Emerging Nations Join Age of Space Exploration

Marsha Freeman attended the Congress of the International Astronautical Federation in Daejeon, South Korea. She reports on plans presented there by countries new to space exploration.

As the first steps are being taken by the leading Eurasian powers—Russia, India, and China—to rescue the planet from the present crisis, through vast, new scientific and infrastructure development projects, including in space, a number of smaller and emerging nations are making a parallel effort to join the Space Age. Their progress was evident at the 60th annual Congress of the International Astronautical Federation (IAF), held in Daejeon, South Korea, Oct. 12-16. It was the first time South Korea has hosted this prestigious meeting, and it provided a showcase for its accomplishments as a burgeoning space power.

Each annual week-long Congress is designed to afford participants from all nations an opportunity to present their accomplishments in space science, manned space flight, planetary exploration, space applications, education, and the impact of space development on society.

Much of the focus of the Daejeon Congress, by design of the IAF president, Dr. Berndt Feuerbacher (see accompanying interview), was to encourage the participation of the emerging space nations, with a special emphasis on young people, who will be the future scientists, astronauts, and colonizers of the Moon and Mars. The new space nations include Tunisia, Nigeria, Guatemala, South Africa, Kazakstan, Vietnam, Peru, and Iran.

Although most of these nations have suffered decades of brutal anti-industrialization and enforced backwardness under their former colonial masters, and, later, recolonization by the British-dominated international financial institutions, today, with the imperial financial system disintegrating before their eyes, they have the opportunity to chart a new path, and move into the 21st Century. As Lyndon LaRouche's proposal for a Four Great-Power Alliance (Russia, India, China, and the United States) is realized, these nations will become part of a global renaissance, allowing them to leave their colonial past behind.

Beginning of the Space Age

The Space Age began in 1957, with the Soviet Union's launch of its Sputnik satellite. The United States quickly followed suit.

In the 1960s, joining the two superpowers, were Western Europe and Japan, which took their first tentative steps into space. The following decade, they were joined by rapidly developing nations, including China, India, Brazil, and Argentina.

By the 1980s, numerous nations with established industrial potential, such as South Korea and Mexico, were making use of space technology. More were added to the list in the last decade of the 20th Century.

The first few years of the Space Age centered around

Tunisia National Mapping and Remote Sensing Centre

The North African nation of Tunisia depends upon remote-sensing images, like this one, taken by the French SPOT satellite, of an area north of the capital, Tunis, to monitor agricultural production, water resources, and to plan land use.

the development and launch of Earth-orbiting satellites, which began to provide views of Earth previously unobtainable. Communications satellites relayed radio and, later, television, and other data signals around the globe. The space-industrial nations designed, engineered, built, tested, and launched such satellites, starting in the 1960s. The less-advanced nations then had access to information from these space technologies, to improve the lives and productivity of their populations.

The emerging space nations are now becoming acquainted with space technology by making use of the remote-sensing and other data, and by using the services of communications satellites, which put their populations in touch with virutally all of the world's peoples. These are stepping stones to participation in space exploration programs in the future. A case in point is Tunisia.

For Example: Tunisia

At the IAF Congress in Daejeon, a founder of the Tunisian National Space Committee (NSC), Dr. Mustapha Masmoudi, and a colleague from Manouba University, presented a discussion of Tunisian policy on space applications, which they described as a "model for African development."

The authors stated: "We are convinced that space will offer us genuine opportunities for the transfer of technologies toward the countries of the South. . . ."

The Tunisian NSC was created in 1984, with the central goal of using capabilities in space for strengthening industry and agriculture, using space communications technology, Earth remote sensing for environmental protection from natural disasters and desertification, upgrading of health care, and promoting technological and scientific capabilities.

Although small, Tunisia, with a population of 10 million, is strategically located (**Figure 1**). An Arab country in North Africa, it sits along the Mediterranean Sea, a stone's throw from Europe. Tunis, the capital, is host to the main office of the Regional Center of Remote Sensing for North African states. It has also been tasked to work on developing the Arabic-language terminology suitable for use in international communications systems. Through these projects, Tunisia is developing a cadre of specialists, and plans to devote 1.25% of its annual federal budget to scientific

FIGURE 1

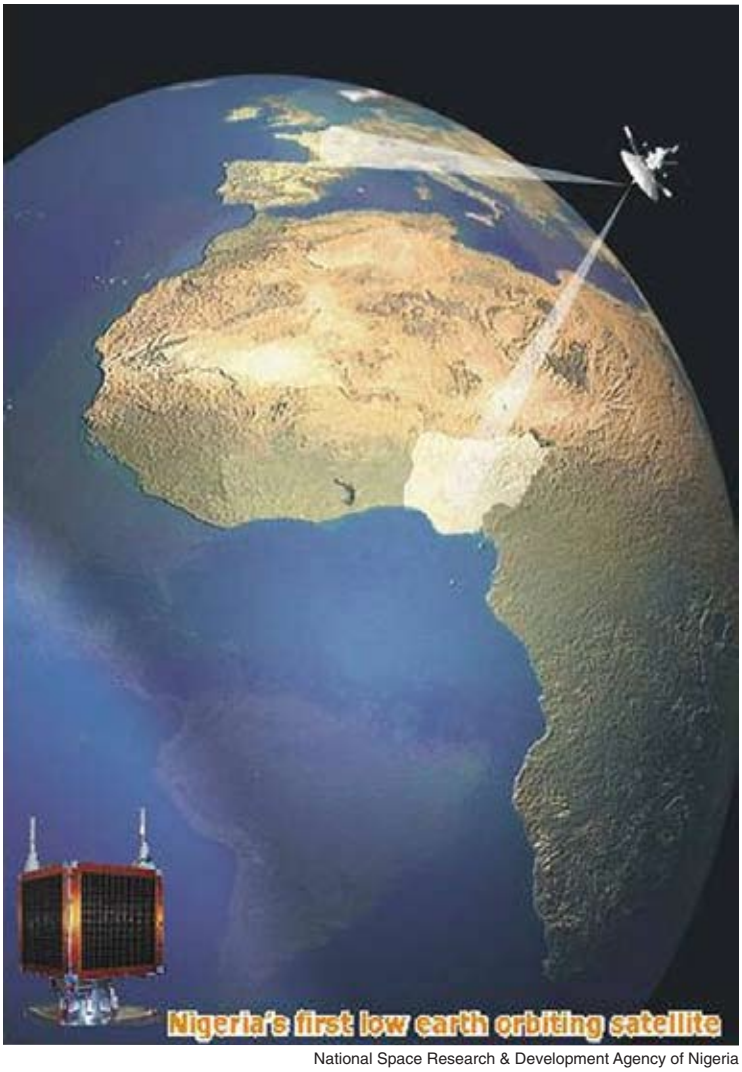
research over the next ten years.

Tunisia participates in a number of international space-related projects for the Maghreb countries. (The Maghreb Union consists of the Arab states of Morocco, Algeria, Tunisia, Libya, and Mauritania.) In 2001, Tunisia's ministers decided to contact other Maghreb nations to coordinate a communications network, designed to develop the skills of the region. One proposal, to take the next step forward, from using space data provided by other nations, to designing and building actual space hardware, led to the preliminary study on developing a small regional satellite space project.

The authors of the proposal explained that, for Tunisia to take the first step in developing its own space technology, "the satellite is the technology that will allow a reduction of the disparities between rich and poor countries."

They also took note of the choice of South Africa as the venue for the 2011 IAF Congress, the first time the Congress will be held in an African nation: "Our greetings go, on this occasion, to the Directing Management of the [International] Academy [of Astronautics] for the organization of this conference in an African capital city."

That conference will undoubtedly highlight the now little-known efforts of nations in Africa to enter the Space Age. And Tunisia sees itself as an upcoming contributor to both Arab and African space technology.



National Space Research & Development Agency of Nigeria

NigeriaSat-1, a remote-sensing satellite, built in England, was used to train Nigerian engineers in satellite technology. The data is used extensively by Nigeria for resource planning.

Nigeria: Building Scientific and Technical Cadre

Nigeria is a sub-Saharan African nation, with an estimated 146 million population, and is more than twice the size of California. The median age of the population is 19 years.

At the IAF Congress in Daejeon, Mariel John, from the U.S. Space Foundation, reviewed the history of Nigeria in space. As early as 1976, Nigeria expressed an intention to become involved in space, but while funds were allocated early on, it was not until 1996 that its National Remote Sensing Center became operational. In 1993, a committee was established to draft a space science and technology policy, and in 1998, the National Space Research and Development Agency (NASRDA), was founded. Today its space agency employs approximately 100 Nigerians.

The vision of the National Space Policy, developed by NASRDA in 1998, states that the purpose is: "To make Nigeria build indigenous competence in developing, designing, and building appropriate hard- and software in space technology as an essential tool for its Socio-Economic development and enhancement of the quality of life of its people."

It continues: "The basis of sustainable development is the development of the requisite manpower within the nation's industrial, research, and academic institutions. Government shall develop a 'critical mass' of Nigerians in the area of space science and technology to enable the country to realize its objectives for achieving technological, industrial, commercial, and economic

self-reliance."

But not everyone hailed this visionary initiative. In early 2001, Nigerian President Olusegun Obasanjo addressed the inauguration of the Honorary Presidential Advisory Council on Science and Technology, and outlined Nigeria's plans in space. The day before, the *Financial Times* of London had published an editorial which criticized Nigeria's spending on its space program, because the country had missed most economic "reform" targets, set by the International Monetary Fund!

Nonetheless, Nigeria forged ahead, and has created a broad, multifaceted space effort, to achieve its vision. NASRDA is made up of six geographically distribed centers, each specializing in a particular area.

National Space Research & Development Agency of Nigeria

On July 30, 2009, the National Space Research & Development Agency of Nigeria celebrated its 10th year. General Director, Dr. S.O. Mohammed, described the day's activities as presenting "the journey so far, and the plans for the future."

To create the educational and research base for Nigeria's space programs, the Center for Basic Space Science, located at the University of Nigeria in Nsukka, was established. The Center for Space Science and Technology Education offers advanced studies for those already involved in space science, including university educators and research scientists.

Satellite payloads are designed at the Center for Satellite Technology Development, while the Center for Geodesy and Geodynamics uses remote-sensing data for surveying and mapping, the location of minerals, monitoring coastal changes, and analyzing agricultural land use.

Locally built rockets are developed at the Center for Space Transport and Propulsion, and the National Center for Remote Sensing operates a ground station which controls and receives data from Nigeria's Earth-observation satellite.

While determined to build up its own resources and capabilities, Nigeria worked with international partners to send its first satellites into space. In 2003, Nigeria joined the Space Age, with the launch, from Russia, of Nigeria Sat-1.

The small remote-sensing satellite was built at Surrey Satellite Technology Ltd. in England, as one of cluster of "smallsats" that function together as a global disaster-monitoring system. The $15-20 million project included the participation of Nigerian engineers who went to England to learn how to design the satellite.

One year later, the Ministry of Science and Technology proposed a Nigerian communications satellite, to greatly lower the cost that Nigerians were paying to foreign satellite owners for telephone and other telecommunications services. Nigeria's plan was to become a provider of telecom services for most of Africa.

Partnering with China

In 2005, Nigeria and China signed an agreement for China to build a communications satellite, NigComSat-1, which was launched on May 3, 2007, becoming Africa's first geosynchronous communications satellite. An 11,354-pound, very capable craft, NigComSat-1 could provide communication services throughout Africa and Europe.

Later that year, *This Day* reported that the Nigerian government had spent $1 million each, to train over 100 Nigerians in space science and technology, to "get them ready" for the country's space infrastructure. Nigeria's Minister of Science and Technology, Prof. Turner Isoun, remarked that "no self-respecting government" depends solely on contracts to foreign experts.

While NigComSat-1 was being prepared, in 2006, it was announced that Surrey Satellite would build Nigersat-2, the country's second remote-sensing satellite, designed to deliver 100-400 images per day. As part of the agreement, Surrey has hosted 40 Nigerian engineers at its production site, where they built their own training model of the satellite, and earn Master's degrees at Surrey University.

As Nigeria's communications satelite was being prepared for launch, the government, once again, confronted the criticism that money should instead be spent "fighting poverty." Prof. Robert Boroffice, head of the space agency, responded that space technology was another way of lifting Nigeria out of povery, by serving as a catalyst for economic development.

Unfortunately, after one year in Earth orbit, the Chinese-built NigComSat satellite failed (it will be replaced, free of charge, by China Great Wall Industries). But this has not discouraged Nigerian planners. Follow-on NigComSats 2 and 3 are in the works. Experts estimate that, thanks to the development of its cadre of engineers, by 2015, Nigeria will be able to design and build its own satellites.

In December 2009, the director-general of NASRDA, Dr. Seidu Onailo, told the National Media Conference on Space Science and Technology that space development is a "tool for technological revolution" for any society. This year, Nigeria is looking forward to the launch of its second remote-sensing satellite, and an experimental Sat-X high-resolution satellite.

The goal, as expressed by Nigerian officials, is for Africa to overcome its colonial designation as the "dark continent," and instead, to become enlightened space-faring nations in the years ahead.

Interview: Dr. Berndt Feuerbacher

Bringing New Nations into Space


IAF

Dr. Feuerbacher is the current president of the International Astronautical Federation. He earned a Ph.D. in physics from Ludwig Maximilian University, in Munich, in 1968. He has participated in many science missions of the European Space Agency, and holds eight patents. He was interviewed by Marsha Freeman on the final day of the IAF Congress in Daejeon, South Korea, Oct. 16, 2009.

EIR: Congratulations on a very successful Congress. You mentioned that there were more people attending than you had expected.

Feuerbacher: Yes. You see normally we expect high attendance in the traditional space countries, in Europe and in the United States. If you are outside, it usually goes down a bit. So we extrapolated from the [2007] Congress in Hyderabad [India], and added a bit of financial crisis, and if you do that, you end up [expecting] less than 2,000 participants. But we had clearly more than 3,000—about 3,300. That was a real surprise for us. I think [the Koreans] did a very good job in advertising the Congress.

EIR: You had mentioned to me last year that one of your goals as president of the IAF was to bring in more young people. It seemed to me that this Congress had many more youth than previous meetings.

Feuerbacher: That has been very, very successful, and the same is true for the Space Generation Congress. We have a youth grant competition newly established within the IAF, which is for students from emerging space countries. And we had 12 young students who came here on those grants. In addition, we have the young professional program. Overall, I estimate than more than 25% of [the attendees] at this Congress are below the age of 33.