Research program: "Modeling of flow boiling phenomena in microchannels" – CODE 1

Annex C

Department of Engineering and Applied Sciences

Tutor: Prof. Marco Marengo

Research project

The research is linked with the European IAPP project FS3000 on the modeling of cavitation and flow boiling in diesel injectors at very high pressures and specific flow rates. The last phase of the project is intended to be dedicated to the construction of feasible flow boiling models to be implemented in numerical codes, such as UDF for FLUENT and for GFS (City University, London).

Research program: "Wetting dependent models of liquid slug-vapour plug regimes in pulsating heat pipes" – CODE 2

Department of Engineering and Applied Sciences

Tutor: Prof. Marco Marengo

Research project

The research is linked with the ASI AO2009 project on the experimental and numerical analysis of a Pulsating Heat Pipe for space applications. A lumped parameter code has already been developed and tested. A robust comparison of the numerical results with the experiments on ground and in microgravity was carried out showing extremely good agreement in case of a capillary pulsating heat pipe. The grant is given to extend such simulation to a Hybrid Heat Pipe, which is working as a capillary system only in microgravity environment. Moreover the implementation of a sub-model considering the effect of wettability of the intermal surfaces both for the fluid-dynamics and for the heat transfer effects is foreseen.