Get to know the corrosion fighters

They have told us their story, how will yours be?

RICCARDO BIELLA

Winner of **Best Oral Presentation - Eurocorr 2023**

Could you give us a little presentation of yours?

I am an aerospace engineer pursuing a PhD in the field of organic anticorrosion coatings at the Aerospace Structures and Materials department in the Aerospace Engineering faculty at TU Delft under the supervision of Prof. Santiago J. Garcia. I got my bachelor's in Rome, at the La Sapienza University, and flew to the Netherlands to get my Master's degree at TU Delft. I was always interested in the pursuit of space and the possibilities it poses; however, during my Master, I realized I am more interested in material science than in other aerospace engineering fields. My internship in the Materials and Processing section of the European Space Agency made me realize the importance of advanced materials in the space field. During my Master's Thesis, I had the opportunity to work in the group of Prof. Santiago J. Garcia and found the topics researched and the approach extremely interesting. Therefore, I decided to pursue a PhD in that direction.

What do your studies consist of?

I focus mainly on understanding how the properties and composition of colloidal waterborne coatings interact with water and electrolytes with the goal of providing design guidelines to improve their anticorrosion properties. To do this, I am trying to combine knowledge and insights from various fields such as polymer physics, membranes, and metallurgy into a truly multidisciplinary approach.

How did you get there? What motivatedyou to do this?

To be completely honest, I started this project without knowing much about anticorrosion coatings; it seemed like the perfect opportunity to explore another field with a good professor, a project full of opportunities, and a collaboration with great scientists at industry (BASF).

Before the PhD, I had the opportunity of working with the same team on my Master Thesis. During the MSc thesis, I really enjoyed not only the project but also the environment around me. When the opportunity came to turn it into a PhD, I had no doubts.

What do you like the most about your activities?
The diversity in the activities I need to do. I am confronted with a vast array of problems and techniques to solve them, ranging from chemistry to polymer physics to electrochemistry. Moreover, the rich scientific community at TU Delft allowed me to collaborate with other faculties, broadening the scope of my knowledge beyond my specific field.

Is there something you don't like?
Sometimes, the PhD journey feels like a lonely one. Extremely few people fully understand what I do due to the relatively specialized nature of the project. It is also difficult to communicate what I do to people who are not technical, such as my family and friends.

How did you get here? How did you discover this world?
I first got interested in materials science following a lecture from my Bachelor material science professor, Prof. Teodoro Valente. In his memorable speech, he noted how many technological leaps were enabled by fundamental advances in material science.
In my Master's, the courses of Prof. Garcia were the most interesting, as they delved deep into the relationship between material structure and properties. Due to this, I chose him as my thesis supervisor. During the thesis, I realized not only the impact of corrosion but also the complexity hidden in this problem.

If you didn’t dedicate yourself to this field, what would you have liked to be?
A car mechanic. Not only do I love cars themselves, but I also love mechanical systems in general, and I would have loved to have a little workshop for niche or prototype cars.

Where do you see yourself in the future?
Being in my first year of PhD I do not know yet what I will do after; however, I know I still have the idealistic dream of working on a high-level mission for the European Space Agency and watching the launch of a spacecraft I worked on.

Do you think networking will be important to get there?
I think networking is an important skill to get anywhere, as I believe that having a five-minute chat with someone allows one to showcase one’s character and abilities infinitely better than any number of emails, motivational letters, and curriculums.

Do you think your field of studies needs more visibility?
Absolutely. Despite the huge impact that corrosion has in aerospace and several other fields, I think it is still considered a relatively niche topic, and more awareness is necessary. Also, focusing more on sustainable anticorrosion coatings and inhibitors will allow the field to become much greener.

In your opinion, what is the single most valuable attribute is researcher should have?
Creativity and the ability to think outside the box. Incredible things can be done without it, but I do believe creativity to be the key ingredient to unlock new knowledge.

What advice would you give to students in an early stage of their careers?
Difficult to say, as I am in my early career myself; however, I would say one of the most valuable factors until now was a proper mentor.
So many little details of how to navigate the industrial and academic worlds are not really written anywhere and are solely based on experience. Having someone with that experience who is willing to pass it on can be absolutely invaluable, and can help avoid many “teaching experiences”.

Could you say how you see the future of engineers/corrosion scientists?
Not really, since I am still extremely early in my career, but I can try!
I think especially in the field of anticorrosion coatings, interdisciplinarity will be the name of the game in the future. In particular, it will be necessary to combine clever experiments, new models, and simulations to better understand the interaction between the metal, the corrosion products, the corrosion inhibitors, and the polymer chains.
Moreover, I believe bigger collaborations will be needed to acquire the massive amount of data necessary to fully exploit the potential of AI in the field.

Corrosionist… is it born or made?
Corrosion is such a complex phenomenon that I would be surprised if a corrosionists are born. Luckily it is also interesting enough to make people into corrosionists :)

TO END… COULD YOU TELL US…

- **A color**:
- **A number:**
- **A song**:
- **A hobby**:
- **A city**: