**Ref. PROMETEO-LNF-D2: Plasma-wave interactions in thrusters and fusion palsmas in the range of electron cyclotron frequency.**

The study of the interaction between electromagnetic waves and plasmas in thrusters and fusion plasmas presents several challenges, especially considering the disparate plasma parameters and conditions to be considered. Waves are of key importance for fusion plasmas to achieve plasma heating and current drive, which can also modify transport and to tailor the rotational transform profile. Regarding thrusters, the use of waves to create and heat plasmas can improve the global efficiency of the device and get it rid of the use of electrodes that limit the life of the engine.

The study of the processes of wave propagation and absorption need the use of techniques of ray tracing and full wave, including a realistic dielectric tensor that takes into account the relevant physics.

The research on the effect of waves on plasma heating, transport and current drive is also mandatory, since the waves will modify the plasma confinement. Several tasks must be developed by the hired person:

* To study the properties of propagation and absorption of waves in the ECR range in thurster and fusion plasmas. This study will require different techniques, form WKB approximation to the full wave calculations.
* Research on the impact of heating on plasma confinement and current. Here, Fokker-Planck and Langevin-equation-based PIC codes must be used.

**Requirements**:

* Doctor in Physics or Engineering (Telecommunications).
* Knowledge of wave properties and plasma-wave interactions
* Computation skills, including the use of parallel codes
* Fluent English