NEWSLETTER OF CHEMICALLY PECULIAR RED GIANT STARS

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Edited by
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I. PRG WORKING GROUP NEWS

A HISTORY OF THE WORKING GROUP ON PECULIAR RED GIANTS AND ITS NEWSLETTER

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This Newsletter is the organ of communication of the Working Group on Peculiar Red Giants, now entering its tenth year of existence. Since taking over as Chairman of the WG two years ago, I have frequently been asked about the purpose of the WG, the origin of its Newsletter, and even the names of these institutions (which have not been used entirely consistently). As our distribution list grows, it includes an ever-increasing fraction of people who were not with us at the beginning and might be wondering about such things.

One reason for writing histories is to remember the past; another is to help plan for the future. As we look ahead, we can expect major changes a year from now in the commission structure of the IAU, and in the number and kind of IAU-sponsored working groups. It is anticipated that the WGs of the future will be fewer in number and justified by well-defined purposes -- more specifically, that they will exist only so long as they have an unfinished "task" that can be carried out in a reasonable length of time. In that case it seems unlikely that our WG will survive past August 1994, and the question arises whether this Newsletter can (or should) be continued without its WG. Perhaps a review of the history will help us decide what we want to aim for in the future.

ORIGINS

In July 1984, a four-day colloquium was held at the Observatoire de Strasbourg on "Cool Stars with Excesses of Heavy Elements". The idea of the colloquium had been suggested by Philip Keenan during a visit to Strasbourg two years earlier, and its organization was supervised by Mercedes Jaschek and Keenan, who also jointly edited the Proceedings. It was the first meeting to be devoted exclusively to peculiar late-type stars, and it was small enough (67 participants) to be the effective "working conference" that its organizers intended it to be. The term "heavy elements" in the colloquium title was intended to refer to the s-process elements that are observed to be enhanced in S stars, barium stars, and certain types of carbon stars; the colloquium itself was rather more general, dealing with all aspects of the spectra, compositions, population types, structure, and evolution of all kinds of chemically-peculiar late-type stars.

It was an indication of the extraordinary success of the Strasbourg meeting that its participants did not want it to end! On the final day, the lively discussion (which unfortunately was not recorded) centered on the question of how the momentum generated by the colloquium might best be maintained. Carlos Jaschek suggested creating a "Newsletter of Chemically Peculiar Late-Type Stars" in order to share information and ideas, encourage collaborations, and help workers in the field stay abreast of the latest developments. Jaschek agreed to serve as editor, and Strasbourg Observatory Director A. Florsch agreed to cover the cost of printing and mailing so that the Newsletter could be distributed free of charge to all interested colleagues. It was also decided to propose, at the next IAU General Assembly (to be held the following year in New Delhi), the formation of an IAU Working Group to deal with the problems of the peculiar red giants and the people who work on them. A committee consisting of A. Alksnis (U.S.S.R.), R. F. Griffin (U.K.), C. and M. Jaschek (France), H. R. Johnson (U.S.A.), T. Lloyd Evans (S. Africa), E. E. Mendoza (Mexico), F. Querci (France), H. B. Richer (Canada), T. Tsuji (Japan), P. R. Wood (Australia), and S. B. Yorka (U.S.A.) was elected to oversee these matters.

THE STRASBOURG YEARS (1984-1987)

During this period the first five issues of the Newsletter, bearing the bilingual title "Bulletin sur les Etoiles Tardives a Spectre Particulier / Newsletter of Chemically Peculiar Late-Type Stars" and edited by C. Jaschek, were distributed from Strasbourg. The first issue appeared in December 1984 and the second in June 1985, establishing the bi-annual pattern that has continued, more or less, to this day.

At the IAU General Assembly in November 1985, a half-day session was reserved for the "WG on Peculiar Red Giants", under the auspices of Commissions 29 and 45. The session had been requested by P. Keenan and C. Jaschek, and the first item of business was to act on their proposal to create such a Working Group under the sponsorship of the two Commissions. Unfortunately, neither of the instigators of the proposal was present in India, and the two Commission Presidents started wondering what they were supposed to do. For some time it was not clear whether the session would take place at all; what did seem clear was that if the proposal were not acted on, three more years would elapse before the Working Group could get its start. Some time was bought by trading time slots with the WG on Be Stars, moving our session to the final day. Ben Peery, always a good sport, agreed to chair the session, and I tried to feed him the right questions and to explain the intentions behind the proposal. Rather surprisingly, the session was well attended and the proposal well received. Thus the Working Group on Peculiar Red Giants came into existence on November 27, 1985, and was endorsed by the Presidents of Commissions 29 and 45.

I no longer have a clear idea how our session in New Delhi managed to take up half a day; my notes from that session were lost when my briefcase was stolen two GAs later, in Buenos Aires. The election of officers could not have taken much time. Since they were not there to protest, it was a simple matter to elect Keenan and C. Jaschek to the positions of co-chairmen of the newly-formed WG and to retain Jaschek as editor of the Newsletter. And the Organizing Committee elected in New Delhi was simply the committee selected in Strasbourg, augmented by the President and President-Elect of Commission 45.

What probably did take some time was the initial planning for a second conference on peculiar red giants. It was generally agreed that a follow-up to the Strasbourg colloquium would be useful, and it was reported that Hollis Johnson of Indiana University was willing to work on it. Initially the colloquium was conceived as a joint venture by three universities of the midwestern U.S. (Indiana, Illinois, and Ohio State), but ultimately it proved more expedient to let Hollis do all the work. The second colloquium was held in Bloomington, Indiana, during the week preceding the IAU General Assembly in Baltimore, and it is described in the next section.

The Newsletter was widely distributed during the Strasbourg years. The first issue was sent to 148 individuals and 19 institutions (named in issue No. 1), and the fifth -- the last one from Strasbourg -- had a total of nearly 300 recipients. At the same time, editor Jaschek experienced increasing difficulty in collecting material to publish. Only a single issue appeared in each of the years 1986 and 1987, and an editorial in issue No. 5 (December 1987) explains why no Newsletter had been distributed earlier in the year: "The reason is simple. I got no material". Thus at the end of this triennium, there was a feeling of uncertainty whether the Newsletter could be maintained. At the same time, however, several members of the WG's Organizing Committee were also serving on the Scientific Organizing Committee for IAU Colloquium No. 106 and were busy planning what was to be an unusually successful meeting in Bloomington.

THE BLOOMINGTON YEARS (1988-1991)

The IAU General Assembly of August 1988, held in Baltimore, marked a turning point in the history of our Working Group as its center of activity moved to Bloomington, Indiana. Hollis Johnson of Indiana University became the WG Chairman, a new Organizing Committee was elected, and the production of this Newsletter moved from France to the midwestern United States. But it seems logical to define the "Bloomington years" as beginning one week before the GA, when 120 scientists arrived in Bloomington for the start of IAU Colloquium 106 on the "Evolution of Peculiar Red Giant Stars".

Of course, Johnson and his Bloomington colleagues had been hard at work on the organization of the colloquium during the preceding year, lining up invited speakers, making local arrangements, and securing the sponsorship of the IAU. The significance of the latter may be appreciated by recalling that none of the previous 105 Colloquia or 135 Symposia of the IAU had been devoted to the peculiar red giants, and in particular the IAU had declined to sponsor the Strasbourg colloquium four years before. Colloquium 106, on the other hand, was endorsed by the IAU Executive Committee and by the Presidents of five Commissions (27, 29, 35, 36, and 45).

Accounts of the Bloomington colloquium have appeared in IAU Information Bulletin No. 61 and in Comments on Astrophysics (v.13, p.245, 1989). Suffice it to say here that, like its Strasbourg predecessor, the Bloomington colloquium was generally agreed to have been extremely successful, leaving its participants with a feeling of great enthusiasm for work in this field.

The following week, during the GA in Baltimore, the WG on Peculiar Red Giant Stars held a session -- this time sponsored by Commission 36 (Theory of Stellar Atmospheres) as well as Commissions 29 and 45 -- that was attended by about 60 persons. In contrast to the up-beat atmosphere of the Bloomington colloquium, the session in Baltimore was marked by a sense of uncertainty. Neither of the outgoing Chairmen, P.C. Keenan nor C. Jaschek, was able to attend, and the session was therefore chaired by Johnson. Jaschek had sent a message that he would be unable to continue as editor of the Newsletter and hoped that the next Chairman would take over the editorial duties; but he also cited the poor response he had been getting to his appeals for Newsletter material and suggested that the WG should discuss whether the Newsletter -- and the WG itself -- should be continued.

My recollection of this session is that we first voted -- overwhelmingly -- to continue the WG for at least another three years. There was also strong support for continuing the Newsletter, provided an editor could be found. A vote of thanks was extended to Jaschek for his work on the Newsletter; no one volunteered to be the next editor, or even suggested any names. We then elected a new (smaller) Organizing Committee, with Johnson its Chairman. We also discussed meetings with which the WG might be involved, the most popular being (1) a session on red giants in symbiotic systems, at a proposed symposium on interacting binaries which was ultimately held in Cordoba, Argentina, in August 1991; and (2) a meeting on the outer atmospheres of red giants, which took the form of a series of papers and a panel discussion at a session sponsored by Commission 36 at the GA in Buenos Aires.

In accepting the WG Chairmanship, Johnson agreed to produce the next issue of the Newsletter to give it a chance of survival, but he warned that the next issue would be its last unless an editor stepped forward. Fortunately, an editor was soon found -- Sandra Yorka of Denison University in the neighboring state of Ohio. Sandy had not been present in Baltimore but had served on the WG’s original Organizing Committee. Both her M.S. thesis and Ph.D. dissertation were written at Ohio State University and dealt with peculiar red giant stars.

Issues 6-10 of the Newsletter thus appeared as a collaboration between Yorka and Johnson. The division of labor that evolved was the following: Johnson, as WG Chairman, took responsibility for "twisting arms" (especially of OC members) to produce Newsletter material, while Yorka mailed out a general solicitation; all material was sent to Yorka for editing and splicing into a single text; the text was then printed and distributed from Indiana University, where secretarial help was available and where, as a much larger institution than Denison University, the associated costs could more easily be absorbed.

As a cost-saving measure, Johnson decided to compile a new mailing list, sending the Newsletter only to those expressing an interest in receiving it. The result was a list largely reflecting attendance at the Bloomington colloquium or the Baltimore General Assembly; new names were added, but the majority of individuals on the Strasbourg list, and nearly all of the institutions, were dropped. Issue No. 6, the first by Yorka and Johnson, appeared in May 1989 after a lapse of 17 months and was sent to only 48 persons (if you have an original copy of this issue, be aware that it will become a rare collector's item!) From that minimum, the mailing list gradually recovered as word spread of the Newsletter's resumption.

The advent of electronic mail as a convenient means of communication among working astronomers coincided, more or less, with the change in editorship of the Newsletter in 1988. It was soon apparent that e-mail provided the most convenient way for editors to solicit, and researchers to submit, material for publication in the Newsletter, and there is little doubt that this development contributed to the Newsletter's recovery. The electronic exchange of computer files also made it possible for editors at two institutions to collaborate on their task without incurring long-distance telephone charges. In addition, Johnson and Yorka saw e-mail as a way to cut down considerably on the costs of printing and mailing, by making the Newsletter itself an electronic publication.

Issue No. 8 (June 1990) was the first issue of the Newsletter to be distributed electronically (to 31 persons), as well as on paper. Readers were asked to send the editors their e-mail addresses, and the implication was that, to save money, paper copies would in the future be sent only to subscribers who were not connected to a computer network -- and to a few holdouts like the writer who insisted on receiving it both ways.

The last three Newsletters mailed from Bloomington thus took the form of unpaginated printouts of the e-mail texts, stapled into covers of heavy paper. Initially the covers were left-over stock from the Bloomington colloquium; when that ran out, Indiana University Department of Astronomy preprint covers were used. Emphasis was placed on getting information into the hands (or computers) of people working on red giant stars as quickly and economically as possible; less importance was attached to producing a formal document that was intended to be kept and referred to.

Another change introduced during the Bloomington years was in the name of the Newsletter: although the original French title was retained, the words "Late-Type Stars" in the English title were changed to "Red Giant Stars". It may never be known whether the change was intentional or just "happened". The new title agrees more closely with the name of the WG, but on the other hand it is no longer a translation of the French "Etoiles Tardives". It is unlikely that the change was noticed by many of our readers, but it was definitely spotted by conscientious librarians, some of whom subsequently wrote to me for clarification.

THE CURRENT TRIENNIUM (1991-1994)

At the General Assembly in Buenos Aires in July 1991, a quarter-day session was reserved for the WG on Peculiar Red Giants under the auspices of Commission 29. Hollis Johnson, who chaired the session, had warned me that I should be sure to attend because he was going to nominate me as the next WG Chairman. This was not so easily done, however, because I was scheduled to give a paper at a parallel session on the Magellanic Clouds. When the time came, I nearly missed both sessions because my briefcase was stolen during the preceding lunch hour. But this story has already been told (see Newsletter No. 11). In any event, a new Organizing Committee was elected with the writer as Chairman, and Yorka was retained -- by acclamation -- as Newsletter editor. A discussion followed about the purpose and domain of the WG.

A session on the outer atmospheres of red giant stars, planned by our WG, was also held at the GA in Buenos Aires, under the auspices of Commission 36. It consisted of papers by K. Carpenter, P. Ulmschneider, W. van der Veen, and A. Hearn, who also formed a panel for a lively discussion chaired by Johnson.

In June 1992, the American Astronomical Society held its Summer Meeting in Columbus, Ohio. The meeting included a half-day session on "Spectroscopy and Abundances in Red Giant Stars", as described in Newsletter No. 12. Although this was not an international meeting and the session was not sponsored by our WG per se, it was organized by four long-time members of the WG (H. Johnson, D. Lambert, G. Wallerstein, and R. Wing).

The Newsletter continues to be produced in much the same way as in the preceding triennium: editor Yorka collects the material (with the help of an arm-twisting WG Chairman), integrates it into a single file, and sends it out from Denison University to the e-mail distribution list; I then produce the paper edition (by working with the e-mail file, paying attention to such details as formating, aesthetics, and pagination, and adding a cover) which is mailed from Ohio State. In practice, most parts of the Newsletter are edited by both of us, iteratively, as we send the files back and forth repeatedly during the weeks before publication.

With regard to distribution, my approach seems to be more akin to Jaschek’s than to Johnson’s. It seems to me that if we go to all the trouble of producing a Newsletter, we should want it to be distributed as widely as possible. As long as my Department does not balk at paying the postage, I would encourage both individuals and libraries to add their names to the mailing list because I believe that this expense is well justified, bringing benefits to both my Department and our profession. The mailing list continues to grow steadily and currently stands at 162 recipients of the paper edition. The current issue is also being sent to 93 persons by e-mail; the overlap between the two lists is considerable.

MEMBERS AND OFFICERS

The Working Group on Peculiar Red Giants has never actually had a list of "members"; rather, it has an Organizing Committee and a mailing list open to anyone wishing to receive the Newsletter. As we have seen, the size of the mailing list has been uneven, depending upon the distribution policies in effect.

The Organizing Committees have been elected at four international meetings, in a manner that assures good geographical representation. The membership of these committees is listed below:

ORGANIZING COMMITTEES

Term :	Initial	1985-88	1988-91	1991-94
Elected in:	Strasbourg	New Delhi	Baltimore	Buenos Aires
Chair:	- - -	P.C. Keenan & C. Jaschek	H.R. Johnson	R.F. Wing
Editor:	C. Jaschek	C. Jaschek	S. Yorka	S. Yorka
Members:	A. Alksnis	A. Alksnis	R. de la Reza	H.R. Johnson
	R.F. Griffin	R.F. Garrison	R. Foy	U.G. Jorgensen
	C. Jaschek	R.F. Griffin	R.F. Garrison	A.M. Magalhaes
	M. Jaschek	M. Jaschek	A. Renzini	M. Querci
	H.R. Johnson	H.R. Johnson	V. Straizys	V.V. Smith
	T. Lloyd Evans	T. Lloyd Evans	T. Tsuji	R.E. Stencel
	E.E. Mendoza	E.E. Mendoza	R.F. Wing	T. Tsuji
	F. Querci	F. Querci		S. Yorka
	H.B. Richer	H.B. Richer		
	T. Tsuji	V. Straizys		
	P.R. Wood	T. Tsuji		
	S. Yorka	P.R. Wood		
		S. Yorka		

For lack of space I have not indicated the nationalities of our OC members, but readers will recognize that the following countries, listed alphabetically, have been represented: Australia, Brazil, Canada, Denmark, France, Italy, Japan, Mexico, South Africa, UK, USA, and USSR.

One would think it would be straightforward to write down four lists of names. However, inconsistencies in the published accounts -- in the Newsletter itself, and in the reports of Commissions 29 and 45 published before and after each General Assembly -- are numerous enough to drive a serious historian crazy (fortunately, I don’t believe any of us take these historical matters very seriously).

First, it is not clear if the initial committee of twelve elected in Strasbourg, before the WG was formally constituted, had a Chairman. In effect the committee was chaired by P.C. Keenan and/or C. Jaschek, but this does not seem to be written down anywhere (in the Newsletter, Jaschek lists himself only as editor and a member of the committee). At the GA in New Delhi, Keenan and Jaschek were elected co-chairmen of the WG -- at least according to the report submitted by Commission 29 President J. Jugaku. But in Newsletter No. 3 (December 1985), editor Jaschek reports that Keenan was elected Chairman, and lists himself only as editor. I believe Jugaku is correct here -- at least he was present at the meeting! Next, the new OC elected in Baltimore was listed in the reports of both Commissions 29 and 45, but with a difference: my name appears on one list but not the other. I have adopted the longer list as being more historically accurate. Finally, the listing of current OC members published in the Commission 29 report lacks one of the names, although it is given correctly in Newsletter

No. 11. There now, the historical record has been set straight, I think.

LOOKING TO THE FUTURE

Here are a few questions that are likely to come up in the next year or so:

(1) Will the WG survive past August 1994? Up to the present, Working Groups have had no official status within the IAU; they have been able to create themselves at any time (usually, as a matter of practicality, at a General Assembly) and have needed only a sympathetic Commission President to gain sponsorship. But it appears that the EC is considering a new definition of WGs, such that in the future they will require EC approval and will have limited lifetimes.

(2) Can the Newsletter continue without its Working Group? Sure. After all, two issues of the Newsletter were published before the WG was formally constituted. In order to have official status within the IAU, I should think our Newsletter could be sponsored by the proposed new Commission on Stellar Atmospheres (along with the Newsletters on Be Stars, Standard Stars, etc.).

(3) Should we change the name of our Newsletter? Bob Stencel has suggested dropping the words "Chemically Peculiar", since the content is in no way restricted to the peculiar stars. I like the idea, but for the sake of librarians' sanity I prefer not to suggest another name change at this time. Perhaps in August 1994, when several changes will no doubt be made in any case, we might consider changing the name to "Newsletter of Red Giant Stars" or something similar.

(4) Should we attempt to increase the circulation of the Newsletter further? This involves time and expense. But I am concerned that some populous parts of the world are poorly represented on the current list, and I feel that more scientists in economically-depressed countries should be taking advantage of this and other Newsletters as a way of keeping in touch with international colleagues at no cost to themselves.

Looking into the crystal ball, then, I think I see a Red Giant Newsletter sponsored by IAU Commission X on Stellar Atmospheres and distrubuted, both electronically and on paper, to an enlarged list of colleagues in all parts of the world where work is done on red giant stars.

II. SPECIAL REPORT

-- MY ESCAPE TO ANN ARBOR --

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Sabbaticals probably rarely turn out as intended, but they are heartily recommended to the student of astronomy nevertheless. I am grateful to Bob Wing for asking me to write this synopsis of my sabbatical before it all became dim memory. I came to Ann Arbor in summer '92 with the intent to learn about new developments in cosmogony and cosmology, and left in spring '93 hopefully wiser in those two fields.

In fairness, my 22 IUE remote observing shifts during that interval were probably a factor in not focusing as fully as I could have on those topics, but the cool-star community is at least 150 UV spectra richer for it. Other factors were the never-ending task of proposal writing, the review of papers and proposals, plus colloquia and interaction with a new set of people, etc. Nevertheless, insights from COBE studies in context, condensed matter physics, star formation, optical molasses and stereo photography were a plus from interaction with the Michigan Physics Department and their excellent Astrophysics Group. If you haven't taken a sabbatical (lately), ask yourself why not.

Included in all of that IUE observing was an effort to find acoustic shocks using the C II] density diagnostic (A&A, Letters, submitted), mass loss variability in VV Cep (1993, PASP 105, 45), and two efforts to augment limited HST coverage of long-period eclipsing binaries with more extensive IUE monitoring: EG And (submitted to PASP) and Zeta Aur (Alex Brown et al., in preparation). The unifying intellectual theme behind these efforts is rooted in the hypothesis that a given stellar structure imposes a unique signature on observable stellar oscillations -- a modern Vogt-Russell theorem, if you will. Also, considering that the Sun oscillates in high-order modes while Mira variables are fundamental-mode oscillators, it seems reasonable that stars of intermediate evolutionary state and interior structure will oscillate with intermediate modes. The conversion of these asteroseismic stresses into chromospheric heating is what Manfred Cuntz has been describing for the past several years, and temporal monitoring with the C II] density diagnostic should be able to detect the passage of such wavetrains. As Phil Judge has recently described, the entire "tomographic profile" of the atmospheric dynamic structure can perhaps be reconstructed from high signal-to-noise monochromatic analysis of relative fluxes at similar line center offsets. Additional monitoring with IUE is planned, but ideally HST/GHST should be used to stare at selected evolved stars for this effect.

There is a lot of exciting science to be done outside the ultraviolet, out in the infrared, especially for the study of evolved-star physics. The extensive but underworked archives of the IRAS Low Resolution Spectrometer (LRS) continue to provide fertile source material for investigation as to the nature of circumstellar matter and the origins of mass loss. In collaboration with infrared observers, I've spent part of my sabbatical exploring the issues of dust spectral shapes and variability, following up on our proposed sequence correlating silicate shape, IRAS color, masers and light curve asymmetry factors for oxygen-rich Mira variables (Stencel et al. 1990, ApJ 350, L45). The next step is to clarify whether this sequence describes a long or short evolutionary period: the ascent of the giant branch, or the cycle time between shell flashes. Also, the observational question of how the 8-micron molecular SiO absorption and 10-micron silicate features correlate as functions of mass-loss rate, evolutionary status, etc. still needs better definition. Cohen et al. (1992, AJ 104, 2045) and LeBertre (1993, A&AS 97, 729) have made important contributions in this area lately. Although my sabbatical has ended, as I begin my new appointment on the faculty at the University of Denver it is in these areas that I hope to continue research, particularly if our development plans for a high-altitude infrared observing facility go forward.

III. REPORT ON IAU COLLOQUIUM 146: "MOLECULAR OPACITIES IN THE STELLAR ENVIRONMENT"

submitted by Hollis R. Johnson
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IAU Colloquium 146: "Molecular Opacities in the Stellar Environment" was held at the Niels Bohr Institute in Copenhagen on 24-29 May, 1993. As planned by the Organizing Committee, led by Uffe Jorgensen, the conference brought together quantum chemists, molecular spectroscopists, and astronomers to foster more informed collaboration. Approximately 100 people from at least 22 countries were in attendance. The setting was excellent, and the weather was unusually fine. Scientists who compute or measure molecular and atomic energy levels, spectral lines, cross sections, and transition probabilities in the laboratory or use these results to tease information from stellar photospheres, chromospheres, and circumstellar envelopes learned how such data are produced and used, what data are most useful in astrophysical research, and how interchange can take place in a more focused way.

Invited speakers were Kurucz, Davis, Grevesse, van Dishoeck, Muchmore, Johnson, Jorgensen, Borysow, Costes, Lambert, Morillon, Lehmann, Schamps, Gustafsson (evening lecture), Wehrse, Liebert, Yorke, Langhoff, Peyerimhoff, Almlof, Jensen, Thejll, Seaton, Larsson, Tsuji, Hinkle, Demuynck, Olofsson, Sedlmayr, Omont, Alexander, Miller, and Malmqvist, and the conference ended with a panel discussion over progress and prospects. About 50 poster papers described additional discoveries and progress over a wide field.

Conference participants heard reports of impressive results in several areas, including comprehensive theoretical calculations of molecular structure and spectra, detailed comparison of calculation methods, formation of molecular clusters and grains, progress in calculations of opacities and model stellar atmospheres, useful atomic and molecular data archives, and current research on various fascinating molecule-bearing stellar objects, including red giants and dwarfs of all colors - white, red, and brown.

Extracurricular activities included an excursion to Kronborg (Hamlet’s castle) and the Louisiana Museum of modern art, as well as a reception, a conference dinner, delicious Danish sandwiches for lunch, and the atmosphere of wonderful Copenhagen. Several suggested that Copenhagen is a natural center for meetings on cool stars.

IV. RESEARCH NEWS

G. M. Rudnitskij (Sternberg Astronomical Institute, Moscow State University) is working on models of radio emission from Mira-type variables. First, two sources of continuum radio emission are considered: (1) thermal, arising from ionized gas behind the shock front and observed on several occasions from R Aql (Hughes and Wordsworth 1973, Nature 246, 111; 1977, A&A 58, 105) and V Hya (Luttermoser and Bowen 1992, ApJ 384, 634); and (2) nonthermal, presumably synchrotron emission, observed by Estalella et al. (1982, A&A 124, 309), which may be accounted for by acceleration of electrons on the shock front. Circumstellar maser emission in the OH and H2O lines is also being studied. Strong flares in OH and H2O may be explained by unsaturated maser amplification in the molecular lines of the radio continuum (both thermal and flaring nonthermal). At first, spherically symmetric geometry was considered for the maser region; but now, in view of new data on bipolar flows from evolved stars, models involving bipolar geometry and thick circumstellar disks (possibly due to the binary nature of some Miras) are also under investigation.

To address the question of the progenitor mass range of carbon stars, J. Kastner (MIT Haystack Observatory), T. Forveille (Grenoble Astrophysics Group), B. Zuckerman (UCLA) and A. Omont (Institute d'Astrophysique de Paris) searched for CO emission from a sample of distant (d = 2 to 10 kpc) heavily-obscured asymptotic giant branch (AGB) stars that are confined to the galactic plane. They detected 47 stars for the first time and have determined luminosities for about 40 of these via a kinematic technique. Based on IRAS low-resolution spectra, detections of circumstellar molecules other than CO, IR colors, and/or CO line strength relative to IRAS flux, the bulk of the circumstellar envelopes were classified as carbon- or oxygen-rich. Average luminosities for carbon stars and oxygen-rich stars are similar: from 1.3 to 2 x 10E4 Lsun, depending on the method used to compute bolometric fluxes. These averages are larger than typically assumed or derived for carbon stars in the solar neighborhood and are similar to the average luminosity of "cold" OH/IR stars. The results suggest that luminous carbon- and oxygen-rich AGB stars near the galactic plane are descended from stellar populations of similar mean mass. This mean mass (>2 Msun) is probably larger than the mean progenitor mass of AGB stars in general.

H. Schwarz (ESO), H. Van Winckel (now at Leuven, Belgium) and Duerbeck (Muenster) have found an emission nebula surrounding a newly classified yellow symbiotic star, V417 Cen. In a deep H-alpha image the nebula shows up as an elongated ring centered on the star with some faint emission to the west, extending about an arcmin or so. They interpret this nebula as the remnant PN from the compact component. The cool component is classified as type G0 to G5. The peculiar thing is that the strength of the red CaII triplet indicates a log g of less than 1, making this a type II or Ib supergiant. There are uncertainties in the Ca triplet method for g determination, but this does pose a problem for the evolution of the system. The supergiant simply shouldn't be there anymore. The spectrum is highly variable: in 1988 only [OIII] lines were seen in emission; now the

Balmer lines, HeI, [NII], and [ArIII] are also seen. These emission lines originate in the central object and this is interpreted as the higher density nebula resulting from the mass exchange between the hot and cool components.

V417 Cen is the second yellow symbiotic with an extended nebula, the first being AS201 (Schwarz, A&A 243, 469). The system is a D-type symbiotic, as witnessed by the IR excess. Moreover, the dust temperature is probably stratified, because a broad IR excess is seen. The presence of dust is unique in a yellow symbiotic. A letter on this object is now being submitted to A&A (Van Winckel, Duerbeck and Schwarz).

B. Plez, V. Smith, and D. Lambert (Univ. Texas, Austin) have performed a chemical analysis of seven luminous asymptotic giant branch stars and one M supergiant of the Small Magellanic Cloud. The abundances are derived from high resolution spectra by spectrum synthesis using new spherically-symmetric opacity-sampling model atmospheres. The average metallicity is [Fe/H]=-0.5, in accordance with other determinations of the SMC's metallicity. The AGB stars show signs of envelope burning, being Li rich and C poor, and with a low 12C/13C ratio. The s-process elements (Rb, Zr, Nd) show an abundance pattern that is different from that in the solar system and that is characteristic of a high exposure at low neutron density. This is not peculiar to the SMC, however, but seems to be an effect of metallicity: galactic stars at the same metallicity display similar s-process element abundance patterns. Apparently, the 13C neutron source is operating in these intermediate-mass thermally-pulsing AGB stars.

T. Tomov (National Astronomical Observatory, Sofia, Bulgaria) and colleagues have continued their systematic photometric and spectroscopic observations of the extremely peculiar binary star MWC 560 (V694 Mon). They have now completed their fourth season of intensive observations of the object, which started in January 1990. The system consists of an M4-5 giant primary and a companion which most probably is a white dwarf. The visual brightness of the system has been varying within the interval 9.2-10.4 mag, with a maximum in March 1990. Flickering of the star's brightness in U, B, and V has been observed in every season. During the past season the amplitude in U reached about 0.5-0.6 mag. The most interesting peculiarity of the system is the presence of intense Balmer absorption lines with great violet-shifts, indicating the ejection of matter from the compact component. During the first observing season the star ejected matter in a "discrete regime" with velocities between 1000 and 6000 km/s, the changes in which had a characteristic time of about 1 day. During the following three seasons the regime of ejection was "quasi-stationary", with relatively small changes in the velocities, which were about 200-300 km/s, 1500-2000 km/s, and 1200-2000 km/s, respectively. The nature of this unique star is still not clear. Photometric and spectroscopic observations of the M giant in the infrared region would be very useful in studying the system's geometry and the physical characteristics of the component stars.

P.C. Keenan (Ohio State Univ) is bringing the carbon stars into the revised MK system. Since the C-classification for the carbon stars has never been very successful except for the early R stars, a new notation that is consistent with the Revised MK system for other stars has been developed.

Combining the old R and N types with the modifications of the C-types made by Yamashita and others, the revised system uses abundance indices for C2, 12C/13C, and other atoms and compounds, whenever they are needed to define the character of a stellar spectrum.

The new notation is described, and types are given for a set of standard stars, in a paper being published in the PASP. The new types are sufficiently compact to allow carbon stars to be included in a planned second edition of the "Perkins Catalog of Revised MK Types for the Cooler Stars". It is hoped also that the revised notation can provide enough information to define the differences between carbon stars in different parts of our Galaxy, or in neighboring ones.

M. Sevenster (Leiden Obs.), H. Habing (Leiden), and H. Dejonghe (Gent) are carrying out a large survey of our Galaxy with the VLA and ATCA in 1612 MHz in a search for OH/IR stars. They are trying to model the dynamics of the Galaxy by fitting orbital families to the observed density and velocity distributions. As a preliminary exercise they modelled the distribution functions of two existing sets of OH/IR stars: one in the very center of the Galaxy and one extended over most of the bulge and the disk. The center stars seem to belong to a small, rapidly rotating disk, whereas the more extended sample has a high dispersion. Together with the observation that on the average the central sample has a higher outflow velocity -- which in this case indicates higher metallicity since it has been shown that the luminosity does not differ much -- this gives good evidence that the two samples are taken at least partly from really different populations, in the sense that they have very different structures in phase space, not just different kinematics, distribution on the sky, or colors.

V. SPECIAL TOPICS

LETTER TO THE EDITOR --

An issue I would like to raise with the readers of this Newsletter has to do with the desirability of creating a new "journal", centered on Stellar Physics. This is a subject I have argued with Jay Bookbinder about, and I acknowledge his stimulus of thought.

U.S. stellar astronomers are keenly aware that to see their papers on the cover page of a table of contents, it is necessary to "go to Europe" because of the extragalactic bias among some journal editors in arranging titles. The number of traditional cool-star papers in the ApJ, for example, has arguably dwindled as the large-scale structure ones have grown. The PASP is an exception to this, for which I am grateful, but its global exposure is nothing like that of the ApJ.

Is another overpriced, poorly circulated, printed journal the solution? No. Borrowing a page from our colleagues in Physics, I think it feasible to establish a bulletin-board service for cool-star abstracts and texts, along the lines already in place in Italy but broadcast globally, called astro-ph@babbage.sissa.it. If you are not already tuned in to it, this is an almost daily emission of paper titles and abstracts, largely on cosmology, which enables the reader to ftp entire texts. Similarly, Reipurth at Heidelberg assembles a "Star Formation Newsletter" of titles and abstracts for monthly distribution. Bulletin boards are not a new idea, but perhaps it is timely for the "Peculiar Red Giant community-of-interest" to move in this direction. If something analogous were done for Stellar Physics (if indeed Evolved Star Physics by itself is too narrow), our students and postdocs would receive better exposure among research colleagues than currently happens with some journals, due to publication delays, title-page style, etc.

Who should run such a bulletin board? There may be no point in duplicating efforts, if this Newsletter already has a well-developed emailing list. Perhaps submitting titles and abstracts to this source would be a start. Or perhaps we should all subscribe and submit to astro-ph-daily (see the example and information below). This could evolve into a distinct activity if the content were to expand beyond peculiar red giants, and if an energetic person from a well-heeled astronomical institution volunteers to manage it. As always, the practicalities of disk space would have to be addressed (how long to archive material? whether to repeat in the printed Newsletter, etc.), but such services are being invented for special interests almost daily, and I feel our speciality would benefit.

Considering how paradigms and models shift, it would seem that an ephemeral, electronic mode of journal comes closer to Nietzsche's definition of truth: "A mobile army of metaphors, metonyms, anthropomorphisms -- in short, an aggregate of human relationships which, poetically and rhetorically heightened, becomes transposed and elaborated, and which, after protracted popular usages, pose as fixed, canonical, obligatory. Truths are illusions whose illusoriness is overlooked."

-- Robert E. Stencel
University of Denver

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     EXAMPLE BORROWED FROM ASTRO-PH DAILY:

>From no-reply@babbage.sissa.it Sun May 23 23:32:15 1993
Date: Mon, 24 May 93 01:32:16 +0200
Precedence: bulk
Note: bulletin board software written by PG at LANL (8/91, 12/92)
To: nobody@babbage.sissa.it (astro-ph daily title/abstract distribution)
Subject: astro-ph daily 9305026 -- 9305028 received  (1207 served)
---------------------------------------------------------------------------
send mail only to astro-ph@babbage.sissa.it,
   do not reply to no-reply@babbage.sissa.it .
send complaints regarding untexable papers directly to submitter.
use a single 'get' to request multiple papers, 'list macros' for available
macro packages, and 'help' for a list of available commands and other info.
---------------------------------------------------------------------------
\\
Paper: astro-ph/9305027
From: tbedding@eso.org (Tim Bedding)
Date: Sat, 22 May 93 14:11:12 +0200

THE ORBIT OF THE BINARY STAR DELTA SCORPII by Timothy R. Bedding, (LaTex 8
pages. Send email to 'tbedding@eso.org' for 4 postscript figures). To
appear in the Astronomical Journal, August, 1993. ESO-TRB
\\
    Although delta Scorpii is a bright and well-studied star, the details
of its multiplicity have remained unclear.  Here we present the first
diffraction-limited image of this 0.12 arcsec binary star, made using
optical interferometry, and resolve the confusion that has existed in the
literature over its multiplicity.
    Examining published speckle measurements, together with the present
result, reveals a periodicity of 10.5 yr and allows calculation of the
orbital parameters.  The orbit has a high eccentricity (e=0.82) and large
inclination (i=70 degrees), making it a favourable target for radial
velocity measurements during the next periastron (in 2000).
\\
--------------------------------------------------------------------------
For e-mail address database, send  To: e-mail@xxx.lanl.gov  Subject: help
For european users, the database is duplicated as e-mail@babbage.sissa.it
--------------------------------------------------------------------------
Note that in submissions you should include your local report no. (e.g.
SISSA-EP-92-001) at the END of the title/author field.
It is used to avoid multiple submissions of the same paper, so ending
title/author field with "mottos" like
  latex 14 pages
  figures upon request
  phyzzx 12 pages
could cause problems for you. Instead END with local report no. as in:

  Title, by author1 and author2, 25 pages, tex dialect (optional),
    SISSA-CM-92-001
\\
  Abstract
\\
  Text of paper
```

VI. MEETINGS

August 25-27, 1993
Stars, Gas and Dust in the Galaxy - a symposium to honor E.E. Mendoza V.
Mexico City
Contact: A. Arellano Ferro
Instituto de Astronomia
Apartado Postal 70-264
Cd. Universitaria
04510 Mexico, D.F.
stars@astroscu.unam.mx

September 20-24, 1993
The MK Process at 50 Years: A Powerful Tool for Astrophysical Insight
Tucson, AZ
Contact: Chris Corbally
Vatican Observatory
University of Arizona
corbally@as.arizona.edu

September 20-25
Workshop on Science with Infrared Surveys
Les Houches, Haute-Savoie, France
Contact: A. Omont
Inst. d'Astrophysique de Paris

October 11-14, 1993
8th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun
Athens, GA.
Contact: J.-P. Caillault
U. Georgia

November 5-6, 1993
Hot Stars in the Halo - honoring A.G. Davis Philip
Schenectady, NY.
Contact: Saul Adelman
The Citadel
Charleston, South Carolina
adelmans@citadel

June 1994
12th International Conference on Spectral Line Shapes
Toronto, Canada
Contact: A. D. May
Univ. Toronto

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