

A Transforming Scenario: the New Space Agenda

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I believe that most coevals of my generation, the so-called 'baby-boom' generation, living as teenagers in the 1960s, have imagined that at the dawn of the 21st century we were witnessing a very lively space flight era, with manned space stations and human colonies on the Moon and even on Mars. Every teenager at that time, witnessing the 'live transmission' of men walking on the Moon, has certainly dreamed of this possibility, and Kubrik's and Arthur Clarke's *2001 – A Space Odyssey* (produced in 1968) represented the incarnation of this hopeful future. But later, in the 1990s, as mature adults, the idea came to those minds that the Earth seemed to have stood still – at least with regard to space activities. What happened?

What is known today as the 'Space Race' began suddenly in the 1950s and has grown explosively during the following two decades, but decreased steadily after the 1970s. There were many reasons for the twilight of space activities observed after this date, among them we can mention the onset of the worldwide economic crisis triggered by the 'oil crisis' of 1972, diminishing space budgets, the gradual innovation process, technological barriers, the end of the Cold War, and perhaps the most important one – the absence of market forces. An extensive analysis of these causes was recently offered in a paper of mine in collaboration with my co-workers at the Technological Observatory of the IAE - DCTA (Devezas *et al.* 2012). But in the same publication we have demonstrated that, after the 1990s, however, we are witnessing a shy rebirth of space-related activities, with characteristics very different from that imagined by futurists active in the 1960s and 1970s. What means this recovery? Are we witnessing the burgeoning of a new space race?

During the space race that characterized the onset and further development of space exploration, the rules of the game, as stated above, were not dictated by the market. Now things are changing, and with the entry at the stage of several other players, the strong market forces are showing their strength. The exciting news for space enthusiasts is that the space sector is experiencing nowadays important changes with two major characteristics: firstly a transition from an exclusively government-led to a new market-oriented space exploration activity, where private enterprises are increasingly involved, and secondly the participation of several nations struggling for a place in the new space scenario, leaving behind the old fashioned one led by incumbent world powers that dominated this field in past decades.

The former constitutes perhaps the most striking aspect of modern aerospace activities, which gave birth near the end of the 1990s to the umbrella term 'NewSpace' (Bizony 2014; Lindsey 2009) which designates the emergent private spaceflight industry, a community of relatively new aerospace companies working to develop low-cost access to space and/or spaceflight technologies, and advocates a new space policy. These two features have given rise to a complex game of interests in the space sector, with the participation of several new players (or agents), nations and private companies, and that still lacks a clear definition of rules that shall better direct the future development of this sector.

The recent dramatic increase in the number of companies engaged in space activities led to the common usage of the phrases 'new space companies' and 'entrepreneurial space', or most commonly 'NewSpace' as stated above, intended to designate a new approach to space development that differ significantly from that taken by NASA and the mainstream aerospace industry. This new group of private enterprises is characterized by seeking the cheaper development of launch systems (Stern 2013) and/or space technologies principally with private funding, with only secondary or no involvement with government spaceflight programs and contractors. Traditional private companies that conduct aeronautical efforts, such as Boeing or Lockheed, are generally not considered part of NewSpace due to their heavy reliance on NASA development funding and military space programs as part of their business model. In some measure, NewSpace companies are still dependent on NASA, often participating in projects such as *Commercial Orbital Transportation*

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Services, a NASA program established in 2006 to coordinate the delivery of crew and cargo to the International Space Station by private companies. But generally speaking NewSpace companies tend to focus primarily on consumers in the private sector. It is worth pointing out the existence to date of about a hundred of such enterprises, some of them have not yet really started commercial activities. Recent extrapolations of the trend curve point to a probable total of about 200 active private companies around 2030 (Ribeiro 2015).

As mentioned above the other major group of new actors in the new environment of space activities consists of the growing number of nations entering the stage. As spacefaring nations we understand those nations capable of independently building and launching craft into space. The list of spacefaring nations grew from just two in the middle of the last century to about 13 today, namely: Russia, USA, China, UK, France, Canada, Japan, India, Israel, Ukraine, Iran, North Korea, and South Korea. But far more significant is the growing number of nations with satellites (mainly communications, but not only) placed in orbit. This number grew from just 4 in 1962, the year in which UK and Canada entered the club of spacefaring nations, to 82 today. Evidently, this number includes not just those nations that did it with their own launching capabilities, but also those that used launching means of the spacefaring nations.

Returning then to our question: are we witnessing now a new space race? Probably not. This time is different, we do not have now the rush factor, there is not the desperate objective to come first. What we have is simply a redesigned configuration of the space scenario that certainly can be defined as the *New Space Agenda* for the first half of the 21st century.

Undoubtedly, this new agenda appears as an excellent opportunity for companies focused on space activities, and this is even better if the nations that are at their home have technological skills for the deployment of craft in space. I was recently surprised by the news that the next nation to enter the exclusive club of spacefaring nations will be Argentina, which expects to gain space access in 2016 through the development and flight qualification of its launching vehicle project Tronador II.

It follows then the natural question: what is our position (Brazil) on this agenda and in this new scenario? What are our real chances to achieve in the near future the goal set about four decades ago of becoming a spacefaring nation? Obviously it is not my purpose in this editorial to analyze, let alone provide an answer to this disturbing question. But I would like to call the attention of our readers to an article published this year in the pages of *Space Policy*, with the suggestive title: "Brazil's space program: dreaming with its feet on the ground" (Moltz 2015). Indeed, a must read!

The author, a researcher at the well-known Department of National Security Affairs of the Naval Postgraduate School (Monterey, CA), starts his reasoning with the sad (to us) statement that Brazil, placed among the world's top ten economies, is the only country that lacks either a national space launch capability or membership in a space-capable regional body like ESA. Still more vexing is our insignificant (regarding space capability) last place among the BRIC countries. The author also offers an interesting analysis of the factors that have held back Brazil in this field, some of which continue to influence its policy today: apart from the obvious 'inadequate funding', but also and importantly, 'conflicting organizations, poorly handled foreign relations, and an unclear vision for Brazil's place in space'. The picture that the author paints about the complex path that Brazil must tread toward becoming an effective member of the restrict club of spacefaring nations constitutes an excellent array of food for thought.

But fortunately not everything we see in the panorama of Brazilian space activities is so negative. I am witness of brilliant initiatives that give us great hope for the future, and wish to highlight the important role that the JATM has played in this context, a journal of high scientific and editorial quality, now indexed in Scopus among other few publications in the aerospace field, and recently upgraded by CAPES as B2 publication. I wish to congratulate the editorial board of JATM for this success, which constitutes an inestimable contribution to enhance Brazilian visibility in the new space agenda.

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