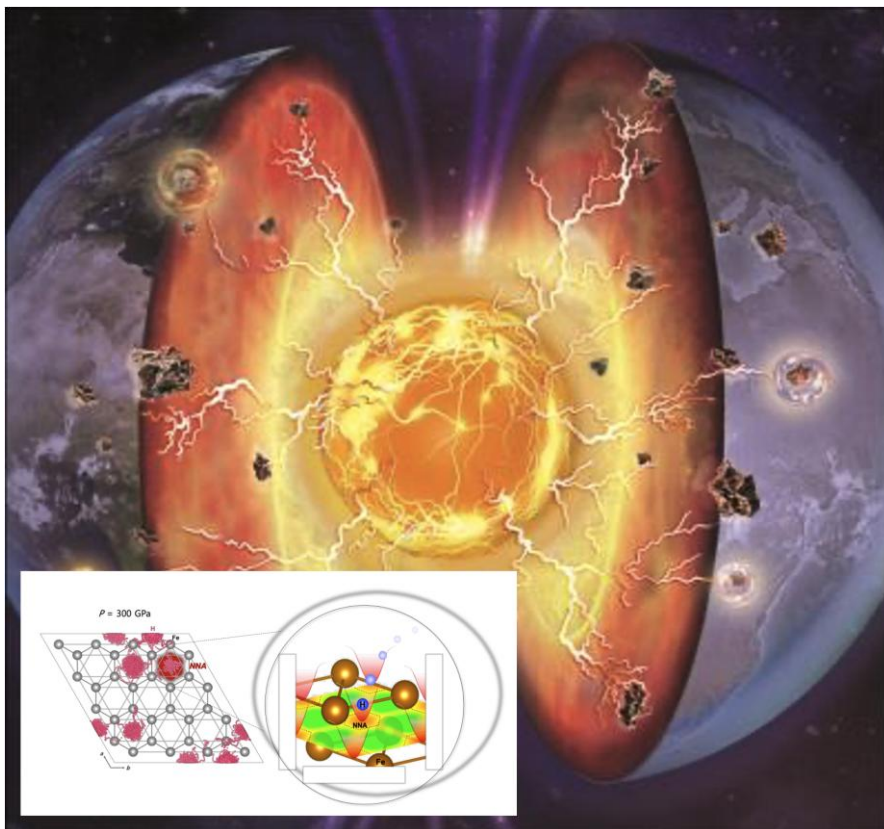




Monday, 9 June 2025 – 10:30 room 201

Viale Regina Elena, 295 Roma Presso Regina Elena - Edificio D

Unraveling Superionicity in the Deep Interiors of Rocky Planets



Short abstract

Iron is a fundamental constituent of rocky planets, including Earth, and forms the dominant component of Earth's core. Understanding its behavior and interactions with neighboring elements under extreme pressure-temperature (PT) conditions is crucial for modeling planetary structure and dynamics. In this talk, I present both theoretical predictions and experimental findings that reveal the formation of superionic iron-based compounds under conditions corresponding to the deep lower mantle and inner core. Our results demonstrate that the interaction of iron with hydrogen or water can induce a superionic transition. Furthermore, we propose that a pressure-induced electronegativity transition in iron may be the key mechanism driving this superionic behavior, offering new insights into the exotic states of matter within planetary interiors.



Dr. Duck Young Kim
(Center for High Pressure Science
and Technology Advanced
Research)

***Following, a brief presentation of the new course entitled Petrology for
Planetary Sciences
by Prof. Stagno (Dept. Earth Sciences)***