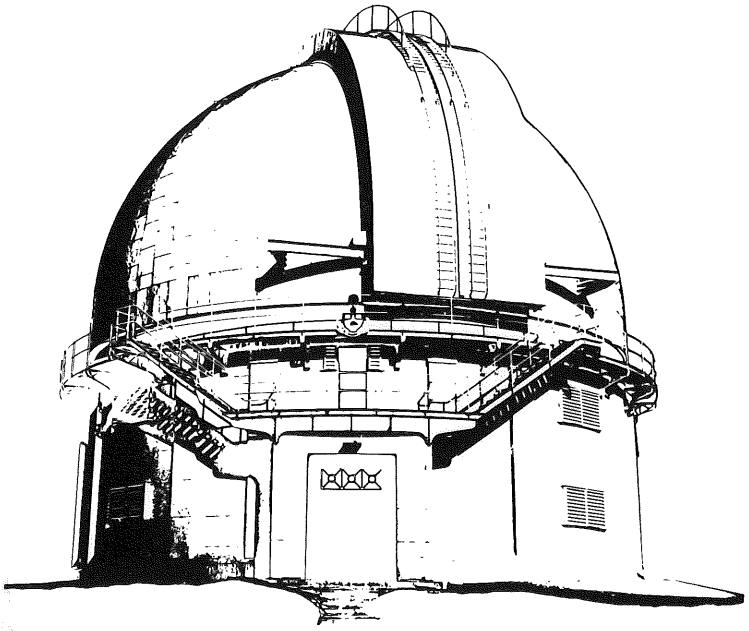


# THE DAVID DUNLAP DOINGS

Vol. 14, No. 7 Oct. 28, 1981

M BATES 269.14

FIELD CENTRE (1950.0) :

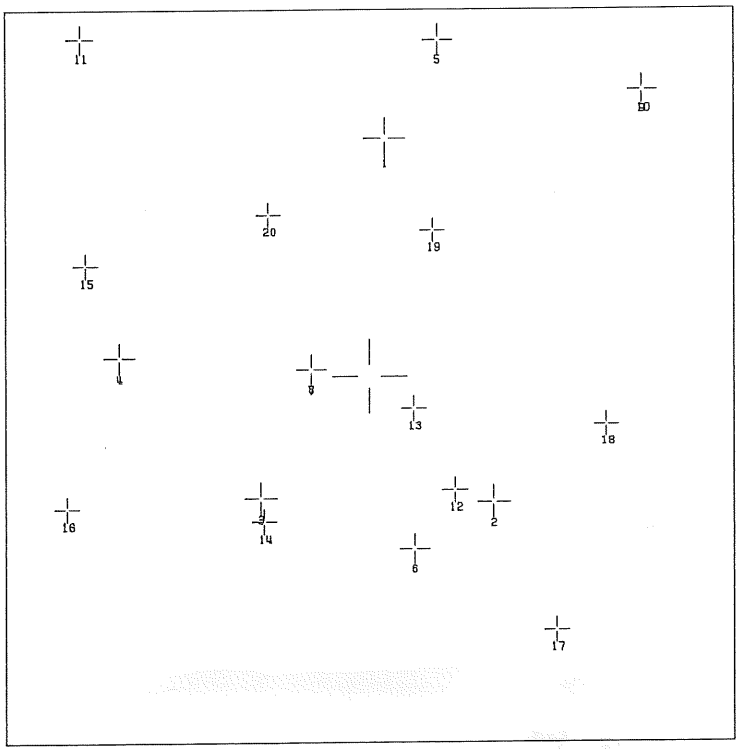
RA = $12^{H}\ 52^{M}\ 24.0^{S}$

DEC = $-44^{0}\ 31'\ 42''$

EPOCH: 1977.0

SCALE : 20′ 67.1"/MM.

M: 4 5 6 7 8 9 10 11




*Cover Story p.3*

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

To *Lindsey Davis* who successfully defended her Ph.D. thesis at an oral examination on Oct. 27. The thesis abstract is on page 17.

To *Raymond Rusk* who has completed the requirements for the M.Sc.

THE DAVID DUNLAP DOINGS Vol 14, No. 7 Oct. 28, 1981
Published at the David Dunlap Observatory, Box 360, Richmond Hill, Ontario L4C 4Y6
*Editors: Donald A. MacRae and Peter G. Martin*

*Cover Story*

## FINDER FIELDS AND FOREIGN AFFAIRS

Matthew Bates

The picture on the cover is of a finder field produced by a programme running on the UTCS system. The field stars are extracted, to a specified density or magnitude limit, from the SAO star fields stored on magnetic tape. The programme has been available for some time and was first documented in *The Doings* by Stuart Button in Vol. 12, No. 5 (June, 1979).

Generation of such fields was preliminary work to a project for Barry Madore which took me to the Royal Observatory, Edinburgh last April. The fields were used to obtain accurate positions of galaxies from the UK Schmidt southern sky survey plates and films archived in Edinburgh. Much of the work had already been done by Petrusia Bojetchko and Ed Anderson on the DDO copy of the survey but there still remained gaps to be filled. Because many of the fields in the survey do not have A grade exposures copies are not yet available; hence the trip to Edinburgh.

Barry and Chip Arp have been compiling a catalogue of peculiar galaxies for the southern hemisphere similar in format to that already published by Arp for the northern hemisphere. A seven year project, it nears completion with expected release in the spring.

Working at the observatory in Edinburgh was a memorable experience. My ascent of Blackford Hill to behold the observatory on that chilly first night in Edinburgh was marked by a brilliant fireball blazing across the western sky and exploding twice with green hue before apparently plunging into the sea off the Irish coast. The observatory is a large installation of several buildings bordered by a stone wall and fronted by an iron gate entrance. Everything there speaks of a culture steeped in history and tradition. Books in the library date back to 1200. Edinburgh is one of the nodes in STARLINK which is a U.K. network of VAX computers. I had the opportunity to work on their system to produce more of the fields like the one pictured on the cover. People at the observatory were most helpful and hospitable, making my stay productive and enjoyable.

Combining business and pleasure we, our family of three, made the trip together and enjoyed many of the sights and activities of Edinburgh. Though somewhat culture-shocked upon arrival we grew to know and like the city. We made a couple of trips into the surrounding countryside and dined royally with friends we made at the observatory, including the family of an old workmate of Dave Blyth's. After the project was complete I took a week's holidays to tour south into England in a rented car. You can't see England in a week of course, but we did manage to see York, London, and Cambridge with memorable nights spent by the fireside in the Yorkshire moors and among the mists of the North Sea coast.

Bts

Ed. Note: The publication referred to by Matt Bates is tentatively titled "A Catalogue of Southern Associations and Peculiar Galaxies". In two volumes, it will list positions, descriptions and references for 15,000 systems and photographic reproductions for as many as 2000 of the best objects. An application for financial assistance has gone forward to NSERC to permit the production in Canada of this important monograph, under the auspices of the all Canadian publishers Clarke Irwin and Co. Ltd. The work will most certainly be of world-wide interest and of permanent value to astronomy.

*The Summer Student Programme at the CFHT*

*Gerry Grieve reports*

*This programme, initiated last summer at the suggestion of B. Campbell and R. Racine, is intended to allow two Canadian Ph.D. students to spend some time at the facility every summer. This year Mike de Robertis (U. Vic, formerly U. of T.) and I were at the CFHT for two months, with Mike spending the early summer there and myself the months of July and August.*

*Being a CFHT summer student was a valuable experience even though the programme demanded no specific tasks or duties and had little organization. I was able to observe and participate in the day-to-day operation of a world-class telescope. Much of my time was spent at the headquarters in Waimea, where, besides my own research, I did some programming towards the goal of archiving the prime focus plate log on the computer, and answered public/media inquiries. Of course "the mountain" (Mauna Kea in this case) is where all the fun happens, and I was able to go up whenever I wished. I got a taste of observing at the coudé and Cassegrain foci, the latter being during an engineering run to test and debug the "Cass bonnette" using the IR secondary mirror. Unfortunately the time during which I was slated to observe at the prime focus was cloudy.*

*As the staff are justifably proud of the installation and anxious to push the telescope and the site to their limits, the CFHT should continue to be an exciting place to visit.*

*Gve*

## A UNIVERSITY INITIATIVE FOR THE CANADIAN LONG BASELINE ARRAY PROJECT

As plans for the proposed CLBA project develop there has been discussion of the form of its administrative structure. Would it be set up as a new "laboratory" of NRC, an extension of the Herzberg Institute, or would Canadian Universities also be involved in some way? There has been keen interest on the part of many Canadian radio astronomers to have the CLBA operated by a consortium involving both universities and government agencies, similar in some respects to AUI and AURA in the U.S., or to the Tri-University Meson Facility (TRIUMF) at U.B.C. (now operated by a consortium of 4: U. Vic, UBC, Simon Fraser U. and the U. of Alberta).

With a view to studying the university consortium option further, and to crystallizing a widely expressed wish into some form of joint action, Phil Kronberg organized two "multi-university" meetings at U. of T. on 24th and 25th September. The dates were picked to coincide with a visit to the U. of T. by Dr. Erich Vogt, the current director of TRIUMF, and past Vice-President (research) of U.B.C.. In the first meeting, Dr. Vogt met with Prof. D.M. Nowlan, our V.P. for Research and Planning, Prof. R.E. Jervis (Chairman, U. of T. Research Board), Dr. T.C. Clark (Director of ORA), Dr. John Beals (Assoc. Dean, Research and graduate studies, Queen's University) and Profs. P.P. Kronberg and J.L. Yen. We learned a great deal from Dr. Vogt about the development, funding, staffing and operation of the TRIUMF consortium, and discussed possible similar CLBA parallels.

The Friday meeting was attended by a wider group of radio astronomers and administrators from six Canadian Universities. They were: Dr. Erich Vogt of UBC, Drs. D. Routledge and F. Vaneldik of U. of Alberta, Drs. T.C. Clark, R.E. Jervis, P.P. Kronberg and J.L. Yen, and Carol Gillin of U. of T., Wayne Cannon of York U., Dr. Serge Demers of the Université de Montréal, and Drs. A. Bridle and A.T. Stewart of Queen's University. Drs. T.C. Clark and R.E. Jervis were also our hosts, and invited the group to a following working luncheon at the U. of T. Faculty Club.

After much discussion of both TRIUMF and the CLBA, it was unaminously agreed that a CLBA consortium, in which some Canadian universities would share in the management of the proposed CLBA, was both workable in principle and desirable. It was felt that a model of this type in which both universities and one or more government agencies jointly manage the project was the most effective way of creating a truly national project, of benefitting Canadian science. It was decided, as the next step toward realizing a joint enterprise of this kind, that a common letter be sent to the President of NRC stating the universities' wish to join with government in forming a CLBA consortium, should the project be funded. The letter was drafted in the course of our Friday meeting, and has since been approved, and signed by the presidents of seven universities. (The addition is the Univ. of Victoria which also expressed its support and desire to be a co-signer of the letter).

The next occasion for discussion of the proposed CLBA administration will be at the coming meeting of the Subcommittee on "Management of the CLBA Planning Committee". Three of the attendees on 25th September (Kronberg, Stewart and Vogt) are also members of that subcommittee. The others are: C.R. Purton (Chairman), B.H. Andrew (Secretary), J.L. Locke, R. Racine, J. Tanner (EMR) and G.A.H. Walker (UBC).

P.P. Kronberg

## P O T P O U R R I

*Helen Hogg* attended IAU Colloqium No. 68, Astrophysical Parameters for Globular Clusters, in Schenectady, N.Y., October 7-10. She chaired the session on Main Sequences and Distances on the Saturday morning. The only other attendee from Toronto was *Wendy Freedman*.

*Armando Arellano* had a successful observing run at Kitt Peak in September, observing small-amplitude Cepheids for his thesis. He was also at DAO in August and reports that he had 8 consecutive nights that were 100% clear. Wow!

Former student (B.Sc. 1962, M.A., 1963) *Richard Larson* is now Chairman of the Yale Astronomy Department. Our best wishes to Dick in this new position.

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*Peter Martin* enjoyed a visit to the Department of Astronomy of the University of Western Ontario in their spacious new quarters in the Physics Building. He delivered a colloquium on "Polarization of Scattered Light in Globular Clusters".

*John Percy* attended the Midwest Astronomers meeting in Ann Arbor, Michigan, Oct. 10, and presented a paper (with *Paul Ford*) on "Recent Observations of HR 7308, a Unique Cepheid". On Oct. 19, he spoke to the Montreal Centre of the RASC on "Observing Variable Stars for Fun and Profit". On Oct. 23-25, he attended the 70th anniversary meeting of the AAVSO in Cambridge and Waltham, Massachusetts, and presented a paper (with *Nancy Evans*, Paul Ford and *Doug Welch*) on "HR 7308: A Unique Cepheid". (Another attendee was *Dr. Edwin Weston*, a member of the Department of Astronomy staff back in the early 1950s.) On Nov. 7, John leaves for ten nights of peace, quiet and (we hope) clear skies at Kitt Peak.

In early September *Rick McGonegal* and *Barry Madore* went to CTIO to use the 4 m reflector in the continuing pursuit of the infrared calibration of the cepheid period-luminosity relation. They got more than they bargained for: two computer failures, a crash of the absolute encoders, high humidity, fog, rain, clouds, snow, sleet, condors but fortunately enough clear skies to call the run a success.

After an unexpected phone call from René Racine to the CFHT Time Allocation Committee, *Wendy Freedman*, Barry Madore and later Ermanno Borra and Eduardo Hardy were speeding out to the CFHT to use engineering time which came available at the last minute at the end of September. Wendy collected a number of important plates for her nearby galaxy programme while the Laval astronomers were using the grism "to search for the edge of the universe".

*Phil Kronberg* spent from 12th to 14th August at the Dominion Astrophysical Observatory as a member of the NRC's ad hoc Review Committee for the DAO. Other members were: B.E. March (UBC), Dave Hartwick (U. Vic.), Georges Michaud (U. de M.), J.B. Oke (Hale Obs.) and Rene Racine (CFHT). At the end of September he visited the VLA for the meeting of the VLA Advisory Committee, of which he is a member. In connection with his duties as NRAO Visiting Committee Chairman he will be in Charlottesville Va. from 4th to 6th November.

*Stuart Button* has just spent a few weeks at Charlottesville working with the NRAO's "AIPS" and Software group. ("AIPS" stands for ASTRONOMICAL IMAGE PROCESSING SYSTEM, a change of name from the earlier "RANCID"). As an temporary member of Ed Fomalont's programming group he is helping to develop additional applications software for the VLA data reduction package. This includes the "pixel by pixel" comparison of multi-frequency VLA maps to generate 2-D distributions of spectral index, depolarization, Faraday rotation, etc. The procedure will be generalized to enable easy point-by-point radio-optical-X-ray etc. brightness comparisons for astronomical image fields. Stuart will also be working with Don Wells (who recently came to NRAO from KPNO) in the early stages of some 2-D optical applications software. These include astrometry in AIPS, the dedistortion of optical fields for purposes of accurate overlaying with the VLA maps, etc. In connection with the CLBA planning study, Stuart is also working with Craig Walker to test the image reconstruction algorithms at NRAO for proposed CLBA antenna locations sets.

During the third week of October *Nancy Evans* was at Goddard Space Flight Center. This was the second I.U.E. run for her project "Ultraviolet Spectroscopy of the Binary Cepheid SU Cygni" (Tom Bolton, co-investigator). Observations were made in four sessions from Oct. 18 to Oct. 25, totalling 12 hours of observing time. Nancy writes: "The I.U.E. staff was very cooperative in scheduling unusually short sessions spread over a week to increase the probability of detecting a possible eclipse of the B companion of SU Cyg. However preliminary reductions show that the light from the B star remained constant with an uncertainty of less than 10%. While I was at Goddard I also made use of the recently opened data reduction facility. For basic reductions, I found the combination of available software, a computer technician to introduce one to the programs, and experienced people to talk to very useful."

*Dave Crampton* (DAO), member of the Canadian Working Group and of the Joint Science Working Group for STARLAB, and chairman of the latter's subcommittee on spectrographs, was at DDO on October 30 and talked with Bln, KK, and Wlr about STARLAB's status and prospects and design considerations for the proposed spectrographs and detectors.

*Ernie Seaquist* was back for a few days October 28-30, looking hale and hearty. He reports enthusiastically about the progress of his sabbatical at the VLA.

## WE HEAR FROM ...

*John Booker, often until recently a "Demonstrator" = Teaching Assistant in several of the undergraduate courses offered in the evening by the Department, is now, by day, at Burnhamthorpe Collegiate Institute in Islington. He writes:*

I have changed schools once more, having been promoted to Head of Mathematics. I no longer teach any Physics or Space and Man courses, but maintain my interest in Astronomy and Astrophysics.

It is particularly intenesting to read of the travels of former classmates and aquaintances. I enjoy the "Doings".

Sincerely

John Booker

Astronomy 6TO.

## An Extended Postcard from Sq

Our drive to Socorro, N.M. in early July was without incident in spite of an incapacitating heat wave on the way. Our 1975 Valiant made the trip without a complaint, and I trust it will survive the trip back as well.

Our first few days in Socorro did not go quite as well. The water was turned off in our rented house, and getting it turned on during the July 4 weekend proved to be a challenging task. The lawn probably fared worse than we did however. Indeed, a survival course in lawn care is a necessity in this part of the continent.

We are pleased with the house. It's a modest three bedroom house on the Rio Grande flood plain, amply shaded by large cottonwood trees. The cottonwoods are a mixed blessing, however, providing both shade in the summer, and the danger of large falling limbs during stormy conditions in July and August. Already, a 20 foot long (1 foot diameter) branch fell near the house crumpling our (strong) chain link fence like so much tissue paper. (The owner's dog, living under our care, narrowly escaped the same fate).

In spite of the heat (up to 105°F in August) the hot season is mercifully short, since the altitude at Socorro is ∿4600 feet. (The VLA is at 7000 feet.)

The Labor Day weekend provided us with our first opportunity for a holiday. The Seaquists joined the Bignells (Carl & family) on a camping trip in Chaco Canyon in the 'four corners' area of New Mexico. Chaco Canyon contains extensive ruins of the ancient Anasazi civilization 5,000 members of which lived in cities in the canyon from 900-1100 A.D. Included among the numerous pictographs on the canyon walls is a record of the Crab supernova in 1054 A.D. (see Sky and Telescope 61, 199, 1981). To see it requires a hike 2½ miles along the canyon to its location on a cliff overhang near the ruins of the city Penasco Blanco. Other examples of archeoastronomy also exist in the canyon, but are harder to reach.

My research activities at NRAO have naturally concentrated on the VLA. I am involved in a program to detect and then map radio recombination lines in M82 and NGC 253. A pilot program to detect the H110α line in M82 was successful, and so I have submitted a proposal to map the H110α and H166α lines in both galaxies. A number of other proposals are in the works as well.

The CLBA design study is into the second major phase with a $145,000 industry contract to determine the cost of the Array. Contract bids closed on Oct. 5, and a meeting of the Planning Committee was held Oct. 7, 8 in Ottawa to begin the selection process. While on this trip I attended a meeting of the Space Committee of the Air Industries Association of Canada and presented a talk on the subject of the CLBA. The Association is an important and influential one comprising more than 100 companies, and we regard the support of this Association of great significance.

At the present time, two dimensional arrays are being considered as an alternative to one dimensional arrays for the CLBA. This represents a change in thinking brought about by extensive computer trials of alternative configurations. A final choice on the configuration, needed for the cost estimates, will be made before the termination of the new industry contract.

I guess that's all the news for now. I hope some of you will come to see the VLA and take the opportunity to visit with us.

Ernie Seaquist

## Undergraduate Awards, 1980

At the September 25, 1981 meeting of the Toronto Centre of the Royal Astronomical Society of Canada, Tom Box, now in our graduate program, was presented with the RASC gold medal for outstanding performance in the third and fourth years of the Astronomy programme of the Faculty of Arts and Science. Other awards made this year on the St. George campus were to Michael Gaspar who won the John Pounder scholarship in Astronomy and Astrophysics and the H.S. Robertson scholarship in Astronomy for third year, and to William Wall who won the John Pounder award in Astronomy for second year.

At Scarborough, the Pounder Prize in Astronomy was presented to David Dilkes at the Awards Dinner on October 17.

At Erindale, the John A. Pounder Prize in Astronomy 100 was won by Louis Raffaghello, and the one in Astronomy 200H was won by Douglas Worndl. There was no award in Astronomy 120Y because the student who qualified otherwise was a part-time student (Iryssa Duda).

Congratulations to these outstanding students!

### *THE HANDS OF MAN*

*Widespread concern is being expressed these days on the issue of nuclear disarmament. It may not be inappropriate to recall and reprint a passage written by Eddington very nearly 50 years ago, six years before the recognition of the process of fission, through the work of Hahn and Strassmann, and 10 years before the first release of nuclear energy in a chain reaction. The passage appears in his "New pathways in science", p. 163. The references to scarcity and abundance no doubt refer to the dislocation brought about by the Great Depression.*

> I have referred to the practical utilisation of subatomic energy as an illusive hope which it would be wrong to encourage; but in the present state of the world it is rather a threat which it would be a grave responsibility to disparage altogether. It cannot be denied that for a society which has to create scarcity to save its members from starvation, to whom abundance spells disaster, and to whom unlimited energy means unlimited power for war and destruction, there is an ominous cloud in the distance though at present it be no bigger than a man's hand.

## CAWiS

### The Canadian Association for Women in Science

CAWiS is an organization to promote equal opportunities for women to enter the science professions, and to achieve their career goals. Membership in CAWiS is open to all people who support its aims. It is particularly interested in bringing together women in the physical, biological, social, medical, nursing, dental, and veterinary sciences, engineers, and teachers of science. Meetings provide a place for discussions of issues of interest, as well as speakers on relevant topics, and simply a place to meet women scientists. The next two meetings in Toronto have been scheduled:

Nov. 10 Dr. Jennifer Sturgess
Director
Warner-Lambert Parke-Davis Research Institute
"Opportunity for Scientists in Industry and Personnel"

Dec. 8 Discussion of Proposed Constitution
Election of Officers

For more information write to: Box 6054 or to me.
Terminal A
Toronto

Nancy R. Evans

## *SEEES*

*Scientists and Engineers for Energy and Environmental Security, a non-profit organization, is a national association of well-qualified individuals, especially academics, which is dedicated through educational means to securing Canada's energy supplies and miminizing associated threats to the environment. It will seek to provide balanced perspectives and to encourage public participation in decision-making, aiming to ensure that the best-available information is available. It publishes a journal entitled "Energy Forum".*

*Helen Hogg was one of the founding members. She attended the all-day inaugural meeting of SEEES on October 22 here at the U. of T.'s Institute of Environmental Studies.*

## One way of putting it

(verbatim, from a quiz)

Newton's Law explain the "how come's" of Keppler's Laws

## Length of time to a Degree

Pamela Sullivan has gone through the files of students who were awarded degrees in the 10-year interval from September 1971 to the present, and compiled statistics of the duration of study for the M.Sc. and Ph.D. degree.

Among 49 M.Sc. degrees awarded in that interval, 36 were completed in one year (or at most 1 year and 4 months), and 13 were completed in 2 years.

Among 24 Ph.D. degrees awarded in the same interval, 3 were completed in 3 years, 12 in 4 years, 5 in 5 years, and 4 in 6 or more years (maximum 8).

Of course not all Ph.D. students also took their M.Sc. with us, and among those who did, the data do not make allowance for the phenomenon of dual registration, by which a student can overlap the two degrees by no more than 6 months. For 20 students, simply adding together the time spent for their two degrees gives the following distribution: 11 took 5 years, 3 took 6 years, and 6 took 7 years or longer.

The lengths of time to a degree in astronomy have always compared well with those in other departments, as published by SGS.

## *CHAOS EPILOGUE*

*The Observatory building has now been more or less restored to normal, the dust and debris largely cleaned up, and the rooms returned to their proper functions. Bright red EXIT signs burn through the night, encouraging one to go home. By day one still hears the occasional hammer blow, strangers with tool boxes still wander about, and last week a leak was discovered in the sprinkler system in the library stacks. Tom has a list as long as his arm of items that still have to be attended to before it can be claimed that the architectural integrity of the building has been properly preserved. He presented it to the men from the Superintendent's Office and the Contractor when they were here for an inspection. Very likely we'll have more to report on that part of the affair in months to come.*

*Caution: If you enter the dark cloakroom in the basement (perhaps weary and done-in from a long night's observing) don't accidently flip the left hand switch instead of the right hand one beside the door (they're 5 inches apart). If you do, bells will sound and lights will flash on at the WELLS FARGO ALARM SERVICES OF CANADA LIMITED at far-off Avenue Rd. and Davenport and the Richmond Hill Fire Department, inexorably galvanized into action, will very soon be at the door.*

*As part of the inspection last week, mainly for the benefit of the representative of the insurance firm, the group stepped into the PDS room. The insurance man said "Why, I didn't know there was a computer in the building. This room should have had a Halon gas system installed, not a sprinkler!" Tom was shocked and speechless as he recollected the five month battle he had fought to have a gas system put in there (as was done in the plate storage room) all to no avail; he met with adamant refusal on the part of the "authorities".*

*Finally the inspection was over, the men were standing in the foyer waiting for their chauffeur. "You know", said the senior of the two university architects, "a building like this really doesn't need to have a sprinkler system installed. I recommended last spring that it not be done".*

*Then they departed.*

*MR*

## Physical Science Saturday

*Christine Coutts Clement reports*

Physical Science Saturday was held on October 24th. This is the annual occasion when high school students are invited to visit the seven physical sciences departments of the Faculty of Arts and Science. It was my task to organize the Astronomy Open House portion. About 475 people attended the event, and of these, 250 came to see our telescope atop the Physics tower. It was a clear day, so the visitors had a chance to view the crescent moon with the 16-inch telescope and the sun with the 8-inch. The questars were set up on the 15th floor balcony to show sights in the Toronto skyline and in Niagara Falls as well!

I was ably assisted by Al Busch, Wendy Freedman, Kwang Tae Kim, Doug Welch and undergraduate students Chris Kelly, Sanju Mehta, Paul Ford, Alex Fullerton, Michael Gaspar and Franklin Smith.

$C^3$

## LAS CAMPANAS NEWS

Tony Estevens is back from a two-week stay on the mountain, giving the telescope its annual maintenance. The mirror was routinely washed, and a set of tests were carried out to identify some of the residual errors in the drive train and encoder, as a prelude to eliminating them altogether. George Preston, the new director of Las Campanas, and Mrs. Preston were on the mountain at the same time, Tony reports.

Ever wonder about the name, Las Campanas (the Bells)? Tony told us its origin. On the highest peak, Las Campanas itself, and at several other places along the range of peaks, rocks can be found which, when struck, return a ringing tone of remarkable purity. He has promised to have one sent back here at the first opportunity.

## FALL MEETING OF THE ASSOCIATE COMMITTEE ON ASTRONOMY

*Bob McLaren reports*

U. of T. hosted the 22nd meeting of the NRC Associate Committee on Astronomy on October 26. Seventeen of the eighteen members were present: Bill Wehlau (ACA Chairman, U.W.O.), Jim Bain (Applied Physics Specialties, Toronto), Sidney van den Bergh (DAO), Bob Garrison, Ian Halliday (H.I.A.), Dick Henriksen (Queen's), Jack Locke (H.I.A.), Bob McLaren, Georges Michaud (U. de Montréal), John Percy, Chris Purton (DRAO), Dave Routledge (Alberta), Jean-René Roy (Laval), Colin Scarfe (Victoria), Gordon Walker (U.B.C.), Gary Welch (St. Mary's) and Lorne Avery (Secretary - H.I.A.). Alan Batten was absent. The principal item of business was the reception and discussion of the priorities reports prepared over the past year by the various subcommittees. It will be recalled that draft versions of these reports appeared in the summer issue of *Cassiopeia*. An editorial committee comprising Halliday (Chairman), Michaud, and Routledge has now been charged with the formidable task of combining these eight documents into a single coherent priorities statement for astronomy in Canada. They were asked to report at the next ACA meeting on June 5, which will also be held in Toronto, just after the June Institute - CASCA meeting.

The ACA members also sit as the Canadian National Committee for the IAU. It has been decided that the surplus funds from the Montreal General Assembly will be used to support travel to Patras next August. CASCA will also be offering support for this purpose through the recently-established Beals Fund. Announcements concerning this support will appear in *Cassiopeia*.

MLr

## *CFHT USERS' SUPPORT*

*As most of you are aware, NSERC provides travel and subsistence support for Canadian astronomers observing at the CFHT. NRC (Herzberg Institute) administers this programme on behalf of NSERC. At the Associate Committee meeting on October 26, Jack Locke, Director of HIA, requested feedback on how well this programme is working. Such information is useful not only for indicating where improvements may be required but also for justifying to NSERC etc. the continuation of this important programme. Your comments concerning CFHT support in this area should be directed to Jack's attention at the Herzberg Institute in Ottawa. He is eager to receive them.*

*MLr*

## PAPERS SUBMITTED

| | |
|---|---|
| M. Simard-Normandin<br>P.P. Kronberg<br>S. Button | Integrated Linear Polarization of Extragalactic Radio Sources at 10.5 GHz (2.86 cm) -- II. |
| P.P. Kronberg<br>J.J. Perry | Absorption Lines, Faraday Rotation and Magnetic Field Estimates for QSO Absorption Line Clouds |

## *COLLOQUIA**

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| *November 4* | *Dr. Fred Walter, JILA*<br>*"Cool Stars with Hot Coronae: Late-Type Stellar Coronae From T Tauri's to RS CVn's and Beyond"* |
| *November 11* | *Harvey Liszt, NRAO*<br>*"Molecular Clouds"* |
| *November 18* | *J.-L. Tassoul, Université de Montreal*<br>*"Meridional Circulation in Stars"* |
| *November 19*+ | *R. Davis, Jr., Brookhaven National Laboratories*<br>*"Solar Neutrinos"* |
| *November 25* | *W. Freedman and L. Noreau*<br>*G2000 - Current Literature Seminar* |

**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.*

+*Joint Physics - Astronomy Colloquium, held on THURSDAY at 4:00 P.M. in Room MP 103.*

## A BRIEF GUIDE TO ASTRONOMICAL LITERATURE

This useful guide, compiled by Lynda Colbeck, has just been distributed internally. It is intended to introduce the first year graduate student to the variety of materials in the literature of astronomy and astrophysics available in our libraries.

# ONEYE TWO

"Oneye", an assembly language program written by Bruce Campbell to control the D.D.O. 24" chopping photometer, has now been replaced by a program written in the FORTH language and having similar capabilities. During the spring and summer I've been working on this project under the supervision of Peter Martin and with the enthusiastic assistance of Bill Weller, Shenton Chew, Frank Hawker and others at D.D.O. Don Fernie has overall direction of the project.

The new "CHOPPER" (as it is called) program effects full control of the filter wheel, initiates and accepts data from the SSR counter through a new serial connection to the NOVA, and performs on-line reductions with output to the terminal display and teletype hardcopy. The program itself requires the star coordinates as user input to initiate the cycle. The overall system requires little more set-up time at the beginning of the night than would be spent for manual observations. Below is a sample of the output from "CHOPPER".

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*****************************************
R.A. :  18:37:6        DEC :  38:39:60         TIME :  20:18:50
U CNTS :   1.98000E+04  B CNTS :   1.10000E+05  V CNTS :   3.60000E+05
H.A. :  1:41:45         AIR MASS :   1.06222
V   :   7.54573         U-V :    .17877
B-V :    .16453         U-B :    .01424
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Future improvements to the program will include diskette data storage and on-line plotting of magnitudes and colour indices versus time. Diskette data storage and spectrum plotting are currently being used in other NOVA projects. The present version of "CHOPPER" is set up for UBV photometry only but will be expanded to handle all five UBVRI filters in any sequence, shortly. Program documentation is available on request from myself.

FORTH is becoming increasingly popular as a language used for instrument control. It is well suited to our present and projected needs on the NOVA computer at D.D.O. which currently controls data acquisition from both the reticon and chopping photometer on the 24" telescope. FORTH allows the programmer access to such basic functions as sending and receiving pulses as does ASSEMBLER or Machine Language and yet maintains the understandability of FORTRAN or BASIC. Given a kernel of basic functions the programmer builds a dictionary of words, or subroutines. He/she then defines new words as combinations of previously defined words. Execution of a word, or program, effects a cascade through the hierarchy of word definitions associated with it. Most of the work adapting FORTH to the NOVA system has already been done by Alan Irwin and Peter Martin. Thus, floating point, double precision, interrupt servicing, job swapping, trig functions, Nather interface functions etc. are already available to the programmer. On the hardware side one has access to two diskette drives, a teletype for hardcopy, a plotter, the Nather-Board interface and a terminal with a remote keyboard and monitor in the 24" dome.

Bts (Matthew Bates)

## WORD PROCESSING AT DDO

DDO has finally taken the plunge into word processing. Esther McCleary has produced several manuscripts and long reports with satisfactory results. Of course, we have a way to go before achieving perfection, but we are working very hard to understand the intricacies of both the DIABLO and the software. The DIABLO is a printer with both INPUT and OUTPUT capabilities. However, while the UTCS system is excellent for most applications, it cannot easily handle large numbers of Greek letters in manuscripts, due to the need for exchanging the printwheel rather frequently. To do this means removing the cover of the Diablo, taking off the ribbon, pulling back on the printwheel and finally very gently exchanging the printwheel. There is one other major problem with the system and that is being able to access our material when WE need it and not when the system is willing to let us login. This condition caused some panic last week when Tom Bolton required a final document on Friday for an early Monday morning meeting. We had entered all data on the VT 100 earlier that week and were ready to run the final copy. Rosemary Diamond was seated at the Diablo prepared to "sign on" - however, this proved to be more difficult than usual. Finally, after hurried messages to the Computer Centre, she was able to find life at the other end, but only to discover that she was all logged in to play "STARWARS". Perhaps the DIABLO was living up to its name! Another mad scramble ensued and the Computer Centre finally came up with a channel that would produce suitable data for the meeting. In spite of the minor hassles, we are enjoying the new word processing system.

The Diablo has been used by several graduate students to run off copies of their theses; however, for those not able to come to DDO, there will be another printer at the DA very shortly. A Datamex Model 1100A teleprocessing terminal is on order and should arrive soon, I hope! Each graduate student using the system has found minor problems in page set-up, etc. It would be an excellent idea if each person having difficulties would note these down along with their final solution. Perhaps some central record could be maintained for future users. NOTE: the VAX RUNOFF is slightly different from the SOS RUNOFF.

One problem for the future is that DDO has already saturated all available phone lines and no new ones can be added without a major trenching job. This will limit word processing unless we reconsider stand-alone systems.

Joan Tryggve

*THESIS ABSTRACT*

"21 cm Studies of Interacting and Isolated Galaxies"

Lindsey Davis

We have observed a magnitude-limited sample of interacting and isolated field galaxies in the 21 cm line of neutral hydrogen with the NRAO 43 and 91 m telescopes and the Arecibo 305 m. The 21 cm data was combined with a homogeneous set of optical data on angular diameters, axial ratios, magnitudes and colours for galaxies in both samples. A subset of the interacting samples was partially mapped with the Arecibo telescope. These observations represent the first systematic attempt to study the effects of close pairing on the integral properties of galaxies.

Although the majority of interacting spirals obey, to first order, the scaling relations and the type dependences determined for the isolated sample, systematic differences exist between the two samples. Interacting galaxies have a higher fraction of galaxies with unusual log σH, log MH/LB and log MH/MT than the isolated sample. There are more high blue surface brightness galaxies in the interacting sample than the isolated sample. Interacting type 3 to 10 spirals are overluminous for their log MT values with respect to the isolated sample. The quantity log MH/LB decreases with increasing luminosity for the interacting galaxies, but is independent of luminosity for the isolated sample. For galaxies with comparable profile widths, the interacting type 3 to 10 spirals are overluminous with respect to the isolated galaxies. The interacting galaxies are both bluer and more scattered in the (U-B)-(B-V) plane than the isolated galaxies in agreement with previous authors. The interacting sample has a higher fraction of Markarian and Seyfert galaxies than the isolated sample. Gas consumption time scales calculated from our HI data and the models of Larson and Tinsley (1978) show that the interacting galaxies have larger than average timescales. For the isolated galaxies good correlations exist between the (U-B) and (B-V) colours and log$\Delta$vo, log MH/MT and log MT/LB. These correlations are either more scattered or nonexistent for the isolated sample. The results are consistent with available models of galaxies undergoing star formation bursts and with the idea that many interacting systems may possess extended HI haloes.

In agreement with previous results on samples of binary galaxies, we find that the interacting sample of galaxies has a larger population of ellipticals and SOs and a luminosity function with a higher characteristic luminosity than the isolated sample.

The Arecibo mapping results, combined with existing data in the literature, show that extended HI distributions are a common feature of interacting systems occurring in > 25% of observed systems.

Although galaxies in interacting pairs pair preferentially with galaxies of similar morphological type, no convincing evidence exists to show that galaxies in pairs have similar log σH, log MH/LB or log MT/LB.

The majority of mixed, E-S and SO-S, interacting pairs are real physical associations. However the spirals in mixed pairs are HI deficient with respect to similar spirals which are interacting with spirals. The HI deficient spirals seem to occur preferentially in systems with large delta Vo. A tentative correlation is suggested between HI deficiency, large delta Vo and early-type companions.

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