FONDAZIONE BRUNO KESSLER
MAGAZINE

e-mrs: best poster of symposium to Francesca Marchetti

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The Ph.D. in Physics at FBK 's Center for Materials and Microsystems was awarded the Best Poster of Symposium prize during E-MRS Spring Meeting 2017 and Exhibit.

The recognition of Best poster of Symposium to "Synthesis, processing and characterization of nanoscale multi-functional oxide films VI" awarded by the European Materials Research Society to the Ph.D. from the Functional Materials and Photonics Structures Unit of the CMM Of FBK has rewarded the quality of research work and the ability to present the scientific and technical results achieved in the deposition and characterization of TiO2 layers on graphene and application in the water purification industry using solar energy.

The study presented in the poster is widely expanded within a bilateral Italy-Algeria project – funded by the Ministry of Foreign Affairs and International Cooperation and co-ordinated by Dr Nadhira Bensaada Laidani from the Foundation's Center for Materials – which aims to develop an innovative water purification system with the use of nano materials, graphene powders in particular.

"The research of which Francesca's work is part, says Dr Georg Pucker, FMPS Unit Head, is based on the need to find innovative solutions to produce purified water by optimizing available resources in environments and settings where standard processes that use non-renewable energy can be particularly difficult. "

For example, in some places in countries such as Algeria, especially in remote areas, having purified water is vital but at the same time often complicated and costly in terms of energy.
To obtain it, it is possible to either desalinate sea water or purify groundwater by acting in two directions: through a water softening plant or acting directly on the water.

The study by Francesca Marchetti goes in this second direction, making the most of available energy sources, i.e. the sun, to purify the water through both decontamination and desalinization. For the latter process, ongoing research shows that, by adding nanoparticles in the water, it is possible to speed up its evaporation to obtain purification, thus significantly reducing the energy required.

Basically, once in water, modified graphene nanoparticles absorb more solar radiation transferring thermal energy to the water and causing it to evaporate faster than in a "solar" distillation process.

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