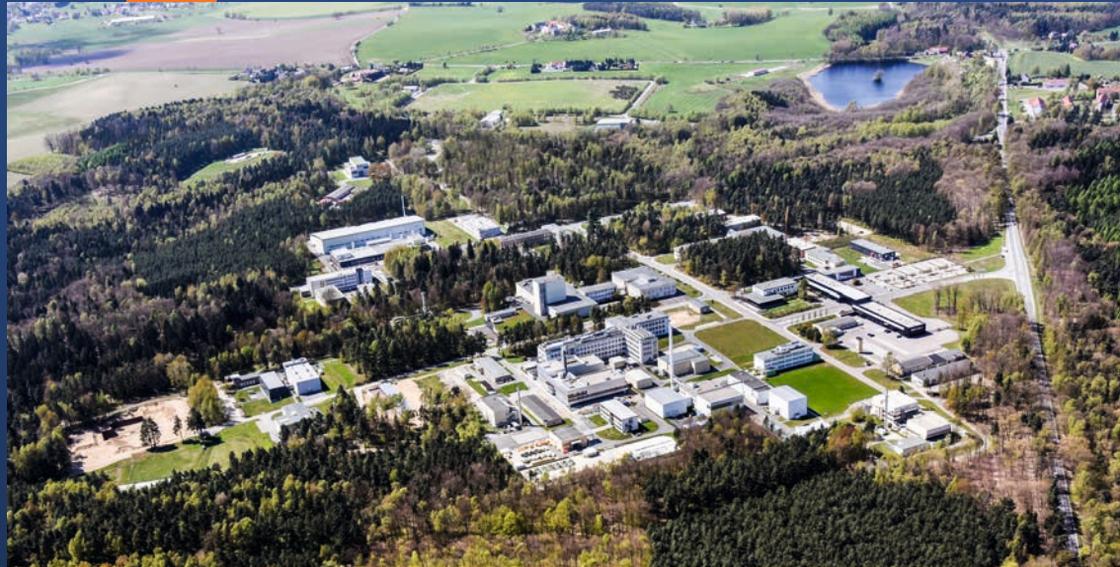


HZDR-TrAIN

Innovation and Exchange Week
10 to 14 October 2022







ABOUT THE PROJECT HZDR - TrAIN





HZDR alumni as ambassadors for worldwide cooperation and networks

Cooperations and networks are indispensable for science. At Helmholtz-Zentrum Dresden-Rossendorf (HZDR) as well because they lay the foundation for successful research and make an important contribution to meeting the great challenges of our time. Alumni can now experience this scientific and social importance in an ongoing and practical way with the HZDR-TrAIN project.

Scientists from twelve nations will be coming to our research centre for the innovation and qualification program. They will exchange knowledge with each other, expand their own skills and develop new ideas together. The focus will be on cooperation and innovation management. We are very pleased about the great interest and warmly welcome the participants from all over the world.

The attractive possibilities of the project and the associated events offer a unique opportunity: to network at the highest level worldwide and together with outstanding partner institutions. Our hope is that this collaboration will not only enable us to pool resources more effectively, but also create a high added value in knowledge for all participants.

With the HZDR-TrAIN project, we also want to expand and deepen cooperation with various universities, research institutions and companies at an international level. For the HZDR, the values of internationality and cosmopolitanism, which we see as part of our DNA, thus come to bear once more.

Germany, Europe and the world - together with its alumni, the HZDR operates globally.

Dr. Diana Stiller - Administrative Director

Prof. Dr. Sebastian M. Schmidt - Scientific Director



Take the next step

Alumni networking means „staying in touch“ - preserving what is known, discovering the new and shaping the future together. The intention of alumni networking at the HZDR is that we want to stay in touch with former colleagues from research areas within a worldwide network and preserve the acquired knowledge. With its interdisciplinary approach, alumni networking will continue to serve as an institutional platform for the exchange of knowledge and experience and to generate new ideas.

In conjunction with the HZDR-TrAIN project and the HZDR Innovators Club, the existing alumni networking of the HZDR will continue to develop new qualities in the areas of cooperation opportunities and transfer management. All HZDR alumni have the opportunity to contribute with their expertise as well as to deepen their acquired knowledge and to establish new contacts and shape the future together. We are delighted to welcome twelve international representatives of the alumni network to HZDR for one week as part of the HZDR-TrAIN project which was initiated jointly by the Personal Affairs and the Technology Transfer departments. We are looking forward to the exchanges, the ideas and the innovative approaches resulting from the collaborations. The declared aim is to bring together the minds from the international research environment at HZDR and to see new connections made and innovative approaches emerge.

Nadine Möhring-Lotsch
Head of Personnel Affairs

HZDR alumni as bridge builders for technology transfer

The idea of involving former scientists in the work of the Technology Transfer and Innovation Department is not new. In association with the Karlsruhe Institute of Technology, the HZDR has tested from 2017 to 2020 how alumni can be inspired for transfer. The advantages of involving alumni in technology transfer are numerous. There is an intrinsic motivation of alumni to contribute their experiences, knowledge and education as innovators and experts to their community. In addition, there is trust between the scientists and their former colleagues, and as the first point of contact, alumni are wonderful bridge builders for technology transfer.

With the HZDR-TrAIN project, we are taking the next step by inviting alumni from all over the world to contribute as experts to our network - the HZDR Innovators Club. I hope that with the Innovation and Exchange Week we will maximize potential for new collaborations and networks and that the program for international alumni will become an integral part of the alumni and innovation work.

Dr. Björn Wolf
Chief Innovation & Technology Officer





HELMHOLTZ-ZENTRUM DRESDEN- ROSSENDORF

We at the Helmholtz-Zentrum Dresden-Rossendorf (HZDR) - as part of the Helmholtz Association - have established our mission in that we want to help shape the future of humanity by securing the livelihood of all people in the world in the long term and creating the technological basis for a competitive economy. The aspiration and driving force behind all of HZDR's activities is excellence and an international top position. This applies to research and the operation of large research infrastructures as well as to the transfer of the knowledge gained to society, science and industry.

By focusing our scientific work in the areas of energy, health and matter, we concentrate our research efforts on answering the following questions:

- How can energy and resources be used efficiently, safely and sustainably?
- How can malignant tumors be more accurately visualized, characterized and treated more effectively?
- How do matter and materials behave under the influence of strong fields and in the smallest dimensions?

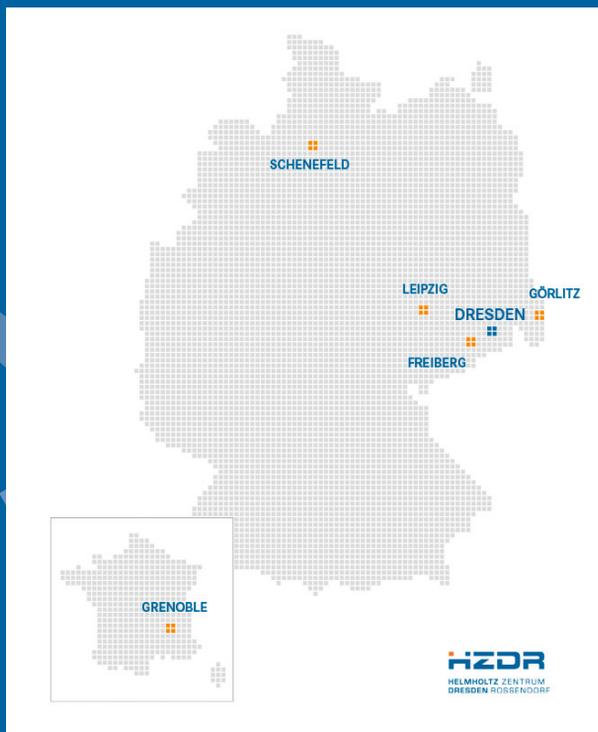
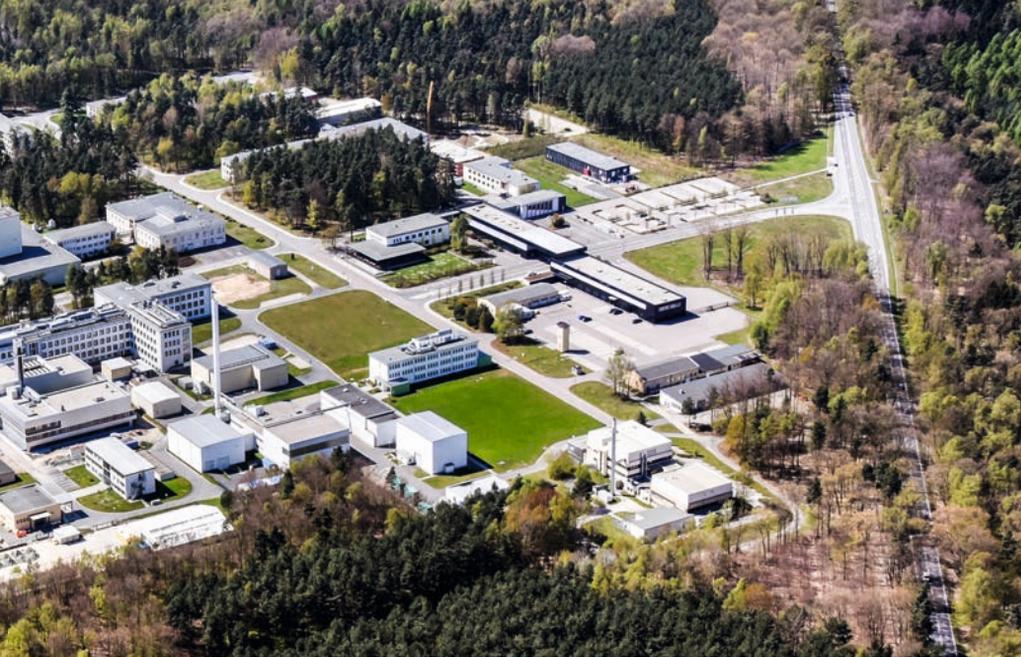
Our nearly 1,500 employees work at six

locations: Dresden, Freiberg, Görlitz, Grenoble, Leipzig and Schenefeld (near Hamburg). Our scientific staff consists of about 670 scientists, including 220 PhD students, among others.

To support their research, they have access to a number of large-scale facilities that are also used by visiting researchers: the Ion Beam Center, the Dresden High Magnetic Field Laboratory and the ELBE Center for High Power Radiation Sources.

With our alumni strategy, we want to ensure that former employees who have a network of relevant contacts in industry through their further professional careers bring these contacts to our center. Our alumni act as ambassadors in industry and initiate innovation partnerships with companies and universities. The goal is to accelerate the transfer of research results into practical applications.

Furthermore, in our role as an employer, we want to contribute to a livable future for next generations in Germany and beyond.





TRAIN ALUMNI FROM INDUSTRY FOR NEXT GENS

Alumni and interested parties from industry and science - as members of the HZDR Innovators Club - have the opportunity to actively shape the knowledge transfer between the network of experts and the Helmholtz-Zentrum Dresden-Rossendorf. With the DAAD-funded project TrAIN - Train Alumni from Industry for NEXT Gens - we have succeeded in building a network of international alumni who are already interested in collaborating with the HZDR during the first phase of the project.

The TrAIN project, enables HZDR to further develop and expand international partnerships. As part of the project planned for 2022 and 2023, HZDR alumni from several countries will receive technical and methodological training on innovation management and entrepreneurial thinking in a varied five-day event. This constitutes the basis for tandems between international and regional alumni and innovation managers and scientists from the HZDR, aimed to strengthen the transfer network. With access to current developments in a wide range of research topics and its integration into the network, the „experts“ receive a significant personal benefit for their commitment.



From 10 to 14 October 2022, international alumni are invited to the HZDR for a one-week event. The program includes visits to laboratories and innovation projects, continuing education courses and a variety of activities to establish contacts with regional start-ups as well as the innovation ecosystem.

The TrAIN project is funded by the German Academic Exchange Service (DAAD) and is executed by the Department of Personnel Affairs, the Postdoc Center and the Department of Technology Transfer and Innovation.



Monday October 10	Tuesday October 11	Wednesday October 12
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8:30 Official Welcome

9:00 Workshop
Cooperation and Networks

9:00 Workshop
Business Model and Cooperation I

9:30 Workshop
Innovation Management I

12:00 HighTech Venture Days (HTVD)
Get to know 40 high-tech startups and 180 high-profile investors from Germany and Europe. The event is entirely about meeting people and networking.

12:00 Lunch

12:00 Lunch

13:00 Workshop
Business Model and Cooperation II

13:00 Welcome
Scientific Director, Prof. Sebastian M. Schmidt

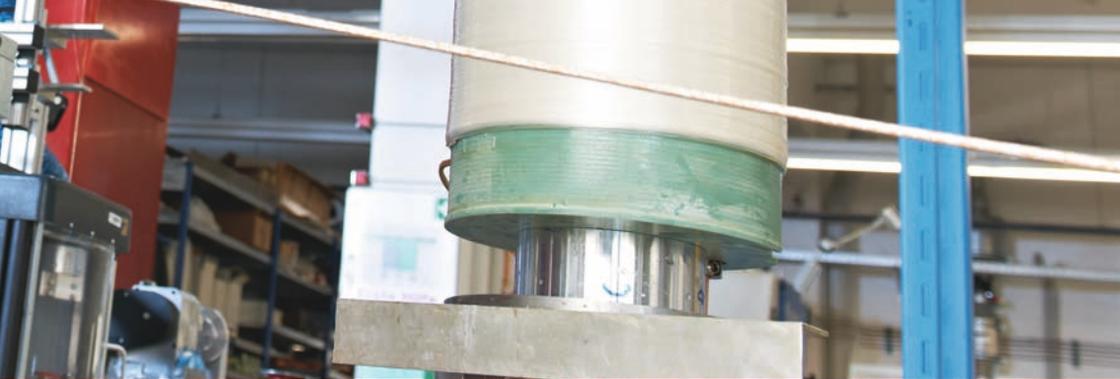
18:00 Business & Beer
Enjoy the end of the day with dinner, drinks and networking in a relaxed atmosphere.

18:00 Leisure Time
Take this time to meet your own contacts or to explore the city of Dresden. We can help you organize transportation to and from city.

13:30 Workshop
Innovation Management II

16:30 Get-Together Barbecue
Meet your former colleagues





Thursday October 13

7:30 Innovation Tour

Choose one out of three tours: HZDR-based research projects and spin-offs will be presented e. g. the projects Coraero, Radiate and Ramses-4-CE and several others. The tour details can be found below.

17:00 Career Dinner Talk

Focus topic: International Career paths beyond Academia

Friday October 14

9:00 Workshop

Project Transfer

12:30 Lunch

Speaker:
Administrative Director
Dr. Diana Stiller

13:30 Poster Session

Present your personal project idea developed in the workshops.

16:00 Certificates

Presentation of the certificates and conclusion of the program





Innovation Tour

HZDR Innovation GmbH	14, 15
FlexiSens	16
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Radiate	20
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TOUR PLAN

As part of the HZDR-TrAIN project week, our participants and interested colleagues will gain insights in the following projects on three different innovation tours:

	TOUR 1 DRESDEN	TOUR 2 DRESDEN	TOUR 3 FREIBERG
Stop 1	HZDR Innovation GmbH	HZDR Innovation GmbH	HZDR Innovation GmbH
Stop 2	FLEXISENS	RADICAL	RECOMINE
Stop 3	CORAERO	ROTOP Pharmacy GmbH	ERZLABOR advanced solutions GmbH & THEIAX GmbH
Stop 4	CASUS	CASUS	RAMSES-4-CE
Stop 5	DRESDYN	DRESDYN	FINE FUTURE
Stop 6	RADIATE	CLEWATEC	





Creating value for industry

We bring future technologies to business



SERVICES

HIGH-ENERGY ION IMPLANTATION

to improve power electronic components

NANO STRUCTURE ANALYSIS
of material properties
using positrons

TECHNOLOGY TRANSFER
consulting and entrepreneurial
training expertise for scientists



PRODUCTS

SENSOR TECHNOLOGIES

Wire-Mesh-Sensor,
Torque Sensor,
Flexible Magneto-electronics,
Radiation Detector, Impedance Biochip

CUSTOM-BUILT PRODUCTS
Two-axis Rotator, Terahertz Emitter,
Ion Backscattering Equipment,
Magnetic-field Coils,
Time-of-flight Spectrometer



STARTUPS

INCUBATION SUPPORT
for spin-offs

SHAREHOLDER
MANAGEMENT

BRAND
NEW

Production site for high-energy ion implantation in Slovakia





#Future Technologies #byHZDRI

About:

HZDR Innovation (HZDRI) is a technology transfer company. As a spin-off of the Helmholtz-Zentrum Dresden-Rossendorf (HZDR), HZDRI realises since 2011 commercial production and service orders and makes the unique large-scale research equipment of the HZDR accessible to partners from industry. The main business field of the HZDRI is high-energy ion implantation. In manual or semi-automated handling, the processing of wafers of different sizes is possible.

Cooperation offers:

The HZDRI promotes the transfer of research results. In addition to the (finished) development of prototypes and demonstrators, various sensors and other innovative products are produced in small series or individual production and sold worldwide.

Furthermore, as an incubator and investor, HZDRI provides start-up assistance for HZDR spin-offs. HZDR Innovation now has around 80 employees. The shareholders of HZDR Innovation are Helmholtz-Zentrum Dresden-Rossendorf e.V. and GWT-TUD GmbH. The latter is a wholly owned subsidiary of TUDAG.

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HZDR INNOVATION



FlexiSens

About the project:

The Helmholtz Innovation Laboratory FlexiSens focuses on the development and application of printable, and elastic magnetic field sensors, these sensors work by usage of the hall and magnetoresistive effects. Besides those efforts, the project develops measuring methods for milli and microfluidic milieus and development of microfluidic connectors and functional fluid geometries.

Cooperation offers:

- Joint development of sensors, powder and pastes
- Production and distribution of flexible magnetic field sensors and powder for printed magnetic field sensors
- Cooperation in the field of liquid analysis
- Licensing, R&D cooperation and contract research

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About the project:

The project CORAERO aims to make broad and interdisciplinary contributions to understanding of SARS-Cov-2 spread by aerosols as well as to development of technological and administrative measures to contain and control the virus.

We conduct research and provide technology transfer for new technologies to inactivate viruses in the air and on surfaces. CORAERO brings together scientist from medicine, virus biology, applied physics, chemistry, material science, engineering, and technology management.

The goal of the project is to further develop technologies for schools, plants, public transportation and institutions.

The following questions are addressed in particular:

- How does the environment effect surface and aerosols contamination through viruses?
- How fast do aerosols evaporate and how does this effect the virus inactivation?
- What is the best ventilation methodology considering dynamic situations?
- What is the best inactivation methodology regarding safety, costs and efficiency and how can it be installed in public institutions?

Cooperation offers:

Our CORAERO project is a network project and is happy to involve external associated partners from industry and research in the work and knowledge exchange.

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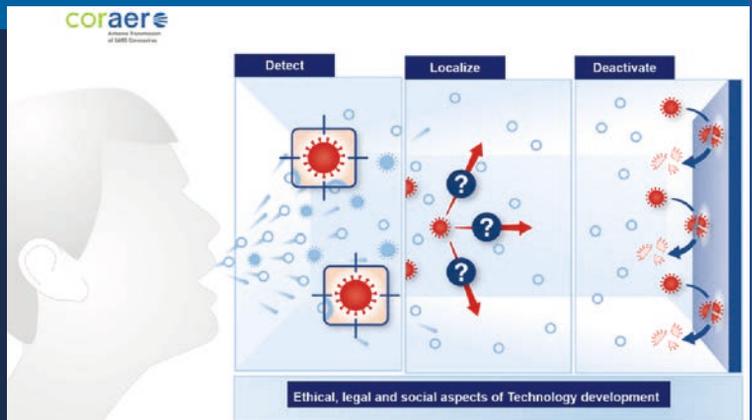
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CASUS

CASUS: OPTIMA - Better cancer treatment through artificial intelligence

About the project:

The OPTIMA research project, led jointly by academic institutions and companies, aims to improve patient care for prostate, breast and lung cancer. As the name – Optimal treatment for patients with solid tumors in Europe through artificial intelligence – suggests data collection and analysis are of central importance for the project. The Center for Advanced Systems Understanding (CASUS), an institute of the HZDR, is one of the 36 partners from 13 countries behind OPTIMA. Together with the pharmaceutical company Pfizer, CASUS is responsible for the implementation of one of the nine OPTIMA work packages. Specifically, it is about setting up a digital platform and developing tools for explainable artificial intelligence (AI) to support decision-making in clinics. The more and the better data is available on the platform, the more relevant the results obtained are likely to be. The OPTIMA partners plan to bring data from more than 200 million people onto the platform.

In addition to data sets, the interoperable OPTIMA platform also contains data analysis tools, learning tools, AI algorithms and electronic decision-making aids. It is crucial that more complex AI evaluations are also possible.

Cooperation offers:

Cooperation with all 35 OPTIMA partners and with Helmholtz HIFIS

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DREsdén Sodium facility for DYNano and thermohydraulic studies

About the project:

The DRESDYN infrastructure project is expected to include large-scale liquid sodium experiments designed to investigate various geophysical and astrophysical questions. On the other hand, it also serves to process technological problems when using liquid metals in energy technology.

Cooperation offers:

Liquid metal technologies in power engineering, liquid metal batteries, cast steel, sodium fast reactors

Contact:

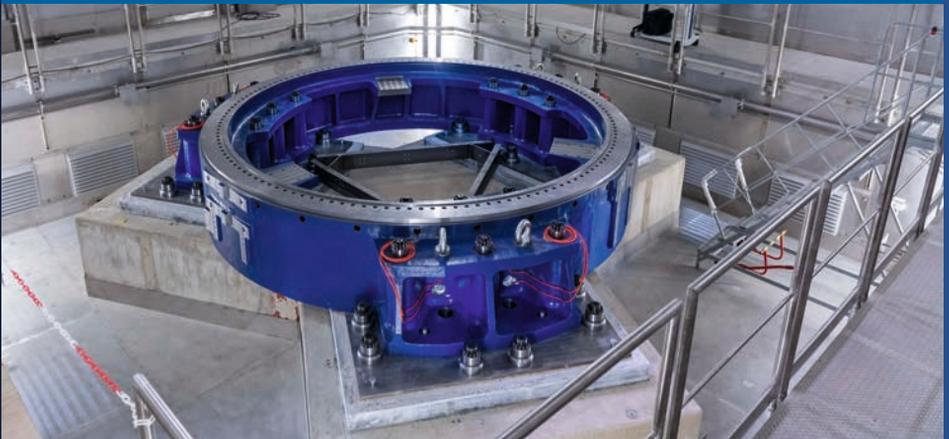
Dr. Frank Stefani

Magnetohydrodynamics at HZDR

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RADIATE

About the project:

RADIATE intensifies the cooperation and increases the visibility for all partner institutions to promote ion beam research and applications across Europe. Ion beam science and technology is constantly evolving to meet the demands of societal and scientific challenges. The inclusion of small and medium enterprises fortifies the cooperation between ion beam centers and industry.

RADIATE also provides easy and efficient access to Europe's key ion beam facilities and opens the facilities to users from new communities and young researchers.

The RADIATE project in numbers:

partner: 19

run time: 1/2019 – 6/2023

budget: 9.9 million EUR

hours of transnational access: ~ 15.800

facilities offering transnational access: 14

Cooperation offers:

- Transnational access - RADIATE provides easy, flexible and efficient access for researchers from academia and industry to European ion beam facilities
- Joint Research Activities (that directly benefit users of transnational access) on ion beam sources and optics, single ion implantation technology, online simulation software, and analysis tools help develop and update the ion beam research infrastructures
- Training the next generation of ion beam scientists to expand the user base: twinning program for inexperienced users, guest researcher stays, summer schools

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RADICAL - H2020 FETOPEN Project- Fundamental Breakthrough in Detection of Atmospheric Free

About the project:

RADICAL is an EU-funded research project to develop a brand-new way of detecting atmospheric free radicals in real-time.

Atmospheric radicals, particularly hydroxyl ($\bullet\text{OH}$) and nitrate radicals ($\bullet\text{NO}_3$), are the drivers of chemical processes that determine atmospheric composition and thus influence local and global air quality and climate. Because of their high reactivity, the atmospheric free radicals have very short lifetimes and low concentrations, which makes their detection and quantification extremely challenging. Current techniques for measuring radicals are based on spectroscopic and mass spectrometric methods, which are technically complex, cumbersome and expensive. As a result, the measurement of atmospheric radicals is far-from-routine and only a few research groups worldwide can perform them in a very limited number of geographic locations. There is, therefore, a clear need to develop new radical detection techniques, which are much easier to implement and deploy than existing methods. The central aim of RADICAL is to develop and deliver the science and technology to electrically detect and quantify, for the first time, short lived $\bullet\text{OH}$ and $\bullet\text{NO}_3$ radicals in the atmosphere via new, low-cost and easily accessible sensors based on Si junctionless nanowire transistor devices. These electronic sensors will 'sniff' out short-lived radicals leading to improved monitoring and control of air quality and better predictions of climate change.

Cooperation offers:

- Collaborations with air sensor companies and research groups to prototype, calibrate and test the sensors
- Academic or industry partnerships for future funding bids
- Discussions or workshops on potential spin-off applications

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CLEWATEC

CLEWATEC – Competence Center for Clean Water Technology

About the project:

The Helmholtz Innovation Lab CLEWATEC researches and develops new technological approaches for flexible and efficient wastewater treatment.

Cooperation offers:

- Development of specialized measurement technology
- technology development and - assessment
- Use of laboratory and pilot plants
- Construction of demonstration plants
- Simulation of complex flow processes
- Process and plant modeling
- Further training in measurement technology
- Development of (funded) cooperation projects
- Partner network sewage technology

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ROTOP Pharmaka GmbH
About:

ROTOP Pharmaka is a leading pharmaceutical company that manufactures cGMP-compliant radiopharmaceuticals for diagnostics and therapy in the fields of nuclear medicine and molecular imaging and sells them in over 30 countries worldwide. With more than 20 years of experience in developing, manufacturing, licensing and distributing of sterile cold kits for radiolabeled drugs, ROTOP is continuously expanding its product portfolio through the development of new products and new strategic partnerships.

Since 2020 there is also the ROTOP Radiopharmacy. Here we manufacture a ready-to-use product under the most modern conditions and sell it all over the world. In the ROTOP Innovation Center we devote ourselves to the area of CDMO Business (CDMO – contract development and manufacturing organization). This is about the contract development and contract manufacturing organization for other companies.

These are the three mainstays of ROTOP, all gathered on the HZDR Rossendorf campus.

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rECOMine

About the project:

Recomine is an alliance of companies, research and public institutions as well as NGOs from Eastern and Central Saxony.

The aims and targets of the alliance are:

- Development of innovative and holistic solutions for contaminated sites from mining and metallurgy, simultaneous remediation and development of disperse raw material sources
- Generation of regulatory and civil society approval, economic and social strengthening of the region and interdisciplinary cooperation
- The 5 established recomine development sites in the Ore Mountains are representative of contaminated sites worldwide and enable the alliance to conduct research and development under real conditions
- Development and testing of innovative concepts and technologies by regional partner institutions
- Evaluation of the technologies under real conditions and coordination with regional actors from society, politics and administration
- Active global technology marketing through the recomine coordination office

Cooperation offers:

- Joint projects for the holistic recycling of contaminated sites
- Technology transfer to the global mining industry

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Alliance Coordinator

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About:

ERZLABOR Advanced Solutions GmbH is a service provider for automated characterization of primary and secondary raw materials. In the area of primary raw materials, for example, we analyze ores, mineral concentrates or dump material. In the field of secondary raw materials, we characterize materials such as used Li-ion batteries. Through efficient and detailed material characterizations, we enable companies in the raw materials industry to increase resource efficiency and sustainability. We were founded in Freiberg a little over 5 years ago and our service is based on know-how that arose at the Helmholtz Institute in Freiberg.

Cooperation offers:

The ERZLABOR likes to contribute to scientific developments - we participate in research projects, offer internships and supervise students.

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RAMSES-4-CE

Raman, Absorption and eMission Spectroscopy in an intEGrated Sensor for the Circular Economy

About the project:

The rapid identification of critical compounds is crucial for an adequate sorting and inherently the adapted recycling that will enable Circular Economy. RAMSES-4-CE is a 4 years up-scaling project funded by EIT RawMaterials to bring latest research into technical solutions for the resource industry. In this context, the RAMSES-4-CE project innovates optical spectroscopy-based multi-sensor systems for the recycling industry.

Partners: HZDR, TUBAF, Freiberg Instruments, Geological Survey of Finland

Research area: Recycling of e-waste, inline material characterization

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TheiaX GmbH – Innovative Mineral Exploration

About:

The sustainable supply of raw materials requires efficient processes with low environmental impact. Researchers at the Helmholtz Institute Freiberg for Resource Technology have developed novel digital mapping methods. TheiaX offers non-invasive raw material exploration with innovative sensor technology as well as AI and VR-supported imaging methods to detect high-tech metals in an environmentally friendly way.

TheiaX GmbH is a spin-off of the Helmholtz Institute Freiberg for Resource Technology (HIF) part of the Helmholtz-Zentrum Dresden - Rossendorf e. V. (HZDR). From science and R&D through to commercial applications, our expertise combines hyperspectral imaging and machine learning technics providing the exploration and mining sectors with bespoke solutions.

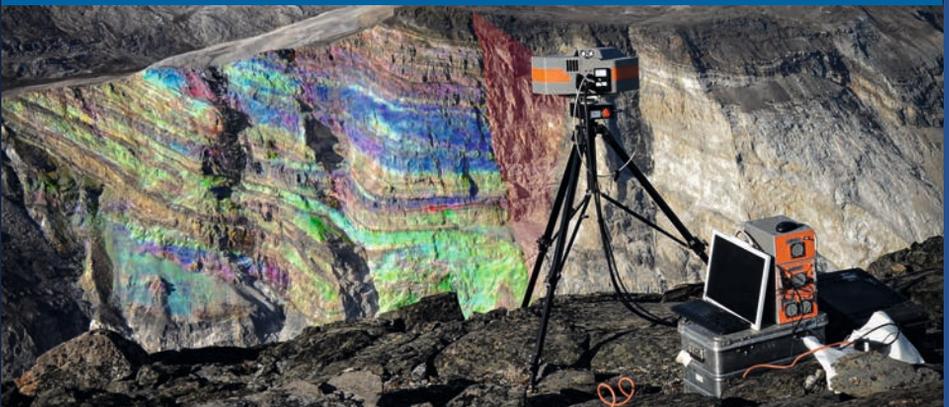
Cooperation offers:

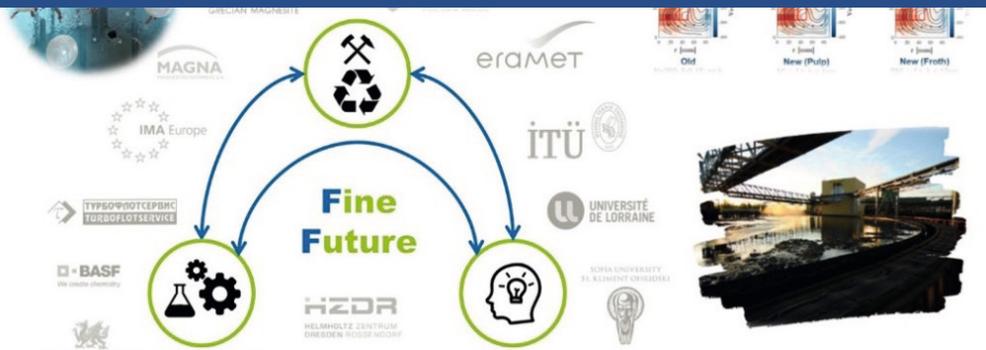
TheiaX GmbH offers services to the exploration and mining industry for fast and efficient raw material discovery and characterization using non-invasive technologies combined with robust machine learning driven data processing routines. Our products consist of digital twins of drill-cores and outcrops, which are derived through our three main services: CORE, PIT & MAP.

- CORE: mineral characterisation of drill-cores and hand specimens
 - PIT: mineral mapping of open pits and outcrops
 - MAP: regional mineral and prospectivity mapping
- TheiaX GmbH is also open to relevant R&D projects

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FineFuture

About the project:

FineFuture is an EU-funded project which explores innovative technologies and concepts to improve the flotation recovery of ultrafine particles. This three-year project (2019-2022) is an intensive collaborative effort bringing together 16 partners from academia and industry from 11 European and associated countries. Led by Helmholtz-Zentrum Dresden Rossendorf (HZDR), the project has received over € 6.2 million in funding from the EU. Besides improving our understanding of the efficient separation of fine particles by proper turbulence design the aim of FineFuture is to combine progressive facility design and process innovations to develop new technological solutions on various TRL levels for the flotation separation of fine particles.

Cooperation offers:

FineFuture has significantly improved our theoretical understanding and provides enhanced modelling and simulation capabilities which can now be exploited by collaboration partners. Various raw material projects involved in FineFuture showed improvement in fine particle recoveries with the FineFuture technologies but due to the nature of raw material processing being quite material specific further cases need to be established with the need of partners from the raw materials sector.

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INNOVATION ENVIRONMENT





HighTech Startbahn

About:

HighTech Startbahn (HTSB) knows the journey of young high-tech companies from start-up to growth and offers support in many areas, with an emphasis on fundraising and sales operations. With over 500 happy consulting customers, 65 industry clients, interactions with over 2.500 young ventures and 2.000 international high-tech investors annually, HTSB has become an expert in company building and an authority in the European tech venture scene.

Cooperation Offers:

- Established and strong relationships to 3.500 international investors and corporates
- Transfer support in over 25+ research projects and high-tech clusters
- Company building and growth support
- Europe's leading high-tech focused investors conference
www.hightech-venture-days.com
- Mentors Club (over 500 years high-tech industry experience)
- Technology and venture scouting

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Chief Executive Officer
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Website: www.htsb.eu



dresden | exists

About:

The start-up service dresden|exists is the first point of contact for students and scientists, who are interested in commercializing research results, in self-employment or in start-up projects. An interdisciplinary team of business professionals and scientists supports the journey from the initial idea to the successful founding of a company. With events and training programs dresden|exists also promotes entrepreneurial thinking in the scientific landscape. dresden|exists offers its services to members and alumni of eight universities and research institutes in the Dresden region: TU Dresden, HTW Dresden, FH Dresden, HfBK Dresden, Hochschule Zittau/Görlitz as well as Helmholtz-Zentrum Dresden-Rossendorf, Leibniz IFW and Leibniz IPF.

Cooperation Offers:

Information & networking:

- Events for founders
- Individual networking with experts and alumni Business coaching
- Assessing the commercial potential of scientific findings
- Business modelling
- Individual coaching during the founding process Training
- Workshops and seminars on entrepreneurial skills and business expertise
- Lectures on the basics of economics Financing
- Advising on start-up funding programs
- Access to investors, business angels and matching events

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dresden | exists

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futureSAX

About:

futureSAX is the central point of contact in the Saxon innovation ecosystem with strong start-up and transfer activities with the aim of making the innovation actors and the innovation region visible. Through a variety of measures, futureSAX raises awareness of innovative entrepreneurship, provides growth impulses for sustainable innovations, networks cross-industry innovators from science and industry and increases the efficiency of innovation processes.

Cooperation offers:

- News from the innovation ecosystem
- information on innovation opportunities in the blog
- Overview of successful financing rounds of Saxon companies and start-ups
- Overview of partner networks and support opportunities
- Overview of experts in the competence network
- Competitive advantages through cooperation and collaboration opportunities
- Saxony-wide networking opportunities via the event calendar

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The International Office at HZDR

About:

We would like to support and assist you in settling down in Dresden and getting oriented in your new community. Our International Office advises and supports foreign scientists and international users of our research facilities together with their families in planning and organizing their stay in Dresden.

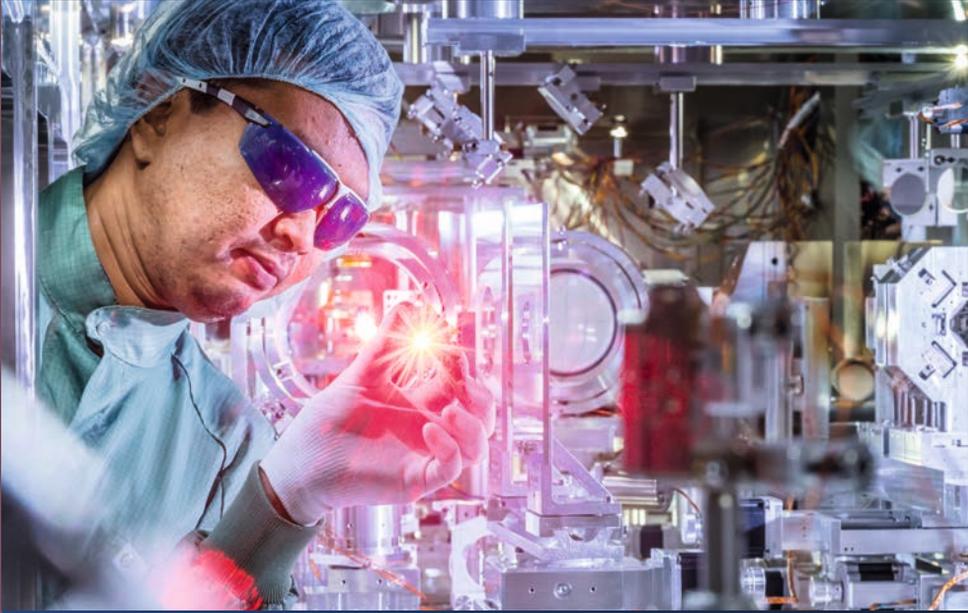
We want to be your central point of contact for all questions concerning your stay at the HZDR.

Our services include:

- Information about the appropriate visa and application
- Assistance with the formalities to be completed upon entry, including information about current entry regulations
- General information about administrative procedures
- Assistance in finding suitable accommodation
- Support for families in their search for a daycare or school placement
- Organization of information events on everyday topics
- Organization of the international summer student program

Contact:

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Agnieszka Bos-Liedke

Nationality: Polish

Research focus: Oncology

Current Position: Assistant Professor

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What is your connection to the HZDR?

PhD 2008-2012, last year short-term collaboration

Which research result has amazed you the most in the past year?

Correlation between Quantitative PSMA PET Parameters and Clinical Risk Factors in Non-Metastatic Primary Prostate Cancer Patients.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

Natural sources of energy and oncological studies (health) – these two topics (unfortunately) are never ending sources of problems that should be innovative. The second one is – nanotheranostics and analysis of the patient's data with deep learning procedures.



Ahmad Hassanzadeh

Research focus: Mineral Processing

Current Position: Researcher and CRO

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What is your connection to the HZDR?

HZDR is my previous workplace. Also, we have two joint projects together and some common interests between MMS and HZDR.

Which research result has amazed you the most in the past year?

Results related to the fluid dynamics and magnetic investigations.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

Energy and matter.

My area of research is related to material and energy simultaneously, in other words, how to effectively produce materials with low energy consumption. Also, how to find new energy resources or alternative media for different applications.

Ahmed Tamer AlAsqalani

Nationality: Egyptian

Research focus: Atomistic modelling of materials

Current Position: Researcher

Institution: Czech Technical University

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What is your connection to the HZDR?

Ph.D student, institute of safety research, 2008-2012.

Which research result has amazed you the most in the past year?

I am impressed by the result of achieving ultralow friction using MoS₂/graphite and MoS₂/hexagonal boron nitride van der Waals heterostructure interfaces.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

Energy and matter are hot and exciting topics due to the highly increasing demand for energy nowadays.

Concerning energy, about a quarter of the total energy losses worldwide result from friction and wear of mechanical components. Thus, the search for new methods to minimize these untoward effects could be of immense value for the energy-efficient economy of the future.

On the other hand, materials under extreme environments have received significant attention recently in the context of next-generation energy, defence, and transportation technologies. For instance, the next-generation nuclear power reactors require structural materials capable of withstanding elevated temperatures and radiation fluxes in highly corrosive environments for long periods without failure. Hence, new concepts in materials design are needed to manufacture materials that resist damage at irradiation and mechanical extremes.



Atef Iqbal

Nationality: Pakistan

Research focus: Solar cell, Electrocatalysis

Current Position: Researcher

Institution: University of Iceland

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What is your connection to the HZDR?

I was a research intern.

Which research result has amazed you the most in the past year?

Nitrogen reduction reaction (NH_3) in transition metal nitrides

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

I will contribute to energy (Solar cells). Solar Power may minimize and eliminate the emission of harmful pollutants such as carbon dioxide, methane, and nitrous oxide that cause greenhouse gases and hazardous air.

Bartosz Liedke



Nationality: Polish

Research focus: Prediction of energy consumption for electricity and gas, neural network studies

Current Position: Senior Java Developer

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What is your connection to the HZDR?

I did my PhD at HZDR followed by post-doctoral research contracts with Dr. Karl-Heinz Heinig and Dr. Mathias Posselt.

Which research result has amazed you the most in the past year?

Development of conversation agents such as LaMDA from Google opens a way towards mimicking the human way of thinking and reasoning. Moreover, IBM application of 127-qubit quantum processor opens a roadmap in a completely new research field and possibly backtracking the CPU performance curve into the Moore's law again.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

In my opinion, clearly the energy is the topic where the most research should focus on. Energetic crisis is approaching and new, more efficient approaches for obtaining energy have to be developed, starting from better PV efficiency and finishing on first industrial application toward fusion power plants.



Daria Navrotska

Nationality: Ukrainian

Research focus: Molecular Genetics

Current Position: Research Assistant

Institution: National Academy of Sciences of Ukraine

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What is your connection to the HZDR?

I am familiar with the HZDR due to work and investigation of my colleagues from the Institute of Molecular Biology and Genetics of the NASU (Ukraine) and Heidelberg University (Germany).

Which research result has amazed you the most in the past year?

It's hard to single out certain studies that impressed me the most because there are some many. However, I want to emphasize that I am inspired by research on investigation of the new radioactive pharmaceuticals for the diagnosis of cancer, and medical imaging technology.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

Obviously all three research areas are very important for investigation and need precise attention of the scientific community. At the same time, all of them connected, and disbalancing in one will have immediate or postponed effects on others. In my opinion, issues that appear in the health topic need a little bit more innovative approach. It is important, because first of all new technologies in that area can save a life to hundreds of thousands of people in the world. The second is although many advances have been achieved to treat aggressive tumors, cancer remains a leading cause of death and a public health problem worldwide.

Ján Šimkanin

Nationality: Slovak

Research focus: Magnetohydrodynamics, fluid dynamics

Current Position: Researcher, Team Leader

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What is your connection to the HZDR?

In 2019, I started cooperating with Dr. Frank Stefani and Dr. André Giesecke on the DRESDYN infrastructure project. Using numerical modelling, we searched for suitable velocity fields for precession-driven convection and precession-driven dynamo. This fall, the hydrodynamic part of the DRESDYN experiment is to be launched, where only precession-driven convection will be studied.

Which research result has amazed you the most in the past year?

Last year and this year I am interested in the JUPITER ICY MOONS EXPLORER project (JUICE for short) of the European Space Agency (ESA). It is a space probe that will explore Jupiter's moons Io, Europa, Ganymede and Callisto. The probe will launch in 2023. For at least 3 years, the probe will collect scientific information about the conditions in the system of the planetary giant Jupiter, including the icy moons Ganymede, Europa and Callisto.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

All three areas require a high degree of innovation, as they significantly affect the life of the human population. As a physicist, I can express myself more on the subject of energy, the sources of which are essential for the life and progress of human society. This is especially important in the current energy crisis. Search for new sources, more efficient use of current sources and sustainability of energy sources.



María Guadalupe Sánchez Loredo

Nationality: Mexican

Research focus: Materials Science, Metallurgy

Current Position: Professor

Institution: Universidad Autónoma de San Luis Potosí, Mexico

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What is your connection to the HZDR?

Alumnae, I have been at HIF three times.

Which research result has amazed you the most in the past year?

In general, the RNA vaccines against Covid 19. The vaccinations started in 2020 but the results were evident last year.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

Matter, because energy and health are both related to the new developments in materials science. Particularly nanotechnology will change the way we produce energy, remediate water, air and soils, and allow the development of new treatments and medicines.

Muhammad Nabil Satria Faradis

Nationality: Indonesian

Research focus: Technology Management

Current Position: Expert Staff to Indonesian Minister of State Secretary

Institution: Ministry of State Secretariat of the Republic of Indonesia

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What is your connection to the HZDR?

Research Assistant to Dr. Hendrik Hessenkemper and Dr. Dirk Lucas on 2017-2018

Which research result has amazed you the most in the past year?

The research on semiconductors, radiopharmaceutical at HZDR to hunt cancer and managing wastewater and energy are the exciting topics that I follow from HZDR. I believe this research would help us to prepare for a better future.

I particularly would also like to highlight the excitement about James Webb Telescope. It is interesting to see how worldwide collaboration and interdisciplinary research have advanced humanity to learn more about where we are.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

I believe energy and health would be the primary drivers of changes and disruption. It will accelerate and intensify in the years to come. When I look at the trends during a couple of decades, the massive effect that energy and health will have on every sector impresses me more than anything else. The next few decades promise to be a time in which technologies and research on energy and health progress ever more quickly from science to engineering to impact-at scale and around the world. I think we also expect to see the multiplying effect of “combinatorial innovation” as different technologies and research come together creatively. For example, this is happening now as organizations combine other technologies to create the Covid-19 Vaccine and the many layers that make it up.



Noora Kinnunen

Nationality: Finnish

Current Position: Marketing Coordinator

Company: Medanets, Finland

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What is your connection to the HZDR?

I was working in the Department of Technology Transfer and Innovation during the years 2018-2020. My tasks focussed on strengthening the transfer culture at the HZDR.

Which research result has amazed you the most in the past year?

What amazes me the most is the devotion that researches across all fields show towards their work to find answers to unanswered questions. All results, big and small, are valuable and add to the knowledge base we have on different topics.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

In all of them, and in many more. No one can solve these challenges alone. We need to get rid of silo-based thinking and cooperate across all fields, disciplines, and sectors.

Nathalie M. L. Kupka

Nationality: French

Research focus: Technology development and optimization

Current Position: Senior metallurgist

Company: Metso Outotec, Finland

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What is your connection to the HZDR?

I did my PhD at the Helmholtz Institute Freiberg for Resource Technology on the topic of chemistry and process mineralogy in the froth flotation with the example of tungsten. At the end of my PhD, I did about two years as a post-doc at the HIF before switching to the industry.

Which research result has amazed you the most in the past year?

Research around black holes but assuming you are meaning something related to HZDR, the research around spent lithium-ion battery recycling at the HIF, with actual solutions to the recycling of graphite, bringing us closer to circular economy.

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

The mining industry is highly energy and water intensive, with increasing stress on an already fragilized environment. Optimizing the energy consumption while reducing the water consumption requires more understanding of the underlying processes and more innovative and clever ideas in order to address climate change, one of the greatest challenges in human history.



Koichiro Takao

Nationality:	Japanese
Research focus:	Nuclear Fuel Cycle, Coordination Chem
Current Position:	Associate Professor
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What is your connection to the HZDR?

I was a postdoc in the Institute of Radiochemistry (currently, Institute of Resource Ecology) from 2008 to 2010. Even after coming back to Japan, I still continue collaboration with the member of IRE to date.

Which research result has amazed you the most in the past year?

“Seven chemical separations to change the world” (Nature, 2016, 532, 435-437), which does not provide the actual research results, but claims interesting topics to be explored. The authors raised the following topics; (1) Hydrocarbons from crude oil, (2) Uranium from seawater, (3) Alkenes from alkanes, (4) Greenhouse gases from dilute emissions, (5) Rare-earth metals from ores, (6) Benzene derivatives from each other, and (7) Trace contaminants from water. Based on my expertise, I would be able to contribute topic (2), (4), and (5).

Energy, health and matter are the three major research areas of the HZDR. In which topic do we have to be particularly innovative in order to solve the great challenges of our time? Why?

Although all three are important, I would choose “energy” as an area that particularly needs innovation. This is because we cannot maintain our current society without sufficient energy supply. Nuclear energy is one of the promising and realistic solutions to achieve carbon neutrality, while it is also true that there are still serious problems related to nuclear wastes such as spent nuclear fuels, radioactive wastes, and depleted uranium. I believe that we can overcome these issues through innovative advances in science and technology.

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