rock. Believing that it might be valuable ore he took it to the local storekeepers, the brothers Timmins who were said to be knowledgeable about such things. The Timmins recognized it as extremely high-grade silver ore, and with La Rose they searched the hillside till they found the narrow vein at the edge of the cut. The Timmins brothers suggested that they get legal help to see how to stake a claim. In nearby Kirkland Lake they found a young lawyer named David Dunlap. Among them they agreed on a four-way partnership. During the next few years the La Rose mine yielded to the pick several million dollars' worth of silver ore which assayed about 95% silver – so rich that it was shipped directly to the refinery. The narrow gash, only one to three feet wide, is still to be seen at the end of the railroad cut near the centre of Cobalt. La Rose frittered away his stake and died poor. The Timmins brothers made it in further mining ventures, as did David Dunlap – mostly from the famous McIntyre Mine. The Dunlaps moved to Toronto.

In May of 1921 Professor C.A. Chant gave a lecture in the Physics Building on the Pons-Winnecke Comet for which Crommelin had computed an alarmingly close approach to the earth in mid-June. Having a large audience, Dr. Chant made his usual plea for funds for a Toronto Observatory, a project on which he had been working for the past ten years. After the talk a man came up and introduced himself as David Dunlap and said he was interested in the project. A week later Dr. Chant wrote to Mr. Dunlap inviting him to join the R.A.S.C. (which he did), and the two men exchanged several letters over the next few years.

David Dunlap died in October 1924 after a short illness. In 1926 Dr. Chant worked up the courage to write to Mrs. Dunlap to ask if she would consider the gift of an observatory in memory of her husband. Her reply was encouraging, and by 1927 the details had been arranged. On May 31, 1935, Dr. Chant's 70th birthday, Mrs. Dunlap opened the Observatory and presented it to the University of Toronto.

David and Donalda Dunlap had engaged in other philanthropies, the best known being the gift of the Dunlap wing to the Toronto General Hospital. Besides a daughter, Donalda, they had one son, Moffat, who died about ten years ago. His widow is now Mrs. J.H. Crang, but the family name is carried on by the two sons of her first marriage, David and Moffat Jr. The family have continued to be interested in the Observatory and from time to time have made gifts as evidence of this, the latest one as recently as last year.

J.F. Heard, May 1969