THERMAL SPACE ENGINEERING COURSE

Introduction to Spacecraft Thermal Engineering

Date: 03.21-22.2024
Location: Miskolc- Admatis Ltd.
3533 Miskolc, Lorántffy Zsuzsanna utca 32/b
Speaker: Romain Peyrou-Lauga
Language: English
Participation: for HUNSPACE members only

ABOUT OUR SPEAKER

Romain Peyrou-Lauga is a thermal engineer working at the ESA, with 26 years of experiences, first in Industry and then at ESTEC.

Currently, he is supporting 2 Earth Observation missions: NGGM (New Generation Gravity Mission) and MetOp-SG (Meteorological Operational satellites – 2nd generation). He is also the focal point at ESA for Thermal Insulations (MLI...) and Heat Storage (Phase Change Materials...) technologies.

Romain was involved in many Earth Observation and Science projects, such as JUICE (JUpiter Icy Moon Explorer) , CHEOPS, SWARM, Sentinel-2 MSI instrument, Herschel Telescope, SPOT-5 or Helios-2. Previously he worked at Astrium (Airbus).

COURSE OVERVIEW

This course provides students with a detailed introduction of the thermal control challenges and solutions faced in space missions. Topics covered include Space thermal environment, basics of heat transfer mechanisms, overview of the thermal control systems, passive and active thermal control, thermal modelling and analysis, and thermal verification by test.

More information: hunspace.cluster@gmail.com

Day 1 10:00- 17:00

- 1. Introduction to Space Thermal Environments and Requirements
  - Thermal environment for different orbit cases
  - Overview of thermal environment outside the Earth orbit
  - Typical thermal requirements
- 2. Fundamentals of Heat Transfer
  - Conduction, convection, and radiation
  - Heat transfer equations and principles
- 3. Thermal Control Design Principles: passive thermal control
  - Introduction about Thermal Control Design
  - Containing the heat
  - Rejecting the heat
  - Transferring the heat
- **Practical examples (short lecture as interludes) and Q & A session**
  - JUICE: from Design to Test realization
  - CHEOPS: Instrument Design, Platform Design

19:00 Dinner- social evening (optional and not included in the price)

Day 2 09:00- 16:00

- 1. Thermal Control Design Principles: active thermal control
  - Active heating
  - Active cooling
- 2. Thermal Control System verification (Modelling and Analysis)
  - Introduction to the overall process of thermal design verification
  - Thermal analysis process
  - Case studies and practical applications
- 3. Thermal Control System verification (Thermal tests)
  - Different types of tests
  - Simulating Space thermal environment
  - Test configurations and sequences, with practical applications
- **Practical examples (short lecture as interludes) and Q & A session**
  - JUICE: from Test results to Launch and Inter-planetary Cruise
  - MetOp-SG: Spacecraft Design and Test

PARTICIPATION FEE

- 200.000 HUF + VAT / person, but max. 500.000 HUF+VAT / company
- including coffee breaks and lunchs

DEADLINE FOR APPLICATIONS

- 03.11.2024 via hunspace.cluster@gmail.com