GALACTIC WATER UPDATE

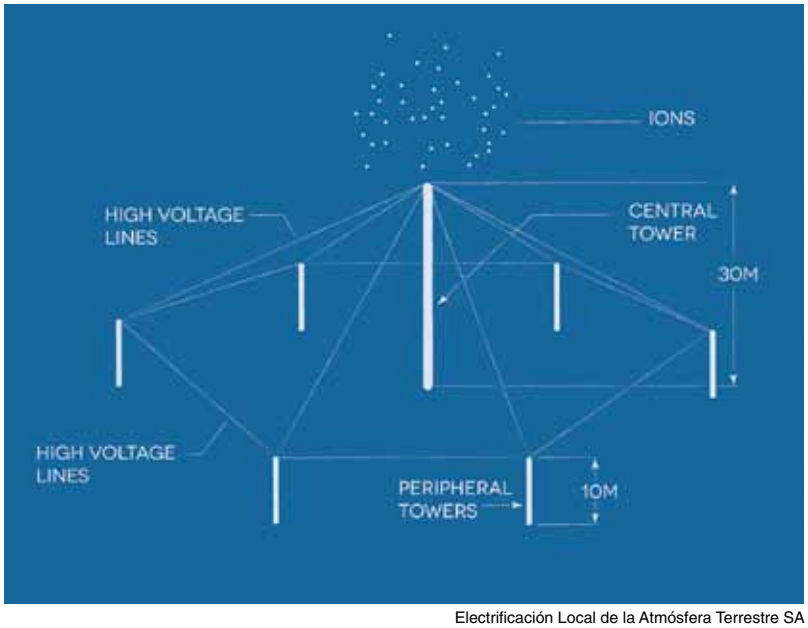
Ionization: The Power of a Weak Force to Water the Earth

by Benjamin Deniston

March 28—Understanding the implications of living within our Galaxy provides new insights for the management of the Earth's water system.[1] Over the past decades, as *EIR* has reported, teams of scientists and engineers in several countries have developed relatively small, affordable systems of thin, high-voltage wires (supported by towers or other structures) to manage and increase precipitation by controlling the ionization levels of the local atmosphere.

One company, Australian Rain Technologies (ART), has just released details of its third successful year in its ongoing five-year trial in Oman. This Oman trial follows four successful trials in two locations in Australia from 2007 to 2010.[2]

The general ART approach is similar to other operations, including ELAT (*Electrificación Local de la Atmósfera Terrestre SA*) systems that have been used for commercial operations in Mexico and Israel.[3] Some of the details of these operations were brought to our attention by the Russian scientist Sergey Pulinets, who was part of an independent scientific team brought in to evaluate the operations in Mexico.[4]



Electrificación Local de la Atmósfera Terrestre SA

The design of the ELAT atmospheric ionization systems used in Mexico. The towers support high-voltage lines that generate negatively charged ions in the atmosphere.

Although it is not usually discussed by the proponents of these ionization systems, understanding these systems can help provide insights into how our Galaxy controls key aspects of the Earth's water, weather, and climate systems. When understood from this standpoint, we recognize that these ionization systems provide a potential to manage the global water cycle from a galactic perspective.

Living in the Galaxy

Galactic cosmic radiation, in net energy terms a relatively *weak force*, permeates the Earth's atmosphere, providing the dominant source of ionization throughout much of the atmosphere. These galactic ionization levels, in turn, have significant effects on the rate of condensation of water vapor, the formation of clouds, and related processes, leading to the following effects:

Short-term variations (days to weeks) in this galactic ionization can affect some of the most powerful

1. "Memo for the Next President: New Perspectives on the Western Water Crisis," https://larouchepac.com/sites/default/files/20150330-Water%20Crisis.pdf
2. See http://www.australianrain.com.au
3. For more background, see a review of these technologies in "Atmospheric Moisture Control," http://www.larouchepub.com/eiw/public/2015/ eirv42n16-20150417/18-25_4216.pdf
4. See the May 2015 LaRouche PAC interview with Professor Pulinets, "End Droughts with Weather Control," https://www.youtube.com/watch?v=0iKFTlphuJs

weather systems (under the right conditions).[5] These variations are generally produced by sudden, explosive outbursts of plasma from the Sun (carrying magnetic fields that temporarily shield Earth from some of the galactic cosmic radiation as the plasma bursts pass by.

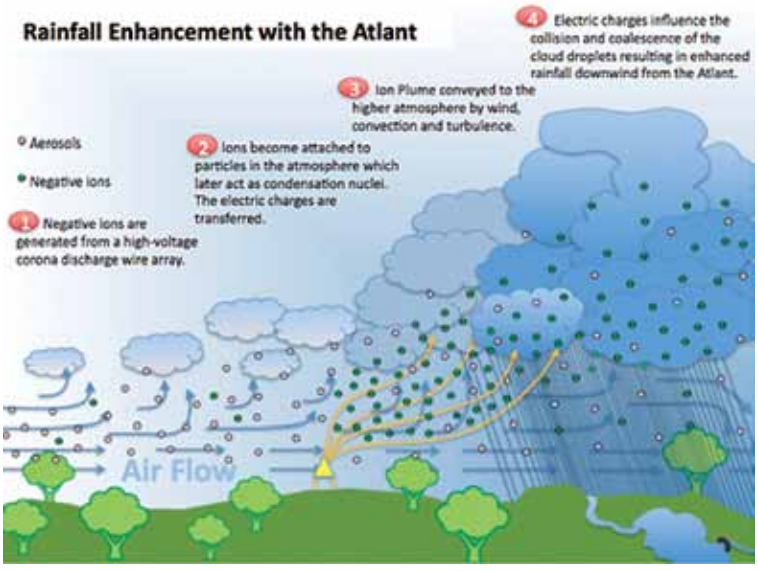
• Medium-term variations (years to centuries) drive climate change by modulating low-level cloud cover.[6] These variations are generally produced by cycles of solar activity.

• Very long term variations (over millions of years) are responsible for the largest and most persistent changes in the Earth's climate system.[7] These variations are produced by changes in our Galactic environment as the Solar System travels through the Galaxy, and by changes in the activity of the galactic systems as a whole.

Thus, ionization levels—whether natural (galactic) or controlled by man—are key to the behavior of the critical atmospheric phase of the Earth's water cycle.

New Results from Oman

At the 2016 International Water Conference in Muscat, Oman, ART announced that the third year of its five-year trial continued to show successful results. Over its initial three years of operation, the Oman trial has provided an 18% increase in rainfall in the area of ionization. This assessment is based on data provided by new weather stations and a few hundred rain gauges (placed inside and outside of the target area), providing the information needed to accurately estimate what the rainfall would have been under natural conditions (i.e., without the enhancement provided by the ionization systems). Independent evaluations of these results are provided by the National Institute for Applied Statistical Research Australia at the University of Wollongong.



Australian Rain Technologies

The rainfall enhancement process is shown here to illustrate the Atlant system of Australian Rain Technologies. The tower is at the bottom center in yellow. The system generates negatively charged ions that attach themselves, by virtue of their charge, to particles in the atmosphere (aerosols). The particles become "seeds" for the condensation of water vapor. The system depends on the presence of water vapor in the atmosphere, hence the expression, "rain enhancement."

Australian Rain Technologies

A rain enhancement system built by Australian Rain Technologies in Australia.

For a better insight into the significance of these results, let's examine the details for 2014.

In 2014 ART operated four ionization stations for 140 days, *enhancing rainfall by 33% over a 16,000 square-kilometer area*. It estimates that this amounted to 96 million cubic meters of additional surface water flow. The four ionization stations ran at 500 watts each, so (assuming they all ran the entire time) only 2 kilowatts of power was needed to power the entire ionization process.

5. V.G. Bondur, S.A. Pulinets, and G.A. Kim, "The Role of Galactic Cosmic Rays in Tropical Cyclogenesis: Evidence of Hurricane Katrina," *Doklady Earth Sciences,* 2008, Vol. 422, No. 2, pp. 244-249.
6. H. Svensmark and E. Friis-Christensen, "Reply to Lockwood and Fröhlich: The persistent role of the Sun in climate forcing," Danish National Space Center Scientific Research Report 3/2007.
7. Nir J. Shaviv, "The spiral structure of the Milky Way, cosmic rays, and ice age epochs on Earth," *New Astronomy,* Volume 8, Issue 1, Jan. 2003, pp. 39-77.

Tex Whitney Productions

The placement of the towers in the Australian Rain Technologies trial in Oman.

Using two kilowatts of power for 140 days to generate 96 million cubic meters of additional fresh water amounts to an average production of 680,000 cubic meters (180 million gallons) per day, and an average energy productivity of 14,000 cubic meters (3.7 million gallons) of fresh water produced per kilowatt-hour.

From this we can make the following comparison with another method for increasing freshwater availability, desalination.

Ionization vs Desalination: Fresh Water per Unit Energy

For comparison, the Carlsbad desalination plant in southern California, currently among the most efficient in the world, provides only 0.3 cubic meters (80 gallons) per kilowatt-hour—which means that in 2014, the ionization systems in Oman produced 50,000 times more water per unit of energy!

The average rate of total freshwater generated was similar in both cases. The Carlsbad desalination plant is producing 50 million gallons per day, while the Oman ionization trial in 2014 generated an average of 180 million gallons per day over the 140 days of operation (or 70 million gallons per day, if averaged over an entire year).

The increased surface water flow from ionization is obviously much more dispersed than the output from a desalination plant, and not all of it can be collected for use. However, ionization systems can be used to direct increased precipitation into watersheds that feed into existing water management infrastructure, as was done in Mexico and Israel, capturing much of it for economic use.

One last consideration provides additional insights into the significance of living within our Galaxy.

Latent Heat and Galactic Cosmic Rays

Since the condensation of water vapor releases the same amount of energy (latent heat) that was required to initially evaporate that water (energy originally provided by the Sun), we can also determine that the energy equivalent of 50 megatons of TNT was released by the condensation of this 96 million cubic meters of water (while this is a lot of energy, it was dispersed over a large area and over a long time period). Recognizing this, we can draw the following conclusions about the energetics of the process:

- Over 140 days of operation, an average of 18 gigawatts of power was being released in the form of latent heat.
- Over the 16,000 square-kilometer area, this comes to an average of 1.1 watts per square meter.
- Two kilowatts of power input can trigger the release of nine million times as much power, 18 billion watts (18 gigawatts)!

This brings us back to the role of the Galaxy in controlling processes on Earth. While the net total energy of Galactic cosmic rays is relatively low, its qualitative effect, via the ionization process, can be very substantial.

Even on very short time scales, the modulation of latent heat release via an ionization system such as the one described here, shows how variations in the relatively low energy input of Galactic cosmic rays can affect the severity of incredibly powerful weather systems, such as hurricanes and cyclones, as Sergey Pulinets and his associates have already shown.[8]

At the other extreme, Nir Shaviv and Henrik Svensmark have shown that the Galaxy controls the largest and most sustained variations in the Earth's climate, on a scale of tens and hundreds of millions of years.

Mankind is coming to actively understand our cosmic-galactic environment and is learning to manage that environment for our betterment.

8. V.G. Bondur, S.A. Pulinets, and G.A. Kim, "The Role of Galactic Cosmic Rays in Tropical Cyclogenesis: Evidence of Hurricane Katrina," *Doklady Earth Sciences,* 2008, Vol. 422, No. 2, pp. 244-249.