Liquid metals are in the focus of a new research alliance

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Liquid metals are used in numerous industrial branches, for example, in steel and light metal castings, and are becoming increasingly significant for such future-oriented technologies as new liquid metal batteries for energy storage, CO2-free hydrogen production, or the manufacture of solar cells. This is due to their capabilities of storing energy in large quantities and dissipating heat effectively. Their thermal conductivity is 50 to 100 times higher than the thermal conductivity of water; and they continue to stay liquid in a broad range of temperatures. That's why liquid metals are best suited to cool down highly energetic processes. They, thus, also contribute towards improving the energy and resource efficiency since the efficiency of thermodynamic processes increases with increased temperatures. Two subprojects of the Alliance are, thus, also dedicated to the use of liquid metals in solar power plants.

Over the past few years, the operational safety of technologies using liquid metals has increased significantly. This was made possible through new measurement procedures which permit the full monitoring of the requisite flows. Continuing this development is one goal of the new Helmholtz Alliance LIMTECH. Another goal is to increase the energy and resource efficiency of liquid metal technologies, for example, in metal casting, the separation of valuable metals from molten slags, and the production of solar silicon. "German research is already among the world's best, and we're planning to expand this position even further," notes Dr. Gunter Gerbeth from the Helmholtz-Zentrum Dresden-Rossendorf, who coordinates the LIMTECH Alliance.

In this Alliance, the Helmholtz-Zentrum Dresden-Rossendorf (HZDR) and the Karlsruhe Institute of Technology (KIT) focus their competences in the liquid metal technologies sector together with other Helmholtz centers and universities in Germany and abroad. The Helmholtz Alliance LIMTECH is scheduled for a period of five years and has an overall investment volume of 20 million euros. The financial means are split equally between the Helmholtz Association's Initiative and Networking Fund, on the one hand, and the participating Helmholtz centers and partners, on the other hand. A program for doctoral candidates is to be established within the scope of the Alliance. Another focus is on the close cooperation with partners from industry so that the research results are implemented technologically in a timely manner.

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