



THE EUROAVIA FORLÌ-BOLOGNA MAGAZINE

**Meet the Local
Board**

PG 6

**Interview with
Lucia Mascotelli**

PG 21

**The Reading
Corner**

PG 30



EUROAVIA
Forlì - Bologna



Credit Military_Material/Pixabay.com
NASA

Table of Contents

From the Editor	4
Meet the Local Board	6
Aeronautic Column	
Additive manufacturing	10
Solar Flare	13
VTOLs	14
International Space Station column	
Bathrooms in Space	16
ISS Debris	17
Women in Science Column	
Rachel Carson	19
Interview with Lucia Mascotelli	21
Art & Science Column	
A chaotic <i>journey</i> into architecture	25
The Reading Corner	30
Did you know?	35

The EUROAVIA Forlì-Bologna Magazine

Editor in Chief

Beatrice Boccadifuoco

Editor

Giacomo Semprini Cesari

Contributors

Elena Tonucci,
Chiara Pennuti,
Francesco Pio Marasco,
Eros Cervoni,
Johan Birnie,
Andrea Curatolo,
Giovanni Mussoni,
Riccardo Casali,
Bob Van Der Wijst,
Raoul Andriulli,
Andrea Togni,
Lucia Mascotelli

General Corrector

Kai Aidan Growcoot

Graphic Designers

Fabio Galuppi,
Elisa Piergiacomì,
Chiara Paceschi

Contacts

team@euroaviaforlibologna.eu

www.euroaviaforlibologna.eu

Via Valverde, 15

Forlì, FC, 47121

Italy

All rights reserved.



From the Editor

Dear readers,

For the end of this academic year the EUROAVIA Local Board would like to greet you with a new edition of its Local Magazine.

The elections are near and so the LB is going to change. Therefore, at the start of the issue, you will find our personal experiences on being an active part of the association. Moreover, you will read articles concerning the Aeronautic Industry and the International Space Station, as well as a new captivating interview, several interesting curiosities and some terrible jokes scattered throughout the pages.

I would like to thank everyone who contributed to making this magazine a reality, the members of the local Working Groups and, obviously, the Local Board. In particular, I would like to thank Elena, our president, who will soon leave our team to devote herself to her studies. You have been a source of inspiration and determination; you have done a wonderful job this year and I will never forget the role you played in making my first experience in this association truly special. You trusted me and this magazine is, for me, the end point of a path that has seen me grow professionally and beyond. In the future, I will think of you and always send you my best wishes.

Finally, I thank you, EUROAVIAN, who gave us the opportunity to work with passion and perseverance. I trust that you will find, among these pages, something that will inspire and excite you.

Best regards,

Beatrice Boccadifuoco

Treasurer of EUROAVIA Forlì-Bologna

*Beatrice
Boccadifuoco*

Elena Tonucci

President



Chiara Pennuti

Secretary



Beatrice
Boccadifuoco

Treasurer



Giacomo
Semprini Cesari

Vice-President



Andrea Togni

Executive Member



L
O
C
A
L

B
O
A
R
D





Meet the Local Board

The President

My name is **Elena** Tonucci and during this business year I had the pleasure to represent EUROAVIA Forlì-Bologna by being President.

I first joined the association in 2019 to make up for the lack of team projects and extracurricular activities present at the university. Beside this, I really liked the idea of organizing events and providing opportunities to others whilst growing as a person. For this reason, I wanted to push myself even more and thus become President in September 2020.

As President, I am legally responsible for the association. My primary task is coordinating and supervising the general work of the Board and the people within the local Working Groups. Moreover, I am in charge of interfacing with professors, event speakers, companies, other EUROAVIA Affiliated Societies and the EUROAVIA International Board, for both local and international projects and collaborations. For example, a new

project that we started this year and that I care a lot about is our local magazine, of which I was editor-in-chief for the first two issues.

I am very grateful for these experiences which have aided me in developing a large set of skills and allowed me to come into contact with a wide variety of cultures and make new friends. The hard work and the time spent to organise events has always been rewarding and worthwhile in the end, because nothing is better than seeing the participants learning and enjoying something you put together with your effort and passion

The Secretary

My name is **Chiara** and throughout this last business year, I had the pleasure to represent EUROAVIA Forlì-Bologna as the Secretary of this association. Being an active member of EA Forlì-Bologna from the very beginning, I can say I am proud of what the Local Board has achieved

with the help of the Working Groups, especially since we've been through hard times, facing a worldwide pandemic!

As a Secretary I was responsible for the supervision of the conformity of all actions of the Local Board with the Statutes and Bylaws, I recorded the minutes of every meeting and general assembly and I assisted the president with different tasks such as preparing presentations and attending BoPs (Board of Presidents). Not only did this position inside the LB of EUROAVIA stimulate me to improve myself and to take up new challenges, but it also gave me plenty of funny moments to cherish. I enjoyed every minute of this last business year, and I am grateful for the amazing people I shared this journey with!

The treasurer

I am **Beatrice** and I had the pleasure to be the treasurer of EUROAVIA Forlì-Bologna as well as the manager of the Event working group.

My main task as treasurer was to draw up the balance sheet. This means that I had to write down every financial movement including both incomes and expenditures in order to present the final balance at the general assembly for the approval by all other EA members.

Whereas, as manager of the Event WG, I am responsible for the coordination of the group. In substance, my main occupation is to work with the other WG members in

order to organise conferences, lectures and any sort of event in general. Furthermore, I also help the Communication working group to write our weekly posts (facts, quizzes, reviews) that we then publish on Instagram and Facebook. Obviously, as a member of the LB, I attend meetings organised by the EA President, usually monthly. We speak about our ideas for new events and we discuss future purposes.

When I decided to apply in order to become a LB member I had to write a curriculum and a motivational letter, which was new to me. This turned out to be very helpful for my university career. Moreover, I can assure you that my English has improved significantly, because everything I write for EUROAVIA is in English. Therefore, being part of the association contributed in making me far more confident with the language.

Finally, my experience in the Local Board helped me to be more reliable, efficient and focused. I learned to respect deadlines and to be ready when somebody needs help, which is the reason why I care a lot about EUROAVIA. Last but not least I had the opportunity to meet a lot of new people and, obviously, it's always pleasant making new friends!

The Executive Members

Hello there, I'm **Giacomo**, current Vice President within our Local Board.



I'm attending the first year of the Master's Degree in Aerospace Engineering and I actively participate in the local activity (forgive me for the wordplay) since the Association's earliest leaps. I'm primarily involved in two different fields of work within the Association: cooperating with the Communication WG and leading the IT one. Right from the start, I truly believed in this community's scopes and in the values that drove it. Being part of this Association is not something that can be concisely written because many are the emotions and the passions carried, however I'll give it my best shot.

Even before the Local Association was officially formed, I glimpsed at its goals and how they could extend my horizon, which was actually much further than I first thought. Meeting students from other countries, sharing ideas with them and, simultaneously, improving myself as a person and as an engineer were something which I hardly believed could

happen when I started this path. At least, what I have achieved is far greater than I could have possibly expected. Even so, this all took place when I chose to commit my efforts to pursue the goals of EUROAVIA.

This is my second year as an executive member within the Local Board. Looking back, I'm very proud for the moment where I decided to raise the bar of my commitment, because this experience has given me so much, both at a personal and professional level. As a member of the LB, I fully realised what the opportunities were that EUROAVIA offered, and thus deeply committed myself in trying to share this and make our fellow members aware of what really are the unique chances offered by EUROAVIA, i.e. in creating a professional network that can last a lifetime. There are too many words that I could say about this experience, but nothing can truly convey the real experience of this involvement. Therefore,

this is the last thing I'll say: commit yourself; what you'll find is a life-changing experience!

Hello there, I'm **Andrea**, current Executive Member of our Local Board.

I am a PhD student here in Forlì, and I have been helping our local association to grow since its foundation. Apart from taking part in activities as a member, I mostly cooperate with the Public Relations WG to bring you inspiring and awesome workshops and seminars!

I started getting interested in the field of aerospace engineering during my bachelor's degree, and my interest only grew more by sharing my passion with

*Remember that the elections to join our team will take place on the **24th of May!** If you would like to actively participate in the growth of EUROAVIA, this is the right chance.*

*However, if you don't feel ready to take such a big step, you can start by helping your local community! Join the local **Working Groups** of EUROAVIA Forlì-*

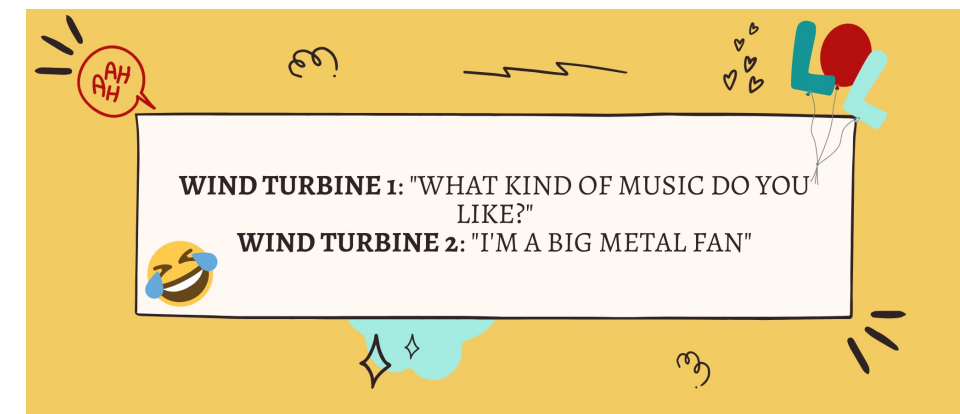
the people that are now my fellow EUROAVIAns. As an engineering student I believe that joining EUROAVIA is a great possibility for students and young graduates, as it permits us to share our passion for this magnificent field of study, as well as meet likeminded people and make lifelong friends. When I heard of a local group being founded, I really looked forward to taking part in its activities and actively contributing to its success, so here I am!

I believe taking an active part in an association such as this can be incredibly inspiring, both from the technical point of view and the human one, as you will learn to manage projects and activities while working with fellow members, and leave your footprint in the books of this unique association!

Bologna! You can choose between: Communication, Design, Events, Information Technology and Public Relations.

Feel free to contact us to know more about both the International and local Working Groups.

*What are you waiting for? **Let's start this journey together!***





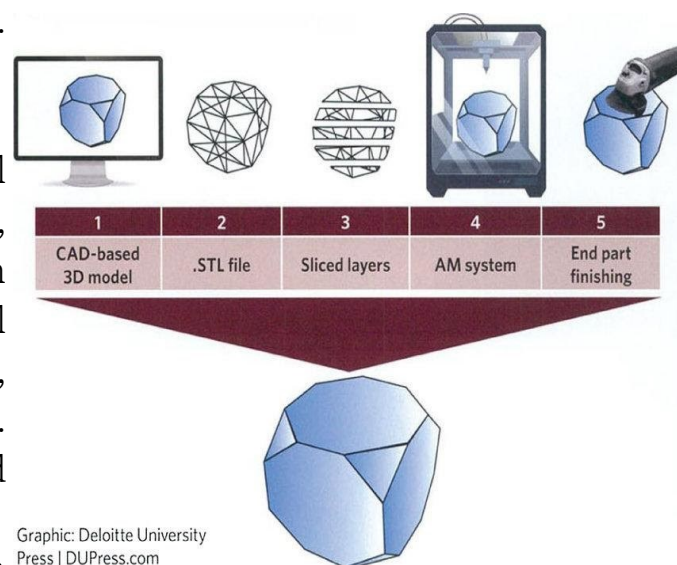
Additive Manufacturing in the Aerospace Industry

Have you ever wondered how engineers create efficient designs for the Aerospace Industry? This article will explain how the additive manufacturing technique is used in the aeronautical field.

Over the years, engineers have always looked for the balance between designing parts with **complex geometries** that have allowed a great performance and parts that can be manufactured with conventional methods (turning, milling, casting, etc.).

Conventional manufacturing methods have several constraints however, especially with complex internal geometries (e.g., cooling of an engine). A technique called **additive manufacturing (AM)** was developed (also

known as 3D printing), which allows the generation of complex geometries in a short period of time (ideal for prototyping!). Like the name suggests, we add material layer-by-layer, allowing us to generate a part.



Additive manufacturing (AM) steps to generate a part.

But how exactly does additive manufacturing work? The process starts with a computer-aided designed (CAD) part, that is then processed in a software specialized for additive manufacture where the part is sliced in

several layers. Each layer represents where the material is going to be deposited, then a path to generate the desired shape is created and at last the information is sent to the machine which will manufacture the part (quite simple, isn't it?).

This process can be separated into two main categories, using **liquid** materials and using **solid** materials. In the liquid category, the part is generated by solidification of a liquid; while for the solid, the part can be produced with: solid powders (melting and sintering), solid filaments (fusing) or with solid sheets (laminating).

Final parts can be **metallic** where the most used process is laser sintering/melting (a laser melts layer by layer a bed of power metal); or polymeric, where the most used processes are: stereolithography (a laser cures a layer of liquid polymer layer by layer) and fused deposition (a filament of polymeric material is melted and deposited layer by layer).

In the aerospace industry, a lot of research is going on to certify parts manufactured with **AM techniques**. Companies like: Boom Technology, Inc, who are developing the Boom XB-1 supersonic airplane are using additive manufacturing techniques for certain



Additive manufactured parts used by Boom

parts of their aircraft, like: manifolds for variable bleed valve system, flight hardware, test rigs, mounts; NASA with Aerojet Rocketdyne tested a rocket engine injector produced with laser melting manufacturing; GNK Aerospace uses AM for rocket nozzle cooling technologies; GE Aviation in their LEAP engine has used AM for fuel nozzle tips; Norsk Titanium has developed AM parts for Boeing's 787 Dreamliner structural support elements; Airbus has also implemented AM titanium parts on a bracket for a section between the wings and engines in the A350 XWB.

Turbine blades can benefit from additive manufacturing techniques to improve

Credit: Franchise Freedom, Studio Drift, Kennedy Space Center
Photographer : Ossip van Duivenbode

Credit: Studio Drift, Franchise Freedom, rendering at NASA's Rocket Garden at the Kennedy Space Center. Image courtesy of PACE

their cooling, allowing them to work at higher temperatures and increased efficiency. General Electric has implemented this technology on the latest GE9X Engine for the Boeing 777X, where components like fuel nozzle tips, heat exchangers, inducers, low pressure turbine blades (look at the image!) and combustor mixers, are manufactured with

AM.

In the aerospace industry, current research and development has allowed slow implementation in spacecraft and aircrafts. With this technique, engineers have more liberty to create lightweight and efficient designs.

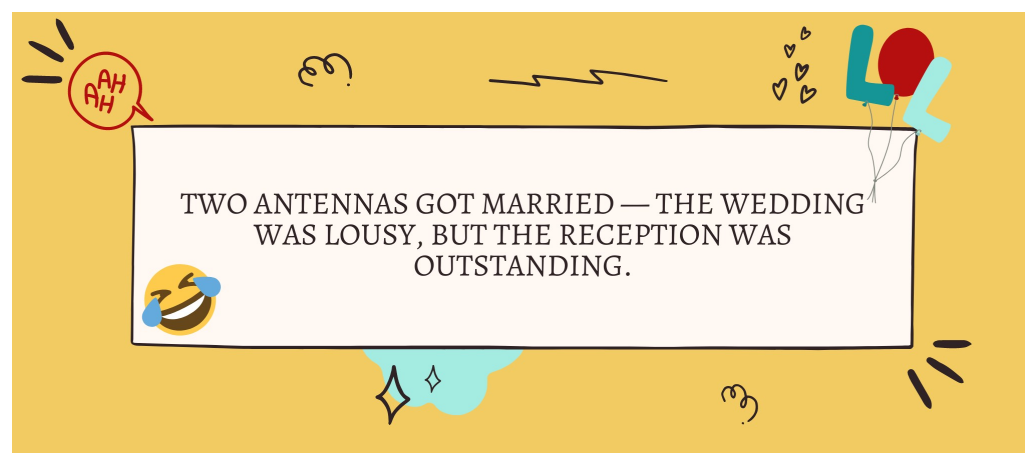
Johan Birnie



Turbine blade manufactured by GE Aviation in Avio Aereo Facilities

Johan Birnie

He is a mechanical engineer who, one day, was driving in the chaotic Guatemalan traffic and, the next, was discovering Italy.



Solar Flare

Why sometimes counting to ten can be a good idea before taking action: the time when meteorology saved humanity.

May 1967, the middle of the cold war. The two superpowers, **USA** and the **Soviet Union**, were completely frozen, staring at each other from opposite sides of the world.

Every passing day the menace of a **nuclear war** was becoming more and more impending, with a record of 31,255 nuclear weapons stockpiled around the globe. From 1957 onward, almost one third of the USAF fleet was on alert, ready to take off at any time of the day, just waiting for the signal of the freshly developed missile strike detector. The so-called **Air Force's Ballistic Missile Early Warning System** consisted in a series of **radar** facilities located all around the globe, aimed to warn the military as soon as possible in the eventuality of a **nuclear strike**.

Luckily, the cold war was not just a period of **tension** but was also characterized by the advancement in many scientific fields, the most famous one being the **space race** between the Soviet Union and the USA.

In particular, after the Soviet Union managed to launch the **Sputnik** in 1957, the US Air Force decided to upgrade its **Air Weather Service**, including the prediction of solar and geophysical events that could affect space missions. A good example of such phenomena tracked were the **solar flares** and their interaction with the earth magnetic field.

The aforementioned system played a crucial role in 1967 when, on May 23rd, a huge solar storm was about to turn the world into a wasteland. The **radio bursts** had in fact caused all communications between the Warning System facilities to blackout. This was however mistaken for a Soviet attempt to jam the radio system, and thus an act of war. Providentially, the communication from the Air Weather Service arrived just in time and **Strategic Air Command** was informed, right as the bombers were taxiing towards the runway.

Raoul Andriulli

Raoul Andriulli

Quattro Ingegneri founder, he's going to finish his study in Aerospace Engineering, while fighting for a better world against the "crescione" and "piada alta".



VTOLs

Have you ever heard about VTOLs? In this article you'll read about how these types of aircraft work and discover what the differences between VTOLs and helicopters are and more!

VTOL is an acronym for “Vertical Take Off and Landing” and is used to describe a type of aircraft which can hover, take off and land vertically, there are also different variations of the acronym like STOL, STOVL or V/STOL (the letter S stands for short).

The difference between these types of vehicles and normal helicopters is that, in the sky, they behave like normal aircraft and can be much faster, reaching speeds of up to **Mach**

1.5. They obviously require more elaborate mechanisms to have both the speed of a plane and be capable of the vertical landing and take-off of a helicopter.

There are two different types of VTOL: ones with a **mounted tiltrotor** and others which gain the initial lift to take off by **directed jet thrust**. An example of the first category is the V-22 Osprey: this type of plane, before taking off, has their propellers rotated upwards and takes off in a similar pattern to that of helicopters.

When sufficiently high and enough speed is reached they begin rotating the engines back again. When the rotation is complete the lift is provided by the wings and the plane behaviour is similar to that of a normal **twin turboprop aircraft**. The second category mounts jet engines and can reach the required **speeds** more rapidly and can therefore take off from a short distance or vertically by directing the thrust of their engines downwards.

The **history** of VTOL is very interesting. The idea was first born in the minds of great inventors like Leonardo Da Vinci and Nikola Tesla. Later, in the 50s, Convair and Lockheed produced the XFV and the XFY-1 Pogo respectively. Both of these planes had to assume strange positions; taking off and landing while facing upwards, which made the pilot's job significantly more challenging.

Several companies joined the research for this type of aircraft by developing ideas

and testing planes with tiltrotor or planes powered by jet thrusters. Nowadays there are a few aircraft defined as VTOLs in use: the V-22 Osprey, the Lockheed F-35, the BAE Harrier and the AV-8 Harrier among most of them.

There is also some research and testing going on to design **hybrid-power** VTOLs; the types of aircrafts mostly studied are: tilt wing, tilt rotor, tail sitter and other variations.

Giovanni Mussoni



XFY-1 POGO.



Harrier AV-8B landing.



V-22 Osprey.

Giovanni Mussoni

He loves watching films and he's a big fan of Scuderia Ferrari. He has other hobbies like mountain biking, gaming and exploring the world of economy and investing.



Credit: Harrier AV-8B Hovering: Robert Sullivan
XFY-1 POGO: SDASM Archives

Credit: V-22 Osprey: jaa1996
Magnificent CME Erupts on the Sun: NASA



Bathrooms in Space

How much do you know about bathrooms in space? Sometimes even the simplest thing in the world can turn into a demanding task.

Regardless of whether you're in your living room or orbiting thousands of miles above Earth, when nature calls, you have to listen. But when you're in **zero gravity**, something as simple as going to the bathroom can turn into a major challenge.

So how do astronauts go to the **bathroom** in **space**?

Each spacecraft comes equipped with a unisex toilet to which the astronauts must **fasten** their bodies, so that they don't float away. They then use a **vacuum-cleaner**-like machine to pull the waste from them and flush it away. After the air is filtered to remove bacteria and odors, it can return to the living cabin.

But where does all the waste go? Don't worry, it's not going to come hurtling

into the Earth's atmosphere and through your roof. Solid wastes are **dried** to remove all moisture, **compressed** and kept in an on-board **storage container**. They're removed and disposed of once the spacecraft has landed. The liquid waste is sent into space.

On the International Space Station, liquid wastes are **recycled** through a special water treatment plant and turned back into **drinking water**. Solid waste goes into a plastic bag. Each time someone goes to the bathroom, the bag is clamped down and sealed like a trash compactor. The bags are collected and placed into a special craft that is launched into space.

Chiara Pennuti

ISS Debris

Manual instruction: what to do in case of collision with space debris. One of the many problems humans cause for themselves.

Space is dangerous: no pressure, no oxygen, extreme temperatures and radiation. But when it comes to Earth orbits, another threat joins the group: **space debris**! We call space debris any man-made object in space that no longer serves a useful function. Space debris can originate from many sources, such as defunct spacecraft, rocket stages and, most of all, from collisions.

and 128 million objects from 1 mm to 1 cm! What makes these debris dangerous is not their size, but their **relative velocity**. Typical velocities in a Low Earth Orbit are 7.8 Km/s, almost seven times faster than a bullet, but the relative velocity of two orbiting objects can be higher.

Given these numbers, it seems a miracle that an object that is 100 meters long like



Cloud of debris around Earth.

Let's look at the numbers. As of January 2021, the European Space Agency estimated that, orbiting around the Earth, there are 34,000 objects greater than 10 cm, 900,000 objects from 1 cm to 10 cm

the International Space Station, is still in one piece. However, this doesn't happen by chance but is the result of accurate risk management from the space agencies. It can be summarized with three words:

Credit: Cloud of debris : ESA

avoidance, protection, mitigation.

Avoidance consists of keeping track of as much debris as possible and, if necessary, performing a collision-avoidance manoeuvre. About 2,800 space debris are constantly being tracked by the **Space Surveillance** Networks and maintained in their catalogue. Unfortunately, the greater risk comes from objects that we are not able to track, like ones smaller than 5 cm. When the probability of collision is greater than 1 in 100,000 a manoeuvre will be conducted unless it implies a greater risk to the crew. By the end of 2020, the Station had performed more than 26 of these manoeuvres.

types of **hypervelocity** impact shields like the ones used on the Whipple shield. This works by **fragmenting** the impacting debris so that its energy is spread on a large area.

Even if these systems do excellent work, there is still the possibility that debris hit the station and that it starts losing pressure. Here **mitigation** plays the main role: astronauts are trained to find the leaking module as soon as possible. If that fails, then at a certain point there is the possibility that they would need to evacuate the station using a docked spacecraft.

Andrea Curatolo

Protection consists of using different

Andrea Curatolo

Space passionate, he wants to contribute to make humanity an multi-planetary species.
In his free time he practices sports and reads books.



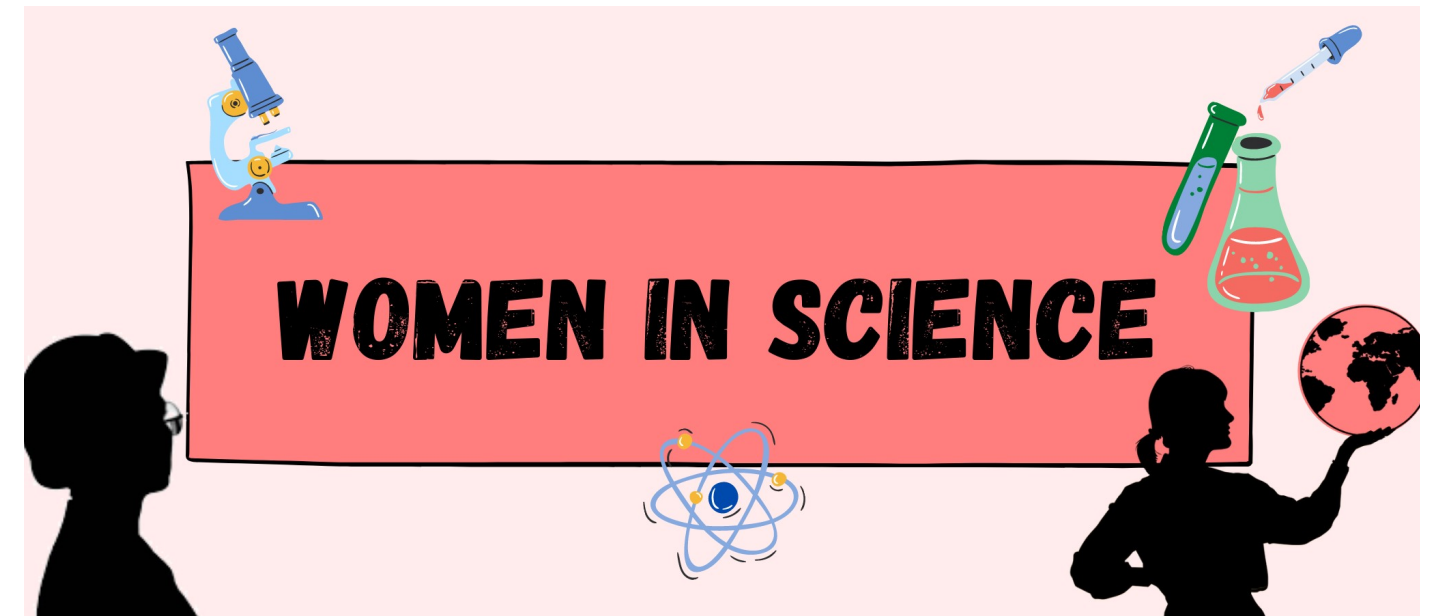
THERE ARE 10 TYPES OF PEOPLE IN THE WORLD...
THOSE WHO UNDERSTAND BINARY, AND THOSE
THAT DON'T!

types of **hypervelocity** impact shields like the ones used on the Whipple shield. This works by **fragmenting** the impacting debris so that its energy is spread on a large area.

Even if these systems do excellent work, there is still the possibility that debris hit the station and that it starts losing pressure. Here **mitigation** plays the main role: astronauts are trained to find the leaking module as soon as possible. If that fails, then at a certain point there is the possibility that they would need to evacuate the station using a docked spacecraft.

Andrea Curatolo

Protection consists of using different



Rachel Carson

A woman's courage and determination against the blindness and greed of the system: how Rachel Carson challenged the American ruling class for the good of humanity.

Rachel Carson was an American marine biologist whose influential books contributed to the birth of the **global environmental movement**.

She was interested in the natural world, particularly the **ocean**, since she was a child. That is why she decided to study biology at Johns Hopkins University, but unfortunately, she wasn't able to get a doctorate because of several family issues.

It is worth pointing out that she was not only a mind-blowing scientist, but also a remarkable hand writer. Indeed, in order to solve her critical financial situation, she started to work as a writer for a radio series entitled **Romance Under the Waters**. The channel was owned by the United States Bureau of Fisheries and, while beginning with only a part-time job, she became the second woman to be

hired full time! After a few years she published the first of her three books about the ocean, in which she conveys a combination between science and meditation with the world underwater. It was named **Under the Sea Wind**. In the following years she published two more books (**The Sea Around Us** and **The Edge of the Sea**) thus forming a trilogy and becoming quite well-known in that period. It was maybe for this reason that she began to use her occupation on a radio station to denounce the most critical changes that affect nature.

"What has already silenced the voices of Spring?"

Rachel Carson

However, her most famous work was

published in 1962 with the title of *Silent Spring*. After years of research on the use of synthetic pesticides, Carson decided to declare the harmful effects of them on the environment. She turned her attention to the ways in which human actions influence the balance of nature, primarily focusing her discussion on the dangerous use of **DDT**. It is known that DDT was originally used during World War II to protect soldiers from insect-borne diseases, and then that the U.S. Department of Agriculture tried to celebrate the benefits of this awful pesticide in order to expand its consumption. Nevertheless, since DDT does not dissolve in water, Carson asserted that it would **remain in the environment**, and underlined this importance from a genetic point of view. In fact, the terrible pesticide would accumulate not only in the environment, but also in the bodies of insects, in the animals that ate those insects and finally within human bodies.

As you can imagine, the response to *Silent Spring* wasn't fully positive. Carson **challenged** the economic interests of the government and the chemical companies.

"Why a spinster with no children was so concerned about genetics?"

The former Secretary of Agriculture, E. T. Benson

Carson was considered a communist who spread sinister influences among public opinion. In spite of this, her combination of scientific knowledge and poetic writing reached a wide audience and helped birth



Rachel Carson

the **environmental movement** against the use of DDT. The dangers of chemicals were not fully understood; Carson affirmed that humans should stop pretending to control nature and that they had to start cultivating *"maturity and mastery, not of nature, but of ourself"*.

Carson died of cancer in 1964, only two years after the publication of *Silent Spring*. Her work had influenced many generations of environmental activists that struggled to obtain the **National Environmental Policy Act** and EPA (**Environmental Protection Agency**) which finally, in 1972, issued a partial ban on the use of DDT.

Beatrice Boccadifuoco

<https://rachelcarsoncouncil.org/about-rcc/about-rachel-carson/rachel-carson-a-portrait/>



Interview with Lucia Mascotelli

Dear interviewee, please introduce yourself.

Hello! I am a fellow **aerospace engineer**. I did a **PhD** here at the CICLOPE laboratory, but I am now working as a Laboratory Engineer for the R&D department of **Electrolux**, focusing on **CFD**. Meanwhile, I am cultivating my other passion, doing a **Master** in Science Communication and writing for the Communication Office of University of Ferrara: it's so nice to actually take science out of the labs and write for a general audience.

As you know, **Euroavia Forli-Bologna** has a very special place in my heart, since I was one of the co-founders two years ago: it's amazing to see how far you guys are taking it, it warms my heart!

How did you meet the girls of the **femminist collective Monnalisa**?

It's actually quite funny because I met **Giada** (one of the three founding girls)

one night last summer, outside the "Bifor" pub here in Forlì: we were both arguing with a guy over **feminist** issues. I'd never met her before but we were strongly agreeing on everything, we just clicked! We randomly met a few other times at the pub, and started talking. After a few weeks she texts me asking to meet up with two other girls, **Sonja** and **Clarissa**, to discuss an idea she had: to found a feminist collective here in Forlì. I didn't need much else to be convinced, but I had some reservations at the beginning: I had a lot on my plate at that time and I wasn't too sure about working with people I had never ever met before. Again, I was super lucky: eight months in and I am amazed at how quickly our friendship developed and how we just really got on. This doesn't mean we agree on everything however, which wouldn't be fun or enriching, but we learn a lot from each other and from our different backgrounds.

Why did you decide to create Monnalisa?

Monnalisa was born from our need to be active promoters and part of the change that we want to see in the world. From our urgency to dismantle the dangerous **stereotypes** that we witness daily in our society, a society that is, still, patriarchal and discriminatory. We have talked a lot, asked questions, questioned ourselves, accepted our differences, our ideas, our stories and ourselves. We wanted to create a space where everyone would feel as welcome as we did. We also realised that **feminism** is still a bad word. We want to spread the idea of what it truly is: **fighting for equality**.

What projects are in store?

Being born in the midst of a global pandemic meant that, so far, we only did a few events in person, but have been active on social media: **@monnalisacollettivo**. We write articles about any type of topic. So far we've touched on intersectionality, body positivity, relationships and sex workers. We also have a monthly podcast, *Il salotto di Monnalisa*, where we talk to our guests about their experiences and ideas on feminism. Out of four episodes, we had three men joining: this made us very happy, because it gives us the chance to **fight** the dangerous idea that **feminism is just for women**, usually a weapon against men. As the writer Chimamanda Ngozi Adichie says:

We should all be feminists!



Anyway, we are waiting for things to slowly start again, to include more and more people in our projects and to organise events here in Forlì and surrounding areas.

It's not the first time that you fight for gender equality, especially in the scientific field. Whence was it born?

As an engineer, I've very often been the only woman in the room, or one of the few. I wanted to know why there's so few women in **STEM** fields! When seeing your classes now, I am very happy to see percentages rising; so much has been done in these past years and we are witnessing a slow change in mindset, so the direction is a good one! But there's still much to do. There are many

stereotypes that have been embedded in **our brains since we were little**: why do we give dolls to girls and cars or tools to boys? Why do we educate girls to be carers and boys to be explorers? Of course this is not always the case, but it has a greater impact on the choices we make later in life, the interests we develop and the expectations we have about others. Just think that **only 3%** of Nobel winners in STEM subjects, from 1901 to 2020 are women. Of course the situation was very different and it is slowly changing, especially at the "lower" level: we are seeing more women enrolled in STEM studies, but the higher the level they occupy, the more isolated they are. It is a well-known phenomenon, called "**leaking pipeline**", which can also be seen by looking at the annual gender report of our



University: at higher levels, science loses contribution from women (for instance, the department of industrial engineering has no female professor). This does not depend only on education or interest that I was mentioning before. For instance: in case you want to build a **family**, the burden of motherhood is still on the women's shoulders for the majority of cases, acting as a **deterrent** for anyone.

You've created a podcast where you interview women scientists. What have you learned?

Yes! It's called "*Un laboratorio tutto per se*" ("A lab of her own"), inspired by one of my favourite writers, **Virginia Woolf**. I made it in collaboration with *She Is a Scientist*, an association to promote women in science. I wanted to create something to promote the research of Italian women in science and to serve as role models for anyone really. I met some incredible scientists and leaders that kindly and proudly opened, virtually, the doors of their lab to show the amazing things they do in their everyday life. We talked about gender differences in **medicine** with **Dr. Silvia De Francia**: did you know that medicines are actually tested only on men, and this means that in the majority of cases, us women are always taking higher doses than we should? **Dr. Anna Grassellino**, director of the FermiLab in Chicago, told me about the quantum computer they are building: the most powerful computer ever made. If that is not mindblowing, I don't know what is!

I went deeper into the science of **gender studies**, happily combining my biggest joys in life, **science** and **feminism**: **Dr. Tullia Toschi** explained how to implement a Gender Equality Plan on a European scale which can be adapted to different realities. A very fascinating interview was that with **Dr. Sabrina Masiero**: she literally took me on a journey around the Universe and beyond, talking about exoplanets and life as an astrophysicist. I also wanted to add a young researcher voice: **Eleonora Piersanti**, PhD student in Applied Mathematics at University of Oslo, talked about the highs and lows of the **PhD**, a recipe to go through to have a rough idea what to expect if you are playing with the idea of embarking in one.

I also took the chance to investigate the role of **failure in science**. Women, in general, are more afraid to fail: we are educated to be perfect, or strive to be. This stops us from trying, from just diving into experiences and learning from our mistakes: a crucial step for growing and getting more and more confidence..and discovering new things (quite important if you are a researcher!). That's why at the end of each episode I ask for a funny episode of failure they remember and what they learned from it: I wanted to show that even very successful leaders and scientists did and still do make **mistakes**, and that does not take anything away from achieving amazing results.



Any ideas for future projects in mind?

I have a new line up for more episodes of “Un laboratorio tutto per se”, where an Euroavia Alumni could actually show up and talk about her impressive career we can all draw some inspiration from! Concerning **Monnalisa**, we have some projects boiling away in the pot, so keep an eye on the page and feel free to suggest or get in contact with us if you have any ideas! As I was saying, we love discussing ideas with people and getting input from them, because that's the voice we want to amplify!

Thank you Lucia!

Elena Tonucci



A chaotic journey into architecture

The pursuit of perfection: when science and nature lead men to build the greatest of things. The role of the mysterious and fascinating "Golden Ratio" in architecture and the fusion of science and nature in the Burj Khalifa.

WARNING!

THIS ARTICLE COULD INDUCE THE READER TO BE CREATIVE, PLEASE FASTEN YOUR SEATBELTS

As humans, we love believing that nature and the course of our life follows **perfect** patterns ruled by rigorous laws.

We always remain enchanted when we look at structures such as the **Parthenon** and the **Taj Mahal**. Both were built according to the **golden ratio**, namely, a particular

proportion known since the time of ancient Greeks which represents harmony and symmetry. Even some plants and organisms exhibit the golden

ratio. Another **magic** structure observable in natural rocks are arches.

We could ask ourselves: “Why are they standing?” The answer is: “Because of science and mathematics”.



Our brain is biased to finding regular patterns in everyday life, searching for answers often precociously. In this journey we will discover how architecture is a **form of art**, the **physics** and **engineering** behind it, and our mind's projection on human nature. We should thank the great work of these brilliant scientists, patrons and artists!

Let's start with the **golden ratio**! If you take a line of length "c" and divide it into two smaller segments "a" and "b", with "a" being about 1.618x larger than "b", their ratio is an **irrational number** called the *Golden Ratio*. We find this Golden Ratio in a lot of human architecture, dating to even before the Greeks, arising through the portrait of *Monna Lisa* and in **Fibonacci's sequence**: when it approaches infinity, the proportion between the next and previous number converge to this *Golden Ratio*.

This *magic* number is also present in plants and in the spiral of the **nautilus**. For a certain time, it was believed that the strands of DNA itself exhibited the Golden Ratio, but it was eventually proved wrong despite the number being similar! This number is as catastrophic as

the Pythagoreans' discovery of the irrationality of the **square root of 2**, which brought about the sentencing of death by drowning to the discoverers...

Our life is full of surprises, sometimes positive, sometimes not. However, when we believe that something is **perfect** we become willing to do anything to prove it!

This is what exactly happened. If we now bring our line up to a higher dimension, we retrieve a **Golden Rectangle** and psychological studies have proved it to be the most *beautiful* rectangle in the world! We can even find it in the **Le Corbusier** movement in the 20th century, which explains why it is so frequently used in architecture.

Beauty, impression and majesty is what a medieval European

Prince (or a modern Arab sheik) would have been presented to a citizen coming from another kingdom. During the 1100s, in France, the **gothic architecture** became popular: high and imponent churches beautifully decorated on the outside with amazing sculptures with more detail than the King's portraits, and bright on the inside! This is the way humans like to appear in front of



unknown people. All modelled following the Golden Ratio.

For a long time, these buildings were the limit of construction altitude. It was only recently that **skyscrapers** began appearing in Europe, definitely later in comparison to Asia and North America.



The **gothic cathedrals** are supported by structures following the Golden Ratio: the arches, especially the **catenary**. They were designed with the task of bearing the church and their characteristic shape help explain the interesting mathematical and physics properties of **catenary arches**. The arch mathematically looks like a **parabola**, described with **hyperbolic equations**. To understand them practically, follow this example: search for a chain (even that of your own bike), take it from the two extremes and let it fall down the center; congratulations you

have a **catenary**!

This specific intuition was recorded in one anecdote by Robert Hooke. After the great fire of London in 1666, the Architect Cristopher Wren asked Hooke: "*How can I build the biggest dome possible?*". Mr. Hooke, by taking a chain and showing the experiment, replied that in such a configuration, the **weight** is **uniformly supported** and therefore **stable** for tall structures. Nonetheless, the mathematical properties of such a curve were derived

just a **century later**, and the most impressive fact is this specific curve was known by ancient Egyptians. Even the Brunelleschi dome follows a catenary path!

Catenary can be art, too. The **Gateway Arch**, a giant catenary, is the symbol of Saint Louis in Missouri, which specifically represents the expedition undertaken by Louis and Clark in 1804. Doors and gates are also supported by arches, but why not **decorate** them?? The Gateway Arch fully represents our

curiosity and explorations, and is less focused on appearance. In the past, Dukes used to boast palaces, properties and rewards. Nowadays, people boast beautiful cars, expensive clothes and it has become common for the statement *it is all about appearance* to be used. We could, however, disagree.

As explained before, the inside of some buildings can contain patterns of arches



with **mathematical** and **physical properties**, where specific studies on materials have been done to achieve these operas. Arches are also present in nature and are observable all around the globe, creating amazing **natural landscapes**. It is time to analyze the case where science, appearance and nature meet together to create one of the most extravagant places in the world: the **United Arab Emirates**.

As a matter of fact, until some decades ago, the cities of Abu Dhabi and Dubai

were anonymous fisher villages. However, after the discovery of the presence of wide **oil reserves** in the entire Emirates, specifically in Abu Dhabi, these villages grew up economically and, literally, in height. In Abu Dhabi, the sheik and founder of the state commissioned a giant and gorgeous **mosque**. With millimeter details and expensive decoration, it is paved with the biggest **Persian carpet** in the world. Not

bad for a King that a couple of years before ruled a poor state subject to pandemics.

As far as Dubai is concerned, we find that the source of revenues was lower than the one of the capital city. Therefore, the sheik decided to transform Dubai into a **financial hub**. In approximately a decade's time, tall skyscrapers and all kinds of roads as well as airports and even a ski center appeared in the middle of the Persian Gulf! Some may argue against these choices, however we can find

inspiration here and analyze the construction structure of the tallest building in the world: the **Burj Khalifa**! The base section is inspired by *Hymenocallis*, a common **plant** in the Arabic peninsula, that possesses **aerodynamic properties** used to resist strong winds at high altitude and to maintain stability. The structure of the *Hymenocallis* branches normally stops at the top of the plant, which for the Burj Khalifa means to terminate at 828m. This is what you get when you mix a successful pattern of nature with the intelligence of mankind.

Modern architecture is leaning towards building higher and higher, somewhat representing the strength of a nation, however it presents other advantages. **Limited construction areas** can be exploited to their full potential (see similar examples in Hong Kong and Singapore), and **water, electricity** and **gas** can be easily provided to the inhabitants.

Since the beginning of the construction era, humans have always found **harmony** with the surrounding environment and this has been a constant throughout

history. You can travel to every corner of the globe and you'll see the balance between construction and nature (this is however not true for block apartments!).

We as humans have always looked for **perfection** and **found**, in our universe, some forms of regular paths, so what is perfection? *The answer is relative* would have said a psychologist, but an architect would simply act to create perfection by exploiting the **power of science, mathematics, geometry** and the magic ingredient: **creativity**. All this, to eventually give birth to an amazing creation with the name of architecture. From an architect's point of view, all the gorgeous and stunning ornaments that he designs inside a church is, metaphorically, the signature of himself in the physical reality.

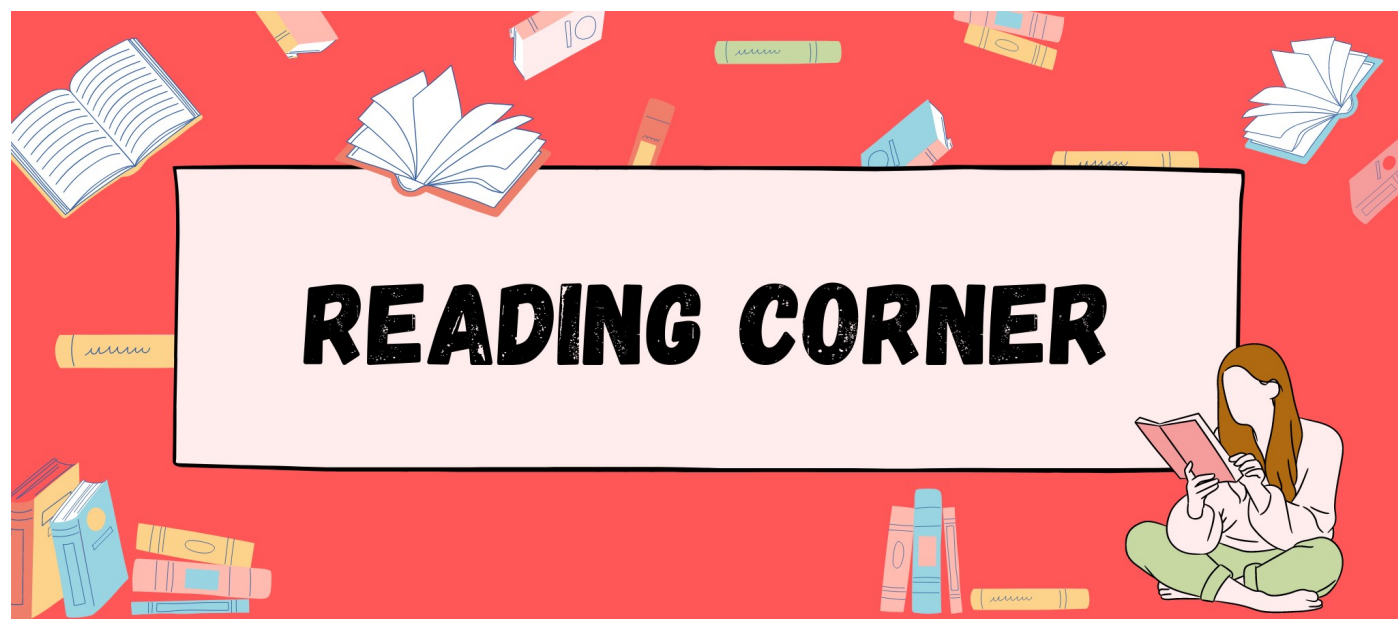
To conclude, with bias and chaos, I think that our brain is helping us to find a base to start our own journey into this complex but amazing world. Let's not forget that ***we are the sole leaders of our own brain!***

Francesco Pio Marasco

Francesco Pio Marasco

My name is Francesco and I am an explorer of everyday life. By pursuing the discovery of nature's best landscapes and panoramas, I adventure around the world with my bicycle or climb rocks of any type on my path.



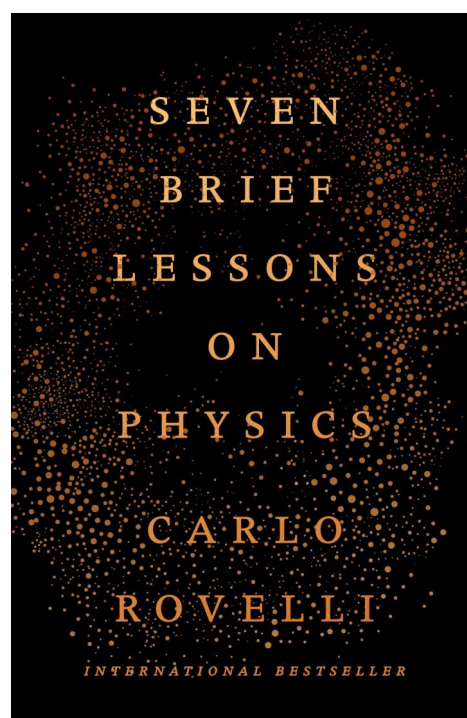


This section was created with the aim of showing different aspects of scientific literature, from purely popular ideas ones closely approaching the sci-fi world. We hope that our literary tips will be welcomed by members that are reading enthusiasts!

“Here, on the edge of what we know, in contact with the ocean of the unknown, shines the mystery and beauty of the world. And it’s breathtaking.”

Seven Brief Lessons on Physics is most definitely a vast journey in the deepest science you could imagine.

Rovelli acts as a sort of guide that leads the reader through the complexity of Nature. We live in a very strange world, governed by very strange rules. The writer



explains that, on one hand, the universe seems to obey our elegant equations and, on the other, there doesn’t seem to be a way to simplify the disorder in the **Standard Model**. The latter is a theory that makes predictions about the world in an absurd and convoluted manner; it is made up of various pieces assembled without any clear order, “it’s as if God had not designed reality with a line that was heavily scored, but just dotted it with a faint outline”, unbelievable!

However, this small book does not pretend to be able to explain everything. I think the purpose of the

book is to picture physics as a work of art, as an infinite and sublime painting.

Rovelli teaches the reader why there are no things in the world apart from **temporary events**, how heat and time are related, what an atom of space is and why it might be the missing piece of the puzzle in the desperate attempt of connecting the **general theory of relativity** and **quantum mechanics** with the beautiful loop **quantum gravity theory**; what the Big Bang is and why it could have been a **Big Bounce** and, most importantly, how we could live in this world entirely based on interactions, on happenings.

If you are a science enthusiast, or just a curious person, this little big book is an opportunity that you shouldn’t miss out on.

Beatrice Boccadifuoco

“Science fiction is something that could happen, but usually you wouldn’t want it to. Fantasy is something that couldn’t happen, though often you only wish that it could.”

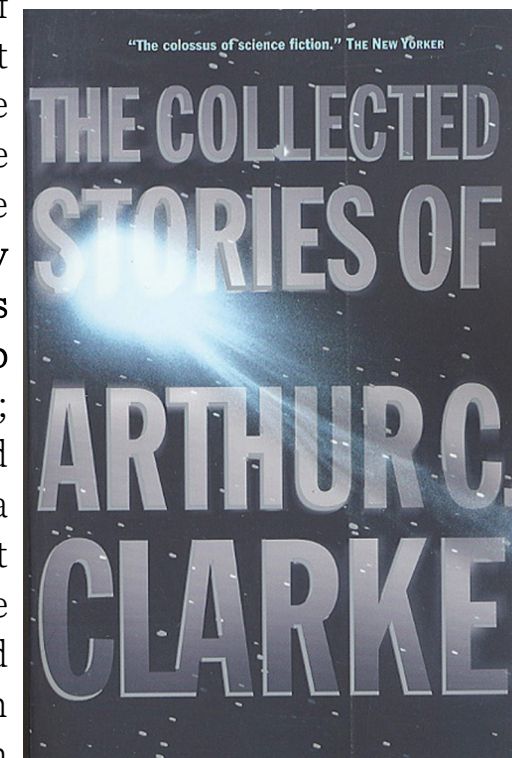
The Collected Stories of Arthur C. Clarke is a massive compendium that brings a total of 116 short **science fiction stories** written by Arthur C. Clarke throughout his life together. Variety is the keyword for this collection; in fact, the stories’ original publication dates range from 1937 to 1999 and their length is also rather varying, from 20 pages to as short as a single page.

Most stories are glaring examples of Clarke’s commitment to strict scientific accuracy and his **optimism** towards technological growth. However, it is quite curious that his most praised stories were

those with metaphysical, and somewhat religious, concerns. The top three stories we recommend from this collection are:

Retreat from Earth (1938) – Technologically advanced extra-terrestrials plan on occupying our planet, which has already been occupied by other aliens millions of years ago. These creatures live among us in real life even to this day. A terrific, detailed explanation of the “aliens” form and social structure is provided, and they are certainly not what you’d expect...

The Nine Billion Names of God (1953) – In a Tibetan monastery, the monks seek



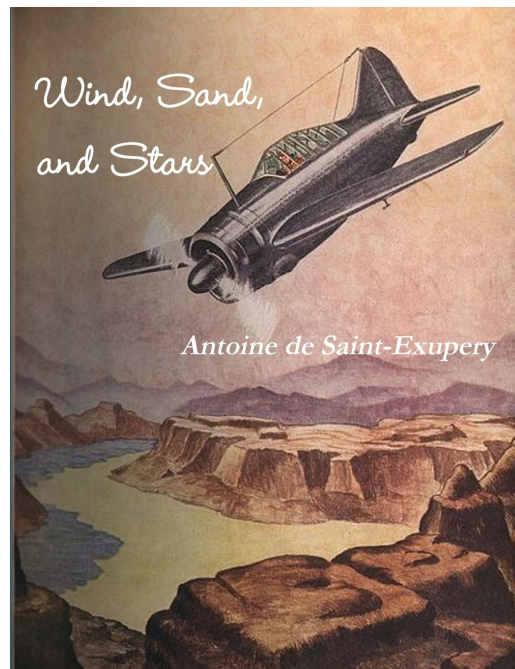
to list all the names of God. They believe the Universe was created for this purpose, and that once this task is completed, God will bring the Universe to an end. They now wish to use modern technology finish quicker. Will they succeed? - In 2003, Clarke reported having been told that even the Dalai Lama had found the story "very amusing".

The Songs of Distant Earth (1986) – A utopian human colony in the far future is visited by travellers from Earth, that has just been destroyed. The travellers bring memories and stories from the forgotten distant Earth to the colony. This is a very touching story and Clarke himself stated that it was his favourite of all his novels!

This book really manages to collect stories for all tastes, and it is impossible not to find one which sticks in your heart. With his awesome inventiveness and openness of mind, Clarke is one of the most cherished science fiction writers: if you are a passionate, this collection should be without a doubt on your bookshelf.

Elena Tonucci

"We must surely seek unity. We must surely seek to communicate with some of those fires burning far apart in the landscape."



There was a time when Aviation was synonymous of bravery and the Aviators were the greatest heroes of this period. In the unsteady landscape between the two World Wars, those men were opening new routes in the most harsh regions ever known: from Paris to Buenos Aires and from New York to Río Grande over the

blasterous Atlantic Ocean, through the freezing "Cordillera de los Andes" and over the vast and empty Sahara Desert. As common factor among these men, it laid the deep bond between **the man and the machine**: a mutual relationship, symbiotic in some ways, keeping both alive.

Wind, Sand and Stars (Terre des hommes), written by Antoine de Saint-Exupéry, is the logbook of the aviator Antoine de Saint-Exupéry in his years as airline pilot at the company Latécoère. Frequently alone up in the sky, lashed by sand storms on the ground, sometimes even deceived by winds, the Aviator bestows us with the most compelling of all the tales about the toughness and wonder to be humans over the sorrows and the joys of life.

Thus, *Wind, Sand and Stars* is both a gripping tale of adventure and a poetic meditation over humankind. Interweaving encounters with nomadic Arabs and other adventures into a richly

textured autobiographical narrative, it reaches its climax in the extraordinary story of Saint-Exupéry's **crash** in the Libyan Desert in 1936 and his miraculous survival.

To conclude, I would like to cite the beautiful summary given by Sam Jordison of the Guardian over the reading purpose in this book:

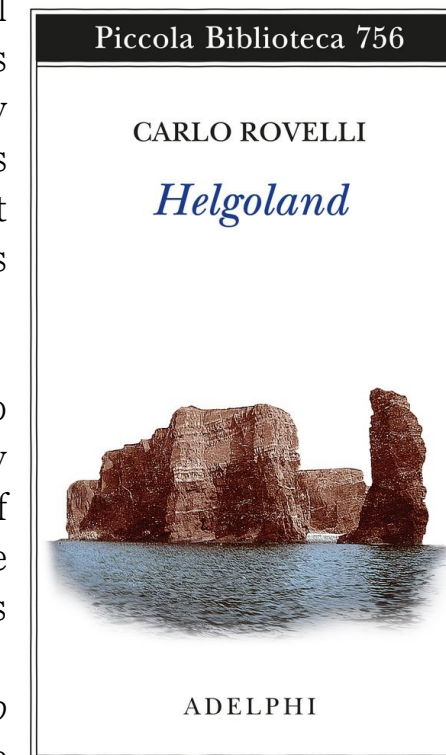
"This book is of deep significance to anyone who has benefited from air travel – and that's everyone. [...] He is just someone who pulled on a leather flying jacket, climbed into the exposed cockpit of a flimsy plane, got its propellers roaring and pointed its nose into the vast blackness of the night sky: his future, our present."

Giacomo Semprini Cesari

"If what I have described seems perfectly clear, then it means I have not been clear enough about it."

Helgoland is a book written by **Carlo Rovelli**, a theoretical physicist as well as a science communicator.

The title refers to an island located in the North Sea, where in 1925 the German scientist **Werner Heisenberg** discovered the mathematical structure of quantum



theory capable of explaining **Niels Bohr's** previous observations concerning the **behaviour of electrons**.

The essay is divided into three sections.

In the first part, the author talks about the birth of the theory and the impact it had on scientific debate, especially through the key-ideas in quantum physics: the "observables", "probability" and "world's granularity".

The concept of "observables" refers to Heisenberg's absurd idea of focusing your attention on the observable aspect of nature such as light intensity and frequency rather than looking at an electron as an object moving with a trajectory and renouncing explanation for its motion.

The "probability" concept alludes to the fascinating but misleading physical and philosophical speculations **Schrödinger** had about the undulatory behaviour of the electron, a suggestion destroyed by **Max Born**, who thought that Schrödinger's equations simply described the **probability of observing** an electron at a certain point in space, **not a real entity** as Schrödinger thought.

Finally, the "world's granularity" concerns the quantum aspect of nature, which is a topic that partially emerged within **Planck's**, **Einstein's** and **Bohr's** research.

The second part deals with different

interpretations given by physicists. Rovelli presents several hypotheses, such as multiverses, hidden variables, physical collapses (all based on Schrödinger's intuition) or QBism theory.

After this, he goes to explain the **relational** interpretation which, according to him, is the most powerful, suggestive and prolific among other interpretations. This view allows us to glimpse into the revolutionary and unsettling view of quantum theory: the physical world is not a set of objects with defined properties, rather it **exists only as a net of relations** whose **objects constitute the knots** of this net. This perspective provides a new radical way to consider the world around us and its components, which exist only in the way they interact with something else and never as an isolated entity. If the electron doesn't engage with anything, it has neither position nor speed!

Another aspect concerns the **reality of properties**: in a relative world, if the properties of an object are real with respect to a second object, they aren't necessarily real in regards to a third! All truths are such only within the

interaction between two different systems: an observer and an observed, so **what is real for me may not be real for you!**

In the last part the Italian physicist invites the readers to reflect on the previous pages and assume an **anti-metaphysical view** to really understand a world that is built by relations and not objects.

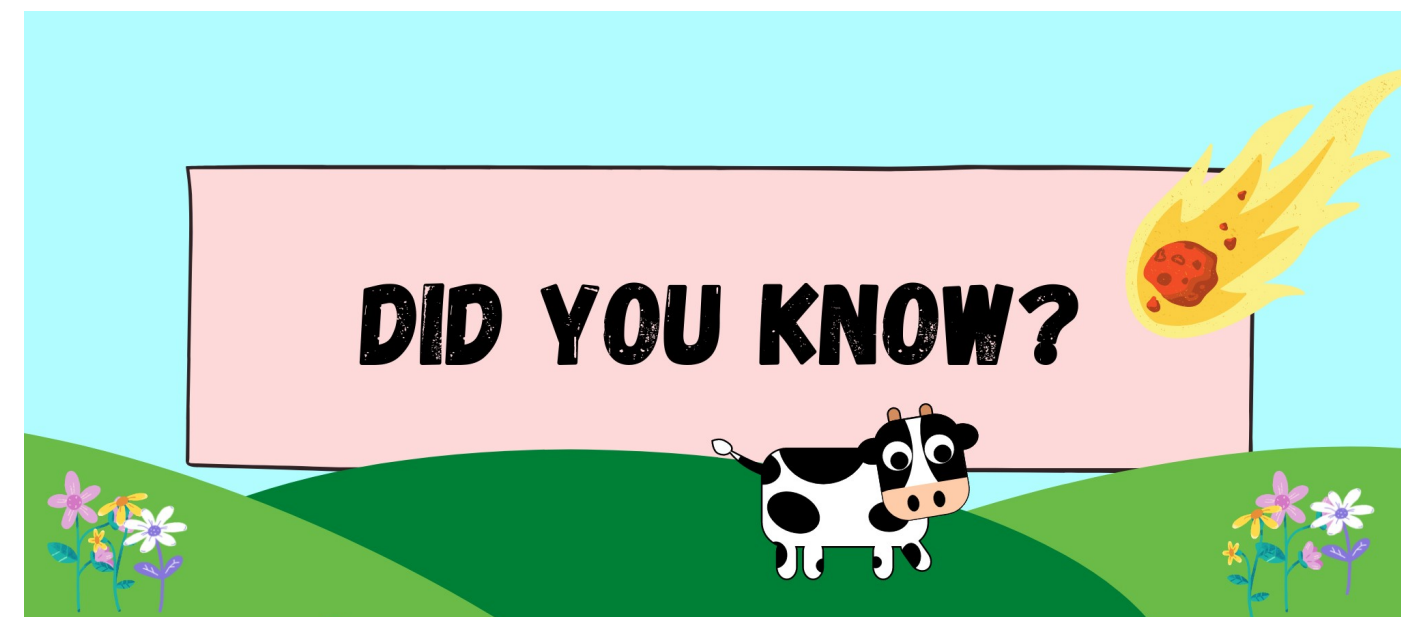
This is not a completely new concept for the world; similar perspectives exist in ancient Indian philosophy! Rovelli refers to Nagarjuna's thoughts, an author who lived in the 2nd century who, in his book **The rooms of the Way of the Middle**, sustains that things do not have an independent existence outside interactions with other objects.

The strength of Rovelli's book is its easy-going but exhaustive style which allows both experts and beginners to understand the message the author wants to convey; through simple and passionate language and by narration of the writers' life experiences and thoughts.

Eros Cervoni

Eros Cervoni

Philosophy student and football lover with a growing interest in physics. He likes chilling with music, especially Italian hip hop and rap, even if he has a weakness for De André and other Italian songwriters.



Mad Science, in the Kitchen

Who hasn't stood in the **kitchen** boiling their eggs or frying an omelette, wondering about the **physics** and **chemistry** behind breakfast? I know very well that I have, and I am not the only person who did. It turns out that plenty of scientists have been stewing in the kitchen with their minds on the *how? and why? of it. They don't see food as anything but a molecular puzzle.*



The field of **food science** has been an important discipline in the food industry for a while now. It focuses mainly on the composition, production and nutrition of food, keeping a close eye on the safety risks for consumers. However, since the

end of the last century a new branch of culinary science has sprouted in the kitchen, with renewed interest in techniques and recipes using basic **scientific principles**. This branch is called **Molecular Gastronomy** and has been dubbed so by Nicholas Kurti and Hervé This. These two Oxford physicists got in touch through their love for cooking and science. They decided to start a series of workshops offered to both chefs and scientists bringing these two professions together.

This mixture of **cuisine** and **technology** has resulted in some interesting and

strange cooking techniques in which we are able to create tasty air (*emulsification*), exploding bubbles (*spherification*), powdered nutella or use flash freezing to make a dashing garnish. Even stranger than the cooking techniques might be the recipes like egg and bacon ice cream, soup dumplings, transparent ravioli or edible riverstones.

An indication, however, of how delicious molecular cuisine really is, is the amount of **Michelin stars** that have been awarded to molecular gastronomy cooks over the years. Famous cooks like Ferran Adrià, Heston Blumenthal and Raymond Blanc have served crowds of people with one

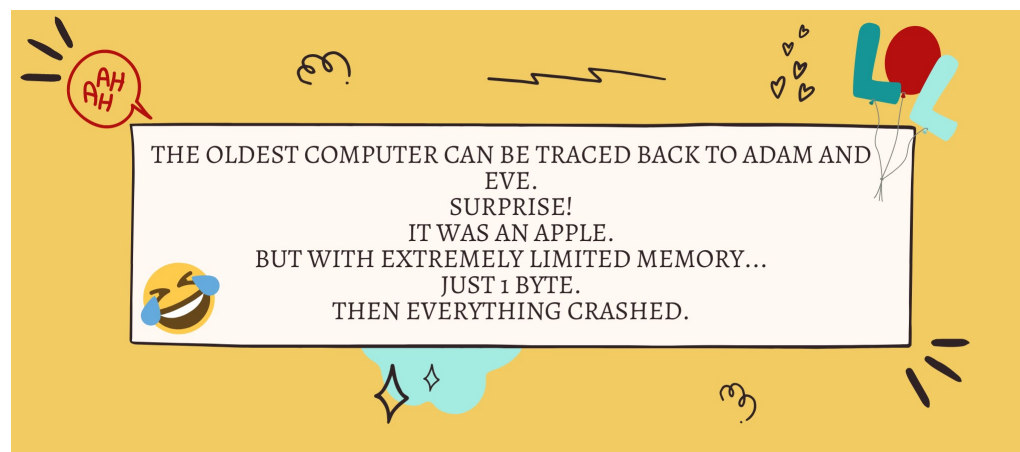
mind-bending dish after the other, proving that a chemistry lab might be as good a place to cook as your kitchen at home, if not better.

For those who, like me, are interested in cooking and fumbling around in the kitchen as well as in a laboratory should watch the lectures of Kurtis and This available online or read “*Molecular Gastronomy, exploring the science of flavour*”, in which This discovers the truths and untruths of the culinary world.

Bob Van Der Wijst

Bob Van Der Wijst

Calm, sensible and filled with laughter, his biggest passion is to discover and create. He loves to travel, cook and do science wherever he goes.



Beer in Space!

Have you ever wondered if it is possible to drink **beer** in space?

First of all, alcoholic drinks are now generally forbidden in spaceflights, but space agencies did previously allow them. There are several problems linked to the consumption of alcohol in space, however two daring Australian companies are trying to overcome all obstacles in order to create a new, tasty beer for astronauts: the **Vostok Space Beer**.

One of the main difficulties is the difference in alcohol **absorption** by the human body. For instance, when in space, the tongue puffs up altering the taste of foods and drinks; which is why the Vostok Space Beer has a strong and full-bodied taste. Moreover, beer is poorly suited for space use because of the **gas** it includes. In fact, since astronauts live in a zero-gravity environment, it's impossible to pull liquids to the bottoms of their stomachs, so gases remain at the top and astronauts tend to produce **wet burps**.

Another huge problem is connected to the liquid's **inability to pour** in zero gravity. Actually, without gravity, bubbles cannot rise, so the foam has no limit. Therefore, a special **space beer bottle** is required. With Vostok, the two companies are trying to improve on the drinkability of space beer by allowing astronauts to drink beer without a straw. This is possible thanks to the new **bottle's passive feed system**, which uses surface tension: it moves beer from the bottle's bottom to its top. The bottle design has already passed several tests to evaluate how well the beer maintained surface tension with glass, plastic and stainless steel. A simulation study and fluid-flow analyses were performed to look at the bottle's wicking insert, which is responsible for passive movement. Finally, in a parabolic flight with microgravity conditions, they validated the beer using the initial bottle prototype.

Beatrice Boccadifuoco



Credit: All Rights Reserved © 2017 Vostok
Mihailodaj

Sheldon's number

Sheldon's number is present in a lot of episodes of "The Big Bang Theory", primarily because the protagonist often wears t-shirts with the number "73" printed on them. But why is this Sheldon's favorite number? One very simple reason may be that Jim Parsons, the actor, was born in 1973. But could such a well-thought story be based on such a simple fact? Of course not.

In fact, it is no coincidence that the explanation appears in a dialogue of the 73rd episode, where Sheldon states the most important mathematical properties of the number.

First of all, it's the 21st prime number, and 21 can be obtained from the product of its digits ($7 \times 3 = 21$). Furthermore, the mirror of 73 is 37, which is the 12th prime, and 12 is the mirror of 21. Last but not least, the binary form of 73 is

1001001, a palindrome number, which means that it can be read from left to right or vice-versa without changing its value. Pretty awesome!

But the story gets more interesting: the Morningside College mathematics professor Chris Spicer got interested in proving that 73 is the **only** natural number with these properties after watching the episode. He managed to get the attention of the colleague Carl Pomerance of Dartmouth, and together they succeeded in finding a **demonstration**. Indeed, the number 73 was named "Sheldon's number", as an homage to Sheldon Cooper, the protagonist of "The Big Bang Theory" who inspired this mathematical discovery!

Riccardo Casali

Riccardo Casali

Keen on mountain sports such as ski racing but also mountain biking and hiking. He loves applying physics to reality and solving difficult problems.



Thanks to all the contributors of the magazine!

Kai Aidan Growcoat

Half Italian, half English,
Astrophysics Graduate from the UK.
Love gaming, space and beer.
Planning on helping humanity



Fabio Galuppi

Aviation and photography enthusiast,
Aerospace Engineering's student
at Bologna University in Forlì and
current member of EUROAVIA Forlì
-Bologna within Design WG



Chiara Paceschi

Passionate about space exploration,
simulation and control programs.
She is dividing her time between
university, helping with Design WG,
being the forewoman of Dinamic
Vehicle of Alma-X and private life.



Elisa Piergiacomini

A girl passionate about space
exploration and everything related to
mathematics and physics. She loves
traveling and listening to music.
You'll either find her studying or
having fun with her friends.





EUROAVIA

Forlì - Bologna

ISSUE 3 - MAY 2021