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Desperate state of space science discourages Turkish astrophysicists

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A speech from world-famous astrophysicist Stephen Hawking created huge interest at the public symposium in honor of his 70th birthday at the University of Cambridge on Jan. 8.

According to Hawking, the world is facing serious problems including a nuclear threat, climate change and diminishing natural resources which will lead to the extinction of humanity in 1,000 years. Colonizing other planets seems to be our only chance for survival. In his speech he stressed the importance of "spreading out across the universe." "Look up at the stars and not down at your feet," he recommended.

Due to disaster and human extinction scenarios, developed countries place vital importance on their space programs. With advanced technology and large budgets devoted to science, developed countries take advantage of space technology in a variety of fields such as the military, telecommunications, space shuttle launches, exploring space and conducting research in space.

On the other hand, Turkish astrophysicists mainly complain about the financial limitations that obstruct space research, which is quite costly. Professor Sacit Özdemir from the Ankara University department of astronomy and space sciences said that scientific research requires a high budget to provide the most sophisticated technology. Due to the low annual percentage of Turkey's gross national product (GNP) devoted to science, it falls behind Western countries in space and science programs. Even if various studies are conducted on this subject at the Scientific and Technical Research Council of Turkey (TÜBİTAK), they aren't really enough.

Turkish astrophysicists agree with the idea that space science was neglected by earlier governments and also the most recent government. Turkish governments have neglected supplying technical equipment and adequate funds for scientific research; that's one of the reasons why Turkey is underdeveloped in technology and science when compared with developed countries. Ankara University's head of the department of astronomy and space sciences Professor Ethem Derman asserted: "The money allocated to science as a percentage of GNP is lower in Turkey than any EU country. Scientific research has not been on the agenda of any past government, or that of the most recent government. Today, Turkish astronomers use telescopes that are almost equal to the telescopes used by amateurs in developed countries. The telescopes used in Turkish universities are even worse. There are only four departments of astronomy and space sciences in Turkey and only three of them have observatories. In these observatories, scientific research is supposed to be conducted by students. In all observatories except one, research is conducted with telescopes that are almost amateur. Even a small expense like a broken camera is not supplied by the university. Under these conditions, astronomers cannot be expected to make discoveries."

The information highlighting the desperate state of space science comes from Director of the Çanakkale Onsekiz Mart University Astrophysics Research Center (ARC) and Director of the Ulupınar Observatory Professor Osman Demircan. "In Turkey, the number of qualified workers in the fields of astronomy, astrophysics, space science and space technologies is around 400. Countries like France, Germany and England have 5,000-10,000 people in these fields. Developed countries have made great efforts in this direction; they have taken big steps towards space with their advanced technologies. Currently there are thousands [up to 10,000] functioning spacecraft around the world. The cost of each of these spacecraft is hundreds of billions of dollars. Like visiting a neighbor, space shuttles regularly go to the International Space Station. People are carried up and experiments are conducted in space," he said.

Professor İbrahim Küçük from the Erciyes University department of astronomy and space sciences calls attention to the limitation of space programs in a few areas. He says: “Space programs in Turkey are planned to be used within the confines of state policy, which are limited to the areas of communication, ground observation, military-based satellite construction and near space.” This means that the space program in Turkey is mostly used for the practical benefits of the state, not for the scientific exploration of outer space.

Additionally, there are underlying reasons for the underdevelopment of space science in Turkey. “Unfortunately, science is not progressing in Turkey. It could even be said that it is regressing. There are many reasons for this, but the most important reason is the ever-changing methods of the Ministry of Education [MEB] and the government’s perspective on science,” said Derman.

On the other hand, Turkey’s struggle with some other serious problems -- terrorism, economic problems and problems with democracy -- occupy the state agenda and require large amounts of money; these are the outstanding reasons why governments have neglected space science in Turkey. Demircan explains, “In developing countries like Turkey it is not very possible to focus on R&D [research and development] due to these countries’ primary problems.”

After referring to the miserable state of space science in Turkey, astrophysicists commented on Hawking’s theories about the upcoming end of the world. They called attention to the importance of developing space capabilities. Özdemir commented on the disaster scenario and added his personal opinions about the end of the world:

“The disaster scenario about the future of the world that Hawking predicted is realistic. Humans [especially Western people from developed countries] are rapidly destroying the natural balance of the world. But it is impossible to predict when the world will become totally uninhabitable; it is a process. Every individual must be aware of this issue. Since the disaster scenario seems to be inevitable, colonization on other planets can be thought of as a solution for survival.

“Even colonization of space stations around Earth seems impossible given the current level of technology, but this is a more realistic solution than colonizing the other planets. The dream of establishing satellite colonies orbiting around the Earth might come true in around 50 years, given the rapid advances in technology and ongoing space research.

“In my personal opinion, humankind -- considering the dimensions of the universe and the solar system -- will never spread to outer space. Humans exist in this world, and they will become extinct in this world.”

Demircan made an analogy to illustrate the disaster scenario, saying: “Once similar to Earth in terms of physical properties, Venus turned into a hell due to global warming, caused by an increase in carbon dioxide due to volcanic activity.”

Since the future of the world is in danger and this scenario is scientifically accurate, the development of a space program seems vital. A lack of technological development, an inadequate budget and qualified manpower are the main problems to overcome in order to have an advanced space program. Derman announced the necessary equipment, saying: "There must be at least one-meter telescopes in every university observatory and at TÜBITAK. A national observatory must have a five to six-meter telescope. Today the largest telescope at the TÜBİTAK National Observatory (TUG) is about one-and-one-half meters in length, which belongs to the Russians." Demircan adds: "Turkey has to increase its qualified manpower by at least tenfold so as to reach the levels of developed European countries. Also, qualified manpower is not the entire solution. The state must to allocate more money to R&D. Today, not even 1 percent of the total budged is allocated to R&D. If the qualified manpower and budget for R&D are raised to a sufficient level, Turkish space research can thrive, as in developed countries."

In an exclusive interview with Sunday's Zaman, Turkey's Minister of Transport, Maritime Affairs and Communications Binali Yıldırım stated that the organization of his ministry was transformed during his term. A new department, the General Directorate of Aviation and Space Technologies, was established to develop a national aviation and space industry. The primary task of the department is to identify, implement and, if necessary, update the policies and objectives of the national aeronautics and space industries with relevant institutions and organizations.

According to Yıldırım, the tasks to be fulfilled include designing, manufacturing and integrating products, technologies, systems, facilities, materials and tools related to space and aeronautics -- such as satellite and aircraft design, testing centers, satellites, launching vehicles and systems, air tools, simulators and space platforms.

Yıldırım asserts that "Even if 'space' is not mentioned clearly in the ministry's name, with the tasks and the organizational structure of the ministry, they [government] has actually established a Ministry of Space with the recent changes in its organization.

Seemingly, it will be a demanding process to fix the problems in Turkey's space science program, as the numerical data presented by astrophysicists demonstrates the gravity of the situation. Considering that the world is becoming uninhabitable, developing an advanced space program is indispensible. Nevertheless, the present government is taking concrete steps to handle the situation.