



LUX:PLORATIONS

A UNIVERSE OF RESEARCH





PASCALE VELLEINE
PARIS CENTRE
 pascal.velleine@libertysurf.fr
 dessins, illustrations
 &
 bandes dessinées



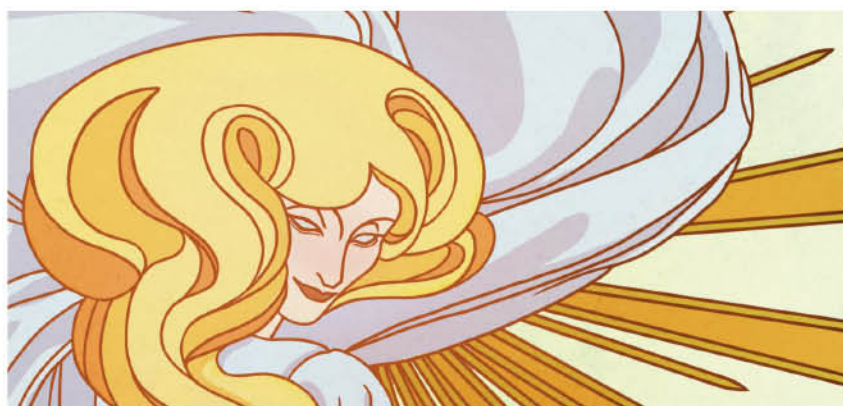
Vincent Biwer // Illustrator
 Instagram @vincebiwer

MARION DENGLER
 ILLUSTRATOR


MARIONDENGLER-ILLUSTRATION.COM


MDENGLER@POSTEO.DE


[@MDENGLER_ILLUSTRATION](https://www.instagram.com/MDENGLER_ILLUSTRATION)



NORA BACK
 ARTIST-ANIMATOR-ILLUSTRATOR

NoraBack.com
contact@NoraBack.com
[@NoraBackArt](https://www.instagram.com/NoraBackArt)



JEFF HEMMER // Comic & Illustration & Workshops
AFURNISHEDSOUL.INFO // [@AFURNISHEDSOUL](https://www.instagram.com/AFURNISHEDSOUL)



SCIENCE meets ART

Follow Charlie on another type of journey: from Earth to space and back, through your mind, brain and guts and finally to a future that might be more sustainable. This newest edition of LUX:plorations promises nothing more or less than entertaining stories about science in Luxembourg. Made in Luxembourg together with artists from Luxembourg. Enjoy the read!

Nicole Paschek (Project Leader)

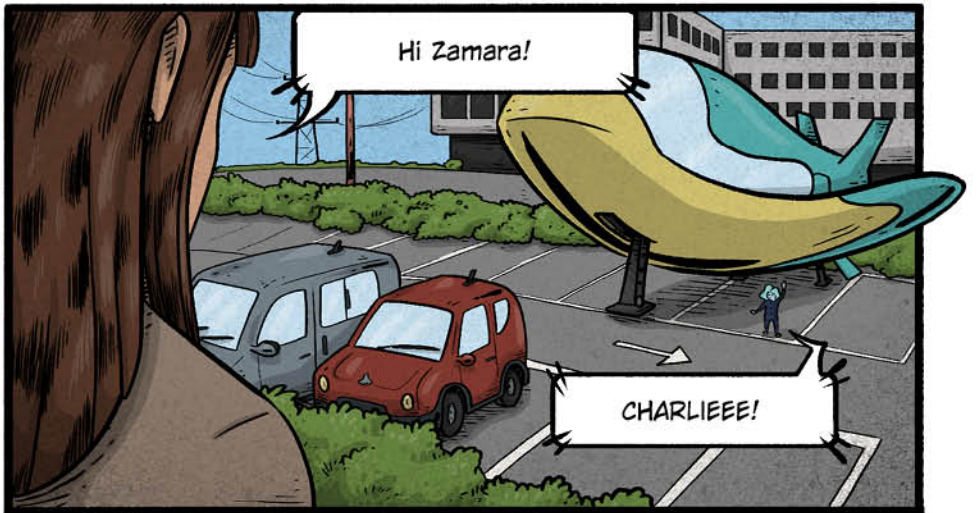
TABLE OF CONTENTS

Echoes of the Future	3
Misread, Misplaced, Understood	8
The Neuronauts	13
Gutham City: A Malignant Story	17
The People Behind the Comics	21
More than comics	24

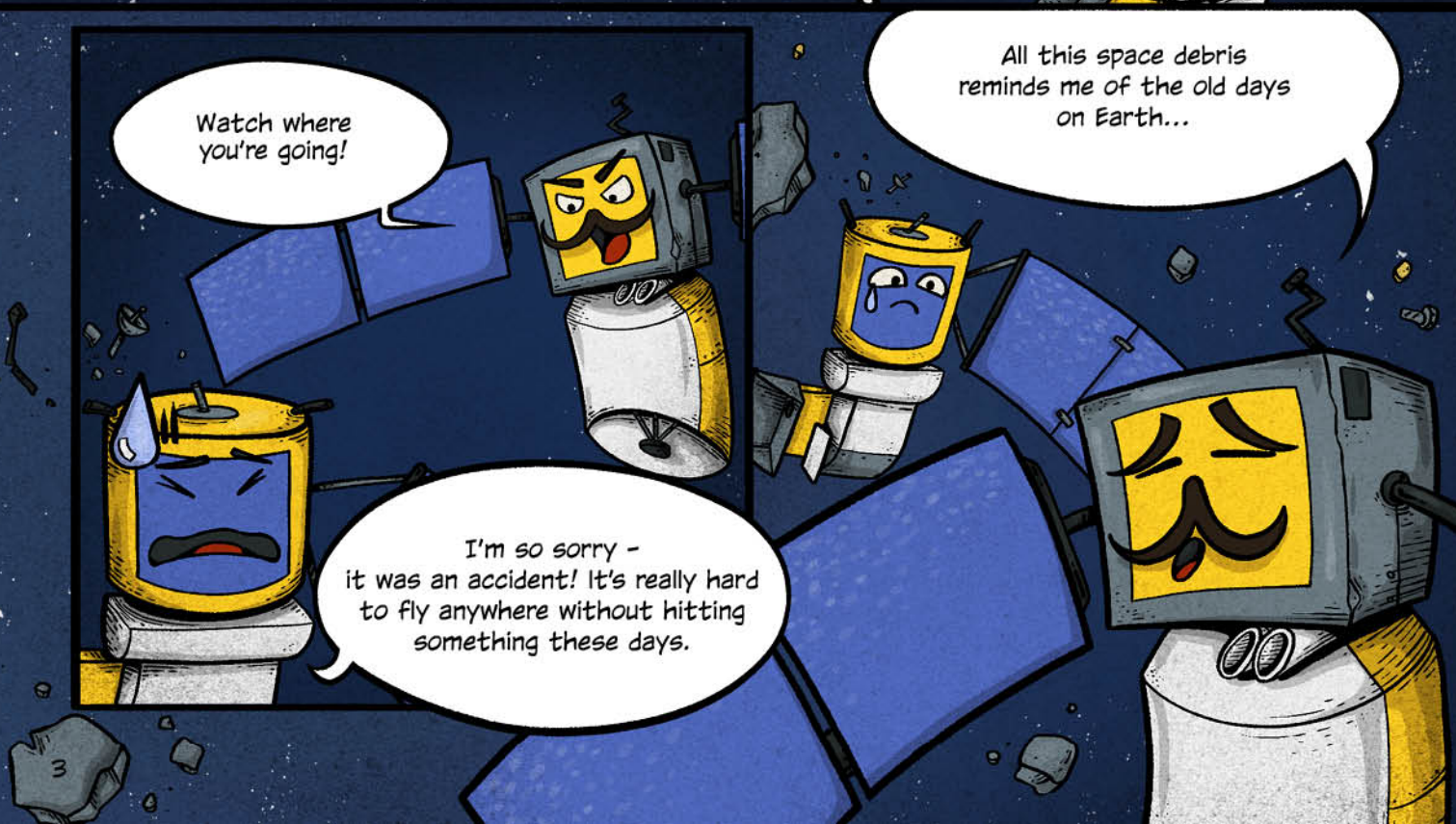


Zamara is an exchange student from a planet called Liquaria. She is the first Liquarian to leave the planet as part of an exchange. Earth is so different from her own world, but she is bursting with curiosity to understand everything she possibly can about her human friends.

Yso (pronounced why-so?) is Zamara's faithful companion. He is as adventurous as our dogs here on Earth and can change shape, turning into liquid whenever he wants.



In a not-too-distant future...





Construction and demolition waste makes up 30% of landfills - and concrete is a big part of it. Is there a way to reuse the materials?

Sorted but unseparated concrete can have mortar still attached to it, which is weaker than concrete. It can be used as aggregate, but its uses are limited.



In theory, yes. But to reuse each material effectively, it needs to be sorted really well. Using new natural resources is much easier.

Poorly sorted material can be used as roadfill, for example (known as downcycling). But you couldn't build a new house out of it.

Sooo, humans didn't try to make things better?



Well, kind of... researchers looked into the problem and found some interesting solutions.

"Reduce, Reuse... Upcycle!"

Reduce
Design efficiently, use durable materials, and prioritise reusability.



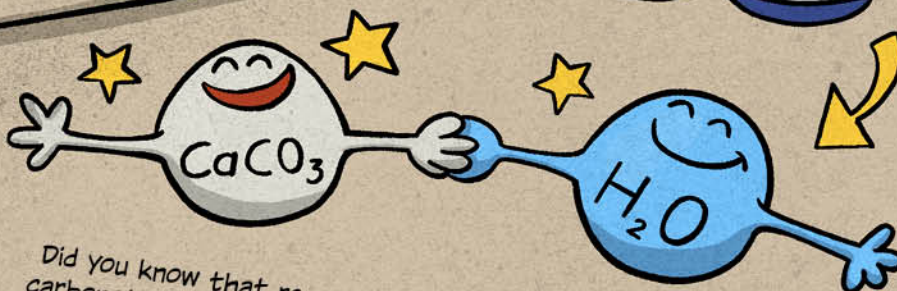
Reuse
Salvage materials like doors, windows, steel and bricks for new projects.

Upcycle - Turn waste into resources of equal or better quality, like processing structural concrete into high-grade raw materials. This allows it to be used in new concrete again.

Look!



"Recycled aggregates can absorb CO₂."



Did you know that recycled aggregates absorb CO₂ through carbonation? That means the more recycled concrete we use as aggregates, the more CO₂ gets absorbed into solid form and stays out of our air. It's not a solution on its own, but it's a nice side-effect!

"Design for Disassembly!"



- STUFF - furniture, for example
- SPACE PLAN - how the interior is divided
- SERVICES - ventilation and lighting
- STRUCTURE - the load-bearing walls
- SKIN - the facade, including windows
- SITE - where the building stands

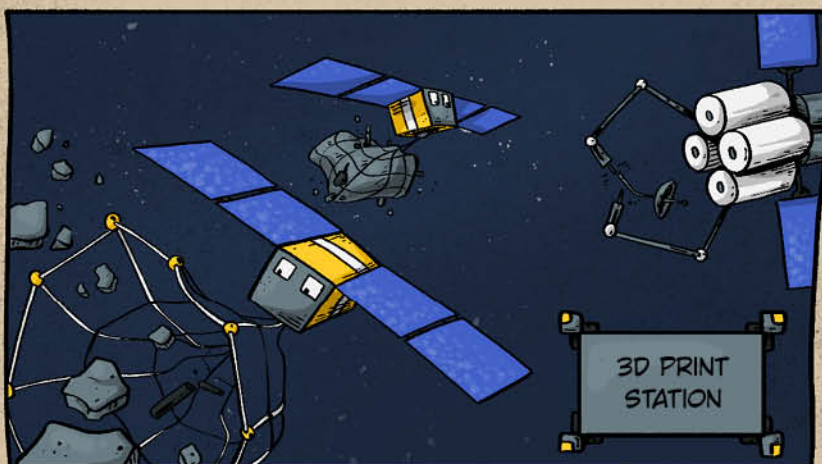
Building in layers allows each part to be upgraded or removed without disturbing the rest. This makes adaptation and demolition easier.

But you know humans - their decisions are not always based on what's best for everyone.

10.2025

GLOBAL NEWS

"Tired of space debris?"



More than 35,000 objects larger than an apple are floating around in space! All this space debris could be collected and used to 3D print new satellite parts in space, or even for repairs!

Wow!
Can you imagine if they
had followed through
with all that?

With no space
debris, I'd be able to relax
and rest...

And I could get a new antenna!

Things **COULD** be so much better...

Back to Zamara and Charlie

Can we go higher?

Sure thing.

To infinity and beyond!

Ooh wow, this is AWESOME!

Diagram illustrating the layers of the atmosphere, from the surface of the Earth upwards:

- EXOSPHERE**: The outermost layer, containing satellites.
- THERMOSPHERE**: The layer above the mesosphere, containing a rocket.
- KÁRMÁN LINE**: The boundary between the mesosphere and the thermosphere.
- MESOSPHERE**: The layer below the thermosphere, containing meteors.
- STRATOSPHERE**: The layer below the mesosphere.
- TROPOSPHERE**: The lowest layer, closest to the Earth's surface.

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Diagram illustrating the layers of the atmosphere, labeled from bottom to top:

- EXOSPHERE
- THERMOSPHERE
- KÁRMÁN LINE
- MESOSPHERE
- STRATOSPHERE
- TROPOSPHERE

BEEEEEP!...BEEEEEP!...BEEEEEP!...BEEEEEP!...BEEEEEP!...BEEEEEP!...BEEEEEP!...BEEEE--

Omg, we are going to DIE here!

Charlie! LISTEN to me.
We are going to be ok!

What did you learn on your first day at uni

Tell me how you calmed down. You can do it!



Anxiety can manifest in many ways.





What you're feeling right now is your brain trying to protect you.

Your brain has an alarm system, called the amygdala.

When reading feels overwhelming, it hits the panic button.

It treats the fear of being judged or humiliated while reading as if it was real danger,

even though you're safe.

Your heart beats faster to pump more blood to your muscles.

They tense up in case you need to fight or run.

But your brain doesn't just send signals.

It listens, too.

How your brain senses and interprets what's going on inside your body is called interoception.

But sometimes, it misreads the signals from your heart or lungs,

thinking something's wrong when it isn't.

The good news?

Just like your body can switch this stress mode on,

it can also switch it off.

Try this...

Breathe in slowly and deeply.

Place your hand on your chest.

Feel your feet on the ground.

Name five things you feel in your body.

Just observe. Don't try to interpret them.

Your brain wants to protect you - but you can show it you're safe.

Breathe in slowly and deeply.

With the right tools, I can handle this.

Dyslexia is a reading disorder that can present challenges at school, at work and in social situations. Reading difficulties can trigger anxiety, and anxiety makes reading even harder. It becomes a vicious cycle. But anxiety can happen to *anyone* at *any* time.



Wow, that helped.
Thanks Zamara.



No prob- oh, seems like we're
back on track.

Let me run a quick
check.



All systems seem to be
up and running again.
Excellent.

Sooo... do you want to steer
us back to Earth?



Oh ... I ... I don't know.
That sounds ... risky?

All you have to do is keep us on course. As soon
as we enter the atmosphere, the autopilot
will do the rest.



Alright. I'll try!

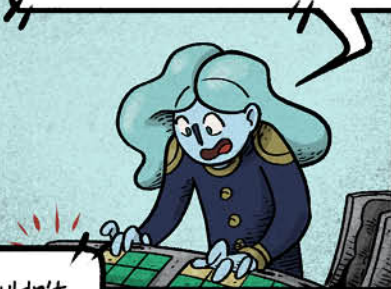


Wooooo-hoo,
this is FUN!

Whoah, Charlie!
Maybe slow down a bit?



Oh shoot! The system isn't responding. It must have
been damaged when we hit the space debris earlier.
How could I have missed that?!



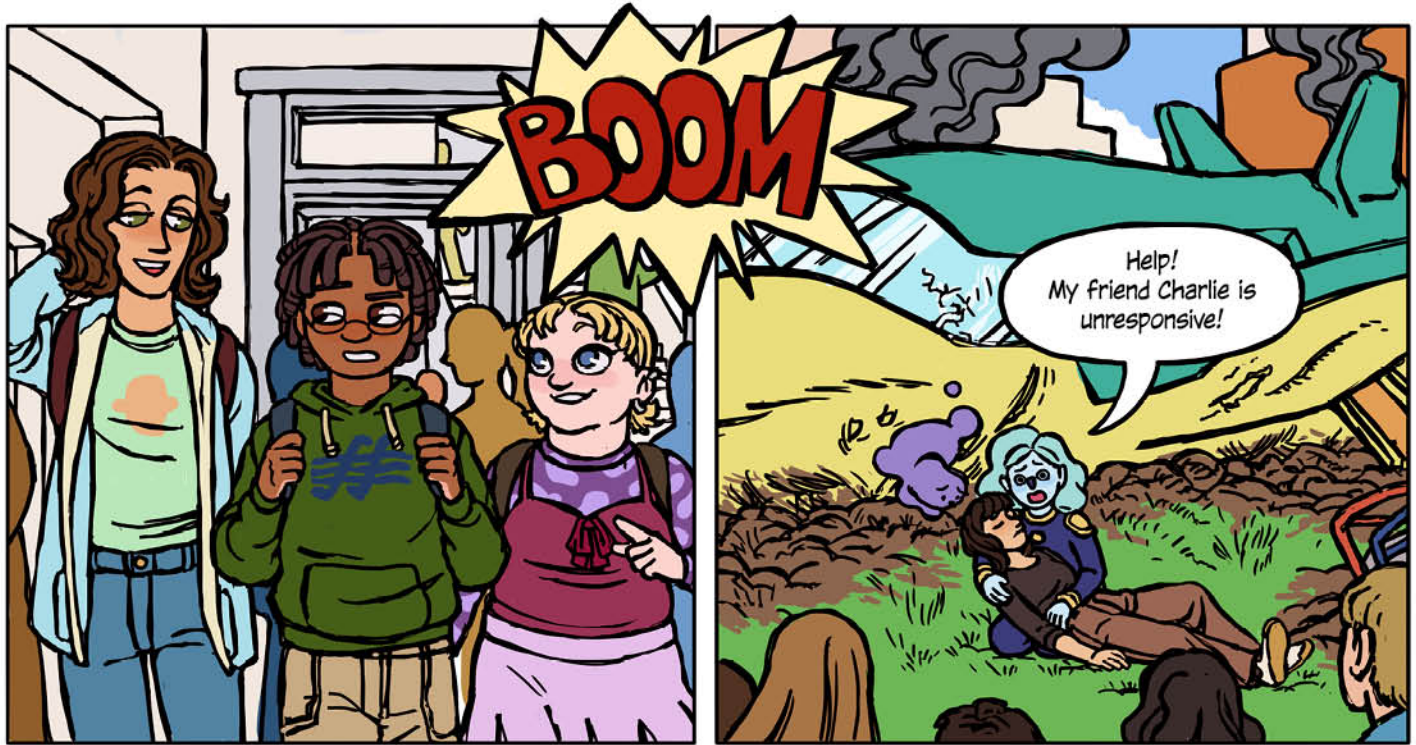
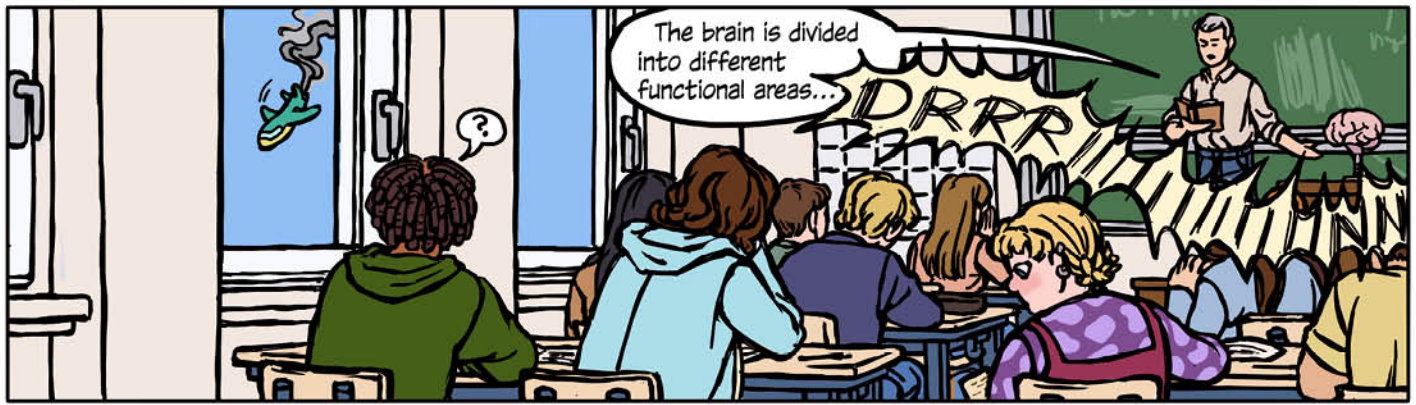
I am not doing anything! Shouldn't
the autopilot be taking over or
something?!?

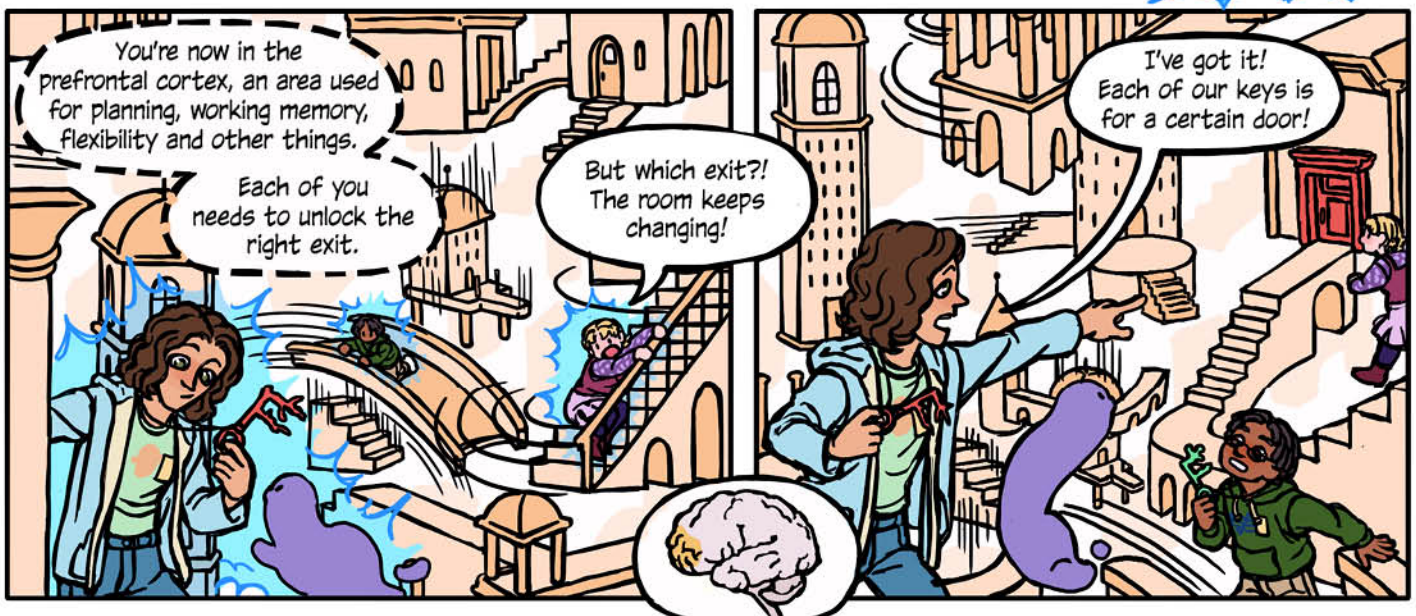
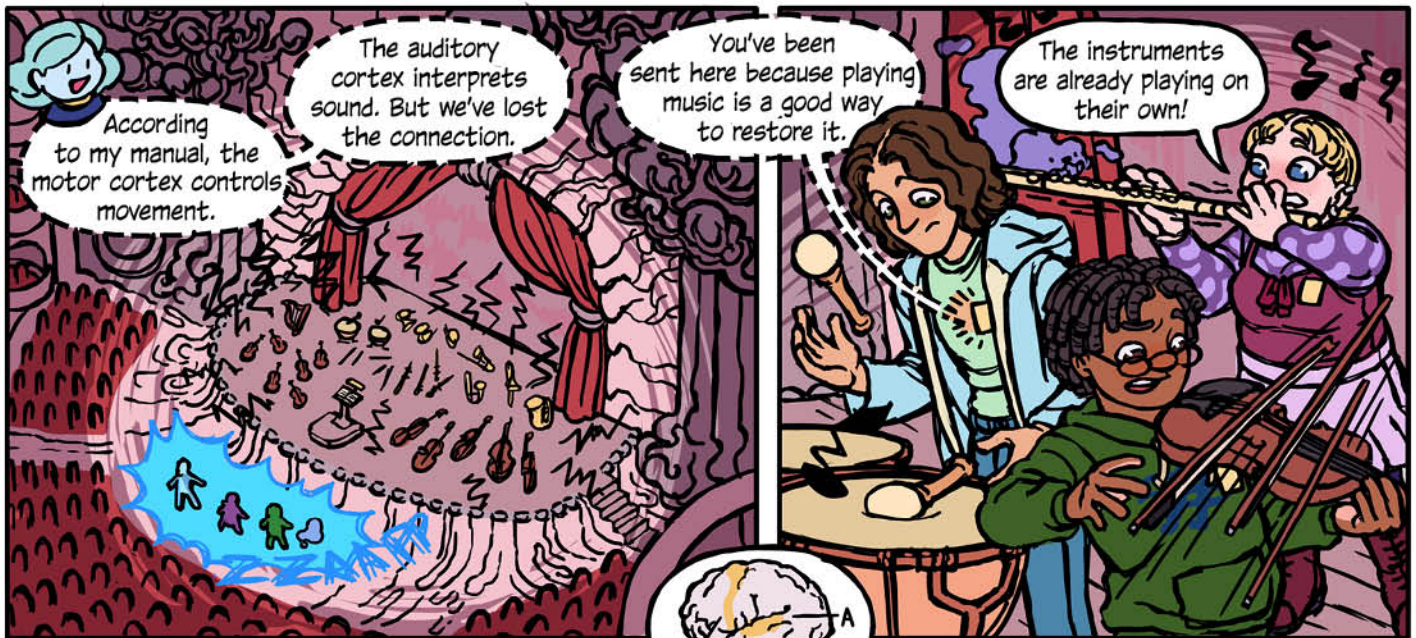
AAAAAAAAAAAAAAAAAAAAH!



AAAAAAAAAAAAAAAAAAAAH!



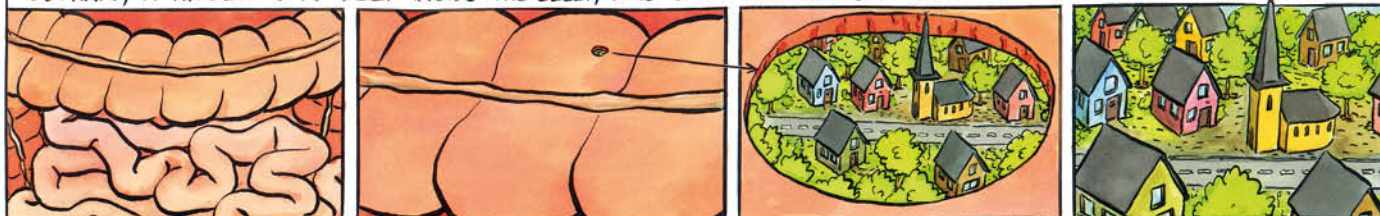








GUTHAM, A HIDDEN CITY DEEP INSIDE THE BELLY, WAS ONCE A PEACEFUL HOME FOR ALL OF ITS CELLTIZENS.

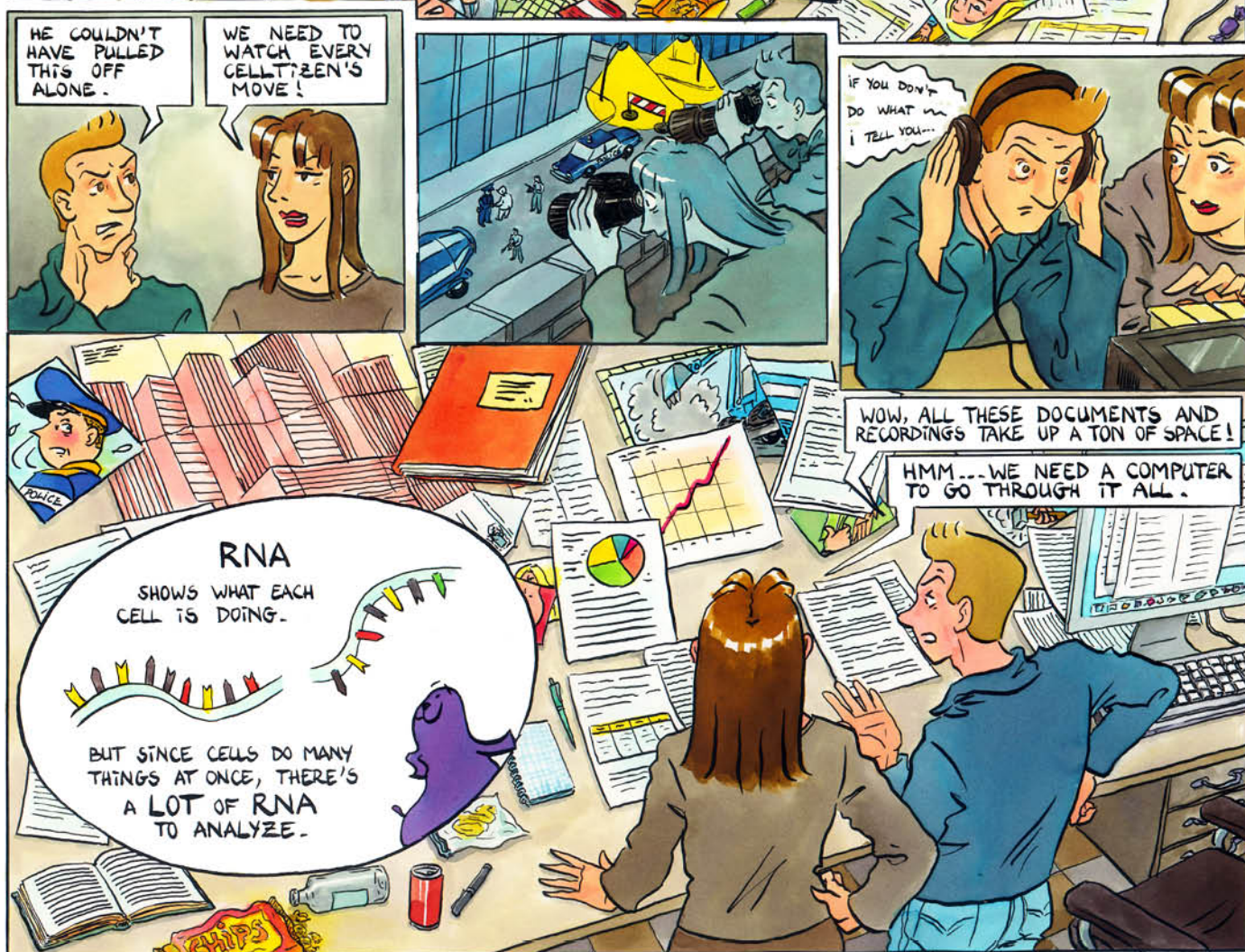
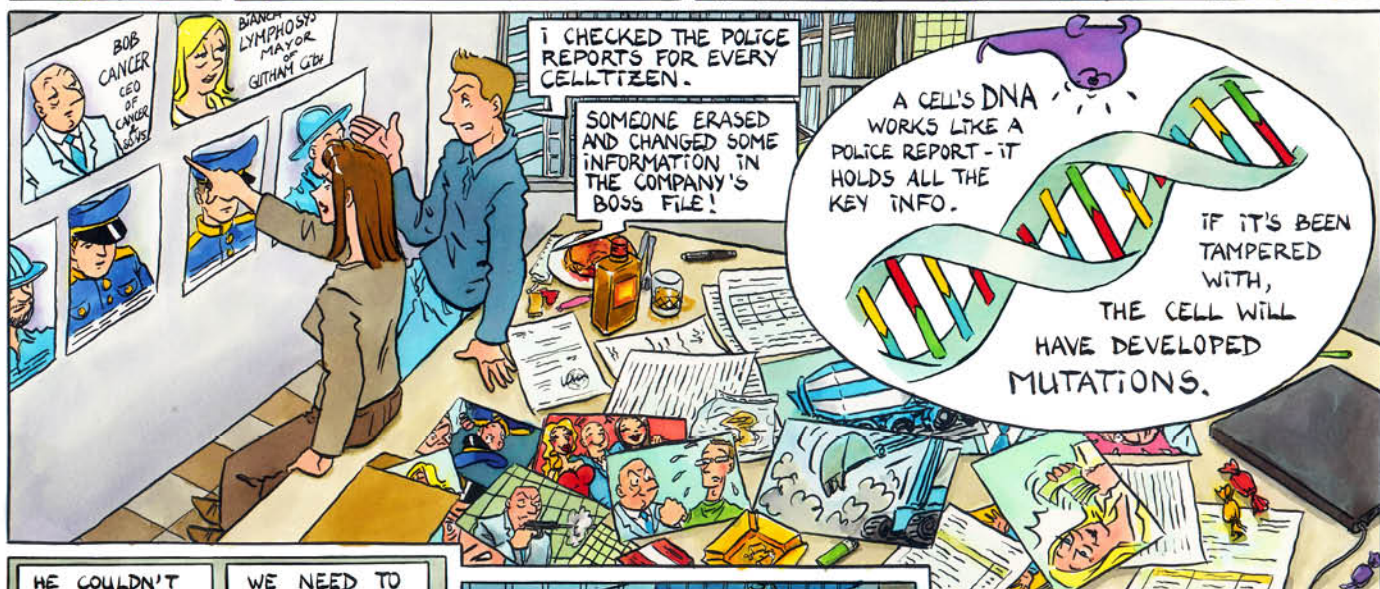


BUT EVERYTHING CHANGED WHEN THE COMPANY "CANCER & SONS" WAS FOUNDED BY ONE OF THE CITY'S OWN, A LOCAL CELL THAT BROKE THE RULES AND REWROTE THEM FOR ITS OWN GAIN.



GUTHAM, ONCE GREEN AND THRIVING, SLOWLY TURNED GREY. MANY CELLTIZENS FELL ILL, AND SOME FOUND THEMSELVES WITHOUT A HOME OR FOOD.







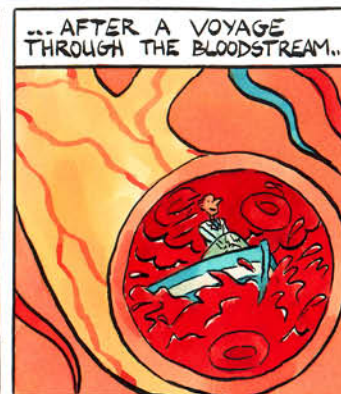
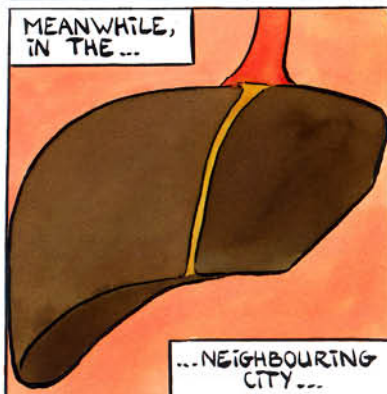
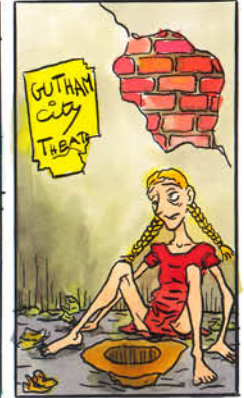
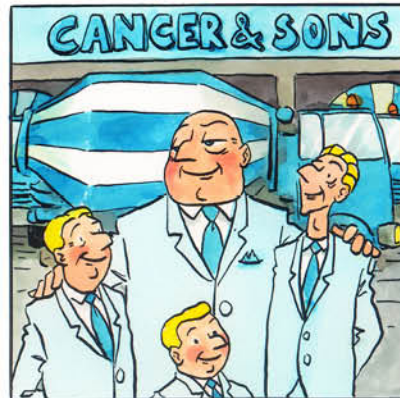
THE FIRST STEP IN THE ANALYSIS IS TO SORT THE INFORMATION ABOUT EVERY CELL TYPE SEPARATELY.

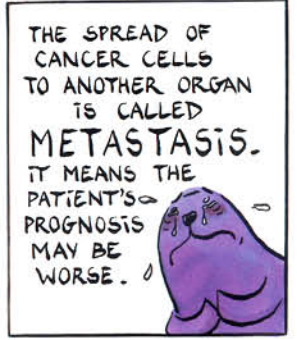
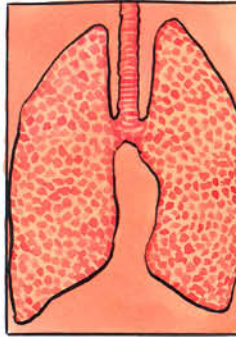


LOOK! THE POLICE ARE ACTING WEIRD!

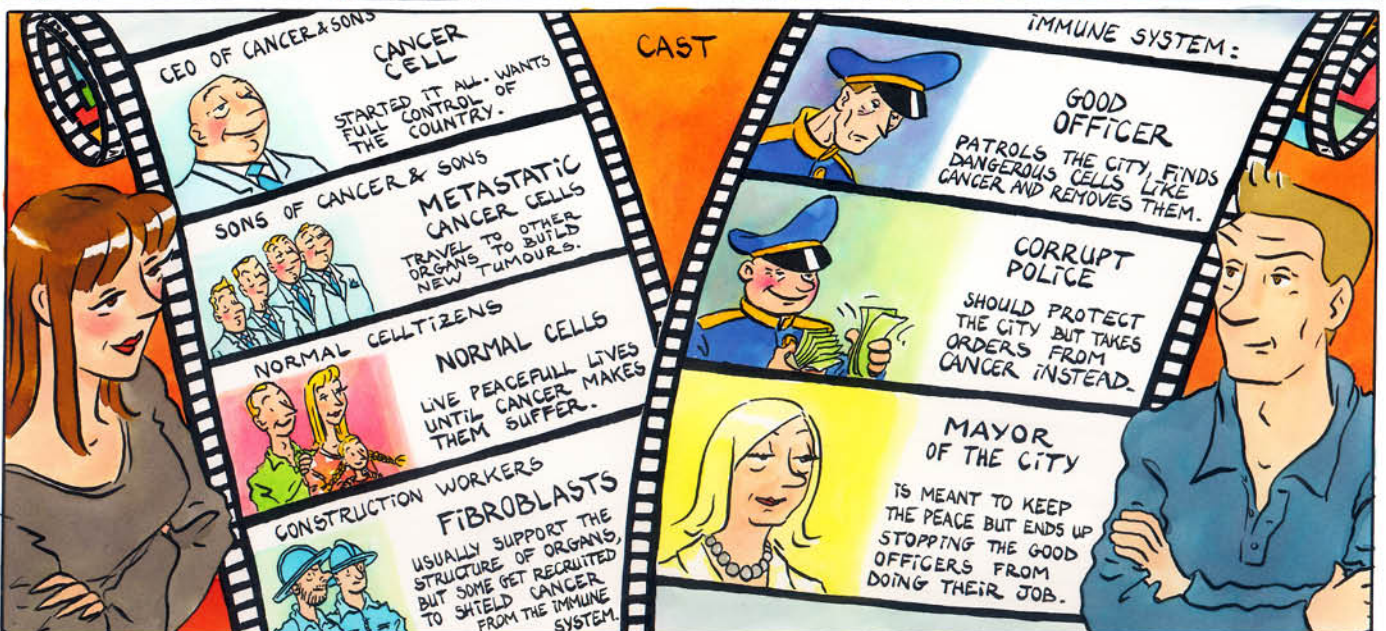
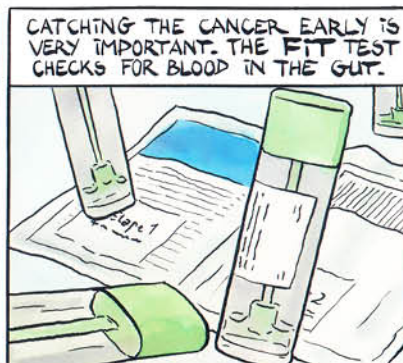
GAIN MONEY	LOOK FOR CRIMINALS	
✓	✗	POLICE
✓	✗	MAYOR
✓	✗	CANCER

HEATMAPS LIKE THIS SHOW WHICH TASKS EVERY CELL IS DOING.





THIS STORY DIDN'T HAVE A HAPPY ENDING. BUT SCIENTISTS ARE WORKING HARD TO SOLVE CASES LIKE THIS ONE.





Nicole Paschek is a former biologist and science journalist. Since 2019, she has been working as a project manager for DESCOM, a training programme in science communication for doctoral candidates in Luxembourg. She currently leads the LUX:plorations project, one of many hands-on training initiatives of DESCOM.

Serge Haan is a professor of biological chemistry and head of the Department of Life Sciences and Medicine (DLSM) at the University of Luxembourg. His research focuses on molecular disease mechanisms associated with the development and metastasis of colon cancer: how do cancer cells develop resistance to treatment and how do they interact with their microenvironment? His strong interest in communicating science to the public led him to found the DESCOM project.



Oliver Glassl is an educational management professional with long-term experience in academic teaching and curriculum development. His education includes degrees in speech and language therapy and business administration. His research in the field of neurorehabilitation has resulted in various publications. Currently working as a project manager at the Faculty of Science, Technology and Medicine at the University of Luxembourg, he is member of the DESCOM team.

Bruno Teheux is assistant professor in the Department of Mathematics (DMATH) at the University of Luxembourg. He also likes to organise activities that allow as many people as possible to experience the multiple aspects of mathematical research and to become aware of the incredible modernity of this discipline. Where there is no fun, there is no math!



Veronika Mischitz (Véro) is a former biologist, turned visual storyteller. For over a decade, she has been creating (science) comics for various clients as well as teaching the magic of her craft to kids and adults. Driven by curiosity and a sense of wonder, she loves to explore unknown territory, learn new things along the way and turn them into compelling stories. She is a mentor for LUX:plorations.

Jessica Burton completed her PhD at the Luxembourg Centre for Contemporary and Digital History (C2DH), where she researched the relationship between European comic transfers in the 1960s as part of the Popkult60 project. She is an editor for international children's books at Paramount Pictures/Nickelodeon and previously worked for Titan Comics on titles such as Doctor Who. She also serves as a mentor for LUX:plorations.



Jeff Hemmer (born 1982) is a freelance comic artist and illustrator from Wormeldange, who currently lives and works in Bremen. He loves cats and particularly enjoys working at the intersection between comics and education. When he isn't busy drawing, he is also a passionate workshop trainer.

THANK YOU to everyone else involved in the production of the science comics, especially the academic supervisors who made sure the comics are scientifically correct, namely Christine Schiltz, Kerstin te Heesen, Aliette Lochy, André Schulz, Andreas Hein, Markus Schäfer and Elisabeth Letellier. We would also like to thank Berta Rato, Eduardo Cruz, Dave van der Meer and the Luxembourg Learning Centre (LLC) for their support.

ECHOES OF THE FUTURE

What do space and construction have in common? The need for sustainability! Natural resources on Earth and in space are limited. We must learn to manage them wisely wherever we go. With this comic, we intend to raise awareness of the concept of the circular economy, which is becoming increasingly important both on Earth and in space.

Citlali Bruce Rosete is researching miniaturised spacecraft missions and technologies. She is a doctoral researcher at the Space Systems Engineering research group of the Interdisciplinary Centre for Security, Reliability and Trust (SnT).

Monica Laisun Louie is using 3D modelling to track materials used in construction and support their reuse during building demolition. She is a doctoral researcher at the Department of Engineering at uni.lu.



Citlali



Monica



Nora

The artist

Nora Back (born 1991 in Esch/Alzette) is a freelance artist, animator and illustrator currently living in Berlin. She already liked to draw from a young age, which led her to attend the Lycée des Arts et Métiers and go on to study 2D animation through the BTS Animation programme. She studied animation for four more years at Filmakademie Baden-Württemberg in Ludwigsburg. Since 2018, she has worked freelance on films, TV series, music videos and more, while continuing to do illustrations and her own personal artwork. Nora is generally open to a diverse range of artistic fields, as long as the work is creative, tells a story, or simply lets her draw.

MISREAD, MISPLACED, UNDERSTOOD

Our comic shows that with the right tools and support, anyone can find a way to overcome life's difficulties. Our brain's ability to sense and interpret signals from within the body is crucial for being able to cope - be it with dyslexia, which can turn a simple task like reading into a cacophony, or with anxiety, which can affect anyone at any time.

Anxhela Sulaj investigates interoception of bodily sensations across organ systems and its relevance to somatic symptoms. She is part of the Clinical Psychophysiology Laboratory (CLIPSLAB).

Claire Gigueux studies reading processes in different languages and in relation to dyslexia. She is a member of the Cognitive Science and Assessment (COSA) Institute.

Both work as doctoral researchers at the Department of Behavioural and Cognitive Sciences of uni.lu.



Anxhela



Claire



Vincent

The artist

Vincent Biwer, born in 1986, is a freelance illustrator. Originally from Basbellain in the north of Luxembourg, he now lives in Liège. A lifelong fan of fantasy and manga, he made a pivotal discovery in his twenties: drawing is a skill that can be learned and refined. This realisation led him to pursue a formal education at Saint-Luc and the Académie des Beaux-Arts of Liège. Since completing his studies, Vincent has applied his artistic talents to various illustration projects.



Melanie



Amaury

THE NEURONAUTS

Curiosity, imagination and active engagement lie at the heart of both scientific discovery and meaningful learning. This comic emerged from a collaboration between two perspectives: neuroscience and science education. Through a humorous narrative and visual exploration, the comic follows characters on a journey inside the brain, revealing how it works and showing how learning can be both hands-on and reflective.

Melanie Jorge Canelas research focuses on supporting pedagogical innovation and the teaching practices of science teachers. She is a doctoral researcher at the Institute for Teaching and Learning at uni.lu.

Amaury Barillon explores how neural representations of words emerge and how they are shaped by teaching methods. He is a doctoral researcher at the Cognitive Science and Assessment (COSA) Institute of uni.lu.

The artist

Marion Dengler is a non-binary queer comic artist living in Berlin, trying to work as a freelancer. Likes the macabre and gothic horror. Main inspirations are Symbolism, Art nouveau and works from the golden age of illustration. "Eerie, mysterious stuff with hidden meanings is my jam, which is why my stories and illustrations tend to veer into magical realism, if not outright fantasy. I grew up with Franco-Belgian comics, started reading manga after that and now primarily read American indie graphic novels, preferably with queer themes. Successfully blending these three different styles of comic art and narration is something I want to achieve in my own work."



Marion



Hugues



Maria

GLUTHAM CITY: A MALIGNANT STORY

We are passionate about making science accessible, and we believe that talking openly about cancer is essential. Understanding how it works helps demystify the disease and reduce fear. In this comic, we show that cancer does not act alone: it is supported by surrounding cells, corrupts the immune system, spreads through the body, and leaves behind massive data trails that scientists analyse to discover new ways to fight it.

Hugues Escoffier develops computational methods to simulate the behaviour of cancer cells in the Systems Biology & Epigenetics group at the University of Luxembourg.

Maria Stepanyan studies cell interactions in colorectal cancer in the Molecular Disease Mechanisms group at the University of Luxembourg.

Both are working at the Department of Life Sciences and Medicine of uni.lu.

The artist

Pascale Velleine, born in Luxembourg, studied at the Federal Academy of Arts Düsseldorf. She has been working as a freelance artist since 1986. Loves living in Paris since 1992.

She draws various comic series, like Paula for the women's magazine 'Brigitte' and works in cooperation with Lucien Czuga on *Déi Branchéiert*, *Ballast & Klüger* and *Jamie Blond*, de Spioun vun der Kroun.



Pascale

More than comics



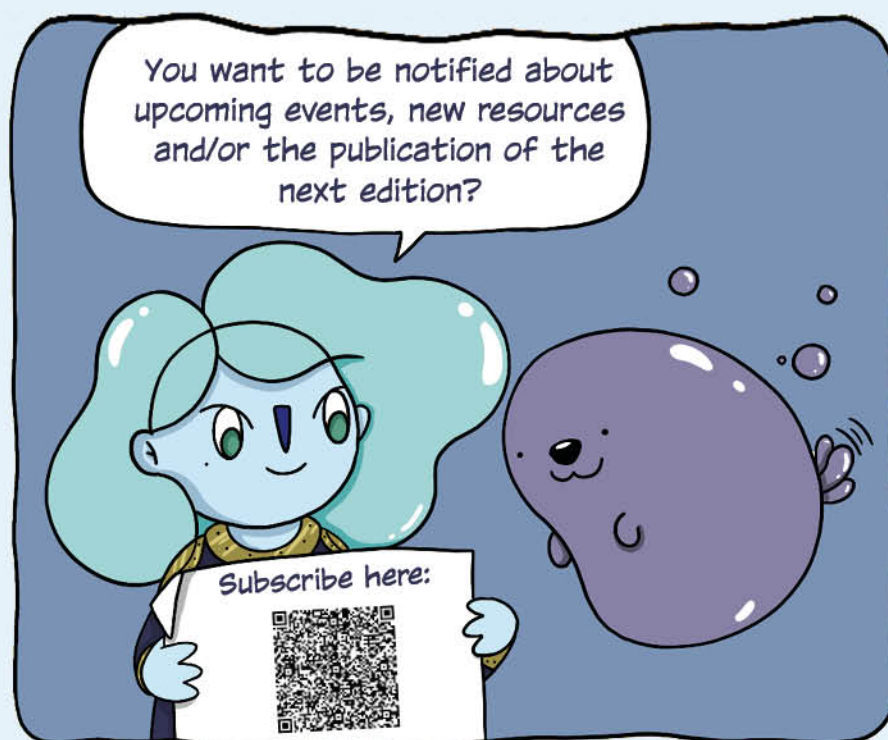
Workshops and comic readings

LUX:plorations is not only a compilation of short stories about science in Luxembourg. You can also touch, see and explore research in one of our many workshops. They dive into the same topics as our comics. Learn more about your immune system, the gut microbiome, virtual reality etc. Teachers can book the workshops for their school classes but also individuals can attend in the context of other events. Comic readings with Q&A sessions and topical discussions can be arranged too.

You can find a list of workshops and activities offered via descom.uni.lu > Outreach activities > Science Workshops. If you're interested, please contact us via luxplorations@uni.lu

Resources

Why not carry out a science workshop yourself or with a group? Guidelines to some of our previously developed workshops are available on our website sciencecomics.uni.lu. You can find them under "Resources". Just download them, get inspired and run your own workshop!





Get your sticker!

All you have to do is participate in our readers' survey. Some weeks later you will find the sticker in your mail.

Thank you for your feedback!

FEEDBACK:



COMPETITION:

Everyone participating in the readers' survey until 15th February 2026 also has the chance to win one of several prices.

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Contributing artists: Valérie Minelli (p. 1, 24), Nora Back (p. 2 - 7, 12), Vincent Biwer (p. 8 - 12), Marion Dengler (p. 13 - 16), Pascale Velleine (p. 17 - 20), Jeff Hemmer (cover and portraits), Andy Genen (p. 25), overarching story (p. 2, 7, 12) based on the idea and script of Veronika Mischitz.

Editorial: Nicole Paschek / Graphic design: Eglantine Denis

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SPECIAL THANKS TO OUR SPONSORS



DOWNLOAD THE COMIC HERE:

sciencecomics.uni.lu

