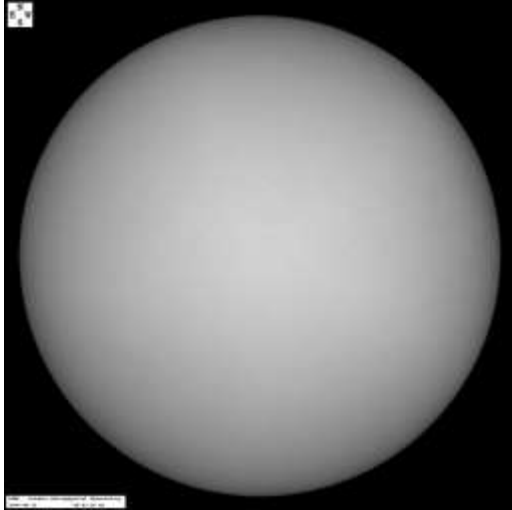


[Svensmark: “global warming stopped and a cooling is beginning” – “enjoy global warming while it lasts”](#)

10 09 2009

This opinion piece from Professor Henrik Svensmark was published September 9th in the Danish newspaper Jyllands-Posten. Translation is from [Google translation](#) with some post translation cleanup of jumbled words or phrases by myself. In cases where the words were badly jumbled or didn't quite make sense I inserted [my interpretation in brackets]. Hat tip to Carsten Arnholm of Norway for bringing this to my attention. – Anthony



Spotless Cueball: Catania observatory photosphere image August 31st, 2009 - click for larger image

[While the sun sleeps](#)

HENRIK SVENSMARK, Professor, DTU, Copenhagen

Indeed, global warming stopped and a cooling is beginning. No climate model has predicted a cooling of the Earth, on the contrary. This means that projections of future climate is unpredictable, writes Henrik Svensmark.

The star which keeps us alive, has over the last few years almost no sunspots, which are the usual signs of the sun's magnetic activity.

Last week, reported the scientific team behind Sohosatellitten (*Solar and Heliospheric Observatory*) that the number of sunspot-free days suggest that solar activity is heading towards its lowest level in about 100 years'. Everything indicates that the Sun is moving into a hibernation-like state, and the obvious question is whether it has any significance for us on Earth.

If you ask the International Panel on Climate Change IPCC, representing the current consensus on climate change, so the answer is a reassuring 'nothing'. But history and recent research suggests that it is probably completely wrong. Let us take a closer look at why. Solar activity has always varied. Around the year 1000, we had a period of very high solar activity, which coincided with the medieval warmth. It was a period when frosts in May was an almost unknown phenomenon and of great importance for a good harvest. Vikings settled in Greenland and explored the coast of North America. For example, China's population doubled over this period. But after about 1300, the earth began to get colder and it was the beginning of the period we now call the Little Ice Age. In this cold period all the Viking settlements in Greenland disappeared. Swedes [were surprised to see Denmark to freeze over in ice], and the Thames in London froze repeatedly. But more serious was the long periods of

crop failure, which resulted in a poorly nourished population, because of disease and hunger [population was reduced] by about 30 per cent in Europe.

It is important to note that the Little Ice Age was a global event. It ended in the late 19th century and was followed by an increase in solar activity. Over the past 50 years solar activity has been the highest since the medieval warmth for 1,000 years ago. And now it appears that the sun returns and is heading towards what is called 'a grand minimum' as we saw in the Little Ice Age.

The coincidence between solar activity and climate through the ages have tried explained away as coincidence. But it turns out that almost no matter what time studying, not just the last 1000 years, so there is a line. Solar activity has repeatedly over the past 10,000 years has fluctuated between high and low. Actually, the sun over the past 10,000 years spent in a sleep mode, approx. 17 pct of the time, with a cooling of the Earth to follow.

One can wonder that the international climate panel IPCC does not believe that the sun changed activity has no effect on the climate, but the reason is that they only include changes in solar radiation.

Just radiation would be the simplest way by which the sun could change the climate. A bit like turning up and down the brightness of a light bulb.

Satellite measurements of solar radiation has been shown that the variations are too small to cause climate change, but so has closed his eyes for a second much more powerful way the sun is able to affect Earth's climate. In 1996 we discovered a surprising influence of the sun – its impact on Earth's cloud cover. High energy accelerated particles of exploded stars, the cosmic radiation, are helping to form clouds.

When the Sun is active its magnetic field shields better against the cosmic rays from outer space before they reach our planet, and by regulating the Earth's cloud cover the sun can turn up and down the temperature. High solar activity obtained fewer clouds and the earth is getting warmer. Low solar activity inferior shields against cosmic radiation, and it results in increased cloud cover and hence a cooling. As the sun's magnetism has doubled its strength during the 20th century, this natural mechanism may be responsible for a large part of global warming during this period.

This also explains why most climate scientists are trying to ignore this possibility. It does in fact favor the idea that the 20th century temperature rise is mainly due to human emissions of CO₂. If the sun as has influenced a significant part of warming in the 20 century, it means that CO₂'s contribution must necessarily be smaller.

Ever since our theory was put forward in 1996, it has been through a very sharp criticism, which is normal in science.

First it was said that a link between clouds and solar activity could not be correct because no physical mechanism was known. But in 2006 after many years of work we managed to conduct experiments at DTU Space, where we demonstrated the existence of a physical mechanism. The cosmic radiation helps to form aerosols, which are the seeds for cloud formation.

Then came the criticism that the mechanism we have found in the laboratory was unable to survive in the real atmosphere and therefore had no practical significance. But the criticism we have just emphatically rejected. It turns out that the sun itself is doing, what we might call natural experiments. Giant solar flares can have the cosmic radiation on earth to dive suddenly over a few days. In the days after the eruption cloud cover falls by about 4 per cent. And the content of liquid water in clouds (droplets) is reduced by almost 7 per cent. Indeed, [you could say] that the clouds on Earth originated in space.

Therefore we have looked at the sun's magnetic activity with increasing concern, since it began to wane in the mid-1990s.

That the sun could fall asleep in a deep minimum was suggested by [solar scientists] at a meeting in Kiruna in Sweden two years ago. As Nigel Calder and I updated our book “The Chilling Stars” therefore, we wrote a little provocative [passage] “we recommend our friends to enjoy global warming while it lasts.”

Indeed, global warming stopped and a cooling is beginning. Last week, it was argued by Mojib Latif from the University of Kiel at the UN World Climate Conference in Geneva that cooling may continue through the next 10 to 20 years.

His explanation was natural changes in North Atlantic circulation and not in solar activity.

But no matter how it is interpreted, the natural variations in climate then penetrates more and more.

One consequence may be that the sun itself will show its importance for climate and thus to test the theories of global warming. No climate model has predicted a cooling of the Earth, on the contrary.

This means that projections of future climate is unpredictable. A forecast [that] says it may be warmer or colder for 50 years, is not very useful, for science is not able to predict solar activity.

So in many ways, we stand at a crossroads. The near future will be extremely interesting and I think it is important to recognize that nature is completely independent of what we humans think about it. Will Greenhouse theory survive a significant cooling of the Earth? Not in its current dominant form. Unfortunately, tomorrow’s climate challenges will be quite different than greenhouse theory’s predictions, and perhaps it becomes again popular to investigate the sun’s impact on climate.

Professor Henrik Svensmark is director of the Center for Sun-Climate Research at DTU Space. His book “The Chilling Stars” has also been published in Danish as “Climate and the Cosmos” (Gads Forlag, DK ISBN 9788712043508)