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THE FUTURE OF SPACE EXPLORATION – PERSPECTIVES FROM DATA DRIVEN FORESIGHT

Abstract

Systemic data driven foresight analyzes data from the past and present from various angles in order to draw conclusions towards possible future developments. From this perspective, the future of space exploration is dependent on conceptions, ideas, and general trends of different societal subsystems, such as science, politics, economics, or mass media. In each of these systems, space exploration is conceptualized differently and underlies different attention cycles. Furthermore, these systems interact with each other, leading eventually to decisions about space exploration. In systemic data driven foresight analysis, the assumption is that future events always produce so-called "weak signals". They "cast their shadows ahead". Putting together relevant "weak signals" thus allows to identify driving forces and trends which can be used as the basis of scenario building. To investigate the subsystems' trends in a data driven manner, we collect documents representing the discourses of the scientific and mass medial subsystems about space exploration and use text mining to extract insights. These documents are taken from the databases OpenAlex (containing scientific works) and Wikipedia (representing mass media). We show their discursive structure, semantics and trends in the last 20 years. Which concepts and methods of space exploration are being discussed and how do they change? In which way do the scientific and mass medial discourses converge or differ? Which are the dominating actors in the field? This "stereoscopic" view gives us important hints on the driving forces behind the international development of space exploration. Eventually, based on the knowledge about driving forces we present likely courses that international space exploration may take in the mid- and long-term.