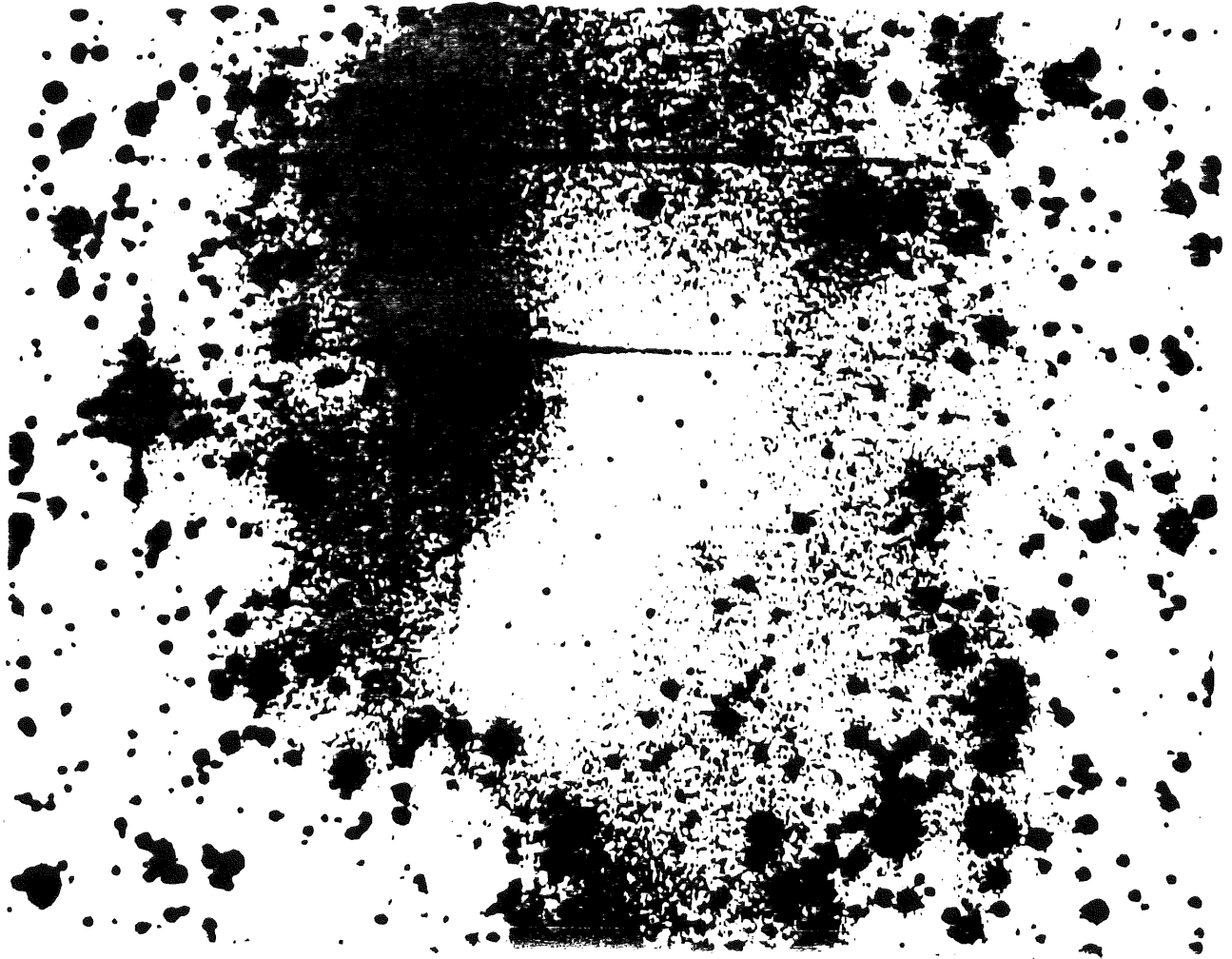


THE DAVID DUNLAP DOINGS

Vol. 20, No. 4 Nov. 2, 1987.



One of Rogers' Bok Globules taken with the new CCD
(Bright star images lost in reproduction)

EDITORIAL

The department is in the throes of NSERC applications, a pre-chair-search external review, and a super-urgent planning operation for the future of the department. None of these activities is reflected in this issue of the DOINGS, except that the issue is late coming out, for all of these reasons and more!

Why is it that we are all so busy? One reason is that there are too few staff members doing too many administrative tasks, most of which could be done by support staff if we had enough to go around. For example, remember when we had a draftsman at DA to help with manuscripts? Now it is all done by computer, but the faculty have to wrestle with the plotting programs.

The modern equivalent of the draftsman would be a computer guru who would be completely familiar with all the tricks and details of the best plotting programs and would do all the wrestling for us. How inefficient it is for each of us to have to learn details of the plotting programs and then to have to learn a new system each year. Even after learning them, nothing ever goes as smoothly as expected. How many times have we all started on something which should take only 15 minutes, yet we emerged from the session 3 hours later because of something that didn't work as it should (usually due to our own ignorance!)?

While preparing this issue we decided a cover drawing, was needed. We discussed the possibility of putting on one of Chris Rogers' CCD frames. It turned out that he had beautiful ones on slides, but had not tried getting a gray-scale printout which would reproduce inexpensively for the cover. Of course, he had to dig into the manual and learn a new trick, and it took more time than he had to spend on it. The upshot is that we decided to spend some money on getting the Media Centre to print something that we could Xerox.

Why can't we have a computer guru to do that for every one in the department? Because we can't afford one for general use, and the few that are hired on large grants are busy working for the grantee and are not shared.

If the Canadian governments (provincial and federal) were really interested in increasing research productivity, they would increase the number of research assistants, thus freeing the highly trained scientists to do what they do best and what, in most cases, only they can do. With good Canadian scientists across the country freed from most of the mundane tasks that fill their working lives, I believe that we would see a dramatic increase in overall productivity. It is so obvious a solution, and not very expensive, so why don't they do it? Beats us.

rG and Rg

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CONGRATULATIONS

To Marshall McCall and Susan Piotrowski, who are engaged to be married on March 26. Susan was a physics graduate student here with an interest in laboratory astrophysics. She has since completed an M.Sc. at York on thin films and is continuing her studies in CRESS.

To Jessika and Patricio Ortiz on the birth of their son Sebastian Elias on August 8th.

To Rick Crowe who began a tenure stream appointment as assistant professor at the University of Hawaii, Hilo campus, this past August. There are many UK astronomers based in Hilo and the UH people have ready access to some of the best telescopes in the world, so Rick considers it a very good position.

To Ann and Charles Dyer on the arrival of their first baby, Ellen Louise Elizabeth, born on July 18.

To Louis Noreau and Guillaume Pérodeau on the birth of Amelie Sonia Noreau-Pérodeau on July 29, 1987. The home delivery was without complication. Being the daughter of astronomy and psychology PhDs, both parents are afraid she might become an astrologer!

COMINGS AND GOINGS

We welcome Francene Gandall to the department. She joined our downtown administrative staff at the beginning of October.

Dale Frail was in Berkeley, CA in mid-August for about two weeks writing papers with Shri Kulkarni and Trevor Clifton on their Arecibo and Greenbank observing runs.

Tom Bolton, accompanied by wife Susan, attended the Tenth European Regional Meeting of the International Astronomical Union in Prague in late August. They spent some holiday time in Paris and Munich on the way to Prague.

Nancy Evans had an IUE observing run at Goddard for a week in mid August, involving both high dispersion observations of binary Cepheids, and low dispersion observations of ZAMS stars in the Alpha Per cluster. The most exciting gossip she picked up was the report presented at the latest NASA-ESA-SERC meeting of a potential 0 gyro guidance system. Work on a 1-gyro system is underway.

Tom Bolton spent the first week of September observing at McDonald Observatory with Doug Gies (Ph.D. 85) and Kim Venn (B.Sc. 87, now at U of T south) as part of a coordinated campaign to study time variations in the stellar wind of 68 Cygni.

While in town visiting his family, Doug Gies took some time to visit DA on September 18 to consult with Tom Bolton and Alex Fullerton on some collaborative research projects.

Bob Garrison went canoeing in Quetico Provincial Park (west of Thunder Bay) for two weeks in July with Susanna (his co-vivant) and his 13-yr-old son David. Highlights of the trip included seeing old pictographs (indian graffiti), a black bear and her 3 cubs (at a safe distance) and several bald eagles (which have more feathers on top than Bob has hair!), two of which were close up (20 meters).

Bob Garrison observed in Chile during August (see supernova update), and reports that it was the cloudiest run he has ever had there. He gave a talk at the University of Chile.

At the end of August, Bob Garrison gave a talk at the Spaced Out Library about the Possibility of Contact with Extraterrestrial Life. On 22 September, he was invited to a luncheon meeting of the Southam Fellows at Massey College. As if that weren't enough, he has also given several talks on the Supernova.

Philip Keenan was at DDO for a week in mid-September visiting with Bob Garrison and using some of the Chile spectra for classifying metal-weak stars and standards.

On 6 October, Bob Garrison gave an invited talk on Classification of Stellar Spectra at the annual meeting of the Federated Analytical Chemistry and Spectroscopy Societies in Detroit. It seems that chemists are becoming very interested in stellar spectra and Bob reports that they were a very keen audience with lots of questions.

POTPOURRI

Tom Bolton and Alex Fullerton were in Prague to attend the Workshop on Rapid Variability of Single, Binary, and Multiple Stars organized by Petr Harmanec. Alex reported on the preliminary results of the survey for absorption line profile variations among the O stars. There were several afternoon sessions devoted to contributed papers in selected areas. Two afternoons were devoted to binary stars and another to ultraviolet astronomy. There were several plenary talks. Among these were a summary of the results from the Vega and Giotto missions to Comet Halley and a description of the upcoming PHOBOS mission to be launched by the Soviet Union. The highlight of the talk on the Comet Halley was a movie of Giotto's approach to Comet Halley created from the fully processed images obtained with the spacecraft. The results were breathtaking.

Ernie Seaquist, Tatusuhiko Hasegawa, and Chris Rogers were successful applicants to the heavily subscribed James Clerk Maxwell Telescope, the new sub-millimeter facility jointly operated by Great Britain, the Netherlands, and Canada. A former U of T post-doc, Russ Taylor, is Ernie's co-investigator.

ON THE VALUE OF DDO

by Tom Bolton

I offer the following tidbits for the enlightenment of those who are skeptical about the value of an Observatory in a poor site or doubt the importance of the work done by the stellar astronomy group at the University of Toronto.

At the Workshop on Rapid Variability in Single, Binary and Multiple Stars, fully 20% of the papers either reviewed work done at DDO or depended heavily on data obtained at DDO in the past 12 years. All of these papers were presented by European astronomers. In addition, two of the four prototypical objects that were most discussed at the Workshop were originally identified as interesting objects from observations obtained at DDO.

In the article "Cepheids as Distance Indicators" in the 1987 volume of Annual Reviews of Astronomy and Astrophysics, one-sixth of the references are to papers authored or co-authored by University of Toronto faculty and students. Approximately 20% of these references are based in part on work done with the telescopes at DDO, and I suspect that more than 50% of these references use data obtained at UTSO. About 9% of the total number of references are by former students at the University of Toronto, and another 6% of the references are by former post-docs or faculty in the Department.

Our Man in Las Campanas

Allow me to introduce myself. I am John Filhaber, the resident observer at the University of Toronto Southern Observatory as Las Campanas. I will be working with you for the next year or so. I hope to use this space each issue to keep you informed of the technical and social scene on the mountain.

The CCD made its maiden voyage this month with the able Chris Rogers at the helm. Although the run was not without its complications, I think Chris will agree that the run was a success. The most serious problems, unstable power and the inability to focus the off-axis guider, have been repaired. Some minor changes will be made in the software to fine tune it to the needs of the observatory.

All users will be happy to hear that a new position-indicating console manufactured by Sigma Research is somewhere between here and Santiago. Recent rains destroyed three bridges on the Pan-American highway delaying all parcel shipments. We expect 1' pointing accuracy using present encoders. The system has TTL outputs and can be easily upgraded to higher precision with new encoders. Stay tuned!

Camera users, photo and CCD, can now focus the off-axis guider with two fingers instead of a pipe wrench. A baffle has been installed in the x-y base obviating the need for wrapping the assembly with your scarf.

Several projects are underway to restore and upgrade various aspects of telescope performance. Much of the finder-scope flexure was found to be in the x-y base focusing ring assembly. Tightening the mounting screws removed 50% of the problem. The rest will be eliminated with new bearings for the x-y base and a new design for the finderscope mount. The transmissions on both axes are being rebuilt to reduce backlash to an acceptable limit.

While these projects are progressing, several others are being planned. The most significant of these is the replacement of the motion control console. It was found that flaming parts in the console were probably not good for dome seeing or the infrared photometer. The proposed system will have an interface for computer control. Stay tuned.

Back at DDO the electricians and machine shops are building a new photometer with an automated filter wheel that will be run by an IBM PC. We are going to donate our Osbornes to the Smithsonian. This new system should speed up photometry and make it much easier on the observer. I sense a cut in pay coming.

During my stay here, I hope to give the telescope a major over-haul and restore it to simple, efficient, reliable performance. If you have any suggestions for changes or additions you would like to see on the telescope, we will gladly consider them, however grandiose or picayune. These should be sent to Dr. Garrison who will distribute them to the mechanical and electronics staff.

As soon as a social scene develops up here, I'll let you know. Until then, don't believe those ugly rumors.

I am very enthusiastic about the progress that has been made and the future of our 24" telescope. I look forward to working with you.

P.S. Please put the scale somewhere on the finder charts you send me. Gracias.

From Our Far-Flung Graduates

Hi Chris! I am still alive here in Princeton. How are things going in Toronto?

Things are starting to get into gear now. This term I have one astronomy course and one seminar. The course is taught by Ostriker and Gunn. Ostriker is trying to go through Mihalas & Binney and Binney & Tremaine's Galactic Dynamics (soon to appear) in 1/2 the term! I am also taking a couple of physics courses but I don't have to worry about passing them. One is a cosmology course taught by Peebles and the other is a Quantum Mechanics course. For my first project I'll be working with Bruce Draine on dust!!

The department here is quite small. There are about 16 grad. students in total (4 new ones including myself). And I have my own office! Almost everyone here (including the few observers) are into theory. They also have tea (no coffee) time every afternoon. And I get to meet a lot of the people that only heard of before in textbooks and papers (e.g. M. Schwarzschild, Spitzer, Ostriker, Binney,...).

My computer mail address is mlee@astrovax.princeton.edu

Man Hoi Lee (B.Sc. 87)

The Revenge of the O Team

by Alex Fullerton

Apparently Murphy was on holidays during the first bit of September, for, on the fourth attempt, the O Team had a successful observing campaign. Long time DDD afficiandos will recall that the O Team is a large collaboration of multi-waveband, multi-national observers determined to unravel the connections, if any, between the photospheric variations and the variability in the winds of certain O stars. The major players in this collaboration include optical types (Fullerton, Gies, Bolton, and Venn), UV-observers (Henrichs, Prinja, Howarth, and Garmany), polarimetrists (McDavid and sometimes Geoff Clayton) and UV spectroscopists posing as IR photometrists (Prinja and Howarth).

The history of the project is somewhat sordid. The optical run of August '85 was perfect, but IUE suffered its gyro failure and produced nothing. IUE performed flawlessly in September '86, but we on the ground were almost completely wiped out by bad weather. During March '87 everyone obtained observations, but the target star was not doing its most dramatic stunts. With these basic permutations out of the way, we mounted our fourth attempt in early September.

The September run was the most elaborate to date, and a marvel, in that co-ordinated observing time was obtained from 5 different time allocation committees! At the height of the campaign, an equivalent aperture of about 5.4m, ranging in individual size from IUE to UKIRT, was trained on our bright, naked-eye objects. In total the team had 9 consecutive IUE shifts, 3 nights on UKIRT, 6 nights on the 1.2m at DAO, and 5 nights on each of the 2.7, 2.1, and 0.9 m telescopes at McDonald - all of which achieved or exceeded their objectives for the campaign, although the observers in Hawaii and Texas had to contend with bouts of poor weather.

Preliminary inspection of the data indicate the program stars were performing in a complicated manner. Consequently, all this boasting must end, and we (or at least I) must get down to the really hard part of the job! Still, one wonders whether Murphy's holidays are an annual sort of thing, and whether his employer (whoever he/she may be !) provides other benefits of this nature...

Childbirths and the Full Moon

by Peter Leonard

With the baby boom we've been enjoying in the Department these days perhaps it is appropriate to consider an old wives tale regarding childbirths, which is that more children are born during the full moon than at any other time of the month. Incredibly, a lot of people believe this is true, including nurses in hospital maternity wards. On the other hand, the doctors who deliver the babies don't think there is such a trend, probably because there is no physical reason to suspect such an effect. In my experience the discussion of wives tales seems pointless, and the best way to address the problem is to gather some data and test the significance of the trend. What follows is such a study.

My data set is based on the birth announcements in the Toronto Star from March 6 to June 13, 1987. I consider babies born during the 13 week period starting March 6 and ending June 4. I have included only babies announced within 9 days of birth (since June 13 is 9 days after June 4), and I have considered only babies with surnames beginning with the letters A, B, or C (to cut down on the work). I see no reason why these restrictions on the sample should result in any selection effects, but if there were any such effects it would be even more interesting than the main problem that I'm trying to address.

There were 346 babies in the sample: 177 boys, and 169 girls. The trend of more boys being born than girls is known to be true for the human race, but in my sample the difference is not statistically significant. That is, if there is an equal chance of a child being of either sex, then the probability of $|N_{boys} - N_{girls}| \leq 8$ is 0.37.

There is one very striking trend that is immediately obvious in the data— the number of childbirths seems to follow a weekly cycle, with most births occurring in the middle of the week, and fewer on the weekends. In fact a chi-square test of the hypothesis that the number of children born on each day of the week is the same can be rejected at the 99.9% confidence level. The reason for this quite real trend is probably because doctors are very religious and don't like to work on the Sabbath. (For those who don't know, induced labour and cesarean childbirth occur quite frequently, and both are done at the doctor's discretion).

Now this weekly trend is so strong that it is difficult to see any correlation with the full moon, three of which occurred during the period in question. So, the daily means of the weekly trend were subtracted out, and the data was binned according to days before or after the full moon. There was no peak at the full moon, and a chi-square test of the hypothesis that the number of childbirths is independent of the phase of the moon cannot be rejected with any confidence. Hence, there is no trend with the phase of the moon in the data set.

Alex Fullerton was kind enough to run his periodogram program on the data set. He found a power peak at 7.1 days with 97% significance. Thus, the weekly trend has been verified by an independent technique. There were no other peaks of mentionable significance, especially variations one month in length. Therefore, the lack of variation with the phases of the moon has also been verified.

In summation, there may very well be more children born during the full moon, but such a conclusion is not borne out by this study. Certainly there is no striking correlation with the moon that a casual observer would notice.

Stranger Than You Think by Dale Frail

All of us, at one time or another, have been called upon to give talks or answer questions on subjects related to astronomy. The stock answer to why we must do this is that it is good public relations for the department; and what is good for the department is good for you! Now and again we get an unusual request. I would like to tell you of some of my experiences and let you judge whether or not Esther sends all the strange calls to me.

My most recent close encounter of the unusual kind was a two day Moslem conference, "On Determining the Direction To Mecca". I was one of three invited expert speakers. The entire proceedings were videotaped, including a heated panel discussion. They tell me that the talks are to be published. It is a good thing that I am always on the lookout for new things to pad out my curriculum vitae. It was just a bit of spherical trigonometry. You know, given two positions on a sphere, A and B, find the azimuth angle between them. Funny how it is when you mix religion and science together, nothing seems quite so easy as that. My wife was with me, so the part that I enjoyed the most was seeing her in the back of the room with the rest of the women and children, partitioned off from us men-folk discussing more important matters. Those Moslems sure know how to live!

And then there was the homosexual rape case. This was a more serious matter. I was called upon by the defence to testify as to “the whereabouts of the moon on the evening in question”. It seems that the crime took place late in the evening, in a field with no nearby sources of artificial illumination. The victim claimed he could identify his assailant from the light of the moon. The moon had been new that day, and I testified to that fact. My testimony might have had something to do with the defendant getting off that charge (he was later jailed for a host of similar crimes); still, it doesn’t justify my friends calling me “defender-of-sicko-rapists”, “ambulance chaser”, and “Dale anything-for-a-buck Frail”.

The last really interesting talk I gave was in the church of the Seventh Day Adventists. I had accepted their request without knowing exactly what I was getting myself into so I decided to do a little investigative research. The Seventh Day Adventists were formed by William Miller back in the mid-19th century. They are best known for once selling all their belongings, donning white robes and climbing en masse to the top of a mountain to wait for the end of the world. One of the portents of the earth’s demise, according to old Bill Miller was the “Great Comet of 1843”. You can imagine my trepidation upon getting a call from the pastor asking me to talk about Comet Halley (incidentally, he also asked me not to use the word Evolution at any time). I in no way wanted to be set up as the next doomsayer, and besides I have an affinity for worldly possessions. As it turned out the event was an uneventful one and in the end I was sent on my way with some inspirational literature. I guess there are not many of us who can claim to have given the half-time show during a sermon of the Seventh Day Adventists.

My list doesn’t stop here but I do.

GASA GOSSIP

by Mike Fieldus

Well, I guess I should get this over with. We, the students, make no excuses. We did play volleyball against the DDO team at the picnic this summer, and we lost. The first game we played was using DDO rules, which amounts to allowing as many people on the court as can fit, and then allowing them to do anything they want with the ball, short of picking it up and throwing it over the net (which, actually, is allowed if you have tenure). This game we lost quite decisively. Just to keep the record straight, and save some face for we students, we played one more game, using the students versions of the rules (six people on the court per team, and follow the rules a little more closely). This game, we lost miserably as well. I would say all sorts of things at this point, such as “wait until next year”, but our team is undergoing a major rebuilding at the moment, and it doesn’t appear any of us will be around next year.

Onward to more important things. Traditionally in the first issue of the year the new graduate students in the department are introduced. I don’t see any reason why this year should be any different, so I will do that. First, however, a list. Our new students this term are Ian Shelton, Ian Short, Mike Richer, Teresa Cripps and Francois Rouleau. Of these, Ian Shelton and Mike Richer are probably familiar to you, as Mike was an undergrad here, and Ian has been working at Las Campanas for the past several years. Ian Short comes to us from UNB, and is very interested in spectroscopy, while Teresa did her undergrad degree at the University of Saskatchewan. Raymond

was at U of S for a while, but it appears the Teresa wasn't actually born when he was working there. Francois is the only Phd student in the new crop. He is from the University of Montreal and will be working with Peter Martin during his stay here. Now that you know all about these people, I leave it up to you to decide which of the faces you don't recognize belongs to whom.

Some other things have occurred during the summer that I am sure you are interested in. Most of you know Mike Wong, who was an undergrad here last year and is working as a tutor (amongst other things) this year. It appears that Mike, despite his 4 years experience here, is a little unclear on some fundamental concepts regarding astronomers, or for that matter, people in general. I leave it to your imagination as to how this situation arose, but last week Mike was in the embarrassing position of claiming as his own a set of keys that had been found in the 14 floor women's washroom. I think the time has come for the first annual GASA GOSSIP creative writing contest. Anyone who wishes to may write a short story about how Mike came to lose his keys in the women's washroom should do so and send it on to me. I will print the best of them in the next issue's column.

My attention was drawn last night to a rather suspicious state of affairs. As most of you know, or at least will know when I tell you, Bob Hill and Laura Carriere are living, in sin, together. Anybody who knows the two of them fairly well realize that it is only a matter of time before Bob displays his rather odd (and cruel) sense of humor at some awkward moment, and Laura kills him. I just want to point out that they have been living together for a little over a month now (which is the time I choose in the "Laura Kills Bob" pool), and Bob hasn't been seen in the department for about a week.

I realize as I wander about the department that my columns have been preferentially (if that is a good word in this case) focused on a few people. I realize this because the graduate student population is divided into two distinct groups, those who will talk to me and those who won't. I think it is time I tried to alienate everyone, so from now on I shall pick one student each week and discuss (pick apart) his/her life in detail. I think the best way to do this is not to actually tell you who I am talking about, but rather let you guess. To give you something to look forward to, I will start this new policy next week when I will discuss a short belligerent GASA treasurer.

I think I will close this column on a rather happy note. This certainly cannot be considered gossip, as it is common knowledge now, but I will mention it anyway. Marshall McCall, that intrepid astronomer and world traveller, has become engaged to be married. Congratulations to both Marshall and Susan.

My First Observing Trip by Chris Rogers

I went to Chile this August for my first “professional” observing run. I’m usually labeled as a theorist, though the term non-observer is probably more accurate. My usual mode of working has been to analyse other people’s observations but recent events encouraged me to eliminate the “middle-men” and try my own hand at collecting data. Last year I saw some really neat CCD images of Bok globules that Rudy Schild had taken for Adolf Witt. Nearly simultaneously, Marshall McCall and Barry Madore were placing the order for UTSO’s off-the-shelf CCD system. It didn’t take much theorizing to realize that I could now both look at and model southern hemisphere objects. My first proposal was accepted and I was to inaugurate the CCD (though Marshall and Ian Shelton had already tested it and Christine Clement had knocked-off a few exposures).

My first impressions of Chile were of its people. Everyone is unfailingly polite and patient with foreign travellers. I was embarrassed to think that in Canada the typical reaction to a person speaking only Spanish would be very different. The pervasive goodwill in Santiago was particularly impressionable since it seemed to me (with limited experience) that the skies there are always overcast. José Maza (Ph.D. 1978) would later substantiate my sweeping meteorological conclusions.

I tried to call José soon after checking in at the Hotel Foresta. Just as I was reaching for the phone, it rang. It was Bob Garrison, just back from the mountain, inviting me upstairs for lunch. In spite of being up for the past twenty four hours or more, he was really wired! He was busy making arrangements to get John Filhaber back to the mountain to make some important SN 1987A observations. The Pan-American highway was impassable after recent storms and my only chance to get Las Campanas would be to get on the plane with John. The confirmation of the flight came to us at Antonio Urrutia’s office. I had to run after Bob through rush hour crowds back to the hotel, grab my tapes and catch a fast cab to airport. My first views of the southern night sky were from a Piper Navajo at 9,000 ft.

I recommend to those considering a first run at Las Campanas to travel to the mountain at night. Throwing back the heavy drapes of the guest room the next morning will be truly breathtaking. I can’t think of any accommodation that is so well tuned to its environment as Casa Canadiense. The locals sometime refer to it as Delta Tau Delta South or Casa Gringo, in honour of the Connecticut Yankee who is its permanent resident. Bob had been mostly clouded out, but I was blessed with fine late winter weather which actually turned out to be rather balmy. At least I tried to create that impression by going about shirtless and in shorts during the day. At night I adopted the dress of the cross-country skier, right down to the fleese-lined boots. I was close to being uncomfortably cold on only two nights. In the end I lost only one night to clouds, though a few nights had pretty bad seeing.

I took to UTSO-style observing right away. Although some time has past since I was an amateur and campus observer, I felt right at home climbing ladders and man-handling the telescope. Controlling the CCD was not very different from running the computer in my office. Of course most telescopes are run from an “office”, with a night assistant. Watching the one and two meter telescopes in operation made me feel like a bit of an amateur, but I knew I was having more fun.

Sometimes. It wasn't fun when your guide star suddenly lurched half way across the field of view or when you once again slammed your head against the finder. I reached my lowest point the night the power system surged and precipitated a very bad hard disk crash. It was the clearest, steadiest night of the run. At these times, when I felt like hurling myself off the mountain (the telescope being much heavier), it was John Filhaber who saved me. He is a genius in matters electrical and mechanical. Even my meekest complaints would send him off to the dome, where he would strip apart, fix and reassemble the telescope. Usually he did this just before dinner, but he works quickly and self-confidently. This is certainly the aspect of the job John likes best. Tracking a star across the slit allows his mind to wander: girls, 120 days until Christmas, girls, five cars at home, girls, etc., girls, etc. In La Serena, on my way back, I came upon a parade celebrating the centenary of the city college. It included their hula-dancing club! I thought of our poor resident astronomer.

Even if John has some serious longings, it really doesn't show. His presence certainly livens up mountain life and he is a favourite of the Chilean crew. On his birthday Mauricio baked him a cake and Roberto presented him with a wood sculpture. The real party started back at Casa Gringo, but to describe it further might be incriminatory. John is the perfect foil for George Preston, who was there on an extended run. The day after John had bothered George for sidereal time (after the power failure), George gave John a handy reference card: "Sidereal times for first half of night - 15:03, 13:37, 18:40, later on - 1:26, 8:42, 5:54."

I had a nice slow trip back to Santiago. The city and country were then very peaceful (quite different this week!) and I felt at ease in the Sunday evening throngs sampling the excellent street theatre on Huerfanos. The next day I surprised José at work, he dropped everything and spent the rest of the day with me. If you ever think things are getting tough here at U of T, spend a day with José.

I can't wait to go back, but with Urania (our hard disk) filled to brim and no way to process my hundred or so images stored on tape I can't justify going back. Now just a minute ... Charles Dyer just got back and he's got a fairly empty disk and IRAF ... I wonder if the December flights are full...

PREPRINTS BY FACULTY AND STUDENTS RECEIVED IN THE ASTRONOMY LIBRARY

Chang, Chong-An, John E. Dove and Peter G. Martin. Computation of the emission spectrum of shock-heated molecular hydrogen at interstellar densities. (CITA) 87.9.22.

Dove, J.E., A.C.M. Rusk, P.H. Cribb, P.G. Martin. Excitation and dissociation of molecular hydrogen in shock waves at interstellar densities. (Ap.J. V. 318, no. 1. July 1987, p. 379-91)

Fullerton, A.W., D.R. Gies and C.T. Bolton. The incidence of absorption line profile variability among the O stars. 87.9.3.

Garrison, R.F. Observer's handbook 1988. The brightest stars. 87.7.10.

Kim, K.-T., P.P. Kronberg, T.L. Landecker. Probe of the magnetic field structure in and around the supernova remnant OA184 (G166.2+2.5) using background radio source rotation measures. 87.8.31.

Morris, Steven L., C.T. Bolton, John R. Percy. On the period and nature of the light and radial velocity variations of HD 25799. 87.8.13.

Percy, John R. Triennial report of IAU Commission 27: Variable Stars. Early-type variable stars. 87.8.25.

Seaquist, E.R., D.A. Frail, M.F. Bode, J.A. Roberts, D.C.B. Whittet, A. Evans, J.S. Albinson. Nova GK Persei - a miniature supernova remnant? 87.7.17.

Seaquist, E.R. The radio properties of symbiotic stars. 87.9.2.

Supernova Shelton 1987A

October 1987

By Bob Garrison

In August, almost 6 months after Ian Shelton's discovery of the brightest supernova since 1604, I finally managed to see it with my own eyes. The first week of my run was completely cloudy and I was afraid that I would miss it entirely, but the skies finally cleared to beautiful photometric conditions.

What a beautiful sight it is with the LMC in the back ground. While it is still possible (now in October - after 8 months!) to see it with the naked eye, a pair of binoculars really brings it in well, highlighted by the Tarantula Nebula. The brightness can be estimated easily by eye, comparing it with delta Dor, eta Dor and other nearby stars which nicely bracket the magnitude.

The Supernova is now at a magnitude of about 5.6 and seems to be following a type II light curve as it fades slowly. The blue-violet region of the spectrum is still optically thick, though emission lines are beginning to appear.

If the speckle companion exists, November should be an exciting time for supernova observers. From the maximum light-travel time, calculated from the first speckle observations, it is possible to estimate the distance. Since we know the velocity of the shell, it is therefore possible to estimate the time of arrival - which is November. It is a nice test of the speckle observations. If there are fireworks, the companion is there; if not, the companion was probably an artifact of the reduction procedures.

In June, there was a lot of confidence in the speckle observations, because they were confirmed "independently" by the Anglo-Australians. In subsequent discussions, the issue has become more cloudy and it appears that the Anglo-Australian observations were not entirely independent. Thus most astronomers are adopting a "wait and see" attitude, especially since July/August observations indicate that the "companion" seems to have disappeared. So November should be interesting.

It is this kind of thing which enables the public to see science as a process, instead of a cut-and-dried listing of established results. The event has a high profile and is continuing over a long period of time, theoreticians are doing a lot of speculating about what is going on, and there are tests of hypotheses leading to a weeding out of the unsuccessful ones. This is science in action, something which the public rarely experiences.

In the meantime, we are continuing to monitor the supernova at UTSO on Las Campanas. UBVRI observations are being carried out every photometric night and spectra at 120 A/mm are being taken once a week. The photometric observations will be reduced along with all of the southern stars brighter than 5th mag, which is a project that Ian started 6 years ago and that will be his MSc thesis. The observations should thus be the most consistent and homogeneous of any published heretofore. The light curves we have seen so far have not been good, and Ian made the very first photoelectric observations with the UTSO 60-cm telescope. The spectra will be used for line identification studies by Garrison and Shelton.

In addition, our Resident Observer, John Filhaber is using periodically the Kristian-Pennypacker-Middleditch microsecond "pulsarator" to search for a signal from the pulsar at the bottom. Once every few weeks, 2-3 hours worth of observations are recorded on high-speed tape and sent to Los Alamos where they are analyzed by Middleditch. It is a complicated process. Since we have the only microsecond detector (others are millisecond), we may be the first group to catch a glimpse of the pulsar through a chink in the turbulent clouds. The earlier it is observed the more we will know about the original rotation speed and the decay rate.

As the supernova fades, we will switch to the CCD and should then be able to follow it down to about 21-22 mag, at which time we hope to have a larger telescope in place.

Peace! They're over!
by Ron Lyons

It's October. It's Saturday, dusk. The setting sun is casting long shadows across the lawn. The reds and yellows of dying leaves stand out against the somber tones of the evergreens. No one is preparing a slide show in the lecture room. No one is in the dome refreshing themselves on the details of the telescope and its operation. No one is standing outside trying to figure out the local weather patterns, wondering if it will be clear, and if so, what object will not only appear impressive when viewed in the telescope but also be conveniently placed in the sky. The public phones are quiet (and have been all week). No one is driving cautiously up the drive pausing to examine the "NO EXIT" sign that marks the road to the Director's house. No one is parked on the lawn. Frank MacDonald is at home - comfortable and warm. The Saturday evening tours for the public are over for another year. It's quiet!

Over 2600 people managed to find the Observatory for the evening tours this year. This wording may sound strange but for some people getting here was a genuine test of daring and perseverance. As the crow flies getting here was easy; on the surface routes, unfortunately, this was not always the case with detours and road closings changing sometimes on a daily basis. At times, some of the roads that were open seemed more like back-country rally roads than suburban streets. (The situation has since stabilized with the only entrance to the Observatory via Hillsview Drive off of Bayview. We will be even easier to find when the Town gets around to replacing the Hillsview Drive signs on Bayview. For the moment we have hung a marker on our fence.) One of the groups that came was a group of hearing impaired - fortunately they brought their own signer.

Once here the visitors all seemed to have a good time. While we had the usual easy questions (e.g. "What does the switch marked "DOME LIGHTS" do?" (the obvious is not necessarily untrue)), it is apparent that the public is getting a lot more sophisticated in its knowledge of science. Someone asked how Einstein's General Theory of Relativity explained the regeneration of the short-lived K naught meson in the time evolution of the kaon beam. The question was answered to his satisfaction (not by me, I wasn't even sure what it meant and having been there when it was asked, I'm not even sure he knew what he meant). Most people still preferred to ask their questions in private and in some cases, lengthy discussions followed. As in previous years, members of the R.A.S.C. set up their instruments in the oval in front of the administration building. Their presence contributed greatly to the entire experience.

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Ph.D. Thesis Abstract

The Luminosity Function of Standard Candles in an Inhomogeneous Cosmological Model
by Lee Oattes

The effect of an inhomogeneous cosmology on the past null cone of a typical observer is discussed. This is of particular interest in deciding the limits to which one can hope to do cosmology through the use of optical and other telescopes. The optical scalar equations together with appropriately defined mean driving terms for subsets of observable objects coupled with corresponding probabilities can yield estimates of the scatter of apparent luminosities of standard candles on the observer's past null cone due to lensing. This imposes a limit on the use of standard observations in determining the structure of the universe which is simply due to the "fuzzy" structure of the perceived past null cone. In addition, the nature of the distributions will produce selection effects which can cause significant biases from the strict mean Freidmann-Robertson-Walker results.