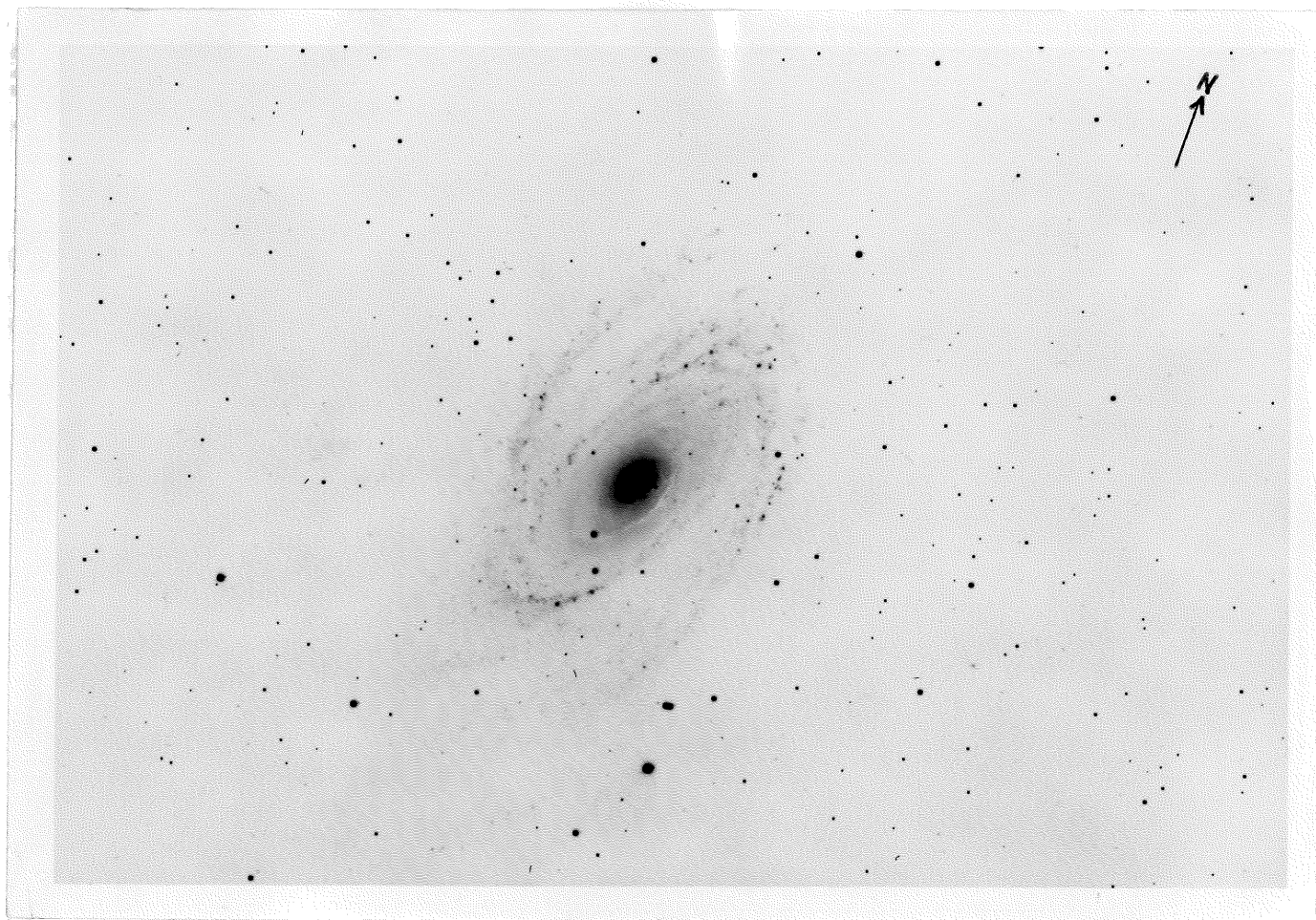


THE DAVID DUNLAP DOINGS

Vol. 13, No. 4 June 20, 1980

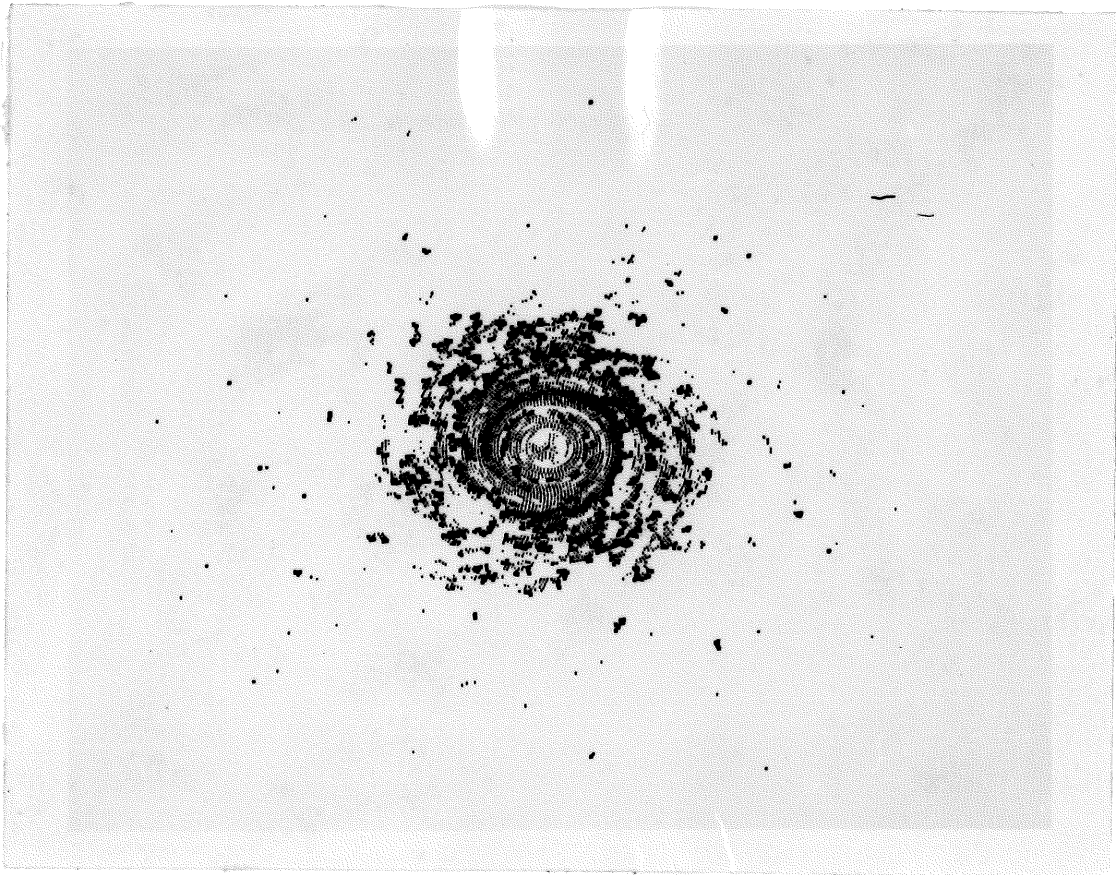


M81 as seen by the CFHT

(see p. 2)

The cover photograph is from an ultraviolet exposure of M81 obtained by Barry Madore and Wendy Freedman using the Canada-France-Hawaii Telescope in May of this year. This was the first of a series of ultraviolet plates of nearby resolved galaxies, part of a programme aimed at studying the systematics of star formation in late-type spirals. Detailed correlations with the gas distribution are underway and these data will be incorporated into the galaxy simulation programme written by Wendy and now working on the VAX computer downtown.

An example of one of Wendy's model galaxy "photographs" appears below. In it the gaseous and stellar evolution has been followed with 7×10^4 cells differentially rotating in a galaxy for 5×10^8 years. We are looking at it at an inclination of 57 degrees.



THE VIEW FROM THE TOP

Wendy Freedman was the first woman astronomer to use the CFHT

Early this May, my supervisor Barry Madore and I set out for the volcanic mountain of Mauna Kea in Hawaii, prepared for a 3-night observing run at the CFHT. Hawaii may be a tropical location but at the 14,000-foot level it is always cold. At the airport I remember hoping that no customs officer would rummage through my carefully packed things, so that I would not have to explain why I was carrying a pair of winter boots, woollen mittens and a ski jacket next to my sandals and tee shirts ("Sure, you're bound for Hawaii!")

There are three airports served from Honolulu on the big island of Hawaii; it so happened that we landed in Hilo which is on the north-east side of the island. Hilo is furthest from the CFHT headquarters, but among its attractions, it boasts of earthquake generated tidal-waves (called tsunamis, so as not to scare away tourists), and as one of the Hawaiian residents informed us, "It rains a lot". Ten feet of rain had fallen since January, six of it in one storm. The home of the CFHT headquarters, Waimea, (called Kamuela so as not to confuse it in tourists' minds with the half-dozen other Waimeas in Hawaii) is not much better off. As we were further informed, "The sun had not come out for two months." However, the weather can't be as monotonous as it sounds. Apparently the rain is so varied on the island that there are 13 different names for the different types! We only saw five, fortunately of course all at sea level.

It is CFHT policy that no observer be allowed on the telescope unless they have acclimatized to the altitude, having spent at least 24 hours at the 9000-foot level (where the base camp Hale Pohaku is situated). We were advised upon arriving, however, that the sooner we made the trek up, the better, because it seemed that many people were experiencing discomfort and ill effects. Short-term memory loss, headaches, and sleeplessness are said to be quite common. We thus began our ascent two days before our actual run, but not before hearing stories about the condition of the unpaved, unguarded road to the top.

The mid-level camp itself is quite nice - the staff is friendly and the food is good. One night they even served seafood - King Crab claws! In addition to the dining hall, which houses the television and pool table, there are two dormitories and a library.

The CFH telescope dome is situated on the second highest point of Mauna Kea. There are five floors in the dome where various dark rooms, equipment rooms, etc. are located (Oh yes, and a 3.6 m telescope.)

On the observing floor, access to the prime focus cage is achieved in an ascending gondola which crawls (at least in speed) up the inside of the dome and meets the prime focus cage which must be locked into position at the zenith. All of the stories that you have heard about the prime focus cage are true. It is extremely small. Fortunately, for someone of my immense height, it did not present much of a problem and it does let in a few more quanta. (However I'm still not sure how people like Barry Madore or Bill Harris actually managed to survive.)

I must admit that I was slightly apprehensive my first time up, not being particularly fond of heights, but by the end I was actually enjoying swinging around the dome. After rotating the cage (which, as I discovered was essential for "comfort"), loading the plates, filters, and focussing, there is plenty of time to sit back (in between guiding) and pleasantly enjoy the sky above and the onset of frostbite below, while listening to Vivaldi through the headphones. I really must say that it is quite beautiful sitting up in the prime focus cage at one of the darkest sites in the world. The romance of astronomy does not come through nearly as clearly from the inside of a control room.

Our observing programme was an ultraviolet survey of nearby resolved spirals aimed at mapping the recent history of star formation for comparison with neutral hydrogen maps and computer simulations. Although we had high cirrus every night, and some telescope difficulties, the run was moderately successful and we did manage to come away with 14 plates. And neither of us had any problems with the altitude (at least that I can remember ...)

Fre

ABOUT LAS CAMPANAS

In the CIW Newsletter (Carnegie Institution of Washington) May 1980, a pending reorganization of the Mount Wilson and Las Campanas Observatories is mentioned. They will be managed by Carnegie, and Mount Palomar will be managed by Cal Tech. George Preston will become Acting Director of Mount Wilson and Las Campanas on July 1.

Bob Brucato and Allan Sandage made observations with the du Pont 2.5 meter reflector at Las Campanas on each of the 17 nights of their run in February. They report that "the stellar seeing disk was less than 0.5 arc sec in diameter for about one third of the nights, again emphasizing the remarkable nature of the Las Campanas site."

THE JUNE INSTITUTE 1980

June Institute 1980 took place from Monday evening, June 2 to Friday, June 6. The large contingent of staff and students from our own department, augmented by about 30 participants from other departments and institutions, was treated to a series of 16 excellent lectures, as well as to the usual congenial social events. The institute was officially opened by John Leyerle, Dean of Graduate Studies.

David Arnett, University of Chicago, gave a stimulating mini-course on nucleosynthesis and gravitational collapse outlining with great clarity the steps leading up to and through the supernova event, and the physical processes involved therein.

Arthur Cox, Los Alamos Scientific Laboratory, gave four thought-provoking lectures on different aspects of stellar pulsation: neutron stars, white dwarfs, near-main-sequence stars and giants, tied together with a common theme: the methods and applications of modern stellar hydrodynamics.

Steve Murray, Harvard-Smithsonian Centre for Astrophysics, gave a series of lectures on the Einstein Observatory and its recent discoveries in extra-galactic X-ray astronomy. The excitement of these new results was heightened by Steve's own enthusiasm and involvement in this work.

Ben Zuckerman, University of Maryland, probed the expanding envelopes of red giants and the mysterious innards of the Orion molecular clouds. As a "change of pace", he discussed his thoughts on and his own searches for intelligent life in the universe. Needless to say, this last lecture attracted a large number of our colleagues from other parts of the University.

As usual, the coffee breaks and evening social events provided an effective means of informal interaction between the participants. Thanks go to Peter and Camie Martin for hosting the Welcome Party, to the Graduate Astronomy Students' Association for organizing a very successful Wednesday evening party in the physics lounge, and to Bob Gauthier and his helpers for arranging the institute dinner in the Hart House Music Room. Thanks also go to our secretaries, Gail Archer, Tinka Shanahan Saul and Linda Twitchin, for dozens of person-hours of work well done.

June Institute 1981 will soon be under consideration. Suggestions are welcome from anyone who came or didn't come (why not?)

John Percy

CONGRATULATIONS

To the following students, all of whom have successfully completed their Ph.D. General Examinations during the past few weeks: *Armando Arellano Ferro, Jeff Clayton, Rick Crowe, Mercedes Davis, and Donna Zubrod.*

To *Charles Dyer* and *Robert Roeder*, whose essay "Galaxies as Gravitational Lenses: Realistic Models" won Honourable Mention this year in the competition sponsored by the Gravity Research Foundation.

Best wishes to *Mercedes Davis* and her fiancé *Donald*. Mercedes left Toronto on June 14, and they are to be married in Kingston Jamaica on July 5. Donald is a mathematics professor at the University of the West Indies.

COMINGS AND GOINGS

Jim Clarke will be leaving us at the end of this month to take a position as Assistant Professor in the Department of Computer Science. Jim completed his M.Sc. here in 1969 and then went to the University of Sydney for his Ph.D. with Jim Roberts. He subsequently held postdoctoral positions at Jodrell Bank and Queen's University before returning to Toronto in the fall of 1977. Since then, he has worked as a Research Associate with Phil Kronberg and Allen Yen.

We are very pleased to have *Pamela Sullivan* back at her desk in the DA office following maternity leave. In a very prominent position on that desk, one finds a picture of young *Todd Allan Sullivan* (epoch 3 months) now 4 months old.

On June 5, during a break in the weighty proceedings of the June Institute, there was a farewell get-together for *Tinka Shanahan Saul*, who filled in for Pamela while she was on leave. Tinka will be spending 4 weeks in Ireland in the near future.

POTPOURRI

Bob McLaren and *John Percy* have been asked to serve on the Associate Committee on Astronomy of the National Research Council for a three-year term ending in March 1983.

Bill Harris reports that he is fully recovered from the stomach upset that hit him on Mauna Kea and in fact that he accommodated himself quite quickly to the high altitude, 2 days being sufficient in that respect.

John Percy completed his RASC presidential visits on May 14-18, visiting Quebec, Halifax, and St. John's, and giving lectures on "Les Étoiles Variables" and "The David Dunlap Observatory: An Informal History" in Quebec and Halifax respectively.

Christine Clement had a 14-night observing run with the 24-inch, on Las Campanas from May 5th to 19th. (The weather was not the best she has had on Las Campanas, but it was not the worst either).

José Maza has found a supernova. He and *L.E. Gonzalez* report its discovery at Cerro El Roble in IAU Circular 3480. On May 18 it was a seventeenth magnitude object in the galaxy MCG -3-34-61.

Bill Herbst (Ph.D. 1974) writes "... I am in my second year as an Assistant Professor here at Wesleyan, and enjoying it very much. Betty and I have one son (2 1/2 years old) and another baby on the way. We still miss Toronto, and enjoy keeping track of old friends through the David Dunlap Doings."

Three visitors have passed through and given colloquia during the past few weeks. On May 22 *Dan Nadeau* (Cal Tech) spoke on his "Study of Interstellar H₂ Emission by Fabry-Perot Interferometry". The following day, *Mike Shara* (Université de Montréal) was here to tell us about "Novae: How and Why They Work". On June 11, *Bill Sherwood* (Max Planck Institut für Radioastronomie) gave a talk entitled " $Z = 1, 2, 3 \dots \infty$ ".

PAPERS SUBMITTED

- | | |
|--|---|
| <i>C.T. Bolton and
G.R. Grieve</i> | <i>The Spectrographic Orbit and Dimensions of
the Early-Type Eclipsing Binary DR Vulpeculae</i> |
| <i>D.G. Turner</i> | <i>Comments on the Cluster Main Sequence Fitting
Method II. A Reexamination of the Data for
NGC 6649 and the Cepheid V367 Scuti</i> |
| <i>J.R. Percy and
N.R. Evans</i> | <i>HR 7308: A Unique Cepheid</i> |

VICTORIA REVISITED, 1979

Helen Hogg recalls her work on the Variable Stars in the Globular Cluster NGC 6934

In August, 1931 my husband Frank and I drove across the continent from the Atlantic to the Pacific in our model A Ford named "Wishbone". In places in the United States where the transcontinental highway was not yet completed across the Rockies, we drove over mountain pastures, directed and spurred on by the road workers.

We arrived in Victoria in late August, to be warmly received by the Director of the Dominion Astrophysical Observatory, Dr. J.S. Plaskett and his wife, at Observatory House on the hill. Frank had been appointed to the D.A.O. staff and while no paying job was available for me, Dr. Plaskett assured me that I could use the 72-inch telescope (the second largest telescope in the world) as much as I wished to photograph variable stars in globular clusters.

These stars were the subject of my work at the Harvard Observatory and of my doctoral thesis under Dr. Harlow Shapley. In June of that year I had received my Ph.D. from Radcliffe College. However, at the Harvard Observatory the plates on which I worked had been taken by various assistants at Harvard Observatory stations in both the northern and southern hemispheres. Now it was up to me to take the plates.

With the help of my husband and the night engineer Tom Hutchinson, I began photographing globular clusters with the 72-inch on September 22, 1931. Before this program began the Newtonian platform and plate holder had to be cleaned up a bit. They had lain idle for some years. Soon after the 72-inch went into use in 1918 a few show plates had been taken at its Newtonian focus, but this focus had not really been used for research till I came along.

At the Harvard Observatory I had become familiar with all the globular clusters then known, about 93, when I measured their integrated magnitudes and diameters. Only 34 of these clusters had then been searched for variables. To start my program I selected four of the unsearched, M 10, M 12, M 14 and NGC 6934. My first published report on the program was to the American Astronomical Society (Pub. A.A.S. 7, p. 185, 1934), mentioning that M 10 and M 12 had few variables but that I was finding many in M 14 and NGC 6934.

In January, 1935 Frank was appointed to the staff of the Department of Astronomy at U. of T. as lecturer (he became Chairman of the Department and Director of the Observatory in 1946). On the night of July 25, 1935 the program of variables in globular clusters was begun with the David Dunlap Observatory 74-inch telescope, first with a 40-minute exposure on M 14, then with one of 45 minutes on NGC 6934. With the help of my husband, Gerry Longworth, Ruth Northcott and various assistants many hundreds of plates were taken. Gradually I added many more clusters to my working list.

A paper on the variables in M 10 and M 12 was published in 1938 (Pub. D.D.O. 1, no. 2). In M 14 I had found 72 variables and in NGC 6934 51 variables. Because of these large numbers and because these clusters were difficult objects to photograph well, the publication of light curves was delayed. In both of these clusters Dr. Amelia Wehlau of the University of Western Ontario has been collaborating with me. In 1964 she found the nova in Messier 14 which appeared on all the plates I took of that cluster during one week in 1938. We have published the light curves of 40 variables in that cluster and are still working on it.

For NGC 6934 periods of 30 variables had been published, but not their light curves. By dint of effort and chance the complete paper on 51 variables in NGC 6934 was finished in time for IAU Symposium No. 85 at Victoria in August, 1979. So with great satisfaction I returned to Victoria then to present the finished paper. This time, to get to Victoria from the east, I crossed the Canadian Rockies on the TransCanada Highway, Route 1, via the IAU chartered bus for astronomical tourists. The complete paper on 51 variables in NGC 6934 appeared in the February, 1980 issue of the Astronomical Journal. The excellent volume of the Symposium, edited by James E. Hesser, has already appeared.

Meanwhile Amelia Wehlau and her student C. Stagg are continuing the saga of NGC 6934 with the period changes of the variables derived from plates taken with the 40-inch reflector of the University of Western Ontario as compared with the early plates from the telescopes of the D.A.O. and the D.D.O.

Helen Sawyer Hogg