

Retrospective

In 2022, Fraunhofer IKTS presented its research and services at numerous trade fairs in Germany and abroad and as the organizer of several scientific congresses as well as at various events for the general public.

February 3, 2022 **NDT4INDUSTRY – Online seminar series on non-destructive testing**

In 2022, Fraunhofer IKTS continued to present developments from the field of non-destructive testing (NDT) for industry as part of the NDT4INDUSTRY online seminar series. In January, Natalia Beshchasna spoke about novel in-vitro testing for cardiovascular implants to improve their compatibility and longevity. A system for inline testing of multiaxial carbon fiber fabrics with a width of up to 2.5 metres was presented by Martin Schulze in March. In June, Manuela Heymann focused on a marking solution that can withstand the extreme conditions in metal processing. Peter Krüger combined X-ray and thermography in September to optimize quality assurance in battery production. Detecting defects and wear with AI-based acoustic diagnostics was the topic of Ivan Kraljevski's seminar in November.



In 2023, the concept of the seminar series will change its focus from processes to branches of industry. In the future, the spotlight will be on industrial challenges for which suitable developments from the institute will be presented. Current topics and dates can be found at www.ndt4industry.com.

March 2, 2022 **Prof. Michaelis receives international materials research awards**

(Bottom image)

On March 2, IKTS Institute Director Prof. Alexander Michaelis became the first European to receive the prestigious “Acta Materialia Hollomon Award for Materials and Society” from Acta Mineralia, Inc. Before that, in October 2021, he had already been honored with the “Rustum Roy Lecture Award 2021” from the American Ceramic Society ACerS. Both awards recognize outstanding contributions to materials science for the benefit of society.

May 30, 2022 **Our trade fair highlights**

(Top image)

Fraunhofer IKTS was represented at 25 trade fairs in 2022. At the JEC, the institute demonstrated inline testing of carbon fiber textiles. Process developments for the energy-efficient and selective separation of valuable materials from hot gas processes by means of filtration were the highlight at IFAT. At the Sensor and Test and Electronica trade fairs, IKTS presented ceramic solutions for sensor technology and power electronics in harsh environments. Electrolysis is central to the decarbonization of industry. At ACHEMA, visitors were able to learn about ceramic technologies and a techno-economic assessment offer for efficient power-to-X processes. In addition to a rail testing system, an ultrasonic testing clamp for compression connectors on contact wire lines was presented at Innotrans, which detects cracks before they have spread to the surface. For the first time, the Multi Material Jetting (MMJ)





3D printing process allows the sustainable production of functionalized multi-material components in a single printing process. At **CERAMITEC** and **formnext**, the IKTS team provided a first glimpse of this technology, which will be commercialized in 2023. You can find an outlook on the trade fair year 2023 on page 70. We look forward to seeing you at GIFA and COMPAMED 2023, among others!

June 7–8, 2022 Ceramics Vision 2022

(Top image)

As the culmination of its 30th anniversary year, Fraunhofer IKTS once again hosted Ceramics Vision in Dresden, now in its 11th edition. 60 guests from research and industry, including former employees, took up the invitation. Key technologies and future challenges in the fields of water, decarbonization and digitalization were the main topics of the two-day conference. IKTS looked back on past developments, highlighted the latest ceramic solutions for industry and society and gave an outlook on the next 30 years.

June 18 | July 8, 2022 Science Night in Freiberg und Dresden

(Bottom image)

“sustainable. research. economy. life.” was the motto of the Freiberg Night of Science and Business on June 18, where the IKTS team of Fraunhofer THM presented its research on battery technologies and battery recycling.

On July 8, Fraunhofer IKTS in Dresden-Gruna opened its doors to the public for the 19th Dresden Science Night. Hands-on experiments, lectures and laboratory tours brought visitors closer to the diverse applications of advanced ceramics. For example, children and young people were able to build a battery from potatoes, make fingerprints visible through electrochemical processes and clean water with electricity, while the grown-ups looked over the shoulders of researchers as they injection-molded ceramic knee prostheses, used modern sensors to look inside cell phones and microelectronics and learned, from our lectures, why wastewater treatment plants are an important source of raw materials and energy and how corrosion protection and climate protection are linked.



August 18, 2022

IKTS spinoff advances monitoring technology for offshore pressure vessels

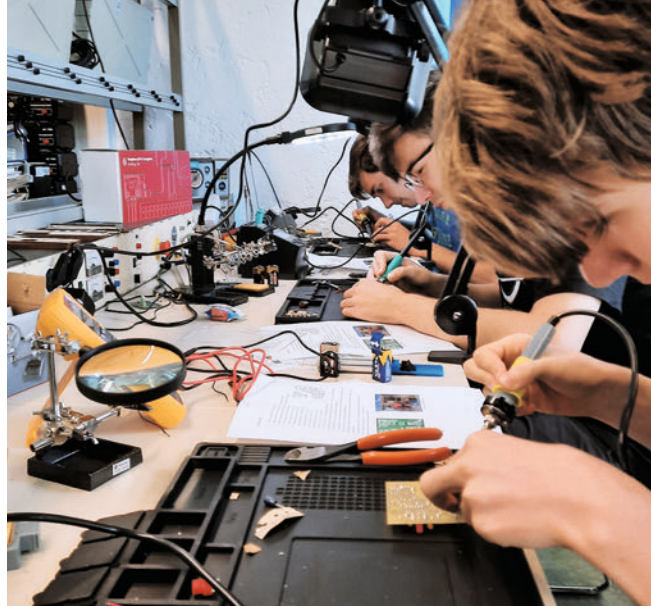
Together with Equinor Ventures and the spinoff company CoFounder, Fraunhofer IKTS founded the deep-tech venture “Nicoustic” in Trondheim, Norway. The new company markets a technology for monitoring offshore pressure vessels, which are widely used in the manufacturing industry. Guided ultrasonic waves can be used to monitor closed vessels non-invasively, permanently, from the outside and without downtime for the operator.

August 22–26, 2022

Sensor Space Summer School

(Top image)

The second Sensor Space Summer School of Fraunhofer IKTS took place as a free summer camp in Hermsdorf (Thuringia) with the headline “Feel the Beat”. Together with researchers from Fraunhofer IKTS, who had developed the concept for the Summer School, the nine young people spent a week working with circuit diagrams, electronic components and measuring devices. The goal was to build their own ECG device, with which they could measure their own heartbeat at the end of the week. The BMBF-funded STEM student lab Sensor Space is



a “maker space” for sensor technology and technical ceramics with the aim of getting students excited about microelectronics, software and technology, and increasing their interest in technical professions.

August 26, 2022

CleanEFX – Prime Minister learns about decarbonization at Erfurter Kreuz

(Bottom image)

More than 20 companies from the Erfurter Kreuz e. V. initiative are working together in the CleanEFX interest group to supply the industrial park at Erfurter Kreuz with climate-neutral energy and process heat. The project idea had been initiated in several workshops by companies and research institutions even before the current geopolitical developments came about. Thuringia’s



Thuringia’s Prime Minister Bodo Ramelow (2nd from left) and Minister of Economics Wolfgang Tiefensee (3rd from left) with Fraunhofer IKTS Institute Director Prof. Alexander Michaelis (r.) and Prof. Michael Stelter (l.), Deputy Institute Director of Fraunhofer IKTS and Board Member of the Thuringian Renewable Energy Network (ThEEN) e.V.

Minister President Bodo Ramelow and Economics Minister Wolfgang Tiefensee visited the Battery Innovation and Technology Center in Arnstadt to learn more about the concepts for sustainable energy solutions from IKTS researchers and company representatives from the region.

September 3, 2022

Open House at Fraunhofer IKTS Hermsdorf

(Image on the right)

Several hundred interested people visited the Thuringian IKTS site in Hermsdorf for its open house event. From lectures, demonstrations and laboratory tours, they gained insights into current research topics and got to talk with researchers.



September 14–16, 2022

ISPA International Symposium on Piezocomposite Applications

(Bottom image)

At the ninth “International Symposium on Piezocomposite Applications”, accompanied by an industrial exhibition, around 40 engineers and designers from six nations discussed current research results, developments, market requirements and framework conditions for the optimal technology transfer of piezoceramic innovations. The focus was on piezoceramics combined with electronic, functional and structural materials for applications in medical technology, mechanical and automotive engineering as well as semiconductor technology. The symposium opened with a themed workshop by CTS Ferroperm Piezoceramics on “Piezoelectric Materials and Applications”. The next ISPA will take place in 2024.

September 21, 2022

Media breakfast: Renaturation with sewage sludge and mushrooms

Soil is a valuable resource. IKTS agricultural expert Nico Domurath presented a promising technology for the renaturation of waste rock piles at this year’s media breakfast at the Fraunhofer Institute Center Dresden. The project team, consisting of Mattias Hoger (Veolia Klärschlammverwertung Deutschland GmbH), Prof. Christina Dornack and Dr. Paula Penckert (Institute for Waste and Recycling Management at TU Dresden), Natalie Rangno (Institut für Holztechnologie Dresden gemeinnützige GmbH), and Nico Domurath and Marc Lincke (Fraunhofer IKTS), inoculated biologically inactive spoil material with a special mixture of sewage sludge compost and fungal substrates. With this top layer, the team has made a landfill site





in the Leipzig area flourish in a short time. In several follow-up projects with other partners, the new recultivation technique is now also being adapted and tested for old mining dumps.

Thuringia's Minister of Economics Wolfgang Tiefensee, District Administrator Andreas Heller and Hermsdorf's Mayor Benny Hofmann were also guests.

October 5, 2022
Industry Day Transparent Ceramics

At the event "Transparent Ceramics at Fraunhofer IKTS – Production, Technology, Potentials", guests from industry were shown the new laboratories and pilot plants of the Research and Development Center Transparent Ceramics in Hermsdorf. Guided tours provided information on innovative production methods, quality assurance strategies and potential areas of application. Concrete applications and joint projects were discussed in individual talks.

October 11, 2022
Honored as an Excellent Provider of Apprenticeships in 2022

In a ceremony on October 11, the Dresden Chamber of Industry and Commerce (IHK) once again confirmed that the dual training at Fraunhofer IKTS offers lasting quality with a high success rate. The professions currently taught at the Dresden-Klotzsche site are those of physics laboratory assistant, industrial mechanic, and electronics technician for devices and systems. Our congratulations go to the successful graduates and the chief training representative, Dr. Beatrice Bendjus.

October 12, 2022
30th Anniversary of Fraunhofer IKTS ceremony

(Image on the right)

Under the motto "Hello Future – 30 Years of Fraunhofer IKTS", the IKTS site Hermsdorf celebrated the 30th anniversary of the institute with a ceremony. In addition to the employees, guests and companions from the companies of the Tridelta Campus as well as former employees, including the former long-time director of the institute, Dr. Bärbel Voigtsberger, were invited.

October 12–13, 2022
AM Ceramics at IKTS in Dresden

(Top image)

Fraunhofer IKTS and Lithoz GmbH welcomed more than 110 international ceramic specialists to the AM Ceramics 2022. The conference focused on the exchange of information on advances in ceramic 3D printing and current material and process developments, as well as on industrial success stories and opportunities for personal networking among the participants. As part of a laboratory tour, IKTS presented its cerAMufacturing 3D printing infrastructure and current ceramic technologies going beyond additive manufacturing, from powder and suspension/raw material development to the selection of manufacturing technology and further functionalization, as well as characterization and evaluation of the manufactured components and systems.



November 3, 2022

Prof. Neugebauer visits former Helmstedt coal mining district

On November 3, the President of the Fraunhofer-Gesellschaft Prof. Reimund Neugebauer visited the former coal mining district of Helmstedt as part of his factfinding mission on structural change, "Fokusreise Strukturwandel", where he learned about regional and decentralized solutions for agricultural structural change in the region with regard to the topics of climate change, world population growth and geopolitical instabilities. IKTS researchers demonstrated a soil density sensor that enables automated soil measurements down to a depth of 2 meters. The sensors, guided by a robot or coupled to a tractor, provide information on the need for loosening up deep soil or on the success of completed tillage operations. In order to effectively consolidate the topics of structural change, the Fraunhofer Institute for Surface Engineering and Thin Films IST, together with Fraunhofer IKTS, is planning to set up an innovation hub through which supraregional initiatives and regional partners can easily network.

November 22, 2022

Fraunhofer communication award for PR campaign

With its #womeninscience campaign, Fraunhofer IKTS put the spotlight on women working in various roles at the institute in 2022. The goal of the campaign, which was launched via the IKTS website and social media, was to increase awareness of the institute, portray it as an attractive employer and promote applications for open positions from women. Maria Kaminski and Marie Kaden from the PR group won second place in the Fraunhofer-wide communication awards contest for planning



and implementing the campaign. The video interviews of the campaign can be found on the IKTS YouTube channel.

November 24–25, 2022

Symposium Applied Electrochemistry in Materials Research

(Bottom image)

For the 7th time, experts met in Dresden for the symposium Applied Electrochemistry in Materials Research. Sponsored by seven industrial partners and accompanied by an industrial exhibition, the symposium was dedicated to the topic of materials for electrochemical storage and converters as well as developments and new possibilities in the field of industrial surface technology. The lively exchange and the positive response of the participants has motivated the organizers to continue the series in two years' time.

February 15, 2023

Minister President Michael Kretschmer visits pilot plant in Thallwitz

(Top image)

With the aim of producing high-quality basic materials for a resilient chemical and fuel industry from regional biomass in a CO₂-neutral manner, Fraunhofer IKTS and its partners TU Bergakademie Freiberg, TU Dresden, Ökotec-Anlagenbau GmbH, Sunfire GmbH and DBI Gas- und Umwelttechnik GmbH have been operating a unique pilot plant in Thallwitz near Leipzig since 2019. This plant converts carbon from local biogas by means of high-temperature electrolysis first into synthesis gas and then via Fischer-Tropsch synthesis into basic chemicals, e-fuels and biogenic waxes. After the successful validation of the plant concept, the consortium now plans to bring the process to industrial maturity together with EDL Anlagenbau Gesellschaft GmbH. The Saxon Minister President Michael Kretschmer visited the site in mid-February to find out more about the current project and emphasized the importance of the technology for structural development in the Central German mining region.