

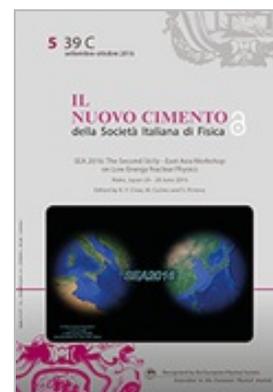
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## **Il Nuovo Cimento, Vol. 39, N. 5 (2016)**

Papers presented at the second "Sicily - East Asia Workshop on Low Energy Nuclear Physics", SEA 2016, Wako, Japan, 26-28 June 2016, edited by K. Y. Chae, M. Gulino and S. Pirrone.

This workshop is part of a series that aims to promote the collaboration of Laboratori Nazionali del Sud of Istituto Nazionale di Fisica Nucleare (INFN-LNS, Italy), the Center for Nuclear Study of The University of Tokyo (CNS, Japan), Sungkyunkwan University (SKKU, Korea), RIKEN (Japan) and other research Institutes. In the last years an intense collaboration was established among our Institutions in the field of low energy nuclear physics. A very special emphasis was given to nuclear astrophysics but also key physics issues in low energy nuclear physics are addressed in collaboration experiments, where the INFN-LNS, CNS and SKKU serve as core Institutes for now, with the aim to establish a broader collaboration for the future.

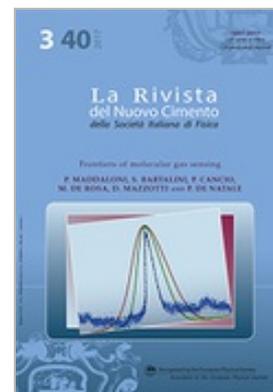


## **La Rivista del Nuovo Cimento, Vol. 40, N. 3 (2017)**

### **Frontiers of molecular gas sensing**

*P. Maddaloni, S. Bartalini, P. Cancio, M. De Rosa, D. Mazzotti, P. De Natale*

Mainly driven by the recent dramatic progress of infrared technologies, and by the emerging methods for cooling of ground-state molecules, the field of precision molecular spectroscopy is experiencing a new youth, as it promises to lead major advances both in fundamental and applied science. The present review will encompass the main results obtained in the last two decades, by our group, in this scope, particularly in the mid infrared and THz spectral regions. Starting from the development of novel, metrological-grade coherent radiation sources, either in continuous-wave or in pulsed-emission regime, we will go through the realization of more and more sophisticated spectroscopic interrogation techniques. We will then conclude with the first demonstration of cavity-enhanced rovibrational spectroscopy on a buffer-gas-cooled molecular beam. High-precision physical fundamental measurements can thus be done, at present, at an energy scale as low as the photons used for harnessing the molecular samples.



## **EPJ E – Highlights**

### **Action of fields on captive disclination loops**

*M. Dazza, R. Cabeça, S. Čopar, M. H. Godinho and P. Pieranski*

Defects that break the symmetry of otherwise orderly material are called topological defects. In solid crystals, they are called dislocations because they interrupt the regularly structured atom lattice. In contrast, topological defects called disclinations take the form of loops in liquid crystal of the nematic variety, whose elongated molecules look like a shoal of fish. New experiments supported by a theoretical model show how defects forming loops around twisted plastic fibres dipped in liquid crystal could be used for the transport of biochemical substances, when controlled by electric and magnetic fields. Published in EPJ E, these findings – achieved by Mallory Dazza from the Ecole normale supérieure Cachan, France, and colleagues - have potential applications in electro-optical micromechanical and microfluidic systems

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### **EPJ Plus – Highlights**

#### **Influence of the surface morphology on the magnetoresistance of ultrathin films of ferromagnetic metals and their alloys**

*A.M. Chornous et al.*

The nanometric-size islands of magnetic metal sporadically spread between vacuum gaps display unique conductive properties under a magnetic field. In a recent study published in EPJ Plus, Anatoliy Chornous from Sumy State University in Ukraine and colleagues found that the vacuum gaps impede the direct magnetic alignment between the adjacent islands -which depends on the external magnetic field- while allowing electron tunneling between them. Such externally controlled conducting behaviour opens the door for applications in electronics with magnetic field sensors -which are used to read data on hard disk drives-biosensors and microelectromechanical systems (MEMS), as well as in spintronics with magnetic devices used to increase memory density.

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