

# Editoria - giugno 2017

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## La Rivista del Nuovo Cimento, Vol. 40, N. 6 (2017)

### Supergravity at 40: Reflections and perspectives

S. Ferrara, A. Sagnotti

The fortieth anniversary of the original construction of Supergravity provides an opportunity to combine some reminiscences of its early days with an assessment of its impact on the quest for a quantum theory of gravity.



## Il Nuovo Cimento, Vol. 40, N. 1 (2017)

### IFAE 2016: Incontri di Fisica delle Alte Energie

Edited by C. Gemme

This issue is dedicated to the XV edition of the "Incontri di Fisica delle Alte Energie" (IFAE) which was hosted in the Physics Department of the University of Genova from March 30th to April 1st, 2016. The opening session was devoted to two important scientific topics: the observation of the gravitational waves and the physics perspectives of the LHC Run 2. Four sessions (namely Cosmic frontier, Intensity frontier, Energy frontier and New technologies) showed the wide spectrum of activities currently ongoing in the field.



## Giornale di Fisica, Vol. 58, N. 1 (2017)

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L'Editoriale dei Vicedirettori, oltre a ricordare il 60° anniversario dalla fondazione della rivista, annuncia alcuni cambiamenti editoriali e nei contenuti previsti a partire dal prossimo anno. È all'anniversario che si ispira la copertina di questo numero che ripropone la stessa immagine del primo fascicolo del Giornale di Fisica. Il presente numero contiene in apertura l'attualissimo articolo "Buchi neri e onde gravitazionali" di E. Coccia, dedicato all'evento del secolo, la rivelazione di un'onda gravitazionale. Segue poi l'articolo di didattica di A. Bonanno *et al.* "La riflettografia infrarossa tra fisica, arte e tecnologia", in cui si rende possibile l'impiego didattico della riflettografia infrarossa, utilizzata per l'indagine non distruttiva di opere d'arte, attraverso un economico dispositivo ottenuto modificando una comune fotocamera digitale. Si passa poi all'articolo storico filosofico di S. Morante e G.C. Rossi "Science from the optimism of Enlightenment to the conceptual challenges of modernity", sull'evoluzione e l'importanza dei nuovi



concetti che appaiono in fisica e matematica dall'Illuminismo a oggi. In chiusura, nella nuova rubrica "Opinioni, Forum e Commenti" dedicata agli insegnanti, l'articolo di I. Rabuffo su "La legge italiana sulla formazione e il reclutamento".

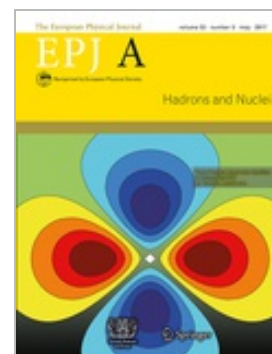
### EPJ A – Highlights

#### **Nuclear and quark matter at high temperature**

*T.S. Biró, A. Jakovác, Z. Schram*

In high-temperature field theory applied to nuclear physics, in particular to relativistic heavy-ion collisions, it is a longstanding question how hadrons precisely transform into a quark-gluon matter and back. The change in the effective number of degrees of freedom is rather gradual than sudden, despite the identification of a single deconfinement temperature. In order to gain an insight into this issue while considering the structure of the QGP we review the spectral function approach and its main consequences for the medium properties, including the shear viscosity. The figure plots a sample spectral density on the left and the effective number of degrees of freedom (energy density relative to the free Boltzmann gas) to the right. Two thin spectral lines result in a doubled Stefan-Boltzmann limit (SB), while any finite width reduces the result down to a single SB. When spectral lines become wide, their individual contributions to energy density and pressure drops. Continuum parts have negligible contribution. This causes the melting of hadrons like butter melts in the Sun, with no latent heat in this process.

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### EPJ E – Highlights

#### **Pressure dependence of the electrical transport in granular materials**

*M. Creyssels, C. Laroche, E. Falcon, B. Castaing*

What happens when you put pressure on bunch of metallic microbeads? According to physicists, the conductivity of this granular material increases in unusual ways. So what drives these changes? The large variations in the contact surface between two grains or the rearranging electrical paths within the granular structure? In a recent study published in EPJ E, a French team of physicists made systematic measurements of the electrical resistance – which is inversely related to conductivity – of metallic, oxidised granular materials in a single 1D layer and in 3D under compression. Mathieu Creyssels from the Ecole Centrale of Lyons, Ecully, France, and colleagues showed that the granular medium conducts electricity in a way that is dictated by the non-homogenous contacts between the grains. These finding have implications for industrial applications based on metallic granular material.

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### EPJ Plus – Highlights

#### **Combined application of imaging techniques for the characterization and authentication of ancient weapons**

*F. Salvemini, F. Grazzi, N. Kardjilov, F. Wieder, I. Manke, D. Edge, A. Williams, M. Zoppi*

Since the 19th century, collectors have become increasingly interested in weapons from ancient Asia and the Middle East. In an attempt to fight forged copies, physicists are now adding their imaging power to better authenticate these weapons; the fakes can't resist the investigative power of X-rays combined with neutron imaging. In a study published in EPJ Plus, an



Italian team, working in close collaboration with the Wallace Collection in London and the Neutron Imaging team at the Helmholtz Zentrum Berlin, has demonstrated the usefulness of such a combined imaging approach to help museum curators in their quest to ensure authenticity. Filomena Salvemini, currently affiliated with the Australian Centre for Neutron Scattering ACNS at ANSTO in Lucas Heights near Sydney, and colleagues can now reliably tell first-class modern copies of early daggers and swords from authentic ones.

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