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COSPAR

TWENTY - THIRD PLENARY MEETING

including

Seven Symposia, Two Workshops
and Topical Sessions



ABSTRACTS

Budapest, Hungary

2-14 June 1980

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ORIGIN AND AIMS OF COSPAR

COSPAR was established by the International Council of Scientific Unions in October 1958 to continue the cooperative programmes of rocket and satellite research successfully undertaken during the International Geophysical Year of 1957—58. The ICSU resolution creating COSPAR stated that the primary purpose of COSPAR was to "provide the world scientific community with the means whereby it may exploit the possibilities of satellites and space probes of all kinds for scientific purposes, and exchange the resulting data on a cooperative basis."

Hence, COSPAR is an interdisciplinary scientific organization concerned with the progress on an international scale of all kinds of fundamental research carried out with the use of rockets or rocket propelled vehicles.

In September 1975, the ICSU General Committee extended the terms of reference of COSPAR to include also space research experiments with balloons.

COSPAR's objectives are carried out by the international community of scientists working through ICSU and its adhering national academies and international Scientific Unions. Operating under the rules of ICSU, COSPAR ignores political considerations and considers all questions solely from the scientific viewpoint.

COMPOSITION OF COSPAR

The Membership of COSPAR is as follows

- a) One representative designed by each national scientific institution adhering to ICSU which is actively engaged in space research and which wishes to be represented in COSPAR.
- b) One representative designated by each international scientific Union federated in ICSU which wishes to participate in COSPAR.

COSPAR SECRETARIAT

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Attention: COSPAR

For the second time, the program and the abstract booklets of the COSPAR Meeting and Associated Symposia are being issued separately. This presentation was appreciated by the participants of the 1979 COSPAR Meeting.

Once again, the camera-ready copies for the booklets have been prepared by the COSPAR Secretariat and printed, generously, at no cost to our Committee, by the Local Organizing Committee.

The timely preparation of the camera-ready manuscript required an enormous effort of the Secretariat's staff. The reasons were threefold:

- i) The staff of the Secretariat has been reduced during the last three months, due to the prolonged illness of Mr. G. Bollenbach and his subsequent passing away on 25 April 1980. Although Mr. Bollenbach's tasks were of another nature, he was always most helpful in the periods of great stress when all the staff had to concentrate on finalization of program arrangements for the COSPAR meetings.
- ii) The time available for preparation of the booklets was three weeks shorter than usual (the Program Committee Meeting took place, for reasons beyond our control, at the very end of March 1980, instead of during the first week of March).
- iii) Resulting from the highest number of symposia and workshops associated with a Plenary Meeting, in the history of COSPAR, and the rich program of topical meetings, the number of scientific papers, and therefore the volume of the abstracts and program booklets, is almost double compared with the 1979 COSPAR Meeting.

I wish to express here my most sincere thanks to Mrs. Deborah Castel and Miss Peta Goodin, who, for all of April, worked with me 11-12 hours per day, and sacrificed all Saturday's in order to terminate the preparation of the camera-ready copies for the printing deadline, in addition to the work necessary for notification of all authors of accepted papers, mailing final programs to National Committees, etc.

If you find any shortcomings in the Secretariat's work, please kindly be indulgent, since the situation was really exceptional.



Z. Niemirowicz

Paris, 28 April 1980.

XXIIIrd COSPAR PLENARY MEETING

HONORARY COMMITTEE

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Prof. J. Kubovics	- Dean, Faculty of Natural Sciences, Eötvös University

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Dr. A. Horváth

Mrs. É. Paccsirszy
Dr. Gy. Tarcsai
Dr. A. Varga

COSPAR EXECUTIVE COUNCIL

The Executive Council is the governing body of COSPAR. It consists of seven elected members (Bureau), Representatives of International Unions, and, in an advisory capacity, the Chairmen of COSPAR Interdisciplinary Scientific Commissions, Panels, and the Advisory Committee on Data Problems and Publications.

Bureau

President	-J.F. Denisse	-Academie des Sciences, France
Vice-Presidents	-F.S. Johnson	-US National Academy of Sciences
	-R.Z. Sagdeev	-USSR Academy of Sciences
Members	-R.E. Barrington	-National Research Council, Canada
	-J.H. Carver	-Australian Academy of Sciences
	-S. Piotrowski	-Polish Academy of Sciences
	-K. Serafimov	-Bulgarian Academy of Sciences

Representatives of International Scientific Unions

Astronomical Union	-P.A. Wayman
Union of Biochemistry	-S. Black
Union of Biological Sciences	-E.B. Shulzhenko
Union of Crystallography	-E. Kaldis
Union of Geodesy & Geophysics	-J.G. Roederer
Union of Geological Sciences	-W.D. Carter
Mathematical Union	-J. Moser
Union of Physiological Sciences	-H. Bjurstedt
Union for Pure & Applied Biophysics	-S. Black
Union for Pure & Applied Chemistry	-C. Ponnamperuma
Union of Pure & Applied Physics	-B. Peters
Union of Theoretical & Applied Mechanics	-W. Fiszdon
Union of Radio Science	-K. Rawer

Chairmen/Vice-Chairmen of COSPAR Interdisciplinary Scientific Commissions, Panels, and Advisory Committee

- ISC A on Space Studies of the Earth's Surface, Meteorology and Climate -
S.I. Rasool
- ISC B on Space Studies of the Earth-Moon System, Planets, and Small Bodies
of the Solar System - J.R. Arnold/V.L. Barsukov
- ISC C on Space Studies of the Upper Atmospheres of the Earth and Planets, in-
cluding Reference Atmospheres - S.A. Bowhill/M.Ya. Marov
- ISC D on Space Plasmas in the Solar System, including Planetary Magnetospheres
- D.E. Page/M.J. Rycroft
- ISC E on Research in Astrophysics from Space - S.L. Mandelshtam/L.E. Peterson/
R.M. Bonnet
- ISC F on Life Sciences as Related to Space - T.H. Jukes
- ISC G on Materials Sciences in Space - A. Bewersdorff/Y. Malméjac/L. Steg
- Panel on Frequency Allocation & Radio Transmissions - R. Leitinger
- Panel on Space Research & Developing Countries - J. Sahade
- Panel on Potentially Environmentally Detrimental Activities in Space - K. Rawer
- Panel on Technical Problems Related to Scientific Ballooning - W. Riedler
- Technical Panel on Dynamics of Artificial Satellites & Space Probes - L. Sehnael
- Advisory Committee on Data Problems & Publications - J.I. Vette

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GENERAL ORGANIZATION

The XXIIIrd Meeting of COSPAR includes:

-Meetings of various COSPAR bodies -

General Assembly (Plenary); Executive Council; Bureau; Finance Committee. Also, the meetings of the Advisory Committee on Data Problems and Publications, Editorial Board, and business meetings of the COSPAR Interdisciplinary Scientific Commissions (ISC's) and independent Panels will be held.

-Specialized Symposia and Workshops -

- Symposium on Progress in Planetary Exploration (COSPAR/URSI/IAU/ IAGA/IUGG)(identification: 1)
- Symposium on Cosmic Rays in the Heliosphere (COSPAR/IUPAP/IAU/IAGA/ SCOSTEP)(identification: 2)
- Symposium on Physics of Planetary Magnetospheres (COSPAR/IUGG/IAU) (identification: 3)
- Symposium on System Performance and Early Results of the Global Observing System for FGGE (COSPAR/ICSU/WMO/IAMAP)(identification: 4)
- Symposium on Theoretical Problems in High Energy Astrophysics (COSPAR/IAU)(identification: 5)
- Symposium on Perspectives for Scientific Ballooning during the 1980's (COSPAR/IUPAP/SCOSTEP)(identification: 6)
- Workshop on Experience with and Proposed Improvements of International Reference Ionosphere (URSI/COSPAR)(identification: 7)
- Workshop on Comparative Studies of Planetary Interiors (COSPAR/IAU) (identification: 8)
- Symposium on Active Experiments in Space Plasmas (COSPAR/IAGA/IUPAP) (identification: 9)

-Topical Sessions of COSPAR ISC's and the Technical Panel -

- Topical scientific sessions of ISC's on Physical Sciences - A, B, C, E, and G (D is concentrating its program in two of the above symposia) and the Technical Panel on Dynamics of Artificial Satellites and Space Probes (identification letter same as Commission letter; T.P. for Technical Panel)
- Topical Scientific sessions on biological sciences (ISC F)(identification: F)

All sessions of Specialized Symposia and Workshops, as well as the Topical Sessions of COSPAR ISC's, are open to all registered participants. In addition, so are the Opening Ceremony and the Open Public Plenary Session, both of which are to be held on Monday, 9 June, a.m.

Some working meetings of other ICSU bodies are also being organized on the occasion of the COSPAR Meeting in Budapest (SCOSTEP, IAU, IAG groups, and CCMP).

PROGRAM SCHEDULE
XXIII PLENARY MEETING OF COSPAR AND ASSOCIATED EVENTS
June 1980 - Budapest, Hungary

1980	A.M. (9:00 - 12:00)	Room	P.M. (2:00 - 5:30)	Room
Monday, 2 June	-Symposium 1. Session 1.1. Planetary Structure and Composition (see page 11) -Symposium 2. Session 2.1. Opening (see page 45)(10 a.m.)	II III	-Symposium 1. Session 1.2. Comparative Planetology (see page 15) -Symposium 2. Session 2.2. Solar Acceleration (see page 45) (3 p.m.)	II III
Tuesday, 3 June	-Symposium 1. Session 1.3. Venus (see page 20) -Symposium 2. Session 2.3. Interplanetary Acceleration (see page 51)	II III	-Symposium 1. Session 1.4. Planetary Atmospheres (see page 25) -Symposium 2. Session 2.4. Propagation of Solar Particles (see page 57)(3 p.m.) -ISC A Business Meeting	II III VI
Wednesday, 4 June	-Symposium 1. Session 1.5. Jupiter (see page 29) -Symposium 2. Session 2.5. Propagation of Galactic Particles (see page 63) -Symposium 3. Session 3.1. Introductory Session (see page 75) -Symposium 4. Session 4.1. FGGE Space Systems (see page 129)	II III I IV	-Symposium 1. Session 1.6. Outer Planets, Asteroids, and Comets (see page 33), followed by -ISC B Business Mtg. -Symposium 2. Session 2.6. Out-of-Ecliptic Propagation and Other Topics (see page 68) (3 p.m.) -Symposium 3. Session 3.2. Solar Wind/Bow Shock/Magnetospheric Phenomena (see page 79) -Symposium 4. Session 4.2. Special Observing System (see page 134) and Session 4.3. Observations in the Tropics (see page 136)	II II III I IV
Thursday, 5 June	-Symposium 1. Session 1.7. Outer Planets, Planetary Atmospheres (see page 35) -Symposium 3. Session 3.3. Magnetopause of Different Planets (see page 87) -Symposium 4. Session 4.4. Wind Determination (see page 139 and Session 4.5. Data Assessment (see page 142)	II I IV	-Symposium 1. Session 1.8. Formation and Evolution of the Solar System (see page 39) -Symposium 3. Session 3.4. Current and Transport Mechanisms (see page 92) -Symposium 4. Session 4.6. Air-Sea Interaction and Future Development (see page 146), followed by	II I IV

	-Symposium 5. Session 5.1. Cosmology and Extragalactic Astronomy (see page 165) -Finance Committee Mtg. (in office of Executive Secretary)	III	-ISC A: Sub-Commission A.1 Business Mtg. -Symposium 5. Session 5.2. Galaxies and Cosmic Rays, SS433 (see page 169) -Bureau Meeting, 1st Session -CCHP Meeting	IV III SZ 09 L 01
Friday, 6 June	-Symposium 3. Session 3.5. Internal Magnetospheric Boundaries (see page 99) -Symposium 4. Session 4.7. Structure of the Troposphere (see page 149) and Session 4.8. Stratosphere (see page 152) -Symposium 5. Session 5.3. Supernova Evolution (see page 173) -Symposium 6. Session 6.1. Balloon Instrumentation and Balloon-Borne Experiments-I (see page 191) -IAU W.G. for Planetary System Nomenclature - Business Meeting	I IV III II VI	-Symposium 3. Session 3.6. Source and Loss Mechanisms in Planetary Magnetospheres (see page 105) -Symposium 4. Session 4.9. Stratosphere (cont d)(see page 155) -Symposium 5. Session 5.4. Binary Systems, Pulsars (see page 177) -Symposium 6. Session 6.2. Balloon Instrumentation and Balloon-Borne Experiments-II (see page 197) -Executive Council Meeting, 1st Session -Panel on Space Research and Developing Countries - Business Meeting -IAU W.G. for Planetary System Nomenclature - Business Meeting -SCOSTEP Open Mtg. on MAP (6:00 p.m.)	I IV III II H.B. L 01 VI IV
Saturday, 7 June	-Symposium 3. Session 3.7. Composition of Planetary Magnetospheres (see page 113) -Symposium 4. Session 4.10. Global Aspects (Radiation Balance, Clouds, Aerosols)(see page 159) -Symposium 5. Session 5.5. Accretion Phenomena (see page 181) -Symposium 6. Session 6.3. Balloon Technology (see page 204)	I IV III II	-Symposium 3. Session 3.8. Instabilities, Plasma Waves and Radio Waves in Planetary Magnetospheres (see page 119) -Symposium 5. Session 5.6. X- and Gamma-Ray Bursters (see page 185) -Symposium 6. Session 6.4. Operational Aspects of Long-Duration Balloon Flights (see page 209)	I III II
1st Business Meeting - A.C.D.P.P. - 12:30 in Room L 01				
	-SCOSTEP Bureau Meeting (please watch bulletin board for possible changes in schedule)	SZ 09	-SCOSTEP Informal Plenary Session (please watch bulletin board for possible changes in schedule)	SZ 09

IMPORTANT: All underscored sessions only are open to all registered participants.

Other notes and all legends concerning this time schedule may be found on page 7 of this Booklet.

1980	A.M. (9:00 - 12:00)	Room	P.M. (2:00 - 5:30)	Room
Monday, 9 June	-Opening Ceremony, followed by -Open Plenary Session	I I	-First Business Plenary Session -ISC A. Session A.1.1. Keynote Address; Vegetation and Soils-I (see page 313) -ISC B. Session B.1. Space Investigation of Comets, Asteroids, Cosmic Dust and its Interactions-I (see page 361), followed by -Business Mtg. of acting Sub-Commission on Small Bodies of the Solar System -ISC C. Session C.2.1. Inner Planets-I (see page 395) -ISC C. Session C.3.1. Stratosphere-Mesosphere (see page 421) -ISC E. Session E.1.1. X-Ray Astronomy - Results from HEAO-1 and 2 (see page 449) followed by -Business Meeting Sub-Commission E.1. -ISC F. Session F.1.1. Physical-Chemical Limits of Life in the Solar System-I (see page 475) -ISC G. Session G.1. Theoretical and Applied Mechanics Contribution to Materials Sciences in Space-I (see page 519) -IAG Commission on CSTG - Business Mtg.	III H.B. IV IV I II VIII V VII L 01
Tuesday, 10 June	-ISC C Business Meeting - 1st (luncheon meeting) -Workshop 8. Session 8.1. Evolution of Planets and Planetary Systems-I (see page 241) -ISC A. Session A.1.2. Vegetation and Soils-II (see page 317) -ISC B. Session B.2. Space Investigation of Comets, Asteroids, Cosmic Dust and its Interactions-II (see page 365) -ISC C. Session C.2.2. Inner Planets-II (see page 401) -ISC C. Session C.3.2. Thermosphere-Exosphere (see page 427) -ISC E. Session E.1.2. HEAO-3 Cosmic Rays, γ-Rays and Related Galactic Phenomena (see pages 453)	III H.B. IV I II VIII	-Workshop 8. Session 8.2. Evolution of Planets and Planetary Systems-II (see page 244) -ISC A. Session A.1.3. Vegetation and Soils-III (see page 321) and Minerals, Rocks and Thermal Radiation Meteorology -I (see page 325) -ISC C. Session C.2.3. Outer Planets-I (see page 409) -ISC C. Session C.3.3. Mesosphere-Thermosphere (see page 431) -ISC F. Session F.1.3. Physical-Chemical Limits of Life in the Solar System-III (see page 483) -ISC F; Sub-Commission F.1. Business Mtg. (3:00 p.m.)	III H.B. I II V L 01

Wednesday, 11 June	-ISC F. Session F.1.2. Physical-Chemical Limits of Life in the Solar System-II (see page 479) -ISC G. Session G.2. Theoretical and Applied Mechanics Contribution to Materials Sciences in Space-II (see page 523) -Technical Panel. Session T.P.1. The Force Effecting the Satellite Motion (see page 543)	V VII VI	-ISC F. Session F.1.2. Physical-Chemical Limits of Life in the Solar System-II (see page 479) -ISC G. Session G.2. Theoretical and Applied Mechanics Contribution to Materials Sciences in Space-II (see page 523) -Technical Panel. Session T.P.1. The Force Effecting the Satellite Motion (see page 543)	III IV H.8. VI II I VIII V L 02 L 03 VII L 04	-Workshop 8. Session 8.3. Internal Structure of Planets-I (see page 247) -Symposium 9. Session 9.1. Energetic Particle Injection (see page 265) -ISC A. Session A.1.4. Minerals, Rocks and Thermal Radiation Meteorology-II (see page 329) and Snow and Ice (see page 331) -ISC B. Session B.3. New Techniques for the Investigation of Cosmic Dust and Cometary Constituents-I (see page 371) -ISC C. Session C.1.1. Energy Sources of Solar Origin (see page 383) -ISC C. Session C.2.4. Outer Planets-II (see page 415) -ISC E. Session E.2.1. Early Results of the SMM Experiment-I (see page 463) -ISC F. Session F.2.1. Cosmos-Salyut Results and Related Studies-I (see page 489) -ISC F; Sub-Commission F.2. Business Mtg. -ISC F; Sub-Commission F.3. Business Mtg. (both the above begin at 11:00 a.m.) -ISC G. Session G.4. Significant Results of Microgravity Experiments-I (see page 531) -Technical Panel. Business Mtg. (1st)	-Workshop 7. Session 7.1. Electron Density Profiles-I (see page 215) -Workshop 8. Session 8.4. Internal Structure of Planets-II (see page 251) -Symposium 9. Session 9.2. Energetic Particle Injection (cont'd) and Plasma Wave Injections (see page 271) -ISC A. Session A.1.5. Surface and Open Waters (see page 335) and Spectral Band Requirements and Satellite Projects (Panel Discussion) -ISC B. Session B.4. New Techniques for the Investigation of Cosmic Dust and Cometary Constituents-II (see page 377) followed by -Business Mtg. of acting Sub-Commission on Small Bodies of the Solar System -ISC C. Session C.1.2. Energy Inputs and Models (see page 389) -ISC E. Session E.2.2. Early Results of the SMM Experiment-II (see page 467) -ISC F. Session F.2.2. Cosmos-Salyut Results and Related Studies-II (see page 495), followed by -ISC F. Business Meeting (5:00 p.m.) -ISC G. Session G.5. Significant Results of Microgravity Experiments-II (see page 535)	I III IV H.8. VI II I VIII V L 02 L 03 VII L 04	I III IV H.8. VI VI VI II VIII V L 02 L 03 VII L 04	-ISC G. Session G.3. Overview of Programs and New Proposals (see page 527) -Technical Panel. Session T.P. 2. Orbital Determination and Ephemeris Computation (see page 547) -Balloon Panel. Discussion on Long-Duration Flights	VII VI VIII	-SCOSTEP Plenary Session (6:00-8:00 p.m.) II (please watch bulletin board for possible changes in schedule)	II
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13:00 - Open SPACEWARN Meeting, in Room L 01

2nd Business Meeting - A.C.D.P.P. - 12:30 in Room L 01 2nd Business Meeting - ISC C, in Room SZ 10 (luncheon business mtg.)					
Thursday, 12 June	-Workshop 7. Session 7.2. Electron Density Profiles-II (see page 221) -Workshop 8. Session 8.5. Planetary Magnetism-I (see page 257) -Symposium 9. Session 9.3. Plasma Wave Injections (cont'd) (see page 277) -ISC A. Session A.2.1. Remote Sensing and Mineral Exploration-I (see page 339) -ISC C. Session C.4.1. Observations of the Planets from Earth-Orbiting Vehicles-I (see page 437) -ISC E. Session E.2.3. Solar X-Ray Radiation (see page 469) -ISC F. Session F.2.3. Cosmos-Salyut Results and Related Studies-III (see page 499) -Technical Panel. Business Mtg. (2nd) (tentative)	II III IV H.B. I VIII V L 04	-Workshop 7. Session 7.3. Electron Temperatures (see page 226) -Workshop 8. Session 8.6. Planetary Magnetism-II (see page 259) -Symposium 9. Session 9.4. Mass Injections (see page 285) -ISC A. Session A.2.2. Remote Sensing and Mineral Exploration-II (see page 341) -ISC C. Session C.4.2. Observations of the Planets from Earth-Orbiting Vehicles-II (see page 442) -ISC E. Session E.1.3. Cosmic X-Ray and γ -Ray Observations (see page 457) -ISC F. Session F.2.4. Cosmos-Salyut Results and Related Studies-IV (see page 505) -Bureau Meeting, 2nd Session	II III IV H.B. I VIII V SZ 09	-SCOSTEP Plenary Session (6:00-8:00 p.m.) (please watch bulletin board for possible changes in schedule) II
12:30 - Editorial Board Meeting, in Room L 01					
Friday, 13 June	-Workshop 7. Session 7.4. Ionic Structure (see page 231) -Symposium 9. Session 9.5. Laboratory and Computer Simulations Relevant to Active Experiments in Space (see page 293) and -Symposium 9. Session 9.6. Poster Session: Energetic Particle Injection (see page 299) -ISC A. Session A.2.3. Remote Sensing and Mineral Exploration-III (see page 347)	II I Hall adjoining I H.B.	-Workshop 7. Session 7.5. General Discussion (see page 237) -Symposium 9. Session 9.7. Effects of Man on the Magnetosphere and Ionosphere (see page 307) and Round-Table Discussion -ISC A. Session A.2.4. Remote Sensing and Mineral Exploration-IV (see page 353)	II I H.B.	-SCOSTEP Plenary Session (6:00-8:00 p.m.) (please watch bulletin board for possible changes in schedule) II