List of proposals for MSCA-Postdoctoral Fellowships:

- Atmospheric chemistry, earth surface-atmosphere interaction
- Environmental Geochemistry / Food Chemistry
- Soil Science, Agriculture, Rhizosphere Research
- Aquatic Geochemistry, Biogeochemistry

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Reference N°	Scientific field	Project	Keywords	Specific requirements
0921-AN	Atmospheric chemistry, earth surface-atmosphere interaction	This project idea aims for examining the potential of mosses to clean the air from pollutants such as ozone, nitrogen dioxide and particles. Next to determining the effect on the target pollutant, we will detect the exchange of volatile organic compounds between the species and the air via GC-MS-methods to learn more about the underlying metabolisms.	Air pollution, exchange of volatile organic compounds, GC-MS, biogenic emissions.	Degree in atmospheric or environmental sciences. Familiar with GC-MS methods for gaseous samples.
0921-BPF	Environmental Geochemistry / Food Chemistry	Rice is a staple for half of the World´s population. Yet, it is also known for accumulating arsenic (As), a class 1 carcinogen. Since 2016, a European directive regulates maximum permissible As concentrations in rice (produced in the EU and imported to the EU). However, it only limits the concentrations of inorganic As, while organic As species are not regulated (partially due to difficulties in their analytical determination, but also based on the assumption that organic oxyAs species are less harmful to humans). Our group has recently developed a novel analytical method based on chromatographic separation and mass spectrometric detection (HPLC-ICP-MS) (Colina Blanco et al. 2021). We have detected novel As species, so-called thioarsenates, specifically dimethylated monothioarsenate (DMMTA), in rice and revealed that they “hide” as oxyAs species when determined by routine methods. The problem hereby is that DMMTA is even more toxic than inorganic As, but currently escapes regulation. Parallel soil and pore water studies in our group have uncovered more details on formation and survival of DMMTA in paddy soils (Wang et al. 2020). Our hypothesis is that in the future, DMMTA accumulation in rice will become even more important based on adaptation of paddy soil development and management as well as fertilization	rice; staple food; paddy soils; arsenic; toxicity; food regulations; climate change; HPLC-ICP-MS	PhD in environmental sciences, chemistry, life sciences or adjacent fields Expertise in inorganic environmental or food chemistry Practical experience in laboratory work; analytical skills (ideally in chromatography and mass spectrometry); capable of conducting field work independently Fluent in English; demonstrated writing skills (first author publications in peer-reviewed journals)

		practices to future demands and climate changes. The envisaged Postdoc project would tackle different aspects from field studies at rice research institutions in selected rice-cultivating countries, laboratory experiments in our world-leading speciation laboratories in Bayreuth with close interactions with plant physiologists, as well as interactions with rice processing companies and regulatory authorities.		
0921-JP	**Soil Science, Agriculture, Rhizosphere Research**	Drought is a critical threat to plant productivity and of global importance for agricultural species. Along with the more frequent occurrence of climate extremes, a stagnation of yields has been observed worldwide. This is likely explained by the low resilience of our modern high-yielding crops to dry conditions. Functional root and rhizosphere traits are of fundamental importance to increase yield resilience to drought. Still, an optimization of belowground traits has been rarely considered in plant breeding schemes. Modern cultivars, selected under high resource availability, may have lost beneficial partnerships at the plant-soil-interface such as the ability to interact with mycorrhizal fungi. Among the beneficial microorganisms, arbuscular mycorrhizal fungi are of particular importance for plant growth, yield and for mitigation of abiotic stress. The project aims to develop a systematic understanding of the importance of mycorrhiza for drought resistance of yield of old and modern varieties.	Soil organic matter, drought, mycorrhiza, crops	PhD in soil science, agricultural science, or related field Ideally, experience with plant-soil interactions, mycorrhiza and/or stable isotope applications Good publication records Profound skills in statistical data analysis

0921-SP	**Aquatic Geochemistry, Biogeochemistry**	Study the effect of redox cycling in wetlands on the sulfur cycle and associated nutrients	Nitrate, phosphate, redox cycling, iron, manganese, sulfur cycle, carbon cycle	Excellent background knowledge in aquatic geochemistry and biogeochemistry, particularly concepts of redox chemical processes Experience in spectroscopical/microscopical techniques