

COMMISSION 33: STRUCTURE AND DYNAMICS OF THE GALACTIC SYSTEM
(STRUCTURE ET DYNAMIQUE DU SYSTEME GALACTIQUE)

Report of Meetings on 21, 22, 23, 25 and 27 November 1985

PRESIDENT: R. Wielen

SECRETARY: W.B. Burton

21 November 1985

Business Meeting of Commission 33

The President pointed out that Commission 33 had its 60th anniversary in 1985. He especially welcomed Professor Willem J. Luyten, who is one of the original members of the Commission since 1925. Professor Jan H. Oort and Professor Luyten are active members of the Commission 33 for now sixty years !

The Commission unanimously approved the election of the new President, W.B. Burton, and Vice-President, M. Mayor. The Commission unanimously accepted the list of names proposed for the new Organizing Committee: continuing until 1988: L. Blitz, G. Lynga, R. Wielen as outgoing president; for the period 1985-1991: J.N. Bahcall, L. Balazs, J.J. Binney, J. Einasto, M. Tosa. The list of IAU members who wish to join Commission 33 was read and adopted: K. Aizu, A.K. Ambastha, J.N. Bahcall, B. Barberis, B. Basu, J.A.R. Caldwell, T. Ciurla, R.S. Cohen, J. Colin, E. Costa, A. Dekel, J.R. Ducati, D. Egret, S.M. Fall, B. Fuchs, D. Galletto, A. Habe, M.R.S. Hawkins, F.P. Israel, D.R. Jiang, S.G. Lee, F.J. Lockman, P.J. McGregor, S. Mikkola, D.G. Monet, M. Morris, S. Ninkovic, M. Nishida, C.A. Olano, J. Palous, Z.Y. Qian, N. Reid, J.X. Rong, M.L. Sanchez-Saavedra, G.X. Song, L. Sparke, Y. Tong, E.I. Vega, S.M. Younis, B. Zhang, J.L. Zhao, C. Zhen.

The scientific scope of Commission 33 was discussed. It was agreed that Commission 33 should continue to act as a joint forum for all astronomers interested in stellar dynamics in general, even if their work is not directly concerned with the Galaxy. Furthermore, basic astronomical data of relevance for galactic astronomy should also remain within the scope of the Commission.

The President reported on the Joint Discussion I on Reference Frames. During this Joint Discussion, a resolution on reference systems was adopted. Commission 33 endorsed this resolution (given elsewhere in this volume) and proposed R. Wielen for membership in the planned Working Group.

The Working Group on Galactic Constants (Chairman: F.J. Kerr, Vice-Chairman: D. Lynden-Bell) has prepared a proposal for the recommendation of new values of galactic constants. A critical review on galactic constants has been written by Kerr and Lynden-Bell. It is planned to publish this review in the IAU "Highlights of Astronomy", Volume 7. The President announced that a decision on the proposal of the Working Group will be taken during the scientific session on galactic constants.

Galactic Constants

Chairman: F.J. Kerr. The following papers were presented:

- F.J. Kerr; Report of the working group
 M.W. Feast: Recent work on R_0
 M.J. Reid, M.H. Schneps, J.M. Moran, C.R. Gwinn, R. Genzel, D. Downes,
 B. Ronnang (presented by F.J. Kerr): First results on the parallax of the
 galactic center
 S. Ninkovic: Orbital eccentricity study for the spherical component of our Galaxy
 V.C. Rubin: Recent work on rotation in other galaxies
 A.A. Stark, L. Blitz, M. Fich: The rotation curve in the outer Galaxy
 J.P. Ostriker: The mass of the galactic halo
 M. Mayor: The solar motion

After a lengthy discussion, the Commission adopted with overwhelming majority (approximately 57 in favour, none against, and 3 abstentions) a resolution on galactic constants which is given at the end of this report. The Working Group on Galactic Constants shall continue its work, especially by investigating the problems connected with the solar motion.

22 November 1985

Information Inferred from Orbits
for Studies of the Structure and Evolution
of Galaxies

Joint Meeting of Commission 28 and 33. Chairman: L. Martinet. The following papers were presented:

- L. Martinet: Recent developments in the field (Overview)
 T. de Zeeuw: Construction of triaxial galaxies
 A. Wilkinson: Integrals of motion of the stellar orbits in a triaxial N-body model of an elliptical galaxy
 H. de Jonghe: On the non-uniqueness of anisotropic distribution functions for spherical systems
 T. Bontekoe: Dynamical friction in a binary galaxy model
 Y. Tong: The general solution of the Poisson equation in 3-D for disk-like galaxies.

23 November 1985

HIPPARCOS

Joint Meeting of Commissions 8, 24, 25, 33 and 37. Chairman: J. Kovalevsky. The proceedings of this meeting will be published in the IAU "Highlights of Astronomy".

25 November 1985

The Galactic Center

Chairman: M. Morris. The following papers were presented:

- M. Morris: Review of recent VLA and other radio observations of the galactic center
 A. Sandqvist: HCO^+ in the inner 5 pc of the Galaxy

- C. Salter: A new 3-mm map of the galactic center at 70" resolution
 R. Sramek: Parallax measurements of the compact radio source at the galactic center
 N. Kaifu: Molecular and continuum observations of the galactic center
 J.H. van Gorkom, U.J. Schwarz, J.D. Bregman: H76 α recombination line observations of the galactic center
 R. Wielebinski: Radio continuum and polarization results from Bonn
 A.A. Stark: ¹³CO mapping of the galactic center

27 November 1985

The Large-Scale Distribution of
 Interstellar Matter in the Galaxy

Chairman: W.B. Burton. The following papers were presented:

- B. Pagel: Metallicity gradients
 P. Wanner: Isotope-ratio gradients
 A.A. Stark: Galactic molecular cloud distribution
 W. Hermsen: Distribution of molecular hydrogen from γ -radiation
 H. Walker: Galactic dust distribution
 F.J. Lockmann: The thickness of the HI layer

The Large-Scale Distribution of
 Stars in the Galaxy

Chairman: K.C. Freeman. The following papers were presented:

- K.C. Freeman: Overview of galactic components
 P. van der Kruit: Pioneer X results - surface photometry of the Galaxy
 A. Murray: Probing the South Galactic Cap
 A.R. Upgren: Properties of nearby dwarf stars
 J. MacConnell: Near-IR photographic survey for southern red supergiants

Joint Discussions

A full account of Joint Discussion I on "Reference Frames" and of Joint Discussion VI on the "Evolution in Young Populations in Galaxies", both co-sponsored by Commission 33, is given in the IAU "Highlights of Astronomy".

Resolution on Galactic Constants
 adopted by IAU Commission 33 on 21 November 1985

- Whereas (1) many recent determinations of R_0 (the distance of the Sun from the center of the Galaxy) and Θ_0 (the circular rotation velocity at the Sun) have departed from the commonly used values of 10 kpc and 250 km s⁻¹ respectively,
 and (2) although these quantities are still not known with great precision, determinations reported in the last decade have led to mean values of R_0 , Θ_0 , and the Oort constants A and B, which form a physically reasonable set,
 and (3) there are practical advantages in agreeing on conventional values which can provide a good basis for comparisons between the work of different astronomers, while being consistent with the best determinations available, to within their uncertainties,

Commission 33 recommends, on the basis of the conclusions of its Working Group on Galactic Constants, use of the values

$$\begin{aligned} R_0 &= 8.5 \text{ kpc} \\ \Theta_0 &= 220 \text{ km s}^{-1} \end{aligned}$$

in cases where standardization on a common set of galactic parameters is desirable.

The estimated uncertainty in these values, based on the dispersion among recent determinations, is ± 1 kpc and $\pm 20 \text{ km s}^{-1}$.

The Commission makes no recommendation concerning A and B, but notes that the above values of R_0 and Θ_0 imply that the quantity $(A-B) = 25.9 \text{ km s}^{-1} \text{ kpc}^{-1}$.

R. Wielen
President, IAU Commission 33