

Editoria - marzo 2018

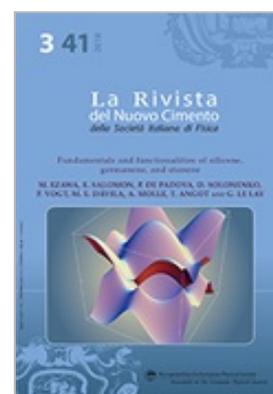
📅 28-03-2018 ↗ <http://www.primapagina.sif.it/article/740>

La Rivista del Nuovo Cimento Vol. 41 N. 3 (2018)

Fundamentals and functionalities of silicene, germanene, and stanene

M. Ezawa, E. Salomon, P. De Padova, D. Solonenko, P. Vogt, M. E. Dávila, A. Molle, T. Angot, G. Le Lay

It pays to be low-dimensional! Honeycomb artificial two-dimensional forms of the ubiquitous silicon, germanium and tin elements, coined silicene, germanene and stanene, and their one-dimensional pentagonal partners, straight pentasilicene strands, are among the hottest topics in condensed matter physics. As created by their modern inventors or after functionalization, they may beat graphene on many exotic grounds. They are formidable competitors in the heavyweight class: their large spin-orbit couplings, make them strong topological insulators and fast quantum skiers on the trail edges. After the successful fabrication of the first Field Effect Transistors with a single layer silicene channel, operating in ambient conditions, they promise fantastic breakthroughs in nano-electronics, spintronics and quantum computing. An international team of experts and scholars from Madrid to Tokyo via Marseille, Agrate Brianza, Rome and Chemnitz narrates the extraordinary saga of silicene, pentasilicene, germanene and stanene, describing and discussing in detail the fundamental and practical aspects of these so exciting newcomers in Flatland.



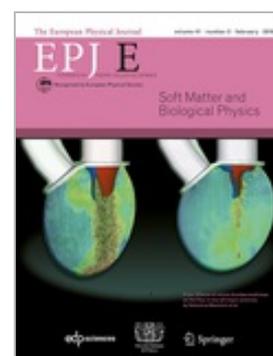
EPJ E – Highlights

Effects of mitral chordae tendineae on the flow in the left heart ventricle

V. Meschini, M.D. de Tullio, R. Verzicco

Did you know that the left side of the heart is the most vulnerable to cardiac problems? Particularly the left ventricle, which has to withstand intense pressure differences, is under the greatest strain. As a result, people often suffer from valve failure or impairment of the myocardium. This is why it is important to fully understand how the blood flow within this part of the heart affects its workings. In a new study published in EPJ E, Valentina Meschini from the Gran Sasso Science Institute, L'Aquila, Italy and colleagues introduce a novel model that examines, for the first time with this approach, the mutual interaction of the blood flow with the individual components of the heart. Their work stands out by offering a more holistic and accurate picture of the dynamics of blood flow in the left ventricle. The authors also perform some experimental validations of their model.

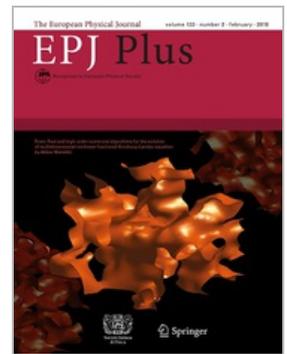
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EPJ Plus – Focus Point

The *Focus Point on the Transition to Sustainable Energy Systems* in the European Physical Journal Plus tries to answer central questions regarding the planned Energy Transition, focusing on the power sector in Europe. Important is the role played by intermittent renewables as a low carbon electricity source, central in the plans by the EU Commission in its Energy Roadmap 2050. Their intermittency however strongly reduces efficiency and security of supply and back up by other systems is unavoidable – large storage and/or nuclear and/or fossil based. Storage of excess electricity production by intermittent renewables at the level required seems far-fetched at this moment and much more research will be needed before this can substantially contribute. With a limited contribution of dispatchable renewable electricity (hydro, bio-fuels etc.) and excluding a priori nuclear power, on various grounds, a continued use of fossil fuels imposes itself to guarantee a secured supply of electricity – in strong contrast with the original aims of the EU Energy Roadmap 2050. A rational debate involving all options is urgently needed and it is hoped that the set of papers in this focus point can contribute to improve insights in a determining factor for the future of our children and grandchildren.

Read more



EPL – Highlights from the previous volumes

Superconductivity at 7.3 K in quasi-one-dimensional RbCr_3As_3

by *Liu Tong et al.*

Rogue waves as negative entropy events durations

by *Hadjihoseini Ali et al.*

Biological rhythms –What sets their amplitude?

by *Jörg David J.*

Reconstructing multi-mode networks from multivariate time series

by *Gao Zhong-Ke et al.*

EPL Highlights are published in the first issue of each volume, *i.e.* four times a year, as well as in Europhysics News (EPN).

