FIZ Karlsruhe
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PRESS RELEASE

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DFG project develops first knowledge graph for patent information

In the "Patents4Science" project, four Leibniz institutes have joined forces to build an information infrastructure for the easy use of patent knowledge in science.

Karlsruhe, November 30, 2022 — Patent knowledge has so far been used primarily in an industrial and commercial context. However, access to this knowledge for researchers in science as well its exploitation for the benefit of society is a difficult and challenging endeavor. As a result, a large part of the opportunities that arise from the use of patent information in order to infer new knowledge remains unused. This fact leads to reduced innovation and competitiveness, loss of quality and missing impulses for technology transfer in the international scientific and economic world.

To investigate the need for patent knowledge and its potential use in research, FIZ Karlsruhe, in cooperation with the Leibniz Institute for Plasma Science and Technology e.V. (INP) in Greifswald, conducted a needs analysis by utilizing online surveys at several Leibniz institutes. While the results indeed confirmed the need for patent knowledge in research, they helped to identify major obstacles and gaps.

Based on this, the "Patents4Science" project, funded by the German Research Foundation (DFG), will now create over the next three years a patent-centric knowledge graph based on Linked Open Data as well as a modern information infrastructure for linking patent knowledge with scientific literature and other domain-specific information. As an initial step the Patent Knowledge Graph integrates domain-specific knowledge from three areas, namely: *plasma technology*, *additive manufacturing* and *battery materials*. The Patents4Science infrastructure will allow scientists to easily access and make use of essential information in patents such as descriptions of technical processes and devices, properties of materials and active pharmaceutical ingredients, and details of specific biomedical processes. As a result, researchers will gain access to new approaches and solutions, experiments or technical specifications that haven't been published elsewhere via dedicated (semantic) information services.

An application example from the Leibniz Institute for Plasma Science and Technology (INP) impressively shows how important easy access to patent information is for targeted research and technological innovation: Search queries of the form: "*Which plasma sources can be used to decontaminate room air and generate a physical plasma that reduces SARS-CoV-2 viral load?*" could be processed and answered by consulting the patent knowledge graph and dedicated information services provided by the Patents4Science infrastructure (P4SI). Hence, providing easy access to patent knowledge not only enables an acceleration of research and development processes,

but ultimately also provides an enormous saving of financial resources and a direct economic and intellectual competitive advantage.

FIZ Karlsruhe's project partners are the Leibniz Institute for Plasma Science and Technology (INP) in Greifswald, the Leibniz Institute for Materials-oriented Technologies - IWT in Bremen, and the INM - Leibniz Institute for New Materials in Saarbrücken. At IWT, the focus is on using patent knowledge to research completely new types of material combinations in additive manufacturing. For example, laser-based 3D printing processes use particles with special physical properties, such as permanent magnets with high field strength, together with alloyed particles specially produced at the institute. Here, patent information is of enormous value for these processes. Furthermore, the rapidly developing field of novel battery materials, energy storage media or even processes for their recycling confronts research institutions as well as industrial companies with the problem of having to orientate themselves in a flood of information often rich in synonyms. Therefore, it is of great importance for INM to be able to distinguish its own research from the patent situation as early as possible in order to avoid duplicate research or to run the risk of affecting already protected patent claims. With the help of the automated information and search tool to be developed, INM expects a simplification and acceleration of its own searches in the defined research environment. In this context, new aspects should open up at an early stage, leading to a time advantage in the exploration of new research fields.

More information is available at www.patents4science.org

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FIZ Karlsruhe – Leibniz Institute for Information Infrastructure is one of the leading providers of scientific information and services and a member of the Leibniz Association. Our core tasks are the professional provision of research and patent information to science and industry, and the development of innovative information infrastructures, with a focus on research data management, knowledge graphs and digital platforms. To this end, we conduct our own research, cooperate with renowned universities and research societies, and are internationally and interdisciplinary networked. FIZ Karlsruhe is a non-profit limited liability company and one of the largest non-academic institutions of its kind.

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