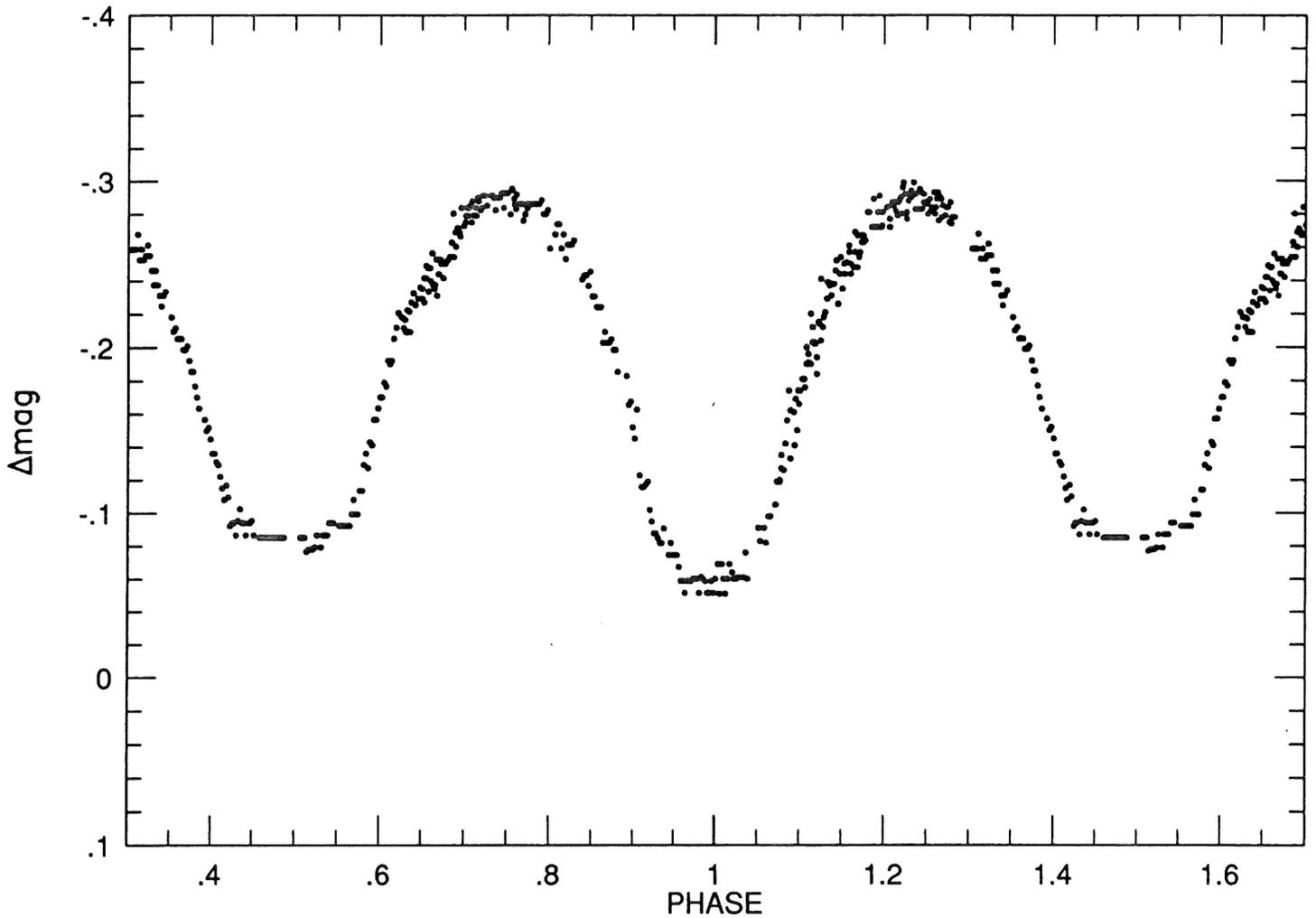


THE DAVID DUNLAP DOINGS

Vol. 22, No. 3 April 15, 1989

AW UMa - January 1989 - 24"/19" telescopes at DDO - Filter R



Our Apologies

Let me offer my most sincere apologies for a simply terrible mix-up that occurred in the last issue of the Doings. Many of you have noticed that Tom Bolton has been walking around these past weeks with an uncharacteristic scowl on his face (I am reminded of a long-gone graduate student of Hindu upbringing, who referred to Tom's uncharacteristic scowl as the "mystical third eye"). You see I was in a bit of a rush to get the issue out and mistranslated some observing initials, Bt, that appeared in an under-the-wire contribution as Tom Bolton. The item in *Potpourri* insinuates that after an observatory tour Tom was kissed by the Uruguayan astronomer, Prof. Gladys Vergara, and her daughter. I fear that Susan Bolton was among our readers of the last issue. Did I put poor Tom in the "doghouse"? Is it true that these women showed their open appreciation to, or rather of (*¡Que Hombre!*), Tom? I am sure other readers know that Tom just does not possess *that* kind of magnetism. Let it be known that Bt is the utterly irresistible Brian Beattie.

For completely unrelated reasons I am resigning immediately from the masthead of the Doings. I have heard rumors that a literary heavyweight, Don Fernie, is being actively recruited as my replacement. He marks his return to these pages with a wonderfully crafted piece on his sabbatical stay in South Africa.

Chris Rogers

THE DAVID DUNLAP DOINGS Vol. 22, No. 3 April 15, 1989 ISSN 0713-5904
Published by the David Dunlap Observatory of the University of Toronto, P.O. Box 360

Richmond Hill, Ontario L4C 4Y6

Editors: Bob Garrison and Chris Rogers

© Governing Council, University of Toronto 1987

CONGRATULATIONS

To Slavek Rucinski, who has been appointed an adjunct professor in our Department. Slavek holds a similar post at York, but his primary affiliation is with ISTS-SAL – he helps us figure all this out in this issue’s lead article!

To Howard Yee, who is the recipient of a Connaught New Staff Grant in the amount of \$10,000 from the University of Toronto. Howard will receive the grant when he begins his position here June 1.

To Peter Leonard, who will take an NSERC post-doc to UBC in September to collaborate with Greg Fahlman on dynamics of globular clusters.

To Alex Fullerton. He has accepted a 2-year postdoctoral position with Stan Owocki of the Bartol Research Institute, University of Delaware, in Newark (DE, not NJ!). Together, they’ll be trying to interpret the numerous observations of stellar wind variability in early-type stars within the context of Owocki, Castor, and Rybicki’s 1-D hydrodynamical simulations of the instabilities inherent to radiatively driven stellar winds. Alex notes that Newark is just a stone’s throw from Goddard and STScI, and expects lots of Toronto traffic....

To Dale Frail for the award of an NSERC postdoc. He plans to spend the summer finishing up his thesis and will take up his new position late in the year. Dale is still undecided as to where he’ll be going but the two places that interest him most are the VLA and the AT (Australian Telescope).

To Chris Rogers who will be taking up a term appointment in the astronomy department at the University of Western Ontario this summer.

COMINGS AND GOINGS

Two new secretaries have joined our downtown offices this past month. We welcome Guddi Gumbhar and Brenda Parkman and hope they man the new “fortifications” for some time to come.

Karl Kamper attended the Fairborn/SAO/IAPPP meeting on “Remote Access Automatic Telescopes” in March. While in Tucson, he also spent a day with Sam Barden at NOAO testing fibers (after his suitcase finally arrived after the engine failure and the emergency landing in the abomination of west Texas, etc.).

Bob Garrison visited W.W. Morgan at Yerkes Observatory for a few days in March, and reports that, at 83, the Master is still as intense and creative as ever, though he needs to rest occasionally. Morgan, Abt, and Garrison are working on a joint project to refine the standards for late-type stars.

Bob is touring the US during April and May as national lecturer for Sigma Xi, the scientific society, and as Shapley Lecturer for the American Astronomical Society. In addition, he is giving colloquia at nearby astronomy departments. Stops will include: Ames, Iowa; Cedar Falls, Iowa; Marquette, Michigan; Detroit, Michigan; East Lansing, Michigan; Providence, Rhode Island; Pittsburgh, Pennsylvania; Potsdam, New York; Denver, Colorado; and Boulder Colorado (whew!).

Louis Noreau gave a colloquium at *Université de Montréal* (in French) on March 23 on Active Galaxies.

John Percy spoke to the RASC Toronto Centre on March 30 on the topic of "Astronomy in the Developing Countries".

POTPOURRI

John Percy has presented several workshops for school teachers on how to implement the new astronomy units in the school science curriculum: to the Peel Board of Education high school teachers on February 17, to a provincial conference of elementary school teachers on March 2, and to two groups of elementary school teachers in the Faculty of Education, York University, on April 4.

The UTSO-Chile CCD will be shipped back to Photometrics for either for replacement of either the coating or the chip, depending on the source of the problem of the bad columns on one side.

The IAU Travelling Telescope, a project carried out by Dieter Bruckner and John Percy and described in the October 15, 1988 issue of the Doings, has been receiving considerable publicity: it was featured in the University of Toronto Bulletin, and the Erindale College newspaper Medium II; John Percy did interviews on the topic for CBC Radio International and Mississauga Cable 10.

ADVENTURER NEEDED

Next summer I'm looking for a pleasant, energetic young man who would like three weeks examining the wilderness east of Georgian Bay. We would fly to Parry Sound, hire a plane for aerial search. Then rent a truck, buy some hip boots and see what things look like on ground. We'll need a surveyors dumpy level and rod for elevation measures. Also an army range finder for distance, plus an accurate compass with sites for direction. I can bring the last two, if necessary. The level and rod can be borrowed locally. We'll need tools such as chain saw, ax, spade, hammer, string, etc. All this can be secured locally. I propose Aug 21 thru Sept 8. Things should have dried out, but still before Autumn rains arrive. Is there someone at NRC who would like this junket?

Grote Reber, General Delivery, Bothwell, Tasmania, Australia 7030

Judith Irwin (Ph.D. 1988), now at NRC-HIA-Ottawa, passed this note on to us (via Dieter Brueckner). Reber wants to build a low frequency array, having the same absolute latitude as another one he has in Hobart, Tasmania. It is suggested that any one adventurous enough to sign on will be working very hard indeed.

From Our Far-Flung Graduates

The famous "KT" has discovered a network link from Korea to Toronto. Don MacRae and Jayanne English are two recipients of KT Kim's electronic missives and share them with us here. First, some background. K-T received his PhD here last year and returned to Korea. There he took up a position with the Seoul National University. The following are our lightly edited excerpts from various communiqués.

Howdeeeeeeeee.....

Well, you might have wondered what's going on with me. I am okay, but have been so busy with my lectures. I am reasonably okay now, Oh, now I remember that you need some news update from me for the DDO doings. The News is that:

KT earns as much money as he has to spend on his travel from one university to another for his heavily laden lectures. So he is not able to make good sum of money for his private future. KT is badly surprised when he was told that one of the big changes made during his absence from Korea is: a good, healthy, and promising bridegroom may ask three keys to his bride's family, if they are rich. One for his good car, other for his new home, and most stunning is the key for his new office (?). No such offer has yet not been made for kt, which makes kt happy but in fact 'confused'.

...I have a total of 17 hours of lectures per week for undergraduates. These lectures will not be given in one University but will be spread all over the country. I mean three different universities, one Seoul National University, another for Kyung-Hee Univ. and the other is for Kong-Ju college. I said I cannot handle those lectures unless I can change the lecture schedule as I want. They said yes so that was it.

My current researches concern:

- 1) the origin of the radio halo in the Coma cluster of galaxies
- 2) CO observations of Dark clouds (with the Dae-Duk telescope)
- 3) Some wish-washy theories for the origin of the Galactic spur
- 4) and, how to teach Astronomy easy...."Your wish is my Command".

KT also says he has gained 10 lbs in 2 months due to his parents good care. He is living at home and there is no place close by to jog which would be his way to control his weight. He mentioned that Koreans spend 20% of their income on alcohol and consider drinking part of their job. Note however that he didn't include that in his job description above. The winter in Korea has been warm with unusually heavy snow-fall in the mountains. The high water-vapour content of the atmosphere has held up his planned CO observations at Dae-Duk.

To reach KT by e-mail try *kt* < JJHYUN@KRSNUCC1 >. His address is Seoul National University, College of Natural Sciences, Department of Astronomy, Seoul 151, Korea.

ISTS – SAL – and Other New Astronomy Institutes

by Slavek Rucinski

In September last year I left the hospitable DDO (in December 1984, after emigration to Canada, I found shelter and good employment at DDO/DA UofT for almost 4 years) and moved to a new institute recently formed in Toronto: Institute for Space and Terrestrial Science, or ISTS for short. ISTS is supported directly by the Province of Ontario and does **not** belong to any university. However, it is distributed partly on, partly close to the York University campus and many members and employees of ISTS are simultaneously professors or adjunct professors at York. In fact, Nancy Evans (who also moved from UofT to ISTS) and myself have been very quickly included among the York adjunct profs ranks. This will give us the privilege of lecturing at York, having grad students from there, etc. There are also links of ISTS with UofT (Aerospace Inst.), Western, Waterloo and Humber College.

ISTS is a relatively big institute: it has 11 laboratories and employs over one hundred people. Our own workplace, called Space Astrophysics Laboratory (SAL in the title), may be considered quite typical, at least in terms of the number of employed people. There are laboratories like Space Geodynamics Lab. (our nearest neighbour, comprised basically radio-astronomers, now concentrating on the RadioAstron mission), Atmospheric Space Physics, and even Human Performance in Space. Frankly, I don't know even the names of all these laboratories. I know that they exist somewhere within about a 3 – 4 km range around York, that they have directors who come to meetings, that they have their own problems with buildings, furniture, lack of money – the usual stuff. So, lets forget about other labs and concentrate on ours.

SAL is located to the north of the York University campus, in a commercially rented accommodation that we share with the Space Geodynamics Laboratory. Our address is: 2700 Steeles Ave. W., about 1 km West of the Keele/Steeles intersection. It is a very characteristic building with much green colour in its walls, windows, etc. Another characteristic sign: a good Italian bakery just underneath us!

Our director is John Caldwell, a well-known planetary astronomer with many ongoing projects, including guaranteed time on HST. John directs 3 projects: Space Astronomy, Laboratory Astrophysics and Planetary Atmospheres. The small group of people at SAL is thus sub-divided and each of us is attached to one project. Nancy Evans and the undersigned are in the first of the above projects: our mandate is to keep on working on space-astronomy projects but also to actively stimulate any Canadian (industrial) participation in space missions. One of our associates is Cliff Anger, manufacturer of a CCD for Canadian/international geophysics satellites and also a strong participant in the Galileo mission. We try to follow developments with the Lyman (aka FUSE), Spektrum X/Gamma, Soviet UV satellite, EUVE, ISO, etc. In the meantime, we try to use the IUE, the IRAS database or ground based facilities, like CFHT or VLA.

I know rather little about other projects at SAL. The Laboratory Astrophysics project will use experimental facilities at York and UofT to measure molecular properties of CH_4 and C_2H_2 whereas the planetary group is very deeply involved in the Galileo mission. Actually, thanks to this mission we have been furnished by NASA with a powerful Sun-4/280 file server (32 M memory, 1.8 G disks). We have two Sun-4/110 workstations attached to the server and quite a lot of activity is already concentrated on image-processing with this system. IRAF is used to analyse planetary images whereas Sun-IDL is becoming increasingly popular for everyday work (IDL fans beware: it is different from the VAX version!). DAOPHOT is the primary tool to analyse hundreds of CCD images of young clusters that I took at Las Campanas last year in an attempt to find spotted variables there (the attempt has been successful!). We are also installing the new Sun-AIPS in an anticipation that any of our VLA proposals will get time.

It is easy to count us at SAL-ISTS: in addition to our director and the two stellar astronomers, the complement consists of Cindy Cunningham and Rick Wagener (planets), Andrzej Udalski (PDF – see another note in this issue), David Anthony (computer manager), Paul Barker (shared with York, stellar) and Paul Delaney (also shared with York, stellar). We try to be open to the outside and we very warmly invite visitors. An especially good time would be a Friday afternoon: every second Friday we have a colloquium. The enclosed current schedule should give you some idea about these colloquia.

Let me know if you would like to learn more about our laboratory. My e-mail address is still MAIA::Rucinski but I have also a couple of new addresses: rucinski@nereid.ists.ca and FS300516@YUSOL.BITNET

AWJ and All Those Guys

by Don Fernie

I must say I was very put out at Toronto's recent mild winter. When, after nearly thirty years, one finally gets to escape a winter one wants to rest happy in the knowledge they're having an absolute stinker of a winter back home, not getting a tan on the back stoop in January!

I shouldn't complain, though. Yvonne and I enjoyed three months of almost literally cloudless skies (there was just a day or two of rain) and pleasant summer temperatures at what Sir Francis Drake called the fairest cape in the whole circumference of the Globe.

The observatory wasn't bad either. Set on some 25 acres between two rivers in the suburbs of Cape Town, its 170 years of history mingle with up-to-date modernity. While you may sit in an office whose polished woodwork dates to 1820, a glance out the window reveals the new workshop complex (about eleven volleyball courts in area, by my keen reckoning) in which labour the CCD and fibre-optic and computer-aided-everything experts and all those guys. A tour of the facilities leaves one gaping and green with envy.

Although old telescope domes dot the site, it is now but the headquarters for the main observing facilities in the desert 400 km up-country. Nothing new is brought to the old telescopes, but they are kept in good working order because on almost any clear night one may espy a familiar, elderly figure striding the grounds, deciding whether to use the 24-inch refrac tor or the 18-inch reflector for the night's photometry. Well may the alternatives be pondered. The 24-inch, dating to 1896, has a sector drive that requires shut-down and re-winding every few hours, while the 18-inch is mounted on the same mounting that once bore Sir David Gill's heliometer a hundred years ago.

Charming you might think, but the charm fades considerably as the observer discovers he must set declinations by squinting in a engraved silver circles calibrated in south polar distance. But the elderly observer is unfazed. His unrefrigerated photometer may have seen better days, the dc amplifier of his own design has been around untold years, and the battered Brown strip-chart recorder is a museum piece, but Dr Cousins is happy. He does, after all, do the best photometry in the world.

I've known A.W.J. Cousins for some thirty-five years now, but I still haven't any idea what the AWJ stand for. I've always been Fernie to him and he Dr Cousins to me. He's getting on a bit these days. A younger colleague of his told me they were recently discussing travel by ship, and Cousins remarked "Ah, yes. The last time I travelled by ship was during the war. Early on, you know, before the U-boat menace became serious." "Really?" said his companion, "I thought the U-boats were a menace almost from the start of the war." "No, no," replied Cousins, "they only really got going around 1916."

He is, in fact, 84 years old and lives by himself in one of the several staff houses on the observatory grounds. Long since retired officially, of course, he nevertheless comes in virtually every day to occupy a tiny office in a remote corner of the observatory's main building, where, plastic ruler in hand, he pours diligently over his strip-charts in hot pursuit of the last millimag residual. It's best not to ask how things are going.

An electrical engineer without formal astronomy training, Cousins was recruited to what was then the Royal Cape Observatory back in medieval times when photo-electric photometry was the coming thing. Around 1950. No doubt His Majesty's Astronomer to the Cape little realized then that this reserved, shy, unassuming man would eventually outlast them all in terms of having a name known everywhere in the astronomical world. Today, HMA long-gone, Cousins soldiers on. We drank tea together most mornings, solemnly and with due reserve discussing the glories of Hamamatsu photomultipliers, agreeing on the demerits of dc inte grators, and at times even touching on synthetic photometry. For Cousins, though not a computer man himself, occasionally prevails upon his young colleagues to produce calculations elucidating the mysteries of transformation equations. And then, of a clear evening, back to the telescope, muttering imprecations at the lights of the soccer stadium a half-kilometre off.

One day I'm going to screw up courage and ask him what AWJ stands for.

My Experience with the 24"/19" Telescope System at DDO

by Andrzej Udalski (York University)

I should state at the beginning that I am primarily a photometric observer of cataclysmic variables (CV) and spotted stars, with experience with smaller telescopes. When I started in November last year my PDF at York, working with Slavek Rucinski, I started looking for something in this category in the surroundings of present place of employment. And indeed, I was told that a virtually unused system is waiting for me at DDO. This lucky circumstance was due to the temporary absence of Dr. Fernie who is the main (some would say sole) user of the system. Thus, the the telescopes were exclusively for my own use.

At first I was a bit concerned about the brightness of the sky at DDO, non-photometric weather, etc. However, I very quickly realized that the system's background elimination works indeed extremely well and that the differential character of observations with two independent telescopes virtually eliminates rapid changes in transparency. Part of the light curve of AW UMa, a relatively neglected contact binary (in spite of its brightness, $V \simeq 6.8 - 7.1$, and an extreme mass ratio, $q = 0.08$), presented on the cover, was obtained during moderately non-photometric conditions.

I am very much impressed by the quality of observations obtained with the photometric system at DDO. I think that with 20 – 30 second integrations, one should be able to observe stars down to about $V \simeq 11$ with accuracy comparable that achieved for AW UMa, i.e. better than 0.010 mag. I tried to observe even fainter stars in the so called "white light", i.e. without any filter. In this case, reasonable S/N ratio was achieved even for stars as faint as 12.5 – 13 mag. To my surprise, in spite of the considerable sky brightness, I was able to locate and point the telescope to such faint stars without any trouble.

Observations of AW UMa were obtained mainly to test the system. Now, I would like to continue my older programs – photometry of CV. Although the CV are usually faint (the brightest on the northern hemisphere – TT Ari is $V \simeq 10.5$), many of them undergo outbursts during which they reach even 9 – 10 mag. Since such phenomena are unpredictable and last only a few days, outbursts of the CV are observed very rarely.

In particular I am most interested in observing of a small group of dwarf novae called SU UMa type. Apart from the normal outbursts lasting 1 – 3 days, those stars exhibit longer (up to 14 days) and brighter eruptions (about 0.5 – 1 mag) called superoutbursts. Unfortunately, those eruptions are also more rare – typically one per several hundred days. The more distinctive feature of the superoutbursts are periodic light variations with an amplitude of up to 0.3 mag – called superhumps. The period of recurrence of superhumps is always ultra-short – below 125 minutes and is several percent longer than the orbital period of the system. What could be better then for small telescopes located in such a climate as the DDO? One clear night gives 3 – 4 full cycles of superhumps!!!

The outbursts and superoutbursts of dwarf novae and SU UMa candidates are almost always detected first by amateur astronomers, mainly from the AAVSO. Usually, they inform the IAU Telegrams Bureau. Therefore my hunting for eruptions begins with checking of the new IAU telegrams. Unfortunately, my first attempt was completely unsuccessful. An almost unobserved SU UMa candidate – CY UMa, erupted on March 28/29, reaching $V \simeq 12.2$ (IAU Tel. no. 4763). The first clear night came four days later – on April 1/2. I very carefully examined the surroundings of CY UMa but I did not find the star. If it were superoutburst, I am sure, CY UMa would be visible. So, probably it was an ordinary short eruption. Maybe this was after all for better because clouds covered the sky very soon and I could not observe CY UMa properly anyway. I am waiting then for the next outbursts and superoutbursts of other CV's.

**ASTRONOMY COLLOQUIA
AT SPACE ASTROPHYSICS LABORATORY
INSTITUTE FOR SPACE AND TERRESTRIAL SCIENCE
SAL – ISTS**

Our colloquia are open to all astronomers, at SAL-ISTS, York or UofT, and to all interested personnel of ISTS, and are quite flexible in format. They take place at bi-weekly intervals, on Fridays at 3 PM, at the Space Astrophysics Laboratory which is located at 2700 Steeles Ave.W., about 1 km West of Keele (right above the Italian Bakery).

We have the following schedule for March–May 1989:

March 17, 1989, Cindy Cunningham (SAL), “The Galileo project”

March 31, 1989, E. R. Seaquist (UofT) “Symbiotic stars, as seen in the radio wavelengths”

April 14, 1989, Paul Barker (SAL and York), “Magnetic fields in early-type stars”

April 28, 1989, Mike De Robertis (York), “The extra-galactic distance scale”

May 12, 1989, Dimitar Sasselov (UofT), “Maxwell Telescope mapping of the proto-stellar core ρ Oph B in the mm-transitions of H_2CO ”

May 26, 1989, Doug Whittet (York/CITA), “Properties of the interstellar dust”

**PREPRINTS BY FACULTY AND STUDENTS
RECEIVED IN THE ASTRONOMY LIBRARY**

January 27 to April 7 1989

Carlberg, R.G.; Hartwick, F.D.A. Sinking satellites and the halo velocity ellipsoid. DDO/U of T. 89-0314. 7 April 89

Carlberg, R.G. Quasar evolution via galaxy mergers. DDO/U of T. 89-0313. 7 April 89

Cummins, Marlene. An observatory publications reclassification project. DDO/U of T. 89-0292. 29 March 89

Evans, Nancy Ramage; Percy, John R. On the variability of 27 Cygni. DDO/U of T. 89-0310. 6 April 89

Fieldus, Michael S.; Lester, John B.; Rogers, Chris. A program for spherically extended line blanketed model atmospheres. DDO/U of T. 89-0271. 17 March 89

Hogg, Helen Sawyer. Memories of the Plaskett era of the Dominion Astrophysical Observatory, 1931-1934. DDO/U of T. 89-0205. 28 Feb 89

Seaquist, E.R.; Bode, M.F.; Frail, D.A.; Roberts, J.A.; Evans, A.; Albinson, J.S. A detailed study of the remnant of nova GK Persei and its environs. DDO/U of T. 89-0161. 20 Feb 89

Zhan, Yin*; Koo, David C.; Kron, Richard G. A multicolor optical survey of QSOs to B 21.8 in the Hercules field. STScI/DDO/U of T* 89-0257. 13 March 89