

RETROSPECTIVE



In 2017, Fraunhofer IKTS presented itself at 35 trade fairs in Germany and abroad as well as organizer of various scientific congresses and events for the general public. The year was also successful with regard to the further international networking of the institute. In addition, IKTS researchers were honored with prestigious awards.

January 17–18, 2017

Ceramics Vision | Dr. Bärbel Voigtsberger honored

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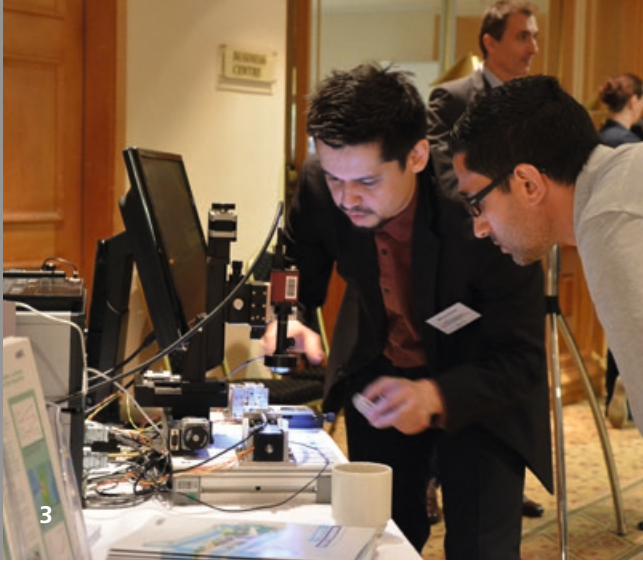
At the 10th “Ceramics Vision” symposium, 110 participants met in Hermsdorf, Thuringia, to discuss new ceramics developments and application trends in energy and environmental technology, medical engineering, as well as micro- and nanotechnology. The application areas represented included energy generation and storage, industrial waste water conditioning, increasing the efficiency of combustion processes, sensor systems, and ceramic dental components. The potential of additive manufacturing and of ceramic fibers and composite materials for the development of novel high-tech products was also pointed out.

“Ceramics Vision 2017” was dedicated specially to Dr. Bärbel Voigtsberger and her visionary contributions to Fraunhofer IKTS, the ceramics location of Hermsdorf, and Deutsche Keramische Gesellschaft e. V. (DKG). Voigtsberger was awarded the Fraunhofer Medal for her life’s work.

March 14–16, 2017

JEC World | Real-time composites testing

The institute used its presence at the leading trade fair for composite materials, “JEC World”, to present the EddyCus[®] PolarLab eddy-current system, which measures and evaluates multi-axial carbon fiber structures and thus the mechanical strength of lightweight components in real-time. Materials made of carbon fiber composites are manufactured in complex processes. Therefore, effective non-destructive testing solutions are needed to detect manufacturing defects in resin-free or consolidated condition. The EddyCus[®] test series sets new standards in flexibility and precision.



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March 15 and November 20, 2017

Early-morning science with Fraunhofer | Media talk

Breaking news for breakfast... From ceramic bone replacement to sensor technologies for safe aviation – at the Fraunhofer media morning talks on March 15 and November 20, researchers from the Fraunhofer Institute Center Dresden introduced their latest research highlights to local and specialized journalists. The experts from Fraunhofer IKTS, FEP, IWS and IFAM briefly presented their developments and presented potential industrial applications. Furthermore, journalists had the opportunity to conduct one-to-one interviews and take a look into the laboratory. Interested stakeholders were invited to follow the event in a live stream via Periscope, Twitter or Facebook, and could ask questions. Further press events are planned for 2018.

March 22, 2017

Dresden kindergarten children visit IKTS

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Unusual guests were expected in March at IKTS in Dresden-Klotzsche: The large group of preschoolers from “Piffikus” kindergarten visited the institute. In the application labs of the “Systems for Condition Monitoring” working group, the children gained insights into the work of a research institution and became acquainted with the professions of technician and scientist. The reactions of children and educators were enthusiastic, so the program will be continued in 2018.

April 2–5, 2017

EuroSimE | International microelectronics meeting

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International electronics and microelectronics experts met for the 18th edition of the “International Conference on Thermal, Mechanical and Multi-Physics Simulation and Experiments in Microelectronics and Microsystems”, organized by Fraunhofer IKTS. More than 160 participants from 21 countries followed the invitation to Dresden. Attendees discussed the latest results in fundamental research and industrial applications in these

areas in about 80 lectures, some of which took place in parallel. Workshops, a poster session, a panel session and an industrial exhibition completed the program. The 19th EuroSimE will take place in Toulouse in 2019.

April 8, 2017

Open house at Fraunhofer IKTS in Hermsdorf, Germany

IKTS opened its doors in Hermsdorf on April 8 under the motto “Experience research on high-performance ceramics”. 350 interested visitors from all over Thuringia informed themselves about ceramic filter membranes, possibilities of energy storage with ceramics, polymer- or bioceramics, tape casting and plasma spraying at 14 different stations. In addition, the building services department offered insights into the ventilation and refrigeration systems that are essential for the successful operation of the research institute. The event was part of the “Day of Thuringian Porcelain”, which was supported by 18 other institutions such as manufactories, institutes and museums.

April 24–28, 2017

Hannover Messe | Ceramic solutions for industry

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With three booths, IKTS was successfully represented at the world’s largest industrial fair in 2017. For instance, IKTS showed in Hall 2 (Research & Technology) how electric energy can be used as raw material for the production of high-quality chemicals. At the same time, the institute presented a selection of ceramic products and systems, such as reliable stationary batteries, robust 3D-printed microreactors or porous ceramics, which serve as problem solvers in hazardous metal melting processes, in the Industrial Supply area in Hall 6. IKTS welcomed the Saxon Minister of State, Martin Dulig, at the booth. In Hall 27, the institute displayed its successful cooperation in the field of fuel cell systems, e.g. with CONVION Ltd. The C50 biogas system, which was put into operation in March and introduced at HMI, has a very high overall efficiency of 82 %. At the core of the system is the MK351 fuel cell stack developed by Fraunhofer IKTS and Plansee SE.



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May 4, 2017
agra Innovation Award for recycling process

Together with Sachsenmilch Leppersdorf GmbH and wks Technik GmbH from Dresden, IKTS researcher André Wufka and his team have developed a process that allows to use almost all of the residual materials from milk processing in terms of materials and energy. Thus, this process chain enables closed material and energy cycles within the production process. In addition to the recovered water and the production of regenerative energy, the process also constitutes an important contribution to the recycling of valuable phosphor. This innovation was realized in three years of development work – funded by the German Federal Ministry of Food and Agriculture BMEL – and thus awarded on May 4 with the “agra-Preis der Innovation” in the food industry category.

May 29–31, 2017
IKTS awarded with Fraunhofer Research Prize

The 16 Fraunhofer Institutes of the Eastern Laender celebrated their 25th anniversary at the Fraunhofer Annual Conference in Dresden. An interactive science exhibition presented their important milestones and future projects. In the presence of the Federal Minister for Education and Research, Prof. Johanna Wanka, the Prime Minister of Saxony, Stanislaw Tillich, and the Fraunhofer President, Prof. Reimund Neugebauer, the IKTS researchers Dr. Hannes Richter, Petra Puhlfürß and Dr. Ingolf Voigt received the Fraunhofer Research Prize 2017 for the development of ceramic nanofiltration membranes for sustainable water treatment. The award ceremony with more than 500 invited guests took place on May 29 at the Dresden Congress Center. On the evening of May 30, visitors to Dresden’s old town were able to experience how science is changing the world. Under the motto “#real_digital: experience research”, light and laser projections



transformed the historical facades into scenic surfaces in which actors presented historical backgrounds of the city of Dresden, relevant research topics and the Fraunhofer-Gesellschaft.

May 30–June 1, 2017
Sensor+Test | Mini sensor warns of explosion risks

It is smaller than a one euro coin, yet able to achieve great things: the robust, autonomous flame ionization detector presented at Sensor+Test is used for the continuous monitoring and recording of process data in harsh industrial environments. For example, it is ideal for explosion protection in sewerage systems, emission monitoring in combustion plants or process analysis in the chemical industry. The project was one of the nominees for the prestigious “AMA Innovationspreis 2017”, which was awarded at the trade fair.

June 16, 2017
Dresden Long Night of Sciences

The “night creating knowledge” achieved new records: more than 38,000 visitors followed the invitation of the “Dresden – City of Science” network to experience research and try it out for themselves at Dresden’s universities, research institutions and science-related companies. At Fraunhofer IKTS, around 2100 visitors learned about ceramic water filters, sensors, 3D-printed implants and light converters at 14 different stations. Guided tours through environmental technology laboratories provided insight into the bathroom of a floating house with a self-sufficient water/waste water loop. Children gold-plated cent coins, tried their hands at screen-printing and witnessed the manufacture of sugar-glass lollipops. 670 events took place that night at 151 venues throughout Dresden.



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June 26–29, 2017

Laser World of Photonics | Ceramics for long-life LEDs

Enormous light yield, longevity and low manufacturing costs – the light-converting ceramics developed at IKTS meet the high requirements for use as a chip and hermetically sealed packaging in high-power LEDs and laser systems. Yellowing or premature ageing, often the bane of conventionally used polymers, can be prevented when using the new white light-converting ceramic technology presented at Laser World of Photonics.

July 12, 2017

Prof. Michaelis appointed Fellow of ECerS

On June 12, Prof. Alexander Michaelis, Director of Fraunhofer IKTS, was appointed “Fellow of ECerS”. Every two years, the European Ceramic Society ECerS honors personalities for outstanding services to ceramic sciences in Europe in the fields of science, education and industry. The award ceremony took place at the 15th ECerS conference in Budapest.

September 13–15, 2017

ISPA | Piezoceramic innovations – smartly done

Piezoceramics combined with electronic, functional and structural materials enable smart solutions for aerospace, ultrasound and sensor applications as well as energy and research services. At the seventh “International Symposium on Piezocomposite Applications ISPA” at IKTS in Dresden, 65 engineers, designers and managers from nine nations discussed research results, market requirements and framework conditions for the optimal technology transfer of piezoceramic innovations. Furthermore, results from the innovation cluster “smart³ | materials – solutions – growth” were presented, which is funded by Germany’s Federal Ministry of Education and Research (BMBF) as part of its

Twenty20 program. The accompanying industrial exhibition encouraged the exchange of ideas on new products and services. The next ISPA will take place in 2019.

September 18–20, 2017

Dresden Battery Days | Storage systems for the future 3

Electrochemical storage technologies play a central role in energy transition. At the 2nd Dresden Battery Days, almost 100 international experts discussed current research and developments of solid-state batteries, production issues as well as aspects of the system integration of the future. Suppliers and manufacturers presented their new developments at an industrial exhibition. The symposium takes place every two years in Dresden. In 2018, the experts will meet in Graz, Austria.

September 20, 2017

IKTS intensifies cooperation with South Korea 4

The Korea-Germany Materials Center (KGMC) was founded on September 20 in Changwon, South Korea, in the presence of Dr. Eva-Maria Stange, Saxon Minister of State for Sciences and the Arts, and Dr. Robert Franke, Head of the Office for Economic Development of the City of Dresden. With this joint materials research center, Fraunhofer IKTS, the Institute for Lightweight Engineering and Polymers Technology ILK at Technische Universität Dresden, and the Korea Institute of Materials Science KIMS aim to develop new materials systems, manufacturing processes as well as test and validation methods for lightweight construction, and make them available to the industry. As a start-up project, IKTS and KIMS initially operate a test center together. In addition, both research institutes investigate further topics, such as the condition monitoring of wind turbines and the additive manufacturing of ceramics.



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September 24–26, 2017

ICBM 12 | Barkhausen effect in materials testing 1

Prof. Heinrich Barkhausen discovered the effect named after him one hundred years ago – a good occasion for holding the 12th “International Conference on Barkhausen Noise and Micro-magnetic Testing” in Dresden, where Barkhausen worked successfully in research and teaching. 70 participants from 19 countries discussed industrial applications of the magnetic effect in non-destructive materials testing as well as new developments, potentials and challenges for the future.

October 9, 2017

Prof. Michaelis honored with ACerS Medal 2

Prof. Bill Lee, president of the American Ceramic Society ACerS awarded Prof. Alexander Michaelis the “Medal for Leadership in the Advancement of Ceramic Technology”. With this award, ACerS recognizes individuals who have made significant contributions to the success of their organization and to the promotion of the ceramics industry through their visionary work. Two medals are awarded each year, one to an American and the other to an international prizewinner.

October 13–16, 2017

Compamed | 3D-printed ceramics for medical devices

Lower costs, shorter waiting times – all for bespoke products: Tool-free additive manufacturing is the key to personalized medicine. The combination of ceramic materials and additive processes opens up new possibilities for medical devices – from patient-specific physical dimensions to components designed and validated for specific applications. IKTS presented ceramic spine and knee implants, infrared heaters to accelerate healing processes and grippers for minimally invasive surgery at Compamed.



October 24, 2017

cerAMufacturing | First results from the EU project

Partners of the “cerAMufacturing” EU project as well as interested developers, manufacturers and users of additive processes met on October 24 at Fraunhofer IKTS to discuss the early results of the technology, device and component development for the suspension- and feedstock-based additive manufacturing of ceramic and multi-material components. A total of 50 guests followed the invitation to Dresden. In the second part of the workshop, various 3D printers were demonstrated in operation. The research project focuses on 3D-printed ceramics for personalized medicine and bespoke consumer goods.

November 8–9, 2017

DKG advanced training for tape casting processes

For the second time, the DKG workshop “Tape casting, slot die coating and aspects of tape post-processing” took place at Fraunhofer IKTS in Hermsdorf. The focus of the two-day training course was on the fundamentals of tape casting processes and the further processing of the tapes and layers produced with them into multilayer structures. The eleven participants worked hands-on with the various casting systems of the new IKTS Tape Casting Competence Center. Further lectures dealt with the production and processing of different slurries as well as methods for analytical quality control.

November 30–December 1, 2017

INSECT | Electrochemical machining 3

Electrochemical machining (ECM) is a suitable technology to machine high-strength or very brittle materials, resulting in high surface qualities. At the “International Symposium on Electro-Chemical Machining Technology INSECT”, 55 experts from all over Europe discussed the latest findings on electrochemical



basics, material properties, application trends as well as the future prospects of ECM. The accompanying industrial exhibition provided participants with an overview on the latest products, services and technical equipment on the market.

December 7, 2017

Fraunhofer promotes smart agriculture

On December 7, Fraunhofer-Gesellschaft and the Portuguese research funding organization FCT (Fundação para a Ciência e a Tecnologia) agreed, in a joint declaration of intent, to push ahead with the digitization of agriculture and forestry. Digital technologies are to be used to manage agricultural and forestry land in an even more targeted and sustainable manner. For this purpose, the partners are pooling their know-how in the fields of information and software technology, process and energy technologies, sensor technology as well as new materials. A joint task force in cooperation with Fraunhofer IKTS will therefore develop potential areas of application and suitable scenarios.

December 12, 2017

TRIDELTA CAMPUS HERMSDORF e. V. founded 4

23 local companies and Fraunhofer IKTS founded the local initiative "TRIDELTA CAMPUS HERMSDORF e. V." on December 12 in Hermsdorf, Thuringia. The initiative is to promote Hermsdorf as a high-tech location for technical ceramics and microelectronics/microtechnology to customers, specialists and investors and strengthen the site for the requirements of globalization. As a first step, the association is planning joint trade fair participations as well as a shared website.

December 14, 2017

25 years of ceramics research in Hermsdorf

Within the scope of a scientific symposium, two events were celebrated on December 14 at the Stadthaus Hermsdorf: The 25th anniversary of the ceramic research institute in Hermsdorf – in various organizational forms over the years – and the founding of the "TRIDELTA CAMPUS HERMSDORF e. V." initiative, whose aim is to promote the site. 300 invited guests from industry, research and politics discussed current research and application trends, such as the potential of power-to-X technologies for a CO₂-neutral economy, ceramics for durable joint endoprostheses, and ceramic membrane technologies.