do it, however, if a rather special condition on the distribution of the gas is fulfilled. Put simply, this is that a large fraction of the Lyman continuum radiation emitted by the nucleus must be intercepted by gas in the galaxy; but this cannot all happen close to the nucleus; a good fraction of it must be absorbed kiloparsecs away where we still see strong line radiation. This immediately rules out a simple geometry like a thin planar disk of gas which, to the nucleus, would cover only a very small fraction of the sky. It is possible to avoid this problem by assuming that the nucleus does not radiate its UV flux in an isotropic fashion and indeed, it may be that, given the high degree of anisotropy exhibited by the radio emitting material, the higher frequency radiation is beamed in some way.

A way out of this dilemma may be sought by appealing to observations of the dynamical state of the material in the galaxy, both stars and gas, and also, perhaps, by drawing analogies with objects closer to home (PKS 2158 – 380 is at 200 Mpc with H_o = 50 km s^{-1} Mpc). High spectro/spatial resolution observations of the [OIII] lines obtained with the IPCS on the AAT reveal the motion of the ionized gas in some detail. The velocity profile along the major axis of the emission line distribution does look rather like a normal galaxy rotation curve, but there are some peculiarities.

The change from positive to negative velocities happens at very small radii; within $\pm$2 kpc of the nucleus. Also, the emission line profile is broad at all radii with wings extending to over 300 km s^{-1} towards higher $|\Delta v|$. In contrast, the stars do not rotate at all about this axis ($<$ 15 km s^{-1} kpc^{-1}), so their motions are clearly quite decoupled from that of the gas. This lack of coupling strongly suggests that the gas is not native to the elliptical galaxy but has somehow recently been acquired. If the gas has been accreted, either from another galaxy in the small group of which PKS 2158 – 380 is a member, or directly from the intergalactic medium, then it is natural to expect any initially formed gaseous disk to be subject to perturbing forces. These could come either from the non-sperical symmetry of the ellipticals' gravitational potential or simply from the proximity of another galaxy. We propose that there is a rotating gaseous disk in PKS 2158 – 380 but that this disk has been severely warped by some such perturbation. The warp could look something like the photographs of a model shown in Fig. 3 which in turn shows a strong resemblance to deep photographs of the dust lane in the famous radio galaxy Centaurus A (NGC 5128). It can be seen in this picture that radiation from the nucleus can easily shine out to large distances before being absorbed by gas. Also, a good fraction of the nuclear sky can be covered by gas (about 40% in this illustration). Without going into detail, it is clear that the kinematical state of such a structure, deduced from slit spectroscopy, may appear quite complex; we believe that it is possible to interpret our "rotation curve" in this context.

While our interpretation of the observations may not be unique, it does perhaps give some clues about another radio galaxy puzzle. That is the question of the alignment of the radio axis (the line joining the components of the double) with the rotation axis of the galaxy.

Firstly there is the problem of defining this rotation axis when we know that the stars and gas can be decoupled.

Secondly, if we choose the gas as being the relevant component (after all the gas feeds the black hole which makes the radio source), we have the problem of defining the rotation axis of a highly non-planar disk. Our spectroscopic observations will indicate a rotation axis appropriate to the gas at some radius where the emission appears strongest and may tell us nothing about the conditions close to the nucleus. We can only say that in the two objects with extended emission lines which we have studied in detail, this and PKS 0349 – 27, there is no alignment between the radio and the apparent gaseous rotation axis. Although observations of other radio galaxies suggest that such an alignment does usually exist, this topic demands many more observations.

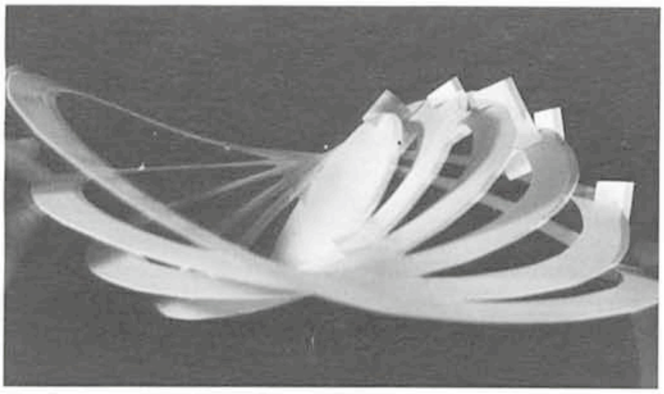

Fig. 3: *A cardboard model of a warped disk which we have used to represent the distribution of gas in PKS 2158 – 380. An important feature of this model is that, viewed from the centre (nucleus), a large fraction of the sky can be covered with gas.*

Our investigations of this galaxy have shown it to be an example of a situation where the dynamical state of the gas must be changing on a time scale which is very short compared to the evolutionary lifetime of the whole system. We believe that this rapid evolution of the gas content may be the cause of the nuclear activity and the extended radio source.

NEWS AND NOTES

The "Centre de Données Stellaires" at Strasbourg

The purpose of this note is to describe the assistance the "Centre de Données Stellaires" (CDS) can provide for either the preparation of an observing programme or for a discussion of results.

Let us state briefly that the "Centre de Données Stellaires" is an institution founded in 1972 by the French astronomical community with the aim of collecting all available stellar data in machine-readable form, in order to facilitate their use. The collection and analysis of the data is made by specialists in each field. Besides the staff of the CDS, several Institutes, namely:

Observatoire de Paris, Meudon
Observatoire de Marseille
Observatoire de Genève et Institut d'Astronomie de Lausanne
Rechen-Institut, Heidelberg
Zentralinstitut für Astrophysik, Potsdam

collaborate closely with the CDS and provide the coverage of certain areas. Furthermore, data exchanges exist with other institutes, like the:

Goddard Space Flight Center, NASA
Astronomical Council of the USSR Academy of Sciences
Computer Center, Kanazawa, Japan.

The data available at the CDS are at the disposal of all interested colleagues all over the world; in the last years the CDS received requests from colleagues of 27 different countries all over the world. The interested reader can learn further details about the CDS in *Vistas in Astronomy,* **21**, 311 (1977) and the CDS Bulletins which appear twice a year.

Let us now consider some of the uses a stellar astronomer can make of the existing data.

First of all, if one is interested in a certain type of data, for instance UBV photometry, one can ask for the latest catalogue in the field. This catalogue can be obtained either on tape or on microfiche (a microfiche has a size of a post-card and contains the equivalent of 200 book pages; it is readable with any magnifying device giving × 35). At this time the CDS has over 200 catalogues on tape and 50 on microfiches; the list of catalogues available is given in the CDS Bulletins.

If on the contrary one is interested only in data for a smaller number of objects, one can proceed differently, namely one can ask for all available data for the stars one is interested in. One gets then a listing containing:

the main identificators (Name, HD, BD)
equatorial coordinates for 1950 and 2000;
galactic coordinates
equatorial proper motion components
MK spectral classification
radial velocity
trigonometric parallax
UBV photometry
Strömgren photometry
UBVRIJKLM
Celescope colour indices
two micron sky survey
V sin i
Hγ
notes about variability and binarity

To complement this information, one can also ask for a listing providing the references to papers published from 1950 on, which refer to or discuss the star. For instance the star α Lyr is mentioned in 343 publications. Less "publicized" stars obviously are not mentioned that often – a "typical" object has about four references. For each paper the full reference and the authors are provided, as also the complete title, which permits to scan rapidly the most interesting papers.

It has been a common experience with the bibliographic service that everyone who uses it discovers that he has overlooked some reference which could have been useful for his own work.

The services mentioned do not cover however one essential aspect needed when one sets up an observing programme, namely to obtain a list of objects of a certain type.

We are also able to provide partial answers to this problem. One can create samples fulfilling certain conditions, like

list all HR objects south of +10° not having a radial velocity.

If one is interested in peculiar objects, one can ask for instance for lists of Ap, Am, Be, CH stars and so on – at present there exist about 30 different classes of peculiar objects. These lists are intended primarily for a first overview to be used together with the bibliographic service mentioned above.

A final point concerns observers of the Schmidt telescope or other large-aperture fields. Finding-charts exist for the Palomar and ESO/SRC Schmidt fields, providing a list of reference stars (which are also plotted on a chart), non-stellar objects and a coordinate grid. These "finding-charts" are provided on microfiche and are well suited for quick identifications.

We hope that this short description may encourage interested colleagues to request our services, or to inquire about more details. If so, please write or telex to the undersigned.

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Astronomical Analysis Software Workshop

A small workshop was held in Geneva on 2 and 3 July 1980 to discuss possible ways of co-ordinating developments in astronomy-related software.

Those attending were: R. Albrecht, Vienna; K. Banse, ESO; A. Bijaoui, CDCA Nice; M. Capaccioli, Padua; P. Crane, ESO; R. Fosbury, Starlink-RGO; U. Frisk, Stockholm; I. King, Berkeley; and F. D. Macchetto, ESA.

A major fraction of those groups involved in large-scale astronomy-related software developments in Europe was represented (I. King attended only as an observer). Broad agreement in several areas was reached. These included:

(a) mechanisms to further communications among and within groups and among individuals on what software they have or are developing;

(b) suggested guidelines for documenting and coding programmes that would increase programming efficiency, useability, and transportability; and

(c) the continuing need for an ad hoc working group which would keep these issues active.

The advantages of software co-ordination and sharing were obvious during the workshop as several participants discovered an interesting programme of another. One participant announced his intention to prepare a magnetic tape with about 500 astronomy-related application programmes. However, the main intent of the workshop was to discuss methods by which a wider community could benefit from co-ordination. To this end, the workshop produced a number of recommendations and conclusions.

The first recommendation was that the IAU Circular on astronomical Image Processing edited by R. Albrecht and M. Capaccioli be produced in a better physical format. Thus it was recommended that the circular have its own distinctive cover including a table of contents and that better methods of reproduction be found. The hope was that this would attract a wider audience and a broader range of contributions. Nevertheless, it was evident that the circular which is distributed free of charge and is not formally refereed would not fulfill all the needs for publication in this field. Therefore, the workshop participants drafted a letter that was sent to the editors of the five major astronomy journals in Europe and the US. This letter asked that these journals give more attention to papers which deal with data-reduction algorithms and computational software.

The second set of recommendations were of a more technical nature. The group endorsed the use of the FITS standard for the exchange of astronomical data (for a description of FITS see the paper by Wells and Greisen in "Imaging Processing in Astronomy" edited by Sedmak, Capaccioli and Allen, 1979, Osservatorio Astronomico di Trieste, or write to F. Middelburg, ESO-Garching). The group recognized the need for a FITS-based standard that extended to catalogue and list types of data. A tape format for the exchange of character data was adopted. This is: (a) 9 track, 800 bpi, unlabelled; (b) ASCII Character set; (c) 80 characters/line; and (d) 50 lines/record. This is essentially a card image format and, although it is not appropriate for very large data sets, it is simple and easy for most normal needs.

A subgroup of the workshop agreed to draw up a set of programming and documentation guidelines which would serve to aid people in developing and using their algorithms. These guidelines will probably be quite similar to those that will be recommended by NASA for the development of Space Telescope related scientific analysis software. The guidelines will be published in the IAU Astronomical Image Processing Circular.

The question of how to entice people to conform to any set of programming guidelines was another major topic of discussion. Clearly anyone who does not want his programmes seen or used by a colleague and who does not need to use his own programmes again 6 months later does not find any inducement to follow anybody else's guidelines. So why would anyone want guidelines? One major reason is that good programming practices help the author as much as anyone. Another benefit of following