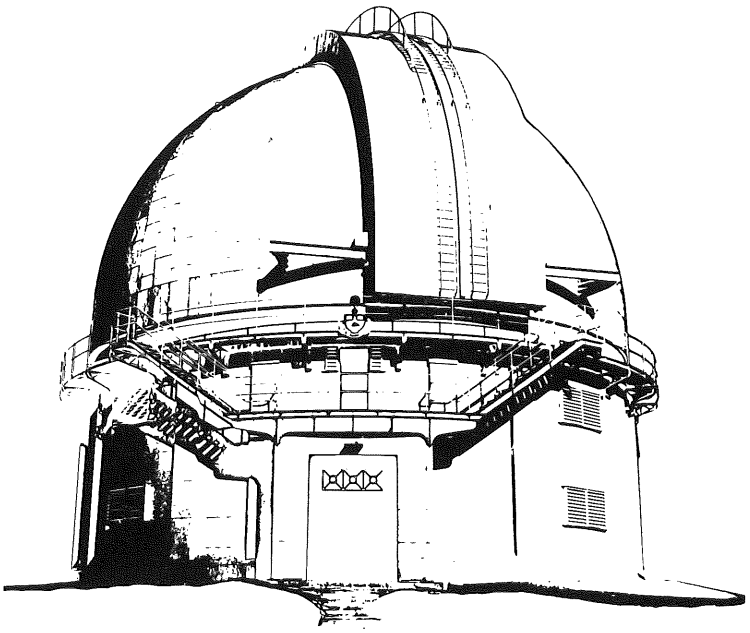

THE DAVID DUNLAP DOINGS

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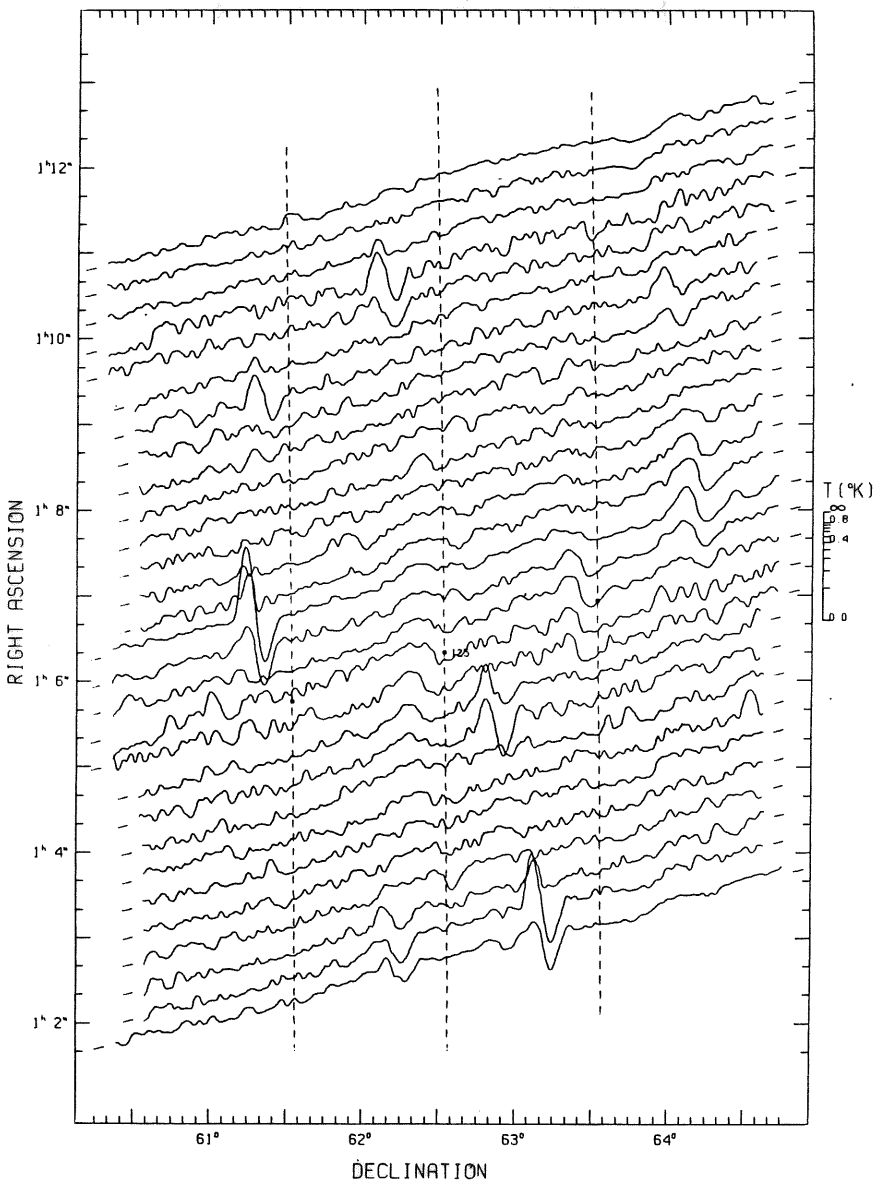

Cover Story p.3

CONGRATULATIONS

To Peter and Camilla Martin on the birth of their son, Adrian Geary, born July 4.

To Matthew and Frances Bates on the birth of their son.

To Bernard and Jacinthe Bois on the birth of their daughter, Stephanie, 7 lbs, born July 19.*

**nothing to do with my supervisor's name, Stefan Mochnacki!*

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Editorial

The cost of photographic covers now precludes using them except on rare occasions. Making a virtue of necessity, however, we are now putting out a call for other visual material for future covers of the DDD. We plan to feature graphs illustrating current department research, together with a brief summary of the project. We promise scandalously lenient refereeing. Graduate students can produce virtuoso technical feats with current graphic capabilities. (Even oriental characters are available; see Ron Lyons.)

Nancy Evans
Barry Madore

COVER STORY

The cover shows a differential map of the 6 cm continuum radio emission from a small portion of the galactic plane. The map is comprised of a number of consecutive scan traces from a survey of the galactic plane for variable radio sources (affectionately known as the Radio Patrol of the Northern Milky Way) carried out by Russ Taylor and Phil Gregory at UBC. The central dashed line is the galactic equator and the outer dashed lines represent latitudes of ±1°. Discrete sources of emission produce an "S" shaped, beam-switched profile with both a positive and negative peak. The signal amplitude is plotted on a logarithmic scale to show both strong sources and weak emission at the 10-20 mJy level. Discrete sources are examined for variability on both a time scale of a few days (short-term) and one or two years (long-term). Approximately 5% of the sources vary significantly on either time scale.

So far, little can be said concerning the identification of individual sources with optical objects. Only one has been identified to date (see following story). It is expected, however, that the majority of the discrete radio sources are extra-galactic.

Russ Taylor

Comments from Russ Taylor

We may also feature from time to time a report of a brief conversation with a member of the department à la "The Informal Tom Bolton", Globe and Mail. In this issue, we talked with Russ Taylor, whom most people will know by now as a post-doc in radio astronomy working with Sq. He said he decided to take up his post-doc in Toronto largely to work with Ernie, but also because he wanted to remain in Canada because the CLBA is an exciting possibility.

Russ is not new to Ontario: he graduated from Western in physics and astronomy. After a brief spell in particle physics at UBC, he concentrated again on astronomy. The cover is from his work with Phil Gregory on their 6 cm survey of the Milky Way (described on p. 3). He summarized his current work as follows. First only about 40% of the 6 cm survey has been completely reduced. It will be completed in about a year from now. The delay is partly due to the fact that the data and the software are still with Phil at UBC. One reason for this is that it was more efficient not to transfer the software for a short-term position.

He is also working with Ernie on symbiotic stars. We hope there is future cover material here.

Russ is also making further observations of the variable sources he discovered in the 6 cm survey. First he is obtaining 2 point continuum spectra at 20 and 6 cm with the VLA, as well as better positions and further observations of the flux variation. (Following that VLBI observation of "interesting" sources, is in the works.) So far only one has an identification (LSI +61°303). It is a binary star with a 26.5 day period, known to be an X-ray source and possibly a γ ray source. Spectra by Crampton and Hutchings show profiles complicated by emission as well as absorption, and sizable radial velocity variations. The distance estimated from an early B main sequence spectral type is approximately 2.3 kpc. The companion is presumed to be a neutron star. At the moment, Russ will only speculate on a couple of possible mechanisms involved: accretion disks and/or jets. Forthcoming VLBI observations by a group at Naval Research Lab will provide more information but Russ's cautious prediction was only that it is probably not spherically summetric.

In august he has a run on the VLA to look at the other variable sources he found. In September he and Ernie have another VLA run to look at symbiotic stars. In between he just may decide it would be more fun to go to Mexico than to come back to Toronto.

Editors

PROPOSED IAU COLLOQUIUM:

Cepheids: Observation and Theory

University of Toronto, Toronto, Canada

May 29 - June 1, 1984

Sponsored by Commission 27

Contact Address: Prof. J.D. Fernie
David Dunlap Observatory
Box 360
Richmond Hill, Ontario
Canada L4C 4Y6

GASA GOSSIP: ASTRONOMY IS NO PICNIC

The Astronomy picnic is the major social event of the season for those of us not spending the summer boating in Cambridge, drinking in Germany, tanning in Hawaii, eating in Italy or trying to get out of Bulgaria. As always the picnic was held on the park-like grounds of the David Dunlap Observatory nestled among the shopping centres of Richmond Hill. When I arrived things were already in full swing. About half the people were playing volleyball to the accompaniment of a sound system consisting of Michael Rensing's car with the doors open. The rest of the crowd was hungrily watching Bill Clarke attempt to start the barbecue. For once I had nothing to do with the arrangements so I opened a beer and sat under a tree. Everyone seemed to be dressed for the occasion with Bob Gauthier and Senor Rick sporting the most colourful costumes.

Eventually the barbecue got going and we stuffed ourselves with hamburgers, hotdogs and other delicious junk foods. Ann Rusk baked 13 dozen cookies and managed to sneak a few of them past Raymond. Finally when everyone was too bloated to move, the Senor announced that it was time for the games to begin. First was the ever popular egg toss. Lynda showed the most innovative technique when she tried to catch an egg between her knees. Next came the tug of war followed by the climax of the afternoon: baseball.

The traditional picnic baseball game was the largest in living memory. There were approximately 18 players per team with everyone on the field at the same time. This had the effect that it was almost impossible to get a hit and no runs at all were scored until the number of outs per inning was increased to 6. Kwang Tae was playing so far out in left field that he stopped at Harvey's for a milkshake on the way back. Eventually the team led by Al "Casey" Busch triumphed 7-6 over the squad led by Geoff "Billy Martin" Clayton.

After baseball was over and the last beer was drunk, it was time to go home. It may not have been Bulgaria but at least we can say we got out of Toronto once this summer.

Ctn

Employment

What becomes of students who take B.Sc., M.Sc. and Ph.D. degrees in Astronomy? This is a question often asked by students considering enrolment in our undergraduate programme. About a year ago, Bob McLaren attempted to answer the question by surveying students who had taken courses in our department. He studied three groups - the people who took our fourth year astrophysics course, the people who received M.Sc. degrees and those who received Ph.D. degrees during the last ten years or so. In this summary, I have updated his findings to include the people who graduated within the last year as well.

Of the 50 students who completed our undergraduate programme, 40% enrolled in Astronomy graduate studies while a further 10% chose graduate studies in related fields such as physics or aerospace studies. Others chose a variety of careers such as computing, teaching, law, accounting or work as research assistants in astronomy or

physics. The whereabouts of 12 of these 50 students is unknown.

About 50 students received the M.Sc. degree during the period surveyed. Of these, 80% continued on for the Ph.D. degree while others entered a variety of fields - computing, teaching, law, university administration or work at observatories or science museums.

There were 41 Ph.D. graduates in our survey. Of these, fourteen have university teaching and research positions in astronomy, a further nine have positions at observatories or research institutions and eight have postdoctoral fellowships. Thus, 75% of our graduates have positions in Astronomy. Of the remaining ten, eight are working at computing, remote sensing or industrial research. In summary then, it appears that 95% of our Ph.D. graduates have positions in Astronomy or related fields.

Christine Clement (C^3)

Chant Reticon Update

Slow but steady progress continues to be made. We have solved many of the noise problems that we were experiencing during the Winter season. Most of the coherent noise has been identified and eliminated. We have also located the source of a very subtle problem that has plaqued us through 2 different versions of the Reticon, (the Campbell reticon and the Chant) and 3 different A/D converter systems. It appears that interference effects between the A/D converter clock, and the Reticon system clock had been causing the A/D system to hang up at exactly half range of the A/D converter. By synchronizing the 2 clocks we have eliminated the problem completely. We are now working on the random system noise and have made progress in this as well. Better filtering of power supplies has lead to an approximately 2 fold decrease in the total system noise. The readout noise of the system is down to 7 or 8 ADU's rms, and this is approaching the design goal.

Lian Zerafa has joined us for the summer, and is working on the VAX-Nova communication link. This link has been working in a rudimentary form for some months, but Lian is installing and programming an asynchronous line multiplexer, which gives us 4 more serial ports. This will allow us to acquire data and transmit files to the VAX simultaneously.

We are now preparing for further testing at the telescope, and we will report on further progress as it occurs.

Wlr

CHILE

It was an exciting experience to return to the Las Campanas Observatory after an absence of 9 years. So much has changed, so much remains the same. I was amazed to find how relaxed the customs formalities had become. It was also amazing to find that transportation was so reasonable (if one avoided Taxis!). Subway rides for ≃20¢, bus to La Serena about $10.00! We should send a Royal Commission down to find out how they do it.

On the mountain there are many improvements. The new Carso lodge is very comfortable. The only thing that was missing was the informal atmosphere of the old "Campamento" days. The paved roads are quite nice, and they cut down on the dust problem considerably. Having a car with which to get around, also was nice. The only disturbing aspect of it was the road. The road winds along a ridge, overlooking a 1 km deep valley. There are no guard rails except on one tight curve, and at night you must drive with parking lights only. I guess that this might, one day, help solve the tight job situation.

The 60 cm telescope is behaving rather well these days. I spent part of my run refurbishing the crystal controlled drive system, and installing a new sine corrector. At last report from the resident, it was working well. During my observing I found that one now occasionally forgets to guide. A star can be placed on a 2" by 8" aperture and left for up to 15 minutes (occasionally a half hour) before recentering is necessary. Improvements were also made to the declination preload motor mounts, so that the motors do not have to be modified before installation.

The weather this time was pretty bad. We spent several nights and days in the cloud. It is quite an experience to look down through breaks in the clouds at the world below. One felt rather Olympian.

The observatory has matured to the point where there is now an abundance of attendant wildlife. The eaves and mission tile roofs of the house are nesting grounds for 3 or four varieties of finches. Their dawn and evening chorus are beautiful to hear. There are also the obligatory condors, that appear occasionally. The cooks and night assistants feed them from time to time. There are also several small foxes that lurk around the buildings in search of food and water. They have become quite tame, and will allow visitors to approach to within a few feet.

The science portion of my stay was marred by equipment problems. I had to do some extensive repairs to the SIT-vidicon system I was using, and had to send to Santiago for spare parts. It turns out that there is a good supplier of electronics parts in Santiago and parts were obtained in 2 days! That's better than one can get here in Toronto! In spite of these difficulties I returned with spectrophotometry of 17 WR stars, 9 spectrophotometric standards, 6 Be stars and 7 single-lined spectroscopic binaries. These data are now being reduced by Dr. Stan Jeffers, and Mr. Tom Stiff, at York University. I had the opportunity to spend a couple of hours at the 100" where Dr. Leonard Searle was using the photon counting Reticon (Schectograph). This was a very valuable experience in view of our upcoming construction of a similar system for the 74" at DDO. All in all my trip was both enjoyable and useful.

Wlr

MK WORKSHOP

R.F. Garrison

A workshop on the MK Process and the MK System was held here in early June. About 50 outsiders and 30 members of the department attended. The former included participants from France, Italy, Germany, Great Britian, and Japan, as well as many from south of the border. The weather was very cooperative after the first day when it rained. The heat that we have experienced since the middle of June mercifully held off for the duration of the meeting.

There were many highlights to the meeting. For me the clarification of the important distinction between the MK System, which is very specific in its restriction to a dispersion and wavelength region, and the MK Process, which can be applied to the classification of almost anything, was one of the most important results of the meeting. That distinction paved the way for discussion of new directions, which may use the new generation of detectors, automatic techniques, and new wavelenth regions, all of which were discussed with a great deal of insight and thought by people who are intimately involved in the process of integrating what has gone before with what will be in the future.

Patrick Wayman flew all the way from Ireland in order to present Dr. Morgan with the Herschel Medal of the Royal Astronomical Society, which had been given in absentia in London in April. The citation and the remarks by Dr. Wayman were made at the banquet at the faculty club and helped to create a very warm and friendly atmosphere. Of course the wine helped as well, but neither would have been successful without the other. People stayed for two hours after the banquet chatting and having a great time.

All in all, it seemed a success. Toronto's reputation was certainly enhanced, as evidenced by remarks at the meeting and in correspondence since. Dr. Keenan remarked that it is obvious that Toronto has the best facilities and opportunities for students wishing to study Spectroscopy in the future. I agree and that is why I like it here.

CITA Update

The following news was obtained in mid-June from President MacNabb of NSERC:

"As you know, your request for support of the Canadian Institute for Theoretical Astrophysics (CITA) was discussed by NSERC Council on June 9, 1983. Although the discussion resulted in a motion for approval of CITA, this motion was formally "tabled" before it came to a vote. Hence, a decision on NSERC support of CITA cannot be taken before the next Council meeting (in October 1983).

Despite this apparent setback in timing, I would like to record a strong endorsement for your initiative, particularly for the support you have received from across Canada for the concept of establishing a single national facility. I am firmly convinced that it is essential to move towards establishing a few research groups in Canada of sufficient size and stature to compete with the best groups in other countries. I know that many members of Council do regard CITA as a pioneering venture of this type."

He concludes by expressing the hope "that the momentum behind this initiative and the strong interest demonstrated by the University of Toronto can be maintained until Council can review, once again, your proposal for CITA."

Plans within the University of Toronto to host CITA are indeed proceeding in the expectation of funding being available immediately in October. The CAS and ACA are also helping to maintain the momentum, and the acting CITA Council is seeking new ways to keep CITA in the limelight.

Mn

Library News

Library Move

The shelves have been purchased and the carpet has been selected for the Astronomy Library tentatively scheduled to be moved in mid-August from DDO to Room 1306, McLennan Physical Labs. It is anticipated that the Library will be unavailable for two days (Thursday and Friday August 11th and 12th tentatively).

Up at DDO, Rosemary and I are cluttering the halls and aisles with boxes of materials to be sent to Robarts Library. Do not Panic! These are not astronomical journals we are giving away but rather general science journals which have been in storage for decades.

The moving of the Library is a formidable task. Our latest report states that we have some 29,000 physical volumes in the Library and everyone knows how heavy journals and books are. As an example, just think of one year of Astrophysical Journal.

From the outset, we realized the task would require a professional library mover. These people remove the books from the shelves, pack and unpack them in the exact same order onto the designated shelves in the new library. I called a company that I knew had a good reputation in moving libraries, and received a quote from them. However, Physical Plant was quite distressed that I did not approach them first, so they sent up their "recommended" mover.

Wally gazed at the books on the main floor of the Library in a "piece of cake" manner, cheerfully scribbling on his pad of paper as he counted and measured shelves.
"No problem" Wally concluded confidently.
"There's more downstairs" I interjected.
"Okey-dokey" replied Wally as he merrily jaunted down the steps.

Poor Wally nearly dropped his pencil when I led him into the Stacks Room and pointed to the rows and rows of oversize observatory publications and journals.
"You want us to pack all this?!?" he asked incredulously.
"Yes" I replied.
"And unpack it too?" he continued.

Wally's "piece of cake" manner immediately turned into a "moving the Pyramids" frown.
But Wally, they moved London Bridge, didn't they?

Needless to say, Wally's company is not going to move the Library. Here's hoping Murphy is on summer vacation and all goes well.

LaC

We report some sad news conveyed by Helen Hogg:

> Awaiting my return from Hawaii was a letter of June 15 from John Baglow of Carp, Ontario, informing me of the sudden death of his father, Robert, by massive heart attack. Bob was a grad student when Frank was Director, but few people here now would know him.
>
> HSH

P O T P O U R R I

The CAS-CAP Congress in Victoria was well attended by the U of T astronomy department. The following papers were presented.

- *"Photometric Variability of B and A Supergiants" by J.R. Percy and D.L. Welch.*
- *"JHK Observations of Classical Cepheids and an Improved Calibration of the Infrared Period-Luminosity Relations" by D.L. Welch, F. Wieland, C.W. McAlary, R. McGonegal, B.F. Madore, R.A. McLaren and G. Neugebauer.*
- *"Radio Patrol of the Northern Milky Way", A.R. Taylor and P.C. Gregory.*
- *"The Impact of a Continental Array on Current Problems in Radioastrophysics" E.R. Seaquist.*

In addition Maurice and Christine Clement, Don Fernie, Bob Garrison, Martin Duncan, and Ray Carlberg also attended the joint meeting.

At the American Astronomical Society meeting in Minnesota the following posters were presented:

- *"The Distribution and Origin of Cosmic Rays in the Sprial Galaxy NGC 3310", N. Duric, E.R. Seaquist, P.C. Crane, R.C. Bignell, and L.E. Davis.*
- *"X Cygni: Duplicity, Period Stability, and Atmospheric Velocity Structure", N.R. Evans*

G. Ferland (U of Kentucky) visited Peter Martin 10-14 July. They are writing a chapter on "Optical Spectroscopy of Novae" in a book entitled "Classical Novae" (ed. A. Evans and M. Bode to be published by J. Wiley).

Chris Rogers (Center for Astrophysics) also visited Mn for a week in early June, to finish writing some joint work on radiative transfer. (Chris is rushing to complete this before a canoe trip down the Nahani in August!)

To the list of summer students in the department, you could add Carol Percy, who is working half-time in July and August helping John Percy to prepare "A Teachers' Guide to Astronomy".

Helen Hogg attended the meetings of the Astronomical Society of the Pacific in Kona, Hawaii June 13-17 and received the Klumpke-Roberts award, consisting of a plaque and a cheque. At the accompanying meetings of the Western Amateur Astronomers she spoke on "Fifty-five Years with Variable Stars in Globular Clusters". She was shown around the new headquarters of the Canada-France-Hawaii Telescope Corporation at Waimea by the director, Dr. Rene Racine. Later she attended the joint CASCAP meeting at the University of Vistoria.

Doug Gies and John Percy are contributing a lecture, lab session and DDO tour for 40 gifted high school students from the Borough of North York.

John Percy was among those at the CAS-CAP congress in Victoria; he also attended the NRC Associate Committee meeting.

The Ontario Science Center officially opened its new hall of astronomy exhibits on June 21. Claude Faubert and John Reed, formerly of our department, had much to do with creating these exhibits.

Dick Henry (M.A. 1962) writes: "My wife, Dr. Rita Mahon, and I returned yesterday from Oak Ridge, where Rita worked on her Lyman Alpha laser Tokamak Diagnostic experiment, and I carried out the more important work of babysitting for George William Henry, who was born on March 30, 1983."