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La Rivista del Nuovo Cimento, Vol. 40, N. 12 (2017)

Functional nanomaterials for water purification

M. Cantarella, G. Impellizzeri, V. Privitera

Water is a natural resource essential for life. However, the access to clean water sources is still a crucial issue especially in developing countries. This review describes the combination of nanostructured photocatalysts and polymeric materials as a scientific breakthrough with respect to the traditional methods for water purification.



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Majorana quasiparticles in condensed matter

Ramón Aguado

The concept of particles that are their own antiparticles was envisioned by Ettore Majorana more than 70 years ago in the context of relativistic quantum mechanics. In the last few years, the idea of creating and detecting these "*Majorana fermions*" in solid state devices has fascinated condensed matter physicists. Despite the widely used name, Majorana fermions in condensed matter are actually not fermions but rather localised zero-energy quasiparticle excitations in topological superconductors. The search for these Majorana quasiparticles in condensed matter has become one of the hottest topics in physics since they hold promise for applications in topological quantum computing owing to their exotic non-Abelian statistics. This issue provides a perspective of the current status of this exciting and rapidly-evolving field, with strong focus on artificial implementations of one-dimensional topological superconductivity.



Giornale di Fisica, Vol. 58, N. 3 (2017)

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In questo numero, oltre ad articoli come "Un modulo per l'insegnamento integrato dell'energia nella scuola secondaria superiore", "Studio sperimentale sul paradosso dei due condensatori" e "L'approccio di Bohm alla meccanica quantistica: una nuova chiave di lettura", compare un interessante lavoro di Franco Bagnoli su: "**20 lezioni di fisica e magia**". La magia al servizio della fisica in un esperimento di insegnamento in diverse scuole della Toscana per avvicinare gli studenti alla fisica con l'ausilio di materiale "di tutti i giorni". Dieci esperimenti per far comprendere meglio agli studenti l'idrostatica, la meccanica, la termodinamica, i fluidi in movimento, e la legge di Bernoulli analizzando, fra gli altri, l'affondamento del Titanic, il "trucco della scopa equilibrista", le traiettorie di un palloncino e utilizzando un cannone a vortici di fumo. I video delle lezioni tenute sono disponibili sul blog divulgativo dell'autore "Fisica X".



EPJ A – Highlights

Evaluation of cross sections for neutron interactions with ^{238}U in the energy region between 5 keV and 150 keV

I. Sirakov, R. Capote, O. Gritzay, H. I. Kim, S. Kopecky, B. Kos, C. Paradela, V. G. Pronyaev, P. Schillebeeckx, A. Trkov

Evaluated nuclear data represent the bridge between experimental and theoretical achievements and final user applications. The complex evolution from experimental data towards final data libraries forms the cornerstone of any evaluation process. Since more than 90% of the fuel in most nuclear power reactors consists of ^{238}U , the respective neutron induced cross sections are of primary importance towards accurate neutron transport calculations. Despite this significance, the relevant experimental data for the $^{238}\text{U}(n,\gamma)$ capture reaction have only recently provided for a consistent description of the resonance region. In this work, the $^{238}\text{U}(n,\gamma)$ average cross sections were evaluated in the energy region 5-150 keV, based on recommendations by the IAEA Neutron Standards projects and experimental data not included in previous evaluations.

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EPJ Plus – Highlights

Modelling Martian landslides: dynamics, velocity, and paleoenvironmental implications

Fabio Vittorio De Blasio, Giovanni Battista Crosta

How good is your Martian geography? Does Valles Marineris ring a bell? This area is known for having landslides that are among the largest and longest in the entire solar system. They make the perfect object of study due to their steep collapse close to the scarp, extreme thinning, and long front runout. In a new research paper published in EPJ Plus, Fabio De Blasio and colleagues from Milano-Bicocca University, Italy, explain the extent to which ice may have been an important medium of lubrication for landslides on Mars. This can in turn help us understand the geomorphological history of the planet and the environment of deposition.

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