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Game changers in the space economy (3)

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## THE FOURTH INDUSTRIAL REVOLUTION AND SPACE

**Abstract**

At the 46th World Economic Forum in Davos, in January 2016, participants gathered to reflect and exchange ideas on the theme “Mastering the Fourth Industrial Revolution”. The fact that this topic is gaining impetus at a high political level reflects the growing expectation that many current and upcoming technological innovations, proceeding at an exponential pace, will soon result in a transition. Such a discontinuity will potentially affect humanity in a fashion that was similar to the historic impacts of the steam engine, electricity and computers. For the space sector, this raises a wide range of questions. For instance, what the role of space will be in this process and in turn what the implications of a wider societal shift could be for space. This paper seeks to clarify what is understood by the “4th Industrial Revolution” and how its relationship with space is characterised. In a first instance, the paper will explore how this debated concept would be defined and how it would be characterised in comparison to the previous Industrial Revolutions. In this respect, the authors will aim to bring clarification by taking a layered approach; i.e. by analysing the dynamics of change at three hierarchical levels. On the micro-level, innovation in sub-field technologies – such as nanotechnology, biotechnology, advanced robotics – constitutes the major driving force behind a new industrial revolution. On the meso-level, these developments are enabling the rise of new phenomena (including: artificial intelligence, internet of things and big data) that, when converged, would ultimately concretise and bring about this transition. On the macro-level, a novel global context could arise as a result of these propagating changes. This will result in a transformation of the current global societal, political, technological and economic landscape. By distinguishing between these three levels, the role of space technologies and activities can then be assessed in greater detail. This will reveal how the strategic position of space within technology development is evolving. Moreover, it will also shed light on how space and its institutions might be affected by changes within society, such as shifting labour markets, societal needs and the potential of game-changing events. Finally, attention is given to the space actors and decision-makers in this process, and their role in anticipating and accommodating the unfolding 4th Industrial Revolution in a way that would strategically position space assets, technologies and policies in the best possible fashion.