Commission 20: POSITIONS AND MOTIONS OF MINOR PLANETS, COMETS AND SATELLITES

Positions et mouvements des petites planètes, des comètes et des satellites

PRESIDENT: A. Carusi
VICE-PRESIDENT: D.K. Yeomans
SECRETARY: E. Bowell

1 Administrative Session (18 August)

The President welcomed members to Den Haag, and alerted members to a number of sessions of potential interest to them.

Those present were invited to stand in silence in remembrance of Commission members and consultants who had died during the previous triennium: S. Arend, M.A. Dirikis, R.S. Harrington, E.I. Kazimirchak-Polonskaya, Ľ. Kresák, B. Popovic, and N.S. Samoilova-Yakhontova.

Four short presentations were given. In the first, L.G. Taff indicated the need for supplementary funding to upgrade the Hubble Space Telescope Guide Star Catalog (to Version 1.2), which would result in a three-fold improvement in positions and proper motions by means of a re-reduction of plate coordinates. Then C. Keay informed members of various kinds of atmospheric pollution that affect astronomical observations. B.G. Marsden outlined the need for a change in the system of cometary nomenclature, and put forward a specific proposal concerning a new temporary designation system (see also the notes on the Commission meeting of 22 August and Commission 20 Resolution no. 4). Last, F.K. Edmonson requested that members recognize a number of anniversaries, bearing on the Commission's work, that will take place at Indiana University in 1995 (see Resolution no. 3 below).

The current membership of the Commission, its committees and working groups, was reviewed, and suggestions were solicited for the names of new members and consultants. It was reported that nomination by the Organizing Committee of D.K. Yeomans as President and H. Rickman as Vice President had already been approved by the IAU Executive Committee for the coming triennium. E. Bowell was unanimously appointed as Secretary of the Commission (1994-1997). It was pointed out that existing consultants must be re-appointed. H. Rickman is to continue as Chair of the working group on comets, J.-E. Arlot as Chair of the working group on satellites, and L.H. Wasserman as Chair of the working group on occultations.

Next, B.G. Marsden indicated that he would like to request from the IAU the sum of 11700 CHS for operation of the Minor Planet Center during the coming triennium. It was decided to submit the request as a Commission resolution (see resolution no. 1 below).

The President then described mooted changes to the structure of the IAU; namely, that Commissions would be grouped into twelve divisions (later changed to eleven divisions), each of which would elect a President who would report to the Executive Committee. After discussion among members, there was general approbation expressed concerning a division comprising the Commissions (15, 16, 20, 21, and 22) concerned with solar system astronomy.

I. Appenzeller (ed.), Transactions of the International Astronomical Union Volume XXIIB, 163-169.

2 Scientific Session dedicated to the memory of J. Štohl and Ľ. Kresák (19 August)

Supported by Commissions 15, 20, and 22, and organized by Alan W. Harris and Iwan P. Williams, this special scientific session was dedicated to the memory of J. Štohl and Ľ. Kresák. The program was as follows:

I.P. Williams	Tribute to J. Štohl
A. Carusi	Tribute to Ľ. Kresák
A. Hajduk	Meteor-Comet Relationships
D.I. Steel	Meteor-Asteroid Relationships
D.K. Yeomans	Comet P/Shoemaker-Levy 9
I.P. Williams	Trans-Neptunian Objects
D. Morrison	(243) Ida and its Satellite

3 Working Group Meeting 2 on Near-Earth Object Detection (20 August)

Supported by Commissions 4, 7, 9, 15, 16, 20, 21, and 22, WGM 2 was chaired by A. Carusi, with the following program:

D. Morrison	Scientific assessment
E. Bowell	Current knowledge survey
R. Jedicke	NEO detection by Spacewatch
D.I. Steel	Schmidt telescope plate archives as an important NEO data resource
D.K. Yeomans	Radar observations
G. Hahn	EUNEASO Update
E.F. Helin	PCAS Update (read by D.K. Yeomans)
D. Tedesco	Planetary astronomy observations using the Midcourse Space Experiment Satellite
S. Isobe	Organized observations by many Japanese public small telescopes and their effects
Miaofu He	Activities of NEO detection in China
B.G. Marsden	International activities
I.I. Brejdo et al.	Investigations of the Russian unsensitized plates NT-1A and orthochromatic NT-1AG

4 Administrative Session and Joint Commission Meeting (22 August)

The President gave a list of deceased members and consultants (see above), and then lists of proposed new members and consultants, and chairmen and members of the Commission's Working Groups and Committees. It was decided to maintain the three WGs on Comets, Satellites and Occultations, while collapsing the Naming Committees into a single Small Body Nomenclature Committee. The names were reviewed and approved by Commission members as follows:

President: D.K. Yeomans.

Vice President: H. Rickman.

Secretary: E. Bowell.

New members: Chr. Froeschlé (France), Kai-Xian Shen ((PRC), A. Maury (France), A.K.B. Monet (U.S.A.), A. Lemaître (Belgium), M. Moons (Belgium), N. Solovaya (Russia), G. Tancredi (Uruguay).

Consultants (1994-1997): C.M. Bardwell (U.S.A.), S.J. Bus (U.S.A.), V.S. Casulli (Italy), M. Cavagna (Italy), K.I. Churyumov (Ukraine), R. Gil-Hutton (Argentina), R.W. Farquhar (U.S.A.), Z.M. Pereyra (Argentina), H. Oishi (Japan), P. Pravec (Czech Republic), ? Raab (Austria), T. Seki (Japan), C.S. Shoemaker (U.S.A.), G.V. Williams (U.S.A.).

Scientific Organizing Committee: K. Aksnes, J.-E. Arlot, E. Bowell, A. Carusi, B.G. Marsden, H. Rickman, V.A. Shor, D.K. Yeomans, L.H. Wasserman, J.-X. Zhang.

Working Group on Comets: M.E. Bailey, M.P. Candy, A. Carusi, A. Gilmore, B.G. Marsden, S. Nakano, H. Rickman (ch.), E. Roemer, G. Sitarski, P. Wild, D.K. Yeomans.

Working Group on Occultations: J.C. Bhattacharyya, C. Blanco, G.L. Blow, D.W. Dunham, M.-F. He, A.R. Klemola, R.L. Millis, M.D. Overbeek, V.A. Shor, M. Soma, G.E. Taylor, L.H. Wasserman (ch.)

Working Group on Satellites: K. Aksnes, J.-E. Arlot (ch.), S. Ferraz-Mello, P.A. Ianna, R.A. Jacobson, J.H. Lieske, B. Morando, J.D. Mulholland, T. Nakamura, D. Pascu, M. Rapaport, P.K. Seidelmann, V.A. Shor, D.B. Taylor, R. Viera-Martins.

Small Body Nomenclature Committee: K. Aksnes, A. Carusi, Y. Kozai, B.G. Marsden (ch.), H. Rickman, L.D. Schmadel, V.A. Shor, R.M. West, D.K. Yeomans.

Satellite Nomenclature Liaison Committee: K. Aksnes (ch. & delegate to WGPSN), J.-E. Arlot, A. Carusi, P.K. Seidelmann (vice ch. & alternative delegate to WGPSN), D.K. Yeomans.

Standing Committee to Oversee Publication of Photometric Data for Minor Planets: E. Bowell, A. Carusi, A.W. Harris, B.G. Marsden.

Study Group on the Origins of Minor Planet Names: V.K. Abalakin, E. Bowell, F.K. Edmondson, H. Haupt, B.G. Marsden, J.D. Mulholland, E. Roemer, L.D. Schmadel (ch.), K. Tomita, I. van Houten-Groeneveld, J.-X. Zhang.

Prior to the General Assembly, members had been asked to suggest a name for minor planet (6000). After considering four suggestions, a vote decided in near-unanimous favor of "United Nations".

The President brought forward four resolutions for discussion and approval by the Commission. Resolutions nos. 1, 2, and 3 were unanimously approved. Resolution no. 2, on a re-reduction of the Hubble Space Telescope Guide Star Catalog, was submitted and supported jointly by Commissions 8, 20, 24, and 45. Resolution no. 3, suggested by F.K. Edmondson, was also supported by Commission 41. Resolution no. 4 had already been discussed in great detail during an extramural meeting on 18 August. It was here further discussed by members of Commission 20, along with members of Commissions 15, 16, 21, and 22, who had been invited to the session as interested parties. Commission 20 members then unanimously approved resolution no. 4. On the matter of comet names (as distinct from their designations, which are dealt with by the resolution), it was decided that a small committee, chaired by D.K. Yeomans, would be charged with reporting to the Commission in time to implement the new

comet nomenclature system by 1 January 1995. Committee members were asked to volunteer from among those Commission members present, with the following result:

Ad hoc Comet Names Committee: M.F. A'Hearn, E. Bowell, A.W. Harris, B.G. Marsden, S. Nakamura, H. Rickman, L.D. Schmadel, D.J. Tholen, D.K. Yeomans (ch.)

The texts of Commission 20 resolutions are as follows:

4.1 Resolution No. 1

Commission 20,

Requires the sum of 11700 CHF in partial support of the Minor Planet Center during the triennium 1995-1997.

4.2 Resolution No. 2

Commission 20,

Recognizing that the Hubble Space Telescope Guide Star Catalog and its associated scan database has been of great value for studies of positions and proper motions of faint stars and for the production of finding charts of such stars, and the reduction of minor planet and cometary orbits, and

Recognizing that a new reduction would result in an improvement of positions by a factor of three, and

Recognizing that the methods and computer programs exist to perform this new reduction,

Resolves that the IAU support a new reduction of the Guide Star Catalog material, and that every effort be undertaken to find the necessary funds.

4.3 Resolution No. 3

Commission 20

and Commission 41 of the IAU offer congratulations to Indiana University on the 175th anniversary of its founding and the 100th anniversary of the founding of the Department of Astronomy, which has continued the tradition of research that was started by Daniel Kirkwood during his thirty years (1856-1886) as Professor of Mathematics.

This Resolution was subsequently substituted by a Letter of Congratulations to be written by the new Commission President on behalf of Commission 20.

4.4 Resolution No. 4

1. **Commission 20 of the IAU,** considering that

(a) there is essentially a 1:1 correspondence between the provisional (year/letter) and definitive (year/Roman numeral) designation systems for comets;

(b) the procedure for interpolating old discoveries of comets into the existing designation systems is unsatisfactory, particularly when orbit determinations are not available;

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(c) the application of a new designation at each return of a periodic comet to perihelion is an unnecessary complication, particularly when the comet's recovery can be described as "routine", or for the rapidly increasing number of periodic comets that are followed all around their orbits; and

(d) there can be confusion whether a newly-discovered object is a comet or a minor planet,

proposes to replace the present designation systems for comets with a system that closely resembles, but is not identical to, the designation system for minor planets.

2. Specifically, it is resolved that the year/letter and year/Roman numeral systems be replaced by one in which each cometary discovery is given a designation consisting of the year of observation, the upper-case code letter identifying the halfmonth of observation during that year according to the procedure used for minor planets, and a consecutive numeral to indicate the order of discovery announcement during that halfmonth. Each new designation shall be supplied by the IAU Central Bureau for Astronomical Telegrams when the discovery is announced in one of its Circulars. For example, the third comet reported as discovered during the second half of February 1995 would be designated 1995 D3.

3. The nature of an object can further be indicated by an initial prefix.In particular, such prefixes should be applied in cases where comets have possibly been misdesignated as minor planets, or vice versa. If necessary, the prefix A/ would precede a comet designation that actually refers to a minor planet (or asteroid). For comets the acceptable prefixes are P/ for a periodic comet (defined to have a revolution period of less than 200 years or confirmed observations at more than one perihelion passage) and C/ for a comet that is not periodic (in this sense), with the addition of X/ for a comet for which a meaningful orbit can not be computed and D/ for a periodic comet that no longer exists or is deemed to have disappeared.

4. If a comet is observed to return (or have its periodicity established by observation through aphelion or from identifications), the P/ (or D/) shall be preceded by an official sequential number (e.g., 1P/1682 Q1 = Halley), the list to be maintained by the Minor Planet Center and published in the Minor Planet Circulars. Subsequent recoveries shall be acknowledged with further designations only when the predictions are particularly uncertain.

5. The practice of providing future predictions for the returns to perihelion of all periodic comets for which there is a reasonable chance of future observations will continue. While this currently means, for example, the publication of predictions for the comets for the year n in the batch of Minor Planet Circulars for May of the year n-3, the elements being for the 40-day date closest to perihelion passage, it is to be expected that this process will be supplemented–and perhaps eventually supplanted–by one that provides the orbital elements for these comets routinely at epochs 200 days apart, as in the case of minor planets.

6. In the case of a comet that has separated into discrete components, those components should be distinguished by appending -A, -B, etc., to the designation (or to the P/ or D/ periodic comet number).

7. Noting that some redundancy of nomenclature is desirable, it is proposed to retain in general terms the tradition of naming comets for their discoverers. In this framework, a committee has been formed to establish more precise procedures to ensure fairness and simplicity.

8. It is proposed that comet names be announced in the IAU Circulars only following consultation between the Central Bureau for Astronomical Telegrams and the Commission 20 Small Bodies Names Committee.

9. Whereas the new designation system for comets implies the possibility of confusion (if incorrect spacing is used) with that for new planetary satellites, it is proposed to indicate satellites with the prefix S/.

10. It is proposed that the new designation system for comets be introduced at the beginning of the year 1995. In the interests of avoiding confusion and maintaining continuity, Roman numeral designations will be published in the Minor Planet Circulars for pre-1995 comet discoveries/recoveries passing perihelion in 1993 and 1994, and new-style designations will be supplied for pre-1995 comets, together with lists of correlations with both the year/letter and the year/Roman numeral systems.

Following the joint discussion on resolution no. 4, members of Commissions 15, 16, 20, 21, and 22 were apprised, by A.W. Harris, of the plans to restructure the IAU. As before, there was general approbation, in particular for the idea that Division Presidents would advise the IAU Executive Committee and attend its meetings during the General Assembly.

Then Commission 20 members present thanked their President, A. Carusi, for his stewardship of the Commission during the past triennium.

5 Business Session of the Working Group on Near-Earth Objects (22 August)

Chairman A. Carusi directed the session. He reviewed past activities and prospects, and outlined the status of the WGNEO within the solar system division. However, most of the session was taken up in a discussion of the wording of IAU resolution B10 concerning renewal of the Working Group's existence during the coming triennium and what the charter of the Working Group's activities ought to comprise. In particular, there was prolonged debate over whether the WGNEO should attempt to act as an organizing body or in a purely advisory capacity. There was also discussion on how information about NEOs should be disseminated publicly (perhaps through an NEO Bulletin), and on the support and coordination of national initiatives. The following resolution was passed with nine votes in favor, two against, and two abstentions:

The XXIInd General Assembly of the IAU, following the suggestion of the WGNEO **recognizes**

(1) that cosmic impact by comets and minor planets is an environmentally significant phenomenon which has played a major role in the evolution of life on Earth,

(2) that our current knowledge of the quantity, distribution and actual orbits of NEOs is very limited,

(3) that an inventory of NEOs as complete as possible with present techniques is best achieved through a cooperative, internationally coordinated program of observation and data collection,

(4) that the IAU, and specifically its Working Group on Near-Earth Objects, is the only international body currently involved in this field, whereas several national communities are ready to plan operations,

and, therefore, **recommends**

that the WGNEO be continued, as a Working Group of the Solar System Division, in order:

(1) to encourage and advice the participation of many nations in the search for NEOs,

(2) to encourage and assist with coordination of national initiatives,

(3) to prepare, within three years, an assessment of the relative merits and defects of plans for these searches,

(4) to invite other scientific organizations, such as COSPAR, IUGG, etc., to join IAU in this effort,

(5) to foster and encourage dissemination of accurate information on the nature and extent of the NEO hazard,

(6) to report back, to the XXIIIrd General Assembly in 1997, on the status of this activity.

There followed discussion and agreement on the membership of the Working Group on Near-Earth Objects for the 1994-1997 triennium:

Members of the WG on NEOs: M.F. A'Hearn (U.S.A.), E. Bowell (U.S.A.), A. Carusi (ch., Italy), T. Gehrels (U.S.A.), G. Hahn (Germany), A.W. Harris (U.S.A.), S. Isobe (Japan), A.-C. Levasseur-Regourd (France), B.G. Marsden (U.S.A.), A. Milani (Italy), D. Morrison (U.S.A.), K. Muinonen (Finland), P.K. Seidelmann (U.S.A.), A.G. Sokolsky (Russia), D.I. Steel (Australia), I.P. Williams (U.K.), D.K. Yeomans (U.S.A.).

A list of consultants was then proposed and accepted by those present. It was pointed out that WGNEO consultants could be drawn from outside the membership of the IAU, and that additional consultants from industry and other areas might be co-opted. The list, with a few additions made subsequent to the General Assembly, is as follows:

Proposed Consultants to the WGNEO: T.J. Ahrens (U.S.A.), C. Blanco (Italy), G.H. Canavan (U.S.A.), M. Carpino (Italy), C.R. Chapman (U.S.A.), N.S. Chernykh (Russia), E.F. Helin (U.S.A.), R. Jedicke (U.S.A.), B.W. Koehn (U.S.A.), C.-I. Lagerkvist (Sweden), J.V. Lambert (U.S.A.), A. Maury (France), G. Neukum (Germany), S. Nakano (Japan), S.J. Ostro (U.S.A.), J. Pike (U.S.A.), S.H. Pravdo (U.S.A.), P. Pravec (Czech Republic), D.L. Rabinowitz (U.S.A.), E.M. Shoemaker (U.S.A.), P. Sicoli (Italy), E. Tagliaferri (U.S.A.), G. Tancredi (Uruguay), P.D. Tennyson (U.S.A.), D.J. Tholen (U.S.A.), R.M. West (Denmark), G.V. Williams (U.S.A.), V. Zappalà (Italy).

Last, the Chairman proposed a four- or five-day Spaceguard Survey Workshop, in Vulcano, Italy (September 1995). The principal goals of the Workshop will be to evaluate technical and scientific aspects of such a survey, and to establish an Assessment Study Team charged with producing an Assessment Report to be presented at the XXIIIrd IAU General Assembly in 1997. Such a report could form the basis of a phase A study.

6 Working Group Meeting 4 on Asteroids and Comets (24 August)

A scientific WG meeting on asteroids and comets was held on the 24th of August, chaired by A. Carusi with the following program:

A. Carusi	Orbital distribution of comets
A. Milani	Orbital distribution and history of asteroids
B.G. Marsden	Asteroidal/cometary objects in the outer solar system
E. Bowell & K. Muinonen	Observational techniques for minor bodies
J.-E. Arlot et al.	Planetary satellites (3 presentations)
M. Standish	Planetary ephemeris