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AMATEURS, NEUTRINOS, AND THE NEXT TYPE II SUPERNOVA

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The next Type II supernova in the Milky Way or a nearby member of the Local Group will likely be identified by an amateur astronomer. He or she will be guided by a near-real-time announcement of the detection of neutrinos emitted during the supernova progenitor’s core collapse; these detections will also constrain the search area to some hundreds of square degrees. Nevertheless, because the nascent supernova has a 70% chance of glimmering between magnitude 14 and 23, it could be days or weeks before its light rises to practical optical detectability.

An excellent search device to image the entire neutrino error box is an ordinary 35-mm camera, which with minutes-long exposure can readily reach magnitude 13. However, raster-like surveys with narrow-field CCDs penetrate much deeper (magnitude 18 and fainter) with equivalent exposure and would detect a faint interloper much sooner.

The AA VSO and Sky & Telescope will establish a worldwide communications network to disseminate the neutrino alert, establish detection protocols, act as the confirmation center to assure that any optical candidate has a high probability of being the sought-for supernova, and provide on-going information about the supernova’s location and brightness to all interested parties.

NEW INSIGHTS INTO RU CAM

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RU Cam is a peculiar Population II Cepheid which “stopped pulsating” in 1966. More precisely, it decreased its amplitude from 1 to 0.1 magnitude, but continued pulsating with a period of about 22 days. Using a compilation of photometry (1966–1982) and (O-C) values (1874–1982) from Szeidl et al. (1992, Comm. Konkoly Obs., No. 97), and AA VSO photoelectric photometry (1983–1997), we have reached the following conclusions: (1) the star has undergone random cycle-to-cycle fluctuations in period, both before and after 1966; (2) prior to 1966, the evolution of the star was visible in the (O-C) diagram but, after 1966, the fluctuations in period were large enough to
mask the evolution; (3) the fluctuations in period, after 1966, seem to be coherent over about 10 cycles, rather than being random; (4) this, and the variations in the amplitude of the low-level pulsation on a time scale of about 10 cycles, suggest that the star may be sporadically multiperiodic.

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AN IMPROVED PERIOD FOR THE ECLIPSING BINARY V608 CAS

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The entry for V608 Cas in the 4th edition of the General Catalogue of Variable Stars (Kholopov, P. N., et al. 1985, Moscow) notes that the type (E), period (0.47 day), and photographic magnitude range (12.3–13.3) are uncertain. CCD photometry in 1997 using a 6-inch f/3.3 reflector confirms that this star is an eclipsing binary, with a V-magnitude primary eclipse amplitude of 0.8, and a secondary eclipse amplitude of 0.6. Based on six times of minima obtained in 1997–1998, new ephemeris elements for primary minima are JD$_{hel} = 2450769.640 + 0.470058$ E.

BRIGHTENINGS OF TWO ECLIPSING VARIABLES AT MAXIMUM LIGHT

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A rapid outburst ($\Delta V = 0.6$ magnitude) followed by an extended modest brightening of the interactive binary RZ Cas was noted in late 1996. A second such event ($\Delta V = 0.5$ magnitude) was observed for WW Aur in early March 1998, and the star was moderately active ($\Delta V = 0.2$ magnitude) until at least late May 1998. These observations suggest that observers should be alert for possible physical variations, involving mass transfer, for such stars at any time.

PHOTOMETRY OF CY AQUARII

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The SX Phe-type variable star CY Aquarii was observed for two nights in September and October of 1997, using a 12-cm Astrograph and a LynxX 2000 CCD camera. Using the IRAF program to reduce the images, and Matlab to analyze the data, the photometry of the two nights was combined and a curve fit to the data resulting in a period of 1.453 ± 0.025 hours.
**A STUDY OF THE BEHAVIOR OF W AQL**

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W Aquilae is a Mira-type long period variable with a published period of 489 days. A visual examination of recent light curves of this star indicates a change in the period of the star as well as an envelope suggestive of a much longer overall period. An analysis of visual observations from the AAVSO International Database from 1961 to 1998 is conducted using the DCDFT and CLEANEST algorithms.

**UNFINISHED BUSINESS: LUYTEN'S HARBARD VARIABLES**

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W. J. Luyten discovered dozens of variable stars during his proper motion surveys on Harvard plates in the 1930's. Most have remained unstudied to the present day because they are generally fainter than 12th magnitude and Luyten did not publish identification charts. This paper begins an investigation of Luyten’s variables on Harvard patrol plates and presents types, periods, magnitude ranges, and finding charts for UV Pyx, NSV 4234, and NSV 4286.

**THE AAVSO SUNSPOT PROGRAM**

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For over 50 years AAVSO observers have monitored sunspot activity on the sun, providing much-needed information on solar activity. However, recently a flaw was uncovered in the way that the AAVSO sunspot index is computed. It is not possible to recompute the index retroactively, because the original raw data were not preserved. We now have a corrected computation method, a complete set of computer programs to automate the calculations, and we are starting an archive of all the raw data from observers’ reports. This will ensure that in the future, the AAVSO sunspot index is computed in a consistent and correct fashion, and that all original data will be available for any other analysis we may wish to undertake.

**THE FOUNDING OF OF THE AAS: THE STATUS OF AMATEURS VERSUS WOMEN**

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In conjunction with the dedication of the Yerkes Observatory in 1897, George Ellery Hale organized a Conference of Astronomers and Astrophysicists. It was so successful that Hale wanted to host a second conference in 1898 to launch an astronomical society (The American Astronomical Society) in the United States.
However, to ensure the participation of East Coast astronomers, Hale asked Edward Pickering to host the conference at Harvard. With this change of venue, the new society developed with less stringent membership requirements than those originally proposed by such astronomers as James Keeler of Lick Observatory. Essentially, Keeler’s requisites would have barred amateurs from joining the society and didn’t even consider women. However, the first Executive Council that met in Cambridge in 1898 decided that membership could be extended to anyone capable of producing an acceptable paper pertaining to some astronomical subject. This review paper will feature the 1898 photograph of the Conference at Harvard and identify some of the attendees.

NEW YORK’S NEW HAYDEN PLANETARIUM

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The Hayden Planetarium in New York City is under replacement by an entirely new facility, to open by New Year’s Eve of 1999. Ground was broken for the new Hayden Planetarium in May of 1997, after demolition of the old edifice on the same site. In the early 1990’s the American Museum of Natural History, operator of the Planetarium, studied ways to update and improve the Planetarium, but in the end found it simplest and cheapest essentially to start all over again. This is America’s first major planetarium in a full generation!

Because of the layout of the Museum’s campus on Manhattan’s Upper West Side, the new structure had to occupy the exact same plot as the old. Yet, being that it is the equivalent of a nine-floor tower, it has many times the work, office, and exhibit space as the old. It is probably the largest planetarium by volume in the world. In addition to the Hayden Planetarium, the Museum is building several new halls along its north flank. These open in sequence during 1999 with the Planetarium being the last.

In design, the Hayden Planetarium is a gigantic brushed steel sphere, 27m in diameter, “floating” in a glass cube about 40m square. It is supported by a tripod of struts hidden by stonework on the lower floors. The upper two thirds of the ball — the Hayden Sphere — is the theatre of the stars, powered by a Zeiss Mark VIII projector. The lower third is a theater for demonstrating the Big Bang and evolution of the universe.

The Planetarium communicates with the Museum along common walls, to a new bus garage adjacent to it, and the street by the traditional circular drive, completely rebuilt, that served the old building. Besides the physical apparatus, the Hayden Planetarium houses a new department of astrophysics for the Museum, now recruiting astronomers for its inaugural crew. This department includes a seamless melding of the news media and the universities and observatories. It also is assembling new programs of public astronomy with the Amateur Astronomers Association, restoring the unique system instituted in the 1920s of a ‘civilian’ corps of astronomers. The Planetarium restored the tradition that its director should be an active member of the Association and that instructor and auxiliary staff jobs be offered to the Association.

The Planetarium project is on schedule and within time and budget. There was only one stoppage, to allow the construction workers to march in a sympathy demonstration for an unrelated labor dispute. The total cost of the project is not quite $150 million, raised by the City of New York, federal agencies, and major corporations. Where to be on New Year’s Eve of 1999? New York!