

News

“I Don’t See This as the End”, interview with Dr Bondar

In March 2023, Dr Yuliia Bondar arrived in Prague to begin her MSCA4Ukraine fellowship at the Faculty of Environmental Sciences. Her project focused on cadmium isotopes and soil remediation, contributing to one of the most pressing environmental challenges linked to heavy metals. We spoke with Dr Bondar and her host supervisor, Prof. RNDr. Vladislav Chrastrný, about the experience, the science, and what this type of fellowship can bring to a university community.



What were your first impressions when you arrived in Prague and joined CZU?

Yuliia Bondar:

“I arrived in Prague in March 2023. By that time, Ukraine had been at war for a full year. I had spent it in Kyiv, living through daily airraid alerts, explosions, and frequent blackouts. So, my first impressions of Prague were of an unusual silence (there were no sirens), smiling passers-by, and evening illuminations. I was amazed by the city’s elegant architecture, immaculate streets, efficient public transport, and the genuine friendliness and willingness to help shown by its residents.

The next day, I visited CZU. The campus and laboratories of the Faculty of Environmental Sciences exceeded my expectations. Cutting-edge analytical instruments such as ICP-OES (inductively coupled plasma optical spectrometry), ICP-MS (inductively coupled plasma mass spectrometry, and TIMS (thermal ionization mass spectrometry), coupled with modern facilities and the immediate opportunity to begin experimental research, made my heart race with excitement. It truly felt like a dream come true.”

Your project focused on cadmium in soil. Why is this important, and what did you aim to solve?

Yuliia Bondar:

“Soil contamination by metals is an increasing environmental concern. Cadmium is particularly hazardous due to its high mobility, persistence, and toxicity. It is classified as a human carcinogen and has no safe exposure level. The biggest problem is its accumulation in agricultural soils, from where it can enter the food chain.

My study aimed to synthesise effective mineral amendments based on natural zeolite that would stabilise cadmium in contaminated soils, using mechanisms like surface complexation, precipitation, structural incorporation, and long-term adsorption, to reduce mobility and plant uptake.”

From your perspective, what did it mean for our faculty to host a fellow through this programme?

Vladislav Chrastrný:

“Hosting a fellow through the MSCA4Ukraine programme was a deeply meaningful experience, both professionally and personally. It allowed us to support a highly talented researcher, Dr Yuliia Bondar from Kyiv, during an exceptionally challenging period, and to actively contribute to preserving scientific continuity in the face of conflict.”

The project involved international collaboration. How did that work in practice?

Yuliia Bondar:

“My work was part of a large-scale project titled *‘Decipher the specific cadmium biogeochemical cycling in the soil-plant continuum: insights from Cd isotopes’*, bringing together four research groups from the Czech Republic, France, Spain, and Ukraine. I didn’t experience any communication difficulties; everything was resolved efficiently during regular online meetings on Teams.

What stood out to me was the interdisciplinary and collaborative approach. Research teams from across Europe joined forces and used cutting-edge analytical equipment to study both short-term processes in the soil-plant system and long-term field dynamics in detail.”

Prof. Chrastrný, how did this research complement the work already being done at FZP?

Vladislav Chrastrný:

"The collaboration was enriching. The project aligned well with our ongoing research on soil contamination and brought perfect synergy. Dr Bondar added real value to our academic environment. Her practical knowledge of amendment applications and field-based methods complemented our laboratory-focused approaches."

Your project involved developing modified zeolite granules. What did you find?

Yuliia Bondar:

"The idea of modifying zeolites with metal oxides is not new. For example, they are used in purification of contaminated water. The novelty of our work lies in the targeted synthesis of composite zeolite granules coated with specific phases like birnessite (a layered manganese oxide) or ferrihydrite (a reactive nanoscale iron oxyhydroxide). Further testing with different oxide structures will help us identify the most effective ones.

What surprised me was how few studies exist on using these materials for cadmium stabilisation in soil. Our results show that the composites slow down the mobility of cadmium, as well as copper, lead, and zinc. This makes them suitable for remediating a range of contaminated soils."

You presented your results at several conferences. What was that experience like?

Yuliia Bondar:

"Unfortunately, I was unable to present the results of my work at specialized "soil" conferences. Instead, I presented at conferences on nanotechnology, where researchers are familiar with the risks and potential of nanoparticles and nanocomposites. My work generated considerable interest. I saw real potential to apply these materials in environmental protection, especially in Ukraine, where soil contamination from military activity is a growing concern."

International collaboration was a key part of the project. What role did CZU play?

Vladislav Chrastrný:

"CZU served as the coordinating and hosting institution, providing the core scientific supervision and infrastructure for the fellowship. We facilitated experimental design, laboratory analyses, and data interpretation, and ensured close integration with our international partners, e.g, University of Oviedo, Spain, or Université Nantes. Our role also involved maintaining active communication within the network and supporting dissemination of results. Overall, CZU acted for the connection between international institutions."

Dr Bondar, you also visited partner labs. What did those visits bring to your work?

Yuliia Bondar:

"I did more than just visit; I conducted experiments, exchanged samples, and discussed future collaboration. The MSCA4Ukraine fellowship gave me the chance to build relationships with European teams.

Many Ukrainian researchers hesitate to approach international partners because of limited funding or outdated equipment. However, my visits convinced me of the openness of European scientists and their genuine interest in working with Ukrainian researchers. I will make every effort to convey this message to my Ukrainian colleagues and develop closer ties with the international scientific community."

What did you learn institutionally from taking part in MSCA4Ukraine?

Vladislav Chrastrný:

"It showed us how important it is to maintain flexible and supportive structures when hosting researchers affected by crisis. Strong mentoring, clear communication, and responsive administration were essential. It also reinforced the importance of scientific solidarity in times of crisis."

How did this fellowship impact you professionally and personally?

Yuliia Bondar:

"Professionally, it gave me access to advanced equipment and new methodologies. I was able to work with leading experts and present at international conferences, which improved my communication skills and broadened my network.

Personally, the fellowship provided me and my family stability and purpose during a very uncertain time. It gave me the confidence to continue my scientific work despite the uncertainties caused by the war. I also experienced the value of academic solidarity and support, which was truly motivating and uplifting. Overall, the MSCA4Ukraine fellowship was a turning point in my career, providing me with resilience and hope in both my professional and personal life."

Do you plan to continue your research back in Ukraine? Will you stay connected with CZU?

Yuliia Bondar:

"In the future, I plan to return to Ukraine and continue working on materials for environmental protection and soil remediation. The

experience I gained at CZU has strongly shaped my direction.

I hope to maintain contact with the CZU community. Our collaboration has been inspiring, and I believe it can continue through joint projects, exchange of students, and shared research. I do not see this as the end, but the beginning of a long-term partnership."

Would you support hosting similar fellows in the future?

Vladislav Chrastný:

"Yes, without a doubt. This type of mobility project significantly enhances the international visibility and scientific profile of our faculty. It fosters long-term partnerships, brings in fresh expertise, and helps us stay connected to emerging research directions globally. I would fully support hosting similar fellows in the future."



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