Ayo Oyoze Baje

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By Ayo Oyoze Baje

The increasing negative effects of powerful solar storms and flares on Planet Earth, characterized by freaky weather conditions that impact adversely on our rain-fed agriculture, as well as their debilitating influence on modern information and communication technology,(ICT) cannot be underestimated. In fact, they have informed the renewed global interest in the study of Space Weather. How Nigeria and indeed, the entire Africa continent would rise to this challenge, especially their effects on the continent's economic development inspired the recent international mini-conference on advances in space weather research in Africa.

Hosted by Nigeria's first private university of technology, BELLSTECH, Ota, Ogun State, there were representatives from 15 other universities in attendance. It was significant to note that the conference was the second of its kind in Anglophone Africa, after Egypt. And it provided the veritable platform for the combined cerebral cross-pollination of ideas by the globally acclaimed Professor of space physics, Christine Amory –Mazaudier of the Universite Pierre et Marie Cure Paris, France; Professor Jacob Adeniyi, the internationally renowned expert in the field of ionospheric and radio-propagation physics, as well as Dr. Babatunde Rabiu, a Director at the National Space Research and Development Agency(NASRDA). But more importantly, it forms the basis for what our policy makers should be doing now that the worrisome effects of climate change and the thinning of the ozone layer is here with us.

According to Professor Isaac Adeyemi, the Vice Chancellor of the host university, we are in the space age and Nigeria, as one of the developing countries in the world has become increasingly affected by the vagaries of climate change. What with the negative effects on our food and nutrient security. Developing human capacity to acquire the relevant technologies, to monitor and perhaps predict fluctuating weather conditions has therefore, become an imperative. The sudden increased attention to space weather studies is aimed at understanding the ever -expanding universe as well as the changing sun and its effects on the solar system, life and society at large.

In retrospect, prior to the 1990s Space Weather activities, were considered as part of physics, aeronomy or space exploration. As rightly highlighted by the Dean of the Department of Physical Sciences, BELLSTECH, Professor Israel Babalola studying Space weather is therefore, crucial to the survival of our national economy because these energies released by the sun affect the technology we depend upon in our everyday lives such as the internet, cell phone and ATM.

As Professor Amory-Mazaudier explained it takes only eight minutes for rays from the sun to reach the earth. But on their way through the stratosphere and troposphere they come in contact with the earth's magnetic field, creating sunspots and impactful energies. These energies include solar storms, solar flares and coronal mass ejections that impact on the performance of space systems, ground systems as well as terrestrial weather. When spacecrafts malfunction or space orbits change and there is unexpected radiation on humans in space these are the effects of space weather changes. Apart from damaging satellites space weather phenomena can interfere with radio signals from and to these satellites, cause damaging surges in long electrical transmissions lines and expose passengers and crews of aircraft travel to harmful radiation, especially on polar routes. On the ground system these impact negatively on our Global Positioning System(GPS) and other spacecraft signals.

Similarly, they induce geomagnetic currents which also distort electrical transmission and cause leakages on buried pipelines. More profoundly, they affect magnetic survey used for geophysical exploration and contribute to the total amount of energy entering the troposphere and stratosphere for meteorological studies. Over the years, the study of Space Weather has inspired the design and production of relevant instrument by the National Aeronautic Space Agency(NASA),USA Missions including SOHO,ACE,SORCE and CLUSTER. Nigeria has not been left out with the recent launch of NIGSAT-2 to complement the previous NIGSAT-1.

What became apparent after paradigm shift to space weather studies in the 1990s was the need for the commercial and military communities, who were mostly affected by weather changes to have more coordinated researches. Man now needs to know much more about communications satellites that are a vital part of global commerce. Weather satellites provide important information about terrestrial weather. The signals from satellites of the Global

Positioning System(GPS) are used in a wide variety of commercial products and processes.

For Nigeria in particular and Africa in general, the recent international conference is useful for space weather experts to discuss, debate and review positions on the effects of sudden weather changes on our health, agriculture, communications and commercial activities. But as pointed out by Professor Adeniyi, Nigeria must be ready for huge investment in space technology because the cost of satellite is astronomical. Mazaudier did also admit that strange events do happen that would need more researches. For instance, when the sun hibernated between 2008 and 2009 no one could offer plausible explanations. With the ozone layer of between 40 to 50 kilometers above the earth being depleted by emissions of harmful hydro-carbon gases,it is important for Nigeria and indeed Africa not to join industrialized western countries that contribute most of these gases.

To make progress in space weather research, Mazaudier has charged Nigeria to lead the development of knowledge network in Africa.Therefore,the laudable initiative of the collaboration between BELLSTECH and the Nigeria Meteorological Agency(NIMET) should be sustained. Its robust e-resources with 48,905 books and journals in space technology,28,229 in space weather research and 42,271 on space weather management would be handy in expanding the frontiers of our knowledge of space science. Therefore, as Professor Adeyemi has advised, developing the required human resources that would drive the process of understanding this new but complex science would prepare Nigeria for sudden weather changes to come.

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