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PATENTS4SCIENCE - ESTABLISHING AN INFORMATION INFRASTRUCTURE FOR THE USE OF PATENT KNOWLEDGE IN SCIENCE

H. Aras (FIZ Karlsruhe), 1st Patents4Science Workshop, Berlin, 05.10.2023

AGENDA

- PATENT KNOWLEDGE
- SURVEY
- DFG PROJECT
- OUTLOOK

- Majority (>80%) of humanity's technical knowledge to be found in patents (Asche, WPI Journal, 2017)

- Use of patent information largely in industrial/economic context (see STN).

- Desideratum: use of patent knowledge in science

- Opportunities from exploitation of patent information untapped

- Losses in innovation, quality, and impetus for technology transfer

- Negative impact on competitiveness

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SURVEY ON THE USE OF PATENTS AND SCIENTIFIC INFORMATION IN RESEARCH AND DEVELOPMENT

- Online survey on the use of patent knowledge in research

  - 6 Leibniz institutes, ~190 scientists

  - What knowledge about and what need for patent information exists among scientists?

- Evaluations confirm the assumption that patents are regarded as an essential source of information in scientific research.

- Access barriers, lack of content linkage with scientific literature, etc. hinder use and exploitation

Survey on Patents and Scientific Information in Research and Development

I. General Information

* 1. What is your position?

- ○ (Junior) Group Leader (Gruppen- oder Abteilungsleiter*in)
- ○ Programme Manager (FB- oder FS-Leiter*in)
- ○ Scientist
- ○ Technician
- ○ Administration
- ○ Other:

2. Which age group do you belong to?

- ○ < 35
- ○ 35-50
- ○ > 50

* 3. What are your main research topics?

- ☐ Materials and Surfaces
- ☐ Plasma Chemical Processes

- Patents are used as a source of information alongside scientific literature and research data.

- Access to and use of patent information is often considered difficult.

- Linking of scientific literature and specific information in patents (e.g. technical specifications, chemical entities) is required.

- There is interest in technology analysis using patents in combination with scientific literature.

- Open access and free sources are preferred.

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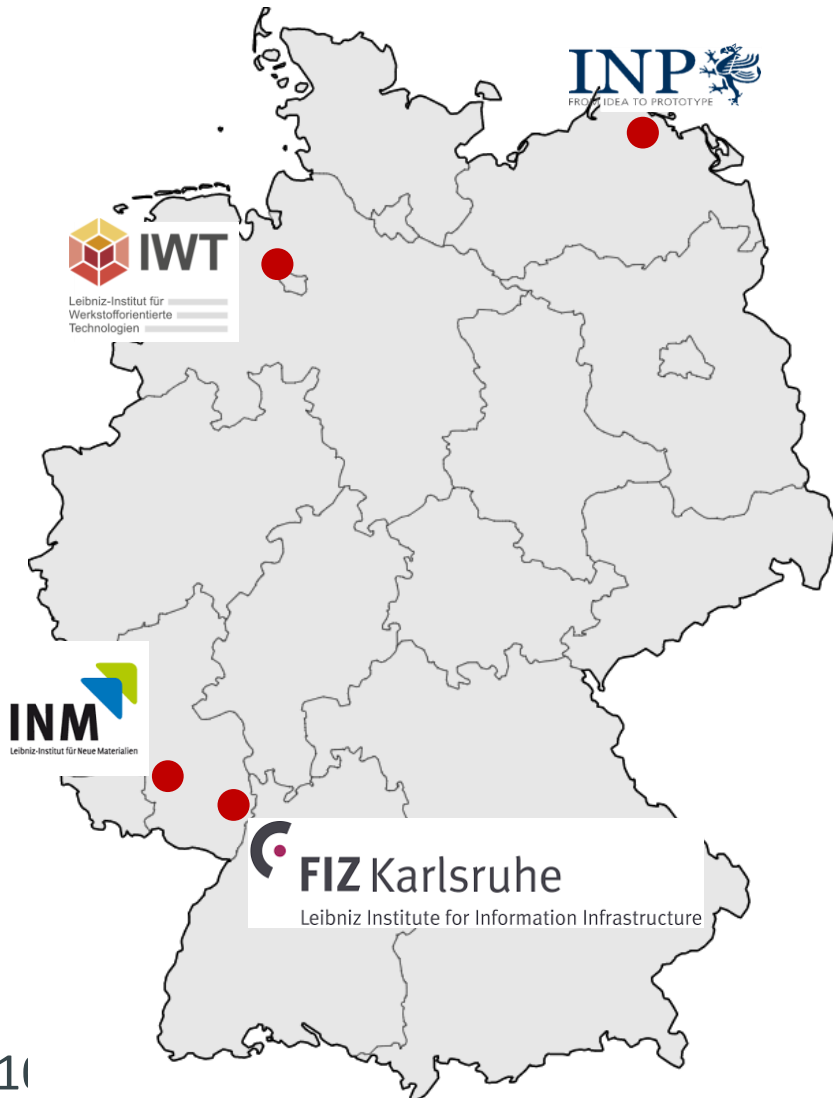Leibniz Institute for Information Infrastructure

- Making the relevant knowledge in patents accessible employing machine learning and semantic technologies

- Provision of a (freely) accessible and linked data platform for accessing patent information

- Easy and efficient Integration into (existing) information infrastructures (APIs)

- (Sustainable) financing

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- Building an information infrastructure for exploiting patent information in scientific contexts, e.g. research labs (submitted to DFG)

  - Builds on existing patent data infrastructure

- Aims to create a Patent Knowledge Graph (PKG) by utilizing semantic enrichment & entity inking.

  - Semantic integration of patent information with scientific literature and *domain-specific resources* based on explicit (machine-understandable) semantics

  - Extending and linking existing knowledge graphs, exploiting explicit semantic models

  - Applying ml/dl, nlp and lod technologies e.g. for (entity) mention detection

- Semantic search and analysis applications that benefit from the patent knowledge graph

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DFG PROJECT PATENTS4SCIENCE:
AN INFORMATION INFRASTRUCTURE FOR THE USE OF PATENT KNOWLEDGE IN SCIENCE

PATENTS4SCIENCE - PROJECT (DFG LIS, E-RESEARCH TECHNOLOGIES)

Research project funded by the German Research Foundation (DFG) with the partners:

- FIZ Karlsruhe – Leibniz Institut für Informationsinfrastruktur (FIZ KA, Projektleitung)

- Leibniz-Institut für Plasmaforschung und Technologie (INP)

- Leibniz-Institut für Werkstofforientierte Technologien (IWT)

- Leibniz-Institut für Neue Materialien (INM)

Total budget: ca. 1 Mio.

Project duration: 06/2022–05/2025

More information: www.pat4sci.org

WORK PACKAGES AND TASKS

- AP1: Project Management
- AP2: Expert Group
- AP3: Requirement Analysis
- AP4: System Architecture
- AP5: Data Ingest / Backend
- AP6: Patent Knowledge Graph
- AP7: Search Infrastructure
- AP8: Services and APIs
- AP9: User Trials
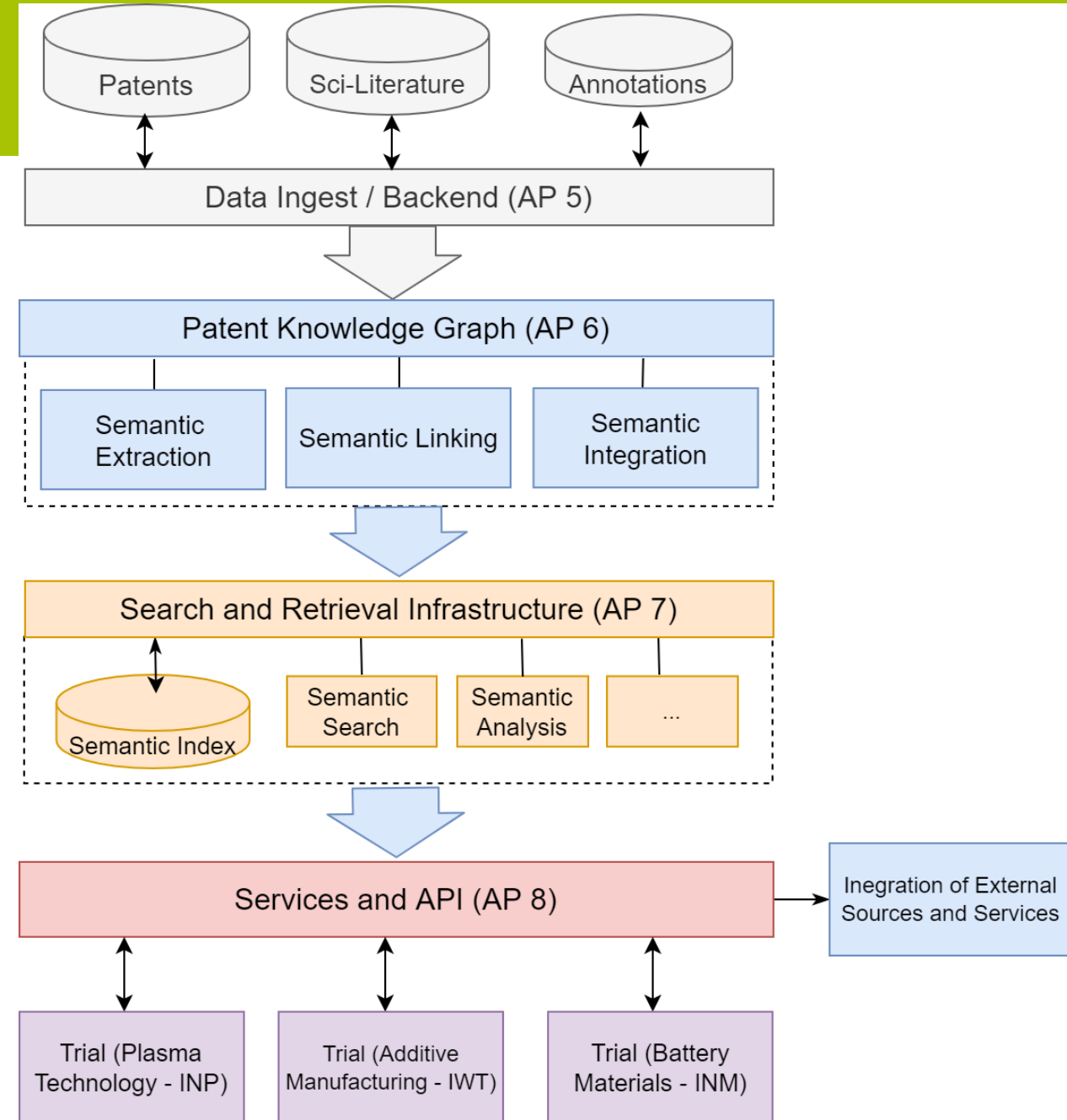
Patents4Science

„ Design, implementation and evaluation of a sustainable information infrastructure for the easy, efficient use of patent information in the scientific value cycle."

Key areas of work:

Patent Knowledge Graph (PKG) interlinks relevant information from patents with scientific literature and domain-specific knowledge.

Hybrid semantic search technology exploiting the Patent Knowledge Graph

Answering research questions

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"Which plasma source can be used for decontamination of room air and produces a plasma with virucidal efficacy against SARS-CoV-2?"
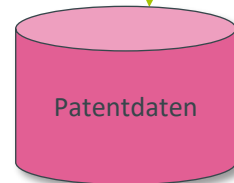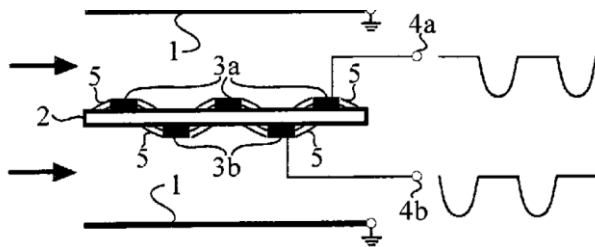
LOD Cloud:
Network of semantically linked data and knowledge sources worldwide

Luft

Dekontamination

Wiss. Literatur

Physikalisches Plasma

SARS-CoV-2

Plasmagenerator

Patentdaten

Forschungs-daten

annotation

LOD Cloud by Thomas Shafee, CC BY 4.0

(19) Bundesrepublik Deutschland Deutsches Patent- und Markenamt

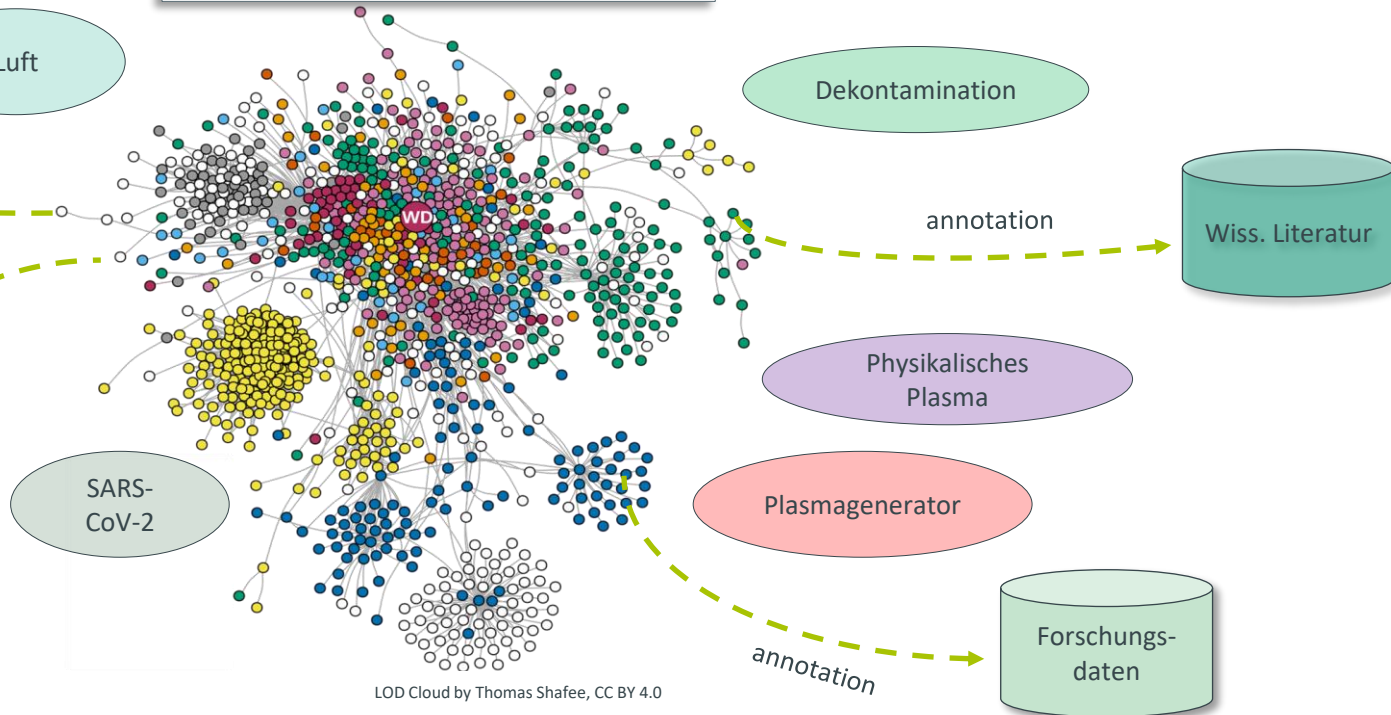(10) **DE 10 2005 024 472 B4** 2007.03.08

(12) **Patentschrift**

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der Patenterteilung: 08.03.2007

(51) Int Cl.⁸: **B01D 53/00** (2006.01)

(54) Bezeichnung: Verfahren und Vorrichtung zur Behandlung von Aerosolen, Schad- und Geruchsstoffen im Ionen-wind

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OUTLOOK

- Expansion of research activities in the field of patent text mining and semantic technologies
- New information services for science in the context of further initiatives such as NFDI and EOSC
- Establishment of interoperable patent information in the LOD cloud
- Support of further application areas and domains, e.g. biotechnologies, material sciences, through the Patents4Science infrastructure
- Sustainability perspective

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THANK YOU!

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