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Exploring the Cosmos
with Astrophysicist

**BURÇIN
MUTLU-PAKDIL**



S.O.S. save our SNOW!

When you think of snow, you probably think of winter—snowball fights and snowflakes melting on your tongue. But snow's most dynamic season is actually spring. Spring's warm, sunny days are when snow's best features shine. Snow is not just for skiers and sledders. Food and electricity come from snow. As climate change warms our planet and melts snow, spring snow has a complicated role to play. All sorts of people are racing to save our snow, with solutions both big and small, whacky and wonderful. And some of them are kids.



Shiny snow means a cooler planet

You know that cold climates create snow. And snow lasts while the season stays cold. But did you know that snow creates climate, too?

Snow's shiny whiteness (albedo) acts like a mirror, reflecting most sunlight back into the sky and keeping Earth cool. The snow and the sky play a hot-potato game with the sun's energy, tossing it back and forth. In the spring, as days get sunnier and longer, more and more light energy hits the snow and gets thrown back into the sky. That energy churns around in the atmosphere, moving air and creating storms. So, shiny spring snow in Europe reflects sun energy, building into powerful monsoons that blow east and drop torrential rain over Asia.

Snow wonder

Snow powers cities and grows our food. Sound crazy? The snowpack is frozen water that melts slowly as it warms. In western North America, mountain snowpacks typically last until midsummer, melting over time into soil, rivers, lakes and wetlands. Meltwater in Washington and other western states swells rivers that run hydroelectric dams, providing hydropower. Turn on the lights in Seattle—that's snow power! California snowmelt is captured in reservoirs used to water 20,000 square miles of farmland. Most nuts are grown in California, so if you munch almonds, you're eating snow! A quarter of US-grown food relies on California's snowmelt.

Snow in the forecast

Because the West depends so much on snowmelt, precise snow measurements are critical to forecast water levels in rivers and reservoirs. Snow scientists calculate snow data at over 1,000 snow stations from New Mexico to Alaska using satellites and automatic gauges. But at least once a year—on April 1—they visit stations to measure it directly.

Climate change and snow

When climate warms, the hot-potato game between the snow and sky changes. Warmer storms don't freeze, they rain. Rain melts the snowpack fast—even more quickly than sunlight. A smaller snowpack reflects less energy, dropping the hot-potato, heating the Earth and melting even faster. When spring snows melt early, there's less water storage in the mountains, and water levels are lower in rivers used for hydropower and reservoirs for farmlands. Forests are drier and burn more easily. Wild plants and animals depend on the same snowmelt that humans need. No matter what species you are, though, it's clear we need to Save Our Snow.

Saving Our Snow

People are coming up with all sorts of imaginative ways to Save Our Snow. In the Alps, ski areas are covering their glaciers with acres of white, plastic tarps. The tarps' high albedo reflects the sunlight, keeping the snow cooler through the summer, preserving the snowpack until the next ski season



Imagine skiing to work! These stations show the West's spring snowpack is much smaller almost everywhere than seventy years ago. Why?



In the Italian Alps, the glacier at Pontedilegno-Tonale is covered with tarps to preserve the snow through the summer

Credit: Pontedilegno-Tonale



A ski area in Colorado is spraying chemicals into cold clouds to create snowflakes, hoping to increase snowfall over the ski slopes. But there are other ways to Save Our Snow, and kids are involved.



Credit: Salomon

Sam Tierney is an avid skier who turned climate anxiety into climate action with classmates in Pemberton, B.C.

Kid Power

If you're anxious about climate change, you're not alone. When he was 13 years old, Sam Tierney lay awake at night, worrying. He finally wrote pro-skier and climate activist Mike Douglas, whose advice was: action is the antidote to despair. So, in small steps that snowballed into big action, Sam organized classmates to march for climate and petition Pemberton's mayor to include their ideas in the town's Climate Action Plan. Finally, he and Mike's documented the journey from despair to action in the movie *Sam & Me: Overcoming Climate Change Anxiety*.

Spring snow has enormous power—to create monsoons, light cities, and turn despair into action. Some of the world's best minds—including kids—are working hard to Save Our Snow.