



# DAVID DUNLAP DOINGS

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JUNE 30, 1979

## SUMMER STUDENTS

This year we have five summer students all U. of T. undergraduates working on various projects at the Observatory and downtown. *Ed Anderson* and *Petrusia Bojetchko* (both 4th year students) are working for Barry Madore, their main project being to cross reference and tune up the coordinates for the 10,000 peculiar galaxies from the new Southern Survey. They are also preparing identification charts for a companion galaxy survey of the 1200 Shapley-Ames galaxies. If they survive that, there is the opportunity to do some iris photometry and more work in the darkroom. Petrusia is also observing on the 74-inch one night per week for Tom Bolton.

*Tom Box* (3rd year) is working for Christine Clement. In addition to observing with the 16-inch, Tom is measuring variable stars with the iris photometer. He will also do some reductions with the PDS.

*Tim Pointing* (3rd year) is assisting John Percy with the *Observer's Handbook* and is also working on upgrading the slide collection. In addition, Tim is doing data reduction for Ernie Seaquist and John Percy.

*Douglas Welch* (3rd year) is doing photometry on the 16-inch for John Percy.

LETTER TO THE EDITOR

Dear Editor:

As a one-time student of the University of Toronto's Department of Astronomy, I am writing in the strongest possible terms to protest a flagrant misrepresentation in the otherwise impeccable David Dunlap Droppings of 19 December 1978. In particular, I feel quite old enough already without being told of items that appeared "ten years ago in the Droppings". The items quoted are actually drawn from the first-ever DD Droppings, the brainchild (or whatever) of myself, Bob Hawkins and Hugh Ross, which we handed out at the Christmas Countdown of 1969, a mere nine years ago.

In correctness I should say that I handed out the issues, the editorial policy being that the junior perpetrator would suffer "the wrath of MR" and stonewall it for the others if such proved necessary. The DD Droppings has never looked back.

Yours

Dave Hanes  
Cambridge, England.

P.S. I have forgotten which of us it was who hit on the happy title. We had been thinking of "David Dunlap's Doings." Perhaps it's just as well.

CONGRATULATIONS

- To *Martine Normandin* who successfully defended her thesis "Rotation Measures and the Galactic Magnetic Field" (see abstract on page 9 ) on June 25. *Gerrit Verschuur* was external examiner. The American Physical Society has awarded Martine an Industrial Post-doctoral Fellowship (one of only 5 such awards this year), and she has decided to take up the fellowship at Fairchild Camera and Instrument Corporation in Palo Alto California starting October 1. The work will involve computer-assisted design of transistors. Conveniently, her husband *Richard*, who is just completing his Ph.D. in Physics at Toronto, has an NSERC PDF which he will take to Stanford.

- To *Bob Garrison* on his promotion to Full Professor effective July 1.

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Editors: Donald A. MacRae and Robert A. McLaren

- To *Donna Zubrod* and *Gerry Grieve* who were married at Donna's family church in New Jersey on June 2. Mary Lane, Zane Sterns, Steve Shore, and Barry and Katherine Madore were among the 150 guests.

- To *Esther Oostdyk* on her marriage to *Craig McCleary*. The nuptials took place on Friday, June 8th, at the Newtonbrook Baptist Church. Esther & Craig spent their honeymoon camping.

- To *Archie* and *Ingrid Ridder* on the birth of their daughter, *Melanie*, who was born on June 13th at York County Hospital in Newmarket. Melanie weighed 5 lbs. 12 oz. All are doing well.

- To *Gerry Grieve*, again, on passing his Oral General Examination on May 10 despite pre-nuptial jitters.

#### COMINGS AND GOINGS

*Don and Betty MacRae* returned from France on June 25 after a very pleasant and productive four months at L'Observatoire de Haute Provence. On their return, Don visited Cambridge and said hello to Dave Hanes and recently-arrived Bjarne Everson.

*Jim de Roux* has resigned as research assistant to *Don Fernie* in order to attend law school at the University of Windsor beginning in September.

#### THE BIG EYE

The primary and secondary mirrors of the 74-inch telescope were re-aluminized in late May. This resulted in a startling improvement in speed - perhaps as much as a factor of 5! It would appear that it is absolutely essential that we re-aluminize twice a year. Unfortunately we received a heavy dose of H<sub>2</sub>S pollution from York Block on Yonge Street on June 15. This is thought to be the primary cause for the deterioration of our coatings. It remains to be seen whether the mirrors were seriously damaged in this latest event.

Work continues on refining and debugging the spectrograph. Archie has installed new access doors to the side of the spectrograph. These replace the former side of the spectrograph, which was held in place by wing nuts. It is now possible to access the inside of the spectrograph in seconds rather than minutes. Karl has adjusted the gratings in their mounts to center the spectrum up in the plate holders and work has begun toward removing the curvature in the spectrum.

Two new wide lens slits have been commissioned in the past month, and work is underway to replace the V deckers with deckers with discrete steps. These should be ready sometime in July. We continue to be plagued by 2-3 $\mu$  shifts between the stellar and comparison spectrum. These seem to arise somewhere in the collimator-slit head assembly, but so far our efforts to isolate the cause have failed miserably. Our only consolation is that the shifts seem to repeat well (within a micron), so they can be calibrated out. However, they do reduce the overall accuracy obtainable with the spectrograph.

The troubles with the calibrating photometer for the spot sensitometer have been identified and fixed. A new highly reliable calibration for the spot sensitometer should be available by the end of July.

BIn

COMPUTER-GENERATED FINDER FIELDS

There exists a programme that may be of general interest to other members of the department. It will produce a finder field, on the CALCOMP plotter, for any reference position. The right ascension and declination of this position are read in from cards. The positions of reference stars are read from a tape merged from the SAO and AGK catalogues. The programme will print out the plate epoch positions of all reference stars within 6 $\emptyset$  mm on the plate. These stars are plotted relative to the reference position at the PSS or ESO plate scale ( $\sim$ 67"/mm). The programme exists as a catalogued procedure and the following JCL is required to run a job.

```
// (UTCC Job Card)
// (User's Job Card)
/*SETUP UNIT=24 $\emptyset\emptyset$ -2,VOL=(EXT=CALCMP,W)
/*SETUP UNIT=34 $\emptyset\emptyset$ -3,VOL=(EXT=F54 $\emptyset$ 5,INT=ANA1B4)
// EXEC OVRLYPLT
//FT $\emptyset$ 5F $\emptyset\emptyset$ 1 DD *
3C 147       $\emptyset$ 5 38 43.1 $\emptyset$ 1 +49 49 13. $\emptyset$ 1
AM467-1     21 59 18. $\emptyset$    -32 09  $\emptyset\emptyset$ .
      (Up to 1 $\emptyset\emptyset$  sources)
/*
//
```

The first 12 columns of the data cards are a source name to identify the plot. The right ascension starts in column 14 and the declination starts in column 27.

It is possible to get plots at a scale other than the default scale by entering the x and y plate scales in "/mm. This is done by including the following cards after the EXEC statement.

```
//FT $\emptyset$ 4F $\emptyset\emptyset$ 1 DD *
12 $\emptyset$ .31 12 $\emptyset$ . $\emptyset$ 
/*
```

It is also possible to get the positions of the reference stars punched on cards by including the following card before the last card.

```
//FT $\emptyset$ 7F $\emptyset\emptyset$ 1 DD SYSOUT=B
```

Because the job has two tape mounts the basic charge is about \$2. $\emptyset\emptyset$ . In addition to this the charge per source should run about \$ $\emptyset$ .25 on class C and about double that on class B. If there are any problems or suggestions please let me know.

Stuart Button

## RESEARCH NEWS

The digitization of the Grant measuring engine has now been completed. At present we only have a digital read-out of the screw position, but even this is a tremendous convenience in using the machine. Jim de Roux is preparing programs to allow an HP 9815 calculator to record the digital readout and perform the radial velocity reductions as the measurements are taken. The data acquisition portion of these programs is well along and should be tested before the end of the month. In the meantime, Matt Bates has been making measurements to map the periodic error in the Grant screw.

Tom Bolton and Matt Bates have begun to transfer some frequently used data analysis programs onto the VAX system. A Fourier series fitting program is now available, and the radial velocity (RADVEL) and spectroscopic binary orbit programs (SBCM and Bertiau and Grobber) are in the process of being transferred. At least one of the light curve synthesis programs and several period finding programs will be transferred at a later date. Anyone wishing to use these programs should contact Tom Bolton.

Bln

## UNDERGRADUATE AWARDS

Nebojsa Duric is this year's recipient of the RASC Gold Medal, awarded to the best graduating student in the Astronomy and Astrophysics Specialist Programme. Neb is working at DAO this summer and will return to the department in September to enrol in a Master's programme.

The Pounder prize for outstanding performance in the second year of the Specialist's Programme has been awarded to Tom Box.

Our congratulations to both of these excellent students.

## IT HAPPENS EVERY YEAR

No sooner is the last exam marked than people scatter in every direction, the principal destinations being distant observatories and ubiquitous meetings and conferences. This year was no exception, and a brief catalogue of these activities appears below.

### Observing Trips

- *Christine Clement* recently returned from a 17-night photographic observing run on Las Campanas - the first 4 nights with the Carnegie 40-inch and the other 13 with the U. of T. 24-inch. In all, she lost about 6 hours to clouds and 3 hours to high winds returning home totally exhausted.

- *Dave Turner* was at Mont Mégantic June 14-21 observing with the 1.6-m telescope of l'Observatoire Astronomique du Québec.

- *Bob McLaren* and *Dennis Crabtree* were at Kitt Peak May 10-17 using the McMath Solar Telescope for 10- $\mu$ m heterodyne observations.

- *Armando Arellano* returned in May from a 1-month observing run at Cerro Tololo. Usually reliable sources described it as "reasonably successful".

- *Ernie Seaquist* and *Bill Gilmore* have two runs upcoming at the VLA. On June 30 and July 1, they will be observing a number of sources (including SS433) which they believe may be stellar remnants of supernovae. On July 21 and 22, they will map SS433 at high resolution in search of jets.

- *Joan Wrobel* was at Greenbank May 29 - June 13 reducing satellite VLBI observations of compact radio sources in elliptical galaxies (e.g. NGC 1052). On May 11 Joan attended a meeting of VLBI observers at HIA in Ottawa.

- *Martine Normandin* and *Phil Kronberg* will be at Bonn July 6 - 27 for 18-cm observations with the 100-m telescope.

#### Meetings Attended

- The University of Toronto was represented at the tenth meeting of the Canadian Astronomical Society held at U.B.C. May 23-25 by *Dennis Crabtree*, *Don Fernie*, *Bob Garrison*, *Chris McAlary*, *Bob McLaren*, *Ernie Seaquist*, and *Dave and Pat Turner*. There were four U. of T. papers presented entitled: "Ammonia in IRC +10 216" (Crabtree), "Radio and Optical Observations of SS433" (Seaquist, Garrison, Gregory, Taylor, and Crane), "Near Infrared Spectrophotometry of SS433" (McAlary and McLaren), and "Anomalous Extinction in the Eta Carinae Nebula?" (Turner and Moffat).

Fernie and Garrison also attended the meeting of the NRC Associate Committee on Astronomy on May 25 and Garrison and McLaren attended the Space Astronomy Subcommittee meeting on May 24.

- *Tom Bolton*, *Lindsey Davis*, *Dorothy Fraquelli*, *Bill Gilmore* and *Ernie Seaquist* were at the Workshop on Radio Stars held at the Herzberg Institute for Astrophysics on June 7 and 8. Bolton described Donna Zubrod's work on the H $\alpha$  emitting material in the Algol system, and Davis spoke about OH emission in V $\gamma$  2-2. Fraquelli presented some of her data on RS CVn stars. Seaquist reviewed his work on Cyg X-3, SS433, and VL500 Cygni. One of our recent alumni, *Steve Shore* came up from Columbia for the meeting.

- *John Percy* presided over the RASC 1979 General Assembly in London Ontario, May 18-21.

- On May 5, *Barry Madore* attended the semi-annual meeting of the Niagara Frontiers Amateur Astronomical Association held at McMaster. After dinner he presented a talk and slide show on "Peculiar Galaxies".

- *Chris Corbally* and *Bob Garrison* were at the AAS meeting at Wellesley College June 11-14 and presented a poster-session paper entitled "New Spectral Classifications on the MK System for Visual Double Stars".

- *Bob McLaren* attended the Annual Congress of the Canadian Association of Physicists June 18-21 in Vancouver and gave an invited talk entitled "Infrared Heterodyne Spectroscopy in Astronomy".

- *Don Fernie* attended a meeting of the National Organizing Committee for the IAU in Montreal on June 1.

## MAUNA KEA OR BUST!

One very early morning a couple of weeks ago I found myself, along with three other librarians, sitting in a very tired-looking jeep. The Special Libraries Association Conference which was held in Honolulu this year had just ended and eight of us had flown to the "big" island with the intention of driving to the top of Mauna Kea.

The lushness of the countryside surrounding Hilo soon gave way to harsh, volcanic terrain as we proceeded along highway 20 which had turned into nothing more than a dirt road. After a brief stop at Halepukahaku, the lodgings and offices located at the mid-point, we continued our bumpy ascent.

The sight that greeted us at the top was no less than magnificent although the effect of being at such a high altitude (14,000 ft.) was felt by us all. After a nutritious lunch of donuts, cookies and coke, we had an interesting tour of the University of Hawaii's 88" telescope. In the control room we couldn't help but notice a sign which told people to call a certain number if Mauna Loa should erupt. Fortunately(?) nothing happened while we were there! Next, we were shown around the CFHT by Kheary, the head engineer. What an impressive piece of equipment! Work on the telescope is progressing well. First light will be available this July and visiting astronomers will be able to start using the telescope in March of 1980.

Our descent proved to be much more eventful than our trip up had been. Our jeep would not go into four-wheel drive which meant we went around the tight corners of the road at a rather fast pace. Worse yet, we almost lost a passenger when the back door flew open. As we approached Hilo, it began to rain. The window wiper on the driver's side refused to work and of course visibility was almost nonexistent. Needless to say, when we got back to our hotel we were pleased to find out we had made it back in time for "happy hour"!

Zane Sterns

### P O T P O U R R I

*Dorothy Fraquelli has accepted a position as Research Associate at Dartmouth and expects to finish her thesis and report there by December 1. She will be working with Delo Mook on X-ray sources using the McGraw-Hill telescope at Kitt Peak.*

*Dr. William Klemperer, chairman of the Chemistry Department at Harvard visited here on May 15 and 16 and gave a talk entitled "Molecule Formation in the Interstellar Medium".*

*Tom Bolton gave a talk at DDO on May 30 entitled "Distribution and Kinematics of Circumstellar Material in the Algol System".*

PAPERS SUBMITTED

- |  |   |
|--|---|
| J.D. Fernie                                      | Comments On The Variability Of HD 219018,<br>Comparison Star To SZ Psc  |
| J.N. Clarke, P.P. Kronberg<br>and M.S. Normandin | Evidence For The Magnetic Field Orientation In<br>Extragalactic Radio Sources   |
| J.R. Percy                                       | Observing Variable Stars For Fun And Profit   |
| D.G. Turner                                      | The Case For Membership Of The 67 <sup>d</sup> Cepheid<br>S Vulpeculae In Vulpecula OB 2                                      |
| R. Roeder  | Einstein And Cosmology: Synopsis Of A Lecture<br>To The Royal Canadian Institute, Toronto, on<br>March 17, 1979               |
| D.A. Fraquelli                                   | Spectral Variations In HR 9070  |
| W. Gilmore                                       | Radio Continuum Interferometry Of Dark Clouds.<br>I. A Search For Newly Formed HII Regions                                    |
| W. Gilmore                                       | Radio Continuum Interferometry of Dark Clouds.<br>II. A Study of the Physical Properties Of<br>Local Newly Formed HII Regions |
| J.N. Clarke                                      | Extraterrestrial Intelligence And Galactic<br>Nuclear Activity  |
| H.S. Hogg and A. Wehlau                          | Improved Periods For Variables In NGC 5897  |
| C.T. Bolton                                      | On The Period And Velocity Of The $\beta$ Cephei<br>Star HR 6684  |
| D.G. Turner                                      | A Reddening-Free Main Sequence For The Pleiades<br>Cluster  |
| D.G. Turner and R.W. Lyons                       | Recent Observations Of HD 127617 = Bidelman's<br>High Latitude Be Star  |

HEARD EDITORIALS IN JRASC

*We would like to draw our readers' attention to the fact that Jack Heard's collected DDD editorials are now appearing (in three instalments) in the JRASC. The first was in the April issue.*



IAU SYMPOSIUM NO. 88

Close Binary Stars: Observation and Interpretation

Planning and arrangements for the Symposium are now well in hand. The preliminary scientific program has been mailed to the invited participants and has been posted on the DA and DDO bulletin boards. The program is quite lengthy, and it has been necessary to add an evening session.

Most of the participants will be arriving on Monday, August 6 and staying at University College, but there will be a substantial number arriving on the weekend from the Rochester Colloquium on White Dwarfs and Cataclysmic Variables. Present indications are that we will have 150+ participants not counting guests and local participants.

There will be a welcome reception for Symposium participants and their guests on Monday evening. This is to be hosted by GASA at a time and place yet to be decided. There will be an open house at DDO for conference participants on either Tuesday or Wednesday evening. The large number of people interested in visiting the Observatory may force us to split the open house onto two nights with the second tour on Friday. The banquet will be held on Thursday night at a time and place still to be determined.

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THESIS ABSTRACT

"Rotation Measures And The Galactic Magnetic Field"

Martine Simard-Normandin

Faraday rotation of the polarization plane (E-vector) of extragalactic radio sources is used to investigate the properties of the galactic magnetic field. 566 new polarization measurements are reported. The purpose of these measurements was to complement and extend the existing body of polarization data for extragalactic sources in order to substantially improve the quantity and quality of rotation measures (RM's).

We have used the 46-metre telescope of the Algonquin Radio Observatory to obtain 68 new polarization measurements at 2.86 cm. We report linear polarization observations of 260 sources at 11.1 cm and 142 sources at 3.71 cm with the three-element interferometer of the National Radio Astronomy Observatory in Green Bank. We have observed 96 sources at 17.42 or 18.92 cm with the 100-metre telescope of the Max-Planck-Institut für Radioastronomie.