

# Thermosyphon and Heat Pipes: Fundamentals and Applications

## ABSTRACT

Heat transfer devices based on the two-phase flows of working fluids have been applied to solve thermal control problems in several equipment, from electronic devices in smartphones or in spacecrafts, to large heat exchangers in petroleum industry, for instance.

Among them, thermosyphons and heat pipes are considered very successful and, in the last three decades, have deserved great investment for research and development of equipment around the world. The speaker has a huge personal experience in applying these devices in several different applications: petroleum industry, industrial waste heat recovery, industrial water saving, electronic temperature control (both for miniature and large equipment), passive solar device for building, solar water warming, Heat transfer at high temperature application (above 800 °C) and other minor applications.

## Syllabus:

The subject will be treated in four talks of one hour, within 15 minutes of questions and answers. The subject of each talk is:

Module 1-) Description of the operational principles of thermosyphon and heat pipes. Physics involving the operation and design of these devices.

Module 2-) Modelling principles of thermosyphon and heat pipes. Overview of designing fabrication and testing aspects.

Module 3-) Classification according to the operational principles (loops, CPLs, PHPs, miniature devices, etc).

Module 4-) Applications.

**PROFILE OF THE STUDENTS:** PhD Students in energy and building applications

## MOTIVATION:

The seminar aims at introducing the students to the thermosyphon and heat pipes technology so that they can consider the use of these two-phase devices for the solution of their thermal problems in their research and/or professional life. The course doesn't require a preliminary knowledge in the two-phase mechanisms and aims at introducing the students in the heat pipe performance prediction with simplified physical models easy to be embedded to different applications.

**VENUE:** "Lorenzo Poggi" Lybrary – School of Engineering – Building A – First floor – DESTEC.

## Dates:

19th March 2024 – 14:30 – 17:00 - Modules 1 and 2

20<sup>th</sup> March 2024 - 14:30-17:00 – Modules 3 and 4.