



SAPIENZA
UNIVERSITÀ DI ROMA

DIMA DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

Newsletter - September 2018

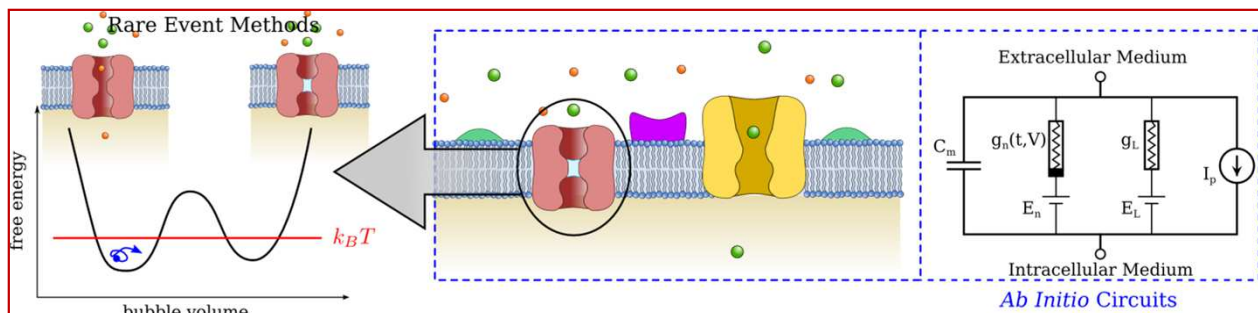


HIGHLIGHTS

Erc Starting Grant 2018 at DIMA

The European Commission has approved two new ERC Starting Grants presented by Sapienza Principal Investigators. The two €1.5 million grants, reserved for outstanding researchers with 2-7 years post-doctoral research experience, were assigned to Project **HyGate**, presented by **Alberto Giacomello** at the Department of Mechanical and Aerospace Engineering, and Specgeo, presented by Emanuele Rodolà at the Department of Computer Science. Project "HyGate - Hydrophobic Gating in Nanochannels: understanding single channel mechanisms for designing better nanoscale sensors" aims to employ multi-scale simulations to design innovative nano-valves inspired by ionic channels. These biological switches control ionic current in cells, allowing complex biological functions such as muscular contraction and nervous impulses. From an engineer's point of view, this is a rack of hundreds of nano-switches with an extraordinary fine tuning that react to different stimuli: transmembrane tension, pressure, PH, etc.

The main phenomenon that will be studied is the hydrophobic gate: the formation of nano-bubbles in many ionic channels that block the flow of ions. The quantitative understanding of this phenomenon will be used to design new biosensors, membranes and nanofluidic circuits. In particular, the simulation of rare events used to study the nucleation of nano-confined vapour will be crucial to replicate both temporal atomic and biological scales. These tools will also allow researchers to simulate electro-physiological responses beginning with the structure of ionic channels. For further information: alberto.giacomello@uniroma1.it





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NEWS FROM DIMA

In recent days, a representation of Professors and collaborators of Department of Mechanical and Aerospace Engineering (DIMA), with Technical Commander, Major General Paolo Giovannini, visited the Multifunctional Experimental Center (CEPOLISPE) at Montelibretti. The visit was aimed at illustrating the various experimental activities carried out at the Center in the field of vehicle engineering, modeling and the study of electromagnetic compatibility; these fields could, in the future, be the object of specific scientific collaboration between the parties. The DIMA delegation was welcomed by the Director of CEPOLISPE, Colonel Raffaele Zorzi, who, after having held an informative briefing in which he illustrated the institutional tasks of the Center, the specialized structures and the main experimentations underway, accompanied the delegation in the test-infrastructures. In particular, the powertrain laboratory has been visited, some of the tracks dedicated to vehicle testing, including the "svergolatelai" track, the one with "typical obstacles" and the "slope ramps". Subsequently, the experiments carried out in the semi-anechoic chamber in the field of electromagnetic compatibility measurements were illustrated and, finally, a visit to the Integration Test Bed (ITB) was carried out, where the integrated simulation of vehicular platforms and tactical set-ups within realistic scenarios takes place. At the end of the activity, Professor Paolo Gaudenzi, Director of DIMA, expressed his sincere appreciation to Major General Giovannini and Colonel Zorzi for the acceptance reserved to the delegation and for the high technical-professional level shown by the staff of the Center. Professor Gaudenzi expressed the wish for a joint participation of the University and CEPOLISPE in research projects on themes of common interest. CEPOLISPE is an agency dependent on the Army Logistics Command deputy to testing and technical evaluation for the suitability of the use of all means, materials, weapon systems, components and equipment of interest to the army. Among the numerous infrastructures, there are test tracks that allow experiments in all conditions both on and off the road.





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The 2017-2018 season ends for Sapienza Corse's Team, satisfied with the goals achieved in two races, Formula Student UK in Silverstone and Formula Student EAST in Hungary. During these competitions, they were able to compare themselves with the best universities in Europe, bringing the name of our Department and representing Sapienza University.

Thanks to the innovation introduced by the integral transmission (the only car in the category with this feature), Gajarda AWD has attracted the interest of students, judges and industry experts, always present at these events to recruit new engineers for their companies.



Best Engineered Brake System 2018

The results achieved were:

FS-UK:

- Award Mercedes-AMG for **Best Powertrain Installation of an IC Engine**
- Award Bosch UK for **Best Engineered Brake System**

- Final of Design Event, 4° position
- Final of Cost Event, 5° position
- Final of Acceleration, 4° position

FS-EAST:

- 8° position at Design Event
- 7° position at Business Plan
- 7° position at Acceleration



*Best Powertrain Installation of an IC Engine
Presented by Mercedes AMG High Performance
Powertrains*



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OPPORTUNITIES FOR RESEARCH, NETWORKING AND INTERNATIONALIZATION

Punti di Contatto Nazionale (NCP)
in HORIZON 2020



- Now updated the European Work Programme for calls for proposals for next 2019, by following the link at Participant Portal with new documents, indicated with v2.0. NCP (National Contact Point) of the Italian Ministry of Education, University and Research (MIUR) and of Agency for the Promotion of European Research (APRE) are now available, for free, for further information. http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2018-20



- Forthcoming ERC Calls this September - ERC Starting Grants & ERC Synergy Grants. Two ERC calls are scheduled to open next month – September 2018. ERC Starting Grants are designed to support excellent Principal Investigators at the career stage at which they are starting their own independent research team or programme in all scientific fields, with Expected deadline: 17 October 2018. ERC Synergy Grants are designed to tackle truly bold scientific challenges by funding groups of up to 4 excellent Principal Investigators (PIs) who jointly address the frontier of knowledge, with Expected deadline: 8 November 2018. Further information are available at this link: <https://erc.europa.eu/funding/starting-grants>



- SOLAR-ERA.NET launched the Cofund 2 Joint Call. 15 countries and regions participate in this call with a total funding budget of 22 million Euro. The following topics are part the SOLAR-ERA.NET Cofund 2 joint call:
 - A) Advanced industrial PV technologies
 - B) Emerging PV technologies
 - C) Building and infrastructure integrated PV
 - D) Operation and diagnosis of PV plants
 - E) CSP low cost and next generation technologies

The SOLAR-ERA.NET Cofund 2 Joint Call is carried out by national / regional research and technology development (RTD) and innovation programmes and national / regional funding agencies in the field of solar electricity generation, i.e. photovoltaics (PV) and concentrating solar power (CSP) / solar thermal electricity (STE). The Joint Call is commonly carried out by the following countries and regions: Austria, Belgium-Flanders and Wallonia, Cyprus, France, Germany and North-Rhine-Westphalia, Greece, Israel, Italy, The Netherlands, Spain, Sweden, Switzerland and Turkey. The call closed on 2 October 2018. 55 preproposals were submitted. Further information are available at this link <http://www.solar-era.net/>