

# Bérengère HOUDOU

**MIT / Supélec Engineer**

**12-year Experience**

**Head of the Lunar Exploration Office at ESTEC**

Nationality: French

Date of Birth: 30 March 1978

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## EXPERIENCE

**European Space Agency (ESA),  
European Space Research and Technology Center (ESTEC),  
Directorate of Human Spaceflight and Operations**

**Noordwijk,  
The Netherlands**

April 2012 - present: Head of the Lunar Exploration Office (ISS Exploitation and Exploration Department)

- Responsible for the industrial and scientific activities of the ESA lunar exploration programme, particularly for robotic missions;
- Works in cooperation with Russian partners;
- Technical responsible of the development of an autonomous system for precise and safe landing
- Animates a team of 5 persons;
- Lunar Lander Phase B1 Manager (until end 2013);
- Member of the Judging Panel of the Google Lunar X-Prize competition.

Feb 2008 - March 2012: System Lead Engineer in the Lunar Lander Project (ISS Programme and Exploration Department)

- Defines and controls the industrial definition, design and planning activities related to the Lunar Lander mission/system;
- Main interface with the Prime Contractor as Technical Officer;
- Monitors and controls the technical progress; ensures technical integrity of the mission and system design;
- Manages schedule and cost performances;
- Coordinates a team of internal experts for review and shadow engineering activities;
- Organises and leads project reviews;
- Interface with the launcher services;
- Contributes to the preparation of official papers (programme proposal, project plan etc.);
- Tutors young graduate trainees/stagiaires.

Oct 2006 - Jan 2008: System Engineer for Robotic Exploration Systems (Future Programmes Department)

- Conducted internal (using concurrent design process) and industrial feasibility studies of various robotic exploration missions (e.g. lunar sample return, Mars rendez-vous missions);
- Analysed the need for future exploration capabilities and related technologies; contributed to the formulation of the corresponding technology policy, including prioritisation and demonstration approach;
- Pre-developed those exploration capabilities and related technologies with the technical support of experts (especially in the Guidance, Navigation and Control field, e.g. developing a helicopter-based platform to test sensors for autonomous landing);
- Coordinates technology development with other programmes of the European Space Agency.

April 2005 - Sept 2006: System Engineer for Human Systems (Development Department)

- Led the detailed design phase of the ARES project (closed-loop Air REvitalisation System);
- Coordinated technology development within the broader field of life support systems (air, but also water recycling and analysis, waste management, food production etc., using physical but also biological processes);
- Life Support Engineer of the Node3 for verification of specifications, test review.

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March 2003 - March 2005: Life Support System Engineer (Development Department)

- Followed the design, assembly, test and operations of the technology-demonstration experiment FAVORITE (electrolyser), which flew onboard the Russian Foton capsule in 2005. Extensive work in Russia, including the launch campaign in Baikonur and the operations in Kiruna;
- Supported the design phase of the ARES project;
- Determined using the ESTEC laboratory facilities the respiratory characteristics of a mask designed to protect children that are hyper-sensitive to ultra-violets (transfer of space technology).

**Massachusetts Institute of Technology,  
Man Vehicle Laboratory ([mvl.mit.edu](http://mvl.mit.edu))**

**Cambridge, MA, USA**

Sept 2000 - June 2002: Designed, implemented and conducted experiments with human subjects using 3D virtual reality. Developed and validated methodologies for preflight training counter-measures against the disorientation problems experienced by astronauts in the International Space Station. Worked extensively with NASA engineers and researchers.

**Parabolic Flight Campaigns**

**Bordeaux, France**

October 2004 & March 2005: Validated a condensate water buffer for the International Space Station Columbus module (European laboratory), specifically designed to work passively in microgravity.

*Patent: Device for intermediate condensate water storage (reference 05027558.5, ESA/PAT/X18)*

Sept 2001: Tested experiment protocols for investigating motion perception and motor-reflexes in microgravity. In collaboration with CNES and the Collège de France.

## EDUCATION

**Massachusetts Institute of Technology,  
Aeronautics & Astronautics Department ([web.mit.edu/aeroastro/www](http://web.mit.edu/aeroastro/www))**

**Cambridge, MA,  
USA**

Sept 2000 - June 2002: Science Master's Program (Grade Point Average= 4.9/5) in Aeronautics and Astronautics, with thesis about 3D spatial memory training using virtual reality.

**Engineering School Supélec ([www.supelec.fr](http://www.supelec.fr))**

**Paris, France**

Sept 1998 - Dec 2001: Graduated in 2001 as Engineer in Information Technology, specialization in Control. Third academic year in the United States at the Massachusetts Institute of Technology to obtain a Master in Aeronautics and Astronautics in parallel with the Supélec Engineering Degree.

**Lycée Sainte Geneviève**

**Versailles, France**

Sept 1996 - June 1998: Scientific Preparatory Classes, specialization in Physics-Chemistry.

## TRAINING

**Latest ESA Trainings**

**ESTEC, The Netherlands**

Project manager training, International project management organised by NASA, Project management principles, Advanced strategies and techniques for business negotiations, Space system verification and validation.

**International Summer School "Space Biology and Medecine"**

**Moscow, Russia**

June 2003: Course delivered by the Faculty of Medicine of the Lomonosov University and the Institute of Biomedical Problems focusing on the physiological effects of microgravity and the biomedical instrumentation developed specifically for space applications.

**International Space University ([www.isunet.edu](http://www.isunet.edu))**

**Pomona, CA, USA**

July 2002 - Aug 2002: Summer Session (SSP'02) sponsored by the Massachusetts Institute of

Technology and ESA. Interdisciplinary program covering the principal space-related fields, gathering professionals from the world space community. Member of the Space Systems Analysis and Design department.

### **COMPUTER SKILLS**

Programming languages: C, Python

Office suite, including MS Project

Software: Matlab, Simulink, Systat, 3D Studio Max, familiar with Ecosim, familiar with DOORS

### **LANGUAGES**

French: Mother Tongue

German: Very Good

Italian: Basic

English: Fluent

Dutch: Very Good

Russian: Beginner

### **ACTIVITIES**

Interests include: swimming, sailing (participation to regattas), hiking, skiing, playing the piano, reading (travel stories).

Member of the ESTEC Sailing Club.

Member of a chorale in Amsterdam.

Member of Women in Aerospace Europe (former director on the Board).

Member of the association Forum of Supélec.

Teaches part of a Human Spaceflight course to university students.