

# 学术报告

**题目:** **New Chemistry of Sodium Hydrides  
and Compressed Hydrogen**

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**地点:** **中科院固体所新楼 520 会议室**

**Viktor Struzhkin:** Viktor V. Struzhkin focuses on experimental research at high pressures. He undertakes transport and magnetic measurements, and applies optical and synchrotron spectroscopy techniques to geophysics, planetary science and condensed-matter physics research. He obtained a Ph.D in solid-state physics from Institute for High Pressure Physics, Russian Academy of Science in 1991 and a combined BSc and MSc in physics from Moscow Institute of Physics and Technology, Russia in 1980. He is staff member of the Geophysical Laboratory since 2003. At the Carnegie Institution, he pioneered a suit of transport measurements in diamond anvil cells succeeding in measurements of superconductivity at very high pressures in excess of 200 GPa (2 million atmospheres). He is recognized expert in a multitude of experimental techniques in diamond anvil cells, including transport measurements, optical and synchrotron spectroscopy. His research interests cover condensed-matter physics, simple molecular solids, the chemistry and physics of the Earth's mantle and core, and high-pressure materials science.

**Abstract:** The only known compound of sodium and hydrogen is archetypal ionic NaH. Application of high pressure is known to promote states with higher atomic coordination, but extensive search for polyhydrides with unusual stoichiometry remains unsuccessful in spite of several theoretical predictions. We combined synchrotron x-ray diffraction and Raman spectroscopy in a laser heated diamond anvil cell and theoretical ab-initio random structure search, which both agree in stable structures and compositions. Our results support the formation of multicenter bonding (three center units such as  $H_3^-$ ) and polyhydride materials with unusual stoichiometry. These results are applicable for the design of new family of hydrogen-rich materials.

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