

## Training Opportunity for Belgian Trainees

Reference	Title	Duty Station
BE-2018-TEC-MSM	Space Mechanisms	ESTEC
<p><b>Overview of the unit's mission:</b></p> <p>The Structures, Mechanisms and Materials Division (TEC-MS) is the centre of competence of the Agency in all areas related to spacecraft and launcher structures, mechanisms and materials, encompassing spacecraft and launcher lightweight structures, stable structures, advanced mechanical materials applications, structural dynamics, damage tolerance, deployable structures/booms, active structures, hold-down and release devices, electrical motors for space mechanisms, launcher and re-entry vehicle, hot- and cold structures, landing attenuation systems, seals, valves, parachute systems, separation systems, solar array drive mechanisms, reaction wheels, pointing mechanisms, pyrotechnics, bearings and tribology aspects. It provides support to projects, preparatory programs and technology programs.</p> <p>Within this frame, the Mechanism Section (TEC-MSM) is the focal point for matters relating to the design, engineering and verification of space mechanisms. This entails, in particular, responsibility for:</p> <ul style="list-style-type: none"> <li>• overall mechanisms definition, design and engineering;</li> <li>• mechanisms performance evaluation and analysis (including hardware tests where appropriate);</li> <li>• mechanisms technology research and development (addressing areas like tribology/lubrication engineering, mechanical components as for instance ball bearings &amp; gears, electric motors, motion sensors, pyrotechnics, new/alternative actuation principles e.g. by using active/smart materials, ...);</li> <li>• mechanisms drive and control laws;</li> <li>• mechanisms operation/performance modelling and simulation.</li> </ul>		
<p><b>Overview of the field of activity proposed:</b></p> <p>The Trainee will participate in the conceptual design, analysis and development of mechanisms for use in space projects. In assistance to ESA engineers working in this domain, the holder of the training position will be given a specific task which may include:</p> <ol style="list-style-type: none"> <li>1. critical review of design / analysis / optimisation / test activities and simulation / characterisation / validation (up to the correlation of analysis with test results) in the domain of space mechanisms, using software packages like MATLAB/Simulink® or other, more specialised software tools (FLUX, ANSYS Maxwell, COMSOL, ADAMS, D-Cap etc.), with particular emphasis on:             <ol style="list-style-type: none"> <li>a. Frequency domain performance representation;</li> <li>b. Multi-Body system simulation;</li> <li>c. Electromagnetic system simulation;</li> <li>d. Ball bearing loading/strength &amp; stiffness analysis</li> <li>e. Multiphysics modelling and simulation</li> </ol> </li> <li>2. feasibility assessment of new mechanisms design concepts;</li> <li>3. review and analysis of design solutions for mechanisms, and participation in the ESA project review process;</li> <li>4. participation in CDF (Concurrent Design Facility) studies;</li> <li>5. participation in the definition and implementation of R&amp;D activities related to space mechanisms.</li> </ol>		
<p><b>Required education:</b></p> <p>Applicants should have just completed, or be in their final year of a University course at Masters Level (or equivalent) in mechanical engineering, and have therefore a good understanding of tribology, Ball bearing, motor and motion sensor technologies.</p> <p>A good grasp of system aspects and a good understanding of other engineering domains are desirable, e.g., electronics, structures, materials, control systems, etc. Proficiency in the use of engineering software tools is an asset,</p> <p>Applicants should have good interpersonal and communication skills and should be able to work in a multi-cultural environment, both independently and as part of a team.</p> <p>Applicants must be fluent in English and/or French, the working languages of the Agency. A good proficiency in English is required.</p>		