

SPACE EXPLORATION SYMPOSIUM (A3)

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Author: Ms. Bin Zhang

China Academy of Space Technology (CAST), China, bin811017@gmail.com

Ms. Zhao Shu ping

China, qianqiuxuebin@163.com

Mr. Yi Wangmin

China, qianqiuxuebin@163.com

Dr. Wan Bile

China, qianqiuxuebin@163.com

TECHNOLOGY OF INTELLIGENT 3D PRINTING ROBOT WILL BENEFIT FUTURE SPACE
EXPLORATION**Abstract**

In order to meet the demand for future space exploration, we should find a way to help human achieve interstellar travel or even immigration to other planets in the future. In the paper, we propose a fusion technology of intelligent robot and 3D printing. That is intelligent 3D printing robot used for autonomous constructing space structure in orbit. As the rapid development of technologies on automation, object identification, robot and arm, intelligent autonomous space robot is introduced for in-orbit work aiming to break restrictions of the launching campaign. 3D printing technology, which is a revolutionary technology of additive manufacturing, will bring great impact on traditional manufacturing. NASA is on his way to use 3D printing technology for future space expeditions and is preparing to launch a 3D printer in space. For both the popular technologies for space exploration task, the fusion of them means much. With the advantages below, intelligent 3D printing robot will have a bright tomorrow. 1) reducing space environment limitations for human activities; 2) reducing launching capacity constraints of launch vehicle, complicated spacecraft even space-based system in-orbit or on other planets can be constructed; 3) removing effects of earth gravity and launching environments, material with less strength but other good performances can be used; 4) exploiting materials on other planets to get good performance and lower the cost, etc. With the development of intelligent 3D printing robot, we believe that in the future not far away we can see the factories on other planets using asteroid materials to construct huge space structures for deep space exploration.