Synchrotron Insights into Environmental Challenges: From Ecosystem Dynamics to Emerging Contaminants

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This presentation celebrates 30 years of the CRG beamlines at ESRF, highlighting their pivotal role in advancing environmental science research. The talk will explore emerging perspectives in environmental studies, focusing on several key areas where synchrotron-based techniques have made significant contributions. We will delve into the study of matter transport within ecosystems, examining how synchrotron radiation can enable new views on mineral formation and weathering processes, helping to constraint carbon cycling and dynamics. Other examples will include the application of new proxies in environmental science, such as the use of bromine (Br) in lakes to trace ecological changes. Finally, the talk will tackle the challenges associated with researching emerging contaminants, including the growing concern of nanoplastics. Throughout the presentation, we will emphasize the role of advanced synchrotron techniques in overcoming these challenges, offering innovative solutions to complex environmental problems.