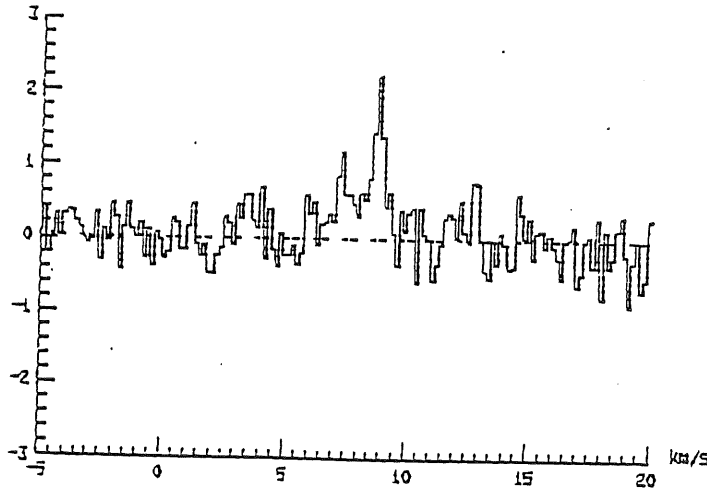
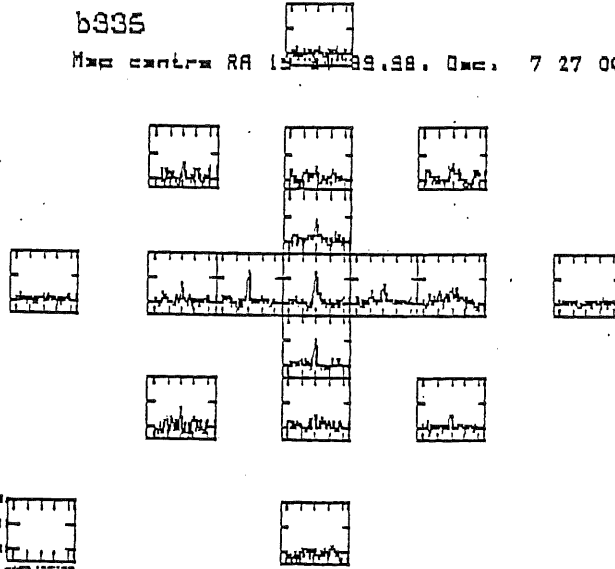


THE DAVID DUNLAP DOINGS

Vol. 20, No. 4 June 1, 1988

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Some Recent JCMT data, see page 6

The members of the observatory and department offer their sincere condolences to Helen Hogg whose husband F .E . L. Priestly passed away on May 11 .

HAIL THE NEW CHIEF

To those readers outside the Department who have not yet heard the news, let me say with the greatest of pleasure that Ernie Seaquist will become the Department's new Chairman and the Observatory's new Director on July 1.

Ernie, who has been Associate Chairman for more years than no doubt he cares to remember, has little to learn about running the Department, while his determination to do well at DDO is clearly shown by his recent presence on the volleyball court there. The quick learning of the underhanded, sly, and generally unconscionable techniques of DDO volleyball will be invaluable in keeping everything going smoothly.

The Seaquist family will be moving into Elms Lea (alias Observatory House) in early July. Meanwhile, my congratulations and best wishes to Ernie, not to mention – after ten years of 'interesting times', as the Chinese say – my profound thanks for his stepping up to bat.

Don Fernie

The deadline for submissions to the next issue of *The David Dunlap Doings* is 15 July, 1988. Send your e-mail to rogers, from outside U of T use: rogers@helios.physics.toronto.edu, rogers@utorphys.bitnet, 18443::atlas::rogers (decnet), or psi%302091600097::rogers.

Impressions of Ernie
by Don MacRae and Shenton Chew

Ernest Raymond Seaquist applied for admission to the School of Graduate Studies in June, 1961. He wrote that he had an Engineering Physics degree from far- away UBC and had been awarded a prestigious National Research Council Bursary. He was accepted. Seaquist was one of the new wave of students which flooded the Department of Astronomy in the early 1960's.

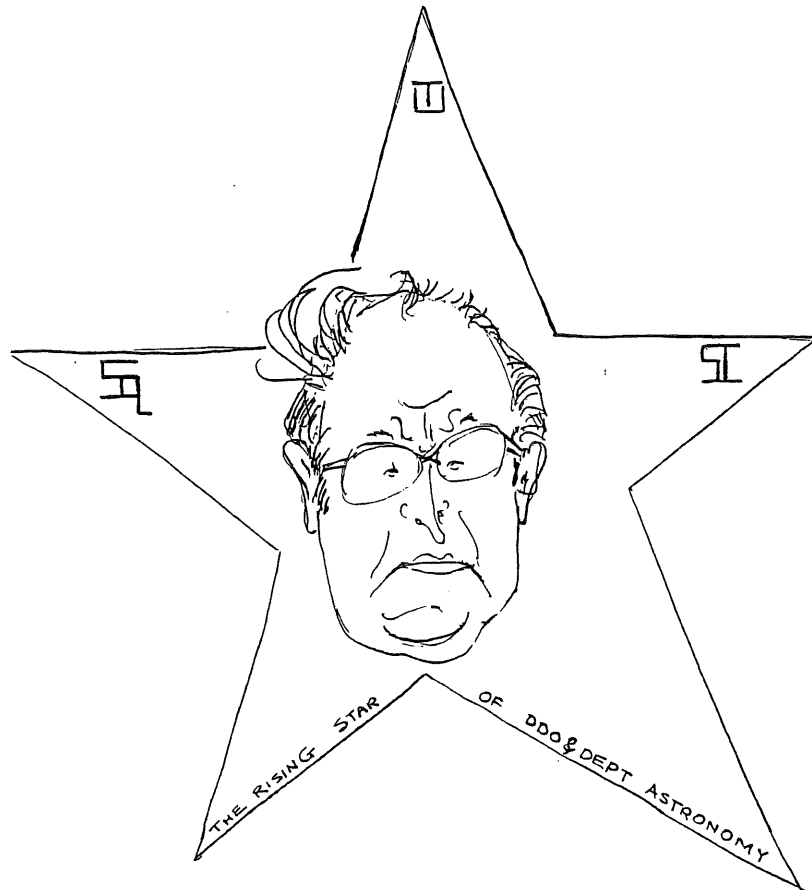
Wait a minute — New Wave? Ernie? ...

Sure, Ernie was a young graduate student here once. But it was long before GASA. Until the late 50's the average number of graduate students in astronomy had been 0.5 per year.

The Department Offices then were two high-ceilinged rooms on the first floor of the Physics Building - that's the old one, now the rebuilt Sandford Fleming building. The office walls were of plain brick, blackened by half a century of age. In winter the radiators hissed and clanked, other times flies buzzed in the windows. The one and only telephone sat on the one office desk (the very same black desk which is in Room 1417 to-day). Between lectures downtown we dreamed of a grating spectrograph for the 74-inch, a radio telescope in the field at Richmond Hill, perhaps one of the new NRC research grants.

Then came Sputnik, and Sq, and it's been up, up and away ever since. Did we think Ernie would survive, stay here, become Chairman and Director of DDO? Did we foresee the present exalted status of the Observatory and Department? In a way, perhaps. It was all part of the dream.

So now, hearty congratulations to Ernie for more than surviving, for all he has so far accomplished, and for the promise of his new appointment.



CONGRATULATIONS

To Don Fernie for completing ten successful years as chairman and director. He begins a well-earned sabbatical in July.

To Dave Blyth on his retirement from the Observatory after 21 years of fine service.

To Drs. Doug and Carol Welch on the birth of their first child, Robert Lindsay, on May 10, in Victoria.

To Bill Weller and Lynda Colbeck on the birth of Gregory William Weller, 27 February 1988.

To Richard Gray as the first recipient of the Plaskett medal from CASCA for the most outstanding doctoral thesis presented in 1986-1987 in Canada.

To Barry Madore on his promotion to full professor.

To Martin Duncan, former URF, for his appointment to the faculty at Queen's.

To Wendy Freedman and Barry Madore, who are expecting a sibling for Rachael this fall.

COMINGS AND GOINGS

Bob Garrison has given dozens of lectures since February on the topic of Supernova Shelton. Highlights include: a colloquium and a public lecture on 25 March at the 5 Colleges in Amherst, Mass., the Durham Board Science Series of public lectures on 2 March, the Académia Diplomática in Chile on 11 April, the Skywide Amateur Radio Club of Toronto on 25 April, and the Acadia University (Nova Scotia) High School Science Seminar on 5 May.

Nancy Evans attended the IUE Tenth Anniversary Conference at Goddard Space Flight Center April 12 to 15. Not bad for a Satellite with a 3 year life expectancy. The conference was well attended (about 200 people), including good participation from ESA and SERC. She gave 3 poster papers ("Cepheid Binaries with Large Mass Ratios", N. R. Evans; "The Orbit of the Classical Cepheid AW Per", N. R. Evans and D. L. Welch; and "The Nebular Velocity Structure of AG Peg", N. A. Oliverson, C. M. Anderson, and N. R. Evans).

Wendy Freedman and Barry Madore with their daughter Rachael passed through Toronto in late April. Wendy was on her way to report on her work in Pasadena to the Carnegie Institute in Washington.

Chris Rogers gave seminars at Trent University and the University of Michigan at Ann Arbor in March. He spoke on recent optical and far-infrared observations of dark clouds.

Nancy Evans gave a seminar at the Physics Department of Brock University March 4 on "Cepheid Masses and Luminosities: The Building Blocks of the Extragalactic Distance Scale".

Bob Garrison was in Chile from 23 March to 13 April, observing for two weeks at Las Campanas. Bob reports that the weather was clear and the seeing was excellent, just like the old days. El Niño seems to be losing its grip.

Karl Kamper attended the "Conference on Fiber Optics in Astronomy" in Tucson in April. There was strong emphasis on the use of fibers in high-precision spectroscopy as well as the current rage in multi-object instruments. It became clear that there were only two manufacturers, one for UV-visible and one for IR, that were interested in the astronomical fiber market. This is, however, much better than none!

Nancy Evans had an IUE observing run from Dec. 11 to 13. Two programs were involved. First, the completion of a program with Karl Kamper, Nancy Oliverson (IUE), and Walt Feibelman (NASA) to look at all astrometric binaries nearer than 20 pc with low-mass unseen companions. The quick-look results are that there are no white dwarf companions. While it is disappointing not to have a positive result, this strengthens the case for brown dwarfs. The second program with Doug Welch and John Butler (Armagh) was to get spectra of Cepheids with orbital velocity variations. Her first collaborative NASA-ESA shift produced a faint detection of the companion of a long-period Cepheid.

Nancy Evans, with Terry Teays and Doug Welch, had an IUE observing run February 9, and obtained the spectrum of yet another Cepheid companion.

Joan Tryggve visited Gary and Zane Stuggins (nee Sterns) in Manila for a four-week period in February and March of this year. Our former librarian Zane has just adopted a baby girl (born November 1987) Laura. Daughter Karen turned 4 yrs old on May 1/88. Zane sends her best wishes to all .

POTPOURRI

Erindale Campus held a very successful "Science Expo" on April 9-10, attracting about 3000 visitors. John Percy spoke to an audience of about 200 on "Supernova Shelton - An Update" and there were other lectures with an astronomical flavour (biochemicals in the early solar system, possible extraterrestrial causes of biological extinctions.....) by other faculty. The sunny weather allowed John Percy and the Erindale Astronomy Club to show sunspots to several hundred visitors, including the Mayor of Mississauga.

Phil Kronberg has been nominated to the National Research Council's Assessment and Audit Committees (He became a member of Council last year.) So as to keep appropriate balance between astronomy and other types of committee work, Phil will be Chairing the IAU Symposium (#140) on Galactic and Intergalactic Magnetic Fields , to take place next year in Heidelberg.

John Percy gave workshops to teachers in North York and in Halton as part of the implementation of Ontario's new school science curriculum. Basic astronomy appears in the grade 1-6 curriculum, and as an optional subject in grade 10 science and in grade 12 physics.

The asteroid 1983 BN has been named in honour of Ruth Northcott, a member of our faculty from 1935 to 1969. The citation in the Minor Planet Circulars noted her contributions to the fields of radial velocities, double stars, and the history of astronomy.

John Percy spoke on "Supernova: The Death of a Star" to 200 students and teachers at North York's "Science Showcase" on April 13, and on "The Search for Extraterrestrial Life" at A.Y. Jackson S.S. on April 25.

A capacity audience of several hundred heard Dick Bond speak on "The Dark Matter of the Big Bang" to the RASC and the Royal Canadian Institute on March 13.

Nancy Evans participated in the IUE Fixed-Pattern Noise Workshop at Goddard Space Flight Center October 19 and 20. A component of noise in the data which is not random has been recognized for several years. Specifically, by various techniques of using template exposures for flat-fielding, it is possible to increase the signal to noise by a factor of 1.4. It has not yet been shown that this can be achieved in routine production processing. However, her results show that one can find an instrumental signal in the cross-correlation of any 2 images from the same camera and the same aperture, so noise reduction in all spectra may be possible. The results of the meeting were its perpetuation as a committee for the production of the final IUE archives (and many pages of recommendations), and a job ad in the recent AAS job register for an IUE Resident Astronomer for Calibration.

JCM would be Proud of this T

by Chris Rogers

Our cover features some observations that Tatsuhiko (“Hase”) Hasegawa and I made in April with the *James Clerk Maxwell Telescope*. This was our second trip up to “sub-millimeter valley” on Mauna Kea and it was by far the most successful: we lost only 75% of the time to telescope problems this run! We are quite happy to get any data. With such a large telescope working in a relatively unexplored spectral region, you can be assured that whatever you get will be interesting.

We looked at the globule B335 which has near its centre a cold IRAS point source and bipolar molecular outflow. Thus it is probably a site of low-mass star formation, possibly in a rather early stage. Receiver A was tuned to the 3–2 transition of the formyl ion, HCO^+ , at around 1 mm. This particular transition is excited at relatively high densities, for small dark clouds, of 10^5 molecules of H_2 or more. Thus it is a very good probe of what may be lurking in the centre.

The cute little pattern of boxes on the cover is a grid of spectra spaced every 10” (our beam size was probably just under 20”). The horizontal scale spans about 50 km/s in frequency and the vertical scale 3 K in brightness temperature. We seem to have resolved the dense core and the signal was stronger than what Hase had predicted from his models. If we can believe our calibrations against Mars, the gas in this core could be relatively warm (up to 20 K, but don’t quote us).

At the bottom is a “high” resolution spectrum of the emission peak. It’s rather interesting. It could really be asymmetrical or perhaps it is a self-absorption feature from quiescent foreground gas at a different velocity. Then again it might be noise. Note that the peak rests on a hump about 2 km/s wide. The molecular outflow observed at larger spatial scales is at higher velocity, so we may be observing the acceleration of the gas.

We hope to go back this fall to fill in the missing spots of the pattern and to integrate a bit longer on the centre. We want to nail down those profiles. We also plan to look at the next higher transition or an isotope. And we expect the JCMT to be running even more smoothly.

Radio Activity

by Phil Kronberg

The radio astronomy group have been busy exercising themselves on a great deal of interesting new software – installed recently on both their dedicated Sun-3 workstation and on the OCLSC's Cray X-MP computer. Some interesting highlights are imaging software which make the Sun colour graphics terminal behave as much as possible like the IIS image computer used hitherto with the VAX. This was written by Brian Glendenning, and has achieved virtual worldwide popularity. It will be incorporated into AIPS by the NRAO, but meanwhile has been exported to a dozen sites in North America and Europe.

Patricia Monger has, together with Dr. Bob Sault of the University of Illinois National Center for Supercomputer Applications, adapted Bob's WERONG code to the Toronto Cray X-MP. WERONG programs do compute-intensive signal and image processing in radio astronomy (principally for the VLA), and run with impressive speed on the Cray – typically 3 orders of magnitude faster than a microvax II on 1 Cray CPU! We enjoyed Bob Sault's visit, and hope he will return.

More recently, the bigger task of porting AIPS on the Cray was tackled by Kerry Hilldrup of NRAO during his recent visit here. Patricia Monger and Brian Glendenning and Laura Carriere also assisted in the fray, as did several members of the OCLSC staff, notably Nina Bregman, Anna Pezacki, Ed West and Bruce Pinn, as well as Jimmy Scott of Cray Research. The first 4K x 2K images of VLA observations have rolled off the production line as a result of this large effort!

The advent of all this software, combined with our local software and system expertise has more recently attracted Rick Perley and Robert Braun of the VLA staff to Toronto. Their latest images of Cassiopeia A are a sight to behold! They were generated during the first week of May on the Ontario Centre for Large Scale Computation's Cray, and constitute the most detailed and complex images yet produced by a radio telescope.

Revisionist's Corner

Most of us are aware that Ceres and Pallas are two of the largest asteroids, but an AST 210 student evidently had her mind elsewhere when she wrote on her final exam: "The first two asteroids to be discovered were Ceres and Phallas"

PCS Ready for Comeback, Credits High-Fibre Diet

from Karl Kamper

The fiber-fed PCS (photon counting spectrometer) is ready for limited observational use. Limited, that is, in the sense that it is working well as far as we can tell, but we haven't reduced enough data to say anything about radial velocity or photometric precision. With the fiber feed as presently configured, we are set up for moderate resolution observations on objects in the magnitude range 6 to 10. Two gratings can be used, with the following characteristics:

1800, 1/mm, 3900A-5200A, 260A/frame, resolution 0.4A, pixel=0.07A

830, 1/mm, 6000A-8400A, 600A/frame, resolution 0.8A, pixel=0.15A.

The resolutions are the actual FWHM. These may improve as we improve alignment. Sky subtraction (not really needed at these magnitudes, except near Hg lines) is enabled only with lower resolution, approximately twice the above values. The usual photographic configuration is also available, BUT note that one cannot switch between detectors during a night. One last remark: due to fiber transmission etc., the magnitude limit below 4200A is probably more like 8.5 or 9.

A Semi-Automated Discovery

by Rachael Webster

I was awarded two nights on the MMT to do spectroscopic followup of the gravitational-lens candidates produced from the automated optical survey. The survey, which is being undertaken with Paul Hewett at Cambridge, uses the Automated Plate Measuring Machine at Cambridge to select quasar candidates which show structure on the direct plates. These must then be observed spectroscopically to determine which are quasars, and then the secondary images must also be observed. The nights on the MMT were both clear, and the seeing, particularly on the second night, was below 0.7".

Over 100 candidates were observed, of which about 30% were quasars. This was pleasing, since the candidates were chosen conservatively to ensure that nothing interesting was missed. Two excellent results were obtained from the data. Firstly, a new lens candidate was found. This is perhaps the 8th or 9th found (each has a different degree of certainty attached to it), but the first found by an automated technique. The separation of the images is again wider than would be predicted by a galaxy-like lens. The second interesting result is that we appear to have strong statistical evidence for a considerable number of quasars in the sample being microlensed by foreground galaxies. This would be the first definite detection of this phenomenon.

The prognosis for this project is extremely exciting, since now for the first time we will have a real opportunity to compile 10-20 gravitational lenses in a statistical sample. Armed with this data, we are going to be able to make the strongest statements about the large-scale mass distribution to date. We anticipate that the project will be in progress for another two or three years.

The Acadia University Science Seminar: An excellent idea by Bob Garrison

How often we complain of the lack of good science students! But how often do we do anything about it? By the time first-rate students get to university, they are already streaming in one direction, usually not towards science. The time to inspire them is in secondary school, or even primary school.

John Percy does spend a great deal of time and effort in his liaison work with the secondary schools. Christine Clement helps to put together a departmental contribution to the U. of T.'s Physical Science Saturday. A few of us give the occasional talk to a secondary school group, help to judge a science fair, or take on a gifted student in the "mentorship" programme for a year. But most of us could do more in this direction.

Acadia University has taken a bold step with Nova Scotia secondary-school students. Every year for the past three years, they have set up a 3-day science seminar with a series of speakers from across Canada. The speakers are chosen not only for their involvement in exciting projects, but also for their speaking ability, so not only do they have something interesting to say, but also they can communicate their excitement well at any level.

Two or three of the best potential science students from each secondary school in Nova Scotia are invited to an all-expenses-paid, 3-day immersion in the best of Canadian science, ranging from biomedical engineering to astronomy and including physics, chemistry and psychology. About 180 students attend each year.

Past years have included astronomers Rene Racine and Terry Dickenson. This year, I was joined by such excellent speakers as Blyth Robertson (geologist from the Department of Energy, Mines, and Resources, who provides the meteorite chapter for the RASC Observer's Handbook), Paul McDonnell (psychologist from UNB, who is working on adaptation of very young children to artificial limbs), Chris Garrett (Oceanographer from Dalhousie, who is working with data from the Strait of Gibraltar), David Wiles (Director of Chemistry Division of NRC, who is working on plastics), and Brian Hall (biologist from Dalhousie, who is working on developmental biology and the "secret of life").

I found the seminar inspiring and I learned a great deal about what is going on in science in Canada. I can't remember the last time I attended such a multi-disciplinary seminar with such excellent speakers; perhaps it was as long ago as my undergraduate, liberal-arts-college days.

The seminar is very well supported, both financially and morally by the university faculty and administration. The after-dinner speech was given by the Chancellor of the University, the well-known artist Alex Colville, who talked about "An Artist's View of Science" - an inspiring vision to say the least. In other words, Acadia puts a really serious effort into the seminar.

The students were keen and enthusiastic - none of the fooling around that we often expect of high-school students; they were the cream of the Nova Scotia crop, and a good prognosis indeed for that province.

I mention all this because I think that we could take a good look at the effort we put in - as individuals, as a department, and as a university - and ask ourselves if it is effective. In my opinion, the effort of Acadia could serve as a good model if we really are serious in our desire to get the best students.

The Spanish "Inquisition"
 - or "How it Feels to Give a Talk in Another Language"
 by Bob Garrison

Now I really can empathize with some of our foreign students and how they must feel when they give their first departmental talk in English. On 11 April, I gave the most difficult speech of my life - in Spanish! It was an invited talk at the Acad mia Diplom tica in Santiago before an audience of Ambassadors, diplomats, the Director of Foreign Affairs in Chile, and other important politicians. The subject was "Advantages of International Cooperation in Science," using Supernova Shelton as an example.

I have never worried so much about a talk before in my life (and, believe it or not, I do sweat some of them out even if it doesn't look as though I do). I spent the better part of 4 days and nights figuring out what to say to such an august assembly, writing it out in English, then translating it into Spanish, typing it out on our lawyer Antonio Urrutia's IBM-PC-XT (with a Spanish keyboard - great fun!), and finally having my "street" Spanish corrected by Antonio and his new English-speaking secretary. The final version was finished one hour before the talk was scheduled to be given, and I still had to change clothes! Luckily it was "hora Chilena" - i.e. it started later than scheduled.

Rarely do I read a speech, but I did not trust my ability to speak *extempore* in Spanish, so read it I did this time, word for word. Luckily, my pronunciation isn't too bad and the assembled group seemed to understand some of what I said; at least, they CLAIMED to comprehend it! However, when I showed slides, I couldn't see the text, so I had to wing it. Also, there was no way to anticipate the questions, so they were off the cuff. The audience seemed to understand all of that as well. Another advantage of writing it out is that the talk will be published in the journal of the Chilean diplomatic community, so will reach an even wider audience.

In spite of all my worrying, everything went smoothly and the talk was a hit. The Canadian Ambassador was ecstatic; we had made some points with the diplomatic community. I don't know how it will all filter down, but maybe someday, somewhere, some international astronomy project will get a boost from someone who was there in that room on that day. Giving talks like this is like doing basic science: you really don't know when it is going to pay off, but you do it because you believe in it and because your curiosity leads you in that direction.

Supernova Update
 by Bob Garrison

Not much is happening to the supernova optically, except for the coronagraph observations of the "light echos." The light echo was discovered on Las Campanas by Crofts from U. of T. (Texas, that is!), using the Carnegie one-meter telescope (which is only a hundred feet from ours - does that count?) and a special CCD instrument which blocks out the image of the supernova to allow a very deep probe of the surrounding area; hence the name "coronagraph." Spectra of the light echos were taken at Tololo and the light seems to be that from March and April (1987, that is).

Since December, the real excitement has been in the gamma-ray and hard x-ray regions, from both satellites and balloons. Since we don't have any experiments in those regions, there is nothing to report here that you can't get better from other sources. Basically, theory is gloriously confirmed, since gamma-ray lines from cobalt 56 actually have been observed.

The supernova is being monitored at UTSO on Las Campanas in at least 3 ways. Spectra (120 A/mm now) are being taken every week or two, UBVRI photometry is carried out frequently and a few hours of "pulsarator" data are taken every few weeks. The pulsarator tapes are sent by courier to Los Alamos for analysis, but obviously no microsecond pulses have been discovered yet (or you would have heard about them before this!). The visual magnitude is about 7.8 and very slowly is fading (less than 1% per day). The B-V color is continuing to get bluer. The blue-violet spectrum is beginning to show some sharp lines, and more emission lines are apparent in recent spectra.

We don't have a big enough telescope or fancy enough equipment to make some of the observations that are needed now, but we're hoping for a breakthrough with the pulsarator, since it is the only microsecond-level detector (that we are aware of) being used at present in the south.

In the meantime we are obtaining some of the best standard data on a regular basis, in anticipation of a need for that kind of solid data to fit with models. And, of course, we're working on the funding for a larger telescope and better equipment.

GASA GOSSIP

by Mike Fieldus

The summer is rapidly approaching, and once again it is time to take stock of the local volleyball talent in light of the upcoming DA-DDO showdown at the summer picnic. The student team had another successful winter season, sporting a record of 15-2 and making it all the way into the championship round, where they lost in 5 games, to, of all teams, Dan Blanchard's old team from Massey College (yes, the team is much better now that Dan has moved on). The championship game was a very close, exciting match, in which for the first time all season Massey lost two games, but in the end we lost in the fifth and deciding game 15-10 when Rob took a ball Laura had called and set it to himself. Most people in the department who know will agree that it was this play that lost it all for us and everything wrong in the world is Rob's fault. I would also like to point out that the astronomy team won the championship two years ago, and lost in the final last year as well, so our performance this year equals our worst showing in recent memory.

On the other side of the fence, I went out to DDO last week to scout the observatory team. They must have heard how awesome the students are this year, because I found an unorganized and dispirited group of people who didn't even have the will to play for fun on a sunny day. The first person I ran into was Brian, who said no, there were not enough people around to play that day. Archie told me the same thing two minutes later, followed closely by Slavek, Tom and then Karl. In total, I ran into seven people, all of who claimed there were not enough people around to play. I've had an awful lot of fun with just two people and a volleyball (but, of course, that is another story), so the only explanation is they have already given up on this summer's contest.

Congratulations to Louis Noreau, who was the only person to correctly guess last issue's mystery student as being Raymond. Louis, in his successful reply, told me a very interesting story about the time he found out that Raymond had constructed "Fort Rusk", but I can't repeat most of the language he used in this journal (or, in fact, in this province). A new development has arisen regarding the G2000 controversy I mentioned last issue. Raymond, who has not had to give a G2000 talk in two years, because he is "just" finishing his thesis, has managed to get a job, doing research in physics. Congratulations Raymond. Alex, on the other hand, had to give a G2000 this term, despite the fact he is just finishing his thesis as well. At the moment, he has no job offers. I think the correlation is clear.

Other meaningless news you might be interested in. Teresa, better known as "Turbo", for obvious reasons, has shifted offices, quoting personal differences between her and Dimiter's new computer as the prime reason. She currently occupies Jim Picha's old desk, while Dimiter, better known as "Dim", for obvious reasons, is using her old desk until physical plant comes and repairs the hole they made in the floor under his space (two months and counting, physical plant).

Ed Zukowski has been wandering around the department these days, but for a change he hasn't been talking about hockey. Instead, he has been asking questions about what spacing SGS requires in printed submissions. Most people take this as clear proof that he has begun writing his thesis. This places him second, behind Judith, as a favourite for graduating next, followed closely by Alex, Peter Leonard, Bob, Dimiter, Peter Ip, Raymond and KT, in that order. Congratulations should go out to Judith at this point, as she has received a job offer from NRC and will begin a post-doc sometime in the early new year.

This week's mystery student is KT. I didn't want to cloud the issue with a lot of veiled clues, as most people will agree that KT is mysterious enough as it is. Next issue's mystery student is a lot harder (no offense, KT) so I will give you some early clues. He comes from the southern states, is a graduate student in astronomy, and goes to U of T, despite never having been to Toronto in his life. Good luck guessing this one.

Last night was the official end to the beard growing contest between myself and Dale. About a month ago, after several drinks, we both decided we hated shaving and would have a contest to see who could grow the best beard the quickest. It was a close call, but I just managed a win, with Dale making the excuse that his wife wouldn't let him grow one. I don't think I want to get married.

LIBRARY NEWS

by Marlene Cummins

In April of this year the preprint database was converted from an antiquated and devilishly awkward VAX system originally "borrowed" from an unnamed West Coast observatory to a sophisticated IBM-PC-resident DBMS. One of the many benefits of this system is that Rosemary will not have to retype preprint titles, sometimes as often as 4 times(!) for the various reports we produce (including the Cassiopeia list). Another is that we won't be kicked out of the system because of a lower case letter slipped in inadvertently! About the only disadvantage is that astronomers won't be able to look online for a preprint at 3:00 a.m. (requests will have to go through us and we don't stay up that late.)

Rosemary took a first-aid course so now you may cut yourself in the library as long as you don't bleed on the books.

PAPERS SUBMITTED

PREPRINTS BY FACULTY AND STUDENTS RECEIVED IN THE ASTRONOMY LIBRARY

Bell, M.B., Seaquist, E.R. Detection of C3H2 emission in the radio galaxy Centaurus A (=NGC 5128). HIA. 88-0332. 6 April 88.

Clifton, T.R., *Frail, D.A., Kulkarni, Shrinivas R., Weisberg, J.M. Neutral hydrogen absorption observations towards high dispersion measure pulsars. U Cal/Berkeley/*U of T. 88-0402. 25 April 88.

Evans, Nancy Remage. Cepheid binaries with large mass ratios (M1/M2). DDO/U of T. 88-0335. 6 April 88.

Evans, Nancy Remage, Douglas L. Welch. The orbit of the cepheid AW Per. DDO/U of T. 88-0334. 6 April 88.

Freedman, Wendy L., Madore, Barry F. Distances to the galaxies M81 and NGC 2403 from CCD I-band photometry of cepheids. Mt. Wilson/Las Campanas. 88-0397. 25 April 88.

Lake, George, R.G. Carlberg. The collapse and formation of galaxies II. A control parameter for the Hubble sequence. U Washington/U of T. 88-0231. 2 March 88.

Leonard, Peter J.T., Martin J. Duncan. Runaway stars from young star clusters containing initial binaries - I. Equal-mass equal-energy binaries. DDO/U of T. 88-0163. 9 Feb 88.

Oliversen, Nancy A., *Evans, Nancy R., Anderson, Christopher M. The nebular velocity structure of AG Pegasi. GSFC/*U of T. 88-0390. 20 April 88.

Percy, John R., Coffin, Bruce L., Drukier, Gordon A., Ford, R. Paul, Plume, Rene, Richer, Michael G., Spalding, Robert. Photometric monitoring of bright Be stars. DDO/U of T. 88-0426. 29 April 88.

Zhan, Yin. Gravitational clustering of galaxies: the probability distribution function. DDO/U of T. 88-0385. 18 April 88.