

1	CEIPEX RESEARCH TOPIC LEVEL2: advanced instrumentation and methods for materials characterization
2	RESEARCH GROUP: Advanced Instrumentation and Methods for Materials Characterization (J. Kaiser)
3	TOPICS/FOCUS: A) Unravelling microplastic fate and transport using combined advanced imaging and chemical characterization methods B) Advancing coral biomineralization studies: Real-time imaging of coral skeletogenesis using 4D X-ray microcomputed tomography
4	SUMMARY: A) This project aims to driving forward microplastic research by developing a novel, multi-instrumental approach that combines high-resolution X-ray computed tomography (CT) with SEM, FTIR, Raman spectroscopy and LIBS. Using a dynamic, environmentally realistic model system, simulating natural processes such as UV degradation, organisms' activity, and biofilm formation, we will track microplastic movement and transformation in complex matrices like soil and sediment. This multi-modal methodology will expand detection capabilities and provide new insights into microplastic fate, informing improved environmental monitoring and mitigation strategies. B) The project will advance our understanding of coral biomineralization by developing a novel, non-invasive method for real-time imaging of skeletal formation in live reef-building corals using 4D X-ray microcomputed tomography. By capturing high-resolution structural changes over time, we seek to uncover the dynamic processes behind coral skeletogenesis and how they are influenced by environmental stressors such as ocean acidification. The methodology developed will provide a powerful platform for interdisciplinary research at the intersection of marine biology, imaging science, and environmental change.
5	RG WEBPAGE/CONTACT: https://www.ceitec.eu/advanced-instrumentation-and-methods-for-materials-characterization/rg6