

Séminaire

Le mardi 27 avril 2021, 10h

Le séminaire se déroulera en anglais.

Seminar

Tuesday, April 27, 2021, 10 a.m.

Photovoltaic and water: a fruitful marriage

Presentation of research activities on floating and PV/T technologies at the University of Catania

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Abstract: Solar energy is intrinsically distributed. Therefore, the best way to use it is with distributed plants integrated with the environment or with structures built for other purposes. For utility scale PV plants, large areas are needed in order to collect solar radiation but this is mitigated by the fact that large water surfaces are already available because of human activities both in rural and industrial contexts. For these reasons, submerged and floating plants could find important applications even if, up to now, only floating plants have been installed and they are now becoming popular. In urban and suburban areas, PV modules can be installed on buildings, which, however, owing to the high density of inhabitants in a modern industrial town, allows the production of only a part, even if important, of the necessary energy. Considering that the building's energy demand consists of both thermal energy and electricity, that may be both provided through solar energy source, there is the possibility to produce simultaneously electrical and thermal energy by hybrid photovoltaic/thermal (PV/T) plants. The under water analysis is extended to the possibility of using the water property of strongly absorbing infrared radiation to build PV/T module able to produce electricity and heat. This solution, called thermal electric solar panel integration (TESPI), can be used to retrofit already existing PV installations. Research activities and experimental results performed at the University of Catania are reported and discussed.



Bio: Giuseppe Marco Tina received the MSc and PhD degrees in electrical engineering from the University of Catania, Catania, Italy, in 1988 and 1992. He joined Agip Refineries, Gela, Italy, and STMicroelectronics, Catania, as an Electrical Engineer from 1992 to 1997. He has been with the Department of Electrical, Electronics and Informatics Engineering, University of Catania since 2002, as an Associate Professor, he received habilitation as a full professor in 2013 and 2020. He has been leading the Power System Research Laboratory since 2010. He has supervised over 100 students at the master's or doctorate level and published over 240 papers in scientific journals, conference proceedings or books. He is the author of the book "Submerged and Floating Photovoltaic Systems: Modelling, Design and Case Studies" and a member of the editorial board of the International Journal of Sustainable Energy.

TOP-SET est un programme de formation FONCER du CRSNG en puissance optoélectronique ayant pour but de façonner une cohorte de personnel hautement qualifié détenant des connaissances approfondies en systèmes optoélectroniques pour joindre les rangs d'équipes de recherche et développement.

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