

# CNES @ MAG

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SPACE • INNOVATION • SOCIETY

#88

May 2021

CSR

CNES RISES TO  
THE CHALLENGE



cnes

CENTRE NATIONAL  
D'ÉTUDES SPATIALES



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- Sylvio Van Der Pijl, President of the Grand Customary Council of French Guiana
- Cécile Dechoz, environmental engineer at the Guiana Space Centre



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this new issue online  
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## CONTRIBUTORS

# PATRICIA SCHULTHEIS



**Patricia Schultheis' commitment to the agency's management system** put her on the path to sustainable development. As Deputy Director of DDP, she worked on the early phases of the CSR project and is keeping close track of its operational roll-out. In this issue, she shows us all the process stages along the way.



# LAURENCE MONNOYER-SMITH

**Her expertise in environmental issues and close knowledge** of the public sphere made Laurence Monnoyer-Smith the perfect choice for the job. Heading up CNES's new Sustainable Development and Performance Directorate (DDP), she has driven and shaped the agency's CSR strategy while firing teams' enthusiasm.



# ISABEL ESPANOL

**Isabel Espanol is an illustrator and lecturer at the LISAA graphic design school** who has been an adept of collage since her childhood days. For this issue, we gave her free rein to bring the agency's CSR commitments to life on the page. She has pulled off the challenge of bridging two different worlds in style.



# ANNE SERFASS-DENIS

**The environment is her world, net-zero emissions her horizon.** CNES's Environment Senior Expert Anne Serfass-Denis knows pretty much everything there is to know about environmental regulations, how they apply and what they imply. Her rigour and insight have proved instrumental in guiding the agency's efforts in this domain.

## CNESMAG

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## EDITORIAL



**Earth is our home and it will remain so for a long time to come.**

**The well-being of our planet's populations** and the preservation of the environment on which we rely for our resources and daily lives both depend on our ability to pull together in the same direction.

At CNES we are keenly aware of our obligations as a government agency, which is why we are committed to affirming our corporate social responsibility (CSR) and ensuring that our space missions and activities bring positive impacts for the planet, society, citizens and CNES's people.

Our CSR strategy is geared towards the challenges facing the space sector and society at large. As you will see in this issue of CNESMAG, we are working at all of our facilities to get space assets to advance our understanding of weather phenomena, preserve nature and tackle climate change, to support territorial needs, to guarantee that space remains open and sustainable, and to achieve gender equality and diversity.

Our contribution to reaching the UN Sustainable Development Goals is obviously fired by the creativity of our people, partners and stakeholders. Because we know that exploration is the way to knowledge, discovery and the pleasure of learning, it is together, spurred by our curiosity and thirst for new ideas, that we are seeking to meet the climate and social challenges before us.

**MARIE-CLAUDE SALOMÉ**

CNES DIRECTOR OF COMMUNICATIONS



## FRENCH GUIANA

### **NEW OFFICE WORKING FOR THE REGION**

With the creation last October of a new Space for Guiana office, CNES confirmed its attachment to the region and its economic and social development. Since the launch base began operating there in 1968, the agency has always remained attentive to local authorities' needs. In 2018, under the PHEDRE 2 plan, a €10 million boost was provided to its contribution to funding of digital infrastructures for the University of French Guiana. Now, with the new office reporting to the Director of the Guiana Space Centre (CSG), the agency is set to step up deployment of space applications—for remote sensing, geolocation and telemedicine—on the ground. It will also be relaying the Connect by CNES initiative (see. p. 11) to foster innovative projects in the fields of healthcare, mobility and the environment for local authorities, businesses and Guianese citizens alike.



## ROUNDUP



The SEIS Mars instrument in thermal vacuum testing.



### GREEN BY CNES INNOVATIVE SOURCES OF FUNDING

**E**nergy consumption accounts for 60% of CNES's carbon footprint. To support its contribution to the nation's low-carbon strategy, the agency is turning to green energies such as solar power, biomass power plants and geothermal or wood-fired heating, as well as green propellants for future launchers. To make these radical, albeit costly changes that will prove profitable and virtuous in the long run, it needs to find new sources of funding. To this end, CNES is innovating with its proposed investment subsidiary called Green by CNES dedicated to such green projects, based on the local authority model. A team is already at work and will be ready to support the first projects starting next year. As subsidies enabling the energy transition make these investments profitable, shares in the subsidiary could be offered through the employee savings plan.

### SPACE PROJECT

## END-TO-END ECO-DESIGN

**C**NES has been working hard to reduce its environmental footprint since 2018. Rather than rely solely on intuition, the agency put its faith in a rational and objective tool for its orbital projects: life cycle analysis, a method for assessing the environmental impacts across the organization from conception through to operation, taking in materials, transport, data processing, human resources and much more besides. All parameters were looked at, starting from a generic template. The result of the analysis is that whatever the space project—satellite, balloon, instrument, etc.—there is always scope to do more, for example in how equipment is shipped and people transported. Useful tools exist to calculate the environmental footprint of a trip or define the best place for a meeting based on who really needs to be present. Data centres constitute another line of action, as sensors on satellites acquire large volumes of data over time and processing them consumes a lot of energy, a parameter that is now factored into projects from the outset. Greener energy to power satellite thrusters is also an area being looked at.



**CSR,**  
three letters that stand for three values: environment, society and the economy. First coined in the 2000s, the concept of corporate social responsibility is founded on these three pillars of sustainable development.



ROUNDUP

TOULOUSE SPACE CENTRE  
SPACE CAMPUS OF THE FUTURE



**T**he Toulouse Space Centre (CST) may be a restricted facility, but it welcomes others with open arms. Besides CNES's teams, it also houses ESA, the European GNSS agency GSA and the new Space Command created in September 2019. It will shortly be welcoming the national mapping, survey and forestry agency IGN and the NATO Centre of Excellence for space. The CST sees its future as an institutional space campus. Now the remit of the Ministry of the Economy, space is spawning start-ups and turbocharging all sectors of the economy. In this new landscape, the CST of tomorrow will be open, resilient and ready to host academics, young businesses and equipment manufacturers. Riding on the momentum of the agency's corporate social responsibility strategy, the CST New Generation project team envisions a future with more-virtuous buildings and new ways of living and working. A public debate will be organized to flesh out this ambitious project, lending an attentive ear to the young generations working at the facility who will be living in this new world in 2030.

GUIANA SPACE CENTRE  
EFFECTING POSITIVE CHANGE

**E**veryone at the Guiana Space Centre is engaged in making the energy transition, with contractors on site adopting virtuous approaches. Besides the large-scale construction work underway at the launch base (see Timeline p. 28-29), green thinking is making inroads everywhere. Europropulsion has switched from diesel to electric fork-lift trucks and its ultra-sophisticated sorting system delivers

pulped waste paper used as a soil amendment by a local orchid grower. MT Aerospace, meanwhile, will soon have a fully autonomous vehicle fitted with solar panels and a power converter, and EES-Clemessy is engaging its employees to encourage digital sorting. Zero plastic waste is also the watchword, with personal mugs and flasks replacing plastic bottles—proving by example that sustainable development can be a concerted team effort.







Bio-methane production in French Guiana could be modelled on this plant in Charente-Maritime on France's west coast.

## LAUNCHERS

### GREENING PROPELLANTS

**C**an environmental quality and space propulsion be reconciled? Today, propulsion is provided by solid propellants and a mixture of hydrogen and oxygen, but for space to be sustainable, propellants need to be made environmentally friendly, and methane produced from natural gas is not. It isn't produced in French Guiana either, where the launch base is located. CNES therefore envisions a more virtuous, renewable and cleaner energy in the form of bio-methane, which could be produced on site from industrial and municipal waste or crops not competing with local farming. This solution would reduce launchers' environmental footprint, while supporting the region's development and offering an opportunity to create a circular economy. Preliminary studies to set up a local bio-methane production plant for Themis and ArianeNext (see p. 27) conducted with anaerobic digestion specialist Naskeo have already confirmed the project's feasibility.

# 3<sup>rd</sup>

France ranks third in the world in CSR, just behind Sweden and Finland.

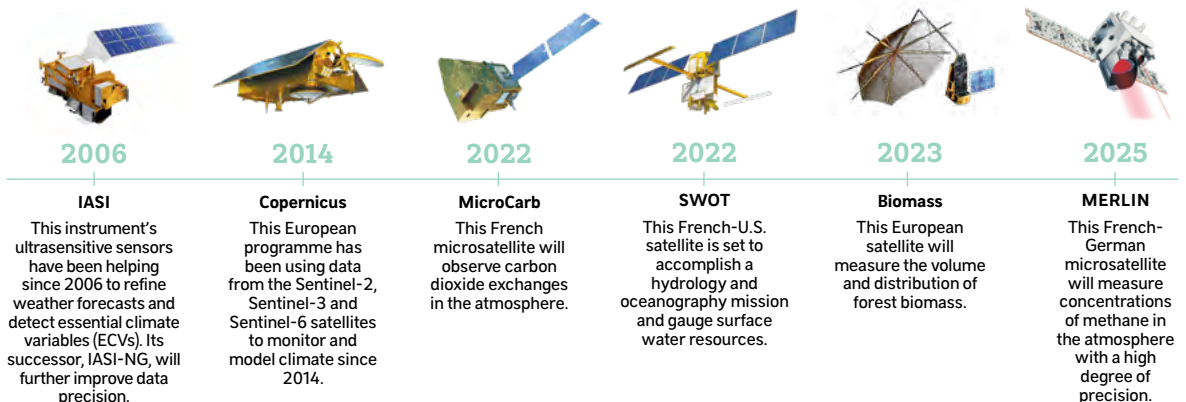
# -90%

CNES is committed to achieving a drastic reduction in its greenhouse gas emissions. Between 2014 and 2019, it succeeded in curbing them by 48%. In 2019, it generated 93,998 tonnes of CO<sub>2</sub>. By 2050, it plans to produce just 9,000 tonnes, i.e., 90% less.

# 109

As of early March, 109 public and private firms of all sizes and from all sectors had like CNES signed up to the French biodiversity office's Act4Nature initiative.

## SPACE FOR THE PLANET





## ROUNDUP



### ACT4NATURE

## A THREE-STEP COMMITMENT

**T**he French biodiversity office OFB's Act4Nature scheme seeks to encourage public and private enterprises to measure their impacts on biodiversity, curb them when they are negative and optimize them when they are positive. CNES has taken on board the 10 principles laid down to candidates by OFB, obtaining its Act4Nature label last December. As the agency now goes about setting its own objectives, biodiversity is the defining priority—in calls for projects for the Space Climate Observatory (SCO), in innovation and R&T proposals, in bio-sourced and organic products and in its facility management plans. In particular, CNES will reuse built-over and sealed man-made surfaces (buildings, car parks, etc.) rather than create new ones. Where this is not an option, it will put in place special measures, like for example in French Guiana, where to offset construction of the Ariane 6 launch pad it has handed over more than 1,300 hectares of land that will benefit ecosystems to the Conservatoire du Littoral coastal conservancy. It has also committed to tackling invasive plants and establishing action plans to protect rare species. Once evaluation and validation of this second step is complete, CNES will move on to step three and apply for the international EpE<sup>1</sup> label, possibly as soon as this summer.

1. Entreprises pour l'Environnement (Businesses for the Environment).

### EDUCSCO

## BETTING ON YOUNG GENERATIONS

**I**n response to the climate emergency, France has added climate science, biodiversity and sustainable development to its school curricula. And one of the best ways to actually perceive the underlying phenomena is through satellite data. CNES is thus lending its weight to EducSCO, a climate change education programme backed by the Space Climate Observatory (SCO). The prime target of this initiative is teachers, a great way of reaching young people. EducSCO will organize conferences led by scientists in partnership with ENM, the meteorology school at the national weather service Meteo France. These conferences will then be made available to education authorities with tutorial exercises, a superb educational tool based on real-world cases illustrated by the SCO database. These space resources may of course ultimately be freely available for teachers to use in the classroom.



Toulouse University Hospital, the Midi-Pyrenees regional council, CNES and the DIAMIP diabetology network joined forces to treat patients close to their home through DIABSAT, a programme using satellite technology to provide mobile screening for the complications of diabetes. A vehicle fitted out with test equipment, seen here in the Tarn-et-Garonne department, scours outlying communities.



## CONNECT BY CNES PREACHING THE SPACE WORD

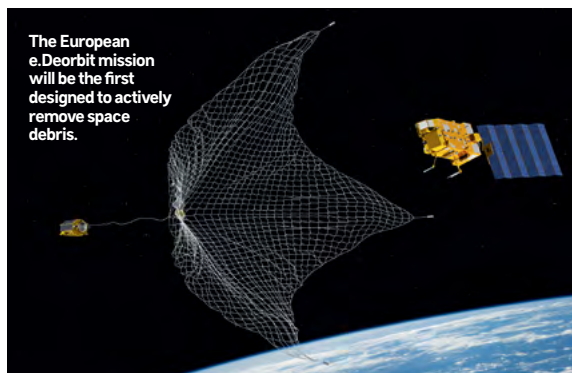
Optimizing merchant shipping routes by harnessing winds and waves, or helping livestock farmers to take their herds where the grass is greenest quite clearly creates added economic value. This is where the Connect by CNES programme to foster uptake of space data as a means to boost economic, social and environmental development comes in. Start-ups, big private firms and public bodies alike can all benefit from space solutions, but many of them are unaware of their potential. Connect by

CNES brings these solutions to their attention and provides support right through to the applications phase. Working closely with the regions, it serves the all-important domains of the environment, healthcare and mobility, and can be found equally well

in the field of telemedicine, making rural areas more resilient, and in effective stewardship of water resources for cities. It is also helping the oil industry to mitigate the economic and ecological impact of possible methane leaks.

## LAWMAKING SAFE AND SUSTAINABLE SPACE

Space is nobody's private property. You don't just go there when you like, as you like. Pre-dating the UN Sustainable Development Goals (SDGs) of 2012, the French Space Operations Act (FSOA) of 2008 shares their spirit, seeking to protect public health, the environment, people and property in space. To guarantee effective protection and sustainability, CNES rigorously checks the technical compliance of space operations for the ministry with responsibility for space, which delivers final authorizations. No French operator can execute a launch without first obtaining this clearance. The FSOA is regularly updated and aims to stabilize the number of space debris by making satellites more virtuous. Where corrective solutions prove impossible, the act provides for preventive measures such as end-of-life passivation<sup>1</sup> and moving satellites to a graveyard orbit<sup>2</sup>.



1. This procedure consists in making a satellite safe by venting its leftover propellants, draining its tanks, discharging its batteries and lowering pressure as much as possible.
2. An orbit into which a satellite is moved at the end of its life. Telecommunications satellites in geostationary orbit (36,000 km) use their remaining stationkeeping fuel to raise their orbit 230 kilometres.



## # COMMUNITY

Every day, CNES engages with you on social media and you share your thoughts and questions with us. Join the conversation!



### @CLS\_GROUP

A global company using #space #data to deliver deeper insights into the #Oceans and our #Planet. Pioneering #Earth-observation applications, #Argos services provider



CLS assisted @energy\_observer to observe #sargassum and #deforestation in #Amazonia during their round-the-world trip with a green-energy boat.



### @THIVALLEE

Ariane 6 Launch Facility Associate Director - CNES Launch Vehicles Directorate



#OTD in 2010: French Space Operations Act (FSOA). To reach space without losing Earth, @CNES ensures compliance with rules protecting our planet and its near orbit for launches from the #CSG and of French operators' satellites.



### @JY\_LEGALL

President of @CNES

Toulouse Space Centre. CNES leading the way in green mobility. Very proud to be using one of our new bikes! @CNES



### @CONNECTBYCNES

Space technologies and innovations serving society: more space for your ideas! #Santé #Environment #Mobility #SpaceForGood - @CNES

Space descends on the @Elysee palace to showcase capabilities for #biodiversity and #climate at the @oneplanetsummit. Effective operational examples and use cases on display. #Space4Climate #Space4Planet #Space4Good #SCO @CNES





Q & A

# ÉLISABETH MORENO

FOR ÉLISABETH MORENO, THE MINISTER DELEGATE FOR GENDER EQUALITY, DIVERSITY AND EQUAL OPPORTUNITIES, corporate social responsibility is key to embracing the deep transformations in our society.



Q & A

## **Have you felt corporate social responsibility become an increasing concern for businesses during the course of your career?**

**Élisabeth Moreno:** I've spent the last 30 years of my life in the world of business, working for French and foreign firms, and in that time I've seen social and environmental responsibility issues take on more importance. This is due to greater awareness on the part of political and business leaders, and increased expectations from employees and citizens. Initially, the main focus of attention was on preserving the environment. Social concerns, the 'S' in CSR, started to be addressed at a later stage. Today, nobody disputes the fact that businesses can't thrive in a degraded environment or a divided society. So, the challenge facing us now is to turn this shared conviction into concrete actions. Firms have a responsibility they must bear.

**"The space sector as a whole has a major responsibility to support and promote exceptional women."**

## **Do you find that firms are doing a better job addressing diversity issues?**

**E.M.:** Diversity became an issue in France in the early 2000s, notably through the diversity charter advocated by Claude Bébéar. Diversity has no legal existence as such; it stems mostly from cultures and traditions in the English-speaking world that need adapting to the French context. I'm delighted to see that firms are starting to get a handle on this concept. They no longer see it as a challenge to overcome or a box-ticking exercise, but rather as a way to boost their attractiveness, innovation and performance. What has changed for the better is that instead of an often isolated initiative in a handful of pioneering businesses, we're now seeing a groundswell driving diversity in both public and private organizations.

## **Is there a French exception in the way firms address diversity in their CSR plans?**

**E.M.:** France's great strength lies in its legislation: for several years now, we've adopted measures to encourage gender, age and disability diversity. These three dimensions are now set in stone. However, like most European Union countries, we stand apart from the English-speaking world in our perspective of diversity of origins. I meet many firms who tell me they want to work on the cultural diversity of their employees, but they

don't know where to begin. Today, they're ready to go the extra mile and gauge the diversity of their employees' cultural and social origins, to improve their recruitment and mobility practices. Few people realize that it's quite possible to achieve this without changing the law, and without falling into the deadly trap of ethnic statistics, which are illegal in France.

## **How do you propose to get French firms to tackle this more effectively in their CSR policies?**

**E.M.:** I propose to institute a diversity index that will give firms a tool to move forward in this area. They'll be able to survey their employees, via a trusted third party, on their social, geographic and cultural origins, as well as their career advancement. We all know that to improve, we have to measure. The diversity index isn't comparable with the gender equality index, as it won't have a score or penalties attached. It will be founded on three main conditions: corporate engagement, employee consent and respondent anonymity.

## **There is scope for improvement in the space sector, notably on inclusion of women. What specific actions are needed in industrial sectors like this?**

**E.M.:** Like all science and engineering disciplines, the space



## Q & A



### ÉLISABETH MORENO

MINISTER DELEGATE  
FOR GENDER EQUALITY, DIVERSITY  
AND EQUAL OPPORTUNITIES

**“The challenge facing us now is to turn a shared conviction into concrete actions.”**

sector suffers from a chronic lack of female talents. We obviously need to start very early, at school, to break down entrenched gender stereotypes. But we can't focus solely on building this talent pool, which would take years; we need to act now by challenging discriminatory biases in job offers, for example through the 'equal skills' concept, in work organization, career management and even layout of work premises. The strategy of the space sector and of each of its firms must be rethought to create the right conditions for women to thrive. I would like to pay tribute here to pioneers like Claudie Haigneré or

more recently Erika Velio, who are wonderful role models for young girls. The space sector as a whole has a major responsibility to support and promote such exceptional women. Erika Velio wrote a beautiful inspirational letter for little girls born on 8 March 2021 for the #1000Possibles campaign that I led for International Women's Day.

### **How do you expect public bodies like CNES to help meet these challenges?**

**E.M.:** In my view, the public sector must lead by example. As a government agency, CNES has legal obligations with respect to equality in the workplace. Its score of 89/100 in the 2020 gender equality index is a testament to the efforts it has accomplished in recent years. Likewise, I can only commend the parity on its Board of Directors. But these results must not hide the fact that women only make up 38% of the total headcount. As always, it comes back to the long-haul effort to educate, engage and support women looking to succeed in careers dominated by men.

### **Is CSR not by definition always something we can improve? What new criteria do you think might emerge in the years ahead?**

**E.M.:** Absolutely! CSR can be improved because it's a reflection of society. It represents what citizens deem acceptable from

firms at a given moment in our common history. I don't think new criteria is where we need to focus, but rather on understanding the deep transformations the world of work is set to see in years to come.

**“Today, nobody disputes the fact that businesses can't thrive in a degraded environment or a divided society.”**

## PROFILE

### **2015**

Volunteer consular magistrate at the Bobigny commercial court, after training at ENM, the French national school for the judiciary

### **2016-2018**

President & CEO of IT firm Lenovo France

### **2019-2020**

Vice-President and CEO Africa at Hewlett Packard Inc.

### **2020**

Minister Delegate for Gender Equality, Diversity and Equal Opportunities



## IN PICTURES



### COASTS UNDER CLOSE WATCH

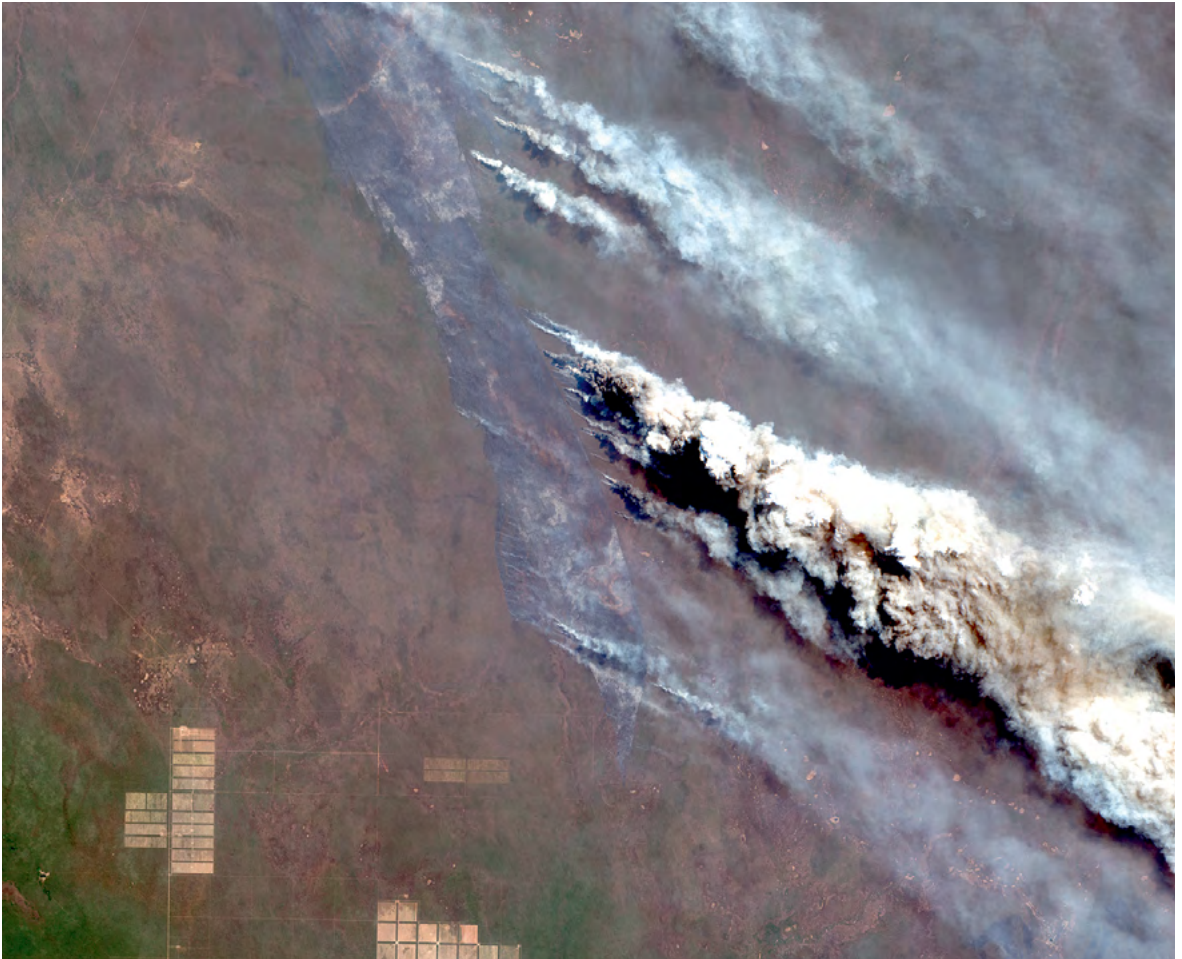
An offshoot of the One Planet Summit, the Space Climate Observatory (SCO) is an informal grouping of space agencies seeking to leverage space assets to inform public policies. Through calls for projects, it selects initiatives likely to help local stakeholders facing climate disturbances to find operational solutions. The SCO covers the full spectrum from storms to heat islands. One of the first projects it has selected is a land planning tool called LittoSCOpe. Led by CLS<sup>1</sup> and backed by CNES, this tool compiles space data and socio-economic indicators to identify coastal flood-risk zones. The Mediterranean coastline is one region where its operational model is currently being validated.

1. In partnership with SIRS and the French geological survey BRGM





IN PICTURES



## SPACE TO THE RESCUE

The one thing that tsunamis, wildfires and oil slicks all have in common is that they leave a trail of destruction and disaster-hit populations in their wake. In 2000, the International Charter Space and Major Disasters entered service, its architecture conceived by CNES, ESA and the Canadian Space Agency (CSA). The idea was to use space assets to aid emergency relief teams around the world in the event of natural or man-made disasters. Twenty years and 700 charter activations later,

17 member space agencies today provide data free of charge from a constellation of nearly 80 satellites. For example, in 2018 the Pleiades and Sentinel satellites closely tracked wildfires in the Amazon forest, delivering detailed imagery to help spot fires and track those that were still active.



## IN FIGURES

# x3



**Business class flights generate three times more emissions than economy class**, and twice as much as premium class. That's because emissions are directly related to the surface area a passenger occupies in the plane, while trains emit virtually no CO<sub>2</sub> at all. At CNES, 96% of emissions from business trips are from flying. The agency is looking at ways to get this ratio down.

# 91,514

**MEGAWATT/HOURS**



The total energy consumed at CNES across all of its facilities in 2019. The Toulouse Space Centre accounts for 50% of that total, as it has the largest headcount and houses the agency's data centres. The four buildings accommodating the data servers consume almost half of the centre's energy alone.

# First full carbon inventory



**France is targeting net-zero greenhouse gas emissions by 2050 to comply with the Paris climate agreement.** That's also the target CNES has set itself. Since 2012, the agency has conducted three regulatory checks of its greenhouse gas emissions, but an in-depth picture of total emissions is needed to inform its low-carbon strategy. It therefore decided to compile its first full carbon inventory including emissions generated by procurement, waste and fixed assets.

# 120

## MEMBERS

**of the Government Agencies and Public Enterprises Sustainable Development Club, recently joined by CNES.** While membership is voluntary and free, a corporate social responsibility policy must nevertheless be developed. The club then helps members to move up a gear and implement new practices, giving encouragement to public sector players like CNES looking to ramp up their CSR efforts.

# ETHICS

**In line with its public service mission, ethics and good governance underpin everything CNES does.** The Sapin II anti-corruption law enacted in late 2016 enabled it to strengthen the legal tools needed to achieve this. From 2018 onwards, the agency committed itself more broadly to tightly controlling corruption or probity risks in its relations with partners in industry, science and institutions. No area escapes this new preventive arsenal, be it in programme management, contractual commitments, governance of subsidiaries, international and European relations or the application of the French Space Operations Act (FSOA).



CNES IN ACTION



LEADING  
**BY EXAMPLE**

TO RECONCILE ITS ECONOMIC, ENVIRONMENTAL AND SOCIAL GOALS, CNES'S NEW SUSTAINABLE DEVELOPMENT AND PERFORMANCE DIRECTORATE HAS PUT TOGETHER A PROACTIVE CSR STRATEGY COMMENSURATE WITH THE AGENCY'S SOCIAL RESPONSIBILITIES. A STRATEGY FOUNDED ON FIVE COMMITMENTS FOR THE FUTURE THAT STAKEHOLDERS HAVE DEFINED TOGETHER.



## CNES IN ACTION



**In France,**  
68% of employees think they will still be working with their current employer three years from now. This proportion reaches 79% in companies with a CSR function or department.



Contrary to Paul Eluard's famous poem, Earth isn't blue "like an orange"; rather, it's turning bright red. And humans are in part responsible. We therefore have a

collective responsibility to combat climate change, which by a domino effect is triggering disasters and directly threatening the most vulnerable populations. We're all Earth's citizens and all cogs in the economy, too, as embodied in



## CNES IN ACTION

the concept of corporate social responsibility (CSR) aligned with the UN Sustainable Development Goals (SDGs) guiding everything CNES does. “The principle of corporate social responsibility is nothing new,” notes Laurence Monnoyer-Smith, CNES’s Director of Sustainable Development and Performance. “In the 19<sup>th</sup> century, precursors like Proudhon were already advocating a more socially responsible vision. Today, the consequences of globalization and the climate emergency have shaken things up.” The Earth Summits in Stockholm (1972) and Rio de Janeiro (1992) brought a new awareness. They also highlighted that sustainable development goes hand in hand with social issues, the future of populations and rising hunger around the world. These summits invited entrepreneurs to make sure their businesses were not only economically sound but also socially fair and ecologically sustainable. Based on this trifecta, the European Commission formally enshrined the concept of CSR in 2011 as “the responsibility of enterprises for their impacts on society”.



**40,000**  
**People**  
**have benefited**  
**from SDG**  
**educational**  
**actions, with 800**  
**undergraduates**  
**involved in student**  
**projects in 2020.**  
**CNES is closely**  
**involved in**  
**SDG 4 (Quality**  
**Education),**  
**working with**  
**schools and**  
**students alike**  
**(see Insights**  
**p. 35).**

### GOING THE EXTRA MILE

“We weren’t starting from scratch,” says Laurence Monnoyer-Smith. “Some initiatives were already underway, but they were sometimes under the radar; they lacked visibility and coherence.” The agency therefore set about defining an overarching, well-structured and ambitious strategy, aided by a favourable legislative context. It then created a new Directorate of Sustainable Development and Performance (DDP) to oversee its development and coordinate implementation of its goals. “The point of a CSR strategy is not to bask in self-satisfaction but rather to map what’s been done and evaluate what remains to be done,” explains the new director. Under her guiding hand, the agency’s other directorates and departments looked at how they work and detailed their assets and ambitions. CSR goals will now be enshrined in all processes and activities, and will be part of the ISO 9001 and ISO audit. A committee will regularly review the CSR strategy and evolve it over time..

### TAKING STOCK

As a government agency, CNES is expected to lead by example and has naturally given a great deal of thought to its social responsibility. This is reflected in its missions, through which it acts as a witness of our planet’s health, serving knowledge and science with programmes like SWOT, MicroCarb and MERLIN (see p. 9). Preserving biodiversity is also a key element in managing its facilities in Paris, Toulouse and French Guiana. And it is a pivotal player in global initiatives like the International Charter Space and Major Disasters (see In Pictures p. 17) and the Space Climate Observatory (SCO), of which it is a founding member. As a leader of the space community, the agency is pulling along a whole industrial and regional ecosystem in its wake. It is also paying close attention to management, instituting a responsible procurement strategy, a constructive work health and well-being policy and building a relationship of trust with its customers and suppliers.

### Roadmap

## AGENDA 2030 IN SIGHT

**CNES’s voluntary CSR effort takes its cue from the national drive to make the 17 UN Sustainable Development Goals (SDGs, see box p. 23) a foundation for this kind of initiative.**

**It has also taken advantage of a legislative and regulatory framework—the 2019 PACTE law—that encourages firms to move in this direction. With its SDGs, the UN has provided a structure and, with its Agenda 2030, a roadmap intended to effect change.**



CNES IN ACTION

# CSR strategy

## A PROJECT THAT MAKES SENSE

A CSR strategy marks a deep commitment to reconciling the environment, society and governance. CNES has set about defining its own strategy methodically and in collective fashion.



### THE 17 SDGS

The member states of the United Nations have set 17 priority Sustainable Development Goals or SDGs contained within the Agenda 2030. 1. No Poverty, 2. Zero Hunger, 3. Good Health and Well-being, 4. Quality Education, 5. Gender Equality, 6. Clean Water and Sanitation, 7. Affordable and Clean Energy, 8. Decent Work and Economic Growth, 9. Industry, Innovation and Infrastructure, 10. Reduce Inequalities, 11. Sustainable Cities and Communities, 12. Responsible Consumption and Production, 13. Climate Action, 14. Life Below Water, 15. Life On Land, 16. Peace, Justice and Strong Institutions, 17. Partnerships for the Goals.



## CNES IN ACTION



CSR strategy sets out in three capital letters an organization's commitment to fostering sustainable development. The idea behind CNES's ODDE<sup>1</sup> corporate sustainable development project was to help outline this ambitious endeavour. "To begin with, we had to review what we had already accomplished in the field of sustainable development and assess our level of maturity to identify priority lines of action," explains Patricia Schultheis, deputy head of the agency's new Sustainable Development and Performance Directorate (DDP).

### SETTING PRIORITIES TOGETHER

Through its membership of business clubs like Global Compact France, the Government Agencies and Public Enterprises Sustainable Development Club and EpE<sup>2</sup>, CNES was able to see where it stood and where it needed to go. But for a CSR strategy to work, it also needs to get the organization's employees to buy into the process. The agency therefore adopted a participatory approach led by a committed project team, surveying a panel of employees on their expectations concerning well-being at work, equality, collaboration across generations, education, environmental protection and much more besides. The agency also tapped its external partners—overseeing ministries, manufacturers, SMEs, etc.—to bring to light other issues such as international cooperation and support for economic growth. "This dialogue provided a fertile ground for building our CSR strategy," notes Patricia Schultheis. In the final analysis, combining these approaches yielded five key commitments.

### KEY LINES OF ACTION

The goals attached to these commitments—*Be a responsible employer*, *Promote protective and sustainable space*, *Create shared value*, *Reduce environmental footprint* and *Support territorial resilience*—are clearly worded, and all of them are closely aligned with one or more SDGs. This is no surprise, since they defend the same caus-



### THE 5 INDISSOCIABLE CROSS-CUTTING COMMITMENTS OF OUR CSR POLICY



**Actions identified will be developed through CNES's CSR strategy.**

es and embrace the same values. The first commitment is firmly rooted in labour relations, well-being at work, equality, education and ethics, while the second is focused on managing outer space, applying the French Space Operations Act (FSOA) and maintaining active solidarity in crisis situations. The third is geared more towards economic growth, for which the space ecosystem has provided promising momentum for several years now. The urgency of the fourth commitment, which cuts across a number of SDG recommendations, is clear. Through its first carbon inventory, CNES has taken a first step towards drastically reducing its environmental footprint (see In Figures p. 18). And fifth and last, supporting regional development with tools for managing natural resources, land planning, epidemiology and mobility is without doubt a mission to which space is ideally suited.

1. Objectifs de développement durable de l'entreprise.  
2. Entreprises pour l'Environnement (Businesses for the Environment).



CNES IN ACTION

# Responsible employer

## TAKING GOOD CARE OF OUR PEOPLE

**For CNES, well-being at work—gender equality, diversity and ethics—is an undeniable social responsibility and a guarantee of performance. The agency’s CSR strategy is looking to go the extra mile and create an environment where its employees can thrive.**



Every time CNES hires somebody, it acquires new skills and does its utmost to nurture them. In a spirit that seeks to favour fulfilment and dialogue, its CSR strategy aims to further reinforce this strongly asserted sense of workplace well-being. “Space is somewhat atypical, as the people who work in it are fired by their passion,” says Pierre Ulrich, the agency’s Director of Human Resources. “But that passion only lasts for so long if it isn’t nurtured.” And here, a government agency like CNES has fewer assets at its disposal than the private sector. So, it has to focus on well-being at work “to achieve individual and collective career fulfilment.” One particular measure the agency is steadily introducing is mobility. Throughout their career, employees in an administrative or technical post can change function, mission or job, move from preliminary project phases to applications, and work in Toulouse, Paris or Kourou. In other words, they can construct their very own career road movie.

### KEEP THE FIRE BURNING

The crucial issue of reducing gender inequalities has also been on CNES’s radar for some time now. “Courses in engineering were for many years discriminatory towards women. We’re looking to achieve real gender equality, but that takes time,” confirms Pierre Ulrich. The dialogue established with trades unions is generating five to eight agreements a year and surveys are measuring satisfaction with initiatives instituted.

With such a high level of social dialogue already in place, can a CSR strategy really make a difference? Pierre Ulrich clearly thinks so. “There’s always scope to improve well-being at work and being perceived as a ‘good employer’ is always an advantage.”

The CSR strategy will thus sustain efforts to achieve better gender and pay equality, and encourage initiatives still in their early stages like rounding up pay (see box) or changes to paternity leave. But it will also lead the agency to develop a more-social side, for example by supporting







insertion for young engineers from underprivileged areas or developing work-study contracts for interns to help young students pursue careers in space.

### Solidarity



## ROUNDING UP PAY

**Mighty oaks from little acorns grow, as the saying goes, and solidarity often relies on small gestures that together add up to bigger numbers.** This is the philosophy behind rounding up pay.

As an employee's net salary is never a round figure, those who wish can donate a few cents or euros to good causes. To make this even easier, such micro-donations can be directly deducted from pay by the employer and given to an association of the employee's choice.

The donation is shown on the pay slip and the employee can cancel it at any time. This principle has simply transposed to the corporate world the increasingly widespread practice of rounding up at the checkout—an initiative that CNES's CSR strategy should help to put in place.

# Eco-system

## ADDED VALUE, SHARED VALUES

**The government outlined its stimulus plan for space at the end of January. As the pivot of the space ecosystem under this plan, CNES has been quick to issue requests for proposals and calls for projects.**



From the month of February, CNES issued 20 requests for proposals aimed principally at SMEs and mid-tier firms. At the same time, the agency launched five collaborative calls for projects aimed at consortia. The sense of urgency has been increased by the COVID-19 crisis, which has seen initiatives to preserve the space ecosystem stepped up a gear. Support measures have been instituted throughout this period, such as maintaining payments for suppliers working on site, implementing electronic signing of contracts across the board and revising payment schedules.

### SME LABEL ADDS VALUE

But such sustained support is nothing new for CNES. As far back as 2010, the agency engaged an SME action plan that it has since revised every year. This plan enables innovations from SMEs to irrigate the space sector by making it easier for them to bid for government contracts, forging closer ties, fostering their business development and opening up new markets to them.

For the 2019-2020 revision of its plan, CNES created an SME accreditation scheme to leverage expertise across the sector in launchers, ground segments, orbital systems and balloons. This label is awarded by an accreditation committee to



## CNES IN ACTION



products and services with strong business development potential. The initiative has been an astounding success.

These capabilities have been plugged into the new CSR strategy, particularly in the area of procurement. "We're taking advantage of this new momentum to make our purchasing more sustainable," points out Brigitte Béhal, Director of Procurement, Sales and Legal Affairs. From now on, 'best bids' for government contracts will be chosen on the basis not only of technical and economic criteria, but also environmental requirements.

### Initiative

## FOSTERING FRENCH SYNERGIES

**The first catalogue of French space industry capabilities is now on line!**

Its aim is to foster partnerships between space stakeholders in an ever-more-competitive market. For today it is vital to forge ties between agencies, SMEs, research institutes and manufacturers, and to support the national ambition to favour French solutions. ESA is expected to institute a similar initiative, ESA-Match, at European scale by this April.

 **LEARN MORE:** [CNES.FR/FR/FRENCH.SPACE-INDUSTRY.CATALOGUE](https://www.cnes.fr/fr/fr/french.space-industry.catalogue)

# 185

### Bestseller.

The first catalogue of French space industry capabilities is one of the most popular pages on CNES's website. The first version lists 185 firms.



MATERIALS



# Reusable rocket

THE ARIANENETWORKS PLATFORM FOUNDED BY CNES AND ARIANEGROUP IS AN INNOVATION ACCELERATOR accommodating the Themis programme to develop a demonstrator prefiguring the new-generation launchers that ArianeNext will be spearheading in the 2030-2040 timeframe. The ability to recover and reuse launchers will be a key factor in reducing space launch costs in a fiercely competitive market. Themis is therefore designed to be the prototype of a reusable launcher first stage. But recovering all or part of a launcher for reuse also calls for a sustainable development approach. That's why Themis's other mission will be to demonstrate that its three reignitable Prometheus engines can run on liquid oxygen and methane in place of traditional propellants that generate more atmospheric pollution (see Roundup p. 9).



## TIMELINE



# 1

## LESS ENERGY-INTENSIVE BUILDINGS

Air conditioning is a must-have to ensure adequate comfort in French Guiana's humid climate and accounts for 60% of the launch base's energy consumption. That's why its latest three new buildings follow more-virtuous construction standards, with special attention paid to improving performance in areas targeted by the QEA<sup>1</sup> environmental quality standard, i.e., comfort, flow management and health. Ultimately, management of the air conditioning network will be centralized, automated and streamlined to achieve an energy saving of 6% per degree gained.

1. Qualité Environnementale Amazonienne, the Guianese equivalent to the HQE standard in mainland France.

# 2

## FINELY TUNED EPCUs

Given the nature of what they do, the EPCU payload preparation facilities where satellites are prepped and fuelled demand strict control of temperature and humidity. Their obsolete air conditioning system is to be replaced by a network built around more-innovative technologies.

The network control unit will use algorithms to closely monitor consumption and adjust it to day, night and seasonal needs, while producing CO<sub>2</sub> emissions indicators.



## T I M E L I N E

**AS THE LARGEST CONSUMER OF ELECTRICITY IN FRENCH GUIANA AND A MAJOR CONTRIBUTOR TO CNES'S GREENHOUSE GAS EMISSIONS, THE GUIANA SPACE CENTRE IS DRIVING ITS ENERGY REVOLUTION. BY 2025, IT PLANS TO MEET 90% OF ITS ENERGY NEEDS FROM RENEWABLE SOURCES AND ACHIEVE A THREEFOLD REDUCTION IN CONSUMPTION IN ITS NEW BUILDINGS.**

# 3

## **TWO SOLAR FIELDS IN SIGHT**

In French Guiana, sunshine is in plentiful supply. And since 2016, the law allows self-generation of electricity from solar energy.

An initial solar field project set the self-consumption wattage at a little over 10 megawatts. The Guiana Space Centre opted for two solar fields sited apart and each capable of producing 5 megawatts.

Precautions need to be taken to allow for the fact that in the dry season a single cloud can wipe out all the benefits. One of the fields is being funded by ESA and the other by CNES under the government's stimulus plan.

They should both be coming on stream in mid-2023.

# 4

## **TWO COGENERATION BIOMASS POWER PLANTS**

A biomass power plant is designed to produce low-carbon energy and use heat for cooling, thus reducing energy costs and the carbon footprint. Two such plants are planned to enter service by 2023. The first will be dedicated to the field centre and the EPCUs (S1 and S5 buildings), and the second to the solid-propellant production plant. The feedstock will be locally sourced wood chips that are dried and then passed through a gasifier. The gas obtained will drive a heat engine, which in turn will drive an electric generator with heat recovery for cooling.



H O R I Z O N S

# FELLA IMALHAYENE

Delegate General, Global Compact France

"A CSR strategy is a kind of mindfulness approach..."



"Education, environment, equality, health—everything's interconnected. Today, no one can function in isolation from the rest of the world. That's what the UN's Sustainable Development Goals (SDGs) are all about." **Fella Imalhayene is responsible for the French branch of the United Nations Global Compact. The organization helps companies and non-profits in France implement the SDGs through their CSR strategies. It works with 1,400 players in France, including CNES.** In 2019, the agency benefited from workshops and tools to help it perform a status check, then define the five core strands of its roadmap. "Public-sector players have a crucial role to

play," says the 42-year-old delegate general, not only in matters of public interest and leadership by example, but also because "as top-tier contractors, their commitments flow down the supply chain to subcontractors".

After graduating with a dual degree in management and philosophy, Fella Imalhayene was first in charge of public relations at the Pompidou Centre in Paris. She then moved into the non-profit sector, where she focused on diversity and equal opportunities in employment. She's been with Global Compact France for four years now. "I love that we're both a business network and an official body with links to UN entities. As a non-profit, we can also

**test ideas and work with a certain degree of independence from government."**

Her vision of CSR? "Work to minimize the negatives and maximize the positives. It's a kind of mindfulness approach. For each decision, you ask yourself what the impacts will be for the teams, the locality and the planet." It's a huge task, but there's real hope. Top executives are becoming increasingly aware, especially since the pandemic. "There was a real tipping point, due to the extreme fear around locking down the economy. There's a growing understanding that, like it or not, you can't work the way you used to when everything around you is falling apart. We're at a pivotal moment!"



H O R I Z O N S

# SYLVIO VAN DER PIJL

President of the Grand Customary Council of French Guiana

“Exhibiting the relics of the past is crucial to our history and our future...”



Metal tools, pottery, beads, heated and sanded stones, cut stones and more—the archaeological finds on the CSG site over the last 15 years are unique. The oldest date back to 2000 BCE, in the middle of the pre-Columbian era. “I’d never seen objects like it before,” says Sylvio Van Der Pijl, President of the Grand Customary Council, which represents French Guiana’s indigenous populations. “It’s really moving. It shows that our ancestors were already highly advanced in their knowledge. We knew it, but these archaeological finds prove it. Personally, it made me feel strong and proud.”

Five tonnes of objects were unearthed

during excavations carried out from 2004, when the Soyuz facility was being built, then 10 years later with the new Ariane 5 launch pad. CNES decided to put them on public display in a permanent exhibition at the site. The Customary Grand Council visited the exhibition in August 2019, just before it opened. This official body, created a year earlier, speaks on behalf of the Bushinengue and Amerindian communities. It is consulted on legal, economic, cultural and environmental projects within its territory.

Sylvio Van Der Pijl has been President for three years and will step down in June. For this Amerindian and traditional Arawak chief of the village of Balaté, in

Saint-Laurent-du-Maroni, such a project is hugely significant. “Little is known about Amerindian history, and there’s still a lot of disagreement about the early inhabitants of French Guiana. **Because we’ve always had oral traditions, we’ve left little physical evidence. When we find proof of our existence here, we need to do everything we can to promote it, with due scientific rigour.**” To this end, there’s no shortage of ideas. They include opening educational spaces across the territory and publishing books in the various local languages, so “the younger generations can connect with their past and look ahead to the future”.



H O R I Z O N S

# CÉCILE DECHOZ

Environmental engineer at the Guiana Space Centre

"I'm taking practical steps to protect French Guiana's rich natural resources..."



"We're located on a huge site, where less than 10% of the area has been altered by human activity—the rest is a natural environment!" Cécile Dechoz discovered the Guiana Space Centre (CSG) six years ago: "From mangrove and wetland to savanna, some dry, some wetter or flooded, there's a whole range of habitats for wildlife, with a large number of protected species. There are more bird species here than in the whole of Europe! Like the scarlet ibis, for example—such a beautiful bird, with its long bill."

Before taking an interest in the natural world, Cécile Dechoz worked on Earth-observation satellite imagery. **Just after graduating, she joined CNES in Toulouse**

**as an aeronautical and space engineer. Then in 2015, she relocated to French Guiana to work on radars. And gradually she changed focus.** From air and space, she came back down to Earth, literally. "It made me see just how much I didn't know about other living creatures, their diversity, how they live and how they use their natural habitat—it's really exciting!" Keenly aware of the environmental crisis, she wanted to do her bit for biodiversity. So, in 2019, aged 34, she joined CNES's ground safety and environmental protection department, which has a team of 15 people, including three environment specialists.

**To study and mitigate the impacts of CNES's activities on local ecosystems,**

**Cécile Dechoz and her colleagues have a roadmap called the Biodiversity Management Plan, first issued in 2010. The second revision of the plan for 2021 to 2030 has just got underway.** "It took us two years to draft. It's comprehensive, more ambitious and includes specific goals and follow-up of actions." The main areas of focus are improving knowledge and monitoring of species and environments, protecting against poaching and public outreach. Her favourite aspect of the job? "Tackling invasive species, like the Australian acacia, which is threatening the savannas, and the paper-bark tea tree. I'm taking practical steps to protect local biodiversity."





JACQUES ARNOULD

## EARTH DOES NOT MOVE!

**Space isn't our primary concern: its theatre plays out above our heads, its works seem complicated or distant. Yet, it offers a singular vision of what makes us human and of our shared responsibility.**

**F**ear not, reader, for I have not suddenly switched sides. By entitling this column in terms Galileo would not have approved, I'm not revealing some eccentric but hitherto hidden belief—not least because it would earn me immediate banishment from the French space agency and the astronomical community. I simply refer to a text published in 1934 by Edmund Husserl: “The original ark Earth does not move”. While no craft built by humans, let alone any human, had yet ventured beyond the bounds of Earth's atmosphere, the German philosopher pondered the consequences for humanity if one day we headed for the stars—which we would a quarter of a century later, though he didn't know that at the time...

### EARTH AND EARTHLINGS, AN UNBREAKABLE BOND

Husserl's answer is categorical: for a long time to come, Earth will remain the ground, the soil, in which humans root themselves and find not only the resources but also the inspiration they need to grow the branches of their future. And for a long time to come, Earth will remain the

origin of humanity, its womb and what makes it unique. Though provocative in its form, Husserl's vision has proved prescient. While Konstantin Tsiolkovsky claimed early last century that we would eventually leave our planet as we leave the cradle, just as our exploration programmes focus on the Moon, then on Mars and beyond, we will never stop observing our planet, scrutinizing it and worrying about it and our own destiny. What have we taken away from our first steps on the surface of the Moon, if not the moving images of our planet, round and blue, “like an orange”, the only origin and only ark for our species? The step forward taken by Neil Armstrong and his fellow astronauts was also a step sideways that gave us a new perspective about ourselves.

So, it's only natural that space should help us build and sustain a greater sense of responsibility between ourselves and for the Earth. To the three pillars of sustainable development—the environment, society and the economy—space offers the pillars of knowledge, technology and imagination. We will only be the children of this Earth if we set our sights and hopes beyond the horizon of space and time.




## INSIGHTS

### FRENCH GUIANA

# FROM ARIANE TO THE SAVANNA



In and around Kourou, CNES is the largest owner of... savanna! It's a privilege and a responsibility we take seriously. Seven marked trails criss-cross this hugely varied landscape of primary and secondary forest, wetland and mangrove. The Ebène and Clusia trails even wind through the protected area of the site, near the Ariane facility. The trails have been created in strict compliance with management plans underpinned by ISO 14001 certification and now our CSR policy. This investment supports the development of local tourism and cultural life. The Guiana Space Centre (CSG) is assisted by its environment and legal departments, local authorities and experts at the French forestry commission ONF, which is delegated to manage this rich biodiversity. By popular request, CNES is planning to extend some of these trails. ONF has installed counters, which confirm the high footfall. On the Montagne des Singes trail, for example, 16,000 single visits were recorded in 2020.

 **LEARN MORE:** A PROGRAMME OF GUIDED TOURS IS AVAILABLE ON THE CSG WEBSITE: [CENTRESPATIAL.GUYANAIS.CNES.FR/FR](http://CENTRESPATIAL.GUYANAIS.CNES.FR/FR)

## 25 KM

### The Ebène,

Clusia, Tour de l'Île Royale, Île Saint-Joseph, Anse and Montagne des Singes trails and the recreation area. In total, CNES promotes and maintains 25 kilometres (15.5 miles) of marked trails.



### CREALAB

#### A hive of creativity

Created at the initiative of CNES staff, CreaLab combines the effectiveness of collective intelligence with a touch of creativity. As a responsible employer, CNES created a neutral space and "handed the keys" to staff, who've transformed it into a place for interaction and discussion. This space sparks curiosity and supports a busy programme. Talks, meetings, workshops, personal reports and more are organized on space-related and broader themes ranging from disabilities, sociology, gender equality and well-being at work to the environment, the climate emergency and the French citizens convention. It began at the Toulouse Space Centre, but the model is now being implemented at the CSG. With the keys it has been given, CreaLab has opened a lot of doors.



### ENERGY OBSERVER

#### Still waters

In silence, Energy Observer made its way up the Maroni River. This catamaran is touring the world without generating any noise, greenhouse gases or fine particulates. CNES is partnering the endeavour. For six years, Energy Observer will test the potential of renewable energies to meet the power requirements of long voyages: propulsion and life on the vessel. To operate, it uses three complementary energy sources—marine current, solar and wind power—which it stores in batteries for routine use or in hydrogen tanks. In December 2020, the floating laboratory docked in Kourou and called in at the CSG.



## INSIGHTS

### SPACE SCIENCES

# A WEALTH TO BE PASSED ON



CNES is keen to pass on its knowledge and is developing a wide range of activities for young people. With PERSEUS<sup>1</sup>, students at France's CSU university space centres and engineering schools are learning about the practical aspects of launcher design. They're also using latest technologies and building demonstrators, which they can fly as part of dedicated sessions or C'Space, an annual launch campaign for nanosatellites developed by students. But that's not all. CNES offers the added value of field experience at the TTVS space technology tutorials. Delivered by experienced engineers, they take a behind-the-scenes look at how spacecraft are designed. This culture is also at the heart of the Nanolab Academy, which aims to raise awareness of the potential of satellites spanning just a few tens of centimetres.

In all cases, learning about space starts at school. To this end, CNES developed the Argonautica<sup>2</sup> programme, then Calisph'Air about climate change. The Youth & Education department, part of the Communications directorate, wants to further extend these initiatives to primary and secondary school classes. On the programme: recoverable buoys and challenges for young eco-citizens and teachers.

1. Projet Étudiant de Recherche Spatiale Européen Universitaire et Scientifique (European university/science student space research project).
2. It has three parts: ArgoNimauX (animals), ArgoOcean (ocean circulation) and ArgoHydro (water resources).



## DIARY

**MAY 2021**  
Inclusivity and CSR dialogues  
*Paris, France*

### CLIMATE COLLAGE COLLABORATIVE WORKSHOPS

As part of our CSR strategy, CNES is offering all staff the chance to take part in fun, participative workshops around the Climate Collage, designed to raise awareness about the mechanisms of global warming. Participants create their own collage showing the links between cause and effect. The first workshops will take place during the week of World Environment Day, 5 June 2021.

### MUST READ **CNESmag #84, biodiversity special**

Published in May 2020, this issue was entirely devoted to resilience.

**Browse it here:** [cnes.fr/en/cnesmag-84-biodiversity-building-resilience](https://cnes.fr/en/cnesmag-84-biodiversity-building-resilience)

### MUST SEE **Legacy documentary**

The new documentary by Yann Arthus-Bertrand entitled "Legacy, notre héritage" (Legacy, our heritage)

**Watch here:**  
[tv-programme.com/legacy\\_documentaire/replay](https://tv-programme.com/legacy_documentaire/replay)



SPINOFF

Each circle represents cases of leptospirosis diagnosed by the Ecomore2 project: red for cases tested positive, green for probable cases and blue for negative.

# CLIMHEALTH

## A SPACE TOOL FOR PUBLIC HEALTH

**ClimHealth's goal is to use space data to prevent health risks. Currently in its validation phase, the project aims to enable early detection of the risk of leptospirosis, a bacterial disease strongly associated with weather conditions.**

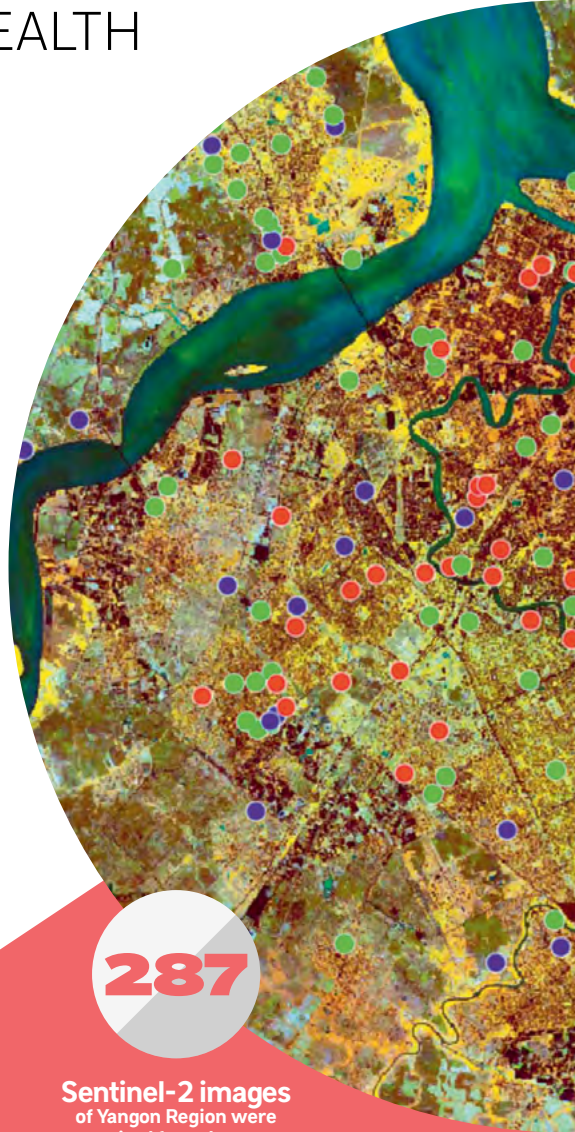


Leptospirosis is transmitted by rodents and can lead to complications in the kidneys, liver or lungs, and even meningitis. Despite infecting more than a million people every year, it's an often neglected disease. But because survival and transmission of the bacteria depend to a great extent on rainfall and water flows, leptospirosis is a real health threat compounded by factors such as climate change and in particular more frequent flooding.

### SENTINEL-2 TO THE RESCUE

To monitor zoonotic diseases, health organizations rely on data collection software like the world benchmark DHIS2<sup>1</sup>. But for environmentally sensitive diseases like leptospirosis, such tools lack climate and environmental indicators. Conceived by the IRD development research institute and CNES, and subsequently accredited by the Space Climate Observatory (SCO), ClimHealth aims to fill this gap. "The idea is to incorporate vegetation and soil moisture indices in DHIS2 that are factors favouring the spread of *Leptospira* bacteria, and therefore to establish relationships between environmental and epidemiological data," explains Vincent Herbreteau, a health geographer at the Espace-Dev unit of France's IRD development research institute. Linking data in this way will aid early detection of telltale signs. "Environmental data are easily acquired via the Sentinel-2 satellites, which supply free detailed imagery every five days," notes Herbreteau. Today, the ClimHealth team is working with the National Health Laboratory in Myanmar to automate data processing and be able to produce information directly usable by health services. The first model of ClimHealth will be trialed in the country's Yangon Region, where the disease is rife.

1. Digital Health Information System.



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Sentinel-2 images of Yangon Region were acquired from January 2016 to January 2020 to calibrate spatial and temporal models for the ClimHealth project.