



DAVID DUNLAP DOINGS

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COMINGS AND GOINGS

Dianne Grazioli will be leaving us on November 1 to start work with Prof. D.B. Redford of the Department of Near Eastern Studies. In her new position, Dianne will be doing artistic work related to Prof. Redford's research in Egyptology. Dianne has been with the DA office since March 1976.

We have a new telescope operator at the observatory in the person of Matthew Bates. Matt has a B.Sc. (7T8) in Physics from Toronto. Most of his work was at Erindale campus - he was a tutor there in 1974-75. Matt's wife Frances is a music teacher in Etobicoke and they are currently living in the Annex area.

We welcome Esther Oostdyk who has joined the office staff at the Observatory, replacing Paulette Le Blanc. Esther finished high school last spring and just last week attended the official graduation ceremonies at Thornhill High School. This is Esther's first full-time office job - she'll be helping Zane in the library part of the time.

P O T P O U R R I

DDO astronomers have certainly done their share to satisfy Kitt Peak's visitor quota over the past several weeks. John Percy had a photometric run (at least that's what he had planned) October 3-10. Mary Lane took fewer chances with the weather and booked in for 3 weeks starting September 24. Her run included 12 nights on the coude feed and 5 nights with the scanner on one of the 36-inch telescopes. John Lester dropped in October 9-11 to make sure Mary remembered how to get home. Bob McLaren took over on October 11 for a 7-night infrared run on the solar telescope.

In September, Martine Normandin and Phil Kronberg had their final observing session with the NRAO Interferometer measuring linear polarization of extragalactic sources. It was definitely final because on September 30, the interferometer was closed down by NRAO and handed over to the U.S. Naval Observatory.

Phil Kronberg has been named as the non-U.S. member of the Associated Universities Inc. Visiting Committee for all NRAO operations. His appointment is for 4 years beginning January 1979. Phil has also recently been appointed to the NRAO Advisory Committee for the VLA.

Steve Shore was back in Toronto briefly October 18-20 and gave a colloquium on his thesis work. (The abstract of Steve's thesis is reprinted later in this issue of the Doings). While he was here, we learned that Steve, Lys Ann and cats have moved to an attractive apartment on Central Park within easy walking distance of Columbia where Steve is now a Research Associate. Lys Ann plans to visit the Vatican in January in connection with her studies.

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Editors: Donald A. MacRae and Robert A. McLaren

Bruce Campbell will be returning to DDO for about a week starting November 13 to revitalize the Reticon.

Chris Smith (M.Sc. 1977) and family are back in town. Chris is currently enrolled as a special student taking Computer Science courses in preparation for an M.Sc. program in that field.

Don Fernie attended a meeting of the National Organizing Committee for the IAU in Montreal October 13/14.

Bob Garrison gave a talk in the "Canadian Perspectives" series to a group of U. of T. alumni at University College on October 11. His title was "The Impact of the Canada-France-Hawaii Telescope on Canadian Astronomy".

The Midwest Astronomers met in Toledo, Ohio on October 21. They were hosted by the Ritter Observatory and the Department of Physics and Astronomy of the University of Toledo. Dorothy Fraquelli attended and presented a paper entitled "A Reinvestigation of the WR Binary HD 190918".

This year's invited speaker was Peter Conti of JILA, who spoke on "Wolf Rayet Stars, What they are, where have they come from and where are they going". He was followed by 14 short papers on subjects ranging from Comets and the Solar Magnetic Field to Quasars and Associated Galaxies.

Dorothy reports that the most unusual paper was that given by Martin Burkhead (Indiana University). The paper, entitled "An M51 MOVIE", presented a three dimensional view of M51 before, during and after background subtraction. (The original data are from photographic plates).

The after dinner speaker was Armand Delsemme of the University of Toledo. His talk "The first space mission to a comet" dealt with NASA's plans to conduct a flyby of Halley's Comet in 1985 and a rendezvous with Comet Temple in 1988.

Afterwards, many of the attendees retired to Mike Molnar's house for more conversation before leaving for home.

As part of the department's School Liason Program, John Percy gave talks on astronomy to about 50 history students at Oakville-Trafalgar High School (September 28) and to about 75 science students at Chaminadi College School (October 24).

Former U. of T. Math and Physics students will be saddened to learn of the passing of Professor R.W. McKay on October 20. For many years, Professor McKay taught the 2nd year course in Electricity and Magnetism, and many of our readers were no doubt among his students.

Henry King's book, "Geared to the Stars" has just come out. It deals with clocks and timekeepers over the centuries and must surely be the definitive work on the subject, running over 500 pages and with 300 illustrations. It was written with collaboration from John R. Millburn of England and is published by the University of Toronto Press.

COLLOQUIA*

October 31 (Tue.)

Vera Rubin, DTM Carnegie Institution
"Dynamical Properties of Galaxies Along the Hubble
Spiral Sequence"
(at DDO, 4:10 P.M.)

November 15 Bob Gauthier and Chris McAlary, U. of T.
G 2000 - Current Literature Seminar

November 22 Peter Pesch, Warner and Swasey Observatory
Title to be announced

November 29 Eduardo Hardy, Université Laval
Title to be announced

November 30 (Thur.) Philip Morrison, MIT
"Search for Extraterrestrial Intelligence"
(Joint Astronomy-Physics, Room MP 102, 4:10 P.M.)

December 1 (Friday) Philip Morrison, MIT
"Mass Flows in Active Galactic Nuclei"
(Time and Room to be announced)

* Unless otherwise noted, colloquia are held on Wednesdays at 4:00 P.M. in Room MP 137 with TEA at 3:45 in the Reference Room, MP 1404.

CFHT NEWS

Bruce Campbell is the first person to be appointed to the Scientific Staff of the CFHT. Two other positions will be filled during the coming year. Bruce and Kaye will move to Waimea in February.

Rick Salmon has accepted a position with the CFHT. He is best known to us as our first resident astronomer on Las Campanas in 1972-73. For three years after that he was on the technical staff of CTIO as head of the Visitor Support Group and then spent 2 more years polishing off an Electronic Engineering Technology course at the Northern Alberta Institute of Technology in Edmonton. At the CFHT he will be a member of the optics group working with J.C. Fouéré, the engineer in charge. He plans to go to Waimea in November.

As we go to press we learn that Rick and Gretchen have set November 10 for their wedding, in London, Ontario.

Bob Garrison attended a meeting of the Scientific Advisory Committee in Paris October 19-21 at which he was elected as one of the two Vice Chairmen of that body. Bob reports that the meeting was a "lively" one and that the telescope is on schedule.

OBSERVATORY HOUSE

Yvonne and Don put on their first party at their new home on Friday, October 6. Billed as a "Get the year started" party, it was a fine get-together for everyone and only a few couldn't make it. (One of the lighter moments was when a guest rang the door-bell and Don MR almost went to answer it. Later Don Fe had to remind himself not to leave when the guests did).

Mrs. N. Foot, Don's mother, was on hand to help greet the guests. She has been visiting her family and enjoying her grandchildren since early August. She returned to her home in Cape Town last week.

THESIS ABSTRACT

The editors have decided to reprint in the Doings the abstracts of recently completed Ph.D. theses in the Graduate Department of Astronomy; The first is the abstract of Steve Shore's thesis which appears below:

"A STUDY OF THE HELIUM PECULIAR STARS OF THE UPPER MAIN SEQUENCE"

Steven Neil Shore

This thesis presents a study of the helium rich stars in general, and a detailed analysis of the prototype, σ Orionis E, in particular. A general model involving downward helium diffusion in a radiatively driven stellar wind is developed in order to account for the helium enhancement observed in the photosphere of these stars. A magnetic field is necessary to stabilize the envelope. In the presence of a magnetic field, it is shown that equilibrium of these oppositely directed flows is possible in the region of the magnetic equator. The mass outflow in this region is suppressed by several orders of magnitude below the normal rate of mass loss in an upper main sequence star. However, the magnetic field produces a funneling of material to the magnetic polar caps, from which the mass can escape from the star, so that the rate of mass loss from these regions appears to be greater than for a normal, unmagnetized star. It is shown that, since the rate of mass loss due to radiation pressure is dependent on mass on the main sequence, stars more massive than approximately 10 solar masses will appear helium normal, while those at lower mass will appear helium weak. In these stars, the equilibrium of helium occurs at the magnetic poles producing spot characteristics.

A phenomenological model is derived on the basis of these results for modelling the radial velocity, photometric, equivalent width, magnetic field and emission line variations of the helium rich stars. A band of helium enriched material is assumed to exist at the magnetic equator, which has an axis of symmetry coincident with the magnetic field axis. This axis is assumed to be inclined to the rotational axis, which in turn is inclined to the line of sight. The rotation of the helium enhanced region in this oblique rotator is responsible for the photometric, spectroscopic and magnetic variations of the helium rich stars. The magnetic field extrema should occur between photometric minima, which occur when the band crosses the line of sight. Equivalent width variations of HeI and hydrogen should be in phase with the photometry (HeI maximum corresponding to photometric minimum). The radial velocity variations from a banded oblique rotator are significantly lower than a spot model, so that no radial velocity variations should be seen in the helium or hydrogen lines. Emission line maxima will occur between photometric minima, with V/R maxima occurring simultaneously.

The model is applied to σ Ori E with the following results. The helium line variations and u photometry indicate the presence of a longitudinal anomaly (enhanced spot) in the magnetic equatorial band. The photometry and HeI equivalent width variations yield consistent oblique rotator parameters. The magnetic field is predicted to reverse sign, in accord with recent observations. Both the magnitude and ratio of magnetic field extrema predicted on the basis of the model agree with the observations. The emission lines are found to be strongest between photometric minima, with greatest emission measure coincident with the weaker magnetic field extremum. For stars for which the data is less complete than for σ Ori E, a set of predictions are given for the magnetic field and oblique rotator parameters.

PAPERS SUBMITTED

- A. Boggess, R. Roeder
et al IUE Observations of the Quasar 3C273
- P.P. Kronberg, et al A Radio Survey of Clusters of Galaxies II.
11.1 cm Observations of A85, A407, A514, A568,
A602, A1361, A1775, A2036, A2079, A2224, A2241,
A2365, and A2634
- D.G. Turner A Study of the Extinction in the Young Open
Cluster NGC 6823
- D.G. Turner Possible Association Membership for the
Three Long Period Cepheids RZ Velorum,
SW Velorum and KQ Scorpii
- S.H. Jakate A Search for Beta Cephei Stars III: Photometric
Studies of Southern B Type Stars
- P.P. Kronberg, et al The Radio Structure of Messier 82 at 23 GHz
(λ 1.3 cm)

ZATSUGAKU JITEN

We present below a translation of a review of Helen Hogg's "The Stars Belong to Everyone" which appeared in a Japanese science journal circulated among high school students. The translation was prepared by Mr. S. Uyenaka of this university and is printed with his permission.

Recently in Japan many handy books of the sort called zatsugaku jiten (encyclopaedic books with a variety of information) have been published, and they have become best-sellers.

However, no zatsugaku jiten on astronomy seems to have been published yet. In the west, it was in Canada that such a book was first published, and I shall introduce it to you.

Not too many books on astronomy, in however simple terms they may be written, are simple enough to be read while relaxing, and if such a book is written in English it is even more of an ordeal. But this book, a collection of interesting items chosen from a series of interpretive articles that originally appeared in the Toronto Star, Canada's largest newspaper, over a period of 25 years, can be easily read even by a high school student.

The author is a Canadian woman astronomer who has done research at the Harvard Observatory, the Dominion Observatory, and the Dunlap Observatory and is currently a professor at the University of Toronto. So, although I called the book a zatsugaku jiten, the contents are quite reliable. The author's husband and son are also astronomers, and she occupies an important position in the Canadian Astronomical Society and the AAVSO. The book provides an easily understandable explanation of modern astronomical knowledge.

Hiroshi Saida