



Under direct sunlight, superwhite paints developed by the researchers remain significantly cooler than traditional white paints, which could lead to higher energy savings in buildings | Photo source [Jyotirmoy Mandal](#)

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'ULTRA-WHITE PAINT' COOLS BUILDINGS AND SAVES ENERGY

 PROPERTY & CONSTRUCTION

Researchers have developed a relatively easy way to make white paints more reflective, helping to cool buildings passively

Spotted: Scientists have previously proposed that using white paint could help cool buildings and even the surrounding climate. Now, a team led by UCLA materials scientists has demonstrated a white paint that can reflect as much as 98 per cent of incoming heat from the sun. If widely applied to rooftops and buildings, the new paint could significantly reduce cooling costs.

Air conditioning is both expensive and energy inefficient — leading to a large amount of carbon dioxide emissions. A more sustainable method is to cool buildings using passive daytime radiative cooling. This is a process whereby the building's surface is made reflective, to radiate heat out into space. One method to make surfaces reflective is to paint them white. This is the same principle behind wearing a white T-Shirt on a sunny day – the white shirt reflects more sunlight and keeps you cooler.

The best-performing white paints typically reflect around 85 per cent of solar radiation. However, the research team have demonstrated that replacing the titanium oxide commonly used in these paints with ingredients such as barite and polytetrafluoroethylene, also known as Teflon, can help the paint to better reflect UV light, keeping the building cooler. The researchers showed that the new paint could reflect as much as 98 per cent of incoming radiation.

According to [Aaswath Raman](#), assistant professor of materials science and engineering at [UCLA Samueli School of Engineering](#), and the principal investigator on the study, "A roof painted white will be cooler inside than one in a darker shade. But those paints also do something else: they reject

heat at infrared wavelengths ... [using the new paint] could allow buildings to cool down even more by radiative cooling.”

Perhaps most encouraging is that replacing the ingredients in white paints is already within the capabilities of the paint and coatings industry. In fact, this is not the first time we have seen advances in paint technology applied to keep buildings cool. Recent innovations include [edible](#) ultra-white paint and a graphene paint that improves [insulation](#).

Written By: Lisa Magloff

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Website: aaswathraman.com

Contact: samueli.ucla.edu/contact-us

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Takeaway:

City governments around the world have been showing interest in using passive methods for cooling buildings and cities. Both California and New York City have started to encourage the use of cool-roof technologies in new buildings. The researchers also suggest that large-scale use of reflective paints could even affect climate change. Researcher [Jyotirmoy Mandal](#) has said [that](#) he hopes the team’s work will encourage the development of more super-white coatings, “for not only energy savings in buildings, but also mitigating the heat island effects of cities, and perhaps even showing a practical way that, if applied on a massive, global scale could affect climate change.”