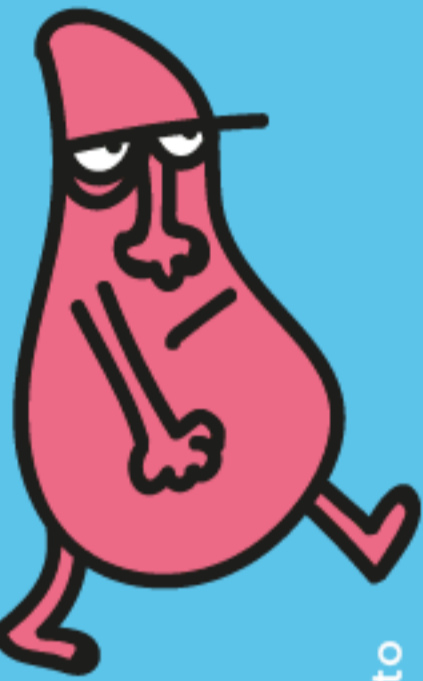
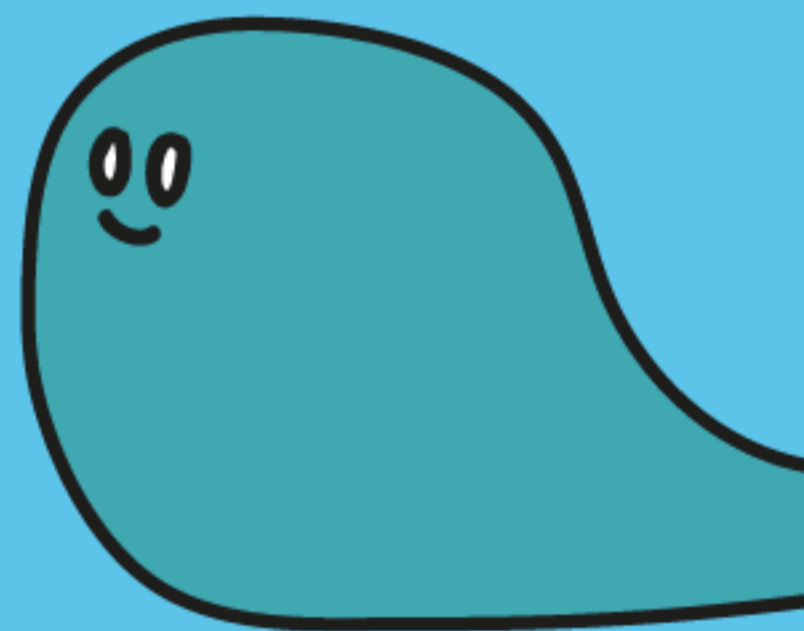
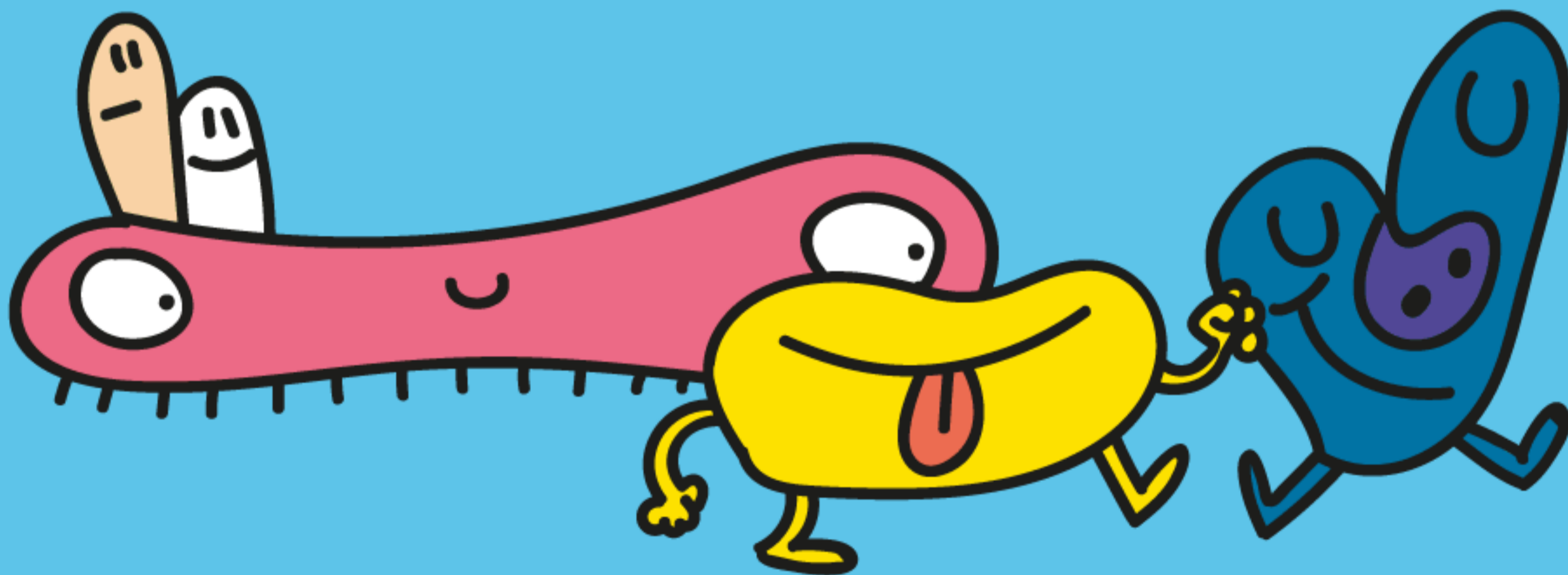
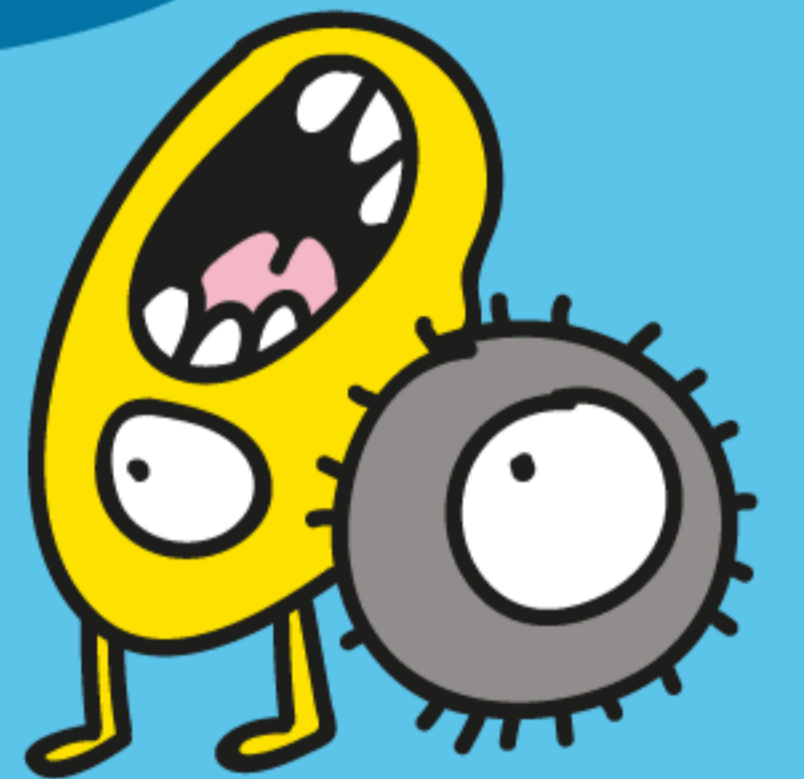


SEARCH & RESEARCH



FIND THEM!




● Culture

Each board contains
6 hidden characters.
Find them!

The wood species gang

The all-dimensions unit

The remediation response team

The metallic cronies

The committed crew

The emotional clan

The medicine squad

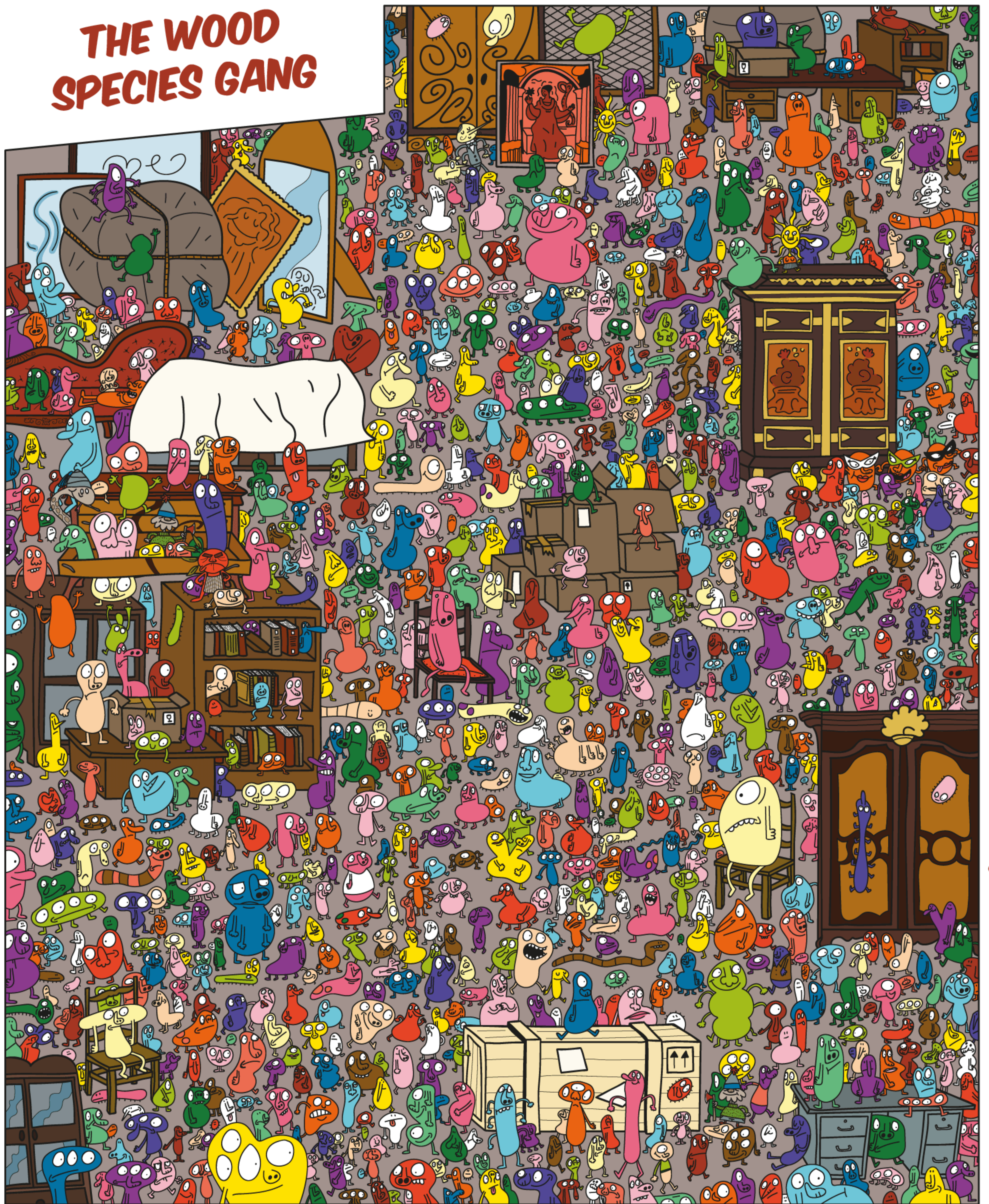
SEARCH&RESEARCH presents the sciences
through little characters that you
will need to find in dense illustrations.

Mushrooms, mathematics, psychology, politics,
medicines... each board was ordered from illustrator
Triton Mosquito and developed in collaboration
with researchers from the Université de Lorraine.

The travelling exhibition, which will be proposed
in the Grand Est region as part of the Escales des Sciences
project, is also available online in French and in English.

www.univ-lorraine.fr/expositions

THE WOOD SPECIES GANG



Since the fifteenth century, exotic wood has been brought back from expeditions and combined with local species to make wooden furniture. Some can currently be admired in museums. To understand these works of art and verify their authenticity, one must be able to identify the species used, without taking any samples, by simply observing anatomical, technological and historical criteria. For more information, read *L'essence du bois* of the Éditions du Patrimoine.

Study and Research Laboratory on Wood Materials - LERMAB (Université de Lorraine)

6 wood species are hidden in this picture. Find them!

- Amir **Plane** arrived from the Middle East during the eighteenth century. Yet, it was only in the nineteenth century that his snake-like skin seduced Art Nouveau cabinet makers.
- Jeanne, Marguerite et Gilberte **Holly** like to set themselves apart by wearing different colours, but they always match the floral motifs on seventeenth century wardrobes.
- With her golden sun-like headdress, Françoise of **Barberry** never goes unnoticed. After all, she needs to equal the marquetry decorating her drawing room.
- Tsioui **Locust** is a Northern Native American. His high-contrast decor is appreciated by Art Nouveau cabinet makers. He hates being confused with Acacia.
- Marcelle **Pine** has a taste for efficient work. For this sharp-axed mountain dweller, it's important to make solid, quick and inexpensive furniture.
- Although he often suffers from jaundice, Auguste **Boxwood** is a gentleman with smooth skin and is always clean. He loves sixteenth and seventeenth century marquetry.

THE ALL-DIMENSION UNIT



The objects from dimensions 1 and 2, like a rope or a sphere, are easy to represent. But for the rest, you'll need to use abstract mathematics. Just because you can't draw an object doesn't mean you can't manipulate it with your mind. During the early twentieth century, David Hilbert introduced the concept of an infinite dimension and created a field of research which mathematicians are still working on today.

Élie Cartan Institute of Lorraine - IECL (CNRS, Université de Lorraine)

6 mathematical characters are hidden in this picture. Find them!

- Filiform, that's how Jeanne's friends describe her due to how thin she is. You could even say that she only has **one dimension**.
- Pierre loves **2D**, as demonstrated by his checked T-shirt. How exciting it is to go on a roller coaster in the shape of a Möbius strip! Its particularity is that it only has one side.
- Bettie is a burlesque stripper with a curved corset: a surface with a **negative curvature** just like the tent she performs under every evening.

- With her generous **positive curvature**, Lola is as round as the ball she balances on.
- In the **fourth dimension**, you can leave a room at the same time you enter it. Will Jacky be able to escape from this cursed attraction?
- Mathematician **David Hilbert** is easy to recognise with his cloche hat, tiny glasses and goatee.

THE REMEDIATION RESPONSE TEAM



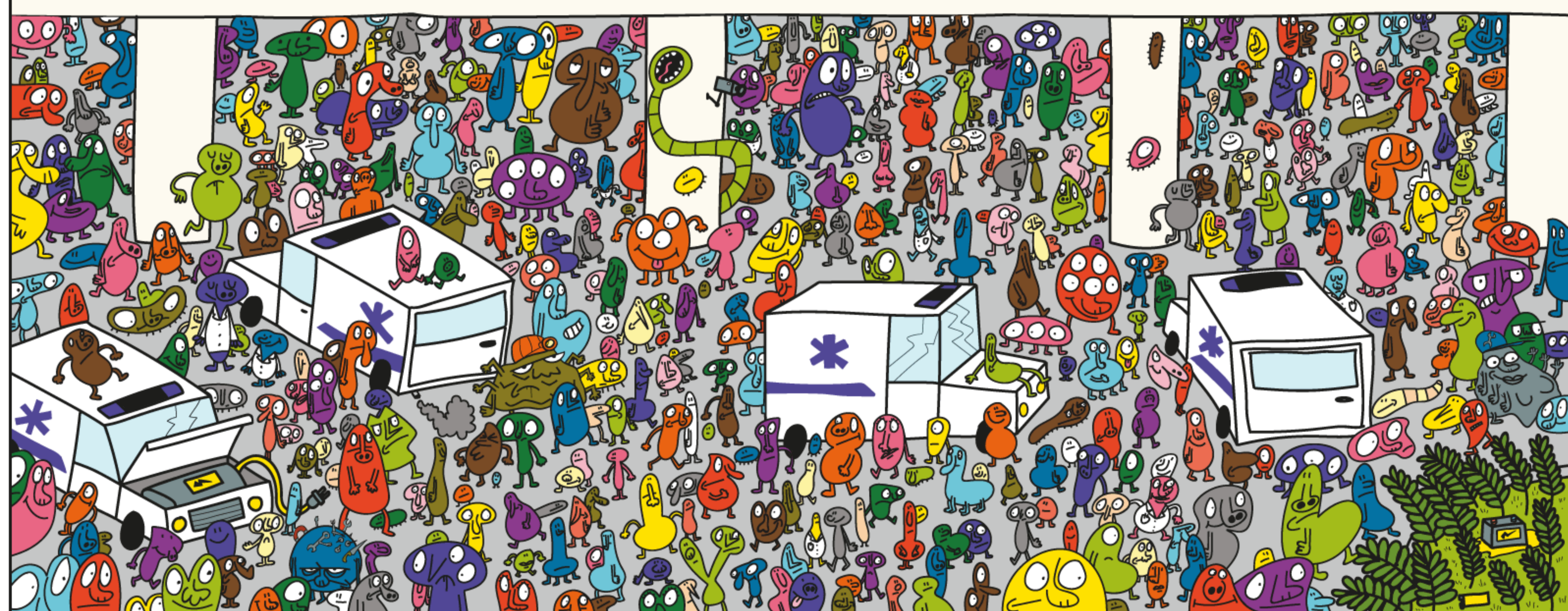
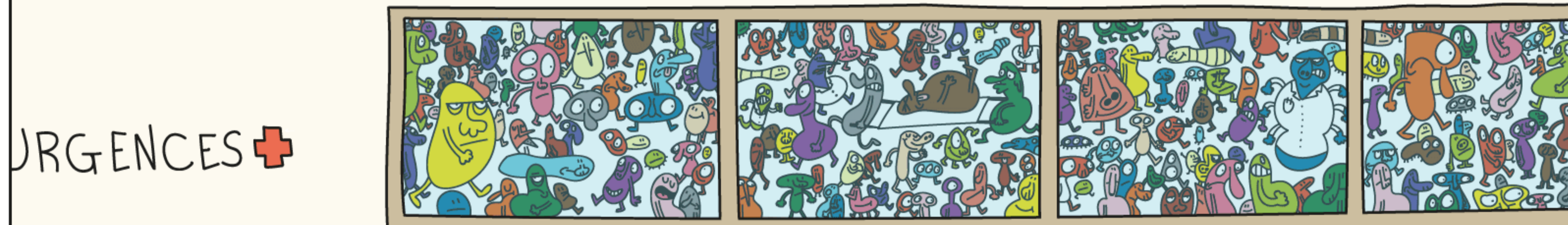
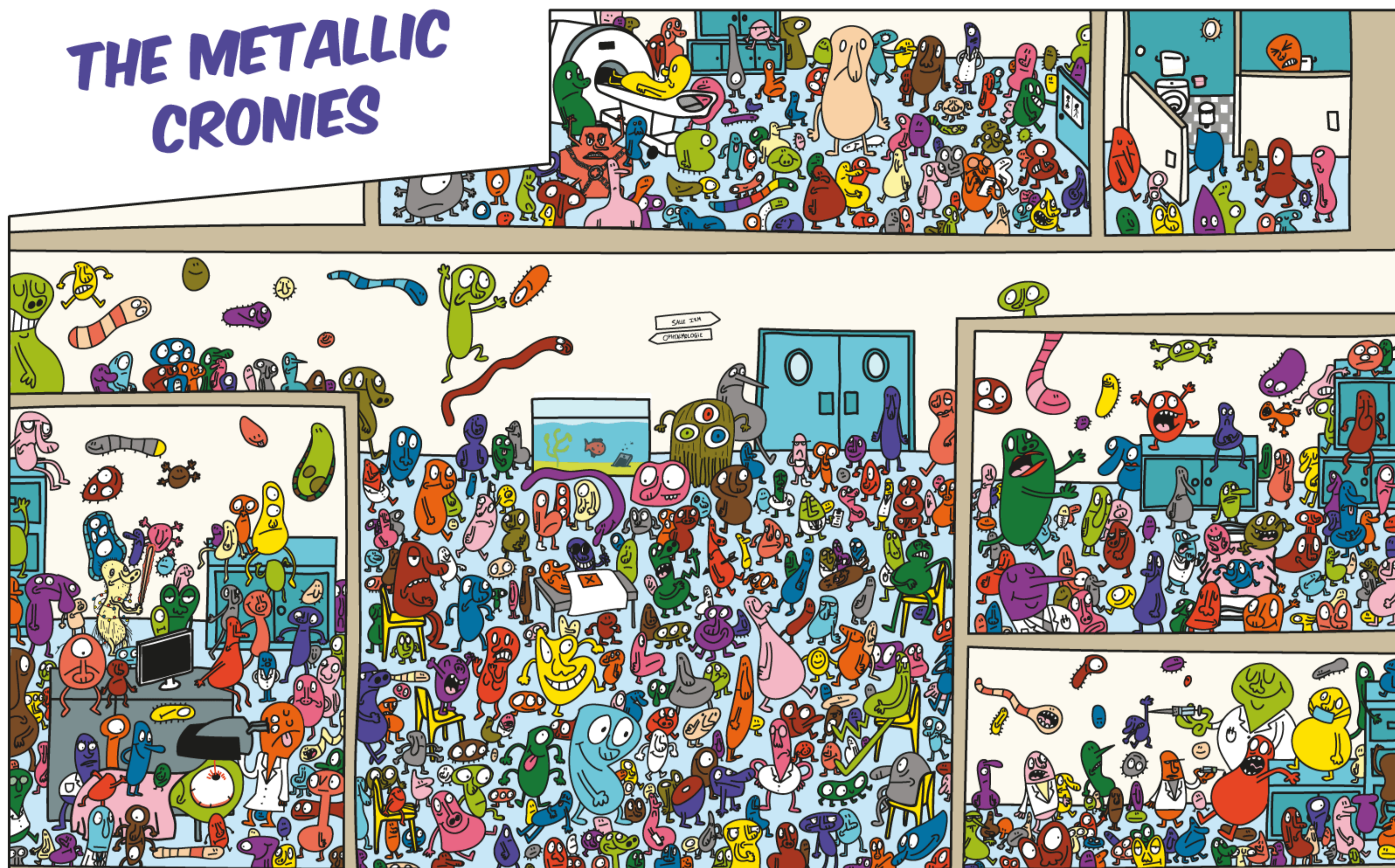
Mushrooms aren't only found on our plates. Thousands of fungi species colonise the soil and aquatic environments. Some feed off of wood while others grow close to the roots of plants, helping them to develop even in highly contaminated areas. Storing heavy metals, mushrooms also break down hydrocarbons. These two properties are being studied to rehabilitate brownfield sites.

Interdisciplinary Laboratory for Continental Environments - LIEC (CNRS, Université de Lorraine)

6 remediation mushrooms are hidden in this picture. Find them!

- Liang *Fusarium solani* snacks on hydrocarbons. When caught red-handed, he actually turns fluorescent blue under a UV light.
- Josette *Amanita muscaria*, nicknamed Fly Amanita, has a taste for heavy metals. She is easy to spot due to her red skin and white spots.
- Gaston *Phanerochaete chrysosporium* devours explosives. He breaks them down into non-toxic compounds which he spreads like little crumbs in his wake.
- Lounes *Funnelformis mosseae* lives in symbiosis with many plants. Growing at their root, he provides them with water and nutrition.
- Henri *Xerocomus badius* collects radioactivity from the soil. His distinctive mark is that he turns blue when handled.
- Renée *Flavoparmelia caperata* is a lichen used to control air quality. Bothered by atmospheric pollution, she quickly raises the alarm at the slightest anomaly.

THE METALLIC CRONIES



Rare-earth elements are a set of metals that are widely used in the field of high-tech: smartphones, screens, windmills, electric cards, etc. They are mainly produced in China, on which the entire world is dependent for its supply. Scattered into the environment as a result of their mining, increasing use and almost non-existent recycling, rare-earth metals are feared. With good reason as, at high doses, they disrupt the development of living beings.

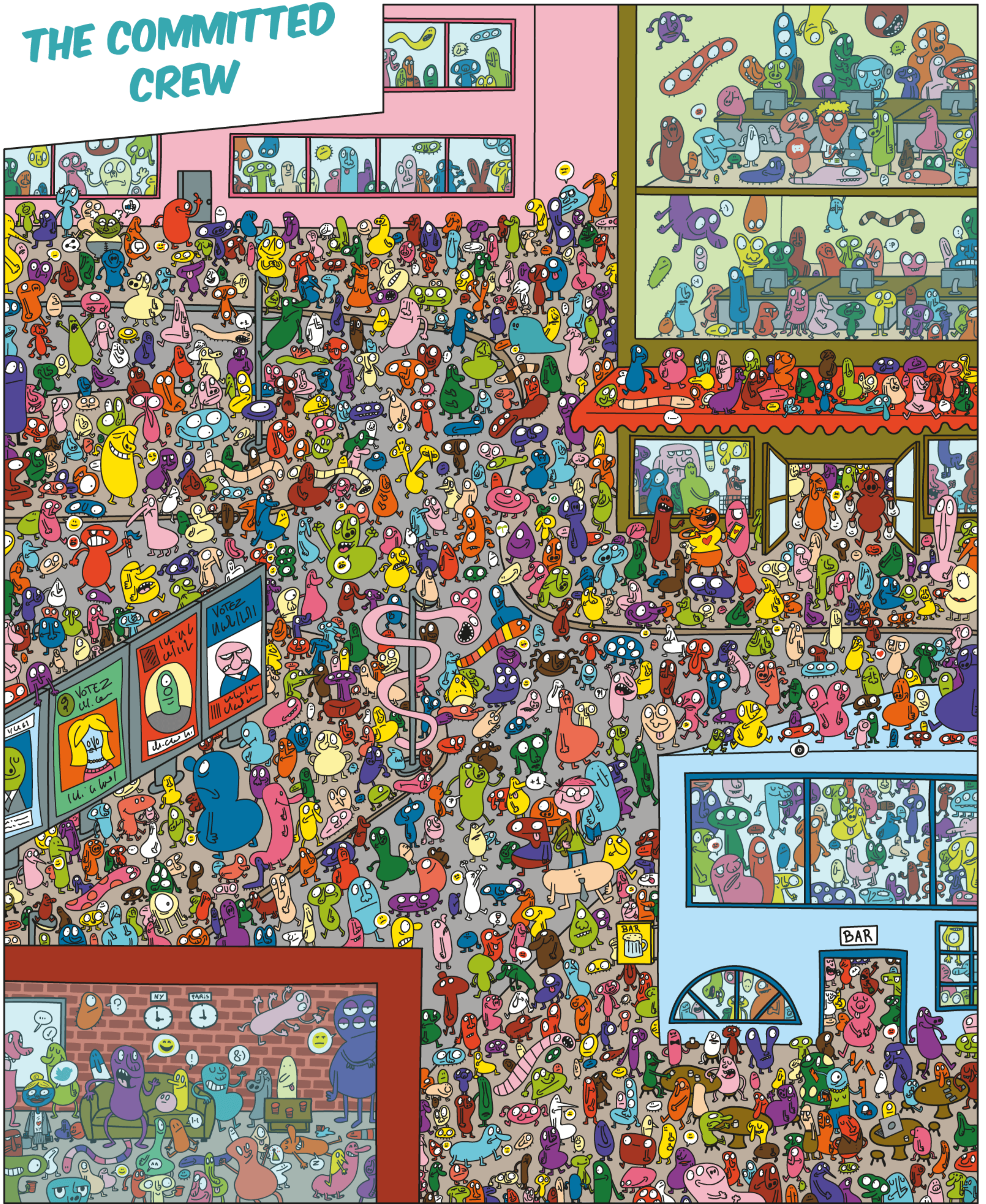
Interdisciplinary Laboratory for Continental Environments - LIEC (CNRS, Université de Lorraine) / Resources 21 Laboratory of Excellence - LabEx R21

6 metal characters are hidden in this picture. Find them!

- Agathe **Lanthanum** is a jack of all trades who likes to fiddle around with batteries, optical lenses, lighters, etc. She can be easily recognised by her grey and malleable body.
- Wearing a headlamp, Gustave **Cerium** likes to work on motors and exhaust pipes. As the least rare rare-earth element, he is very polyvalent, hence his many arms!
- Extremely angry, Louise **Gadolinium** is toxic. For use in medical imagery, she is chained in a cage molecule which makes her harmless for the human body.

- Blaise **Neodymium** is magnetic. He is part of the many objects using magnets. But he's not very lucky, he attracts everything with iron in it!
- With his hypnotic red-green-blue eyes, Dario **Europium** is used to generate colour in the screens of smartphones and tablets. His fibrous aspect makes him look like a wet dog.
- Gérard **Yttrium** loves light. He never goes out without his string of luminous diodes and his light sabre.

THE COMMITTED CREW



Digital political commitment during Presidential elections is found in the affective and emotional attachment to a candidate, as well as in strong community ties. Committed internet users are often men, with a diploma and who are already interested in politics. They must have time, especially given that they are often already ground activists. Although the virulent nature of discussions is often criticised, it justifies bringing the “fight” to social networks.

*Institute of Research on the Evolution of the Nation and of the State
- IRENEE (Université de Lorraine)*

6 activist characters are hidden in this picture. Find them!

- Caroline is an **expat militant** in the United States. She fights on Twitter when she's not working, making the most of the time difference.
- Théo is a **young and creative geek**. Wary of social networks, he prefers to gather on forums and produce dissident websites to support his favourite candidate with his friends.
- **Disengaged**, Gédéon was a long-standing activist. In disagreement with the directions taken by his former party, he now only likes, comments and shares the messages relayed by others on social networks.
- Martine is a **campaign assistant**. Having already been active in the field for around fifteen years, she accepted to organise and develop her political movement's local Facebook page.
- Annick is a **connected ground activist**. When speaking with passers-by, she uses the mobile app supplied by the presidential campaign team.
- Lazuli is a **law student**. Being very studious, he gathered information online to make up his own opinion and ended up joining a group of activists in his neighbourhood.

THE EMOTIONAL CLAN



Anger, joy, fear... primary emotions influence personal relationships. In 2006, Jaak Panksepp, an Estonian neuroscientist, demonstrated that all mammals have cerebral systems that generate emotions necessary for survival, adaptation, and interactions with their fellow species. For humans, when emotions are out of kilter, this may cause the development of psychological pathologies such as depression or anxiety. Learning to manage one's emotions is crucial.

Laboratory for Health Adaptation, Measurement and Assessment.
Interdisciplinary Approaches - APEMAC (Université de Lorraine)

6 emotional systems are hidden in this picture. Find them!

- The comforter is **panicked** at the idea of being alone. Nothing can console him, not even his dummy. Thankfully, Teddy Bear rushes to **take care** of him.
- Pol, Léo, Tom and Gaby love to **play**. Will helping each other and cooperating in good spirit lead them to victory?
- Gaspard always **fears** hurting himself. He prefers to play dead in a corner rather than going on a treetop adventure.
- Lea the adventurer is constantly **seeking** to explore and discover the world around her. She is well equipped to avoid being caught out.
- Bruno's **rage** gives him a hunger to win. Overcoming obstacles, defending his place and being victorious are his only motivation.
- Jacqueline is full of **lust**. So much so that her heart just might jump out of her chest.

THE MEDICINE SQUAD



Administering medicine is often difficult: it tastes or smells bad, some forms are difficult to swallow, and it can even have side effects... Galenic pharmacy consists of using various technological means to circumvent these issues and optimise how a medicine is presented in order to facilitate their use by patients and obtain maximum therapeutic effects. Far from our medicine boxes, research is currently focused on polymer and metal nanoparticles and microparticles.

Laboratory of Therapeutic Targets, Formulations and Pre-clinical Medicinal Expertise - CITHÉFOR (Université de Lorraine)

6 medicinal forms are hidden in this picture. Find them!

- Gaby is a **gastro-resistant** capsule. She wears a full-protection bodysuit that protects her from acidity and enables her to release her active substance outside of the stomach.
- With his latest-technology GPS, Godefroy, the horseman of **active targeting**, knows which routes to take to heal the princess.
- Jasmine is a soldier waiting in ambush. She awaits orders before acting and performing a successful **triggered release**.

- He's small, sneaky and knows how to hide. George is a **nanomedicine**, trained as an elite commando.

- Don't judge her by her slimy look: Alice is as soft as **cream**... She works on the human body's ramparts: the skin.

- Gaston is an old **tablet**, known in french as "un cachet", the ghost of galenic pharmacy. He hasn't been around for quite some time but his name continues to be used by mistake.