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The Cryosity project – Artistical preservation of snow crystals and glacier ice samples from Antarctica and the Arctic

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Snow crystals are among the most delicate and aesthetically beautiful things in nature. Looking at their geometrically unique features has inspired photographers and scientists for more than two centuries. However, being made of frozen water, their beauty is usually ephemeral and can usually only be captured in pictures. In this project, we present a system and a procedure to permanently preserve the highly detailed imprints of snow and ice crystals using special kinds of glue and a custom built cooling device. The resolution of the imprints is even high enough to reveal the inner structure of the sometimes only millimeter sized features. We collected more than 100 snow crystals from Antarctica and the Arctic so far. It should be emphasized that this includes samples from both polar winters, captured during a scientific overwintering stay on Neumayer Station III (Antarctica) and on the MOSAiC cruise (Arctic). This makes the collection truly unique. Additionally we also found a way to preserve imprints of larger glacier ice and ice core samples. This enables to highlight the ancient air bubbles and fine glacier ice microstructure (e.g. sub-millimeter crystal grain boundaries) without the need to keep them frozen. The current focus of this ice core sample preparation is an ice core from Skytrain Ice Rise in West Antarctica, reaching back to ice ages of about 150 000 years before present. The samples we prepare from this core have mainly been used in laser-ablation ion coupled plasma spectrometry for chemical impurity analysis. We incorporate both the snow crystals and the ice core samples into art objects. The objects not only highlight the delicate beauty of the ice, but also refer to the fragility and delicate balance of the environments they originate from. This is supported by the integration of other materials that have been in use in the polar regions, for example discarded parts of scientific and technical equipment. We consider the artistic presentation as a pathway not only to communicate the fascination of our scientific work and results, but also to bring people closer to the sometimes uncomfortable truths of climate change. We therefore aim to use the artistic presentation of the snow and ice samples to communicate the dramatic impacts of climate change, especially in the polar regions, to a non-scientific audience.