

## Contactless and Multiple Space Debris Removal by Micro to Nanno Satellites

**Authors :** Junichiro Kawaguchi

**Abstract :** Space debris problems have emerged and threatened the use of low earth orbit around the Earth owing to a large number of spacecraft. In debris removal, a number of research and patents have been proposed and published so far. They assume servicing spacecraft, robots to be built for accessing the target debris objects. The robots should be sophisticated enough automatically to access the debris articulating the attitude and the translation motion with respect to the debris. This paper presents the idea of using the torpedo-like third unsophisticated and disposable body, in addition to the first body of the servicing robot and the second body of the target debris. The third body is launched from the first body from a distance farer than the size of the second body. This paper presents the method and the system, so that the third body is launched from the first body. The third body carries both a net and an inflatable or extendible drag deceleration device and is built small and light. This method enables even a micro to nano satellite to perform contactless and multiple debris removal even via a single flight.

**Keywords :** ballute, debris removal, echo satellite, gossamer, gun-net, inflatable space structure, small satellite, un-cooperated target

**Conference Title :** ICSDD 2022 : International Conference on Satellite Design and Development

**Conference Location :** Sydney, Australia

**Conference Dates :** August 30-31, 2022