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ORBITAL AND PHYSICAL PARAMETERS OF DOUBLE STARS

Proceedings of Colloquium No. 18 of the International Astronomical Union held at Swarthmore College, Pennsylvania, U.S.A., April 12–15, 1972.

Edited by W. D. HEINTZ

The conference was held upon the recommendation of Commission 26 of the I.A.U. Peter van de Kamp of Swarthmore College acted as Chairman of the colloquium, assisted by Miss S. L. Lippincott as Vice-Chairman. The Organizing Committee consisted of A. N. Deutsch (Pulkovo Observatory, Leningrad), J. Dommanget, W. D. Heintz, P. Muller, P. J. Morel and K. Aa. Strand (Chairman). Local organization was handled by the entire Sproul Observatory staff. The conference participants are shown in figure 1 and their names are listed in Table I.

Six scientific sessions were held on the following topics: (1) orbital parameters; (2) continuation of orbits; (3) multiple systems; (4) photometric and spectroscopic data; (5) faint binaries; (6) progress in observing techniques. In the following pages the introductory papers are presented or summarized followed by a summary of the discussion on the various topics.

The conference was opened by the President of Swarthmore College, Robert D. Cross. Dommanget expressed the thanks of the Commission for the invitation to hold the meeting at Swarthmore. The presence of the Nestor of double-star work, G. van Biesbroeck, was particularly appreciated. Regrets were received from several invited participants who could not make the trip, including Arend, Deutsch, Finsen and Fracastoro from overseas.

The conference program included an excursion to Old Philadelphia on April 13. The following day, a reception at the Observatory and a dinner "in honor of the first seventy years of P. van de Kamp" were given, the conference participants being joined by 200 College staff, in-town and out-of-town friends of the guest of honor on this occasion.

The resolutions passed by the conference at the closing session appear on page 87. It was also agreed to dedicate the proceedings of the colloquium to P. van de Kamp (see figure 2). After a statement expressing the thanks of the participants to the College president, faculty and staff was carried,

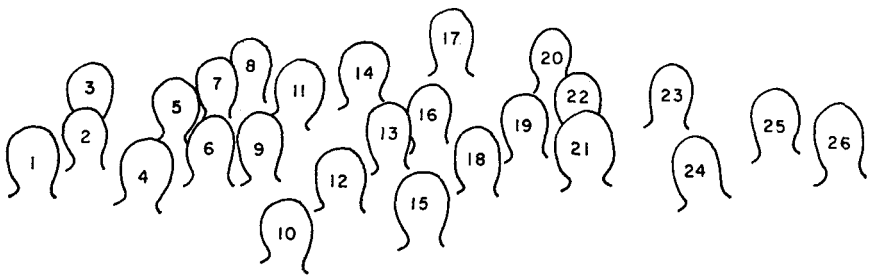


FIG. 1—I.A.U. Colloquium No. 18 in Swarthmore, Pa. 1, J. Dommanget; 2, P. Couteau; 3, W. R. Beardsley; 4, P. van de Kamp; 5, P. Bachmann; 6, A. H. Batten; 7, J. Hershey; 8, P. J. Morel; 9, R. R. de Freitas Mourao; 10, G. van Biesbroeck; 11, L. Binnendijk; 12, A. Poveda; 13, H. Abt; 14, W. D. Heintz; 15, K. Aa. Strand; 16, P. Muller; 17, R. Harrington; 18, R. H. Hardie; 19, T. Hallowell; 20, O. G. Franz; 21, S. L. Lippincott; 22, P. Laques; 23, R. L. Walker; 24, C. E. Worley; 25, F. Villamediana; 26, J. Josties.

Thomas Hallowell (member of the Board of Managers of the College) was asked to give his impressions of the colloquium since he had been present at all the sessions. He said that he sensed interesting times ahead, due both to the new technical progress reported and to the further evaluation of data already gathered. Research need not be on a very high level of expense in order to be worthwhile.



FIG. 2—Peter van de Kamp.

TABLE I

PARTICIPANTS OF I.A.U. COLLOQUIUM NO. 18

- H. Abt, Kitt Peak National Observatory, Tucson, Arizona
 - A. H. Batten, Dominion Astrophysical Observatory, Victoria, Canada
 - W. R. Beardsley, Allegheny Observatory, Pittsburgh, Pa.
 - G. van Biesbroeck, Lunar and Planetary Laboratory, Tucson, Arizona
 - L. Binnendijk, University of Pennsylvania, Philadelphia, Pa.
 - P. Couteau, Observatoire de Nice, Nice, France
 - J. Dommanget, Observatoire Royal de Belgique, Bruxelles, Belgique
 - O. G. Franz, Lowell Observatory, Flagstaff, Arizona
 - R. R. de Freitas Mourao, Observatorio Nacional, Rio de Janeiro, Brasil
 - R. H. Hardie, Dyer Observatory, Nashville, Tenn.
 - R. Harrington, U.S. Naval Observatory, Washington, D.C.
 - W. D. Heintz, Swarthmore College, Swarthmore, Pa.
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 PARTICIPANTS OF I.A.U. COLLOQUIUM NO. 18—*Continued*

J. Hershey, Swarthmore College, Swarthmore, Pa.
 J. Josties, U.S. Naval Observatory, Washington, D.C.
 P. van de Kamp, Swarthmore College, Swarthmore, Pa.
 P. Laques, Observatoire du Pic du Midi, France
 S. L. Lippincott, Swarthmore College, Swarthmore, Pa.
 P. J. Morel, Observatoire de Nice, Nice, France
 P. Muller, Observatoire de Paris, Meudon, France
 A. Poveda, Observatorio Astronomico, Mexico City, Mexico
 K. Aa. Strand, U.S. Naval Observatory, Washington, D.C.
 F. Villamediana, Universidad de Zulia, Venezuela
 R. L. Walker, U.S. Naval Observatory, Washington, D.C.
 C. E. Worley, U.S. Naval Observatory, Washington, D.C.

The editor wishes to thank Dr. I. Halliday for the offer to publish the Proceedings in this JOURNAL, and for careful help in preparing the script.

Session 1. Orbital Parameters

THE TOOLS TO DETERMINE ORBITAL PARAMETERS

BY W. D. HEINTZ

Swarthmore College, Swarthmore, Pa.

How can an apparently cut-and-dried textbook matter such as orbits become the topic for an international conference? The answer is found in statements from the reports of presidents of Commission 26 which criticize the existing state of affairs and is further elaborated upon by van den Bos (1962) in his well-known query "Is this orbit really necessary?" The objections refer to useless repetitions or multiple solutions and results that are distinctly inferior to observational accuracy. Unanimous agreement on what constitutes a useful orbit, or revision, is unlikely to be achieved, but considerable published work which is based more on computer experience than on double-star knowledge is clearly of inferior quality. To some extent, errors of observation (including poor distribution of data, etc.) are unavoidable, but published material contains errors due to the method of analysis which could have been avoided.

If it is the accumulation of observations which triggers excessive orbit computations then I am "glad" to say that this incentive is dying out. Seen from today, the nineteen-fifties were still a golden age of binary observation. By 1961, at the first double-star conference held in Berkeley, voices of concern arose on the lack of observers and a resolution was submitted by Hertzprung, yet the situation worsened steadily. Most of the highly productive observers of fifteen years ago have terminated or reduced their output. Combined with the dropout of some other contributors, the loss of observers