



PhD in SCIENZE E TECNOLOGIE ENERGETICHE E NUCLEARI / ENERGY AND NUCLEAR SCIENCE AND TECHNOLOGY - 39th cycle

PARTENARIATO PNRR Research Field: CFD MODELS FOR THE SIMULATION OF COOLING SYSTEMS FOR BATTERIES AND ELECTRIC MOTOR COMPONENTS TO PREVENT THERMAL RUNAWAYS

Monthly net income of PhDscholarship (max 36 months)

€ 1400.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field	<p>CN-MOST Spoke 13 - CUP D43C22001180001 Decreto di concessione D.D. 1033 del 17/06/2022</p> <p>To improve the understanding of physical and chemical processes occurring inside batteries, electric motors and electric components of battery and hybrid vehicles and provide computational tools which can help the design phase in the development of electric and hybrid propulsion systems. Focus of the new PhD program will be on: a) cooling systems and mechanical/thermal stress simulation of batteries and b) cooling systems and mechanical/thermal stress simulation of electric motors.</p>
Methods and techniques that will be developed and used to carry out the research	<p>Investigation and optimization of new cooling systems carried for batteries and electric motors and predict the risk of failure and thermal runaway by the development of advanced CFD models, implemented under the OpenFOAM technology.</p>
Educational objectives	<p>To provide a cutting-edge know-how in the modelling of electric and hybrid propulsion systems and meet the ever increasing needs of preventing the risk of thermal runaway of these devices.</p>



Job opportunities	Applied research in electric motor and cooling systems design and optimization within industry or university. There is a wide number of international and national industrial collaborations with a strong request of high profile CFD specialists in the rapidly emerging market of electric vehicles.
Composition of the research group	2 Full Professors 3 Associated Professors 2 Assistant Professors 6 PhD Students
Name of the research directors	Gianluca Montenegro

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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>Educational activities: Financial aid per PhD student is available for purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences, instrumentations and computer, etc. This amount is equal to 10% of the annual gross amount, for 3 years.</p> <p>Teaching assistantship: Availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.</p> <p>Computer availability: individual use.</p>



Desk availability: individual use