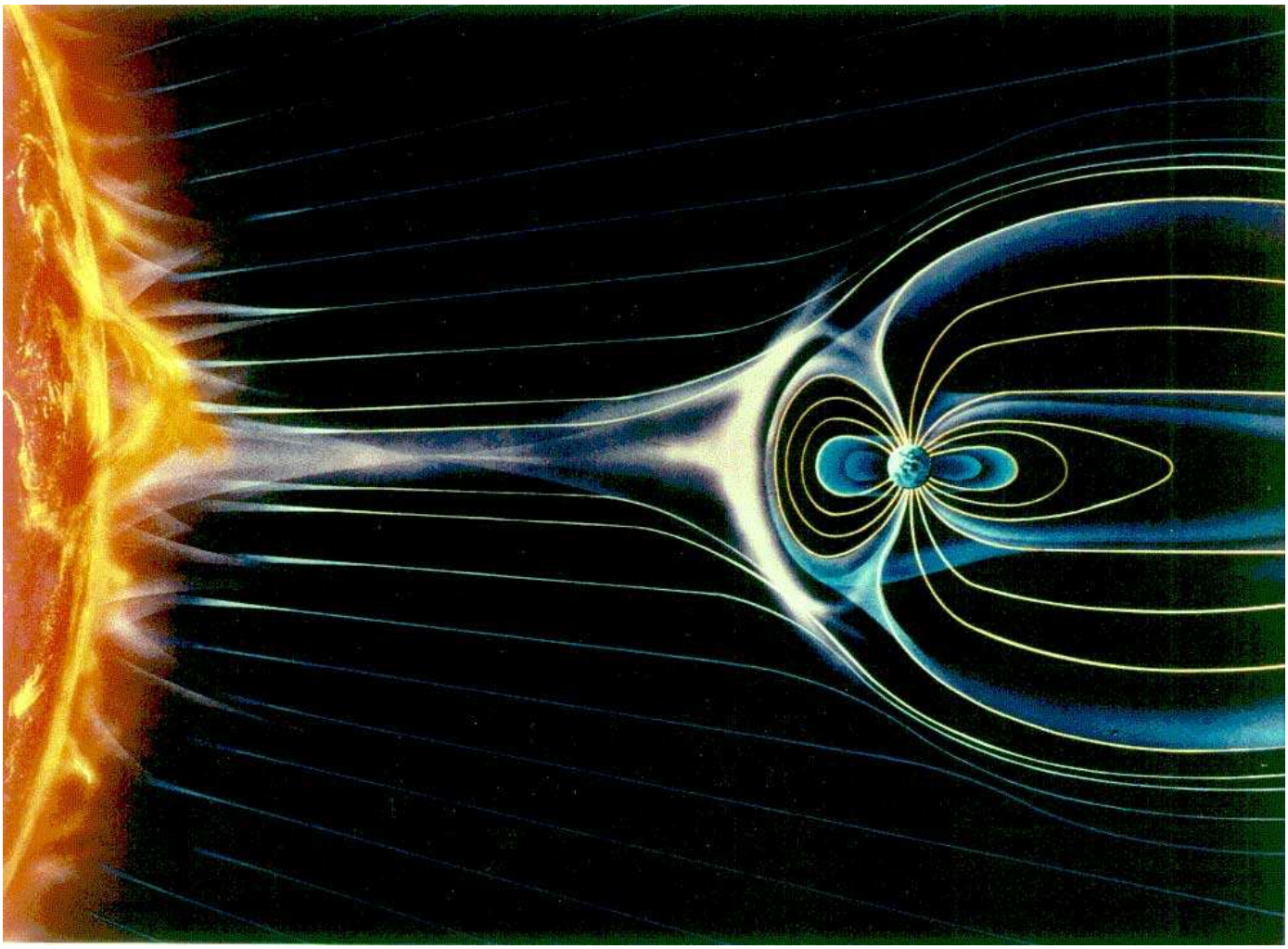
Jack Venrick

From: "Jack Venrick" <jacksranch@skynetbb.com>
To: "AJack R. Venrick" <jacksranch@skynetbb.com>
Sent: Sunday, October 19, 2008 11:53 PM
Subject: Its the Sun Stupid - That Drives Our Climate Not CO2

Sent: Saturday, June 21, 2008 12:49 PM
Subject: Its the Sun Stupid - That Drives Our Climate Not CO2

These photos & charts from NASA will explain in graphic form the overwhelming force of the sun's solar solar radiation -

- **Compared to any other force of nature or man existing on earth.**
- **Dr. Willie Soon has pointed out that over the last 150 years the force of the sun**
  - **is ten times CO2 at the top of the atmosphere**
- **THE SUN IS THE DOMINENT DRIVER OF OUR CLIMATE, OUR TEMPERATURES & OUR CO2**
- **MAN DOES NOT DRIVE OR CHANGE THE CLIMATE OR THE TEMPERATURE OR C02**
- **MAN IS INSIQNIFICANT TO THE POWER OF NATURE**
- **MAN'S CONTRIBUTION TO CO2 IS BETWEEN .017% TO .04%**
- **THE FOLLOWING GROUPS ARE CREATING THIS GREEN DEBAUCHERY FOR THEIR OWN GAIN**
  - **GREEN EXTREME TAKING GOVERNMENT**
  - **GREEN EASTERN EXTREME**
  - **GREEN CONTRACTORS**
  - **GREEN EXTREME MEDIA**
  - **GREEN EXTREME TAKING ACEDEMIA**



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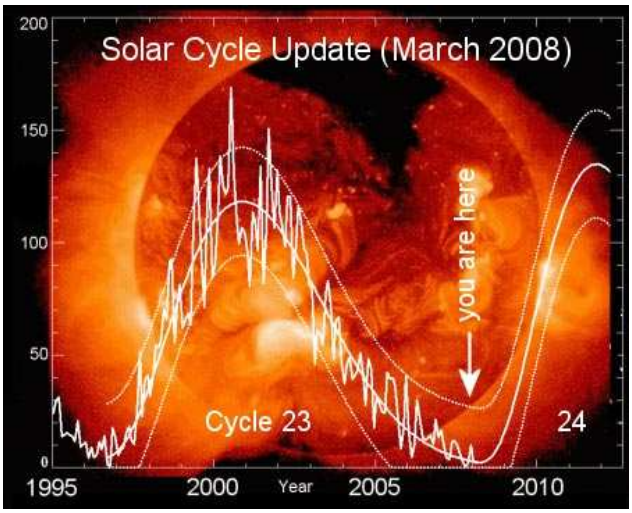

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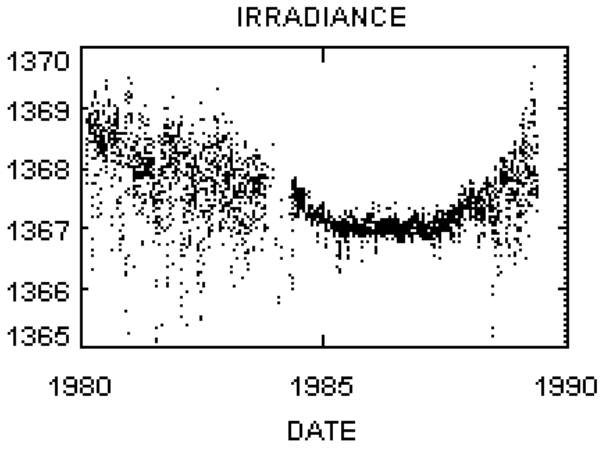

http://solarscience.msfc.nasa.gov

www.hubblesite.org

----- Original Message -----
From: Roni Sylvester
To: Jack Venrick
Sent: Saturday, June 21, 2008 6:58 AM
Subject: Re: Its the Sun Stupid - That Drives Our Climate Not CO2

Hi Jack,
This is soooooooo excellent.
Can you re-send without wallpaper, - and or just the blue line?
Thank you,
Roni

To: Washington House and Senate, Washington Supreme Court, King Communist County, King County Ag, Washington Governors Office, Property Rights Movement, Freedom Foundations, Media, Senators Cantwell and Murray, Representative Reichert, Friends

Two articles follow entitled;
1. Cosmic Rays and Climate plus
2. Blame the Sun

These two independent scientific hypothesis agree with Dr. Willie Soon's independent hypothesis and excellent presentation when when he spoke at the March 15, 2008 Good Neighbor Law Forum, www.goodneighborlaw.com, i.e. that solar radiation is the force force behind the earth's temperature variations which in turn vary the CO2 not vice versa. This spurred me to do a little research research and dig up the following research.

Now this is more like real independent objective science.

- **Amazingly, this is not new information.**
- **It is more like ignored scientific data.**
- **Why is this highly correlated data minimized and ignored ?**
- **because it is easier to steal private and public property using one sided junk "science"**

Jack Venrick
Enumclaw, Washington

"In a related article someone noted that junk science occurs when facts are distorted, risk is exaggerated and science is warped by by politics and ideology to serve another agenda. These political movements are having a profound impact on business and the economy. The author asks: "Why does business seem congenitally incapable of dealing with the growing threat of junk science? … the modern corporation routinely collapses in the face of junk science activists".

"Blame the Sun" Ian Clark, professor of Earth Sciences at the University of Ottawa. See article below.

Extracted feedback from a reader of Cosmic Rays and Climate below.
On April 29th, 2007 William Sellyey (not verified) says:

You do beautiful science; keep up the good work.

The results in your publications and the ones presented in your blog give no reason to believe that anthropogenic CO2 or any other emissions are involved in global warming. The difference between measured global temperature change for the 20th century, 57±.17ºC and your calculation, 0.47±.19ºC is 0.10±.25ºC and this is consistent with zero. It also seems clear (as you have pointed out) that the IPCC reports do not predict anything useful because they cannot explain the warming that has happened in this century. Greatly increased support for research on the effect of cosmic rays and their possible interactions with human caused emissions is needed to accurately pin down what, if any, anthropogenic effects will develop in the future. It seems likely to me that, if there is an anthropogenic cause, CO2 will not be the main problem.

The CO2 model is now the politically correct model. It is a freight train that is moving with a huge political momentum and it will be extremely difficult to influence. Do you have any idea of how to stop it from carrying the world into huge pointless expenditures?
I believe that this is extremely important for countries like the USA and China where coal could provide all needed energy for a few centuries. It may be true that this could lead to additional global warming, but there is no evidence for it now.

Assuming the link between cosmic rays and cloud formation hold true, one can imagine engaging in planetary climate control. I estimate that the total cosmic ray power hitting the earth in the range of 10 to 11 GeV is 260 MW. The design of a 10 GeV, 26MW accelerator with this sort of power on the earth's surface is not a great challenge. Putting one in orbit (perhaps in a geo-synchronous orbit) would be a challenge but probably achievable with existing technology. Once NASA gets its new heavy lift rocket working this accelerator could be assembled on the ground and then put in orbit in pieces. A wild guess on the cost is something like $20 billion (US). A group at Los Alamos National Laboratory (USA) has performed a proof of principle of small accelerator operating in orbit.

It is possible that weather or climate altering accelerators could be operated on the ground. The potential problem is that the energy of particles would be too degraded by the time they reach altitudes where cloud formation takes place. I suspect one could do useful experiments by taking existing machines and directing their output upward. A potential problem with this is "sky shine" in which neutrons are generated by the beam and travel back to the ground thus exposing the public to radiation.

I am interested in you comments.

Article 1.

http://physicaplus.org.il/zope/home/en/1105389911/1113511992_en

or http://www.sciencebits.com/CosmicRaysClimate

Cosmic Rays and Climate

Nir J. Shaviv

Atmospheric levels of CO2 are commonly assumed to be a main driver of global climate. Independent empirical evidence, however, suggests that solar activity and galactic cosmic ray flux (CRF) variations may play an important role in the observed climate variability.
We review the historical development of this link – from the apparent correlations between solar activity and climate, to independent indications that cosmic rays are indeed the missing link between solar activity variations, which modulate the CRF, and climate change. We review in particular the evidence demonstrating that this link is most likely through the role played by the tropospheric ionization in the process of cloud formation.
We show also that independent CRF variations arising from the periodic passages through the galactic spiral arms coincide with globally cold epochs. A variable CRF, whether modulated by solar activity or by our galactic journey, seems therefore to be a dominant climate driver.

Sir William Herschel was the first to seriously consider the sun as a source of climate variations, already two centuries ago. He noted a correlation between the price of wheat, which he presumed to be a climate proxy, and the sunspot activity:

> *"The result of this review of the foregoing five periods is, that, from the price of wheat, it seems probable that some temporary scarcity or defect of vegetation has generally taken place, when the sun has been without those appearances which we surmise to be symptoms of a copious emission of light and heat."*
>
> *— Sir William Herschel, Phil. Trans. Roy. Soc. London, 91, 265 (1801)*

Herschel presumed that this link arises from variation in the luminosity of the sun. Today, various solar activity and climate variations are indeed known to have a notable correlation on various time scales. The best example is perhaps the one depicted in fig. 1, on a centennial to millennial time scale between solar activity and the tropical climate of the Indian ocean (Neff et al. 2001). Another example of a beautiful correlation exists on a somewhat longer time scale, between solar activity and the northern Atlantic climate (Bond et al. 2001). Nevertheless, the relatively small luminosity variations of the sun are most likely insufficient to explain this or other links. Thus, an amplifier of solar activity is probably required to explain these observed correlations.

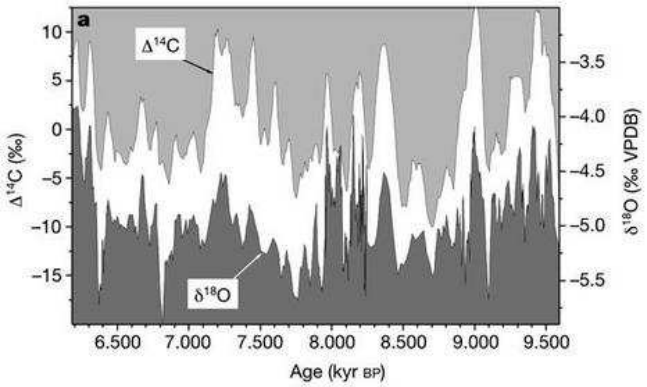

Figure 1: The correlation between solar activity, as mirrored in the ^{14}C flux and a climate sensitivity variable, the $^{18}O/^{16}O$ isotope ratio from stalagmites in a cave in Oman, on a centennial to millennial time scale. The ^{14}C is reconstructed from tree rings. It is a proxy of solar activity since a more active sun has a stronger solar wind, which reduces the flux of cosmic rays reaching the Earth from outside the solar system. A reduced cosmic ray flux will in turn reduce the spallation of nitrogen and oxygen, and with it the formation of ^{14}C. On the other hand, the $^{18}O/^{16}O$ ratio reflects the temperature of the Indian ocean, the source of the water that formed the stalagmites. (Graph from Neff et al., 2001, copywrite by Nature, used with permission)

Several amplifiers were suggested. For example, UV radiation is all absorbed in the stratosphere, such that notable stratospheric changes arise with changes to the non-thermal radiation emitted by the sun. In fact, Joanna Heigh of Imperial College in London, suggested that through dynamic coupling with the troposphere, via the Hadley circulation (in which moist air ascends in the tropic and descends as dry air at a latitude of about 30°) the solar signal at the surface can be amplified. Here we are interested in what appears to be a much more indirect link between solar activity and climate.

In 1959, the late Edward Ney of the U. of Minnesota suggested that any climatic sensitivity to the density of tropospheric ions would immediately link solar activity to climate. This is because the solar wind modulates the flux of high-energy particles coming from outside the solar system. These particles, the cosmic rays, are the dominant source of ionization in the troposphere. More specifically, a more active sun accelerates a stronger solar wind, which in turn implies that as cosmic rays diffuse from the outskirts of the solar system to its center, they lose more energy. Consequently, a lower tropospheric ionization rate results. Over the 11-yr solar cycle and the long term variations in solar activity, these variations correspond to typically a 10% change in this ionization rate. It now appears that there is a climatic variable sensitive to the amount of tropospheric ionization - clouds.

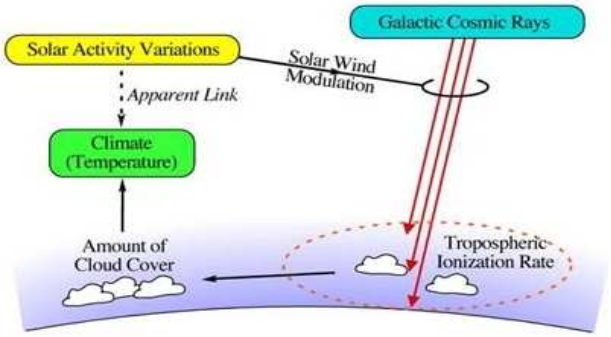

Figure 2: The cosmic ray link between solar activity and the terrestrial climate. The changing solar activity is responsible for a varying solar wind strength. A stronger wind will reduce the flux of cosmic ray reaching Earth, since a larger amount of energy is lost as they propagate up

the solar wind. The cosmic rays themselves come from outside the solar system (cosmic rays with energies below the "knee" at 10^{15}eV, are most likely accelerated by supernova remnants). Since cosmic rays dominate the tropospheric ionization, an increased solar activity will translate into a reduced ionization, and empirically (as shown below), also to a reduced low altitude cloud cover. Since low altitude clouds have a net cooling effect (their "whiteness" is more important than their "blanket" effect), increased solar activity implies a warmer climate. Intrinsic cosmic ray flux variations will have a similar effect, one however, which is unrelated to solar activity variations.

Clouds have been observed from space since the beginning of the 1980's. By the mid 1990's, enough cloud data accumulated to provide empirical evidence for a solar/cloud-cover link. Without the satellite data, it hard or probably impossible to get statistically meaningful results because of the large systematic errors plaguing ground based observations. Using the satellite data, Henrik Svensmark of the Danish National Space Center in Copenhagen has shown that cloud cover varies in sync with the variable cosmic ray flux reaching the Earth. Over the relevant time scale, the largest variations arise from the 11-yr solar cycle, and indeed, this cloud cover seemed to follow the cycle and a half of cosmic ray flux modulation. Later, Henrik Svensmark and his colleague Nigel Marsh, have shown that the correlation is primarily with low altitude cloud cover. This can be seen in fig. 3.

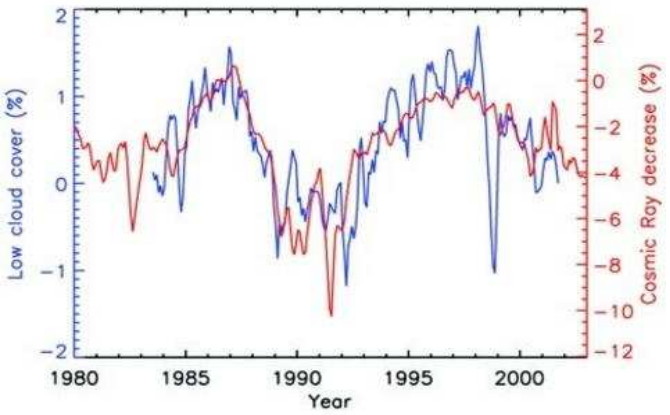

Figure 3: The correlation between cosmic ray flux (red) as measured in Neutron count monitors in low magnetic latitudes, and the low altitude cloud cover (blue) using ISCCP satellite data set, following Marsh & Svensmark, 2000 (used with permission).

The solar-activity – cosmic-ray-flux – cloud-cover correlation is quite apparent. It was in fact sought for by Henrik Svensmrk, based on theoretical considerations. However, by itself it cannot be used to prove the cosmic ray climate connection. The reason is that we cannot exclude the possibility that solar activity modulates the cosmic ray flux and independently climate, without any casual link between the latter two. There is however separate proof that a casual link exists between cosmic rays and climate, and independently that cosmic rays left a fingerprint in the observed cloud cover variations.

To begin with, climate variations appear to arise also from intrinsic cosmic ray flux variations, namely, from variations that have nothing to do with solar activity modulations. This removes any doubt that the observed solar activity cloud cover correlations are coincidental or without an actual causal connection. That is to say, it removes the possibility that solar activity modulates the cosmic ray flux and independently the climate, such that we *think* that the cosmic rays and climate are related, where in fact they are not. Specifically, cosmic ray flux variations also arise from the varying environment around the solar system, as it journeys around the Milky Way. These variations appear to have left a paleoclimatic imprint in the geological records.

Cosmic Rays, at least at energies lower than 10^{15}eV, are accelerated by supernova remnants. In our galaxy, most supernovae are the result of the death of massive stars. In spiral galaxies like our own, most of the star formation takes place in the spiral arms. These are waves which revolve around the galaxy at a speed different than the stars. Each time the wave passes (or is passed through), interstellar gas is shocked and forms new stars. Massive stars that end their lives with a supernova explosion, live a relatively short life of at most 30 million years, thus, they die not far form the spiral arms where they were born. As a consequence, most cosmic rays are accelerated in the vicinity of spiral arms. The solar system, however, has a much longer life span such that it periodically crosses the spiral arms of the Milky Way. Each time it does so, it should witness an elevated level of cosmic rays. In fact, the cosmic ray flux variations arising from our galactic journey are ten times larger than the cosmic ray flux variations due to solar activity modulations, at the energies responsible for the tropospheric ionization (of order 10 GeV). If the latter is responsible for a 1ºK effect, spiral arm passages should be responsible for a 10ºK effect—more than enough to change the state of earth from a hothouse, with temperate climates extending to the polar regions, to an icehouse, with ice-caps on its poles, as Earth is today. In fact, it is expected to be the most dominant climate driver on the 10^8 to 10^9 yr time scale.

It was shown by the author (**Shaviv 2002**, **2003**), that these intrinsic variation in the cosmic ray flux are clearly evident in the geological paleoclimate data. To within the determinations of the period and phase of the spiral-arm climate connection, the astronomical determinations of the relative velocity agree with the geological sedimentation record for when Earth was in a hothouse or icehouse conditions. Moreover, it was found that the cosmic ray flux can be independently reconstructed using the so called "exposure ages" of Iron meteorites. The signal, was found to agree with the astronomical predictions on one hand, and correlate well with the sedimentation record, all having a ~145 Myr period.

Figure 4: An Iron meteorite. A large sample of these meteorites can be used to reconstruct the past cosmic ray flux variations. The reconstructed signal reveals a 145 Myr periodicity. The one in the picture is part of the Sikhote Alin meteorite that fell over Siberia in the middle of the 20th century. The cosmic-ray exposure age of the meteorite implies that it broke off its parent body about 300 Million years ago.

In a later analysis, with Ján Veizer of the University of Ottawa and the Ruhr University of Bochum, it was found that the cosmic ray flux reconstruction agrees with a quantitative reconstruction of the tropical temperature (**Shaviv & Veizer, 2003**). In fact, the correlation is so well, it was shown that cosmic ray flux variations explain about two thirds of the variance in the reconstructed temperature signal. Thus, cosmic rays undoubtedly affect climate, and on geological time scales are the most dominant climate driver.

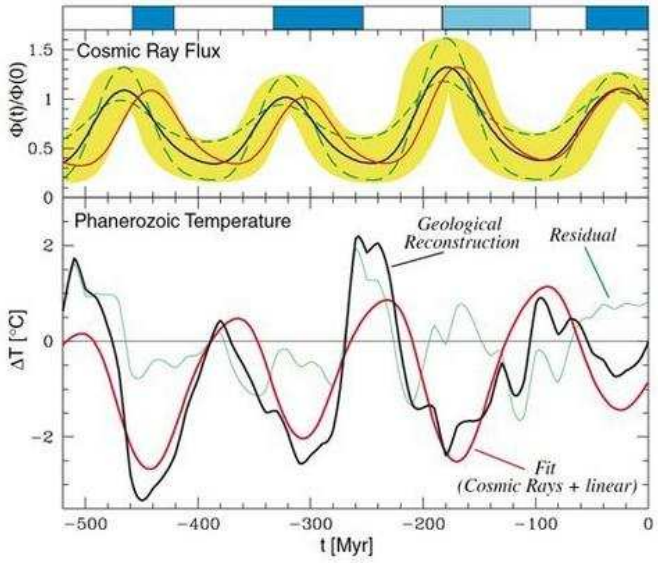

Figure 5: Correlation between the cosmic ray flux reconstruction (based on the exposure ages of Iron meteorites) and the geochemically reconstructed tropical temperature. The comparison between the two reconstructions reveals the dominant role of cosmic rays and the galactic "geography" as a climate driver over geological time scales. (Shaviv & Vezier 2003)

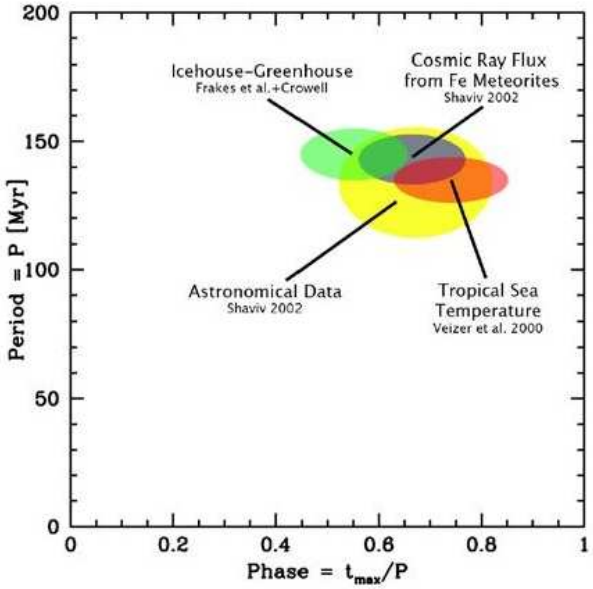

Figure 6: A summary of the 4 different signals revealing the cosmic ray flux climate link over geological time scales. Plotted are the period and phase (of expected peak coldness) of two extraterrestrial signals (astronomical determinations of the spiral arm pattern speed and cosmic ray flux reconstruction using Iron meteorites) and two paleoclimate reconstruction (based on sedimentation and geochemical records). All four signals are consistent with each other, demonstrating the robustness of the link. If any data set is excluded, a link should still exist.

Recently, it was shown by Ilya Usoskin of the University of Oulu, Nigel Marsh of the Danish Space Research Center and their colleagues, that the variations in the amount of low altitude cloud cover follow the expectations from a cosmic-ray/cloud cover link (**Usoskin et al., 2004**). Specifically, it was found that the relative change in the low altitude cloud cover is proportional to the relative change in the solar-cycle induced atmospheric ionization at the given geomagnetic latitudes and at the altitude of low clouds (up to about 3 kms). Namely, at higher latitudes were the the ionization variations are about twice as large as those of low latitudes, the low altitude cloud variations are roughly twice as large as well.

Thus, it now appears that empirical evidence for a cosmic-ray/cloud-cover link is abundant. However, is there a physical mechanism to explain it? The

answer is that although there are indications for how the link may arise, no firm scenario, at least one which is based on solid experimental results, is yet present.

Although above 100% saturation, the preferred phase of water is liquid, it will not be able to condense unless it has a surface to do so on. Thus, to form cloud droplets the air must have cloud condensation nuclei—small dust particles or aerosols upon which the water can condense. By changing the number density of these particles, the properties of the clouds can be varied, with more cloud condensation nuclei, the cloud droplets are more numerous but smaller, this tends to make whiter and longer living clouds. This effect was seen down stream of smoke stacks, down stream of cities, and in the oceans in the form of ship tracks in the marine cloud layer.

The suggested hypothesis, is that in regions devoid of dust (e.g., over the large ocean basins), the formation of cloud condensation nuclei takes place from the growth of small aerosol clusters, and that the formation of the latter is governed by the availability of charge, such that charged aerosol clusters are more stable and can grow while neutral clusters can more easily break apart. Several experimental results tend to support this hypothesis, but not yet prove it. For example, the group of Frank Arnold at the university of Heidelberg collected air in airborne missions and found that, as expected, charge clusters play an important role in the formation of small condensation nuclei. It is yet to be seen that the small condensation nuclei grow through accretion and not through scavenging by larger objects. If the former process is dominant, charge and therefore cosmic ray ionization would play an important role in the formation of cloud condensation nuclei.

One of the promising prospects for proving the "missing link", is the SKY experiment being conducted in the Danish National Space Center, where a real "cloud chamber" mimics the conditions in the atmosphere. This includes, for example, varying levels of background ionization and aerosols levels (sulpheric acid in particular). Within a few months, the experiment will hopefully shed light on the physical mechanics responsible for the apparent link between cloud cover and therefore climate in general, to cosmic rays, and through the solar wind, also to solar activity.

Figure 7: The Danish National Space Center SKY reaction chamber experiment. The experiment was built with the goal of pinning down the microphysics behind the cosmic ray/cloud cover link found through various empirical correlations. From left to right: Nigel Marsh, Jan Veizer, Henrik Svensmark. Behind the camera: the author.

The implications of this link are far reaching. Not only does it imply that on various time scales were solar activity variations or changes in the galactic environment prominent, if not the dominant climate drivers, it offers an explanation to at least some of the climate variability witnessed over the past century and millennium. In particular, not all of the 20th century global warming should be attributed to anthropogenic sources, since increased solar activity explains through this link more than half of the warming.

More information on the subject can be found at:

1. More information on the cosmic ray climate link over geological time scales can be found in **Nir Shaviv's Web site**.
2. Various publications related to the cosmic-ray/cloud cover link can be found on **Henrik Svensmark's web site**.
3. Further analysis including the relative role of CRF variations vs. el-niño can be found in: N. Marsh and H. Svensmark, "Galactic cosmic ray and El Niño-Southern Oscillation trends in International Satellite Cloud Climatology Project D2 low-cloud properties", J. of Geophys. Res., 108(D6), 6 (2003).
4. The awaited results of the Danish *SKY* cloud experiment will be reported on **their website** within several months.

Notes and References:

* On solar activity /climate correlation:

1. For the first suggestion that solar variability may be affecting climate, see: William Herschel, *"Observations tending to investigate the nature of our sun, in order to find causes or symptoms of its variable emission of light and heat"*, **Phil. Trans. Roy. Soc. London, 91, 265 (1801)**. Note that Herschel suspected that it is variations in the total output which may be affecting the climate (and with it the price of wheat).
2. Perhaps the most beautiful correlation between solar activity and climate proxies can be found in the work of U. Neff et al., *"Strong coherence between solar variability and the monsoon in Oman between 9 and 6 kyr ago"*, **Nature 411, 290 (2001)**.
3. Another beautiful correlation between solar activity and climate can be seen in the work of G. Bond et al., *"Persistent Solar Influence on North Atlantic Climate During the Holocene"*, **Science, 294, 2130-2136, (2001)**.

* On cosmic ray and cloud cover correlation:

1. The paper by Henrik Svensmark, reports the correlation between cosmic ray flux variations and cloud cover changes: H. Svensmark, *"Influence of Cosmic Rays on Earth's Climate"*, **Physical Review Letters 81, 5027 (1998)**.
2. The specific correlation with low altitude cloud cover is discussed in N. Marsh and H. Svensmark, *"Low Cloud Properties Influenced by Cosmic Rays"*, **Physical Review Letters 85, 5004 (2000)**.
3. The analysis showing the geographic signature of the cosmic ray flux variations in the low altitude cloud cover variations can be found it: I. Usoskin et al., *"Latitudinal dependence of low cloud amount on cosmic ray induced ionization"*, **Geophysical Research Letters 31, L16109 (2004)**.

* On cosmic ray climate correlations on Geological time scales:

1. The suggestion that cosmic ray flux variations spiral arm passages could give rise to ice-age epochs is found at: N. Shaviv, *"Cosmic Ray Diffusion from the Galactic Spiral Arms, Iron Meteorites, and a Possible Climatic Connection"*, **Physical Review Letters 89, 051102, (2002)**.
2. A highly detailed analysis, including the cosmic ray reconstruction using iron meteorites is found in: N. Shaviv, *"The spiral structure of the Milky Way, cosmic rays, and ice age epochs on Earth"*, **New Astronomy 8, 39 (2003)**.
3. The analysis of Shaviv & Veizer demonstrates the primary importance of comic ray flux variations over geological time scales, and with it, place a limit on climate sensitivity: N. Shaviv & J. Veizer, *"A Celestial driver of Phanerozoic Climate?"*, **GSA Today 13, No. 7, 4, 2003**.

About the Author :

Dr. Nir J. Shaviv is a Senior Lecturer at the Racah Institute of Physics of the Hebrew University in Jerusalem. His research interests cover a wide range of topics in astrophysics, most are related to the application of fluid dynamics, radiation transfer or high energy physics to a wide range of objects – from stars and compact objects to galaxies and the early universe. His studies on the possible relationships between cosmic rays intensity and the Earth's climate, and the Milky Way's Spiral Arms and Ice Age Epochs on Earth were widely echoed in the scientific literature, as well as in the general press.

Article 2.

http://www.thehumanspirit.net/enviro_econ/Blame%20The%20Sun.doc

Blame The Sun

By Ian Clark, professor of Earth Sciences at the University of Ottawa, specializing in paleoclimatology and isotope hydrology

Kyoto and climate change have at last become election issues. And why not? Many people in the more wealthy parts of the world consider climate warming our greatest environmental threat, with new extremes in weather and damage to fragile ecosystems wrought by our CO2 emissions. Our Environmental Minister tells us that the science of Kyoto is 'solid' and 'settled', and that we must accept to spend billions of dollars on attempts to stop global climate change. Most of us endorse policies that improve air quality. We also embrace technologies that improve fuel efficiencies. However, the Kyoto Protocol is being sold, not for these reasonable objectives, but on the pretence that we can thwart an impending climate disaster. Nothing could be further from the truth.

CO2s skyward trajectory during the industrial era does indeed appear alarming. Moreover, this rise has occurred during a period of global warming that has delivered us from four centuries known as the Little Ice Age. Both temperature and CO2 seem to ascend in unison like the twin contrails of the Space Shuttle, leading the public, and even many scientists, to conclude that increasing CO2 is driving temperatures higher.

Yet, too few observers have considered the possibility that we have the science backwards- that temperature rise is driven by factors unrelated to human activity, and that CO2 is following in the wake. Blaming ourselves as the Machiavellian hand wreaking climate disaster satisfies a sense of collective guilt, and also engenders the anthropocentric view that humans are so powerful that our actions are a major global climate determinant. The collary to this has even greater appeal- all we need to do is tweak CO2 emissions and we can turn it around and 'stop climate change'.

The problem with this hypothesis is that it is undoubtedly wrong- we haven't affected global climate, never have and never could. Furthermore, there is no chance that we will effect measureable climate changes with Kyoto or any other accord, or with technologies we can deploy in the foreseeable future.

Many scientists know this and some are even brave enough to say so publicly. Other scientists recognize that the politically correct view of human-caused climate change is largely unfounded but remain loyal to the cause because this is their source of research funding. Others stay quiet because they believe that cutting greenhouse gas emissions will have the side benefit of reducing air pollution (it may or may not, depending on the application). Or because they believe that reducing consumption is generally good for our moral well-being.

However, there are many enormously expensive and environmentally dangerous initiatives being promoted to reduce CO2 emissions in the name of Kyoto: the twisted logic of subsidizing ethanol production (with collateral environmental damage from pesticides and fertilizers) and 'sequestering' power plant CO2 emissions deep underground are just two of them. And the trading of green credits will most certainly benefit lawyers and corporations' bottom lines, but not the environment.

To appreciate the mistake that is Kyoto, one must first understand what really drives climate.

Weighing in at more than 10,000 parts per million and taking gold, silver and bronze medals as the principal greenhouse gas in our atmosphere, is naturally occurring water vapour, the stuff that gives us clouds, rain and snow. Were it not for water vapour, Earth's temperature would be about 30 degrees colder than it is today. At 360 parts per million, CO2 is only a very minor player in the greenhouse gas Olympics. So increasing its concentration by 32%, as has happened since the beginning of the industrial era, or even doubling it by the year 2100 (a highly unlikely proposition) will do little to raise temperatures. In fact, the correlation between CO2 levels and temperature rise over the past century is actually quite poor, as it fails to capture the distinctive cooling trend of the 1960s and 1970s when greenhouse gases were increasing at the highest rate in recent history.

But what about ice core studies that Kyoto supporters cite as 'proof' that CO2 rise directly results in temperature increase over long time periods? Studies by paleo-climate researchers reveal that, while CO2 and temperature do indeed rise and fall in close unison over much of the record, temperature increases actually preceded CO2 rise by as much as 800 years or more.

So where do the dire predictions of increases of three to four degrees come from?

Computers are used to simulate climate and predict warming by increased CO2, based on the fundamental laws of physics. However, the amount of warming they determine from predicted CO2 rises doesn't warm the simulated atmosphere much at all. They predict measureable warming only by presuming that an increase in CO2 will trigger a much greater increase in water vapour, and that the water vapour will raise global temperatures. While this implicates CO2 as a prominent indirect climate driver, it remains a theoretical and untested hypothesis. Lacking confidence in the veracity of the CO2 climate link, it seems absurd to spend billions of dollars on a scheme to reduce the rate of CO2 increase in the hopes that it will ameliorate global temperature rise.

So if not increased atmospheric CO2, what is driving climate warming?

Not so surprisingly, it's the sun. Scientists have discovered good correlations between trends in the output of the sun and temperature, measured using proxy data from climate indicators such as tree rings and ice cores. These data are not theoretical. They are real climate records that span many time scales. And all point to solar variation as being the primary driver of climate change. Like CO2, they fit with warming in the first half of the 20th century. However, unlike CO2, they trace the cooling trend of the 1960s and 1970s, and even the apparent warming of the past two decades. There is even a strong correlation between solar activity, temperature and cloudiness- the most direct and telling line of evidence for a heliocentric climate.

As the source of most of our planet's energy, it is astounding that more scientists did not suspect the sun to be the driver of today's global warming. We were clearly misled by the apparent temperature-CO2 correlation as well as our lack of appreciation of the variable nature of our home star. Until recent satellite observations showed variations in radiant output from the sun, its output was commonly referred to in textbooks as 'the solar constant'. We know now that it is anything but steady and that the sun is more active today than it has been in centuries. Evidence for this is found in the number of sunspots, a measure of solar activity and a record carefully established since the 1600s when Galileo invented the telescope.

However, linked with increased solar activity is an effect that was largely unknown till recently. Two decades of satellite data have revealed that when the sun is more active, storms on its surface, manifested by sunspots, are accompanied by strong increases in 'solar wind', a continuous stream of charged particles ejected from the outermost layer of the solar atmosphere into space. An increase in solar wind acts to deflect away from the earth an even more energetic form of radiation that is continuously streaming into our solar system from the galaxy. Referred to as 'galactic cosmic rays' (GCR), these high-energy particles cause an electric charge to build up on dust and other small particles in our atmosphere, which in turn causes them to attract water molecules and so form clouds. Of course, clouds, particularly high clouds, reflect a lot of incoming sunlight back into space, which acts to cool the planet. Not surprisingly, there is a strong correlation between temperature and the measured index of cloudiness.

So the total effect of the sun appears to be more significant than previously thought. When the sun is brighter, not only do we experience more direct heating, but the more intense solar wind 'blows' away the incoming GCR which in turn warms the planet through a reduction in cloud cover. Thus, past and recent climate warming can be explained by changes in solar activity. And the data exist to support it.

Which brings us to Nicholas Copernicus. The timid Canon of Warmi, Poland, spent much of his career deconvolving the Earth-centered universe theory, with its wild gyrations in the solar system invented by clergy scientists to account for the observed motions of the planets. Copernicus discovered a much simpler heliocentric universe where the celestial bodies orbited the sun, obeying the established laws of physics.

What was his secret? He looked for a solution to explain what he saw, unencumbered by the Church's constraint that if God created the earth, it must be at the center of the universe. Intimidated by the overpowering forces of political correctness, Copernicus delayed publishing his magnificent work until the very end of his life and received a copy of the printed book for the first time on his deathbed.

In the intended preface to his book, Copernicus wrote: 'Perhaps there will be babblers who, although completely ignorant of mathematics, nevertheless take it upon themselves to pass judgment on mathematical questions and, badly distorting some passages of Scripture to their purpose, will dare to find fault with my undertaking and censure it. I disregard them even to the extent as despising their criticism as unfounded'.

Much like Copernicus, the many climate experts who have moved away from the clergy science of Kyoto seek with an open mind to understand the real, testable and observable mechanics of climate. These scientists are the vanguard of a modern Copernican revolution that should be encouraged by all thinking Canadians".

By Ian Clark, professor of Earth Sciences at the University of Ottawa, specializing in paleoclimatology and isotope hydrology.

Included in Clark's article were several graphs, one showing the correlation of variations in solar activity with change in temperature and with CO2 concentration in the atmosphere. Temperature correlates very well with solar activity but poorly with CO2.

In another graph sunspot activity shows strong correlation with warm and cold periods over the past 1,000 years.

In a related article someone noted that junk science occurs when facts are distorted, risk is exaggerated and science is warped by politics and ideology to serve another agenda. These political movements are having a profound impact on business and the economy. The author asks: "Why does business seem congenitally incapable of dealing with the growing threat of junk science?… the modern corporation routinely collapses in the face of junk science activists".