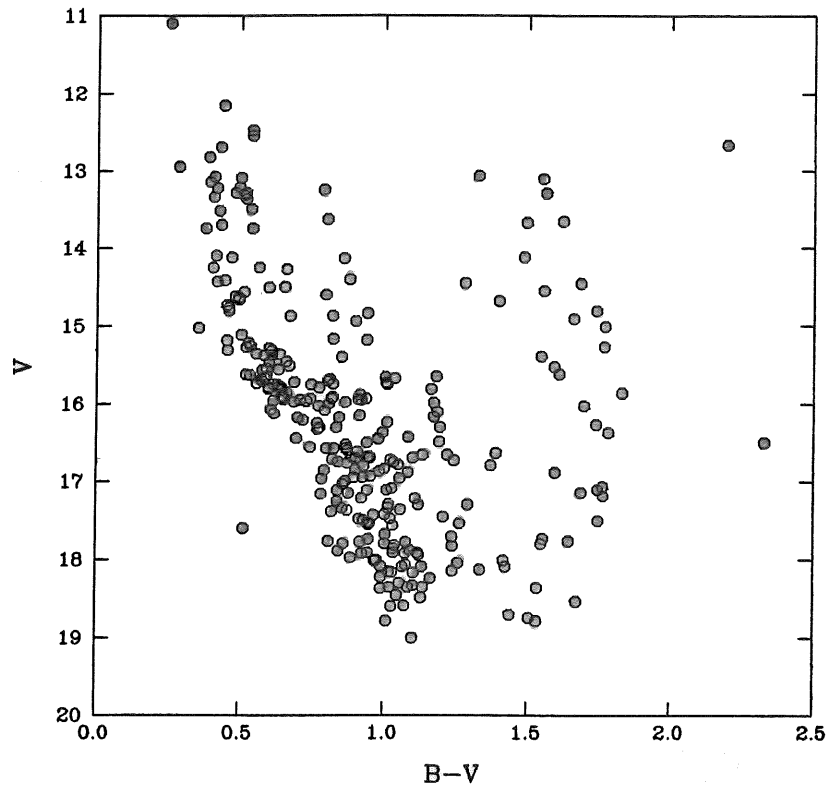


THE ^{DAVID} DUNLAP DOINGS

Vol. 17, No. 3

May 22, 1984



Illustrated is a new colour-magnitude diagram for the open cluster NGC 7790 based on plates taken at the CFHT. NGC 7790 is one of the many clusters recently re-analyzed by Mario Pedreros in his Ph.D. thesis, entitled "A New Method of Main Sequence Fitting".

C O N G R A T U L A T I O N S

To Neb Duric who has been awarded a post-doctoral fellowship by NSERC to be taken up upon the completion of his doctorate this fall.

To Rick Crowe upon the successful defense of his thesis entitled "The Spectra of Mira Variable Stars". Rick's supervisor was Bob Garrison. Rick is to be the next Canadian astronomer resident at the CFHT, replacing Bob McLaren who moves into the position of Associate Director.

To Louis Noreau who has been offered a post-doctoral fellowship at the Universite de Laval in Quebec City. Louis also plans to begin his fellowship this fall.

To Maritta Ellis, Bob Garrison's former research assistant, who is engaged to marry Jarmo Sinisalo. The wedding is planned for August 11.

To Zane and Gary Stuggins on the birth of their first child Karen Elizabeth on Tuesday May 1. Zane (Sterns) was Departmental and DDO Librarian from 1976-1980.

To Pat and Dave Turner on the birth of their first child Jennifer Barbara Lee on Tuesday May 8.

To Ed Anderson who has accepted a position at the National Optical Astronomical Observatory (Kitt Peak). Ed will be working with the computer data reduction support group.

To Mario Pedreros who successfully defended his doctoral thesis entitled "A New Method of Main Sequence Fitting". Mario now returns to his teaching and research position at the University of Chile in Santiago.

To Bill Weller who has accepted a new position as a scientific engineer at the Cerro Tololo Inter-American Observatory. Bill will be taking up his new position in August.

Progress on the Photon Counting Spectrometer

Last year, we received an NSERC grant of over \$89,000 to build a "Spectograph" or intensified Reticon photon-counting spectrometer. Various components and sub-assemblies have been purchased, and the major construction effort comes this summer. Shenton Chew and Andrew Platzler are building the electronics, Frank Hawker and Karl Kamper will build the intensifier head and fibre-optic coupling, the mechanical shop team of Dave Blyth, Dave Earlam and Archie Ridder will fabricate mechanical components and modify the spectrograph, while Lian Zerafa is programming the on-board micro-computer. I hope we'll be able to make use of Bill Weller's expertise before he leaves us.

Stefan Mochnacki

Volleyball Roundup

Entering the playoffs with a 13 and 7 record the "Wild Bunch" lost a 3-0 decision to Geography 2 and thus ended their 1983/84 volleyball season.

Many thanks to those who overcame their fear of embarrassment:

Russ "Sky Spike" Taylor,
Ann "I'd really rather play tennis" Rusk,
Raymond "Scoop" Rusk,
Fred "Twisted Ankle" Schmidt,
Judith "This is more fun than a C-8" Irwin,
Alex "I really should be working on my solar model" Fullerton,
Ed "Let's have a beer before the game" Zukowski,
Dale "I'm cool" Frail,
Mercedes "I'd rather be on the injured list" Richards and
Jan "Sorry about that"? (forgot your last name....sorry about that).

Ed "How did I get to be captain?" Anderson

POTPOURRI

John Percy was Canadian Association of Physicists Lecturer at University of Western Ontario Feb. 29 and at Laurentian University March 8, speaking on both occasions on "Bicentenary of a Cosmic Yardstick: the Cepheid Variable Stars". On March 8 he spoke to the Sudbury Astronomical Society on the work of the A.A.V.S.O.

On March 27-28, *John Percy* was Harlow Shapley Visiting Lecturer at Nazareth College of Rochester, where he gave lectures on "The Cosmic Perspective" (jointly with the Rochester Academy of Sciences), "Bicentenary of a Cosmic Yardstick" and "Variable Stars and the Work of the A.A.V.S.O." (jointly with the Strassenbergh Planetarium). He also gave a workshop on "Astronomy in Your Classroom" for about 50 schoolteachers.

On April 12, *John Percy* addressed the combined science classes of Downsview Secondary School (his alma mater) on "The Scientific Search for Extraterrestrial Life".

On April 17, *John Percy* addressed the Clarkson-Mississauga Rotary Club at Erindale College on "Astronomy: the Cosmic Perspective".

Phil Kronberg gave a colloquium to the physics department at the Université de Montréal on Feb. 3rd, 1984 entitled: "M82: Laboratoire Extragalactique pour l'étude des étoiles Massives et leurs Effets".

At the AAS meeting, *Phil Kronberg* described recent VLA results obtained with Dick Sramek at NRAO, in which they have detected variability on timescales from months to years for 30 of the new radio supernova and supernove remnant candidates discovered by Kronberg, Biermann and Schwab. One of these sources, 10X as strong as Cassiopeia A in February 1981, has "turned off" within less than 13 months.

Louis Noreau, also at Las Vegas, presented the VLA 21cm. "cube" of the Arp 205 interacting galaxy system (part of a detailed radio-optical study with P. Kronberg, and F. Bertola, G. Galletta and D. Bettoni at Padua).

M.F. Bietenholz has just completed his M.Sc. thesis, which is entitled "An Investigation of the Polarization Properties of Extragalactic Radio Sources of Different Morphologies, and their Relation to Claimed Large Scale Anisotropies in the Universe". This work has shown conclusively for the first time that the recently claimed evidence for such large scale anisotropies does not exist.

Tom Bolton was the speaker at the Spring Banquet of the Niagara Centre of the RASC on April 6. He spoke on "The Moon: Post-Apollo".

Tom Bolton was in Cleveland on April 7 to attend a meeting of the Working Group on Helium-Peculiar Spectrum Variables, which was hosted by Steve Shore (Ph.D. '78).

Y'ALL COME VISIT NOW, Y'HEAR?

Ron Lyons is a pretty even-tempered sort of chap, but that evenness became just ever so slightly ruffled recently when the Richmond Hill post-office refused to deliver an urgent parcel because the Observatory does not have an actual street address. Ron had a few words on the phone with the township offices, and, contrary to earlier experience, discovered that there was no real difficulty to assigning a street address to DDO.

So I put in an official request, and within a few days the Observatory had been officially located at 123 Hillsvie Drive, Richmond Hill, L4C 1T3. We shall soon be putting up the number out at the gate, but let me emphasize that we do not intend using this as a mailing address; that will remain as Box 360, Richmond Hill, L4C 4Y6. The usefulness of the street address is that it will make it immensely easier to direct visitors and deliveries. For some reason people hate to get instructions like "Go up Hillsvie to the top of the hill, where on the south side you will see..."; an actual street number seems to relieve all uncertainties.

So there we are. You know where to find us now -- no excuses about not coming round!

Don Fernie

Micro-mania

The Micro-computer revolution has arrived! Micros are proliferating, and even some of our students have privately acquired their own micro-computers. A rough census indicates that we now have about 7 DEC Rainbows, 3 Osbornes, 2 IBM-PC's, 1 HP-85, 1 HP-87, 1 HP200 Model 16, 1 DEC Professional 350, 1 KAYPRO, 1 Sharp 5000 and 1 COMPAQ. I've included a couple of the private student machines, but there are almost certainly others I don't know about.

The diversity of machines reflects the diversity of our ways of working, since all these machines can exchange files with the VAX if so desired, it's no Tower of Babel. Let's hope for a Tower of Productivity!

Stefan Mochnacki

After seven years of faithful service my TI 58, which never could exchange files with the VAX, has stopped communicating with the entire world. So the big question: Should I buy a micro...or a new battery? - Editor.

ON THE GO AGAIN

March 27, 1984 marked yet another move for that most venerable of telescopes, the six-inch Cooke refractor. A team from the National Museum of Science and Technology dismantled and crated the century-old instrument for removal to Ottawa and its eventual re-erection at the Museum there.

A full description of the telescope and its history has been given by Brian Beattie in the *Journal of the RASC* (vol. 76, page 109, 1982), but in brief the instrument was built by Cooke & Sons in England in 1882 and brought to Toronto for the transit of Venus in that year. It spent the next twenty-seven years in the old Magnetic Observatory that stood near Convocation Hall, and then in 1909, after the Observatory was demolished, moved to the Meteorological Service's new building (now the University's Office of Admissions) on Bloor Street.

Generations of university students used it there, and when in 1930 the Met Service decided it had no need for the telescope, the University acquired it and moved it into the Observatory just east of University College. There it served as the Department's main campus instrument until 1952, when the University assigned the campus observatory to other purposes, and the telescope moved to the DDO.

Here too it served many an undergraduate class, but once the new McLennan Labs with the 16-inch and 8-inch opened on campus in 1966 there was little incentive to use the old 6-inch. Neither was it suited to crowds on visitors' nights since access to it was via narrow stairways. Thus the venerable old telescope, although still a fine instrument and in good working order, fell into disuse and desecration by intruding pigeons.

It seemed that a more fitting home for the telescope would be the National Museum of Science and Technology, where it could be displayed to and perhaps even used by the public. Mary Grey, in charge of astronomical matters at the Museum, was enthusiastic about the move, the University officially agreeable, and so after a hundred-and-two years in Toronto the old telescope has undergone perhaps its final remove. Not, one hopes, to the equivalent of a glass case, but to a renewed life of usefulness in bringing pleasure to new generations. Long may it continue.

Don Fernie

Announcing the First Meeting of the Subcommittee on Space Astronomy

As announced in the latest issue of *Cassiopeia*, Jim Hesser at DAO has recently organized a Joint Subcommittee on Space Astronomy. This team will report to the Canadian Astronomical Society, the Associate Committee on Astronomy, the Associate Committee on Space Research and to the Canadian Centre for Space Science. An open session to discuss the role of this Subcommittee and to obtain direct feedback from the astronomical community is slated for 4 p.m. Wednesday June 6, 1984 at 100 Sussex Drive during the CASCA annual meeting.

Certainly a great deal of discussion will centre on the demise of STARLAB after years of effort. But the objective is to pick up the pieces and decide on new directions. Everyone is encouraged to attend this meeting and to communicate in advance their sentiments and advice, in person or in writing to any of the members of the Subcommittee listed below. T.A. Clark (Calgary), G.G. Fahlman (UBC), J.W. Glaspey (Montreal), J.D. Hutchings (DAO), J.E. Hesser (DAO), B.F. Madore (U of T/DDO), J.C. McConnell (York) and M. Shara (STScI).

See you in Ottawa

Barry F. Madore

COLLOQUIA*

April 25
(1:00 p.m.)

*Professor John W. Moffat, Dept. of Physics, U. of T.
"Orbital Motion of the Eclipsing Binary Di Herculis
As a Test of a Theory of Gravitation"*

May 9
(1:00 p.m.)

*Dr. Chu Yu hua, Purple Mountain Observatory, China.
"Astronomy in China To-Day" and "A Search for Variation
in Asymptotic Branch Stars in the Globular Cluster
Messier 15"*

May 9
(1:00 p.m.)

*Dr. Christine Clement, University of Toronto.
"Current Problems in the Research of RR Lyrae Variables
in Globular Clusters"*

May 23

*Wendy L. Freedman, University of Toronto.
"The Young Stellar Content of Near-by Spiral Galaxies"*

*Unless otherwise noted, colloquia are held on Wednesdays at 3:10 p.m. in Room MP137 with TEA in Room 1505, following the talk.

End of Canadian Participation in STARLAB

The federal government has recently made some decisions concerning Canadian space plans. Participation in STARLAB has been rejected. Seed money for space station developments has been allocated, with nothing for space astronomy. The policy seems to be a conservative one of developing existing Canadian capabilities with a good chance of economic payoffs, that is building CANADARMS rather than space telescopes. There is a strong feeling among some of us who participated in STARLAB that the Ministry of Science and Technology has paid no attention whatsoever to the several years of work put into STARLAB by Canadian scientists and engineers.

It is clear that Canadian astronomers will have to rely once again entirely on the generosity of the United States and the European countries for access to astronomical observatories in space. This is ironic when one considers that much smaller countries contribute large shares into such facilities. Gordon Walker, Jim Hesser and others have stressed these concerns, in the context of Canadian space astronomy. What worries me is that this will continue the tendency of Canadian astronomers to ask for a "free ride" on ground-based foreign facilities as well as in space. That is fine up to a certain point because our participation elsewhere is based on scientific merit but unless we make the effort to develop at least some reciprocal world-class capability ourselves, we may find our welcome at foreign observatories wearing thin.

Our one present major optical facility is the Canada-France-Hawaii Telescope. Still it lacks a general-purpose workhorse Cassegrain "photon-counting" spectrometer such as is used for about 50% of the time on most 4-metre class telescopes. For the time being astronomers must look elsewhere for there is a severe shortage of modern image processing systems in Canada to analyse, among other things, CCD frames being obtained at the CFHT. The image processing facilities at Kitt Peak are used by several astronomers to reduce CFHT data. I haven't even mentioned the plight of our radio astronomers, but just building up ground-based facilities to a respectable level in Canada is a "mega-project" in itself. We cannot rely on getting a continuing free ride unless we have at least some premier facilities with the necessary detectors which, like the CFHT, are open to foreign applicants on the basis of merit. The demise of STARLAB and the slow progress in funding CLBA are serious setbacks to the creation of world-class Canadian astronomical facilities. This decision by the Canadian government is much to be regretted.

Stefan Mochnacki (Mki)

PAPERS SUBMITTED

A. Heck
J. Manfroid
J.R. Percy

HD 172256 Revisited

C. Rogers

Half-Range Moment Methods for Radiative Transfer in Spherical Geometry V. Line Formation in a Static Atmosphere

S.W. Mochnacki
G. Starkman

A Spectrum of the Symbiotic Nova RT Ser

R. Crowe

Spectral Classification of Southern Hemisphere Variables

R. Crowe

A Spectral Catalog of Southern Hemisphere Mira Variable Stars

C. Rogers
P.G. Martin

Half-Range Moment Methods for Radiative Transfer in Spherical Geometry III.

P.G. Martin
C. Rogers
G.B. Rybicki

Half-Range Moment Methods for Radiative Transfer in Spherical Geometry II.

A.R. Taylor
E.R. Seaquist
P.C. Gregory

High Resolution Observations of Galactic Plane Radio Variables

F.H. Schmidt
J.D. Fernie

FO Vir: A Newly Discovered Eclipsing Binary

A.R. Taylor
E.R. Seaquist

Radio Emission From Symbiotic Stars: A Binary Model

THESIS ABSTRACT

The Spectra of Mira Variable Stars

by Richard Alan Crowe

The catalogue of Keenan, Garrison and Deutsch (1974) has been extended by the addition of 483 blue spectrograms of 72 southern-hemisphere Mira variables. About 190 direct and image-tube plates at a dispersion of 120 A/mm were obtained in Chile between 1977 and 1982. Spectral types, emission-line ratios for $H\delta$ $\lambda 4101/H\gamma$ $\lambda 4340/H\beta$ $\lambda 4861$ and eye-estimated intensities of the absorption lines Ca I $\lambda 4226$, Cr I $\lambda 4254$ and Sr II $\lambda 4077$ have been tabulated. Spectral montages for six stars are used to illustrate changes in the visual spectra of Mira variables through their respective cycles.

Radial velocities of absorption- and emission-line systems have been determined for 22 northern-hemisphere Mira variables. These were measured from approximately 65 spectra obtained on sensitized IIA-O plates at a dispersion of 12 A/mm with the DDO 1.88-m telescope. Most of these northern-hemisphere stars were observed close to maximum light, and so only a few cases (for example, R Trianguli) is there any useful phase information available.

It can be shown from this data that the irregular behaviour of absorption features in Mira variables can be explained by a second shock front which is higher up in the atmosphere than the one producing Balmer emission, as has been proposed by Hill and Willson (1979). We present evidence that strong emission is associated with weak-line cycles (when overlying TiO absorption is also weaker) and that the velocity gradient is directly responsible for the weakening by the escape-enhancement process (Mihalas, 1978). Since the shock strength varies from cycle to cycle, we do not expect the affected lines to maintain the same equivalent width at the same phase in different cycles. There is, however, a great deal of variation from star to star which confuses the interpretation. The separation of Mira variables into two groups (namely, those with spectral types earlier and later than M5e at maximum light) helps to clarify the overall perspective of these enigmatic stars.