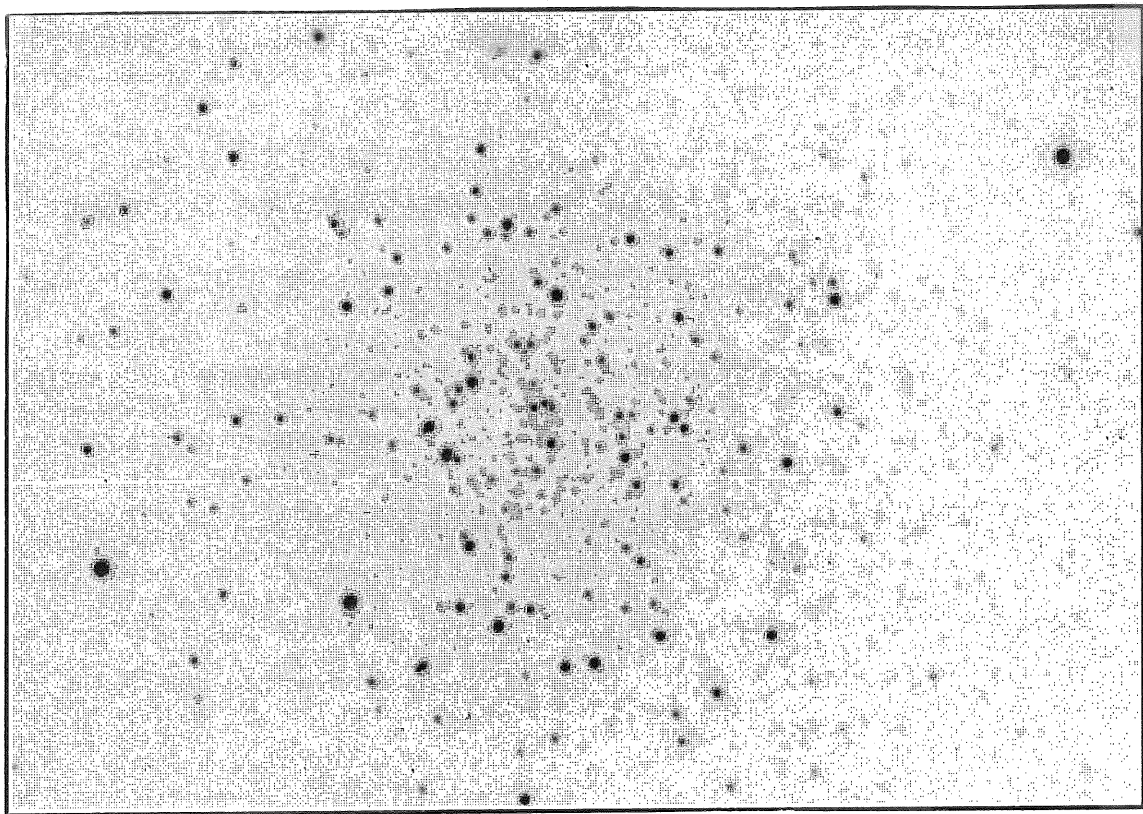


THE DAVID DUNLAP DOINGS



CCD frame of the cluster NGC 7492 displayed using the new gray-scale program developed by Patricio Ortiz. (Story, p. 4).

EDITORIAL

This being the first issue of the 1988/89 academic year, it is appropriate that it is full of new information about developments over the summer. That the number of pages is large bodes well for the health of the department.

Our covers can be a good public relations vehicle. Phil Kronberg's spectacular picture of the Crab Nebula caught the attention of the editors of the Staff Bulletin. They called Phil for an interview, which resulted in a nice story in the Bulletin. With much better reproduction facilities, they were able to capture more of the gray scale of the original "graph" or "photo"... What do we call these things, anyway?

I suppose we can call them "images", but are they really? They are visual representations of what used to be represented by contour maps. The radio astronomers are stealing the optical astronomers' medium! Visual pattern recognition seems to be alive and well in radio astronomy, at least for PR purposes.

The medium is the message! Gone are the days when perfectionists like W.W. Morgan would refuse to allow dodging of the center of M31 to keep it from being burned out in reproduction. Now, we will go to any lengths to produce a good-looking picture; never mind if it is far removed from reality (in energy of the electromagnetic radiation, especially). This is PR gone wild, but is it dishonest or is it a good way to get a message across?

We seem to need to justify ourselves more and more these days, which is probably good in some ways, but it does get out of hand sometimes. It is interesting that radio astronomers have learned the value of photographs, while optical astronomers are producing CCD images which often resemble contour maps more than pictures! We optical astronomers need to take lessons on how to spruce up our image! The question remains; how far can we go without being dishonest?

This issue's cover story is by Patricio Ortiz, our graduate student from Chile. It is a CCD image of NGC 7492 taken with a visual filter, so at the photons were "optical."

CONGRATULATIONS

Barry Sloan has been awarded the 1988 Gold Medal of the Royal Astronomical Society of Canada. This year, for the first time, the medal is awarded by the Toronto Centre of the RASC, rather than by the society as a whole. The Toronto Centre plans to present the medal at its Annual Awards Banquet later in the fall.

Dave Blyth and Frank McDonald have retired from DDO. See Don MacRae's article for more about Dave and Frank and their plans.

COMINGS AND GOINGS

Dieter Brueckner and John Percy attended IAU Colloquium #105: The Teaching of Astronomy, at Williams College in Massachusetts, from July 27 to 30. They exhibited the "travelling telescope" described elsewhere in this issue. Dieter also co-authored a paper about the CASCA program of collecting unused astronomical books and journals for shipment to countries which have need of them. John was chair of the Scientific Organizing Committee of the Colloquium. He and Jay Pasachoff are editing the Proceedings for Cambridge University Press. The Colloquium was attended by 165 astronomy educators from 31 countries, who enjoyed a full and diverse program of papers and discussions (formal and informal) in the pleasant setting of the Berkshire Mountains.

John Percy attended the IAU General Assembly in Baltimore, where he again exhibited the "travelling telescope" - which attracted much attention from individuals and the media. He was elected Vice-President of IAU Commission 27 (Variable Stars), and continues to serve on the Organizing Committee of IAU Commission 46 (Teaching of Astronomy) as Editor of its Newsletter, and Co-ordinator of the Travelling Telescope project.

Huib Henrichs (University of Amsterdam) visited the Department August 8-10 to collaborate with Alex Fullerton and Tom Bolton on a joint optical/UV study of O-star variability.

Dimitar Sasselov and Alex Fullerton attended IAU Colloquium #113, "The Physics of Luminous Blue Variables", hosted by the Université de Montréal at Val Morin, PQ, August 14-19.

Nancy Evans attended IAU Colloquium #111 on Stellar Pulsation in Lincoln Nebraska. She was a contributor to three papers: "Forthcoming Cepheid Database", J. D. Fernie and N. R. Evans, "S Sge: A Cepheid Triple System", N. R. Evans, M. H. Slovak, and D. L. Welch; and "The Binary Cepheid S Sge Revisited", M. H. Slovak, T. G. Barnes, N. R. Evans, D. L. Welch, and T. J. Moffett. This was followed immediately by an observing run at IUE involving two programs, the temperature of δ Cep (with T. Teays) and the first of a series of observations of the eclipsing supergiant system, BM Cas. These observations are to be analysed in connection with DDO observations by J. D. Fernie and S. Mochnecki. This final month seems to be a fitting way to end two pleasant years back at the University of Toronto. As of Sept. 1, she started work at the Institute for Space and Terrestrial Sciences at York University (BITNET address: FS300515@YUSOL).

Slavek Rucinski and Marshall McCall also started work at York University in September.

Don Fernie and Bob Garrison attended IAU Colloquium #106, The Evolution of Peculiar Red Giant Stars, held at Indiana University, Bloomington.

Bob Garrison attended the IAU meeting in Baltimore, where he completed his 3-year term as President of Commission 45: Stellar Classification. He organized the business meeting and two scientific meetings: "Automatic Spectral Classification" and "Classification using Digital Detectors".

Several others attended parts of the IAU meeting, but the editors don't remember all the names. (Hint, hint; please let us know of your comings and goings.)

Co-editor Chris Rogers is observing with the JCMT and reports from the summit that the sky is clear (at 800 microns) and the data is just pouring in. Then he is off to the International Symposium on Submillimeter Astronomy across the island in Kona.

POTPOURRI

John Percy has been elected Honorary President of the Science Teachers' Association of Ontario, ostensibly to recognize his years of activity in school liaison; (the fact that the Past President of the association is his brother-in-law is probably coincidental). His first duties were to address the STAO Board of Directors on September 22, and - as part of a STAO delegation - to help make a submission to the Select Committee of the Ontario legislature which is examining the province's educational system. John and Bob Garrison will be giving several presentations at the annual conference of STAO early in November. Most of STAO's 2300 members are secondary school science teachers, but interested university people are welcome to join. See John for information.

OBITUARY

by Don Fernie

Jean Petrie called from Victoria recently to say that Joseph Pearce died September 8th. He must have been something like 95 years old. Pearce was born in Ontario and earned a degree at U of T; in fact, as I recall, he held some kind of junior position here shortly after World War I. He later moved to DAO, where he was director through the 1940s. Historically, he was one of the best-known of all Canadian astronomers, principally through his work in 1930 with Plaskett. Their monumental work on the radial velocities of OB stars provided the first — certainly the most important — confirmation of Oort's earlier hypothesis of differential galactic rotation.

OUR COVER
Gray-Scale Pictures from CCD-Frames
 by Patricio F. Ortiz

This is an announcement to all the users of the CCD in Las Campanas (UTSO) or any other CCD's. Up to now, we haven't had the code to generate gray-scale images of our frames in Toronto. As a personal need, I developed a program to do that in my "spare time" (that's maybe why it took me more than a year to come up with something fast and which doesn't use too much disk space). My attempts to use PGLOT were frustrated by the size of the output files that I was getting; as a last attempt I decided to use imPRESS, which is the language that the laser-printer understands. It took me a while to get it to work because of the hidden tricks that I had to learn, and several difficulties which I found working from the VAXen. Finally, using the UNIX machines made things quite easy (in comparison to the VAXen), and now the program is working quite well. The routine is able to read two formats now, FITS and TYB; in the future I'm planning to make it recognize DST files (the output from DAOPHOT). What the program essentially does is to take the size of the frame, get an optimal scaling factor to determine the number of gray-scale levels, scale the picture accordingly, encode the picture, and send it to a printable file (sounds easy now!). One is required to tell the program a few things: the filename :-), the lower and higher cutoff, and the kind of scaling that is desired; at this point the choices are linear, logarithmic and exponential. Logarithmic scale is quite useful to enhance the low intensity areas of an image, exponential scale enhances the high intensity areas (its usefulness is still to be determined!). The number of gray-scale levels implemented as of now are: 17, 65, 26, 10. some intermediate numbers might be available in the future (if I have time to do it). This program is available to anyone willing to use it; see me to get started. I'd like to thank D. Frail, R. Millner (SYSRUTH), and B. Glendenning for some very helpful suggestions.

So long Dave, So long Frank
 By Donald A. MacRae

This year the Observatory has to manage without two long-time colleagues. David Edward Blyth (that's Dave) retired last March 24, and Francis McDonald (that's Frank) on June 30. Both of them came to DDO in the mid-sixties, out of the blue.

"Do you require an experienced engineering technician?", asked the man on the telephone from Citizenship and Immigration in October 1966. Why, yes, was the surprised reply. It was just when we were making some rather ambitious plans for the future. When we heard more about Dave's experience, we could hardly believe our good fortune. Mainly it was that he had been engaged for four years in making photometers, spectrographs, and "a host of other experimental devices and instruments" at the Royal Observatory, Edinburgh.

There was much weeping and wailing at ROE when Dave decided to emigrate, and we can understand why. Dave's professionalism set new standards for construction, appearance and performance in the output of the DDO workshop. Spectrographs: Dave has probably made more of them than any man alive — six in all for rG, scattered and used around the world from Chile to Mexico to Hawaii, in addition to DDO and downtown on campus. Photometers: a total of four for Fe, each an improvement on the last. Dave made his own layout and drawings, relying only on general specifications and on-going discussions - another of his traits that made him so

valuable to us. His skill and quiet dedication were major factors in the expansion of activities at DDO in the last two decades. We owe Dave our sincere thanks and extend to him and Margaret our best wishes for a happy retirement in their new home in Stroud, up Highway 11 a piece.

In Frank's case, the Director had nothing at all to do with his selection as caretaker. He just showed up one day in 1965 and started to work. This was because, unlike everyone else, he "reported" to Physical Plant. Such an end-run around the Director could have serious consequences to the prestige of the Observatory — after all, how could one be sure that the new man could at least perform adequately on the volleyball court? *

Contrary to what was implied above, the DDO caretaker is actually a member of the Arts and Science staff like the rest of us. Reason: he receives a small but specific stipend from our A&S budget for helping out with our visitors on Saturday nights. Surely then, this qualifies Frank to be elevated to the rank of "Caretaker Emeritus!".

As it turned out, Frank was caretaker *par excellence*. In the words of the immediate past director, he developed great skills in protecting us from distractions and annoyances such as recalcitrant snowplow operators, garbage collectors, people who wander in on weekends, grass cutters, etc. As for me, I always got a lift when Frank came regularly at 5:00:00 PM to empty my wastebasket of the good-riddance remnants of the day's chores. But of course that was only a minor part of his duties; mostly unseen, Frank did much more for us, keeping the Observatory in good condition at all times. Good natured, friendly, and cheerful, Frank was greatly liked by everyone around.

The McDonalds were the first to occupy the Gate House at DDO. Our best wishes now go to Frank and Mary in their new condominium, over near the Richmond Hill GO-station.

* [Ed note: Both Dave and Frank played volleyball right up to the moment of retirement, and played very well indeed. If we keep losing our best volleyball players at such a rate, how can we expect to keep beating the students at the picnic year after year?]

The Travelling Telescope by Dieter Brueckner and John Percy

The "travelling telescope" is a small, fully-instrumented telescope whose purpose is to provide astronomers, teachers and students in the (astronomically) developing countries with practical training and experience in observational astronomy. The concept of the travelling telescope was developed in 1984 by Derek McNally and Richard West of the IAU. Thanks to the "UCAP" grant program of the Canadian Commission for UNESCO and the Canadian International Development Agency, we have been able to purchase a Celestron 8" telescope, OPTEC solid-state photometer, Optomechanics Research Inc. slit spectrograph, camera, power supply, accessories, spare parts, and books. Other instruments (such as a microcomputer and a CCD electronic camera) can be added at a later time. We have also prepared instruction manuals for the use of the telescope and instruments, and outlines of teaching and research projects which it could carry out. Much of the testing of the telescope, and the development of projects was done by summer student James DiFrancesco, supported by the federal government's Challenge '88 program.

We expect the travelling telescope to be ready for its first assignment by the end of 1988. The telescope will be "owned" by the International Astronomical Union, and IAU Commission 46 will be responsible for deciding upon its itinerary and use. It will be used primarily in conjunction with existing programs of the International Astronomical Union (IAU) in the developing world: the Visiting Lecturers Program (which sends a series of lecturers into target countries for periods of weeks or months), and the International Schools for Young Astronomers (intensive three-week schools for groups of 30 to 40 young astronomers, held every year or two in different parts of the world).

Further contributions of funds, additional equipment, and ideas for research projects would be gratefully received.

Fibre-linked Spectroscopy at DDO

by Brian Beattie and Karl Kamper

The DDO has recently increased the number of instruments available for use on the 1.88m telescope with the construction of a fibre-fed, photon-counting spectrometer (PCS). The fibres feed the light from the telescope to a new pseudo-coudé room in the dome. This fibre-optic link will play an important part in future instrumentation development at DDO; the four fibres currently installed can be used for a variety of different instrument configurations. The PCS is only one of the instruments that will be in use on the optical table of the new room. Others include a naked Reticon detector on a high-dispersion Echelle spectrograph.

The intensified Reticon detection system of the PCS is based on a successful design from the Centre for Astrophysics, but several interesting modifications have been incorporated into the DDO instrument. With this instrument it will be possible to profitably study stars as faint as 13th magnitude. Radial velocities have been obtained to an accuracy of $\pm 1 \text{ km s}^{-1}$ at a reciprocal dispersion of 11 \AA mm^{-1} . The fibres will also permit sky subtraction with the simultaneous detection of the object and the sky. The electronics incorporate a digital encoding scheme for fast data transmission, with a serial connection to the host computer.

The construction of a temperature-controlled room to house spectrograph optics is particularly useful for the PCS, because it allows the heavy thermoelectric-cooling system to be mounted off the telescope. At the telescope, the fibres are mounted in guide heads where formerly interchangeable collimators were located in the Cassegrain focus spectrograph. The light is put through a focal-ratio adapter, thus permitting the existing TV-camera guider on the Cassagrain spectrograph to be used. The fibres lead to the pseudo-coudé room where the light passes through two image slicers designed by Harvey Richardson at DAO and then to the Reticon detector.

The fibre-fed PCS has been in use for six months, and it has largely performed as expected. Additional work will be carried out to bring the system to its optimal level. Further, work is underway that will improve the seeing conditions of the dome. The innovative instrumentation that is being used with the 1.88m telescope will enable the DDO to continue its contributions to astronomy for years to come.

Saturday Evening Happenings

by Ron Lyons

The summer tour program concluded October 1 with over 2400 people visiting the Observatory on 19 Saturday evenings. This is less than usual because the dome was under repair for an extended period.

During the summer some work was carried out on the dome wheels under the shutters. A section of the rail was cut out and the wheels removed, repaired and replaced one at a time. While each wheel was out, the dome remained stationary, supported by jacks in the weakened area. Because we did not want to move the dome unnecessarily, the tours during the period of the maintenance work were cancelled. However, the University's reluctance to give the OK to proceed (because the government hadn't actually given us the money promised) and the contractor's later reluctance to give us a firm starting date resulted in a lot of uncertainty as to when we should stop booking people for the tours. Initially, based on the contractor's time estimates, we expected to be closed for 6-8 weeks but he later indicated 3 weeks would be required. Since this type of maintenance work had never been done before no one was quite sure what sort of problems would arise. We did not set a date for the resumption of the tours until work was well underway. The first few wheels went quickly so we set the date and started taking reservations albeit with some caution. Naturally all the serious complications happened after this and the work was completed the Friday before the tours restarted. Our lowest nightly attendances were in the weeks just prior to shut down and the weeks just after we reopened. The lowest attendance for one evening was 72 people.

In spite of relatively poor weather, about 90 people came out to the annual tour for the Toronto RASC. This was the first tour for many. One of the highlights was the "beam-me-up-Scotty" revolving door between the 74" control room and the new instrument room. Refreshments were served.

Late in the season, a surprisingly clear night (the weather forecast had been for clouds) and massive publicity about Mars resulted in a tremendous turnout (much of it unreserved). According to Archie, it was just like a Richmond Hill Open House with people arriving on foot and in cars throughout the evening. A number of teens showed up because they had heard that there was a party at the Observatory. Our highest attendance was recorded this night - 197 people checked in at the desk. From all reports, however, many people never registered at the desk. Fortunately, the RASC was out in force and there were no problems handling the crowd.

Many thanks to the stalwart crew who helped out on this year's program: Brian Beattie, Dieter Brueckner, Mike Fieldus, Brian Glendenning, Ron Lyons, Mark Neeser, Patricio Ortiz, Archie Ridder, Ian Short, Dorian Simos, Barry Sloan, Rob Straker, Pavel Thommee, Mike Wong and Andrew Yee. Special thanks to the secretaries, especially Florence Unwin, who handled all the reservations. Thanks also to the Toronto RASC members who helped out.

The International Space University by Dan Blanchard

This past summer, I attended the inaugural session of the International Space University held at MIT from 20 June to 21 August, 1988. Over 100 graduate students from 21 countries, including the Soviet Union, China, Japan, United States, *et cetera* attended. Over the course of eight weeks, we attended over 240 hours of lectures in eight fields of study: space sciences, space engineering, architecture, business and management, space life sciences, policy and law, resources and manufacturing, and finally, satellite applications. In addition, we spent another 280 hours on a detailed lunar-base design as a class project. Everyone was required to attend the lectures in all areas of study; however, students chose a specialty for the design project work. I personally was involved in deciding what kinds of basic science could be done on the lunar surface. By far, the majority of the projects the basic-science team worked on were astronomy-related experiments and facilities.

Lunar-base designs have been considered and even published before. What made ours unique was the international and multi-disciplinary composition of our design teams. We took our design beyond engineering considerations and included proposed international treaties and agreements as well as a business plan that will make such a base self-supporting in a couple of decades. NASA and Soviet space concerns have already shown an interest in obtaining copies of the final report, once it has been through the final editing stages.

The curriculum makes for a lot of work, and because of the short duration of the course, we faced many deadlines. We were often under quite a bit of pressure, so we needed to blow off steam once in a while. The Canadian contingent found what turned out to be the most popular way of accomplishing this: sponsor an intercultural event (a party). We had our party on Canada day, and it was so successful that over the course of the summer, many other delegations did the same thing. In this way, we learned about other cultures, as well as taking a much needed break from the regular, hectic curriculum.

The ISU has big plans for the future. Because of the unqualified success of the inaugural session, there will be little problem in securing the funding for future sessions. Next year it will be held in Europe (possibly Toulouse, France) followed, hopefully, by Moscow in 1990. Canada is making a strong bid to host the 1991 session, though we will have to compete with China. Japan already has 1992 locked up. After this, ISU intends to expand to a two-year Master's program with a permanent site to be determined.

On the whole, this summer was one of the most satisfying and enjoyable I have ever experienced. I would strongly encourage anyone who is interested to apply for one of the future sessions. It is a lot of work, a lot of fun, and certainly a worthwhile experience.