



# HEALTH CRISIS

## CNES ACTIVE ON ALL FRONTS

*While the CNESmag team had its attention focused on biodiversity, a pandemic was turning our lives upside down. CNES's response to support the national effort and all sectors affected by the crisis was immediate. In this supplement, we take a look at some emblematic initiatives it has been pursuing.*



### HEALTH CARE



To meet the most urgent needs of front-line medical teams, CNES gave up its stock of face masks, gowns and goggles to hospitals. But it is above all in the core field of innovation that the agency has contributed its valuable expertise.

#### **Innovating to support front-line medical teams**

Working with La Pitié-Salpêtrière Hospital in Paris, a small team of engineers sought ways to overcome the lack of ventilators. The complex equation they had to solve was how to design essential equipment quickly and affordably with materials immediately to hand. The team came up with the idea of making airflow dividers, designing within a week a device capable of serving two or three patients from a single ventilator. In the spirit of an improvised fablab calling on garages and 3D printers, the engineers supplied

ideas and prototypes. Resuscitation capability could thus be easily increased, since any firm can fabricate up to 25 dividers a day with a single 3D printer. CNES has submitted its Y and three-way divider models to the CARE analysis, research and expert committee charged with guiding the government's COVID-19 response. Once the device is certified, CNES will make its fabrication drawings freely available.

But to keep patients under respiratory assistance or placed in a coma alive, nutritional substances and drugs need to be administered automatically. This requires six syringe pumps per patient per day. Also working with La Pitié-Salpêtrière Hospital, CNES has designed a 'low-tech' model of a syringe pump and applied for its certification. Due to the lack of available off-the-shelf components, the pump will initially be produced in limited numbers by a team of Toulouse-based SMEs (Erems, Comat and Soterem).



## E C O N O M Y

Q&A

# LIONEL SUCHET

CNES Chief Operating Officer

### **The economy has been hard-hit by this health crisis. Has CNES been able to sustain its operations?**

**Lionel Suchet:** As a government agency assuring strategic activities, CNES has in place a specific response plan to be deployed in time of crisis. Among other things, this plan covers orbital satellite operations, sustainment of critical systems and the security and safety of our resources at the Guiana Space Centre (CSG). It served as the blueprint for defining the minimum number of personnel required to remain on site to sustain all these activities while adhering to the restrictions imposed by health guidance. For the rest of our operations, we have transitioned to teleworking on a massive scale. Only certain operations like launch campaigns and construction work on the ELA4 complex at the CSG have had to be deferred. It would have been impossible to ensure the health and safety of our people, which has always been our top priority.

### **Has the space ecosystem been forced into a complete shutdown?**

**L.S.:** No, not at all. It was very important that we provide support for the space ecosystem. Industrial production was shut down completely at the start and then scaled right back. On the other hand, all design work was able to continue to maintain a minimum level of revenue for our manufacturers. It was therefore vital to pursue and even ramp up all upstream activities, which we have succeeded in doing thanks to the efforts of our engineering, legal and accounting teams (see over).



### **What is this crisis going to change in your view?**

**L.S.:** It's too early to say at this stage, but a global crisis of this scale is bound to change all of us. I believe space will have an even more important and strategic role to play in the post-crisis world. Indeed, its strong resilience has proved its worth and economic recovery plans will need to take that into account.

We are also going to change the way we work when the time comes to learn the lessons from this crisis. In particular, teleworking has shown us just how much we can do remotely. Obviously, that in no way detracts from the need to get the work-life balance right.



## **BUILDING THE POST-CRISIS WORLD**

The effects of the COVID-19 crisis reach beyond our health. It will also have social, economic, political and geopolitical consequences. Responding to a call for projects from France Stratégie, the government's strategic foresight and planning unit, 50 CNES employees have been envisioning what the 'post-crisis world' might look like. They took part in a webinar and came up with ideas that should help chart vital recovery plans to restart the economy.



## E C O N O M Y

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## Innovation CHALLENGES THAT CNES IS LEADING

Under the Caroline Herschel FPA<sup>1</sup>, CNES is leading the **Copernicus Innovation Challenges** alongside the Aerospace Valley competitiveness cluster. The challenges are putting up a prize of €50,000 for French firms, SMEs and start-ups in each of four Copernicus end-user categories: farming, local government, water and the environment. The firms selected will have six months to develop a proof of concept based on Copernicus satellite data and will receive support from experts at CNES's Lab-OT Earth-observation laboratory. The agency is also maintaining its **Launchers R&D Challenge** for SMEs, start-ups and research laboratories. The 10 best projects presented at a pitch day on 24 June will get R&T support and sign a big funding contract.

Learn more at [www.cnes.fr](http://www.cnes.fr)

1. Framework Partnership Agreement

## INITIATIVE AN ECONOMIC OBSERVATORY FOR THE SPACE SECTOR

**T**he fast-changing business environment is both a source of opportunities and threats. To share analysis of its impacts on firms, research laboratories and academia working in the space sector, CNES is setting up a space economy observatory with its partners outside the agency. The economic crisis looming behind the health crisis has given new urgency to this effort, fuelled by a weekly dialogue instituted with the sector's leading players, SMEs, mid-tier firms and start-ups via competitiveness clusters. CNES, ESA and the Ministry for Higher Education, Research and Innovation, the Ministry of Armed Forces and the Ministry of Finance have thus been kept informed of the difficulties they are facing and provided the necessary support. After the crisis, the new observatory will of course be pursuing and stepping up its actions.

## PROCUREMENT CUSTOM ADJUSTMENTS FOR CNES CONTRACTORS

**A**s a cornerstone of the space ecosystem, CNES has taken urgent measures to mitigate the impact of the health crisis on affected partner firms. The agency has maintained its procurements—tenders, notices to proceed, orders, etc.—and adapted contract terms for firms unable to execute their work or experiencing cashflow problems. By extending recourse to electronic signatures, it has shortened times for signing contracts. It has maintained payments for 55 firms working on regular contracts. And it has so far forgone penalties, revised payment schedules and granted advances for 14 SMEs, seven mid-tier firms and six big corporations out of 40 partner manufacturers, SMEs and start-ups who have applied for help.



EDUCATION

# SPACE

## EXPLAINED TO PARENTS

*The two-month lockdown has been hard on parents juggling roles full time without respite. As the Ministry of Education and Youth's historic partner, CNES has been helping them in their new home-schooling role.*



To help parents, the Ministry of Education and Youth launched a broad initiative at the start of the lockdown called 'Operation Learning Nation', tapping notably into the mainstream media to devise educational content. In line with its mission to educate and engage youngsters and teachers, CNES was asked to post a vast library of free resources and material on its website. It selected high-quality and scientifically validated curriculum-aligned content about the solar system, our environment, living and working in space and more. Teachers were thus able to access a range of educational material, while fun activities were provided for parents and their children.

one's time, CNES has also conceived a range of fun space-related activities. A coloured salt cellar inspired by the Proxima mission is one example. And to encourage people to indulge in some culture, alone or with their family, it has published colouring mandalas based on Guianese tembe art. It has also posted templates for building true-to-life paper rockets and satellites and, for those lucky enough to have a 3D printer, the historic Diamant-B rocket.

All of these materials are still available on CNES's website ([www.cnes.fr](http://www.cnes.fr)). Satellite images showing the pandemic's effects on the planet can be viewed on the Geoimage website (<https://geoimage.cnes.fr/fr>).

### Making time for fun

To provide some light relief while making good use of



## SPACE TUESDAYS CARRY ON

Listening to experts from the world of space talk about their experience and share their knowledge is the philosophy behind Space Tuesdays. And they weren't going to let the lockdown get in the way! For the 28 April edition, CNES put together a 'lockdown special'. Those spending six months on the International Space Station (ISS) or 500 days in isolation in a module to prepare for crewed missions to Mars may well have volunteered to be in confinement, but did it change their lives? What are the right reflexes we need to adopt?

Inaugurating its Twitch streaming platform channel for the occasion, CNES invited three very special guests: Michel Viso, who went through the astronaut selection programme, Cyprien Verseux, who spent two long periods in confinement, and Romain Charles, who also took part in the Mars 500 confinement experiment.

Subscribers were thus able to take virtual leave from lockdown by connecting to <https://www.twitch.tv/cnes.france>.