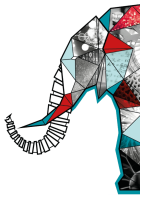
25e Congrès Général de la Société Française de Physique



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Superhydrides and room-temperature superconductivity: an experimental viewpoint

Monday, 8 July 2019 17:00 (30 minutes)

Over the past decade, calculations have unveiled a novel view on the chemical combination of hydrogen with metals1): hydrogen solubility in metals should drastically increase under pressure heading to the stability of hydrides with nontraditional stoichiometry, named superhydrides. These hydrogen rich systems become metallic at lower pressure than expected for metallic hydrogen, the ultimate hydride. A rich variety of hydrogenic sublattices composed of H-, H2, H3 or cage units should be stabilized and, remarkably, these superhydrides form a novel class of high-Tc superconductors. At first, this line of research was essentially based on computations2). Now, few superhydrides have been synthesized such as LiH63), FeH54), LaH105) and record superconductivity measured, respectively 200K for H3S6) and 250 K for LaH107).
In this talk, we will review the discovery of superhydrides. How they are synthesized and characterized under very high pressure in the diamond anvil cell. Various data on the superhydrides of the elements will be presented, mainly focused on the structures and the stoichiometry. Prospects towards materials design and screening to discover an ambient temperature-ambient pressure superconductive superhydride will be discussed.

Choix de session parallèle

1.2 La supraconductivité par couplage électron-phonon dans les composé à éléments légers: vers la température ambiante?

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Session Classification: Séance Parallèle