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Sommario/riassunto	The cryosphere is very sensitive to climate change, and glaciers represent one of the most important archives of atmospheric composition and its variability. From the Himalaya to the European Alps, the longest mid-latitude mountain chain in the world, lie thousands of glaciers that have collected atmospheric compounds over the last millennia. China and Italy are located at the opposite terminals of this long mountain chain, comprising strategic positions for understanding climate evolution and providing important information for the modeling of future climates. The results presented are highlights of some of the most recent advances in cryospheric studies, especially on the topic of mineral dust and aerosols in the atmosphere. They evidence the complexity of the chemical-physical processes involving solid compounds occurring in glacier, snow, and permafrost environments, covering different aspects such as spatial and temporal trends, as well as the impact of mineral and nonmineral particles. Results also show that recent advances in measurement techniques and source apportionment may be powerful and sophisticated tools to provide novel, high-quality scientific information.