



Dipartimento  
Meccanica  
Matematica  
Management

MUR  
Dipartimento  
di Eccellenza  
2018-2022  
2023-2027

## Research project

**Nome and Surname:** Michele Ciavarella

**Title:** Study of adhesion in elasto-plastic contacts, with applications in cold welding for space

**Description:**

Cold welding or contact welding is a solid-state welding process in which joining takes place without fusion or heating at the interface of the two parts to be welded. Cold welding was first recognized as a general materials phenomenon in the 1940s. It does not occur in hard materials mainly because of the presence of oxide layers, and of roughness. However, when two clean, flat surfaces of similar metal with reduced roughness are put into contact, particularly after fretting which wears out oxides, the adhesion becomes strong enough for welding. Based on extensive experience of the PI on rough contacts, the project will develop specific geometries and guidelines for implementing cold welding in space, as a simple technology to repair parts of the space structures damaged perhaps after high velocity impacts.

**Candidates should provide detailed CV**

**Contacts**

Michele Ciavarella: [michele.ciavarella@poliba.it](mailto:michele.ciavarella@poliba.it)