

November 3,4,5 2023 - Beffroi de Montrouge

# Explor'Espaace

A vibrant, futuristic space scene. In the center, an astronaut in a white and blue suit stands on a glowing blue surface, holding a glowing orange sphere. The background is a deep blue and purple nebula with a bright yellow and orange light source on the horizon. Several planets of various colors and sizes are scattered throughout the scene, including a green planet with a ring system on the left and a blue planet with a ring system on the right. The overall atmosphere is one of wonder and exploration.

Europe's first immersive, interactive astronomy festival



# The concept

The first French-language interactive and immersive space and astronomy festival

- An entirely free event, where the public is a player in the conquest of space, not just a spectator.
- A place where you can touch the universe through a series of interactive, immersive and innovative experiences.
- A place for new space-related technologies: virtual reality, simulators, new planetariums, etc.
- Laboratory from leading research institutes and space agencies in France and Europe.
- A prestigious event in a superb setting. The Beffroi de Montrouge combines the monumental architecture of the 1930s with the modernity of a completely renovated infrastructure, just a few meters from the metro.





# The main axes

- At least 20 unique experiences to feel the sky and space.
- Conferences given by exceptional guests
- Every day, fun workshops, round tables and conferences open to all.
- A vast treasure hunt, with a meteorite and a trip for 4 to the Cité de l'Espace, Toulouse, as the prize.
- Breathtaking virtual reality experiences
- A large astrogaming area
- A space bus with fun space escape games
- Documentary screenings followed by panel discussions





# Special guests for special encounters

Explor'Espace is a unique opportunity to get up close and personal with leading figures in astronomy and space. These include Gerry Griffin, flight director when Apollo 13 was in peril; Michel Mayor, winner of the 2019 Nobel Prize in Physics for the discovery of the first extrasolar planet; Claude Nicollier, who flew on the Space Shuttle and helped repair Hubble; ESA astronaut Luca Parmitano, who will give a live lecture from Houston; and Caroline Freissinet, who will take you on a journey to the ocean worlds.



Gerry Griffin at Ground Control during Apollo 13 mission.



# Planet hunting

Embark on a celestial treasure hunt! Track down the clues associated with the moons and planets of the solar system scattered around the 10,00m<sup>2</sup> of the Beffroi de Montrouge, and gather key information by participating in some of the laboratory experiences. The winner of this "planet hunt" will win a trip for four to the Cité de l'Espace in Toulouse.





# Extraordinary immersive experiences

*Do you dream of driving a jeep to the Moon, or exploring the Solar System aboard a spaceship? At Explor'Espace, it's (almost) possible! We offer ultra-realistic virtual reality experiences, developed by scientists using data collected by spacecraft.*

## 1. Trek through the Solar System

Stroll around Comet Chury and relive Philae's landing. Fly over the geysers and glaciers of Enceladus! Land on Titan. Walk around the Curiosity rover. Alone or in collaboration, travel through the Solar System in virtual reality.



## 2. Drive on the Moon

In a full dome, immersed in a magnificent lunar landscape, step into the shoes of an Apollo astronaut and drive the lunar jeep. At the wheel of this mythical vehicle, you'll visit the valleys, mountains and seas of our satellite. Bon voyage !





### 3. Embark in european rockets

Come and discover the "Launchers Island", home to the rockets of yesterday, today and tomorrow, presented in scale 1. With this experience, you'll contemplate Vega, Ariane 5 or Ariane 6 as if you were on board!

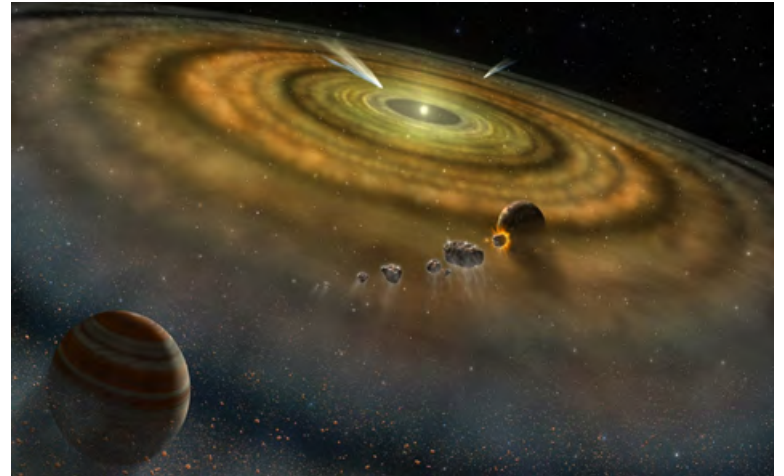


Explor'Espce 7



### 4. The universe as never seen before

Have you ever wandered through a cluster of galaxies? In a solar storm? In the heart of a star? Using data from major space missions and theoretical work, French researchers have developed breathtaking numerical simulations. Contemplate them in virtual reality. You'll feel as if you're sailing through the Galaxy...



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## 5. Destination Phobos

Program the MMX rover to land on the surface of Phobos, a small moon of Mars, and play with the gravity of this strange object!



## 6. Embrace the whole universe

Experience the immensity of the universe through virtual reality. Like a cosmic traveler, observe all the billions of galaxies in the universe, grouped into large structures. While you wait to put on your helmet, you'll be invited to piece together the puzzle of these great structures of the universe.







# Lab experiences to touch the sky and space

*Laboratories and observatories are overflowing with treasures: experiments for everyone to understand the Universe. Come and experience them in the company of leading researchers in astronomy, astrophysics and Earth science!*



## 1. Probe beneath the surface of the Moon and Mars

Does the Red Planet still experience earthquakes, even mild ones? That's the question the Insight probe must answer. With a sandbox and a model of the spacecraft, come and take the pulse of Mars yourself, as well as that of the Moon!

You'll even have the chance to build a model of Insight.



## 2. Experience the Moon in a Lab

You're used to seeing the Moon in the sky, but do you really know it? Thanks to the Labo Lune offered by Toulouse's Cité de l'espace, you'll have a much better idea of its size, distance and phases by building an Earth-Moon model. You'll also understand why there's no sound on the Moon thanks to a vacuum bell, and you'll even have the chance to reproduce a boot print in the regolith...





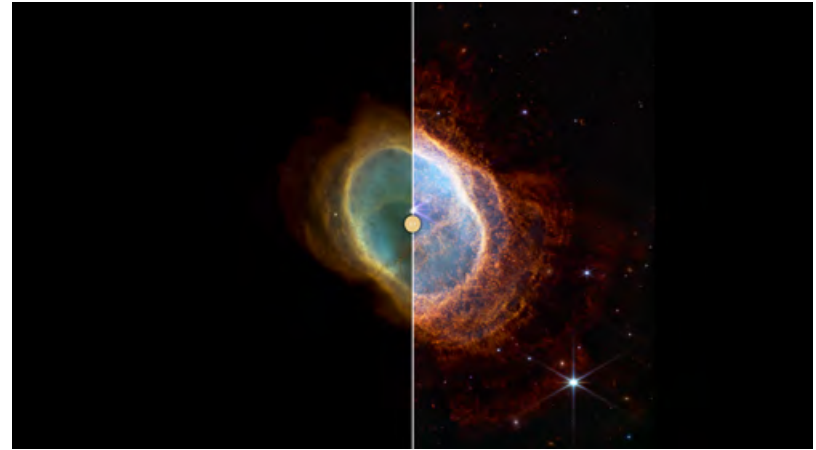
### 3. Witness the explosion of a star

How do stars die? The laws of physics at work during the supernova explosion of a star are analogous to those that govern... the flow of water! Discover in just a few seconds, thanks to a fabulous "supernova fountain", how the heart of a star collapses and how gravitational waves propagate during the cataclysm...



### 4. See the world through a space telescope

Since its launch in orbit, the James Webb telescope has revealed images of the Universe of unparalleled precision. Unlike its predecessor Hubble, it doesn't see the cosmos in visible wavelengths, but in infrared. So what does this mean? What additional clues does this new view give us about the cosmos? You can find out for yourself by contemplating the world around you in infrared, and comparing the magnificent photos of a same cosmic object taken by Hubble and the JWST.



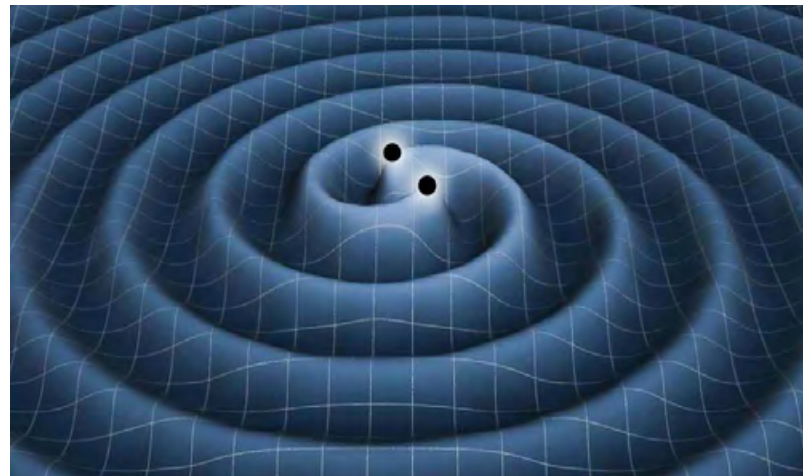
## 24. Discover the secrets of a spacesuit

What does a spacesuit look like up close? Find out from a space enthusiast who makes ultra-realistic astronaut suits himself. As well as strolling around the festival in costume, he'll answer all your questions about how these "personal spaceships" work.



## 6. Curve space-time yourself

Space-time, the fabric of our cosmos, warps under the influence of the stars, planets and galaxies that populate it. It sometimes twists so much that it produces a kind of cosmic wave known as a gravitational wave. It's these tiny, almost imperceptible ripples in space-time that the LISA instrument is designed to detect. To better understand the phenomenon, come and play at distorting space-time!



## 7. Play Elon Musk with Hugo and Maxime Lisoir

Behind the Hugo Lisoir YouTube channel, which has almost 400,000 subscribers, are two brothers, Hugo and Maxime, who created the Apogée board game. Play with them in groups of 5 players and take charge of a space company. You'll not only have to build a rocket capable of going into space, but also manage your teams of engineers...



Explor'Espce 12



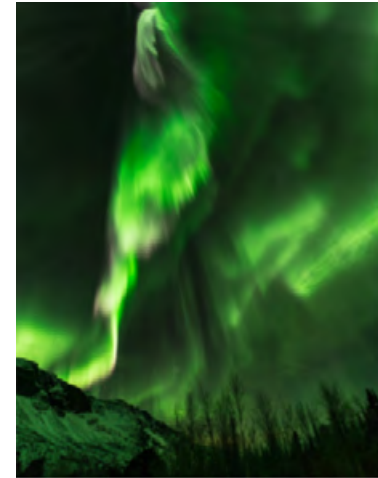
## 8. Experience a space launch

Experience the thrill of a rocket liftoff as you watch "Road to Space", Arianespace's special launch program. A unique opportunity to meet the experts behind the Ariane and Vega rockets. As well as explaining the key stages of a successful launch, they'll tell you how they experienced some emblematic missions such as Webb or Juice. Are you ready?



## 9. Create you own northern lights

With the help of the planeterrella, an aurora-making machine, you can create your own fascinating, colorful swirls of light. The best way to understand the scientific mechanisms behind the phenomenon!



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## 10. Contemplate a "real" rocket

FROG, the reusable launcher demonstrator, a 2m high vehicle that is regularly flown by its designers (CNES, IUT Cachan and the planète sciences association) will be installed in the Beffroi, a first!



## 11. Touch the Moon and Mars

See and touch a collection of precious meteorites, including those from Mars and the Moon.



## 12. Walk on the Moon

Thanks to Moon Desk, you'll feel like an astronaut visiting the Moon! This interactive tool offers highly realistic visualization of planetary surfaces with resolutions down to 0.5m. Even shadow effects are precisely calculated. Enjoy your trip to our satellite!



## 13. Design rockets like an aerospace student

Students at École Polytechnique's student space center are designing a whole arsenal of innovative experimental rockets: some can be recovered by a parachute system, others are solar-powered, others look like drones or are nano-sized. Come and touch them, understand how they work, and assemble the parts of these rockets yourself. You'll be the aerospace engineer!





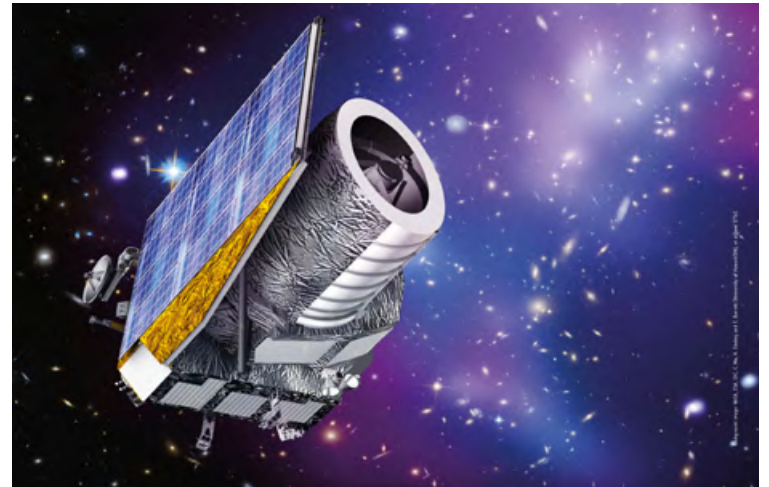
## 14. Visit the Orion module

Artemis astronauts will travel to the Moon in the manned Orion module. It will be powered by the service module designed by the European Space Agency. Take a closer look at this spacecraft, a key element in the new lunar program.



## 15. Probe the dark universe

The Universe is expanding at an accelerating rate. It's being driven by an energy that astronomers have little understanding of, and which they call dark energy. The Euclid space satellite is designed to help them unravel this mystery. Find out how, by manipulating a model of one of Euclid's hi-tech instruments.





## 16. Discover the violence of the universe

Discover the Universe's most violent phenomena, such as supernovas and supermassive black holes. And find out how you, as an astronomy enthusiast, can take part in the study of these cosmic cataclysms.



## 17. Travel among exoplanets

Ocean planets, gas giants orbiting close to their star, Earth's twin sisters where life is possible... With the help of a model, discover the most fascinating extrasolar planets detected by astronomers and learn their methods of finding them.





## 18. Explore a comet

In 2014, the European Space Agency's Rosetta probe landed on a comet. A world first! Come and get to know this comet, known as ChuryumovGerasimenko (Tchouri, to those in the know), thanks to a reconstructed cometary floor. Specialists will guide you through Tchouri's striking topography.



## 19. How about a slice of Cosmic Pudding?

Beneath one of Explor'Espace's domes, embark on a scientific tale made entirely from food, with culinary experiments filmed in macro, and which resembles, to all intents and purposes, real images of the sky. Bon (cosmic) appétit!





## 20. Decipher the secret code of gamma-ray bursts

What is the origin of the mysterious gamma-ray bursts, ultra-high-energy radiation from the farthest reaches of the Universe? The Franco-Chinese SVOM mission must find out. Learn how to trace the source of one of these powerful bursts of light using the technique of the ECLAIR instrument on board SVOM. You'll feel like you're cracking a secret code...!



## 21. Spacefox, the space bracelets

If you're a fan of the singular, come and discover Spacefox and their meteorite bracelets, and you might just go home with a piece of Mars or the Moon on your wrist. For the more adventurous, come and compete in a virtual adventure where your dexterity will be put to the test to win numerous prizes.





## 22. Experience life as an aerospace student

Based in Paris and Toulouse, IPSA offers students a 5-year engineering course and a 3-year Bachelor's degree. In direct contact with major decision-makers and specialists in the field, the school enables its students to enter working life straightaway and live out their passion to the full. Come and meet these apprentice space engineers. They'll tell you everything you need to know to make your space dreams come true.



## esric 23. Test your space explorer's talents

What skills do you need to create a lunar living base? Do you think you have what it takes to be a true space explorer? The European Space Resource Innovation Center (ESRIC), the world's first innovation center entirely dedicated to space resources, offers a whole range of fun, interactive activities to help you find out. study these cosmic cataclysms.



## **SAFRAN** 24. Observe the Universe from Earth

Are you fascinated by the infinite cosmos and the mysteries of the universe ? Discover how Safran's antennas capture the distant whispers of galaxies, and how telescopes reveal the secrets of the stars! Thanks to virtual reality and scale models, immerse yourself in a journey that brings you closer to the extraordinary.



## Space Gaming : conceive, launch or... crash rockets

Are you a fan of space, but also of video games? Then take your place in the gaming booth set up by École polytechnique's "Science and Video Games" chair. With Kerbal Space Program, Heavenly Bodies and Reveal (a brand-new game designed at Polytechnique!), you'll be able to build and launch your own rocket, repair your satellite in zero gravity, detect cosmic rays... Beware, crashes are guaranteed, but the important thing is to have fun!





## Spacebus makes a stop at Explor'Espace

SpaceBus France goes from town to town to introduce you to astronomy through fun activities, all led by astronomy professionals (researchers, PhD students, engineers)! For Explor'Espace, it will be stopping off in front of the Montrouge Belfry.

Come aboard a reconstructed space shuttle bound for Mars. On this long journey, not everything will go according to plan, jeopardizing your plans to travel to Mars. Your nerve will be put to the test! You'll need to react quickly and as a team to make it back to base alive!

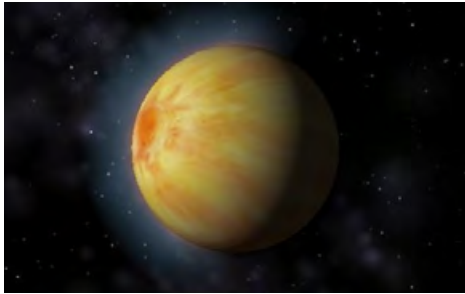




# Conferences where you are an actor of knowledge

## 1. The great exoplanet epic

He was awarded the Nobel Prize in 2019 for the discovery of the very first extrasolar planet. Michel Mayor will share with us the story of this incredible discovery, which has provided an answer to the age-old question: do other worlds exist elsewhere? The astrophysicist will tell us that we have yet to answer another question that has plagued mankind: Are we alone in the Universe?



## 2. Apollo as told by Ground Control

Gerry Griffin was flight director of the Apollo missions from 1969. He was one of the voices of Houston-based Ground Control. Exclusively for Explor'Espce, he will tell us about his experience at the head of the Apollo missions (including the famous Apollo 13!), but also about his life alongside the astronauts.





### 3. Space exploration as seen by one of its heroes

Claude Nicollier, a former European astronaut, flew four missions on the US space shuttle, including one to repair the Hubble telescope. What does a launch feel like? How do you sleep, eat in weightlessness? How do you go about repairing a machine in space? Claude Nicollier will share his extensive experience in space. His lecture will be preceded by a screening of the film *L'odyssée d'Hubble*, broadcast on France 5.



### 4. The dawn of a new scientific revolution?

Why continue to explore the Universe? Don't we already know enough with the images and spectra collected by a whole generation of telescopes? New discoveries are constantly upsetting our well-established theories. Galactic black holes seem to arise spontaneously, galaxies are forming stars much faster than expected, and other surprises are blooming like mushrooms in images from the James Webb Space Telescope... Are we at the dawn of a new scientific revolution? That's the question astrophysicist David Elbaz will be asking.







## 5. Asteroids : the Earth strikes back

The success of the Dart mission proved that humans are capable of defending themselves against the threat of an asteroid. But this was only the first technological test. What would really happen if a killer bolide were detected ? How would decisions be made at the highest level ? How would a defense mission be set up ? In the company of Patrick Michel, a specialist in these matters at the Côte d'Azur observatory, you will witness a real planetary defense exercise.



## 6. We're stardust (and so are the beers!)

Éric Lagadec is a star specialist at the Côte d'Azur Observatory. Lagadec is himself a star on social networks, with tens of thousands of followers on Instagram. This lecture invites you on a long co(s)mical journey of 13.8 billion years from the big bang to the appearance of life on Earth and the ultimate product of evolution, composed of a of malt and hops. He will explain how almost everything that makes up our body

(and a good beers)  
was formed in the  
stars.





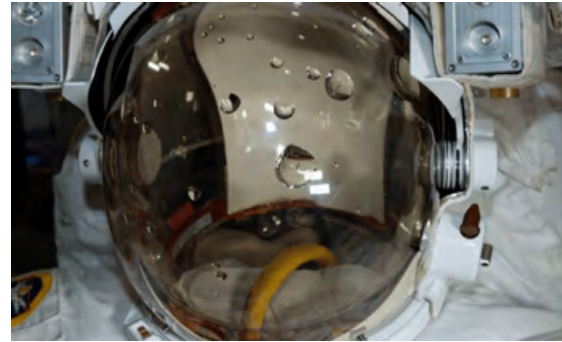
## 7. Can Humanity explore the Solar system ?

At a time when more and more skeptics are questioning the reality of Apollo missions, the space agencies of many are preparing astronaut flights to the Moon, Mars and beyond. Is this really possible? How can we justify such efforts when our Earth is suffering? These are the questions that planetary scientist François Forget will explore with you.



## 8. Crisis management in oG

Luca Parmitano, European Space Agency astronaut, nearly lost his life in space! During an extravehicular activity, water seeped into his helmet, threatening to drown him. He will tell us how he managed out of this predicament, live from Houston, in Texas, where he trains Nasa's new generation of astronauts.





## 9. Solar System : in search of life

After the golden age of discovering planets near and far, the new missions exploring the Solar System are aiming for worlds of astonishing diversity. Could life have developed there? What remains to be discovered? An interview with planetary scientist François Forget and Alain Cirou, editorial director of *Ciel et Espace*.



## 10. Dive into the ocean worlds

Nasa plans to send a quadricopter to Titan to study the surface of Saturn's mysterious moon and the many methane seas that cover it. Caroline Freissinet, a specialist in the search for life in the Solar System, will recount this future high-flying mission, as well as all the other attempts by scientists to detect life, wherever there are lakes, geysers, underground oceans...





# Space documentaries

Documentary screening and panel discussions

## 1. Hubble's odyssey, an eye to the stars

For thirty years, the Hubble Space Telescope scrutinized the cosmos in an attempt to unlock the secrets of the Universe and trace its origins as closely as possible. How did Hubble revolutionize astrophysics through its major discoveries? And how, over the years, did he reach the general public and change the way we look at the cosmos? We take a look back at the adventures and misadventures of the star of space telescopes, with some of the players who have written its history. Their stories, NASA's extensive archives and Hubble's own images combine to tell the story of this great human, scientific, artistic and philosophical adventure.

A film by Laurent Lichtenstein





## 2. Alerte in orbit, the threat of space debris

At a time when space has become a new Eldorado, scientists all over the world are seeking to clean up the sky of its rubbish. It has only taken 60 years of space conquest to pollute the planet's inner suburbs, leaving behind more than a hundred million pieces of debris - pieces of rockets, metal carcasses and obsolete satellites. More and more of this debris remains in orbit for decades, if not centuries. They are all projectiles capable of colliding with a satellite, a space station or falling back to Earth.

A film by Liza Fanjeaux





# Exhibition

## **MICROCOSMIC**

With his artistic work, Philippe Collot pays tribute to the singular relationship between Man and the ethereal spheres. The intention is to interrogate this cosmic connection through a mise en abime of the space epic in our everyday lives. This desacralization of the cosmonauts' status makes them more human, more accessible, encouraging identification with these characters reputed to be out of the ordinary. Exclusive to Explor'Espce, the artist will be performing live sketches during the festival.





Young, medium and old, come and get your fingers on the sky and space, in small groups, accompanied by enthusiastic experts.

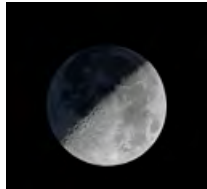
### **Star map**

Come and make your own sky map, and learn all about the night sky by recognizing its main constellations.



### **Moon phases**

Come and discover why we always see the same side of the Moon, with life-size models and tests. You'll discover that the Moon still has many surprises in store for us!



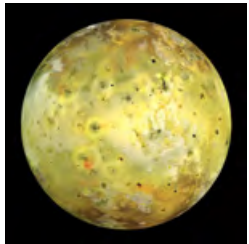
### **Lunar tourism**

Everyone wants to go to the Moon. It's beautiful, it lights up the night and it's not far from us! But before you go, it's best to know where you're going and what it's like! So, as you prepare for your vacation, let's take a look at what there is to visit and where the first explorers went. Everyone wants to go to the Moon. It's beautiful, it lights up the night and it's not far from us! But before you go, it's best to know where you're going and what it's like! So, as you prepare for your vacation, let's take a look at what there is to visit and where the first explorers went. Choose your tour: cultural, historical or geological.



## Planets and their moons

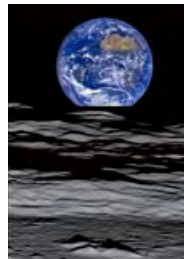
Did you know that the Earth is not the only planet to have a moon? While it only has one natural satellite, some other planets in the Solar System have more than fifty! Diverse environments, ice, volcanoes... New landscapes that we invite you to discover in the form



of a game. Ideal before observing four of them in real life during the evening.

## Valse à 3 - Earth Moon Sun Trio

Come and understand the different movements of the Moon around the Earth and of the Earth around the Sun, thanks to a model that will help you get to grips with the whole merry-go-round.



## Astro Magic

Come and discover the birth, life and death of a star, all with magic! Have you ever seen two stars become one?

Louis, our magician, will tell you all about it in his show.







## Feel gravity

Thanks to an astonishing orbit simulator, you can experience gravity for yourself. You'll gain a better understanding of what this "force" is all about. You'll learn all about black holes – objects from which nothing, not even light, can escape. You'll even be able to clearly reproduce the complex motion of the



Sun-Earth-Moon system! Other surprises await you in this unique workshop

## Astro board games

Space lovers, intergalactic curiosity seekers and cosmic gamers, hang on to your favorite stars, because AstroLudes are coming to Explor'Espce. Come and explore the farthest reaches of the playful universe with captivating games that will take you on a journey through the universe, meeting



wacky extraterrestrials and crossing new frontiers of space exploration. AstroLudes are accessible to everyone aged 8 and over, including the deaf (LSF).



# Cultivate yourself and meet your favorite authors at the bookstore



Looking for the best astronomy and space books? They'll all be available for sale or simply to read in our bookshop area. This is also where you can meet the authors, and get your copy signed.





## A show combining humor and astronomy

### Hookup under the sky

The theme of amorous seduction is an excellent pretext for a light-hearted and humorous approach to various notions of astronomy (the seasons, the precession of the equinoxes, shooting stars...). The astronomy simulator takes you on a journey through time and space. The Beffroi becomes the antechamber to the seventh heaven...





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## Galileo's party - DJ Ciel

Galileo has been under house arrest since his trial for heresy. To cheer him up, a mediator becomes a DJ and offers a modern playlist (from Dua Lipa to Daft Punk) while evoking the discoveries and life of the renowned physicist. But what would a birthday party be without prestigious guests? You'll meet Cosimo de' Medici, Grand Duke of Tuscany, Johannes Kepler, the Pope, Galileo's mother or even a platist, all of whom will leave astonishing messages for our friend!

Show for all ages 7 and up





## Photo contest

Huge snapshots of the universe, inflatable moons and planets, astronauts wandering around, a place steeped in history... Explor'Espac's decor is inspiring. Use it to take part in the festival's photo contest, and enter to win subscriptions to Ciel & Espace, meteorites and many other prizes. Post your image on social networks with [#explorespace2023](#), tagging AFA [@afa\\_](#) [stronomie](#). Crazy selfies, costumes, staged objects... Have fun, anything goes!





# Our current sponsors



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