

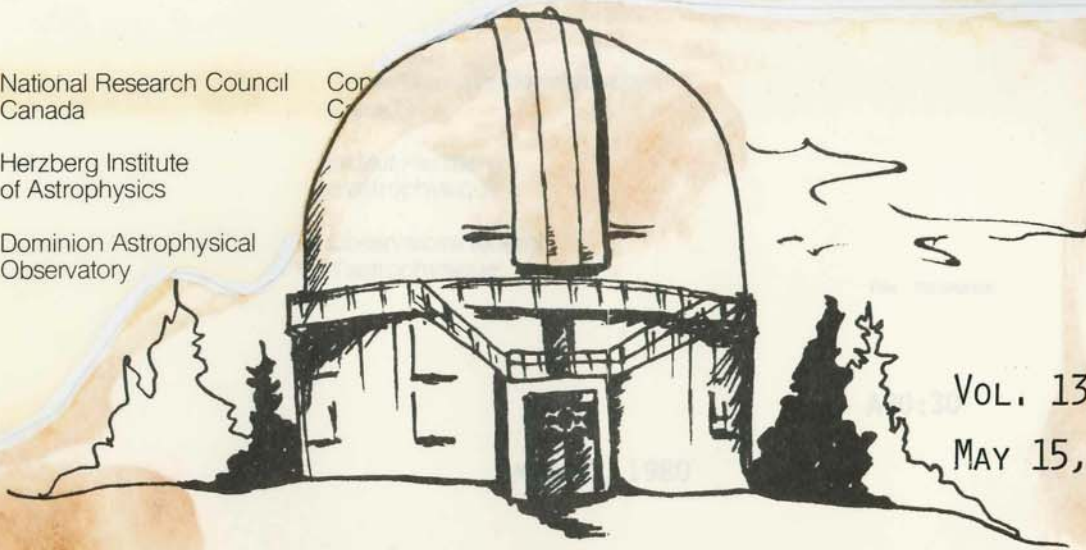


National Research Council
Canada

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Herzberg Institute
of Astrophysics

Dominion Astrophysical
Observatory



Vol. 13, No. 3

MAY 15, 1980

DAVID DUNLAP DOINGS

Prof. Donald A. MacRae,
David Dunlap Observatory,
P.O. Box 360,
Richmond Hill, Ontario,
L4C 4Y6

Dear Don:

This is in response to your phone call requesting a paragraph or two about my most recent experiences observing with the CFH telescope.

Bill Harris and I were the first Canadian observers who were given an opportunity to use the CFH telescope for their research. Our project was mainly directed towards the study of globular clusters associated with elliptical galaxies in various environments. All five of our nights were clear; on two nights the seeing was ~ 1 arcsec, and on half a night it was even better than that. Even though the mirror support system still needs to be "tweaked up" and the large field corrector requires some more alignment, exposures obtained in the best seeing produced images with diameters of ~ 0.9 arcsec. Since we were really scientific guinea pigs it is not surprising that large numbers of minor problems arose, so that the overall efficiency of our observing was only $\sim 50\%$. Nevertheless, the CFH telescope clearly showed itself to be a good sturdy telescope with excellent optics that tracks very well when used close to the zenith. Our only major complaint was that the prime focus cage turned out to be exceedingly uncomfortable. As a result, exposures of more than about two hours appear to be beyond the limit of human endurance. This is particularly regrettable because at the F/4.2 focus of the wide field corrector, limiting exposures on baked IIIaJ and IIIaF will require approximately four hours. A baked IIIaJ plate exposed in seeing better than 1 arcsec near the zenith was found to have a limiting magnitude $J_{lim} = 22.6 \pm 0.2$.

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Among the first scientific results, I might mention that NGC 3928 (Markarian 190), which is classified as an E or SO galaxy in literature, turned out to be a super compact spiral in which the disk containing the spiral structure extends to only $750 h^{-1}$ pc from the nucleus. This makes NGC 3928 the smallest spiral galaxy that is presently known. A photograph of the jet in 3C 273 shows this feature to have a much smoother brightness distribution than does the jet in M87 which consists of a number of discrete knots.

One thing for which we had not been adequately prepared was the harshness of the observing environment on Mauna Kea. After three nights I had to drive Bill Harris (who is now fully recovered) down to hospital for treatment of what appeared to be food poisoning aggravated by the effects of high altitude. I, myself, had to give up, totally exhausted, after four and one half nights of observing. Finally, I should like to record my deep gratitude to Roger Cayrel who cheerfully jumped into the breach as we fell by the wayside.

I hope that this will provide you and the readers of the DDD with the information you wanted to have.

With best personal regards to Betty and yourself,

Yours sincerely,



Sidney van den Bergh

SvdB/dc
cc: R. Cayrel

May 2, 1980

The editors are pleased to be able to provide this rapid publication of the first Canadian astronomical results from the CFHT. And they congratulate and thank Messrs. Harris & van den Bergh.

TWO ZONTA AWARDS TO THE DEPARTMENT

Its not by any means every year that a student receives an award in an international competition. But this year both Wendy Freedman and Joan Wrobel have won Amelia Earhart Fellowship Awards for 1980-81. These awards, which are valued at U.S. \$5000, are provided by Zonta International, a worldwide service organization of executive and professional women. The competition is international and is open to all women students in the physical sciences.

SUMMER STUDENTS

Once again this year, we have five summer students, all U. of T. undergraduates, who will be working on various projects both at the observatory and downtown. *Alex Fullerton* (who will enter 3rd year in September) has been hired by Tom Bolton and Karl Kamper to help with their program of determining systematic corrections to the radial velocities obtained from 74-inch telescope spectrograms. This project was described in some detail by Tom and Karl in the last issue of the *Doings*.

Margot Loren (4th) and *Paul Ford* (3rd year) have started work with Dave Turner, assisting him in his studies of young open clusters. Margot will be working for Barry Madore during the second half of the summer.

Michael Gaspar (3rd year) is working with Christine Clement. He will be doing iris photometry and also PDS reduction of plate material of M5.

Last, but not least, *Doug Welch* (4th year) is back again this summer to continue his work with John Percy doing photo-electric photometry with the 16-inch at DA.

LAS CAMPANAS NEWS

Peter Wizinowich is the new Resident Astronomer for 1980-81. He is a former U. of T. Astronomy undergraduate (7T8) with a Master's degree in Aerospace Studies. During his Master's program, he has gained considerable experience in electronics and optics and should therefore be ideal for the position. In addition, he has a cheerful disposition and gets along very well with people. Peter started his training at DDO on May 6 and will begin work on Las Campanas on June 30.

SUMMER TOURS 1980

As in past years, the Summer Visitors' Program at the DDO is being run by a number of the graduate students. The Saturday evening public nights have already started and continue through to mid-October. This year's tour workers are Chris Corbally, Dennis Crabtree, Nebojsa Duric, Karen Finstad, Doug Gies, Gerry Grieve, Bob Gauthier, Mary Lane, Louis Noreau, Mario Pedreros, and Donna Zubrod. We are hoping to set up hall displays describing some of the research activity at DDO, but we need help in obtaining material. If you can assist us in this area, please contact either Tom Bolton or Gerry Grieve.

Gve

CFHT NEWS

Bob Garrison reports:

Having just returned from meetings of the Scientific Advisory Committee (SAC) and the Time Allocation Committee (TAC), in Hawaii, I would like to report on the highlights of those meetings.

The telescope is now operational and functioning well in its prime focus mode. The first three Canadian observers (van den Bergh, Harris, and Hickson) all had successful runs and agreed that the site conditions are exceptional, with less than 1" seeing sometime during their few days. The first U. of T. observers, Barry Madore and Wendy Freedman, are scheduled for the three nights May 7-9.

At the SAC meeting, it was decided to upgrade the HP computer with an RTE IV operating system. This is the only new item in a very tight budget. The instrumentation budget received a blow when it had to accommodate 126 K\$ worth of cabling. The Canadian cassegrain spectrograph will not be ready until a year from now because of difficulties encountered at D.A.O. The IR upper end is scheduled for January 1981, and the IR photometer for March 1981, along with the polarimeter and the Fourier transform spectrometer. One camera for the coudé should be available by November 1980. The visible photometer will be ready in the summer of 1981. A number of national instruments, including some interesting specialized spectrographs, will be made available, and at a future date I will elaborate on these.

At the TAC meeting, Canada was given 29 dark nights and 11 bright nights for a total of 40. Unfortunately, 108 nights were requested by 30 astronomers. Some proposals were easy to eliminate because the instruments were not available, but it was still not possible to accommodate all the good proposals.

Currently, I am the only U. of T. representative on CFHT committees, but we are well represented on the staff by former U. of T. astronomers. Bruce Campbell (Ph.D. 1976) is a staff astronomer and Rick Salmon (B.Sc. 1972 and our first resident Astronomer in Chile) is doing great work as a photographic and optical technician.

The Board of Directors will meet in Paris on June 18-19, and I will be attending as vice-chairman of SAC. I will report again upon my return.

Keep in mind that the deadline for the next round of applications, for the period January-June 1981, is September 1, 1980.

rG

CONGRATULATIONS

To Bob McLaren, who has been recommended for promotion to Associate Professor with tenure, effective July 1. Bob joined the Department (with a 20% cross-appointment in Physics) in November 1975 after spending two years at Berkeley on NATO Postdoctoral Fellowship. It was during his stay in California that he reoriented his research interests from laser physics to IR astronomy.

To Bill Harris, who will be promoted to Associate Professor with tenure in the Physics Department at McMaster on July 1. Bill completed his Ph.D. here (with René Racine) in 1974 and then went to Yale as a PDF before joining the staff at McMaster in 1976. He writes that both he and Gretchen are very appreciative of the support McMaster has given him. Their twin daughters (21 months old now), however, have taken little notice of their father's accomplishment.

To Donna Zubrod-Grieve and Bob Gauthier who are the newly-elected GASA co-presidents, succeeding Dennis Crabtree.

JOBS

The Department of Physics of the University of Calgary had an opening for an assistant professor earlier this year. We have it on the best of authority that the successful candidate has accepted Calgary's offer. A usually reliable source informs us further that that individual is *Chris Pritchett*. Chris completed his Ph.D. with us in 1975. He went first to UBC and subsequently to DAO.

So far as we are aware the other position at Calgary, a postdoctoral for work on synthetic light curves of close binaries with Dr. Milone, has not been filled.

Closing date for the position at Toronto is July 1, 1980. This appointment, at the assistant professor level, does not begin until July 1, 1981.

A very recent announcement from UBC tells of a position as "academic curator" in Geophysics and Astronomy. Details are available from the Head of that department or from the CASCA Employment Committee.

Finally, there is a position at Montreal: "Un poste de professeur est disponible au Département de physique. La durée initiale de l'engagement sera de deux années, avec possibilité de renouvellement. ... L'entrée en fonction pourrait avoir lieu le 1^{er} août 1980." There is a strong suggestion that this position is somehow connected with the still-to-be-announced appointments of a new Director and a new Associate Director for the CFHT. The latter will presumably be an astronomer from France, while the former will be a Canadian.

VISITORS

Dave Hanes stopped off on April 21 and 22 enroute back to Cambridge from the AAT, and while here he gave an informal seminar entitled "Sandage and Tammann Revisited - What's Wrong with the Hubble Constant". Dave has been a Research Associate at the Institute of Astronomy since completing his Ph.D. here in late 1975. On July 1 next, he will take up a position as Staff Astronomer at the AAT.

Billy Bidelman, from Warner and Swasey Observatory, was here April 30 - May 2 and gave a colloquium on "The Classification of Infrared Stars". Billy and his wife Verna came to Toronto at the invitation of GASA, and he most graciously left us a library copy of his just-completed publication "Spectral Classifications of the Stars of the Caltech Two-Micron Survey".

Kim Innanen came down from York on April 23 to tell us about the many manifestations of the Coriolis force in a talk entitled "Retrograde Jovian Satellites and Spiral Galaxies".

Peter Biermann dropped in on May 8 and 9 on his way back to Germany from the Center for Astrophysics in Cambridge, Massachusetts where he had been reducing Einstein X-ray observations.

OBSERVING TRIPS

Bill Gilmore is off again to the VLA in New Mexico to observe SS 433 during the period May 12-18. At this epoch, the jets are expected to have maximum tilt angle on the sky. The resulting map will be compared with previous maps in an attempt to observe jet precession, or at least structural changes in the radio source. Bill will meet *Ernie Seaquist* in Charlottesville later in the month for further analysis of the maps.

Chris McAlary had a successful observing run at KPNO during the period April 14-26. Chris obtained additional optical and infrared photometry of the nuclei of active galaxies for his thesis. Chris also reports a naked-eye observation of a sunspot which he made just as the disk was sinking below Ajo Peak. The observation was confirmed with a telephoto lens.

Peter Martin was at Steward Observatory in late March obtaining high-spectral-resolution (speckle) polarimetry of VY Cma.

Phil Kronberg and *Stuart Button* spent several days in Charlottesville at the NRAO in March analyzing VLA observations from several programs. As we go to press both Phil and Stuart are back again at NRAO for a week's visit.

Barry Madore and *Wendy Freedman* had bad luck during a six-day run at Mont Mégantic a few weeks ago. They experienced 140 km/hr winds, snow, sleet, rain, and nighttime temperatures of -12°C .

POTPOURRI

John Percy was in Montreal March 25-26 to give a colloquium at U. de M. (on "Beta Cephei and Related Stars" and at the Centre d'Astronomie de la S.R.A.C. (on "Les Etoiles Variables"). On March 27, he gave the C.A.P. Undergraduate lecture at the U. of Guelph (on "Stellar Seismology"). On April 17-18, he was Harlow Shapley Visiting Lecturer at Colgate U., Hamilton, N.Y., giving lectures on "Current Problems in Stellar Pulsation Theory" and on "Observing Variable Stars for Fun and Profit". As part of his liaison duties (he has been for a long time the department's Secondary School Liaison Officer), he served as a judge at the Peel Science Fair (held at Erindale College) and gave two presentations on astronomy in the Etobicoke Public Libraries.

On April 22, *Christine Clement* gave a party to honour *Helen Hogg* in her 75th year. All female staff and graduate students at DDO and DA were invited, and *Amelia Wehlau* came from London for the occasion. Helen showed slides illustrating some of her travel experiences, including a 1958 trip to Central Asia and a number of recent visits to the Canadian Arctic. Later she presented each of the guests (and the hostess) with a coffee spoon bearing the coat of arms of Richmond Hill.

Wendy Freedman and *Barry* and *Katherine Madore* were in Saas-Fee, Switzerland in late March to attend the tenth advanced study institute on "Star Formation" as well as to take in a bit of the Alpine scenery.

Phil Kronberg is spending the next four months at the Max Planck Institut für Radioastronomie in Bonn. Phil and family left for Germany on April 26.

Our downtown secretary, *Gail Archer*, passed her driving exam on April 11 so she is now a "legal" driver. It seems she is learning very quickly how to become a true Toronto driver as she received a parking ticket the following Tuesday. We look forward to seeing Gail in the next GASA rallye.

COLLOQUIUM

May 23 (Friday)

Michael Shara, Université de Montréal
"Novae: How and Why They Work"
(Room MP 137, 11:10 a.m.)

*** BULLETIN ***

Just as we are going to press, we learn that our DDO librarian, Zane Sterns, is now "Deemed to have permanent status with the University of Toronto" - i.e. tenure.

Congratulations Zane - all of us appreciate your skillful management of the library and also your invariably cheerful disposition.

PAPERS SUBMITTED

J.B. Hutchings,
D. Crampton and
C.T. Bolton

H α Emission in Cygnus X-1 1977

R.A. McLaren and
A.L. Betz

Infrared Observations of Circumstellar Ammonia
in OH/IR Supergiants

M. Simard-Normandin,
P.P. Kronberg and
S. Button

The Faraday Rotation Measures of Extragalactic
Radio Sources

D.G. Turner, W. Herbst,
W.E. Harris and
G.R. Grieve

The Young Open Cluster NGC 3293 and its Relation
to Car OB1 and the Carina Nebula Complex

E. Seaquist, B. Gilmore,
et al.

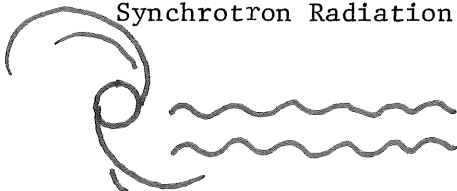
The Quiescent Radio Spectrum of SS 433

REVISIONISTS' CORNER

The annual Faculty Final Examinations are usually a pretty good source of original thought on astronomical topics. This year, however, the originality tended to be more "dumb" than funny and so our offering is rather slim.

From the AST 100 Final:

Synchrotron Radiation - radiation given off by the spiralling motion of the arms of spiral galaxies. The radiation is given off synchronously, twice every period of rotation.



Olympus Mons - the ancient Greeks' annual grand-prix chariot race.

In answer to the question "Why did Jupiter not become a star?", one wit replied "Because he has bad legs and can't sing".

From the AST 120 Final:

Henrietta Leavitt - served tea to Harlow Shapley.

To explain how masses are determined for a spectroscopic binary, one student wrote:

"Find the mass ratio M_a/M_b from the velocity curves and then use:

$$M_b - M_a = 2.5 \log (F_a/F_b)''$$

HERE IS THE SCIENTIFIC PROGRAM OF OUR 1980 JUNE INSTITUTE

All lectures will be held in Room 102
McLennan Physical Laboratories

- Tuesday, June 3
- 9:30 a.m. The Nature of the Cosmic Gamma Bursts
Dr. Arthur N. Cox, Los Alamos Scientific Laboratory
- 11:00 a.m. Extra-Galactic X-Ray Astronomy: The Einstein Observatory
Dr. Stephen S. Murray, Harvard-Smithsonian Center for Astrophysics
- 2:00 p.m. Envelopes Around Evolved Giant Stars: Physical and Chemical Conditions
Dr. Ben M. Zuckerman, University of Maryland
- 3:30 p.m. Nucleosynthesis and Gravitational Collapse I
Dr. W. David Arnett, University of Chicago
- Wednesday, June 4
- 9:30 a.m. Oscillations of White Dwarfs
Dr. Arthur N. Cox
- 11:00 a.m. Extra-Galactic X-Ray Astronomy: Active Galaxies and Clusters of Galaxies
Dr. Stephen S. Murray
- 2:00 p.m. Envelopes Around Evolved Giant Stars: Evolution
Dr. Ben M. Zuckerman
- 3:30 p.m. Nucleosynthesis and Gravitational Collapse II
Dr. W. David Arnett
- Thursday, June 5
- 9:30 a.m. The Beta Cephei Star Puzzle
Dr. Arthur N. Cox
- 11:00 a.m. Extra-Galactic X-Ray Astronomy: Quasars
Dr. Stephen S. Murray
- 2:00 p.m. Where Are They? The Quest For Intelligent Life In The Universe
Dr. Ben M. Zuckerman
- Friday, June 6
- 9:30 a.m. Pulsations of Yellow Giants
Dr. Arthur N. Cox
- 11:00 a.m. Extra-Galactic X-Ray Astronomy: Deep Surveys and Number-Intensity, *Dr. Stephen S. Murray*
- 2:00 p.m. Star Formation And The Orion Nebula
Dr. Ben M. Zuckerman
- 3:30 p.m. Nucleosynthesis And Gravitational Collapse IV
Dr. W. David Arnett

THE NEW HOGTOWN PRESS

Should you be searching for the New Hogtown Press it won't do much good to look in the Metropolitan Toronto and Vicinity telephone directory, for all that is given there is the phone number - no address. But you will find its geographical co-ordinates listed in the American Ephemeris and Nautical Almanac for 1980 to a greater precision than you are likely to need:

Longitude	+ 5 ^h 17 ^m 35.60 ^s
Latitude	+43°40'00"8
Altitude	116 meters

In fact, to judge from this entry on page 490 of the Ephemeris, the New Hogtown Press is where Toronto is at. Never mind the CN Tower, Casa Loma, or Honest Ed's. If people from far away places want a precise location for Toronto, the New Hogtown Press is where they'll end up, give or take five feet.

Incidentally, that is almost exactly what happened to five of our current graduate students. Dominique Barceloux, Mercedes Davis, Louis Noreau, John Reid and Joan Wrobel all live within about 100 feet of the New Hogtown Press.

No, it is not in the old Meteorological Office at the corner of Devonshire and Bloor; that's where the U. of T. Admissions Office is now located. It is, in fact, in a tiny romantic-looking building with a separate existence, an individualistic orientation, and a different architectural style. It's squeezed between the old Met Office and the St. George Graduate Residence at 321 Bloor West. It's worth stopping to have a look next time you use the St. George subway station. I suppose the NHP leases the space from the University.

I can't tell you much about what goes on in the New Hogtown Press because on the several occasions that I've peered in the windows there's been no one there. It seems though to have two desks at which some activity is being carried out, and I have the impression that it specializes in books on the social order in Canada. The building is a one-storey, three-room, brick structure and on the east side is a very small wing now used as the shipping room of the NHP. The roof of this wing tells the story of the building's original purpose, for it still carries the hinged shutters covering the slit through which a transit instrument could scan Toronto's celestial meridian. And the wing, indeed the whole building, is canted some 15 degrees to the street lines just as our instruments on the 16th floor. It must have been constructed around 1910 when the Met Office moved to that location from in front of what is now the Sandford Fleming Building. The Director of the "Meteorological Observatory" sent the position of the transit pier to the American Ephemeris in 1912 and it has been listed every year since 1916.

When you do visit the New Hogtown Press you'll see on the south wall a very white stone, strikingly in contrast with the burnt brick of the walls and the darker stone foundations. How that stone got there, and the significance of its inscription, is another story, though.

MUSICAL BEDS AT THE IUE

A novelette by Cbt

I recently had the opportunity to make use of the IUE receiving station near Madrid, Spain, for a program I am working on with Peter Martin. First of all I would like to say that the idea of going to Spain is much more attractive than making a trip down to Goddard Space Flight Center. Just something to keep in mind when you are making your next IUE proposal.

Since the VILSPA station is located some 20 miles north of Madrid, the SRC (Science Research Council) has made special arrangements to aid the U.K. observers while in Spain. They have leased an apartment in Madrid that the observers are free to use, and as well they have a car on long term lease from Avis. This enables the astronomer to make the trip out to VILSPA whenever necessary, which can be at very strange hours since the observing shifts are determined by the satellite's orbit and not by the clock.

After arriving in Madrid, I picked up the car that had been reserved for me at the airport and attempted to make my way to the SRC apartment. After struggling with the Madrid traffic and getting lost once, I finally arrived. The next day, Friday, I went out to the receiving station to prepare for my shift which was to start at 3:00 a.m. Sunday morning. While there, I learned that there were some small rooms available to visiting astronomers. Since I did not look forward to getting up and driving to VILSPA at some ungodly hour, I reserved one of these rooms for the Saturday night before my Sunday morning shift and for the Monday night as well, since my second shift was on Tuesday.

Well everything worked fine the first night. However my second night at the VILSPA station was not so peaceful. When I arrived there on Monday afternoon I found out that someone else also had my room reserved for that night. But it appeared that only three of the four rooms were booked for that night, one by a German, one by a Frenchman and the third one by the resident astronomer for my shift, who was an Italian. Then came another problem though. No one could find a key for the fourth room. Since it seemed that no one was using the room the key should have been around. Finally one of the caretakers found a spare key and we thought that everything had been settled. But wait. When I opened the door to this room I found that someone's belongings were still in it, indicating that they intended to use it that night. Still nobody could remember who, if anyone, was using the room. So finally I decided to sleep in the room until my shift started or until this mysterious person showed up and demanded his room back.

About 1:00 a.m. I was awakened by someone entering the room with a key. It was then that I knew this mysterious person actually existed. I persuaded him to let me have the room until 2:30 when I had to get up and then he could take over the bed. I arose at 2:30 and completed my shift at 11:00 that morning. During lunch I once again met this mystery person, although this time the conditions were more favourable. It turned out that he was an Australian visiting at VILSPA for a month.

The final laugh came when I discovered that he spent most of the night trying to get some sleep on a small cot in a closet-like first aid room inside the station itself. It goes to show that one should make reservations well in advance, and even then ...

Dennis Crabtree