A vibrant space-themed background featuring a bright star with a lens flare in the upper left, a crescent moon in the upper right, and a portion of a reddish planet (Mars) in the lower left. The background is filled with numerous colorful stars and nebulae.

Scenario for the Robotic and Human Exploration of the Solar System

AURORA Industry Day
1 March, ESTEC

Scope and Assumptions

Scope

Identify and define
**European long-term
priorities** for

- ✍ Future of ISS utilisation and evolution
- ✍ Participation to US-led human return to Moon
- ✍ Mars exploration

Assumptions

- ✍ Societal Project
- ✍ Global Endeavour

Activity Elements and Objectives

Approach

- ✍ Engage a wide range of European stakeholders for identifying **European strategic priorities**
- ✍ Analyse **long-term scenarios** to ensure robustness of European contributions and programme in an uncertain international context



Architecture

- ✍ Analyse exploration architectures for deriving **high-level requirements**
- ✍ Confirm strategic interest in and verify technical and programmatic **feasibility** of European priorities



European Exploration Strategy

Integrated Scenario Development Process

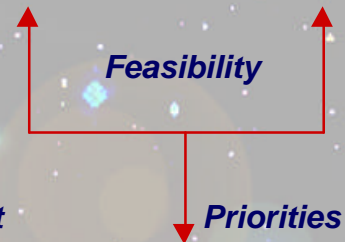
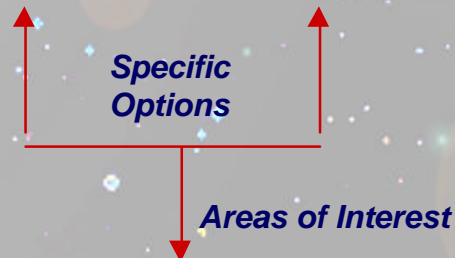
European Space Exploration Approach

STEP 1
Analyse Status

STEP 2
Analyse
International and
European Context

STEP 3
Set Objectives
through Stakeholder
Consultation

STEP 4
Define
Implementation



*Identification
and Definition of
European
Contributions to
Global Space
Exploration
Activities*

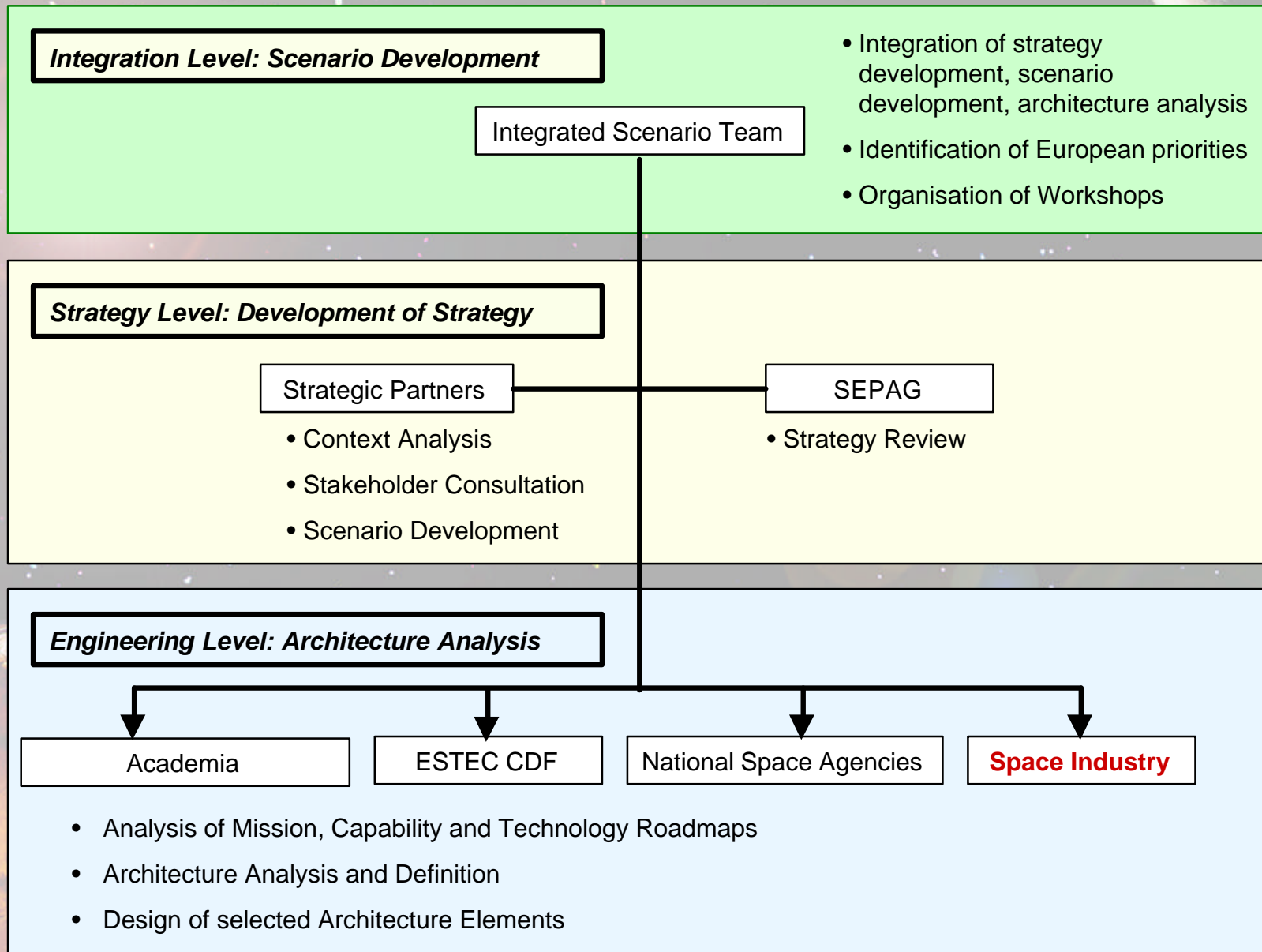
STEP 1
Obtain
Understanding

STEP 2
Identify European
Possibilities

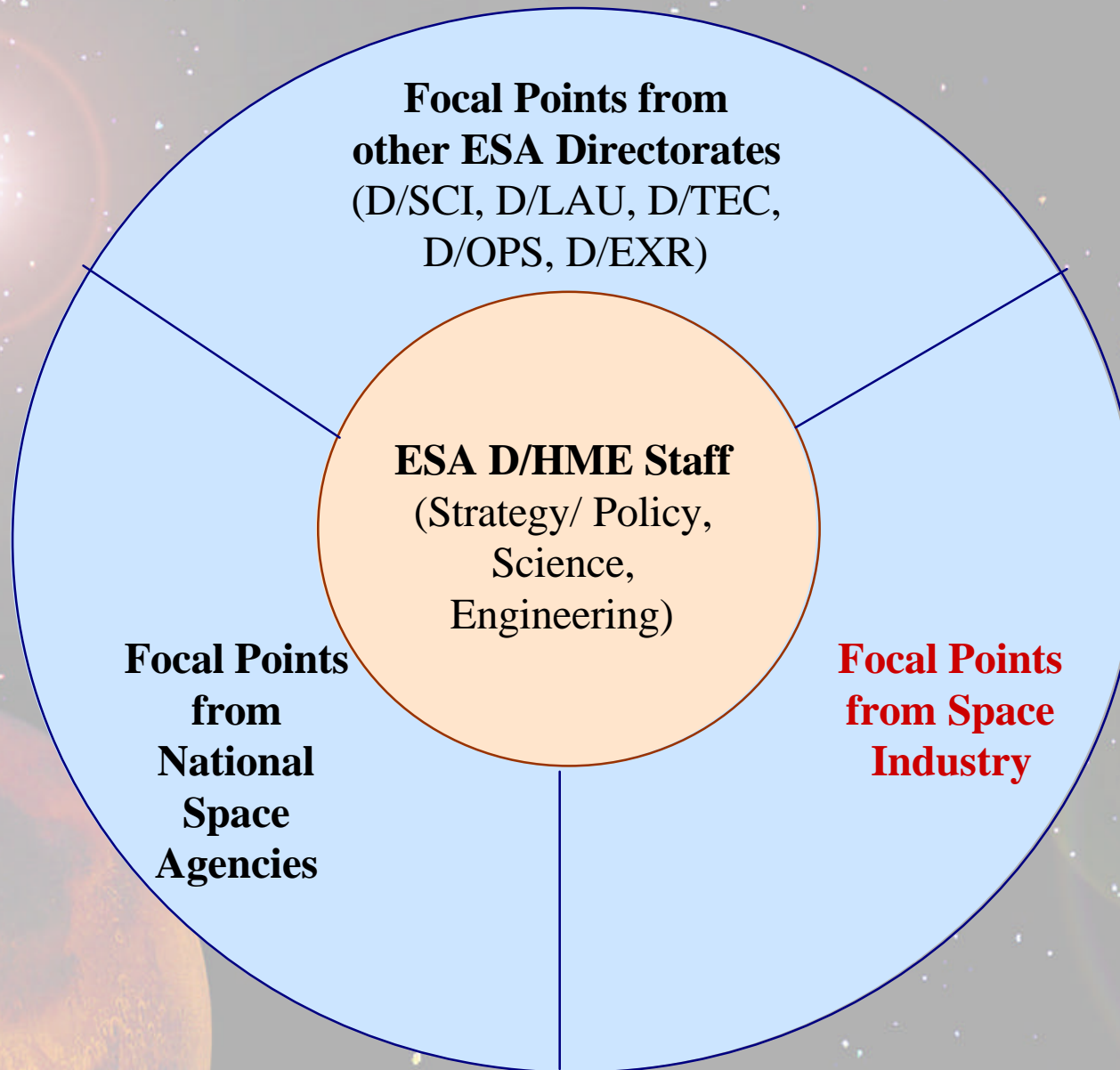
STEP 1
Define European
Contributions

Space Exploration Architecture Analysis

Overall Organisation of Scenario Development



Organisation of Integrated Scenario Team



User Driven Strategy

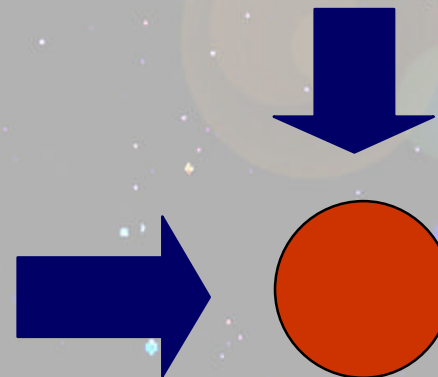
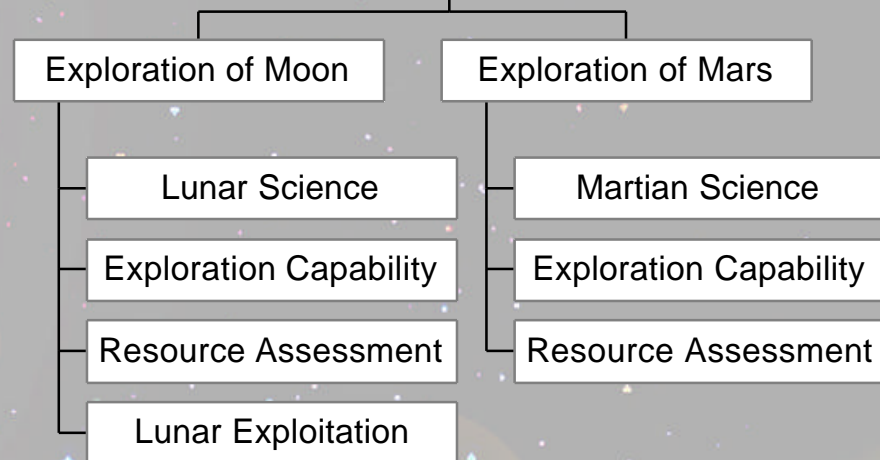
Stakeholder Groups

Public
Industry
Scientific Community
EC
Member States

European Strategic Objectives

- Knowledge
- Innovation and Development
- European Project
- Inspiration and Education
- Global Societal Security
- Cultural Development

Exploration Opportunities



European Strategic Cornerstones

Organisation of Stakeholder Consultations

	Knowledge	Innovation and Development	European Project	Inspiration and Education	Global Societal Security	Cultural Development
1. Find, protect and understand life , create awareness on the history of life and study the history and future of the Earth and its environment	?	??	ESF (EU)	??	??	?
2. Provide space exploration enabling services		? ???????????			UNOPS, UNOOSA	
3. Protect and sustain human health in hostile environments	?	??	??	?	European Cultural Foundation	
4. Develop innovative concepts for resource and energy management		??	??	?	??	
5. Share the Space experience and create new perspective for cultural development		??		?		??
			DEMOS (UK)			

Schedule for Space Exploration Scenario Development

Dec. 04 | Jan. 05 | Feb. 05 | Mar. 05 | Apr. 05 | May 05 | Jun 05 | Jul 05 | Aug 05 | Sep 05

NASA Roadmap Development

Meetings of EPAC/ Delegate Bodies

SEPAG Meeting

Space Exploration Approach

- Documentation
- Stakeholder Consultation
- Reference Scenario

Space Exploration Architecture Analysis

- CDF Studies
- Contributions of Academia
- National Agency Contributions
- Industrial Studies

Architecture Analysis

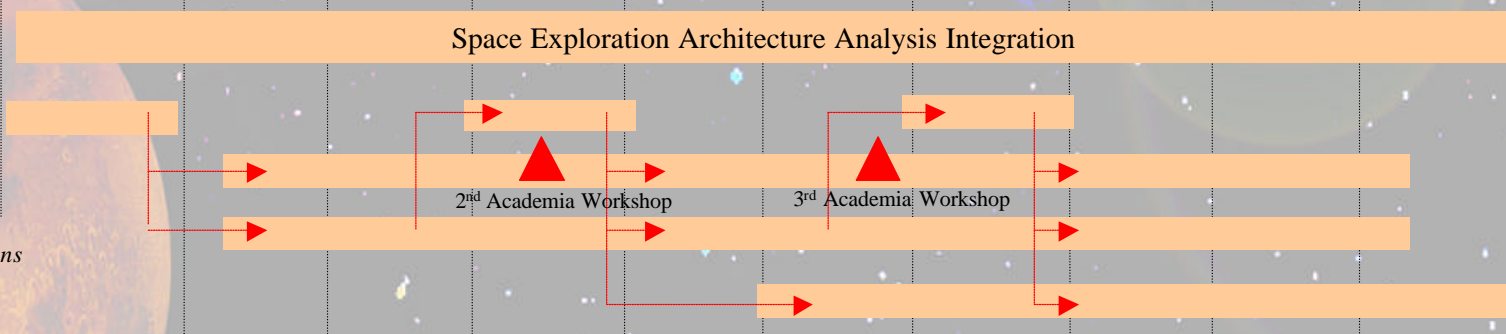
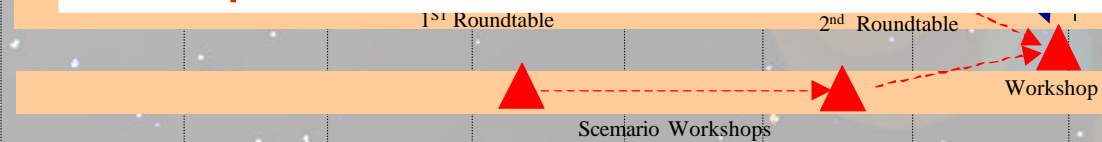
✍ 1st CDF study on lunar exploration (lunar excursion) completed and 2nd study (NASA strawman) in preparation

✍ 1st Academia workshop on lunar exploration organised in 2004

✍ Call for innovative proposals from Academia in preparation

✍ National Agency contributions solicited

✍ **Preparation of statement of work for industrial study initiated**



▲
egic
eted

▲
PB
gy

■

Partners for Stakeholder Consultations

European drivers	Organizations
Knowledge	ESF (European Science Foundation)
Innovation and Development	ENEA (Italian National Agency for New Technologies, Energy and the Environment)
	UVS International (Unmanned Vehicle Systems International)
	Fraunhofer Institut
	ANVAR
Inspiration	DEMOS
Cultural Development	European Cultural Foundation
	UNESCO (United Nations Education, Science and Culture Organization)
Global Societal Security	UNDP (United Nations Development Programme)
	UNEP (United Nations Environmental Development)
	UNOOSA (United Nations Office for Outer Space Affairs)
	UNOPS (United Nations Office for Project Services)
	WHO (World Health Organization)
Context Analysis	ESPI (European Space Policy Institute)

Elements of Space Exploration Architecture Study

Phase 1 - Architecture Analysis

- ✍ Analysis of integrated Moon/ Mars space exploration architectures for derivation of high-level requirements for key capabilities

Phase 2 - Capability Analysis

- ✍ **Capability Definition:** definition of selected capabilities for lunar exploration; candidates for European contributions to spiral 2 (human mission to Moon) and spiral 3 (sustainable lunar exploration) of US led-return to the Moon
- ✍ **Capability Roadmap:** analysis of evolution scenarios of defined capabilities to support future exploration missions beyond and development of long-term capability roadmaps
- ✍ **Capability Assessment:** prioritisation of European capability developments on the basis of agreed criteria such as costs, risks, strategic value, European heritage, cooperation opportunities, exploration scenario versatility

Phase 3 - Development Plan

- ✍ Preparation of detailed development plan leading to capability demonstration

