

## Séminaire P2M

Lundi 6 décembre 2021 à 14H-amphi 200

Francesco A. Volpe

Renaissance Fusion, 38600 Fontaine, France

### Renaissance Fusion – the High-Temperature Superconducting, liquid metal wall stellarator start-up

Renaissance Fusion is a French company developing fusion-enabling technologies to reach unlimited clean energy with a cheap, modular and scalable design. It is one of only two stellarator companies worldwide and lays special emphasis on making stellarators smaller (via High-Temperature Superconducting coils), less radioactive (via mesoscale liquid metal walls) and simpler to build. After a reminder of some basic notions on fusion reactor concepts, the main technological options characteristic of our project will be outlined. Initial results will be presented in the areas of coil optimization for force minimization, simplification of the coil winding surface, neutronic optimization of the liquid wall materials, design point of a compact, profitable stellarator reactor and retrofitting of a fission power-plant. Emphasis will be laid on liquid metal experiments. In particular, a 1 cm thick, gravity-defying flow of Ga-In-Sn was realized, which fully coated the inside of a hemicylindrical chamber, in the absence of plasma. Evidence of passive and active MHD stabilization was obtained, as well as initial results toward feedback stabilization. Future research and areas of possible collaborations in stellarator modeling will be discussed and a liquid metal wall experiment will be proposed, which could be realized at SPEKTRE, in the presence of plasma.

<https://stellarator.energy/people/francesco-volpe/>