

DIVISION IV

STARS

Division IV organises astronomers studying the characterisation, interior and atmospheric structure, and evolution of stars of all masses, ages, and chemical compositions.

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BOARD

L. Cram	Past-President of Division IV
D. Dravins	President Commission 36
T.L. Evans	President Commission 45
G. Mathys	President Commission 29
C. Scarfe	President Commission 26
D. Vandenberg	President Commission 35

PARTICIPATING COMMISSIONS

COMMISSION 26: DOUBLE AND MULTIPLE STARS
COMMISSION 29: STELLAR SPECTRA
COMMISSION 35: STELLAR CONSTITUTION
COMMISSION 36: THEORY OF STELLAR ATMOSPHERES
COMMISSION 45: STELLAR CLASSIFICATION

No Business Meeting of Division IV was held at the XXIVth General Assembly

COMMISSION 26: DOUBLE AND MULTIPLE STARS (*ETOILES DOUBLES ET MULTIPLES*)

PRESIDENT: Hans Zinnecker

VICE-PRESIDENT: Colin Scarfe

ORGANIZING COMMITTEE: C. Allen, T. Armstrong, W. Hartkopf, R.D. Mathieu, A. Tokovinin, M. Valtonen

1. Introduction

This is the report of Commission 26 business meeting which took place on August 14, 2000 during the IAU General Assembly in Manchester (England).

The meeting was chaired by H. Zinnecker (outgoing President) who also took a group photograph at the end of the meeting. This report is based on notes taken by C. Scarfe (incoming President) and W. Hartkopf (incoming Vice-President).

2. Election results and new Commission members

More than half the Commission's members voted in the recent election of Vice-President Hartkopf and the three new OC members: F. Fekel (U.S.A.), P. Lampens (Belgium), and J. Ling (Spain). The following people continue to serve as OC members: T. Armstrong (U.S.A.), R. Mathieu (U.S.A.), and M. Valtonen (Finland).

The commission has added twelve new members, as follows (thus bringing the current number of members to a total of 117):

1. W. Chen (Taiwan),
2. C. Clarke (U.K.),
3. A. Ghez (U.S.A.),
4. P. Kroupa (Germany),
5. O. Malkov (Russia),
6. B. Mason (U.S.A.),
7. B. Reipurth (U.S.A.),
8. R. Sagar (India),
9. M. Simon (U.S.A.),
10. C. Terquem (France),
11. A. Tarasov (Ukraine),
12. L. Vaz (Brazil).

B. Mason has been a consultant for the past three years, but has now joined the IAU and becomes a full member of the Commission. Some discussion was held about how one might connect amateur double-star experts with the Commission - the names of A. Alzner (Germany) and R. Tanguay (U.S.A.) were mentioned specifically - but no conclusion was reached. It appears that the IAU. rules prohibit their appointment as consultants.

L. Lodén's retirement and resignation from the Commission was noted.

3. Deceased

The deaths of three members, C. Worley (C26 President 1994-1997), P. Muller (C26 President 1952-1958, 1976-1979; founder and first editor of the Information Circulars), and C. Jaschek, were acknowledged with a moment of silence. (p.s. Kaj Strand, also a former C26 President (1964-1967), died Nov. 1, 2000).

4. Outgoing President's Report

H. Zinnecker briefly presented C. Worley's report from the last business meeting in Kyoto. He then presented and briefly discussed the triennial report for the Transactions. He also reported on Symposium 200, the highly successful meeting in Potsdam on "The Formation of Binary Stars", for which our Commission was the primary sponsor. We also supported Colloquium 170, on "Precise Stellar Radial Velocities", held in Victoria in 1998, and a Symposium on "Extragalactic Star Clusters", to be held next year in Chile. Finally, we were among the supporting commissions for two Joint Discussions at this year's General Assembly, JD 5 on "Mixing and Diffusion in Stars" and JD 13 on "Hipparcos and the Luminosity Calibration of the Nearer Stars", as well as a multi-Commission meeting on the nomenclature of companions to stars.

5. Incoming President's Report

C. Scarfe reported on the multi-Commission meeting on nomenclature. With the advent of extrasolar planet discoveries, a further level of complexity has been added to that already engendered by the discoveries of binaries by observations at wavelengths other than optical. The potential discovery of many more from space missions lends urgency to the task of finding a nomenclature scheme that encompasses those new discoveries and techniques. In the end it was resolved to let the WDS (Washington Double Star catalog) group tackle the problem over the next three years, with the support of our Commission and others with a stake in the outcome.

6. Miscellaneous Reports and Discussion

6.1. Commission Website

W. Hartkopf reported briefly on the Commission's website, which has been moved from Atlanta to Washington. He encouraged members to visit the site (<http://ad.usno.navy.mil/dsl/>), and welcomed suggestions for matters to be included in it.

6.2. Commission Information Circulars

H. Zinnecker presented a report from J. Docobo on the Information Circulars. D. Latham felt that they should be linked to ADS or Simbad, and that future distribution should be done electronically as much as possible to reduce costs. The possibility of including spectroscopic orbits was also raised by A. Tokovinin.

6.3. Status of the WDS

B. Mason reported on the current status of the WDS, including new data sources to be included, and W. Hartkopf discussed the new USNO catalog of visual binary orbits (<http://ad.usno.navy.mil/wds/hmw5.html>), which is now nearly complete. H. Zinnecker suggested that a list of calibration objects be posted on the web, and W. Hartkopf agreed to post a list of "Grade 1" objects with expanded ephemerides. B. Mason mentioned that a list of single stars already resides on the WDS site (<http://ad.usno.navy.mil/wds/>). An email message from J. Docobo stated that his group is also preparing an orbit catalog.

6.4. New Instrument Developments

A very brief discussion of new instrument developments ensued. We really needed more time to discuss the variety of new instruments, both ground-based and in space, which should lead to rapid growth of double star astronomy in the next few years. An extra session for such a discussion is being considered for the next General Assembly, since several new instruments (especially long baseline interferometers) will be in operation by then.

7. Possible Future Meetings

Possible future meetings were discussed. Topics included a Herschel bicentenary, multiple star studies, complementary techniques (a sequel to the 1992 Atlanta IAU Colloquium 135), interaction of binaries with their environments, binaries as distance indicators, and mass determination at the bottom of the main sequence. Possible sites included Mexico, Russia, the United States, and the next General Assembly in Australia.

H. Zinnecker

President of the Commission



COMMISSION 29: STELLAR SPECTRA (SPECTRES STELLAIRES)

PRESIDENT: Beatriz Barbuy

VICE-PRESIDENT: Gautier Mathys

ORGANIZING COMMITTEE: M. Bessell, P. Cottrell, D. Gray, U. Heber, V. Khokhlova, L. Lyubimkov, P. Nissen, R. Peterson, C. Sneden, F. Spite, B. Wolf

1. Report on the Business Meeting

The triennial business meeting of the Commission was held on 12 August 2000, with about 20 members in attendance. The members approved the new Commission President to be G. Mathys, and the new Vice-President to be C. Sneden. New Scientific Organizing Committee (SOC) members elected are: E. Friel, R. Gratton, U. Heber, J. Landstreet, P. Molaro, P. Nissen, P. Parthasarathy, N. Piskunov, F. Primas, F. Spite; B. Barbuy continues as Past President. The President thanked retiring SOC members M. Bessell, P. Cottrell, D. Gray, V. Khokhlova, L. Lyubimkov, R. Peterson, B. Wolf for their service to the Commission.

The Commission has 250 members, and 15 new members were transmitted to the IAU Secretariat for admission.

2. Facilities created

A list of e-mails of all members was prepared, among which those for about 40 members are still missing. A WEB page was created, where the list of members and their addresses are given. This material was transmitted to the New Commission President.

3. Symposia and Colloquia

Commission 29 has sponsored, or co-sponsored, the following IAU Symposia that have been held since the last General Assembly: # 190 New Views on Magellanic Clouds, Victoria, Canada July 1998; # 191 Asymptotic Giant Branch Stars, Montpellier France August 1998; # 192 The Stellar Content of Local Group Galaxies, Cape Town, South Africa September 1998; # 193 Wolf-Rayet Phenomena in Massive Stars and Starburst Galaxies, Puerto Vallarta, Mexico November 1998; # 198 The Light Elements and their Evolution, Natal, Brazil November 1999. And the Colloquia # 169 Variable and non-variable Winds in Luminous Hot Stars, Heidelberg, Germany June 1998; # 175 The Be Phenomenon in Early-Type Stars, Alicante, Spain July 1999. Commission 29 is also sponsor or co-sponsor for approved IAU Symposia to be held in 2001: # 207 Extragalactic Star Clusters, Pucon, Chile March 2001; Planetary Nebulae: their Evolution and Role in the Universe, Australia November 2001; Modeling of stellar atmospheres, Uppsala, Sweden, June 2002.

4. Joint Discussions at the General Assembly

Commission 29 was the principal organizer of the Joint Discussions JD 3 Massive Star Birth; JD 8 Oxygen Abundances in Old Stars, and co-organizer of JD 1, JD 5, JD 13 and Special meeting on Ultra Cool Dwarfs.

Beatriz Barbuy
President of the Commission

COMMISSION 35: STELLAR CONSTITUTION (*CONSTITUTION DES ETOILES*)

PRESIDENT: Jean-Paul Zahn

VICE-PRESIDENT: Don Vandenberg

**ORGANIZING COMMITTEE: R. Canal, C. Chiosi, W. Dziembowski, J. Guzik
G. Meynet, G. Michaud, A. Renzini, H. Saio, A. Tutukov, G. Vauclair**

Business meeting Commission 35, Manchester Aug. 15, 2000

This meeting drew little audience because many members of the Commission stayed in Manchester only during the first week, in which were scheduled most meetings of prime interest to stellar physicists, except Joint Discussion 13, which was running at the same moment.

The president Jean-Paul Zahn reported the results of the consultation which was held by e-mail to renew the Organising Committee. The new Vice-president, and thus next president, is Wojciech Dziembowski (Poland), and the new members are Jørgen Christensen-Dalsgaard (Denmark), Franca D'Antona (Italy) and Norbert Langer (Netherlands). He greeted the newcomers, and expressed his thanks to the two officers who were leaving the OC: Ramon Canal and Cesare Chiosi.

The candidatures for membership of the Commission were all approved.

J.-P. Zahn gave a brief account on the Division meeting and recalled that one of the main tasks of the Commissions is to approve the Symposia and Colloquia which are sponsored by the IAU, and to organise Joint Discussions at General Assemblies. Commission 35 took the initiative of the Joint Discussion 5 on Mixing and Diffusion in Stars at the present GA, and it is pleased by the success of this meeting which was judged very interesting by all participants.

Before closing the session, J.-P. Zahn expressed his best wishes to Don Vandenberg, the new president of Commission 35, who in turn thanked him for what he had accomplished.

J.-P. Zahn
President of the Commission

COMMISSION 36: THEORY OF STELLAR ATMOSPHERES (*THEORIE DES ATMOSPHERES STELLAIRES*)

PRESIDENT: Roberto Pallavicini

VICE-PRESIDENT: Dainis Dravins

ORGANIZING COMMITTEE: B. Barbuy, L. Cram, I. Hubeny, S. Owocki,
H. Saio, D. Sasselov, M. Spite, K. Stepień, R. Wehrse

The business meeting of Commission 36 was held on Saturday, August 12. It was attended by about 15 members of the Commission including the President (R. Pallavicini), the Vice-President (D. Dravins) and two other members of the Organizing Committee (M. Spite and B. Barbuy, the latter one also as Deputy President of Division IV).

1. Commission Activities

The President reported on the activities carried out by the Commission over the past 3 years with special regard to the preparation of the Commission Report and to the advice given to Division IV on proposed scientific meetings.

The President reminded that, of the two options offered by the IAU for the preparation of the report (either a short 4 page report or a full ≥ 10 page report), the Commission decided this time to follow the second approach, which resulted in a report of 12 pages. This issue was discussed further and the general consensus was that writing a full report is still useful provided the report is circulated widely and timely. It was recommended that future reports be circulated by the IAU electronically to all IAU members even before publication. Ideally, they should be available on the IAU Web pages, provided copyright issues are solved. It was stressed that a full report, even longer than 10 pages, could be quite useful also as a reference source for future historical research.

With regard to Commission advice on scientific meetings, it was felt that the current system should be improved. It was recommended that proposals for new meetings should be sent to Commission Presidents at least one month in advance of the IAU deadline, in order to allow Commission Presidents to consult their OC before granting sponsorship. It was also recommended that proposals for new meetings should be held by the IAU and sent all together to Commission and Division Presidents at regular intervals in order to allow them to compare different proposals and rank them more effectively.

The President noticed that the primary areas of interest of the Commission, and of Division IV in general, were poorly represented in the Symposia held during the 24th General Assembly, whereas a number of JDs cosponsored by Commission 36 had a much better success in the selection process. The Commission agreed that a greater effort should be made by the Commission to come out with strong proposals for stellar Symposia sponsored by Commission 36 and Division IV for the next GA.

2. Policy Issues

A number of general issues were raised and discussed about the relationship between Commissions, Divisions and the Executive Committee. It was felt that Divisions should play a greater role in coordinating the activities of the Commissions, particularly in the case of Commissions (like, e.g., Commissions 29 and 36) with largely overlapping areas of interest. Similarly Divisions, rather than Commissions, should be the natural framework within which Working Groups could play an important role.

With regard to the possibility being considered by the EC of publishing the proceedings of JDs held in connection with GAs, the Commission was by and large in favor, but noticed that alternative ways should also be considered for publishing JDs without the direct involvement (but with the prior approval) of the IAU. There was some concern that raising the status of JDs to that of "mini-Colloquia", possibly lasting more than one day, could increase the number of parallel sessions held during each GA, thus making the present, already unsatisfactory, situation even worse. In addition, publishing only some JDs and leaving the others for the Highlights may result in a more fragmented presentation of the scientific content of each GA.

3. Members and Officers

The Commission then considered the issue of Commission membership. The importance of maintaining updated lists of active Commission members, including electronic addresses, was stressed, as well as the need to check and correct current lists distributed by the IAU Secretariat. It was recognized that this is a task to which the highest priority should be given by the Commission. It was recommended that a list of electronic addresses of Commission members should be prepared as soon as possible. If available, this list could also be used to increase the participation of the entire Commission in the nomination of new Officers. It was felt that a regularly updated Commission Web page, linked to the IAU Web page, would be very useful for circulating information about Commission activities, but this should not be a substitute for direct electronic communication between the President and Commission members in the form, for instance, of periodic letters from the President or of more formal Commission Newsletters.

The President proposed a list of new Commission members formed in part by new IAU members who asked to join the Commission and in part by current IAU members who responded positively to the invitation by the President to join the Commission. The proposed new Commission members were approved unanimously by the Commission. With the new entries, the total number of Commission members come close to 300.

The Commission then proceeded to the election of new Officers. The President illustrated the criteria followed for the nominations. In the absence of written rules by the Commission, the usual practice was followed of proposing the current Vice-President as new President and to select the new Vice-President from current OC members that had served in the OC at least a triennium. According to these rules, Prof. D. Dravins and Dr. Monique Spite were proposed as new President and Vice-President, respectively. The President also proposed to maintain in the OC the current President of Division IV (L. Cram), the incoming President of Division IV (B. Barbuy) and the outgoing President of the Commission (R. Pallavicini). He also proposed to reappoint for another term those OC members that had served for only one triennium, while replacing those OC members that served already for two terms or more. The President thanked on behalf of the Commission the outgoing OC members for their service to the Commission. New OC candidates were proposed and voted on taking into account geographical distribution, areas of expertise and expressed willingness to serve in the OC. It was agreed that OC members should not exceed the maximum number (12) recommended by IAU. At the end of the voting process, the new OC of Commission 36 resulted to be composed as follows: D. Dravins (President), M. Spite (Vice-President), T. Ayres, B. Barbuy, L. Cram, D. Kiselman, J. Landstreet, R. Pallavicini, H. Saio, C. Sneden, K. Stępień and K. Werner (members).

There being no further business, the President thanked Commission members for their attendance and closed the meeting.

R. Pallavicini
President of the Commission

COMMISSION 45: STELLAR CLASSIFICATION (CLASSIFICATION STELLAIRE)

PRESIDENT: Michèle Gerbaldi

VICE-PRESIDENT: Thomas Lloyd Evans

ORGANIZING COMMITTEE: J. Claria, C. Corbally, J. Drilling, C. Garmany, R.O. Gray, D. Kurtz, O.H. Levato, P. North, K. Zdanavicius

The business meeting of Commission 45 was held on Friday, 10 August. It was attended by the President and Vice-President of the Commission as well as by approximately a dozen members of the Commission.

Attendance was limited due to the number of other parallel sessions of direct relevance to the members of the Commission.

The memories of our Colleagues Dr. Carlos Jaschek, Dr. Philip Keenan and Dr. Arne Slettebak were evoked.

The President reported on the JD and Scientific Sessions organized during this General Assembly with the direct contribution of the Commission, in particular JD 13 *Hipparcos and the Luminosity Calibration of the Nearer Stars* and the Scientific Session *Ultra Cool Dwarfs: Surveys, Properties and Spectral Classification*.

The proceedings of this Scientific Session should be published by Springer Verlag in their Lectures Notes in Physics Series.

The Organizing Committee (OC) for the next triennium was unanimously adopted, following an e-mail consultation of the Commission Members before the General Assembly.

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Vice-President Chris Corbally (Vatican City State) corbally@as.arizona.edu

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Michèle Gerbaldi
President of the Commission

WORKING GROUP ON AP AND RELATED STARS

(GROUPE DE TRAVAIL SUR LES ETOILES PARTICULIERES DE TYPE A)

CHAIRPERSON: M. Takada-Hidai

ORGANIZING COMMITTEE: G. Alecian, R. O. Gray, M. Landolfi, J. Matthews, P. North, K. Stępień, W. W. Weiss, J. Zverko

The business meeting of the Working Group on Ap and Related Stars was held on August 11, 18:10 – 18:40 at the 24th IAU General Assembly in Manchester. The new SOC members were elected and a plan for future Symposium/Colloquium was discussed.

1. The new SOC members

The term of the new SOC members is from 2000 August to 2003 July (the 25th IAU General Assembly in Sydney).

1. **PRESIDENT:** W. W. Weiss
2. **MEMBERS:** S. Bagnulo, R. O. Gray, D. Kurtz, M. Landolfi, F. LeBlanc, T. Ryabchikova, B. Smalley, K. Stępień, G. Wade, M. Takada-Hidai (ex-officio)
3. **EDITORS of the Ap Newsletter:** S. Bagnulo and G. Wade

2. The future conference

A plan for a future conference relating to Ap and related stars was discussed and many people declared their wish that such a conference take the form of an IAU Symposium or Colloquium by 2003. It was confirmed that a proposal for such a conference would be submitted to the IAU by the new SOC.

M. Takada-Hidai
Chairperson of the Working Group

WORKING GROUP ON STANDARD STARS (*GROUPE DE TRAVAIL SUR LES ETOILES STANDARD*)

CHAIRPERSON: Robert Garrison
MEMBERS: C. Corbally, R. Gray

1. Business

The meeting opened under the outgoing chairmanship of R. Garrison. C. Corbally was elected as the new chairman of the Working Group on Standard Stars (WGSS) and the appointment of R. Gray as newsletter editor was approved by those present (17). Garrison defined the ongoing tasks of the WGSS as promoting and communicating work on standard stars, and its organizing structure as the chairman and editor. These definitions were accepted as both still relevant and workable.

2. Science

The meeting then turned to science matters. C. Scarfe outlined his comparison of DAO measures of IAU radial velocity standards with those from CfA, and he showed that now there was virtually no difference, whatever the color of the star. S. Adelman pointed out how Hipparcos photometry was most useful in picking out the non-variable stars which might be used as photometric or radial velocity standards. He is preparing a list of these. D. Crawford described the plan for photometric monitoring of standards by automated telescopes. The appeal by W. Buscombe (not present) for a clear identification of standards in the SIMBAD database was recognized as important. Garrison said that he had found the SIMBAD team very receptive to any tables of standards that he had submitted. P. Harmanec's (not present) request for a uniform set of solar values was also recognized. Garrison noted that a meeting in Flagstaff had settled on 18 Sco as the best solar analog. E. Griffin communicated the Spectroscopic Virtual Observatory's plans for a database of spectra of standard stars (at an R of about 30,000).

R. Viotti and M. Meyer (neither present) called for settling the spectral classification criteria out to the thermal IR. This provoked considerable discussion on the task of classifying in the near-IR (Garrison), on the need for a set of specifically IR standards (E. Milone), and on establishing faint standards, suitable for telescopes of 6-m aperture and greater (Meyer & Garrison). Such topics could form part of a JD during the next IAU-GA.

T. Hawarden warned that a set of photometric filters in the IR was in danger of being called the "MK system". The prospect of confusion with the long-established spectral classification system was greeted with alarm by those present, and alternate names were suggested. In particular, it was urged that the naming of the new IR system should be submitted to the acronym clearing house which is under Commission 5. This discussion highlighted the need for liaison between the WGSS and Commission 5, and indeed the WGSS's necessary role in keeping communication about standards open between its sponsoring Commissions, namely 25, 29, 30, and 45.

Robert F. Garrison
Chairperson of the Working Group

Christopher J. Corbally
Secretary of the Working Group