



22 September 2021

## COMMUNIQUÉ DE PRESSE

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### **ALPHA MISSION : PROGRESS REVIEW OF CNES EXPERIMENTS OPERATED BY THOMAS PESQUET**

**The docking of the NG-16 resupply spacecraft with the ISS in August marked the arrival in orbit of the latest French experiments designed by CNES as part of the Alpha mission. After 152 days in space, astronaut Thomas Pesquet has already completed four spacewalks and performed a host of science experiments from CADMOS/CNES and from other space agencies like ESA and NAS. His schedule is still busy.**

#### **FRENCH EXPERIMENTS ON THE ALPHA MISSION**

##### Dreams

For the Dreams experiment, Thomas Pesquet is wearing a sleep headband for several nights fitted with an electroencephalogram sensor using dry electrodes, in order to study his sleep patterns. He has completed three two-night sessions with the headband, the third earlier this week. Scientists have already begun analyzing the data. The headband will stay on the ISS to study the sleep patterns of other astronauts.

##### Pilote

Several sessions of the Pilote experiment were held in May and July 2021. The goal for scientists is to understand hand-eye coordination in microgravity in order to assist astronauts with robotic tasks and, in turn, optimize workstation ergonomics for when they need to remotely operate robotic instruments. Wearing a virtual reality headset, Thomas Pesquet and Megan McArthur (NASA) performed several guiding and handling activities, like an immersive videogame.

##### Telemaque

The Telemaque acoustic tweezers are designed to hold, move and study objects and liquids without ever touching them. Acoustic tweezers emit ultrasound waves that effectively trap small objects in an acoustic vortex. Thomas Pesquet tested this instrument for the first time on the ISS on 20 July 2021. The aim of the experiment was to capture 11 small spheres of varying shapes and sizes. Based on the success of this first session, scientists are preparing a second session for October.

##### Immersive Exercise

The purpose of the Immersive Exercise experiment is to break the routine of the daily physical exercise sessions on the ISS and use virtual reality to boost the crew's motivation. A first session was held on 28 July 2021. A few software tweaks on the virtual reality headset are now being made ahead of the next session planned for late October.

##### Lumina

The Lumina experiment is based on an optical-fibre dosimeter, which was successfully activated on 18 August 2021. The purpose is to measure radiation on the ISS using radiosensitive optical fibres, a recent and innovative French technology. The first data downlinked to Earth is now being analyzed by scientists. Lumina is scheduled to operate on the ISS for at least another year.

## [Eklosion](#)

The capsule of the Eklosion student experiment contains French marigold seeds, which were rehydrated for the first time by Thomas Pesquet on 19 August 2021. He also began to read personal messages from friends and family on scented cards designed to remind him of familiar terrestrial smells, like pine and rose. On Earth, amateur gardeners are also taking part in the experiment and sharing their adventure via #EklosionISS.

## [Blob](#)

Sclerotia, a dehydrated form of slime mould popularly known as “the blob”, were “revived” by Thomas Pesquet on 2 September 2021. This was done by rehydrating them using a syringe of water. For a week, an automatic imaging system built into the “blob box” photographed the changes in these four space blobs every 10 minutes. On Earth, the 4,500 schools selected as part of the #ElèveTonBlob\* educational experiment will start the experience on 11 October 2021.

*\*Experiment designed by CNES in partnership with CNRS and with the support of the Toulouse education authority.*

## [TetrISS](#)

The TetrISS automated platform has been performing well since it was activated on the ISS on 3 September 2021. However, the Chladni Pattern experiment housed in the platform has encountered difficulties: the particles clumped together due to the effect of static electricity. A corrective protocol will be applied at a next session.

## [Eco Pack](#)

For the Eco Pack experiment, Thomas Pesquet will answer a questionnaire about new forms of recyclable and edible packaging. Like, did it properly protect the material it contained? His answers are expected on 22 September and 11 October 2021.

## [Food Processor](#)

The Food Processor demonstrator will arrive at the ISS in the summer of 2022 on the NG-18 resupply craft.

## [Cerebral Ageing](#)

The Cerebral Ageing cell biology experiment, designed to better understand the mechanisms of how brains age at the molecular level, will arrive at the ISS in late 2022.

## **DECLIC BACK ON THE ISS**

The French-American DECLIC mini-laboratory (*Dispositif d'Etudes de la Croissance et des Liquides Critiques*), dedicated to the study of supercritical fluids and the directional solidification of transparent alloys, has returned to the ISS. It was brought back to Earth in 2019 for refurbishment, but will now be installed in the Japanese KIBO module in early October. Thomas Pesquet will be in charge of operating it.

## **NEW SUPPLY SHIP MEANS CULINARY DELIGHTS**

The resupply craft regularly deliver fresh produce such as fruit and vegetables to the ISS. They also sometimes bring “special” dishes, with French gastronomy always proudly featured. On the menu this August: *fénétra* (a Toulouse specialty almond tart), *bouchées chocolatées* (chocolate bites) and *flan aux châtaignes* (chestnut flan) from Maison Pillon and Jean Hénaff group.

## **THOMAS PESQUET TO BECOME FIRST FRENCH ISS COMMANDER**

On 4 October 2021, ESA astronaut Thomas Pesquet will take command of the International Space Station until he returns to Earth in early or mid-November. He will take over from Japanese astronaut Akihiko Hoshide (JAXA) and become the first French astronaut to serve as ISS Commander.

## **CONTACTS**

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