委１４－５

第１回ＳＳＬＧ宇宙協力活動計画会合の結果について

昭和６２年１１月１１日
科学技術庁研究開発局

標記会合が下記により開催され、その結果として、別添のとおり宇宙分野における日米常設幹部連絡会議（ＳＳＬＧ）に対する活動報告及び提言がとりまとめられたので、ここに報告する。

記

１．日時

昭和６２年１０月２６日～２８日

２．場所

箱根　富士屋ホテル

３．会議

全体会合	１０月２７日	14:00～17:00
分科会合	１０月２６日	14:00～17:00
	１０月２７日	10:00～12:00

別添 1

SUMMARY REPORT AND RECOMMENDATIONS

TO

THE SENIOR STANDING LIAISON GROUP (SSLG)

OCTOBER 26 - 28, 1987

HAKONE, JAPAN

JAPAN-NASA COOPERATIVE SPACE ACTIVITIES PLANNING GROUP

Pursuant to mutual agreement between the Japanese side and NASA at the 4th meeting of the Senior Standing Liaison Group (SSLG) held at Washington, D.C. in June 1986, the Japan-NASA Cooperative Space Activities Planning Group was established under the SSLG to coordinate planning for possible future joint studies and projects in space science and space applications. The first meeting of the Cooperative Space Activities Planning Group took place at Hakone, Japan in October 26-28, 1987.

Based upon discussions at its plenary session, the Cooperative Space Activities Planning Group submits the following summary reports and recommendations to the SSLG regarding its five discipline sub-groups and other general matters:

a) Astrophysics

The Astrophysics sug-group met for the third time and reviewed several recently completed and on-going efforts, as well as several proposed new programs. These cooperations have all been entirely successful and a spirit of enthusiasm characterized the discussions.

First, with respect to on-going projects, the following was noted:

- The principle of interferometry with space elements was demonstrated using the Tracking Data Relay Satellite (TDRS) with the Usuda antenna system.

- The Solar-A mission is proceeding well with the parallel development and incorporation of the NASA Team and Soft X-Ray Telescope instrument.

- The data from the Ginga satellite have been of crucial importance to the launch planning for the NASA rockets and balloons for Supernova 1987a, and the visiting scientist program is underway.

Second, with respect to new activities:

- There is high interest in collaboration on the ASTRO-D mission, the SFU infrared mission, and in the ISAS VLBI mission.

- Cooperation in the areas of Scout-class missions, Astrophysics data systems, and in the SIRTF project appears desirable and will continue to be discussed.

Finally, it is recommended that the disciplines of Radio VLBI and Infrared Astronomy be formally included in the overall SSLG framework.

b) Solar System Science

Work continues on three approved projects with a good spirit of cooperation. The GEOTAIL mission for solar terrestrial science in the 1990's has launch scheduled for July 1992 with a Japan/U.S. Memorandum of Understanding to be signed by mid-1988. The Charge III sounding rocket is the next in the series of space tether systems to be launched in 1990. To be launched in 1991, the Solar-A mission provides information on the solar system energy source. All three of these missions should be continued under the SSLG.

Because of recent science developments and based on discussions between ISAS and NASA, it is recommended that the titles of several SSLG collaborative research programs be revised: "OPEN" becomes "ISTP/GEOTAIL", "Halley's Comet Study" becomes "Comets and Small Bodies", "Saturn Orbiter and Dual Probe Mission" becomes "Collaborative Study of Planetary Science" and "Transpacific Ballooning" becomes "Long Duration Ballooning". In addition, it is recommended to update the collaborative programs to include "Space Station Solar Terrestrial Physics", "Space Environment Monitoring" and "Superconducting Magnetic Facility".

It is recommended that studies and discussions be initiated between ISAS and NASA on potential future collaborations including - a sounding rocket program in 1990 to test instruments for GEOTAIL, the use of Sakigake to make Earth magnetotail measurements, definition of a Comet Sample Return mission and a Mercury Orbiter mission, potential coordination of missions to the moon, Venus and Mars, joint long duration balloon techniques, definition of a solar probe, collaboration in use of the Space Station for solar system science, plans for collaborative space environment monitoring and use of a balloon magnet facility which could lead to the Space Station Astromag project.

c) Life Science

Current cooperation between the Japanese side and NASA include Spacelab-J, IML-1, and IML-2 missions; joint flight and ground-based research projects involving University-based researchers; and continuing strategic planning for future activities.

Future activities will focus upon the development of specific hardware items as described in Annex II of this report. A workshop on the development of methodology to minimize crew time in executing experiments in space is planned for January 1988 in the United States. Current status of the science requirements documents for the 1.8m centrifuge facility have been provided by NASA, and representatives from the Japanese side have been invited to at-

tend the Centrifuge Facility Working Group to be held in Napa, California in December 1987. Continuing interaction is planned to facilitate the transition from Spacelab to Space Station activities, including standardization of data acquisition and analysis and the development of science management techniques at the international level. Potential candidates for such activities are SLS-3 and IML-2 missions.

d) Earth Observation

The phase A study of TRMM (Tropical Rainfall Measuring Mission) is nearing completion in both Japan and the U.S.A. Cooperation on polar platform payload studies is continuing with the Japanese side studying AMSR and ITIR for deployment on NPOP-1 and the U.S. side studying LAWS for deployment on JPOP. The Japanese side has defined preliminary weight, power, and data rate for ADEOS to accommodate an additional sensor(s). The Japanese side has not yet made a decision on the ERS-1 MOU. Crustal Plate Motion cooperative studies are continuing.

TRMM should be considered for outline of phase B studies by both sides. The cooperative roles in TRMM were re-emphasized. The Japanese side will inform NASA of the status of AMSR and ITIR development and NASA will inform the Japanese side of accommodation of these sensors on NPOP-1. NASA will study 4 candidate instruments to determine the feasibility of accommodating one or more on ADEOS. NASA requested the Japanese side to make an early decision on the ERS-1 MOU. It is proposed that a cooperative research study be undertaken to determine the feasibility of LAWS including measurement of background atmospheric aerosols and its accommodation on JPOP. Cooperative studies on crustal plate motion should continue. Provision for and encouragement of personnel exchanges is recommended to enhance these cooperative efforts.

e) Microgravity Science

In the first and second sub-group meetings held in New Orleans and Hakone respectively, the status of microgravity science-related projects developed by both sides for Spacelab missions, such as IML and SL-J, and Space Station were reported. Discussion and information exchanges for collaboration in the following fields were made: Fluid Dynamics, Combustion, Electronic Materials, Metals & Alloys, Vapor Crystal Growth, Glass, Protein Crystal Growth, Biotechnology, Test Facilities, and Technology Development.

At its Hakone meeting, Microgravity Science sub-group made the following recommendations:

- Establish a forum and mechanism for establishing collaborative programs in ground-based research for the following five fields: Combustions, Fluid Dynamics, Glass, Electronic Materials, and Vapor Crystal Growth.

- Conduct study of IML-1 experiments and preparations for a more effective and closer relationship.

- Maintain communications between agencies and scientists in both countries to assure that all opportunities for cooperation are utilized, e.g. workshops or symposia.

In addition, the following observations and comments were made by the participants:

1. Both the Japanese side and NASA recognized the necessity of common interfaces on the Space Station to enhance the opportunities for the scientific use of the three Space Station laboratory modules.

2. With respect to two cooperative projects which have resulted from earlier SSLG-sponsored consultations, NASA expressed its concern about delays that have recently been encountered in the final stages of negotiating cooperative agreements for: (1) the GEOTAIL project in the category of the Solar System Science sub-group and, (2) reception by NASA of data from the Japanese ERS-1 satellite in the category of the Earth Observation sub-group. NASA expressed its hope that any current problems can be expeditiously resolved and that the agreements can be rapidly concluded.

The Japanese side and NASA desire that potential new joint activities in space science and applications are further encouraged. To this end, the Cooperative Space Activities Planning Group wishes that the potential future collaboration envisaged in these recommendations will continue to be investigated with the formal approval of the SSLG.

Next meeting of the Cooperative Space Activities Planning Group will be held in 1988 in the United States. The specific location and date will be decided by the mutual agreement of the Japanese side and NASA.

Lennard A. Fisk Associate Administrator for Space Science and Applications, National Aeronautics and Space Administration	Masahiro Kawasaki Director-General Research and Development Bureau, Science and Technology Agency
Date:	Date:
Place:	Place:

ANNEX I

LIST OF ATTENDEES

Plenary Session

(JAPAN)

Masahiro Kawasaki	Director-General, Research and Development Bureau (RDB), Science and Technology Agency (STA)
Hideo Nakatsugawa	Deputy Director-General, RDB, STA
Seiji Tanaka	Director, International Space-Affairs Division, RDB, STA
Morifumi Tanaka	Deputy Director, International Space-Affairs Division, RDB, STA
Kazumi Okuda	International Space-Affairs Division, RDB, STA
Yutaka Hishiyama	International Space-Affairs Division, RDB, STA
Yutaka Miyawaki	International Space-Affairs Division, RDB, STA
Kan Imai	Office of Space Utilization Promotion, Space Development Division, RDB, STA
Mineo Suzuki	Office of Space Utilization Promotion, Space Development Division, RDB, STA
Tatsuo Yamanaka	Supervising Researcher, Space Technology Research Group, National Aerospace Laboratory (NAL), STA
Hisao Azuma	Senior Researcher, Space Technology Research Group, NAL, STA
Minoru Oda	Director-General, Institute of Space and Astronautical Science (ISAS), MONBUSHO
Yasuo Tanaka	Professor, ISAS, MONBUSHO
Atsuhiro Nishida	Professor, ISAS, MONBUSHO
Jun Nishimura	Professor, ISAS, MONBUSHO
Masatoshi Ono	Director, Advanced Technology Division, Electrotechnical Laboratory, Agency of Industrial Science and Technology, Ministry of International Trade and Industry (MITI)

Tsuneto Nakamura	Director, Space Communications Development Division, Communications Policy Bureau, Ministry of Posts and Telecommunications (MPT)
Daiji Takeuchi	Space Communications Development Division, Communications Policy Bureau, MPT
Shigeru Miyazaki	Director of Applications Division, Radio Research Laboratories (RRL), MPT
Nobuo Matsuura	Director of Radio Science Division, RRL, MPT
Nobuyoshi Fugono	Director of Planning Division, RRL, MPT
Fujinobu Takahashi	Chief of Frequency and Time Measurement Research Section, RRL, MPT
Yoshio Yorimizu	Executive Director, National Space Development Agency of Japan (NASDA)
Yoshihiro Ishizawa	Director, External Relations Department, NASDA
Makio Ichihara	Director, International Affairs Division, External Relations Department, NASDA
Setsuo Horiuchi	Deputy Director, International Affairs Division, External Relations Department, NASDA
Akiko Ijichi	International Affairs Division, External Relations Department, NASDA
Hiroyuki Kimura	International Affairs Division, External Relations Department, NASDA
Yasuhiro Morishita	Director, Space Experiment Group, NASDA
Shunji Nagaoka	Assistant Senior Engineer, Space Experiment Utilization Promotion Office, Space Experiment Group, NASDA
Seiji Higuchi	Senior Engineer, Space Environment Utilization Promotion Office, Space Experiment Group, NASDA
Kouji Yanagawa	Assistant Senior Engineer, Space Environment Utilization Promotion Office, Space Experiment Group, NASDA
Yasuaki Hashimoto	Space Experiment Group, NASDA
Hideshi Kozawa	Director, Space Experiment Program Office, Program Planning and Management Department, NASDA

Tasuku Tanaka	Director, Earth Observation Satellite Program Office, Program Planning and Management Department, NASDA
Kohei Cho	Engineer, Earth Observation Satellite Program Office, Program Planning and Management Department, NASDA
Hiroyuki Matsumiya	Special Consulting Engineer, NASDA
Akira Sawaoka	Professor, Tokyo Institute of Technology

(NASA)

L.A. Fisk	Associate Administrator for Space Science and Applications
Richard Barnes	Director, International Relations Division
William Turner	International Relations Division
Charles Pellerin	Director, Astrophysics Division, Office of Space Science and Applications (OSSA)
Stanley Shawhan	Director, Space Physics Division, OSSA
John Theon	Chief, Atmospheric Dynamics and Radiation Branch, OSSA
Ramesh Kakar	Assistant to Chief of Atmospheric Dynamics and Radiation Branch, Jet Propulsion Laboratory
Roger Crouch	Chief Scientist, Microgravity Science and Applications Division, OSSA
Warren Hodges	Microgravity Science and Applications Division, OSSA
Arnauld E. Nicogossian	Director, Life Science Division, OSSA
J. Richard Keefe	Life Science Division, OSSA
Paul Todd	Professor, Pennsylvania State University
Larry Delucas	Professor, University of Alabama, Birmingham

Astrophysics Sub-Group

(Japan)

Yasuo Tanaka	Professor, ISAS, MONBUSHO
Shigeru Miyazaki	Director of Applications Division, RRL, MPT
Fujinobu Takahashi	Chief of Frequency and Time Measurements Research Section, RRL, MPT

(NASA)

Charles Pellerin	Director, Astrophysics Division, OSSA

Solar System Science Sub-Group

(Japan)

Atsuhiro Nishida	Professor, ISAS, MONBUSHO
Jun Nishimura	Professor, ISAS, MONBUSHO
Nobuo Matsuura	Director of Radio Science Division, RRL, MPT

(NASA)

Stanley Shawhan	Director, Space Physics Division, OSSA

Life Science Sub-Group

(JAPAN)

Mineo Suzuki	Office of Space Utilization Promotion, Research and Development Bureau, STA
Masamichi Yamashita	Associate Professor, ISAS, MONBUSHO
Yasuhiro Morishita	Director, Space Experiment Group, NASDA
Shunji Nagaoka	Assistant Senior Engineer, Space Environment Utilization Promotion Office, Space Experiment Group, NASDA
Hiroyuki Matsumiya	Special Counsulting Engineer, NASDA
Makio Ichihara	Director, International Affairs Division, External Relations Department, NASDA
Setsuo Horiuchi	Deputy Director, International Affairs Division, External Relations Depertment, NASDA
Hiroyuki Kimura	International Affairs Division, External Relations Depertment, NASDA

(NASA)

Arnauld E. Nicogossian	Director, Life Science Division, OSSA
J. Richard Keefe	Life Science Division, OSSA

Earth Observation Sub-Group

(JAPAN)

Kan Imai	Office of Space Utilization Promotion, Research and Development Bureau, STA
Masatoshi Ono	Director, Advanced Technology Division, Electrotechnical Laboratory, Agency of Industrial Science and Technology, MITI
Hiroji Tsu	Chief of Research Section, Geophysics Deprtment, Geological Survey of Japan, Agency of Industrial Science and Technology, MITI
Hideyuki Hasegawa	Senior Assistant to the Director of the Division, Technology and Safety Division, Transport Policy Bureau, Ministry of Transport (MOT)
Nobuyoshi Fugono	Director of Radio Science Division, Radio Research Laboratories (RRL), MPT
Fujinobu Takahashi	Chief of Frequency and Time Measurements Research Section, RRL, MPT
Tasuku Tanaka	Director, Earth Observation Satellite Program Office, Program Planning and Management Department, NASDA
Kohei Cho	Engineer, Earth Observation Satellite Program Office, Program Planning and Management Department, NASDA
Makio Ichihara	Director, International Affairs Division, External Relations Department, NASDA
Setsuo Horiuchi	Deputy Director, International Affairs Division, External Relations Depertment, NASDA
Hiroyuki Kimura	International Affairs Division, External Relations Depertment, NASDA

(NASA)

John Theon	Chief, Atmospheric Dynamics and Radiation Branch, OSSA
Ramesh Kakar	Assistant to Chief of Atmospheric Dynamics and Radiation Branch, JPL

Microgravitiy Science Sub-Group

(JAPAN)

Kazumi Okuda	Special Staff, STA
Hisao Azuma	Senior Researcher, Space Technology Research Group, NAL, STA
Michio Yamazaki	Supervising Researcher, Energy Materials Research Group, National Research Institute for Metals (NRIM), STA
Kazuhiko Kuribayashi	Associate Professor, ISAS, MONBUSHO
Isao Kudoh	Chief of Space Environment Engineering Section, Advanced Technology Division, Electrotechnical Laboratory, Agency of Industrial Science and Technology, MITI
Seiji Higuchi	Senior Engineer, Space Environment Utilization Promotion Office, Space Experiment Group, NASDA
Kouji Yanagawa	Assistant Senior Engineer, Space Environment Utilization Promotion Office, Space Experiment Group, NASDA
Hiroyuki Matsumiya	Special Cousulting Engineer, NASDA
Yasuaki Hashimoto	Space Experiment Group, NASDA
Naomichi Takeda	Space Experiment Group, NASDA
Makio Ichihara	Director, International Affairs Division, External Relations Department, NASDA
Setsuo Horiuchi	Deputy Director, International Affairs Division, External Relations Depertment, NASDA
Hiroyuki Kimura	International Affairs Division, External Relations Depertment, NASDA
Akira Sawaoka	Professor, Tokyo Institute of Technology

(NASA)

Roger Crouch	Chief Scientist, Microgravity Science and Applications Division, OSSA
Warren Hodges	Microgravity Science and Applications Division, OSSA
Paul Todd	Professor, Pennsylvania State University
Larry Delucas	Professor, University of Alabama, Birmingham
Franz Rosenberger	Professor, University of Alabama, Huntsville

ANNEX II

REPORT OF ACTIVITIES AND RECOMMENDATIONS

FROM

FIVE DISCIPLINE SUB-GROUPS

Report of Activities and Recommendations

1. Name of Sub-Group

Astropysics Working Group

2. Name Of Co-chairmen and Their Titles

Y. Tanaka, Professor, Institute of Space and Astronautical Science
C.J. Pellerin Jr., Director Astrophysics Division, Office of Space and Applications, NASA Headquaters

3. Activities and Recommendations

The Astrophysics sub-group met for the third time and reviewed several recesntly completed and on-going efforts, as well as several proposed new programs. These Cooperations have all been entirely successful and a spirit of enthusiasm characterized the discussions..

First, with-respect to on-going projects, the following was noted:

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-The data from the Ginga satellite have been of crucial importance to the launch planning for the NASA rockets and ballons for Supernova 1987a, and the visiting scientist program is underway.

Second, with respect to new activities:

-There is high interest in collaboration on the ASTRO-D mission, the SFU infrared mission, and in the ISAS VLBI mission.

-Cooperation in the areas of Scout-class missions, Astrophysics data systems, and in the SIRTF project appears desirable and will continue to be discussed.

Finally, it is recommended that the disciplines of Space VLBI and Infrared Astronomy be formally included in the overall SSLG framework.

SSLG Planning Group

SOLAR SYSTEM SCIENCE SUB-GROUP

Much activity has occurred in the past year on cooperative projects, studies and discussions in the Solar System Science research area. These cooperative activities fall into six of the seven cooperative programs identified under the SSLG Cooperative Space Activities Planning Group:

(1) OPEN (Origin of Plasmas In the Earth's Neighborhood)
(2) Halley's Comet Study
(3) Saturn Orbiter and Dual Probe Mission
(4) Space Tether System
(6) Transpacific Ballooning
(7) Collaborative Solar Studies

In addition to these bilateral Solar System Science activities the Inter-Agency Consultative Group for Space Science (IACG) involving the four major space science agencies--ISAS, NASA, European Space Agency (ESA) and Soviet Intercosmos Council (IKI) have continued coordination activities for 13 approved spaceflight mission in Solar Terrestrial Science (STS) covering the decade 1989-1998. The most recent IACG meeting was held in Kyoto, Japan 19-22 October 1987. Plans being formulated within the four agencies in the two areas of Planets and Small Bodies and of Space Very Long Baseline Interferometery were discussed by the two IACG Panels. These areas are candidates for coordination by IACG in the future.

Details of the cooperation activities of the Solar System Science subgroup for the cooperative programs are as follows:

(1) OPEN

It is recommended to change the name of this program to

"International Solar Terrestrial Physics (ISTP) program / Geotail". This new name reflects the cooperation between ISAS and NASA in the ISTP/Global Geospace Science program which includes Geotail from ISAS and the Wind and Polar missions from NASA in cooperation with the U.S. Combined Release and Radiation Effects Satellite (CRRES).

About 25 scientific and technical exchange meetings have been held between ISAS and NASA concerning the cooperative Geotail mission. Five of the seven instruments are to be provided by ISAS and two of the seven instrument by NASA for a combined payload of 130 kg. The Memorandum of Understanding between Japan and the U.S. is undergoing the approval process in both governments. Launch is now planned for July 1992 on a NASA Delta-II type expendable launch vehicle (ELV) (according to the October 22, 1981 NASA ELV Manifest).

The Geotail, EXOS-D, and SOLAR-A missions from ISAS and the Wind, Polar, Upper Atmosphere Research Satellite and CRRES missions from NASA are among the Solar Terrestrial Science missions being coordinated with ESA and IKI missions by the IACG in 1989-1998.

To test an ISAS electric field instrument of the Geotail mission, a cooperative rocket flight from the NASA Poker Flat, Alaska, rocket range is planned for 1990. Results from this new ion beam technique will be compared to the conventional electric field double probe technique.

(2) Halley's Comet Study

Since the missions to Halley's Comet, Sakigake and Swisei, have been completed with great success but since there is still mutual interest between ISAS and NASA on continued research, it is recommended that the name of this program be changed to 'Comets and Small Bodies".

During 1986, the orbit of Sakigake was slightly modified so that it

would return to the Earth in order that it might possibly be re-targeted to another comet. It has been realized by the IACG that Sakigake will pass several times through the Earth's magnetotail in the 1990-1993 time period. A joint study by ISAS and NASA has been initiated to determine the value of the Sakigake measurements to solar terrestrial science.

ISAS and NASA have jointly developed a concept for a Comet Coma Sample Return mission. Further discussions of this concept between ISAS and NASA are expected to occur over the next year.

(3) Saturn Orbiter and Dual Probe Mission

It has been mutually agreed between ISAS and NASA that the Saturn Orbiter and Dual Probe Mission cannot be carried and in the near future. It is therefore recommended that the title of this program be made more general-"Collaborative Study of Planetary Science".

NASA is developing two approved planetary missions: Magellan, the Venus radar mapper, and Mars Observer, a Mars surface observer mission. ISAS is studying a Venus Orbiter mission as well as a Lunar Orbiter with penetrator. NASA is studying a Lunar Geochemical Orbiter mission and plans to conduct a feasibility study for a Mercury Orbiter mission. The possibility of a joint study for one or several of these missions between ISAS and NASA is being considered.

(4) Space Tether System

Development is continuing on the next in the series of cooperative ISAS/NASA space tether projects. The approved Charge III rocket payload is now planned for an NASA Aries sounding rocket in early 1990.

(6) Transpacific Ballooning

Because the possibility for long balloon flights exists in several parts of the world, it is recommended to change the name of this program to "Long Duration Ballooning".

ISAS reported on a three year agreement with China which has had four successful flights of abut 20 hour duration. In 1988 an attempt will be made to increase the duration. NASA reported successful flights from Australia to South America of many days duration. Both ISAS and NASA noted plans for flights in the Antarctic in the near future. Informations about the details of these missions will be exchanged and topics of collaboration such as tracking will be discussed.

Possible flights from the U.S. over Japan into China have been considered. China is interested but the political issue (overflights of Korea and Formosa) and the safety issue (overflights of Japan) will have to be investigated further. Flights from Japan to the U.S. are feasible from a meteorological standpoint but the landfall prediction on North America needs further investigation. Both sides agree that there are many candidate payloads for these potential long duration flights.

(7) Collaborative Solar Studies

Solar-A is an approved collaborative ISAS/NASA mission with launch planned for 1991. This mission is relevant to the Solar System Science, as well as to Astrophysics, because it provides information on the Sun as the energy source for the solar system. Solar-A is one of the missions to be coordinated by the IACG for solar terrestrial science.

Both ISAS and NASA have expressed interest in a "Solar probe"--a mission to make in situ observations (as close as 5 solar radii) of the solar corona to understand the heating process and the acceleration mechanism for the solar wind. Further definition of the solar probe concept will be developed over the next several years.

(NEW) Space Station Solar Terrestrial Physics

Scientists from both ISAS and NASA are participating in the International Forum on Scientific Uses of the Space Station (IFSUSS). It is expected that proposals for cooperative solar system science programs using both the manned station and the platforms will evolve from the ISAS and NASA science communities.

(NEW) Space Environment Monitoring

The Radio Research Laboratory (RRL) of Japan and NASA have identified a mutual interest in research on solar flare and magnetic substorm predictions.

Discussions should begin between the RRL,NASA and the U.S. National Oceanic and Atmospheric Administration (NOAA) Space Environmental Laboratories about predictions research. Initial measurements may come from the ISAS missions including Geotail, Solar-A and EXOS-D and the NASA missions Wind, Polar and CRRES. This research may lead to a series of space platforms with operational measurements in the late 1990's and early 2000's that could reliably monitor solar terrestrial parameters of interest.

(NEW) Superconducting Magnet Facility

Over the past two years ISAS and NASA have been discussing a mutual interest in a superconducting magnet system for high energy cosmic ray research that might first be developed for a balloon and later developed for the Space Station in a project called Astromag. ISAS informed NASA that ISAS and the high Energy Physics Laboratory (KEK) are considering a potential collaboration for a balloon borne system (1 meter diameter) which may be available for collaboration with U.S. scientists in three years. The performance of this system will contribute to the design of the Astromag which is a potential future collaborative program.

REPORT OF ACTIVITIES AND RECOMMENDATIONS

1.Name of the Sub-Group Life Science

2.Name of Co-Chairmen and Titles

Japanese side : MORISHITA, Yasuhiro
NASDA/HQ's, Director
Space Experiment Group

(Alternate) NAGAOKA, Shunji,Ph.D.
NASDA/HQ's
Assistant Senior Engineer
Space Experiment Group

NASA side : Nicogossian,MD.
NASA/HQ's, Director
Life Science Division

(Alternate) White,R.J.,Ph.D.,
NASA/HQ's
Program Scientist
Life Science Division

3.Current Status of Japan-U.S. Cooperation

The Life Science Sub-Group Meeting was held three times since November,1986. All meetings were successfully carried out. The first meeting involved the exchange of information on the space life sciences programs.The second meeting focused on specific topics for cooperation of mutual benefit. The major accomplishments and recommendations are summarized in the Minutes of the Meetings. The third Life Sciences Sub-Group Meeting occurred on October 26-27, 1987 in Hakone, Japan, in conjunction with the annual meeting of Cooperative Space Activities Planning Group of SSLG.

4. Summary of meetings and recommendations

The 1st. Life Science Sub-Group Meeting was held on Nov. 6-7, 1986, Tokyo, Japan. Information was exchanged on the program areas of space life sciences. The Sub-Group proposed the Space biology area to be considered as the first step for collaboration.

A Space Biology Workshop was held on Jan. 26,30, 1987, Tokyo, Japan. The results are summarized in the workshop proceedings.

The 2nd. Life Science Sub-Group Meeting was held on Jun. 27-29, 1987,Washington D.C.,U.S.A., after the NASA Life Science Symposium with attendance from US and Japanese Scientists. The meeting included two splinter sessions on Space Biology and Space Station,and recommendations in three major topic areas were proposed:

a) International Microgravity and Life Sciences Spacelabs joint activities for the purpose of fostering scientific cooperation aimed at an orderly transition into the Space Station era.

b) General approach to the utilization of the Space Station for scientific experimentation purposes,

c) Specific Projects : Ground and Flight of mutual interest.

The Space Biology Joint Working Group made recommendations to begin interaction by exchange of scientists and initiation of joint ground based experiments. The first scientific interchanges are being implemented and planning for joint studies has begun .

The third meeting of The Life Science Sub- Group was held on Oct. 26-27, 1987, in Hakone, Japan, and the necessity for the development of hardware to avoid unnecessary duplication and promote stronger scientific collaboration were discussed. The basic approach will be to develop specific scientific instruments for joint use by the sides in a coordinated manner. Potential candidates are :

1) 1.8m centrifuge facility, work station, biomedical monitoring system , modular habitats (NASA)
2) Aquatic research holding facility (NASDA)
3) analytical facilities including advanced digital microscopes and video-data analyzers (NASDA) and
4) anthropometric measurement system for use in manned space flight (NASDA)

The formation of scientific research teams to utilize those instruments is advisable and will be addressed during the next year.Specific recommendations will be made by the Life Sciences Sub-Group at its next meeting.

Report on the Activities and Recommendation

1. Name of Sub-Group

   Earth Observation Sub-Group

2. Names of Co-Chairman and their titles

   Japanese side : Tasuku Tanaka (Director, Earth Observation Program Office, NASDA)

   NASA side : John S. Theon (Acting Deputy Director, Earth Science and Application Division)

3. Past and Current Activities of Sub-Group

   1) TRMM

   - 1987 Jan. 20 1st Expert Panel
   - 1987 Apr. 3 2nd Expert Panel
   - 1987 Aug. 17 3rd Expert Panel

   2) Utilization of ERTS-1

   - 1986 Sep. 17-19 Discussion on Joined Project
   - 1987 Oct. NASA/NASA MOU to be signed off

   3) Polar Orbiting Platform

   - 1986 July 2nd ICWG
   - Japan will participate in POP Program by providing AMSR and ITIR to NASA POP.
   - Japan will issue AO for sensor proposals.

   4) Measurement of Cloud Height by Satellite Stereography

   - Several contacts were made by letters and telephones between U.S.A. and Japan to arrange the simultaneous observations between GOES-W and GMS.
   - The joint observations were made five times from Sept. 1980 to Feb. 1981.
   - The result were examined in COSPAR symposium in Canada in 1982.
   - Several Contacts have been continued after that.

4. Recommendations

1) TRMM (Tropical Rainfall Measuring Mission)

- Decide the outline of phase B study by the end of February 1988.
- Re-emphasize cooperative roles
  NASA : spacecraft, AVHRR, microwave radiometers, and tracking and data acquisition & relay.
  Japan : launch H-II, rain radar, and Data Relay Experiment.
- NASA is exploring the possibility of approval for phase C/D of TRMM under an Earth Observing Explorer line in FY 1990 budget (with TRMM as a leading candidate). Success in NASA depends upon TRMM phase B and C/D approval in Japan. Due to the tentative schedule (attached), close coordination is required by both sides.

2) POP (Polar Orbiting Platform)

- Japan to inform NASA the status of AMSR & ITIR.
- NASA to inform Japan the status of flying AMSR & ITIR on NPOP-1.
- Continue cooperative studies on JPOP.

3) ADEOS (Advanced Earth Observing Satellite)

- Propose to study feasibility of NASA furnished sensor(s) from candidates.
  TOMS, ACR, MAPS, SCATTEROMETER

4) ERS-1 (Earth Resources Satellite-1)

- Continue to exchange technical information.

5) LAWS (Laser Atmospheric Wind Sounder)

- Propose to study feasibility of LAWS including study background of aerosols and its accommodation on JPOP.

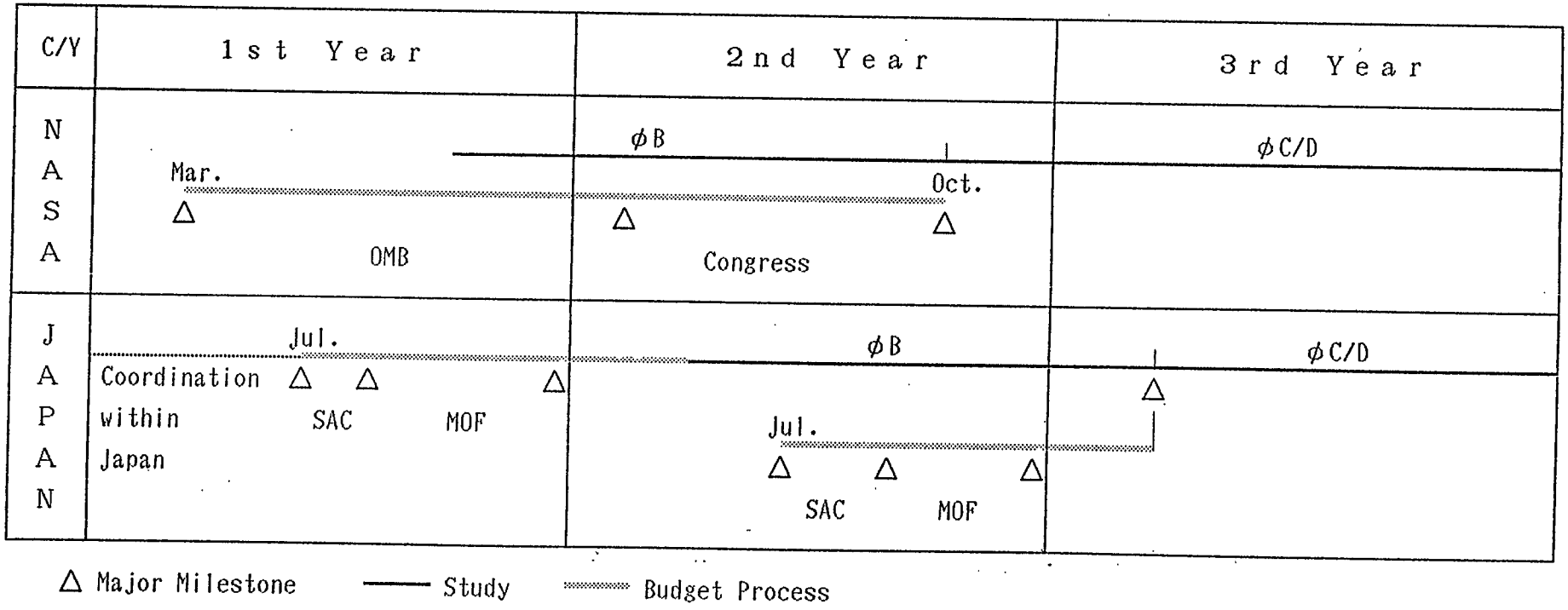
6) Study of crustal plate motion

- Continue cooperative studies

7) Personnel exchange

- For mutual cooperation, personnel exchange is encouraged.

Tentative Schedule of TMRMM



△ Major Milestone —— Study ▒▒ Budget Process

OMB : Office of Management and Budget

SAC : Space Activities Commision

MOF : Ministry of Finance

Report on the Activities and Recommendation

1. Name of Sub-Group Microgravity science

2. Names of Co-Chairmen and their titles

Japanese side : Kiyoshi Higuchi
Senior Engineer,
Space Experiment Group,NASDA

NASA side : Roger K. Crouch
Chief Scientist,
Microgravity Science and Applications
Division, OSSA, NASA

3. Current Status of Japan U.S. cooperation:

Space Lab-J/FMPT
Cooperation on IML program. NASDA's hardware for IML-1
Cooperation on Space Station Program.

4. Past and Current Activities of Sub-Group

Fall 1986 to Spring 1987
Coordination and Preparation of 1st Subgroup meeting by letters and informal discussions between co-chairmen.

Aug. 31, and Oct. 26-27,1987
The first and second Subgroup meetings were held in New Orleans and Hakone.
Status reports of microgravity science related projects from both sides, for Spacelab missions such as IML, SL-J and Space Station.
Discussion and information exchanges for collaboration in the following fields

Fluid dynamics, Combustion, Electronic Materials, Metals & Alloys, Vapor Crystal Growth, Glass, Protein Crystal Growth, Biotechnology, Test Facilities and Technology Development.

5. Future Program

- Realization and conduct of ground based collaboration program for the five fields.
- Study and information exchange regarding on-going hardware development programs
- Discussion of incorporation of advanced technology studies and microgravity science research in future cooperative flight experiments such as the IML series.
- Continuation to have 1 to 2 meetings per years necessary.

6. Recommendation

Establish a forum and mechanism for establishing collaborative programs in ground-based research for the following five fields. (Listed also are the Japanese and U.S. investigators who has been involved in initial discussions. Other investigators may be contacted and/or selected as further discussions are held):

Combustions	Prof. Kohno(Univ.of Tokyo)
	Prof. Myer(Univ.of Wisc.)
Fluid Dynamics	Dr. Enya (IHI)
	Prof. Ostrach (Case Western Reserve Univ.)
Glass	Dr. Hayakawa (GIRI,Osaka)
	Dr. Day (Missouri, Rolla)
Electronic Materials	Crystal Growth
	Prof. Nishinaga (Univ. of Tokyo)
	Profs. Witt, Wargo (MIT)
Vapor Crystal Growth	Prof. Sawaoka (Tokyo Inst. Tech.)
	Profs. Rosenberger (UAH), Wiedemeier(RPI)

Conduct study of IML-1 experiments and the preparations under the SSLG framework for more effective and closer relationship.

Maintain communications between Agencies and scientists in both countries to assure that all opportunities for cooperation are utilized, e.g. workshops or symposia.

別添　2

宇宙分野における日米常設幹部連絡会議（ＳＳＬＧ）

に対する

活動報告及び提言

（仮　訳）

昭和６２年１０月２６日～２８日

於　箱根

宇宙協力活動計画会合

日本－ＮＡＳＡ宇宙協力活動計画会合は、１９８６年６月に米国ワシントンにおいて開催された第４回ＳＳＬＧにおける日本とＮＡＳＡとの合意に従い、宇宙科学応用分野における将来可能な共同研究及びプロジェクトに関する計画の策定を調整するため、ＳＳＬＧの下に設立されたもので、その第１回会議が、１９８７年１０月２６日から２８日まで箱根において開催された。

宇宙協力活動計画会合は、同会議の全体会合における議論に基づき、５つの分科会及びその他の一般的事項に関して、ＳＳＬＧに対し、次のとおり概要報告及び提言を行う。

a) 天体物理学

天体物理学分科会は、第３回目の会合を開催し、最近終了した計画及び進行中の計画並びに新規提案についてレビューを行った。これらの協力はすべて成功裏に行われており、熱のこもった議論が展開された。

第一に、現在進行中の計画に関しては、次のとおり。

- データ中継衛星(TDRS)と長野県臼田のアンテナシステムを使って、宇宙用干渉計の原理が確認された。
- SOLAR-Aミッションは、ＮＡＳＡとの協力による軟Ｘ線望遠鏡の開発とともに順調に進められている。
- 科学衛星「ぎんが」から得られるデータは、超新星1987aを観測するＮＡＳＡのロケット及び気球の打上げ計画にとって極めて重要である。また、客員研究者制度も進められている。

第二に、新規活動に関しては、

- ASTRO-D計画及びSFU搭載赤外線望遠鏡に関する共同研究並びに宇宙

科学研究所が進めている超長基線電波干渉計(VLBI)計画に強い関心がある。

・　スカウトロケットを利用したミッション、天体物理学データシステム、宇宙赤外線望遠鏡(SIRTF)計画などにおいては協力が望ましいため、引き続き検討を進める。

最後に、VLBI及び赤外線天体学の分野を、ＳＳＬＧの枠組みの中に正式に組み入れることを提言する。

b)　太陽系科学

３つの既存プロジェクトにおける活動は友好的な協力関係の下で進められてきた。

１９９０年代の太陽地球系科学のためのGEOTAILミッションは、日本と米国との了解覚書が１９８８年半ばまでに署名されたのち、１９９２年７月に打ち上げられる予定である。Charge-Ⅲサウンディングロケットは、一連の宇宙テザーシステムの中で次回１９９０年に打ち上げられる予定である。１９９１年に打上げ予定の Solar-A 計画は、太陽系エネルギー源に関する情報をもたらす。

これらの３つの計画は、すべてＳＳＬＧの下で引き続き推進されるべきである。

近年科学が進歩したことから、ＩＳＡＳとＮＡＳＡとの意見交換に基づき、ＳＳＬＧの下での協力プロシェクトの名称を一部次のように変更することを提言する。

「OPEN計画」	→	「ISTP/GEOTAIL計画」
「ハレー彗星共同研究」	→	「彗星及び小天体」
「土星探査計画」	→	「惑星科学共同研究」
「太平洋横断気球観測プロジェクト」	→	「長時間飛翔気球計画」

さらに、「宇宙ステーションを利用した太陽地球系科学」、「宇宙環境モニタリング」及び「超電導磁場装置」を新たに協力プロジェクトに含めることを提言する。

また、次に掲げるような将来可能性のある協力に関して、ＩＳＡＳとＮＡＳＡとの間で研究及び意見交換を開始することを提言する。

・GEOTAIL用機器を試験するため１９９０年に打上げる予定のサウンディングロケット計画
・磁気圏尾部測定のための「さきがけ」の利用
・彗星サンプル回収計画及び水星オービタ計画の概念の検討
・月、火星、金星探査計画の調整の可能性の検討
・長期時間飛翔気球共同技術
・太陽ロケットの概念の検討
・宇宙ステーションを利用した太陽系科学に関する共同研究
・宇宙環境モニタリングの計画の立案
・宇宙ステーションアストロマグ計画につながる気球搭載型超電導磁石の利用。

c)ライフサイエンス

現在の日本とＮＡＳＡの協力には、Spacelab-J、IML-1、IML-2、大学研究者も参加している飛行実験や地上研究、将来計画に対する戦略的計画の立案等がある。

将来の活動は、本報告書の付属書Ⅱに記述されているように特定の機器の開発に重点をおいて進めることとする。

宇宙実験を行う際の搭乗者の作業時間の最小化方法の開発に関するワークショップが、１９８８年１月に米国において開催される予定で

ある。

ＮＡＳＡから、1.8m 遠心分離機に関する要求文書の現状についての説明があり、また、１９８７年１２月にカルフォルニア州ナパにおいて開催される遠心分離機ワーキンググループに日本側代表も出席するよう要請があった。

データ取得及び分析に関する標準化並びに国際的な科学管理技術の開発等、スペースラブから宇宙ステーションへの移行を促進するために引き続き相互交流が行われる予定である。こうした活動の候補として将来考えられるは、SLS-3及びIML-2である。

d)地球観測

熱帯降雨観測計画(TRMM)のフェーズＡ研究は、日米両国とも終了に近づいている。

極軌道プラットフォーム搭載機器研究に関する協力は、NPOPに搭載予定のAMSRとITIRに関する日本側の研究並びにJPOPに搭載予定のLAWSに関するアメリカ側の研究により継続して行われている。

日本側は、ADEOSにセンサーを追加するために、予備設計上の重量、電力及びデータレートを明確にした。

日本側は、ERS-1に関する了解覚書の締結について未だ決定していない。

地殻プレート運動に関する共同研究は継続している。

TRMMについては、日米両国によりフェーズＢ研究の概要が検討されるべきである。同計画における両国の役割が改めて強調された。

今後、日本側はAMSR及びITIRの開発の現状をＮＡＳＡに知らせることとし、ＮＡＳＡは、日本側に対しこれらのセンサーのNPOP-1への搭載の可能性について知らせることとする。

ＮＡＳＡは、1つか2つの機器のADEOSへの搭載の可能性を明確にす

るため、４つの機器の候補について検討を進める。

ＮＡＳＡは、日本側にＥＲＳ－１の了解覚書締結に関する早期決定を要請した。

LAWSによる大気中のエアロゾル測定や同機器のJPOPへの搭載等の可能性を決定するため、共同研究に着手することを提案する。

地殻プレート運動に関する共同研究は継続すべきである。

これらの協力を強化するため、人材交流の準備を進め促進することを提言する。

e)微小重力科学

ニューオリンズと箱根において開催された第１回及び第２回分科会において、IML及びSL-J等の宇宙実験並びに宇宙ステーションに向けて日米両国で進めている微小重力科学関連のプロジェクトの状況について報告がなされた。

次に掲げる分野における協力に関する議論や情報交換が行われた。

－ 流体力学、燃焼、電子材料、金属及び合金、気相成長、ガラス、タンパク結晶成長、バイオテクノロジー、試験装置及び技術開発

箱根会議において、微小重力分科会は次のような提言を行う。

・燃焼、流体力学、ガラス、電子材料及び気相成長の５つの分野に関する地上研究の協力計画を作成するためのフォーラム及びメカニズムを構築すること。
・IML-1実験の研究を行うとともに、より効果的かつ緊密な関係を整備すること。
・協力に関する全ての機会が確実に利用されるように両国の機関間や研究者間のコミニケーションを維持すること。例えば、ワークショップやシンポジウムなど。

以上の各分科会からの報告に加え、会議参加者により以下の意見が出された。

1．日本側とＮＡＳＡは、宇宙ステーションの３つの実験モジュールの科学的利用の機会を高めるため、宇宙ステーションのインターフェースの共通化の必要性を認識する。

2．以前のＳＳＬＧでの話し合いから生まれた２つの協力プロジェクト、すなわち、①太陽系科学分科会のGEOTAIL計画、及び②地球観測分科会のERS-1データのＮＡＳＡによる直接受信に関して、ＮＡＳＡは、協力取極の交渉が最終段階に至って遅れが生じてきていることについて関心を表明した。ＮＡＳＡは、現在の問題がすべて迅速に解決し、取極が直ちに締結されることを望む旨の希望を表明した。

日本側とＮＡＳＡは、宇宙科学応用分野における将来の新たな協力につながる活動がさらに促進されることを希望しており、このため、宇宙協力活動計画会合は、本提言において企画されている協力の萌芽が、ＳＳＬＧの正式な承認の下に引き続き検討されることを切望する。

宇宙協力活動計画会合の次回会合は、１９８８年に合衆国において開催される。具体的場所及び時期については、日本側とＮＡＳＡとの相互の合意により今後決定される。

レオナード　Ａ．フィスク
米国航空宇宙局宇宙科学応用局長

年月日

場　所

川　崎　雅　弘
科学技術庁研究開発局長

年月日

場　所

欧州宇宙機関（ＥＳＡ）・新長期宇宙計画について

昭和６２年１１月１１日
研究開発局宇宙国際課

１１月９日及び１０日、オランダで開催された欧州宇宙機関（ＥＳＡ）閣僚理事会において、現行の長期宇宙計画に代わる新しい長期宇宙計画が承認されたところ概要次のとおり。

1．　現行の長期宇宙計画が承認された１９８５年１月のローマの閣僚理事会以後、①１９８６年１月の米国スペースシャトルチャレンジャー事故による有人宇宙活動に関する基準の見直し（→ヘルメスの再設計）及びスペースシャトルに依存する計画の遅延並びに②アリアン５、コロンバス及びヘルメスがＥＳＡの準備計画のもとフェーズＢ（決定段階）に至ったことなどから、これらを背景として、現行の長期宇宙計画（１９８５年）をベースにしつつ世界情勢の変化及び新計画の実施を盛り込むべくあらたなる長期宇宙計画の作成に至ったとしている。

2．　新長期宇宙計画は１９８８年から２０００年までの１３年間の期間を対象とし、同期間中における全計画支出予算総額を、３１０億６０５０万通貨単位（ＡＵ）（約５兆６６５４億円）と見積もっている。

また、本計画の構成は、①科学、②地球観測、③微小重力、④通信、⑤宇宙ステーション及びプラットフォーム、⑥宇宙輸送システム及び⑦宇宙技術に関する分野から構成されており、さらには、将来の宇宙インフラストラクチャー、宇宙インフラストラクチャーの運用及び一般活動予算を横断的に網羅している。

なお、同計画の作成にあたっては、

・新しい科学的知見の獲得
・現行の公衆サービスの向上及び新規サービスの導入
・環境保護及びそのためのモニタリングへの寄与
・欧州の政策及び経済面への協調・寄与
・欧州工業の競争力の向上
・若い世代の技術者及び科学者に意欲を与えること

を考慮したものとしている。

3．　今回の新計画に盛り込まれた主な新しい計画は、

①アリアン５計画
②コロンバス計画
（取付型与圧モジュール（ＡＰＭ）、有人支援型フリーフライヤ（ＭＴＦＦ）及　び極軌道プラットフォーム（ＰＰＦ）を含む）
③ヘルメス計画
④データ中継衛星（ＤＲＳ）計画

の４つである。

うち、アリアン５開発計画、コロンバス開発計画及びヘルメス開発計画は、欧州の宇宙インフラストラクチャーを築くものとして積極的に推進すべきものとして、１９８８年１月１日からその開発に着手することとし、各々の総開発経費は、それぞれ、３４億９６００万ＡＵ（約６３７７億円）、３７億１３００万ＡＵ（約６７７３億円）及び４４億２９００万ＡＵ（約８０７８億円）と見積もられている。

なお、コロンバス計画及びヘルメス計画は、取りあえずフェーズ1として3年間それぞれ6億6900万AU（約1220億円）、5億3000万AU（967億円）の経費で開発を進め、その結果に基づいて、フェーズ2に入るかどうかあらためて検討することとしている。

一方、データ中継衛星計画は、上記の宇宙インフラストラクチャーをサポートするものとして位置づけられ、1989年中から着手される。

＊＊＊＊　ＥＳＡ長期計画　　１９８８年～２０００年における全計画支出の概要　＊＊＊＊

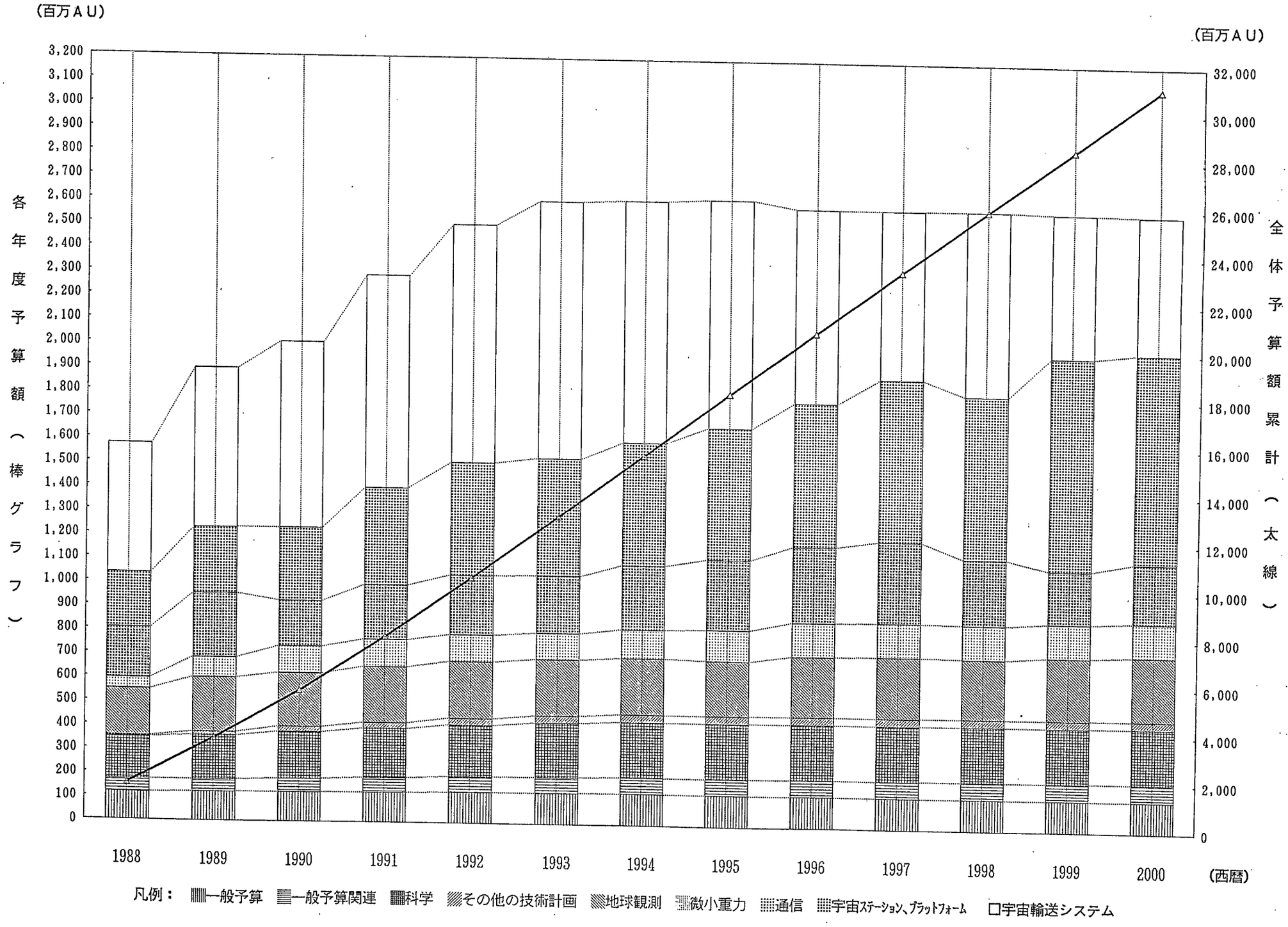
1EAU=184.2億円

単位：百万ＡＵ／１９８６年

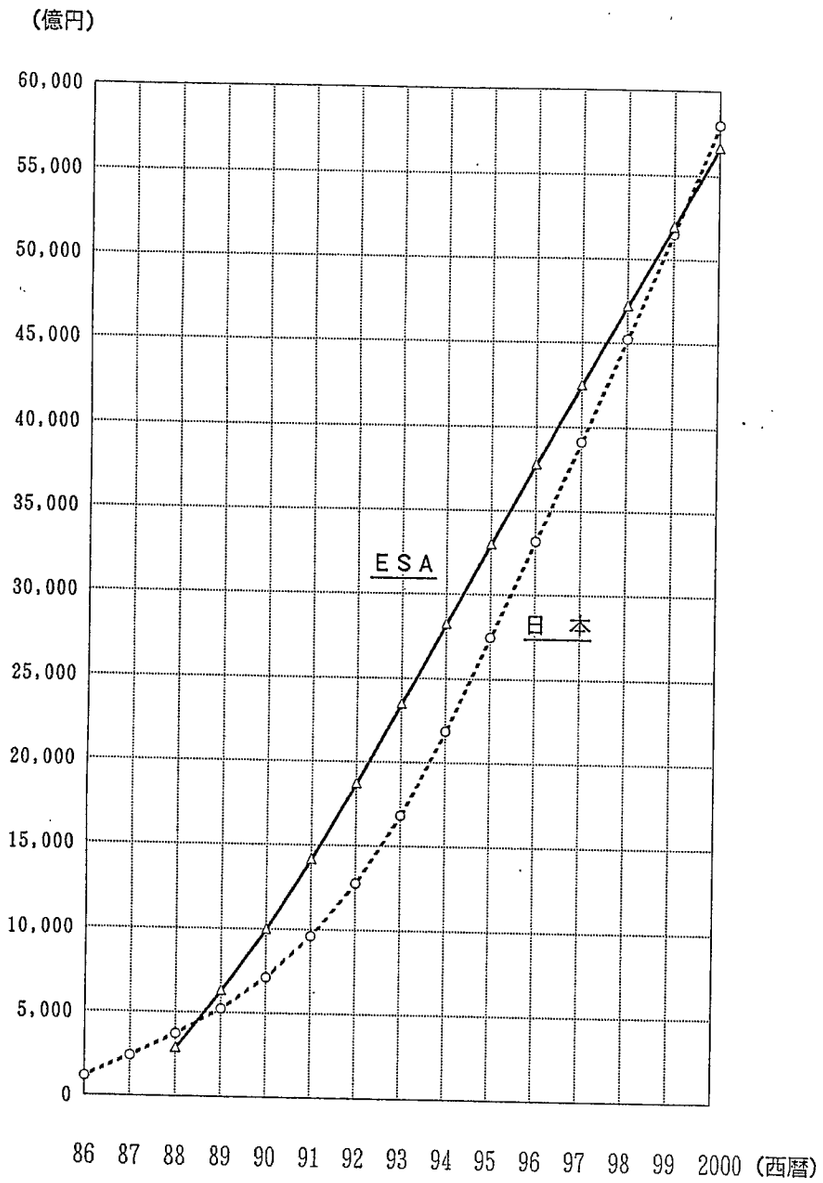
種別＼年度	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	合計	備考
一般予算	117.2	120.9	122.0	125.1	128.1	130.7	133.2	133.2	133.2	133.2	133.2	133.2	133.2	1676.4	
一般予算関連	55.1	52.6	57.7	62.9	67.1	67.1	68.1	68.4	69.7	70.8	71.8	72.9	74.0	858.2	
科学	176.8	185.3	196.7	206.4	216.7	227.9	232.0	232.0	232.0	232.0	232.0	232.0	232.0	2833.8	
その他の技術計画	4.8	13.2	21.4	24.3	27.3	30.3	32.4	32.4	32.4	32.4	32.4	32.4	32.4	348.1	
地球観測	197.5	229.5	224.2	234.9	239.7	237.2	236.9	230.7	252.3	255.9	251.4	261.1	267.4	3118.7	
微小重力	45.2	84.3	112.2	113.5	111.0	110.0	120.0	130.0	142.0	142.0	142.0	142.0	142.0	1536.2	
通信	211.1	267.2	191.3	228.3	248.6	239.2	268.5	293.7	319.1	340.1	276.7	223.0	248.0	3354.9	
宇宙ステーション及びプラットフォーム	229.4	277.8	306.8	407.3	472.0	490.0	513.0	550.0	600.0	678.0	681.0	890.0	877.0	6972.3	
宇宙輸送システム	540.0	666.5	775.0	887.0	994.4	1074.0	1010.0	952.0	810.0	707.0	772.0	599.0	575.0	10362.0	
合計	1577.0 *2,876*	1897.4 *3,461*	2007.3 *3,661*	2289.7 *4,176*	2504.9 *4,569*	2606.4 *4,754*	2614.2 *4,768*	2622.4 *4,783*	2590.7 *4,725*	2591.4 *4,727*	2592.5 *4,729*	2585.6 *4,716*	2581.0 *4,708*	31060.5 *56,654*	

注）　斜字は日本円換算値で単位は億円

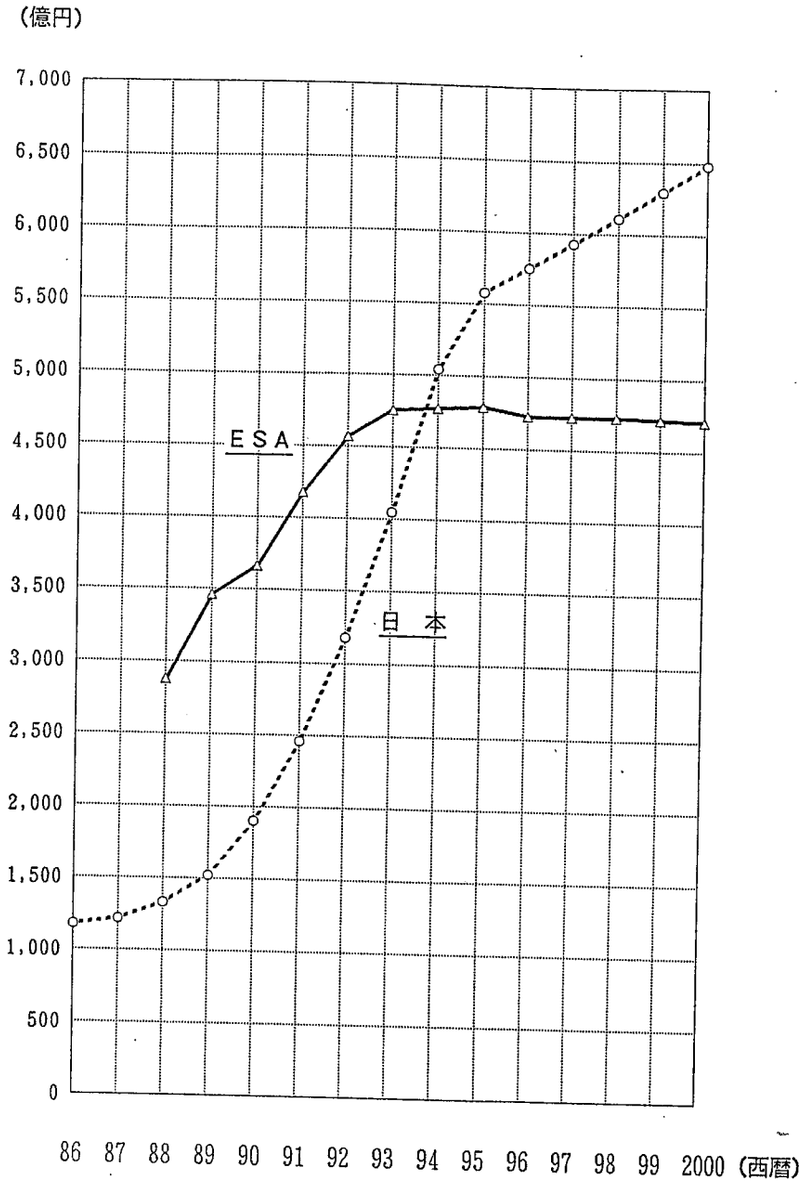
ＥＳＡ長期計画　全体予算額及び累計額の推移



日本ーＥＳＡ宇宙開発予算累計額比較表



日本ーＥＳＡ宇宙開発予算額年度別比較表



注１）日本の予算額は宇宙開発委員会長期政策懇談会報告書積算資料による（１９８６年からの積算）

注２）ＥＳＡの値は日本円換算値（１９８８年からの積算）

ＥＳＡ主要計画開発予算見積もり

◎アリアン５開発予算見積もり

（単位：百万ＡＵ）

年　度	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	合　計
開発費	72	410	485	510	565	565	430	350	109	—	—	—	—	3496

総額 ： 3496

◎ヘルメス開発予算見積もり

（単位：百万ＡＵ）

年　度	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	合　計
ﾌｪｲｽﾞ1	*100*	*170*	*260*	—	—	—	—	—	—	—	—	—	—	*530*
ﾌｪｲｽﾞ2	—	—	—	342	394	464	535	565	560	525	475	39	—	3899

総額 ： 4429

◎コロンバス開発予算見積もり

（単位：百万ＡＵ）

年　度	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	合　計
ﾌｪｲｽﾞ1	*161*	*232*	*276*	—	—	—	—	—	—	—	—	—	—	*669*
ﾌｪｲｽﾞ2	—	—	—	395	461	460	471	488	450	213	106	—	—	3044

総額 ： 3713

各計画に対するＥＳＡ加盟国の参加率一覧

（単位：％）

国名＼計画	アリアン５	コロンバス	ヘルメス
オーストリア	０．４	－	０．５
ベルギー	６．０	５．０	６．４
デンマーク	０．５	１．０	０．５
フランス	４５．０	１３．８	４５．０
西ドイツ	２２．０	３８．０	３０．０
アイルランド	０．２	－	－
イタリア	１５．０	２５．０	１２～１５
オランダ	２．０～２．５	１．０～１．５	１．５～３．０
ノルウェー	０．４	０．４	－
スペイン	３．０	６．０	５．０
スウェーデン	２．０	－	－
スイス	２．０	－	１．５
連合王国	－	－	－
カナダ	－	－	－

大綱改訂審議における主要項目

1．我が国宇宙開発利用を巡る諸情勢の変化

(1) 我が国技術力の向上

・技術試験衛星Ⅵ型（ＥＴＳ－Ⅵ）及びＨ－Ⅱロケットの開発により、世界的水準の衛星、ロケット技術確立の見通しが得られつつあること。

(2) 宇宙開発利用の本格化

・通信、放送、気象観測、海洋観測等の分野における衛星利用が着実に進展し、一部分野においては商業ベースの活動として捉え、市場メカニズムに委ね得るまで発展してきていること。

・欧米における通信、衛星打上げ等の分野での商業活動が進展してきていること。

(3) 宇宙環境利用への期待の高まり

・米国スペースシャトルを利用した第一次材料実験（ＦＭＰＴ）計画及び国際協力による宇宙ステーション計画が進行中であり、宇宙環境利用の可能性が拓かれ、それへの期待が高まりつつあること。

(4) 欧米における宇宙開発への取り組みの強化

・米国では1986年５月、米国国家宇宙委員会報告（いわゆる「ペインレポート」）が発表され、また1985年１月にはESA 長期宇宙計画が発表され、それぞれ宇宙開発を国家の威信、経済発展の成否等に係る重要問題と認識し、意欲的な取り組みの姿勢を見せていること。

(5) 我が国を巡る国際環境の厳しさの増大

・米国等との間では技術開発只乗り論、技術摩擦、シンメトリカルアクセス等の言葉で表されるような事態下にあり、今後更にその厳しさは増すものと危惧されること。
（参考：宇宙開発分野においてはその性格上、比較的平穏に推移してきているが、昭和59年には衛星調達問題が生じ、外国衛星購入の途が開かれた経緯がある。）

・ＬＤＣから、宇宙開発分野においても協力の期待が高まりつつあること。

今後の人工衛星開発の在り方(検討用メモ)

1．ＥＴＳ－Ⅵにより、２ton級バス技術の確立を図る。

2．これにより確立した技術をベースに、

ⅰ)５５０～７５０kg級

ⅱ)１．０～１．２ton級

ⅲ)２ton程度

の三種のバスを標準タイプのものとして、その確立を図る。

3．来世紀初頭頃までの衛星需要に対しては、基本的には上記バスをもって対処する。

4．来世紀初頭の技術確立を目指して、次世代の衛星たるプラットフォーム型衛星のＲ＆Ｄを進める。

このＲ＆Ｄは、軌道間輸送機、修理用宇宙ロボット等のＲ＆Ｄと整合性をもって進める。

5．通信・放送分野に関しては、その高度化、低コスト化等は、主として民間に期待する。

即ち、ポストＣＳ－３、ポストＢＳ－３の段階においては、それまでのような、国が開発(Ｒ＆Ｄ)の一翼を担うことを止め、それらの調達はユーザ・メーカにおける通常の市場メカニズムに依ることとする。

但し、関連Ｒ＆Ｄのうち、民間での実施が期し難く、かつ、公共性の高いと認められるもの及び公共業務上必要とされるものについては、国がその実施に当たることとする。

観測分野に関しては、そのミッションが、公共性が高く、また市場性が充分でないことにかんがみ、当分の間、その開発は国が主導的役割を果たす。

7．上記４及び５の後段部分の実施については、技術試験衛星シリーズの開発により国が行うものとする。

8．また、通信、観測等の複合化については、宇宙開発の効率的、経済的推進と多様化するニーズへの適切な対応を図るとの観点において意義のあるものであることから、技術的可能性、運営体制等の検討を行うとともに、ユーザの結集を図り、可能なものからその実現を図る。

今後の輸送系開発の在り方(検討用メモ)

1．H－Ⅱロケットにより、2トン級ロケット技術の確立を図る。

2．これにより確立した技術をベースに、(即ち、原則的には本格的なR＆Dを行うことなく、provenな技術の組み合わせにより、)多様な打上げ需要に、弾力的、機動的に対応すべく、H－Ⅱ派生型ロケットシリーズの整備を図る。

例えば、次のようなシリーズが考えられる。

ⅰ)数百kg級

ⅱ)1t超級

ⅲ)2t程度級

ⅳ)2t超級(H－Ⅱ改)

3．宇宙ステーションとの間の物資の輸送、回収に対応すべく、1990年代中頃の技術確立を目指して、HOPEのR＆Dを進める。

4．今後、相当長期にわたって、貨物の輸送需要には、上記をもって対処する。

5．有翼・水平離着陸式の再使用型有人機(いわゆるスペースプレーン)については、その実用化は来世紀初頭以降であると見られ、当面は基礎的、先行的研究を進め、その成果等を踏まえ、1990年代以降において、チェック・アンド・レビューを行い、開発プロジェクトとしての計画策定、推進体制の整備等を進める。

6．ロケット打上げ業務については、当面は、受け皿たる民間にそのための環境条件が整っていないこと(具体的にはペイする見通しがないこと)、当面考えられる打上げ需要は国の役割に属するものが多いこと等から、引き続きNASDAにおいて行う。長期的にはNASDAの業務から切り離し、民間事業化を図ることを目指すこととし、このための所要の検討を進めることとする。

7．打上げに係る国際市場への参入については、当面、積極的な打ち出しは行わないものとする。

東南アジア、環太平洋地域を中心とするLDC協力の一環としての人工衛星の供与、共同製作・打上げ等については、積極的に取り組むこととし、日米政府間の取極等の見直しも含め、必要な措置を講ずる。