EPSC Abstracts
Vol. 13, EPSC-DPS2019-1859-1, 2019
EPSC-DPS Joint Meeting 2019

EPSC
EPSC-DPS Joint Meeting 2019
15–20 September 2019 | Geneva, Switzerland

An introduction to the Planetary Exploration, Horizon 2061 foresight exercise and to the preliminary conclusions of its synthesis workshop (Toulouse, Sept. 11-13, 2019)

Michel Blanc (1) and the Scientific Organization Committee of H2061 Toulouse 2019
(1) Research Institute in Astrophysics and Planetology, Toulouse, France; (2) See Table I.

Abstract

We will present a summary of the concept, objectives and current implementation of the "Planetary Exploration, Horizon 2061" long-term foresight exercise initiated by the Air and Space Academy under the auspices of COSPAR. We will focus on its third step, the Horizon 2061 Synthesis Workshop hosted by the Institut Aéronautique et Spatial in Toulouse (September 11th to 13th, 2019) to introduce the audience of EPSC-DPS to its logical structure, its programme and its preliminary conclusions, which will be open to discussion. We will also introduce the approach and steps we propose to follow to prepare a full report of this exercise to the COSPAR General Assembly in August 2020 in Sydney, Australia.

1. Introduction and main objectives

"Planetary Exploration, Horizon 2061" is a long-term foresight exercise initially proposed by the Air and Space Academy and led by scientists, engineers and technology experts heavily involved in planetary sciences and in the space exploration of the Solar System. This foresight exercise is opened to all scientists, engineers, technicians, journalists, industry and space agencies and people interested in the future of planetary exploration and the space adventure.

The ultimate objective of this foresight exercise is to develop a long-term picture of the four pillars of planetary exploration:

1. the major **scientific questions**;
2. the different types of **space missions** desired;
3. the key required **technologies** ;
4. the needs in support **infrastructures**.

The year 2061 symbolically represents the intention to encompass both robotic and human exploration in the same perspective. During a series of three successive Horizon 2061 workshops, planetary scientists have been invited to formulate what they think are the most important scientific questions that need to be addressed and solved to make progress in our understanding of Planetary Systems, a new class of astrophysical objects which are ubiquitous in our Galactic neighborhood but can be explored in situ only in our Solar System! These science questions have been formulated independently of the *a priori* technical possibilities of answering them. Subsequently, engineers and technology experts have been invited to contribute to the exercise by looking for innovative technical solutions that will make it possible to fly the challenging space missions needed.

Four main objectives can be reached via this dialogue between scientists and engineers: 1. Identify the technologies and infrastructures needed; 2. Provide a broad spectrum of interesting national space missions of diverse sizes and complexity levels; 3. Inspire coordination and collaborations between the different players of planetary exploration; 4. Share with the public and public/private leaders the major scientific questions and challenges of planetary exploration.

2. Implementation, debate and reporting

The "Horizon 2061" exercise involved three successive steps (workshops) designed to progressively build the three pillars. Its third step is the "Horizon 2061 synthesis workshop", hosted by the Institut Aéronautique et Spatial (IAS) in Toulouse from September 11th to 13th, 2019. Its conclusions will be presented for discussions at this session of the joint EPSC-DPS meeting in Geneva (September 15th to 20th, 2019). Following the Geneva discussions and additional contributions, a final report of the Horizon 2061 exercise will be prepared for COSPAR in the form of a dedicated COSPAR publication and of a book to be published by Elsevier. This report will be presented for final approval at the COSPAR General Assembly (Sydney, August 15th to 23rd, 2020).

3. Scientific Organization Committee of the H2061 Synthesis workshop

NAME & Surname	Affiliation
AL HASHMI Khaled	UAE Space Agency, UAE
ALVES Jorge	ESA/ESTEC, The Netherlands
ANAND Mahesh	OU, UK
BARABASH Stas	IRF, Sweden
BHARDVAJ Anil	PRL, India
BEAUCHAMP Patricia	JPL, USA
BLANC Michel - Chair	IRAP, France
BLELLY Pierre-Louis	IRAP, France
BOITHIAS Hélène	Airbus, France
BOLTON Scott	SwRI, USA
BOUSQUET Pierre	CNES, France
BROQUET Jean	AAE, France
BUNCE Emma	U. Leicester, UK
CAPRIA Maria Teresa	IASF, Italy; co-chair, COSPAR commission B
CASOLI Fabienne	LERMA, Obs. Paris, France
DAOU Doris	NASA/GSFC, USA
DEHANT Véronique	ORB, Belgium
DEMONET Jean-François	CHUV, Switzerland
FERRI Antonella Ferri	Thales Alenia Space, Italy
FLAMINI Enrico	ASI, Italy
FOUCHET Thierry	Dir. PNP, LESIA, Obs. Paris, France
FOING Bernard	ESA, The Netherlands
FREEMAN Antony	JPL, USA
GRANDE Manuel	Aberystwyth, UK
GUDIPATI Murthy	JPL, USA
GUO Linli	CAST, China
HAMMEL Heidi	AURA, USA
HARRI Ari-Matti	FMI, Finland
HEAD James	Brown University, USA
HELLED Ravit	ETH Zurich, Switzerland
IP Wing - Huen	NCU, Taiwan
IVANOV Anton	EPFL, Switzerland
KIM Kyeong Ja	KIGAM. South Korea
KNEIB Jean-Paul	EPFL, Switzerland
KORABLEV Oleg	IKI, Russia ; chair, COSPAR Commission B
KRUPP Norbert	MPS Gottingen, Germany
LAKEW Brook	NASA/GSFC, USA
LASUE Jérémie	IRAP, France
LEBLANC François	LATMOS, France : Chair SHM w.g., CNES
LEBLEU Denis	Thales Alenia Space, France
LEBRETON Jean-Pierre	LPCEE, France
MACKWELL Stephen	USRA, USA
MADI Mohammad	ISEF, Switzerland
MAKAYA Advenit	ESA/ESTEC, The Netherlands
MAURICE Sylvestre	IRAP, France
McCUBIN Francis	NASA/Johnson SFC, USA
McNUTT Ralph	APL/JHU, USA
MIMOUN David	ISAE, France
MONTMESSIN Franck	LATMOS, France; Chair Solar System WG, CNES
MOUSIS Olivier	LAM, France
MUSTIN Christian	LIEC, Nançy; Chair Exobiology WG, CNES
NAKAMURA Takuji	NIPR, Japan; chair, COSPAR Commission C
ORI Gian Gabriele	Universita d'Annunzio, Pescara, Italy
PERINO Maria Antonietta	Thales Alenia Space, Italy
PRETI Giampaolo	Leonardo, Italy
PROCKTER Louise	LPI, USA
RAUER Heike	DLR, Germany
ROCARD Francis	CNES, France
SCHERER Klaus	Ruhr-Universitat-Bochum, Germany ; chair, COSPAR commission D
SCHONBAECHLER Maria	ETH, Switzerland
SZEGO Karoly Szego	KFKI, Hungary
TIAN Feng	MUST, China
TSUDA Yuichi	ISAS/JAXA, Japan
UDRY Stéphane	Obs. Genève, Switzerland
WESTALL Frances	CNRS Orléans, France ; Chair, COSPAR PEX
ZONG Qiugang	Peking University, China
ZOU Yongliao	NSSC, Beijing, China