

# "How do we return to the Moon?"



Panel discussion in the Library Hall of the Round Tower, October 5<sup>th</sup> 2019



Foto/Photo: NASA

# “How do we return to the Moon?”

Panel discussion in the Library Hall of the Round Tower- arranged as part of Space Days 2019 and the exhibit “Around the Moon” celebrating the 50<sup>th</sup> anniversary of the first manned landing on the Moon. See full program on [www.spacedays.dk](http://www.spacedays.dk)

**Date:** Saturday October 5<sup>th</sup> 2019

**Time:** 5 PM – 8 PM

**Place:** The Round Tower, The Library Hall, Købmagergade 52A, 1150 Copenhagen K, Denmark

**Participants in the panel:** John Horack (moderator) USA, Andreas Mogensen Denmark, Emily Law USA, Peter Batenburg Holland, Gitte Bailey Hass Denmark, Sebastian Aristotelis Denmark

## **PROGRAM:**

5 PM: PART ONE - presentations

6.00 PM: Break – 30 minutes

6.30 PM: PART TWO – discussion and Q & A

Networking after discussion up to 8 PM

**Tickets:** [www.rundetaarn.dk](http://www.rundetaarn.dk) [www.rumfart.dk](http://www.rumfart.dk)

*Andreas Mogensen's participation is arranged in collaboration with the European Space Agency (ESA) and the Ministry of Higher Education and Science (UFM).*

 CINEMATEKET  
DET NORSKE FILM- OG TV-ARBEJDE

 AARÉ OG JORANDE  
LOUIS-BRANSON FOND

 tpu

 DUF INITIATIV  
STØTTE

THOMAS B. THIRIGES FOND

 EUROPLANET

 Uddannelses- og  
Forskningsministeriet

 eesa  
EUROPEAN SPACE AGENCY

 IDA  
Space

 KrogagerFonden

 ELLEHAMMER FONDEN

 TICRA

## **Participants in the panel discussion “How do we return to the Moon”**

### **Participants**

#### **John Horack (Moderator)**

##### **Topic: Return to the Moon: Collaboration, Competition, or Commercialism**

**Bio:** John M. Horack, Ph.D., is the inaugural holder of the Neil Armstrong Chair in Aerospace Policy at The Ohio State University, with tenured, full-professor appointments in the College of Engineering’s Mechanical and Aerospace Engineering department and the John Glenn College of Public Affairs. A 30-year veteran of the spaceflight industry, Dr. Horack also currently serves as He also serves as the Senior Associate Dean of Engineering at Ohio State, and is a globally recognized leader in space-based research, flight hardware development, program management, and space policy.

**Abstract:** National space agencies around the globe are discussing their plans for returning humans to the Moon, it is not at all certain that these actors alone will drive the agenda and modalities of human exploration. Furthermore, within this flurry of activity on the part of NASA, ESA, China, Russia and others, the landscape between collaboration and competition is dynamic, and commercial interests are also strong actors in the future. The first commercial Moon mission - the Beresheet Lander from SpaceIL - was driven from Israel, and while not fully successful, it demonstrated that market forces and non-governmental entities are poised to play a substantive role. Dr. Horack will build on the discussions from the other panel members to explore the dimensions of cooperation and competition, the potential relevance or obsolescence of the ISS partnership model, and the role that non-government actors may play in our return to the Moon.

#### **Andreas Mogensen**

**Topic:** ESAs European Space Exploration Envelope Program

**Bio:** Andreas Mogensen is an astronaut with the European Space Agency. Andreas became the first Danish astronaut in space on 2 September 2015, when he launched on a ten day mission to the International Space Station. He is currently stationed at NASA's Johnson Space Center in Houston, Texas, where he serves as ESA's liaison to the NASA astronaut corps. At NASA, Andreas serves as the deputy chief of the Assigned Crew Branch. Andreas is an aerospace engineer with a PhD from the University of Texas at Austin and a M.Eng. from Imperial College London. His past research has focused on

guidance, navigation, and control of spacecraft during entry, descent, and landing on Mars and the moon.

**Abstract:** The European Space Agency has an ambitious program of human and robotic exploration of the Moon and Mars, that will see humans returning to the Moon for the first time since 1972, and eventually traveling to Mars. The exploration program provides a modular and sustainable path, building on the scientific knowledge and technology gained from the International Space Station. ESA's European Service Module is an integral part of the Orion capsule that will soon ferry astronauts back to the Moon. ESA will also develop two of the modules for Gateway, a space station in lunar orbit and a transit point for astronauts landing on the moon as early as 2024.

## **Emily Law**

### **Topic: "Where We've Been And Where We're Going"**

**Bio:** Emily Law has over twenty years of experience in research, development and management of complex information systems. Since 1996, she has been working at NASA's Jet Propulsion Laboratory where she has provided leadership and management in the architecture, development, technology and operations of highly distributed ground data systems for planetary exploration and earth science. Emily currently serves as Deputy Program Manager and Development Manager to two separate directorates covering data systems in solar system research and earth science. She also leads operations for NASA's Planetary Data System, and oversees the development and operations of science data infrastructures and portals in support of Earth and Planetary science including the Solar System Treks Project (SSTP). She has authored papers and made numerous presentations on data intensive systems at various national and international venues.

**Abstract:** During the Apollo program in 1960s and 1970s, six of the nine missions sent by NASA landed astronauts safely on the surface, the only times humans have visited another world. July 20, this year, marked the 50<sup>th</sup> Anniversary of the first human landing. The Apollo lunar flights ended in 1972, but the Moon has remained of great interest to NASA, international space agencies and scientists around the world. It's time for us to recommit ourselves to our future presence in space beginning with a return to the Moon with a clear vision. This talk will reflect on "Where We've been" and share "Where We're going" with NASA moving forward to the Moon.

## **Gitte Bailey Hass**

### **Topic: How do we inspire the next generation to choose STEM topics?**

**Bio:** Gitte Bailey Hass has 20 years of teaching experience in the STEM subjects. 10 of these years were in the European School system, the rest in the Danish public schools. She has been teaching physics, chemistry, biology, mathematics and ICT for kids in the age between 7-17. During the years Gitte been a part of the political work to improve the level of science teaching. She was a board member of the NTS center, the National Center for Science, Technic and Health education, she is the chairman of DFKF, the Danish association for physics and chemistry teachers and in 2019 she was a part of the ministerial group responsible for the rewriting of the national syllabus for physics and chemistry."

**Abstract:** How do we return to the Moon? We will never gain success with our dream of space exploring, if the next generation does not share the goals. How do we open the STEM subjects for our students in schools? What do we teachers need to catch their interest, so they choose to spend years of hard studies and low income, and we get enough of talented, well educated people to continue the quest for scientific knowledge of the universe and other vital and basal questions about being a human being.

## **Peter Batenburg:**

### **Topic: Lessons learned from Apollo for future moon and Mars missions**

**Bio:** Peter Batenburg is a space system engineer and project manager with over 9 years of experience in different sectors of the space industry. He has worked for the ISS operations as an Operations Support Engineer and Payload and Mission integration manager for the IRISS mission. Besides the professional career Peter is active in the International Astronautical Federation (IAF), Netherlands Space Society (NVR) as board member and activity committee coordinator and fellow initiator of the national Apollo 11 celebration platform [www.50jaarmaanlanding.nl](http://www.50jaarmaanlanding.nl). Spaceflight, and in particular the Space Race and Apollo era, have fascinated Peter since the age of 4. As a result Peter has studied the history of spaceflight and Apollo in detail and the passion for space was a major driver for him to pursue a career in space.

**Abstract:** On July 20th, the world celebrated the 50<sup>th</sup> anniversary of Neil Armstrong first step on the Moon not only the US. What made this event so unique is that it united the world while ironically it started with a cold war. Within less than 10 years the US managed to do what seemed impossible. What made this unique accomplishment possible and why we have not returned to the Moon or have not reached Mars yet? In other words; what

are the lessons learned from Apollo and the Space Race and what does this mean for the next exploration mission to the Moon and Mars?

## **Sebastian Aristotelis**

### **Topic: How to thrive in space**

**Bio:** Sebastian is a space architect and the co-founder of SAGA Space Architects, a newly formed architecture studio which focuses on how humans can thrive in space and not just survive. SAGA was founded last year after Sebastian and his Co-founder Karl-Johan Sørensen graduated from the International Space University. SAGA has won several awards for their work, most recently their *Circadian Lunar Home*. SAGA is currently working on a lunar habitat together with DTU Space which they are testing on an analog mission to the icecap of Greenland in April 2020.

**Abstract:** With a background in architecture Sebastian will talk about how we go from surviving in outer space to thriving in outer space. Living in outer space has its own very extreme challenges. Together with his partner, Karl-Johan, Sebastian and their team are building a Moon habitat, which the two will test in northern Greenland next year. Sebastian and Karl-Johan will live in the habitat for 3 months in isolation. Sebastian will talk about the challenges and solutions of such a mission. He will explain why they do it and what they hope to learn.