

## Training Opportunity for Portuguese Trainees

Reference	Specialist Area	Duty Station
PT-2010-TEC-MTV	Thermal Analysis and Verification	ESTEC
<p><b><u>Overview of the Division missions:</u></b></p> <p>The Thermal Division TEC-MT is the centre of competence of the Agency in all areas related to thermal design, engineering and verification. It provides support to projects, preparatory programs and technology programs. Within this frame, the Thermal Control Section TEC-MTT is in charge of all thermal and environmental control aspects, and <b>the Thermal Analysis &amp; Verification Section TEC-MTV</b> is the focal point for Thermal &amp; Environmental Control analytical methods and systems, software tools and experimental/test services executed in the MSL (Mechanical Systems Laboratory).</p>		
<p><b><u>Overview of the field of activity proposed:</u></b></p> <p>1/ <u>Thermal systems analysis and modelling</u>: Perform thermal modelling including steady state/transient analyses of instrument and satellites following familiarisation with project requirements and Agency's standard tools (ESATAN-TMS, ARTIFIS/TOPIC, TCDT and ESATAP).</p> <p>2/ <u>Thermal Protection Systems (TPS) modelling</u>: Perform thermal modelling of TPS using the Amaryllis software tool and coupled analyses with ESATAN.</p> <p>3/ <u>Thermal analysis methods</u>: Identify and evaluate advanced algorithms for hybrid local finite element/global lumped parameter analysis models, parameter variation/sensitivity analysis/design optimisation in combination with stochastic methods, radiative heat transfer modelling and/or hybrid surface and solid thermal analysis models to better interface with CAD.</p> <p>4/ <u>Thermal analysis tools</u>: Contribute to development and validation of ESATAN-TMS (ESATAN/FHTS for thermal/thermo-hydraulic analysis and ESARAD for thermal radiative analysis) and of EcosimPro for advanced Environmental Control and coupled thermal/propulsion analysis.</p> <p>5/ <u>Experimental verification</u>: Participation in the daily testing activities of the Mechanical Systems Laboratory, to get familiar with the organisation and execution of tests and the evaluation of test data. More specifically, participate to thermal balance / thermal cycling tests on small-scale space equipment and payloads and support the measurement campaigns of key thermal and mechanical properties of space materials such as the thermal conductivity, the thermal efficiency of multi-layer-insulation (MLI) and the coefficient of thermal expansion.</p>		
<p><b><u>Required Education:</u></b></p> <p>Applicants should have just completed, or be in their final year of a University course at Masters level in a technical or scientific discipline. Candidates must be fluent in English or French, the official languages of the Agency. Specific knowledge is very different, depending on the field of activity selected:</p> <p>1 and 2/ Physics, thermal / mechanical engineering university degree or equivalent, with basic knowledge of radiative and conductive heat transfer and thermal simulations.</p> <p>3 and 4/ Thermal/mechanical engineering with basic knowledge of thermal analysis, numerical methods and software engineering.</p> <p>5/ Experimental physics or aeronautical/mechanical engineering.</p>		