



THE ^{DAVID} DUNLAP DOINGS

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Computer system used by relativistic astrophysics group at Scarborough College. See cover story on page 3.

C O N G R A T U L A T I O N S

As we go to press Mike Marlborough (M.A. Toronto 1963) is here from U.W.O. to give a colloquium on "Mass loss from hot stars". Some of us were surprised, not to say dumfounded, to learn that Mike, so long a bachelor, is now a married man. The turning point, it seems, occurred in April 1980, but since not all his friends and colleagues may be aware of it, we record it here, along with our sincere congratulations to Mike and best wishes to Lynda.

Congratulations to Kwang-Tae Kim on the receipt of a \$900 Korean-Canadian Foundation Scholarship for 1981-82. Kwang-Tae was one of only four successful applicants in last spring's competition.

Cover Story

DIRAQ JOINS ASTRONOMY

C.C. Dyer and R.C. Roeder

In May, 1981 we took delivery of DIRAQ (Digital Investigator of Relativistic Astrophysical Questions), a DEC LSI 11/23 (alias a PDP 11/23) for use in the relativistic astrophysics group at Scarborough College. We have the LSI 11/23 processor with the floating point processor option (KEF11) and the memory management unit. Main memory amounts to 256 Kbytes of MOS memory. The DLV11-J 4-line serial interface handles three VT100 VDT's and a Complot plotting system and Diablo combination. At present we have two RL01 5.2 Mbyte disk drives, which we will probably augment in the near future.

To allow a multi-user and multi-tasking environment we chose the DEC RSX-11M operating system, which also has the advantage that our programs can be easily transferred to and run on the VAX VMS operating system under RSX compatibility mode. The languages used at present are MACRO-11 and FORTRAN IV PLUS, with most programming in the latter. The RSX system is supplied with a broad range of utilities, including three editors, file format translator for RT-11, DOS-11, etc. files, a Real-time Memory Display, and more.

The editor most used by us is DEC's KED which is the full-screen portion of the VAX's EDT, in both VT52 and VT100 format. Either of the other editors, EDT (not quite the same as the VAX EDT) and EDI can be used for line editing, for example by telephone connection. At present text formatting for papers, etc. is done with a home-grown formatter, TXT, which is a variant of a formatter one of us wrote for the DEC 10 to drive terminals like the Diablo for superscripts and subscripts. TXT looks like a subset of Runoff, but with improved handling of escape sequences in word-filling, paging, etc. to allow better use of a Diablo. The capabilities of TXT are being extended, with particular interest in the use of extended character sets and host-generated scalable symbols such as integral and summation symbols.

The numerical software includes the standard types of integration, statistics, etc. routines and we have recently purchased DSS/2, the Differential Systems Simulator developed at Lehigh University. Box and R^2 have made heavy use of DIRAQ in the analysis of the distribution of quasar redshifts. The study of gravitational lenses has continued, using DIRAQ, and at present there is considerable effort in the direction of finding all the zeroes of a non-analytic complex function. To our great surprise, the problem of finding all the zeroes of such a function (or even the total number) is far from solved by anyone, and we seem to have made some progress in this direction. This problem is most important for gravitational lenses since each image is one zero of such a non-analytic function, so that the imaging of a distant source does require knowledge of these zeroes.

DIRAQ has fulfilled our expectations as a good user-oriented system and RSX-11M has proven to be a convenient operating system for a computer non-expert. It is easy to tailor the priority structure on the system to reflect the users' priorities, making editors, formatter, and other utilities above the usual Fortran number crunching jobs. The longest single run to date was a job by Tom Box of about 5 days, during which time we all were able to edit, compile, etc. higher priority jobs without noticing a difference. It seems clear that such a system, with the right software, can be many things to many people without adverse interaction.

TAKEOVER BID AT SCARBOROUGH SUCCESSFUL
ROEDER HEADS NEW REGIME

We are pleased to report that Principal J. Foley, acting on the recommendation of the Search Committee, has appointed *Robert Roeder* to serve as Chairman of the Division of Physical Sciences at Scarborough College. Rob's term of office will be five years commencing 1 July, 1982. In addition to his responsibilities for astronomy, which he has carried out so admirably since the earliest days of the College, Rob will undertake to oversee activities in chemistry, computer science, geology, mathematics and physics. This will be a demanding load, especially in these times of financial stringency, but the College can undoubtedly look to a strengthening in all disciplines under Rob's leadership. We wish him well in his new post.

TEACHING AS AN ART

During a staff-meeting discussion of G2000 this fall (it is an oft-recurring item on staff-meeting agenda) Bill Clarke was struck by an apparent lack of opportunity for graduate students to acquaint themselves with some of the patterns, techniques, and tricks in communication. Wendy Freedman is one of the student reps at staff meetings this year. She writes:

Bill Clarke approached me a couple of months ago and asked whether the students would be interested in an informal teaching seminar or workshop, aimed at improving speaking skills. Students are often called upon to speak in public, not only in G2000's but when leading tutorials, on DDO Open House occasions, at the RASC, and when invited by outside groups.

When polled at a GASA meeting a number expressed interest in such a workshop, and so with the help of Mercedes Richards we determined a convenient time and location, and have thus far had two out of the proposed three Monday evening sessions.

Participating are Kwang-Tae Kim, Louis Noreau, Al Busch, Petrusia Bojetchko, Doug Welch, Ann Rusk*, Peter Wizinowich, Mercedes and myself. We have discussed such topics as the preparation of talks, the use of overhead and slide projectors, feedback with the audience, projection of the voice, and numerous other topics. The general feeling in the group is that the seminar has so far been most interesting and enjoyable, and that Bill has discussed many useful techniques for improvement of one's speaking skills.

As we have discussed, an important aspect of learning how to speak well is simply practice and so I'm not sure that sudden dramatic changes will show up in the upcoming G2000's. I do think that we can put Don Fernie's fears to rest though. Rumour has it that when he first heard about the workshop, he voiced concern about how long it would be before someone showed up at a G2000 dressed in a clown's costume.

Fre

*Readers of the Doings outside DDO may not know Ann Rusk. She is Raymond Rusk's wife, a graduate student in the Department of Chemistry, and is auditing some graduate courses in astronomy.

REVISIONIST'S CORNER

"Tycho Brahe - a Great Dane, made many
meticulous" - from A03V (Scarb.)

SHOP TALK

Anyone want to measure something big (or small) to high precision? Big means up to a meter and high precision means to a thousandth of an inch (or the metric equivalent). The DDO shop has a new vernier caliper that does just that. It's all packed carefully away in its own wooden case (4.85 cm x 27.63 cm x about 130 cm) complete with instructions in English and Japanese. See one of the Daves.

Also new in the DDO shop is the SMOKEETER which as its mis-spelled name suggests removes particulate matter from the room air. This makes it possible to carry out a variety of operations in the basement without having the dust and fumes spread throughout the building. When it is operating, a fan draws air and suspended particles through an electrostatic collector which can later simply be washed off.

POTPOURRI

On November 19 and 20 *Barry Madore* was at M.I.T. in Cambridge, Mass., to attend a workshop (75 attendees!) on interacting galaxies. There he advertised the imminent publication of the Arp-Madore Catalogue of Peculiar Galaxies, (*Doings*, 14, no. 7, October 28, 1981), by giving a slide-show sampler of the new objects from the southern survey.

John Percy was at Kitt Peak from November 7 to 17, using the #4 0.4 m telescope to study small-amplitude variability, mostly in Be stars. The run was about 55% successful, in terms of photometric hours. (*Austin Gulliver* was using the other 0.4 m telescope to observe eclipsing binaries).

We hear that *Shyam Jakate* is now living in Thunder Bay with his wife *Shubha* and their year-old daughter *Aditi* whom he adores. He says he has a few irons in the fire - export/import, retailing and insurance (Monarch Life). He may be the only astronomer in Thunder Bay.

"I'D RATHER BE IN TUCSON"

Chris McAlary and *Lindsey Davis* have now taken up residence in their apartment in sunny Tucson. They are both recipients of NSERC Postdoctoral Fellowships, and both are continuing in astronomical research. *Lindsey* is based at Kitt Peak, where she will be working with *Garth Illingworth* on a variety of projects. *Chris* is situated just across the street at Steward Observatory, on the University of Arizona campus. He is working with *George Rieke*, and seems to have got off to a fast start since he was observing on the MMT this past week. *Chris* and *Lindsey* will be back in Toronto by mid-December; *Chris* will be here to defend his thesis and they will be in Ottawa for a few days at Christmas.

RIGHT ON

(verbatim, from an AST 200F quiz)

- Q. Why is it that meteor showers are observed to occur on or near the same date in each year?
- A. because it occurs when the earth is on the right ascension and declination.

CFHT NEWS

Wendy Freedman reports

At the end of October, Barry Madore and I made the trek to the top of Mauna Kea again, this time for four scheduled nights of observing. My thesis program is on the rate of star formation in external galaxies. Fortunately, we managed to retain some of the acclimatization which we had acquired during our "engineering" run four weeks previous to this trip and neither of us had any of the light-headed (or in my case dizzy) symptoms which usually accompany the first night at 14,000 ft.

Unfortunately, the rest of our luck was not nearly as good. Our first night was perfectly clear with excellent seeing. But we never did get to expose a single plate for the simple (and frustrating) reason that we were unable to open the dome slit. It had closed without problems the morning before, but would not budge that night for us. The malfunction had apparently surfaced before and to correct it requires an immense effort on the part of contracted electrical engineers. They began working on replacing the entire cable the next day, but even so, did not finish until 2½ hours past twilight the next evening. Away in the prime focus cage and finally observing for five hours, I had to shut down early when the seeing blew up to 5", and the humidity climbed to 100%. Our third night began much better; we managed to get another five clear hours, but again the humidity rose and hit zero on the scale (which means it goes the full way around the scale - past 100%). We were never able to open again and our last night was even more dismal as it snowed, the winds were high and then there was freezing rain and fog (which made the drive down somewhat slow).

There was one positive aspect to the lousy weather. We finally got a chance to visit some of the other telescopes on the mountain, and we got a Cook's tour of both the UKIRT and NASA telescope.

Although we ran into difficulties on this particular run, it appears that the CFHT operation is making great progress. A successful engineering run this fall saw the infrared end of the telescope up and working, plans are underway for cassegrain focus work to be possible within a year, an image tube is now in operation, the prime focus cage is being redesigned, the movement of the telescope can now be computer operated, and bit by bit improvements are being added every day. - Fre

Lest our readers get a biased view of weather, etc. at CFHT, we report the statistics for the 3½ months up to October (from the CFH News, 1, No. 6, 1981):

clear sky: 71 of 103 nights (69%) (excludes thin cirrus)
good seeing: (<1"): 13 of 70 nights (18%) with records
observing time lost to failures: 4.5 nights in 77 (6%)
engineering: 31 nights (of 109 between June 19 - October 5)

H. Welsh Lectures 1982

One of the three speakers of this upcoming series will be Carl Sagan who will lecture on 17 and 18 May.

JOHN ABRAMS

John Werner Abrams, the first Director (1968-1973) of the Institute for the History and Philosophy of Science, died last summer. He was Professor of Industrial Engineering at U. of T., a post he had held since 1967, and he was concurrently Professor in the Department of History (History of Science). He joined the university in 1962 as Associate Professor, having held various positions in the Defence Research Board (DRB) from 1949 to 1962, notably Chief of Operations Research.

I remember when, leafing through a copy of the President's Report in the early 60's, I noticed a name with the letters "F.R.A.S." after it. My colleagues (Hd, Fe are examples) were Fellows of the Royal Astronomical Society, but what was an Associate Professor of Industrial Engineering doing in that company? A misprint, I concluded; but Jack Heard knew and told me a little about John Abrams - they had both been navigation instructors in the RCAF. When I met him some time later, he was pleased to be recognized as an astronomer, but his interests by that time were exclusively in the field in which he made his strongest contributions to science and to the university - the history of science.

John Abrams had a remarkably varied career. Born in San Francisco in 1913, he graduated with an A.B. in Astronomy and Astrophysics from Berkeley in 1933. Subsequently he studied astronomy with Oort at Leiden, and with Opik at Tartu in Estonia, and at Harvard. He has a paper jointly with Opik ("The degree of variability of calcium content in atmospheres of A-type stars") in *Ap.J.* 86, 203, 1937. Then he returned to the University of California and worked with Trumpler, receiving his Ph.D. in 1939. He was Lick Observatory Fellow in 1938-39. His thesis ("The luminosity functions of the brighter stars") was not published (*Ap.J.* 105, 268, 1947) until after the war. His forte was the application of statistical methods to astronomy.

Even before the U.S. entered the war, John Abrams had volunteered in the RCAF where he became a pilot, attaining the rank of Wing Commander. He was closely connected with the development of radar tactics in the air patrols of the North Atlantic.

Immediately after the war John Abrams spent a year in the Physics Department at the University of Manitoba as Assistant Professor, and then for three years was Assistant Professor of Astronomy and Physical Science at the Van Vleck Observatory of Wesleyan University in Middletown, Conn. He left there in 1949 to go to DRB, but he also was at University College, London, for a time, and there he sharpened his interest in the history of science.

Among his other accomplishments, Abrams was a past chairman of the Canadian Federation for the Humanities, past chairman of the Canadian Society for the History and Philosophy of Science (1968-1972) and past secretary-general of the International Union for the History and Philosophy of Science. Locally and latterly he served on the Board of the Royal Canadian Institute.

Through the kindness of Mrs. Abrams, a large collection of John Abram's

scientific journals - Monthly Notices, P.A.S.P., A.J., etc. - has recently been donated to the Erindale College library.

MR

COLLOQUIA*

December 2, 1981 Dr. J.M. Marlborough, University of Western Ontario
 "*Stellar Winds From Hot Stars*"

December 9, 1981 Chris Rogers, University of Toronto
 "*Radiative Transfer in Spherical Geometry*"

December 15, 1981 Dr. Dan Weedman, Pennsylvania State University
(Tuesday) "*Star-Burst Galaxies*"

* Unless otherwise noted, colloquia are held on Wednesdays at 4:00 P.M. in Room MP 137 with TEA at 3:45 in the Reference Room, MP 1404.

PAPERS SUBMITTED

J.R. Percy The 1981 Light Curve of the Unique Cepheid HR 7308
R.P. Ford

C. Dyer A Method for Estimating the Masses of Some Quasars
R. Roeder

R. McGonegal The Cepheid Distance Scale - A New Application for
R. McLaren Infrared Photometry
C. McAlary
B. Madore

G.C. Clayton Optical Polarization Observations of the X-Ray
I. Thompson Transient A0538-66

H.S. Hogg Early Days of Astronomy in Toronto. Parts 1 & 2,
 Part 3.

D.R. Gies The Optical Spectrum of HDE 226868=Cygnus X-1 :
C.T. Bolton I. Radial Velocities and Orbital Elements

ASTRONOMERS TAKEN TO COURT

The DDO tradition of excellence on the volleyball court is being continued on campus again this year. A team composed of graduate students, research assistants and friends is competing in a league of teams drawn from the graduate departments. After 5 weeks of play, (excluding successful exhibition matches), our record is 3 wins and 2 losses. The games are held in the GSU gym on Monday, Tuesday, or Thursday evenings (watch bulletin board for details). Players, fans, cheerleaders and mascots are welcome.

Next game: Thursday, December 17 at 8 p.m.
Betting line: Astronomy in 4 games

Fifth Kingston Meeting on Theoretical Astrophysics

An important meeting for Canadian theorists took place at the Donald Gordon Centre, Queen's University on 19-20 November. The local organizing committee, headed by R.N. Henriksen, is to be commended on all aspects of the event. There was good participation from across Canada, from Halifax to Victoria. About 25 papers were given in three sessions, denoted "General Relativity and Gravitational Radiation", "Extragalactic Astronomy", and "Galactic Astronomy". The University of Toronto was well represented by T. Box (Periodicity in the spatial distribution of quasars), C. Dyer (Possible measurements of quasar masses), P. Martin (Polarization in molecular clouds), R. Roeder (Possible identification of gravitationally lensed quasars), C. Rogers (Radiative transfer in spherical geometry), and M. Swift (Chemical models of cometary comae).

The final session was devoted to a wide-ranging discussion of "the nature and location of a National Institute of Theoretical Astrophysics". After current initiatives were reported and reviewed various pertinent resolutions were debated. A committee was struck to incorporate these resolutions into a concrete proposal, which after review by Canadian theorists, would be used in founding the institute.

Mn

TIME DILATION AT KINGSTON

An enthusiastic speaker being warned that the time allotted to his talk has nearly expired:

"Gee, 15 minutes seems so much longer when you're sitting down there!"

