# ****EBS-Workshop on Nuclear Resonance Scattering**** Submicron SMS for High-Pressure Mineral Physics

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As one of the most common elements in Universe, iron plays a central role in global chemical and physical processes of planets’ life ranging from generation of the magnetic field to control of atmospheric composition.

How were the Earth and Earth-like planets formed from planetesimals and differentiated into the core, mantle, and crust? How did Earth become habitable? Could suitable conditions for life be at exoplanets? An important piece of information may be extracted from experiments which model conditions at deep planetary interiors. The nuclear resonant scattering (NRS) based on the Mössbauer effect has proven to be an important spectroscopic method over the past decade to address the most advanced scientific issues from physics to chemistry, to material sciences, and to geosciences and particularly high pressure mineral physics. Development of new X-ray optics for sub-micron-size beam and methodology of SMS and NIS experiments at pressures over 200 GPa and thousands of degrees will allow to apply novel tools to investigate physical properties and chemistry of iron-based alloys and compounds at conditions of Earth core and super-Earth interiors.