

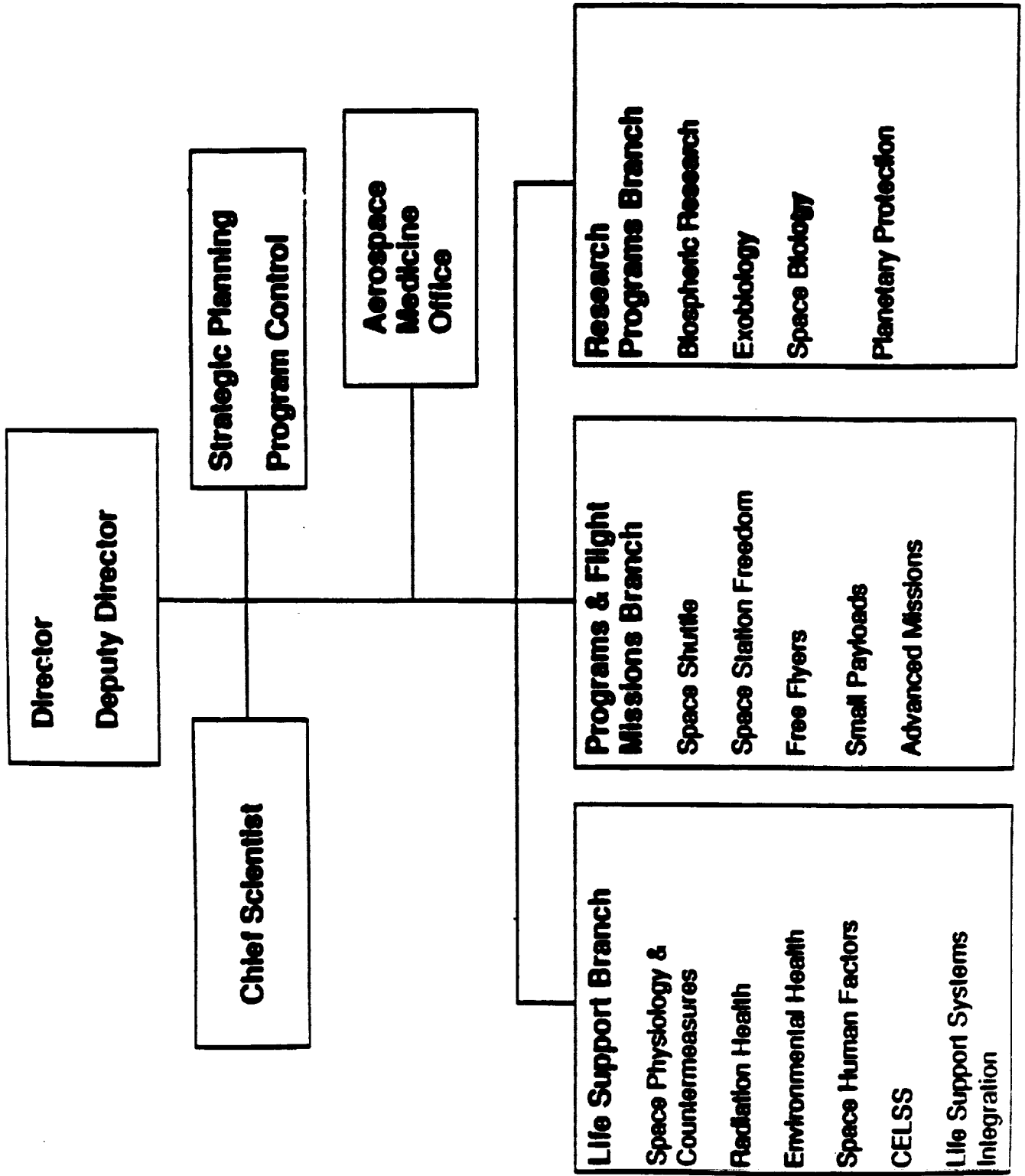
# NASA/NSF Antarctic Science Working Group

N 9 3 - 1 6 8 0 2

Dr. Janis H. Stoklosa  
Program Manager  
October 11-12, 1990  
Washington, D.C.



# Life Sciences Division Organization



## **Tentative Schedule for Space Exploration\***

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<b>Space Station</b>	<b>1997-2003</b>
<b>Humans Return to the Moon</b>	<b>2004</b>
<b>Lunar Presence</b>	<b>2005</b>
<b>Lunar Habitat</b>	<b>2007-2009</b>
<b>Humans Land on Mars</b>	<b>2018</b>

\* Schedule currently under scrutiny by various outside Advisory Committees

## **Biomedical Programs**

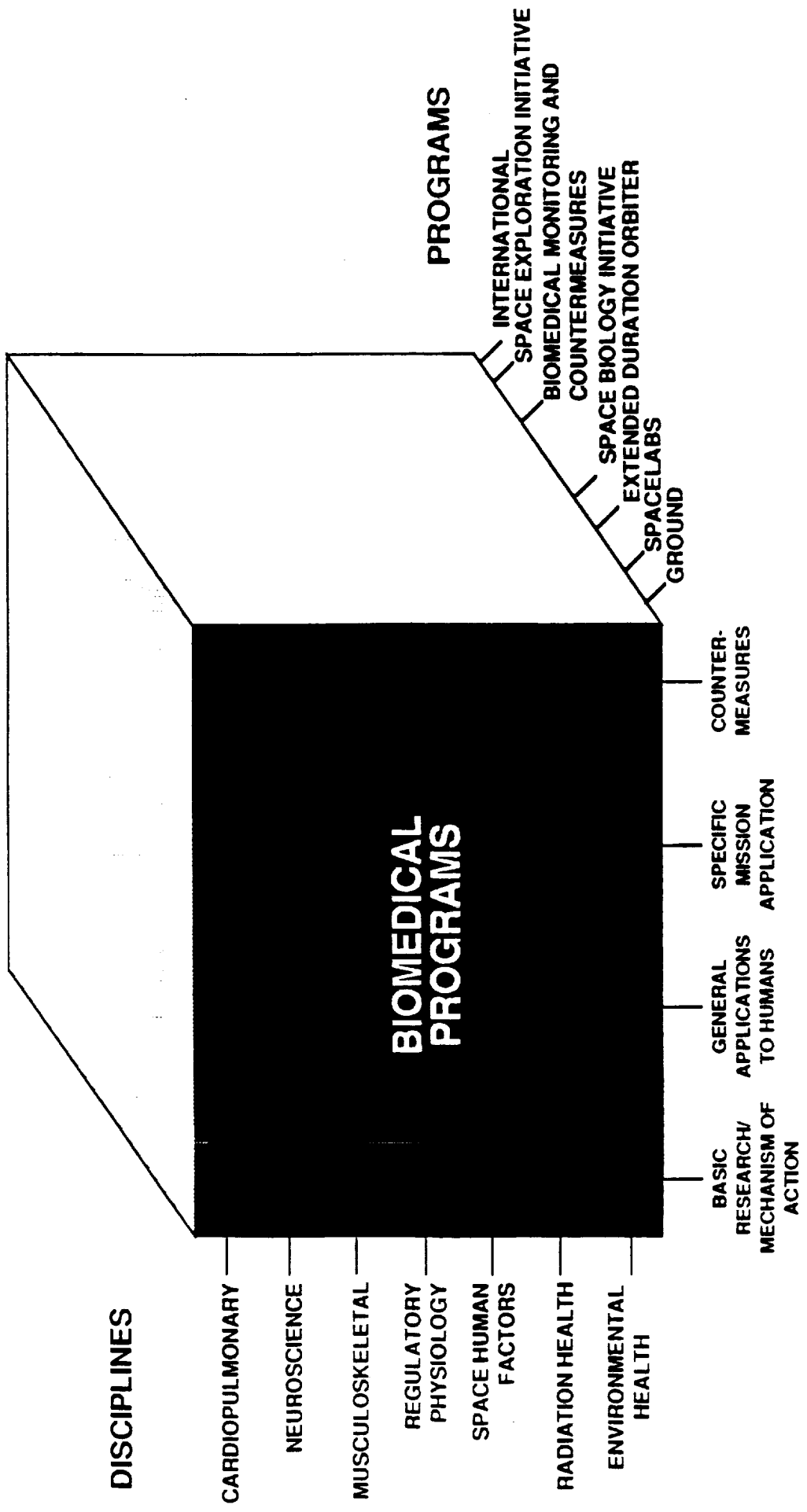
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### **Goals**

- **Develop an understanding of the physiological, psychological and behavioral adaptation to space**
- **Ensure the health, well-being, and performance of humans in space and on return to Earth's gravity**
- **Promote the application of biomedical research to improve the quality of life on Earth**

### **Objectives**

- **Determine the acute and long-term physiological and behavioral adaptation to space**
- **Determine the psychological and sociological implications of space flight**
- **Determine the crew performance and mission consequences of the physiological, psychological and behavioral adaptation to space**
- **Develop adequate monitoring techniques and countermeasures**
- **Verify adequate models and/or analogs for space**



**DISCIPLINES**

CARDIOPULMONARY

NEUROSCIENCE

MUSCULOSKELETAL

REGULATORY  
PHYSIOLOGY

SPACE HUMAN  
FACTORS

RADIATION HEALTH

ENVIRONMENTAL  
HEALTH

**BIOMEDICAL  
PROGRAMS**

BASIC  
RESEARCH/  
MECHANISM OF  
ACTION

GENERAL  
APPLICATIONS  
TO HUMANS

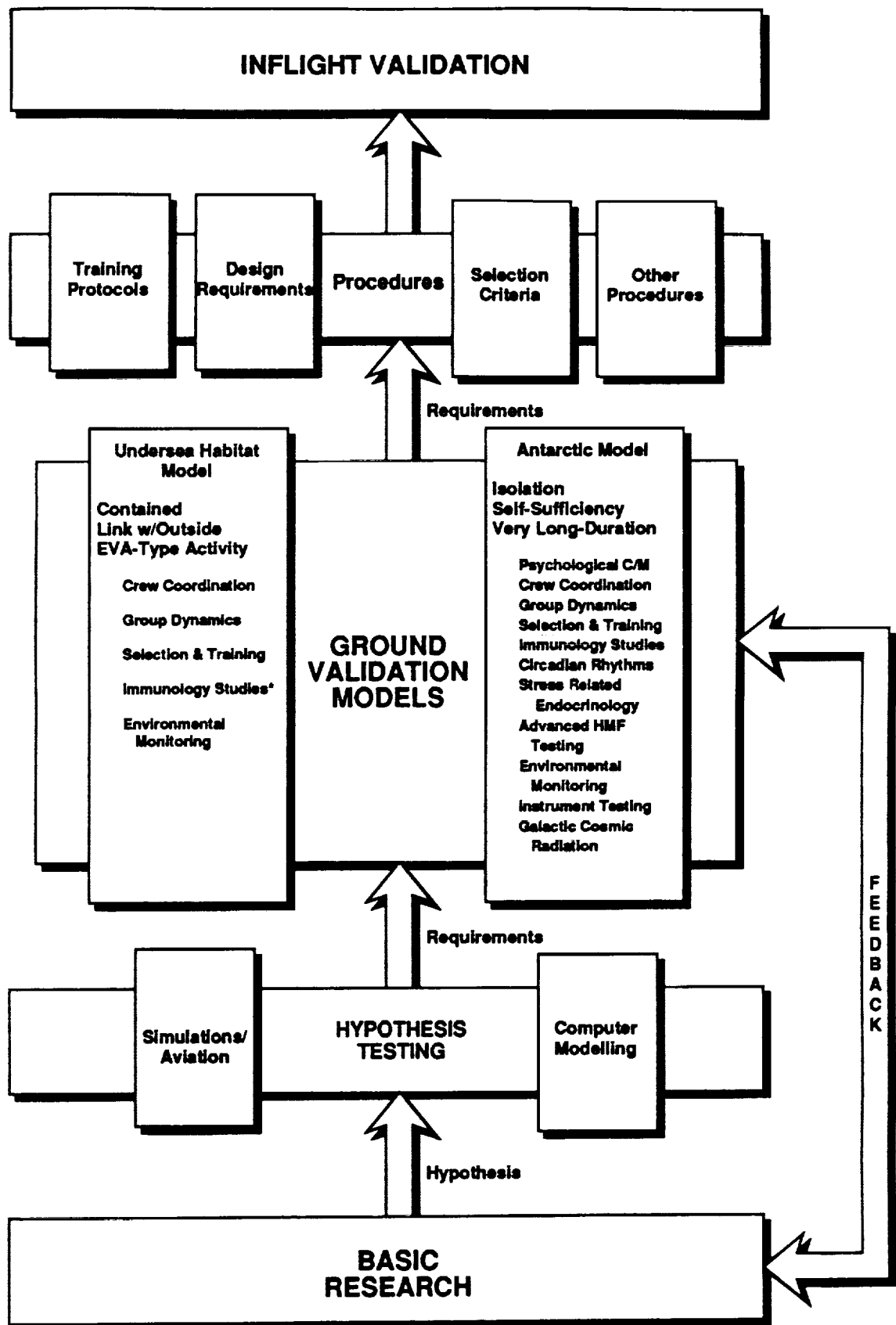
SPECIFIC  
MISSION  
APPLICATION

COUNTER-  
MEASURES

**PROGRAMS**

- INTERNATIONAL SPACE EXPLORATION INITIATIVE
- BIOMEDICAL MONITORING AND COUNTERMEASURES
- SPACE BIOLOGY INITIATIVE
- EXTENDED DURATION ORBITER
- SPACECELABS GROUND

**RESEARCH ELEMENTS**



\* If longer than 2 weeks

## **Justification for Using the Antarctic as an Analog**

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- **Similarities Between Extended Duration Space Missions and Antarctica Conditions**
  - **Long Duration**
  - **Extreme Environments**
  - **Isolated Location**
  - **Delayed Communications**
  - **Confinement**
  - **Small Group Dynamics**
  - **Diverse skill mix**
  - **Various Nationalities**

# NASA Proposed Biomedical Research in the Antarctic

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## Goal

- To use the Antarctic as an analog for space exploration to study human behavior and performance, physiology under stress, and environmental health.

## Areas of Research Interest

- Space Human Factors
- Human Physiology
- Environmental Health



## **NASA Proposed Biomedical Research in the Antarctic (Continued)**

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- **Space Human Factors**
  - **Crew Selection and Training**
  - **Isolation**
  - **Psychological Support/Countermeasures**
  - **Human-Machine Interactions**
  - **Work Station/Habitability Requirements**
  - **Workload**
  - **Small Group Dynamics**
  - **Command and Control Structure**
  - **Crew Composition: Gender, Nationality, Skill Mix**
  
- **Human Physiology**
  - **Stress-Related Endocrinology/Immunity issues**
  - **Circadian Rhythms and Sleep Disorders**
  - **Sedentary Issues Related to General Fitness/Motivational Aspects of Exercise**
  
- **Environmental Health**
  - **Microbiology and Toxicology Issues**
  - **Epidemiology of Infectious Diseases**

# Science Working Group Schedule of Events

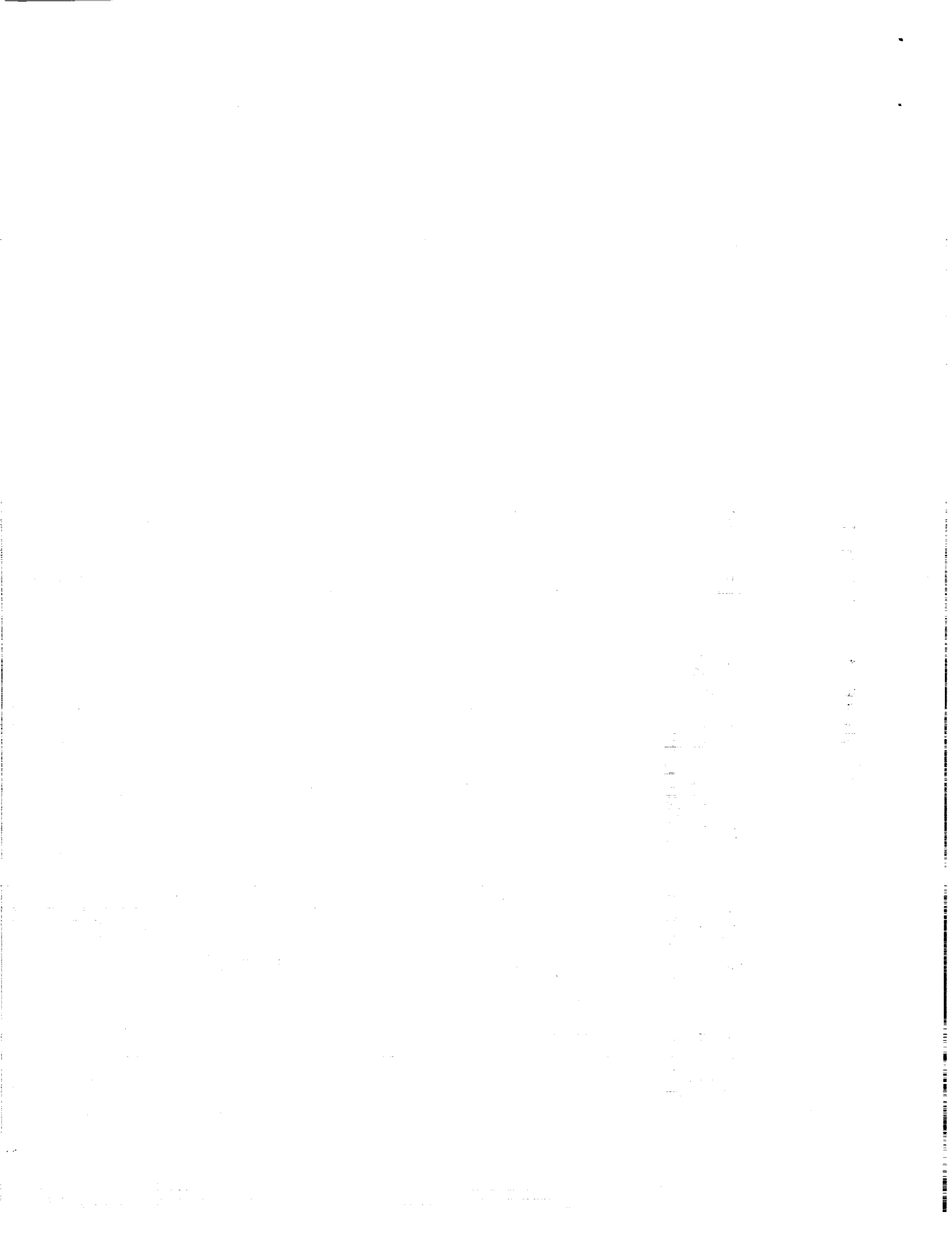
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<b>Initial Meeting of the Science Working Group</b>	<b>October 11-12, 1990</b>
<b>First Draft of NASA/NSF Research Announcement</b>	<b>January 2, 1991</b>
<b>NASA/NSF Research Announcement Release</b>	<b>March 1, 1991</b>
<b>Proposal Submission Deadline</b>	<b>June 1, 1991</b>
<b>Investigation Selection</b>	<b>Summer 1991</b>
<b>Investigation Initiation</b>	<b>Fall 1991 (FY92)</b>

## **Charge to the Committee**

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**The NASA/NSF Science Working Group is charged with defining specific science requirements and priorities for biomedical research to be conducted using the Antarctic as an analog for space exploration.**



# **Attachment 9**

