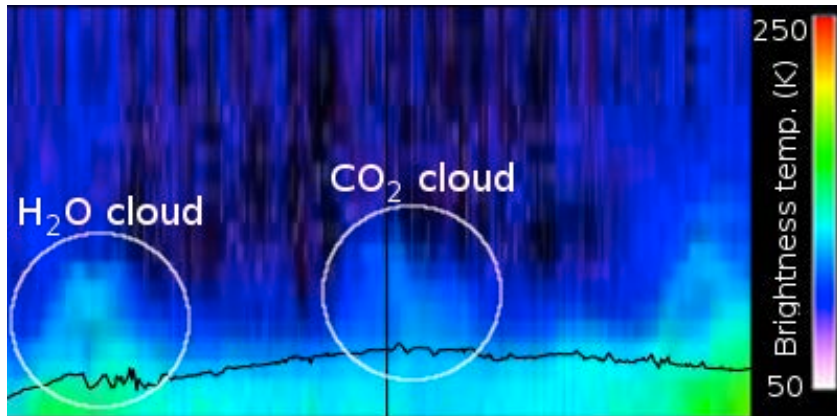


Carbon Dioxide Snowfall on Mars

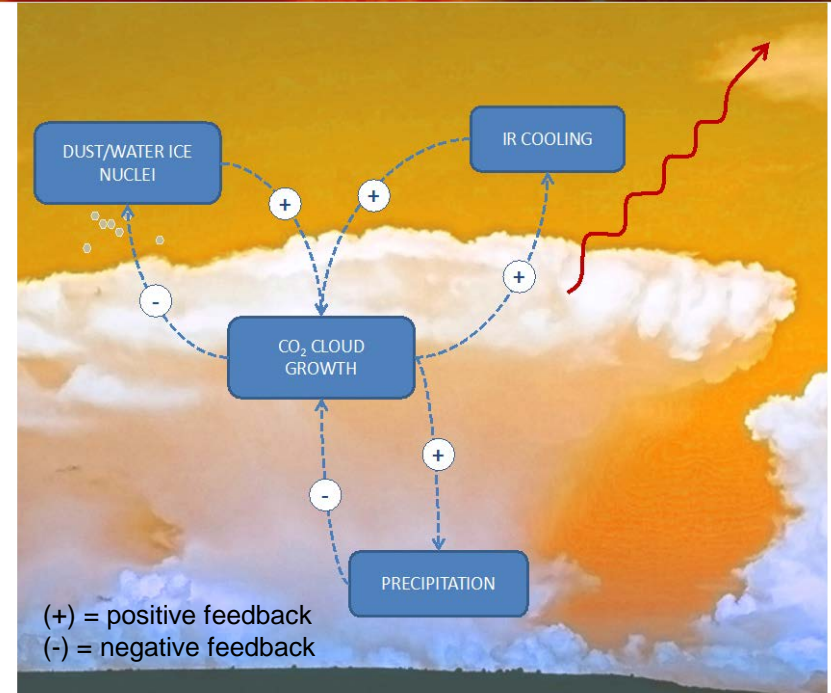
New observations from the Mars Climate Sounder (MCS) on the Mars Reconnaissance Orbiter help to calculate rates of carbon dioxide (CO₂) snowfall, shedding light on the CO₂ cycle and present-day Martian climate.

Winter temperatures in the polar regions of Mars are so cold that CO₂ freezes out of the atmosphere, forming massive seasonal ice caps of dry ice. The amount of these ice caps that come from snowfall rather than surface frost, remained an outstanding question.



South pole

View of over the south pole of Mars from MCS. Brightness temperature data shows both water ice clouds and carbon dioxide snow clouds.



MCS observations indicate that up to 20% of the southern ice cap is made of CO₂ snow, and that snow originating closer to the ground (<4km), is more likely to be deposited than snow formed at higher altitudes. Cooling of the atmosphere promotes cloud growth and CO₂ snowfall. However, when atmospheric water ice and dust (which the snow crystals grow on) are depleted, cloud growth and snowfall slow. This process (illustrated above) blankets the surface and blocks infrared radiation, which may strongly influence the polar energy budget and climate of Mars.