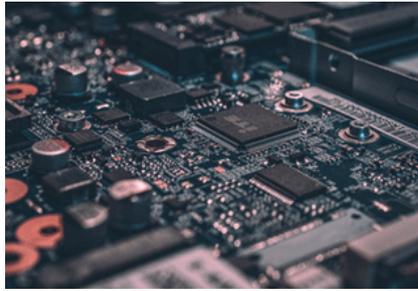




## New DFG Project to Manufacture Computer Chips

Over the next three years, the German Research Foundation (DFG) will be funding a project at the University of Bremen with around 300,000 euros which will enable the production of computer chips that can simultaneously store and process data. The project, entitled „HDL-based synthesis and verification for programmable logic-in memory architecture“, is headed by Prof. Dr. Rolf Drechsler of the Computer Architecture Working Group (AGRA).



Processors are being installed in more and more devices: from notebooks to mobile phones and dictation machines to satellites. According to Drechsler, nowadays, especially in cars there is a lot of electronics. „A car in the luxury class contains more than 250 microprocessors with millions of lines of programming code. The problem is that the manufacture of computer processors is now reaching the physical limit. „Processors were first developed in the 1970s. At the time, Intel co-founder Gordon Moore predicted that twice as much would fit on a chip every 18 months. Meanwhile we are at ten nanometers and cannot build smaller at reasonable cost. We are at a turning point here,“ explains Prof. Drechsler. The computer architecture has to move in a new direction.

One solution could be so-called logic-in memory computing, says Drechsler. „What’s new is that computers can simultaneously store and process data in their memory. This process normally runs separately. The boundary between memory and calculation unit is thus removed. „This is to be seen as a revolution in the field of architecture, as it removes the separation that has been in place for decades.“ The DFG project deals specifically with the question of how such circuits can be rebuilt. „We are not building the chip, but the production line.“ To this end, Prof. Drechsler and his team carry out computer simulations.

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## Successful Cooperation between ISL and FRoSTA AG: Research Project LoKo-TK Completed

Imagine that: Companies with a similar portfolio, the same customer structure and comparable delivery channels join forces despite competition, and in the end the environment and customers benefit. This is exactly what FRoSTA AG from Bremerhaven is striving for and has therefore developed a software tool called „LoKoST“ with the ISL in the LoKo-TK research project, which is intended to facilitate collaboration between producers of frozen goods in the future. The aim is to use the freight space of delivery vehicles cost-efficiently and across companies by simulating various possible situations in the logistics process.



„LoKoST supports strategic planning for cooperation by providing important information by evaluating cross-company data. On the basis of this information, cost-efficient transport flows can then be planned in cooperation partnerships.“ - says FRoSTA project manager Thorsten Heitland. This in turn would have a positive effect on the CO2 balance in addition to reducing costs. A merger in terms of distribution of frozen products makes particular sense for northern

Germany, where several manufacturing companies are located.

LoKo-TK has been officially terminated in December 2018 after a period of 24 months.

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Details: [www.isl.org/de/projekte/loko-tk](http://www.isl.org/de/projekte/loko-tk)

Photo: pixabay

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## Hand-in-Hand with Industrial Robots: Research into the Coexistence of Man and Machine

If you come too close to a working industrial robot, it stops working immediately. Because of the high risk of injury, there are strict safety regulations. That's why robots work in cages. In production, close hand-in-hand cooperation between man and robot has hardly been possible up to now, but is increasingly needed. The new research project „Autonomous Assistance System to Support MRK Assembly Processes“ (AutARK) is looking for solutions here. H-RC stands for human-robot collaboration. With the establishment of a demonstrator at the BIBA - Bremer Institut für Produktion und Logistik at the University of Bremen, research has now picked up speed.



The task of the project is to develop an autonomous, body-hugging, sensor-based and system-neutral H-RC assistance system for assembly. It is intended to simplify processes within various applications, particularly in small and medium-sized enterprises (SMEs), and to make H-RC in industrial assembly more economically sustainable. The assistance system should lead to fewer interruptions in assembly processes and thus reduce costs and increase efficiency in production. The development is intended to improve working conditions at ergonomically unfavorable workplaces and to promote cooperation with robots from the training stage onwards.

In addition to BIBA, the partners Pumacy Technologies (Berlin/Bremen, coordinator), Block Transformatoren-Elektronik (Verden) and Arend Prozessautomation (Wittlich) are working together on the two-year project. It has a total volume of 1.9 million euros and is funded with almost 1.3 million euros by the Federal Ministry of Economics and Energy (BMWi). The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) is the project-executing agency of the project integrated into the BMWi Digital Technologies for Industry program (PAiCE - Platforms, Additive Manufacturing, Imaging, Communication, Engineering).

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## Stardust Reloaded: EU Research Network for Sustainable Use of near-Earth Space

Near-Earth space involves not only risks for the earth and its inhabitants but also great potential. With the participation of the German Research Center for Artificial Intelligence (DFKI), the EU training network Stardust developed new methods for monitoring and deflecting asteroids in order to avoid collisions with the Earth. In the follow-up project Stardust Reloaded, junior researchers will again be provi-



ded with a platform to explore, with a grant of 4 million euros, how near-Earth space can be explored and used in a sustainable manner.

The Stardust Reloaded training network, with 20 European partners including the DFKI Robotics Innovation Center and coordinated by the University of Strathclyde, provides 15 young researchers with the chance to research the opportunities and risks of asteroids. The project is funded by the Marie Curie Initial Training Network (ITN) as part of the European Union's H2020 programme.

The goal of the project is to expand our understanding of the evolution of near-Earth space, in particular, the shape, gravity, composition, and dynamics of asteroids and comets. In this context, it shall be explored how the increasing space traffic can be handled and organized in such a way that collisions with the earth, satellites and other near-Earth objects can be prevented. In addition, the project's focus is also on the sustainable use of space – a necessity for the future, which increasingly relies on space-based resources.

The DFKI Robotics Innovation Center, directed by Prof. Dr. Dr. h.c. Frank Kirchner, contributes to the Stardust Reloaded network, its many years of expertise in the development of mobile autonomous robots, especially, for use in hostile and extreme environments such as space, or the deep sea. The focus is on the development of a real-time control system for robotic manipulator.

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Photo: Space for Art Strathclyde Aerospace Centre of Excellence

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## Recyclable Insulated Shipping Containers for Food (RETROFIT)

The food trade has expanded in recent years to online sales. Direct selling offers many small and medium-sized companies a good opportunity to deliver high-quality food products directly to the customer by means of refrigerated mailing via courier, express and parcel service providers (CEP service providers). The use of EPS packaging, e.g. Styrofoam®, however, has a strong negative impact on the life cycle assessment of each product, leaving a lot of waste for the customer. Here, the use of a recyclable insulating packaging made of renewable raw materials makes sense, which can be disposed of in the waste paper cycle or the bio-waste bin at best.



The use of renewable raw materials as an alternative to petroleum-based raw materials represents a significant added value for the bio-economy of food delivery (shipping). The RETROFIT project uses cellulose-containing materials as starting material, e.g. cellulose flakes that are used as blow-in insulation or paper dust that accumulates in waste paper recycling as residue. The paper foam sheets produced from these raw materials form the basis of a bio-based insulation container, which can easily be fed to a recycling cycle. The sub-project of BIBA - Bremer Institut für Produktion und Logistik deals with the logistics-oriented design of the overall solution as well as the development of a sustainable cooling unit, which can be disposed together with the insulated container.

Based on an extensive requirement analysis, the logistics-oriented design of the overall solution takes place. For this purpose, the individual components are first subjected to corresponding practical tests or environmental simulations. Later on they will be optimized with regard to production parameters and material usage/selection. From a BIBA point of view, various coolants

(water ice, cooling gel and dry ice) in combination with various bio-films and paper products are investigated both realistically and simulatively. One focus is the evaluation of ultrasonic welding technology for later process scaling on an industrial scale. The project concludes with the evaluation of a prototype solution in the field trial.

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Photo: Universität Bremen

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## Intelligent Pumping Station and Sluice Control (Tide2Use)

Sufficient water levels in discharged ports are of great importance for maritime transport. In many cases such water levels can only be ensured by the energy-intensive use of pumps. Alternatives are the bundling of lock operations to avoid water losses and the use of tides to ensure water inflow. These activities have failed so far due to expected losses in the lock service level or due to competition for the use of the flood for the lock of large ships. Intelligent networking and control of lock operations and the associated pumping stations makes it possible to increase energy efficiency and facilitate the integration of renewable energies into port operations in order to ensure the smooth inflow and outflow of goods in tide-free port facilities.



The Tide2Use project in which BIBA - Bremer Institut für Produktion und Logistik is involved as a research partner, is making a contribution to digitalization/industry 4.0. The use of modern information and communication technologies (ICT) is implementing innovations in the port. The aim of the bremenports initiative is to balance the supply of water by means of pumps and the demand for water by means of locks. The operation of the two types of structures must be coupled in such a way that pumping takes place when cheap electricity, e.g. from renewable sources, is available and otherwise high tidal water levels are used (freewheeling) to adapt supply to water demand. In the foresight pump and lock operation, the technical availability of the plants as well as the necessary lock operating times from shipping must also be taken into account.

The project uses and supports the existing experience knowledge of the employees with the following objectives:

- Reduction of operating and energy costs at a defined service level for the shipping industry
- Increase in technical availability through medium-term water level management
- Integration of renewable energies
- Integration of ICT in port infrastructure.

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Photo: bremenports

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## Individual Predictive Maintenance (IMP)

At present, maintenance services on diesel engines of rail cars are carried out either reactively or preventively at recurring intervals. However, this procedure is associated with high costs, as consequential damage usually occurs in the event of an incident. In addition, the defective trains not only cause delays for the people and goods transported on them, but also block the rail route for the further supply chain. However, the preventive replacement of components



results in relatively high maintenance costs, as these could have been used for a longer period of time. Maintenance in case of demand (shortly before an incident) can minimize maintenance costs without significantly increasing the risk of a train breakdown.

The aim of the new BIBA-project is to collect data on diesel engines using a toolbox and to evaluate it in such a way that maintenance can be carried out in line with requirements and individually adapted to the engine type. Consequently, an engine is repaired based on predicted values before the damage occurs in order to maximize the service life of the components.

Within the framework of the project, an analysis of the most frequent engine damages and their causes will be carried out. In addition, sensor data will be used to determine which damage can be detected. Based on these results a toolbox will be designed. At the same time, forecast models will be created that can predict engine defects on the basis of the sensor data. Instead of developing a model to calculate the predictions for all engines used, a meta-algorithm will be developed. This algorithm determines an individually suitable prediction model for each engine type.

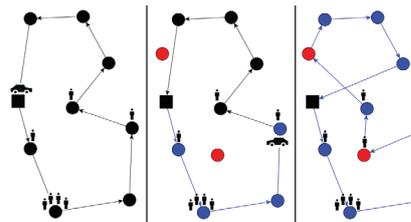
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Photo: Kurt Kleemann / Fotolia

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## Multi-objective Optimization Model for a Dynamic Dial-a-Ride Problem

The project from the working group Dynamics in Logistics (DiL) is about a transportation problem in Ouro Preto a Brazilian city. On a daily basis the transportation sector transport the patients from the health sector to hospitals and medicinal offices in Belo Horizonte to do exams and health treatments. The patients are classified according with the treatment. If the patient needs an immediate treatment it is classified as an emergency and the patient is attended in the same day, otherwise patients are served in a specific date. The goal is, therefore, calculate a daily route plan to attend all the patients with a given heterogeneous fleet of vehicles.



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## Next Stop Morocco: EU Partners Test Innovative Space Robotics Technologies in the Sahara Desert

Before space technologies are actually deployed in orbit or on other planets, they must be tested on Earth. As part of the European Union's Strategic Research Cluster (SRC) on Space Robotics Technologies, a consortium of European partners has developed core technologies for a new generation of space robots. Coordinated by the German Research Center for Artificial Intelligence (DFKI), the software developed in the SRC will now be put to the test outside the laboratory, in a four-week field test campaign on the northern edge of the Sahara.



The objective of the Strategic Research Cluster (SRC) on Space Robotics Technologies is to advance European research and development in the field of space robotics. With the participation of the European Space Agency (ESA), the German Aerospace Center (DLR) and the national space agencies of

France, Spain, Italy and Great Britain, the Program Support Activity (PSA) PE-RASPERA outlines the research roadmap of the Strategic Research Cluster and monitors its implementation in currently six subprojects. An important part of the cluster are extensive tests and evaluations of the technologies developed therein. This includes a four-week field test campaign in the Moroccan desert, which is organized by the FACILITATORS sub-project, led by GMV from Spain. The DFKI Robotics Innovation Center (RIC) coordinated the tests from November 15th to December 15th, 2018 with other European partners to validate space software developed in the subprojects ERGO and INFUSE for the first time outside the laboratory under realistic conditions.

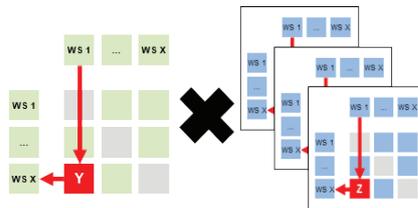
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Photo: DFKI GmbH

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## Examining the Influence of „Industry 4.0“ on Factory Layout Planning (EILa)

In the context of ongoing industrial digitization, new technologies are introduced to make production processes more efficient. However, the digital data, which are created and processed by cyber-physical systems, promise improvements as well for adjacent areas, e.g. the restructuring of factories. Thus, the trend towards

„Industry 4.0“ influences factory planning and requires adapted methods for this task. In this project, in which BIBA - Bremer Institut für Produktion und Logistik participates, the prospects of digitalized factory planning are identified and examined, based on a literature study as well as an empirical investigation. The results will provide a methodical guideline for state-of-the-art factory layout planning and identify further research areas for adaptable digital factories.



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## Smart Sensor Platform for Autonomous Rope-Force Measurement in Safety-Critical and Harsh Environments (SmartSens)

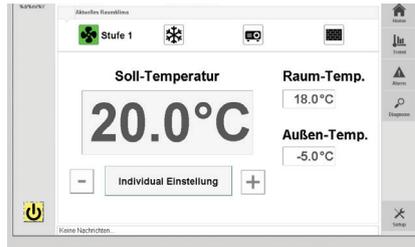
As part of the new BIBA-project SmartSens, an autonomous sensor solution is to be developed that can also be used in harsh environments and meets the highest reliability requirements. The measurement of the rope forces on a tow rope during the winch launch of gliders was identified as an application field for the implementation of the sensor solution. The platform determines the occurring rope pull forces according to the situation and transmits them to a ground station, which is operated by a winch driver and visualizes the current forces. This controls the rotational speed of the winch according to the tensile forces on the rope. Incorrect operation can result in considerable material damage and possibly even personal injury. The implementation of an autonomous, inexpensive communication and computer unit with a minimum form factor and the highest degree of reliability opens up many other innovative applications in aviation (e.g. in production and maintenance).

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## Supply Technology 4.0 - Predictive Control of Energy Consumers

In the student project „Supply Technology 4.0 - Predictive Control of Energy Consumers“, a demonstrator is designed and implemented at a lecture room: the BIBA Auditorium. The aim of the demonstrator is to show how the room climate can be improved if its degree of utilization, ambient climate and room behavior are taken into account. Therefore, electric power consumption and weather data as well as the BIBA room schedule plan are utilized to infer optimal lighting, air-conditioning and heating.

The basis analysis as well as the following conception study conducted during the project showed that supplementary digitalization of the auditorium was necessary to allow the integration of autonomic control and that further improvements could be achieved with modifications in several systems. Accordingly, new sensors and actuators and also energy-saving electricity and heating units as well as digital evaluation units for a constant situation analysis have been installed. The modification work was completed in mid-February and the subsequent test and optimization phase will be accompanied by user surveys on the individual perception of the indoor climate. For evaluation, the survey results and the energy consumption before and after the modification (energy balance) will be consulted. The student project is linked to the BIBA research project „Geregelt“ ([www.geregelt.biba.uni-bremen.de](http://www.geregelt.biba.uni-bremen.de)) and the work is supported by the university's building control. Ideally, findings on energy-efficient equipment and the automatic control of energy consumption in lecture rooms can be used in future optimization efforts on campus.



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## Best Paper Award at the 7th International Conference on Through-life Engineering Services for BIBA-Researcher

Modern sea and inland ports are increasingly controlled by IT systems. The smooth exchange of information between port actors is of great economic importance. Even the shortest system failures can lead to considerable financial losses. In the new SecProPort project, a consortium of industry and research - including the German Research Center for Artificial Intelligence (DFKI), the Institute of Shipping Economics and Logistics (ISL) and the University of Bremen - is developing a security architecture to provide port logistics with comprehensive protection against cyber attacks.



Today, all players involved in port transport are cross-linked in a complex port communication network via their own, historically grown IT systems. If a hacker succeeds in attacking this network, they can import manipulated messages into the overall system and, for example, manipulate container information, access confidential data or block customs releases. In the worst case scenario, this can lead to a total breakdown of the entire port operations including the associated transport infrastructure. This is where the project SecProPort comes in, which was launched on November 1st, 2018 and is funded by the Federal Ministry of Transport and Digital Infrastructure (BMVI) as part of the Innovative Port Technologies (IHATEC) programme over a period of three

years. The aim of the project is to develop a general and comprehensive IT security architecture for the communication network used in ports.

Project partners are dbh Logistics IT AG as coordinator and BLG LOGISTICS GROUP AG & Co. KG, Duisburger Hafen AG and Hapag-Lloyd AG, the research institutions DFKI GmbH, the Institute of Shipping Economics and Logistics (ISL) and the University of Bremen, as well as a service provider in the field of information security, datenschutz cert GmbH.

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Photo: Hapag-Lloyd AG

## Awards ▲

### Excellent Teaching - Team around Prof. Dr. Rolf Drechsler Receives Berninghausen Prize 2018

On Teaching Day 2018, Prof. Dr. Rolf Drechsler, Head of the Cyber-Physical Systems Research Unit at the German Research Center for Artificial Intelligence (DFKI GmbH) and Head of the Computer Architecture Working Group at the University of Bremen and his team were awarded this year's Berninghausen Prize



in the „Outstanding and Innovative Course“ category at Haus Schütting in Bremen. The award ceremony took place in the presence of Dr. Jutta Berninghausen, unifreunde e.V., Prof. Dr. Eva Quante-Brandt, Senator for Science, Health and Consumer Protection, Prof. Dr. Thomas Hoffmeister, Vice-Chancellor of the University of Bremen, and Prof. Dr. Bengt Beutler, 1st Chairman of unifreunde e.V.

Professor Drechsler's team included Dr. Cornelia Große (University of Bremen), Prof. Oliver Keszöcze (formerly DFKI, now Friedrich Alexander University Erlangen-Nuremberg), Kenneth Schmitz (DFKI) and Dr. Jannis Stoppe (formerly DFKI, now DLR). They were honored for their innovative course „BugRunner“, a bachelor project in computer science. This project dealt with the automated search for errors in hardware-related software, so-called firmware. In order to get the students enthusiastic about the project, the topic was implemented using computer games as an example.

An inspiring learning and working atmosphere was created in a playful atmosphere. Through regular feedback, for example in the weekly plenary sessions or in individual discussions, progress was recorded and new goals were set. The team also spent a weekend together with the students in Bad Zwischenahn in order to work more deeply on the project and get to know each other better within the group, which also had a positive effect on further cooperation among the students.

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Photo: Universität Bremen / Harald Rehling

## Expertise from Bremen in Demand Internationally - Prof. Dr. Herzog Appointed to Chinese Committees

LogDynamics member Prof. Dr. Otthein Herzog is researching at Tongji University in Shanghai alongside the University of Bremen and Jacobs University. There, he is involved in the China Intelligent Urbanization Co-Creation Center for High Density Region (CIUC). His scientific expertise in areas such as industry 4.0, logistics, artificial intelligence and smart cities is increasingly in demand in the Far East. During the last year, Prof. Herzog was appointed to the following Chinese committees:



- Governing Board of the UNESCO Institute IKCEST - International Knowledge Center for Engineering Sciences and Technology of the Chinese Academy of Engineering, Beijing
- Scientific Advisory Board of the Strategy Committee Artificial Intelligence of the City of Shanghai
- Scientific Advisory Board of the Institute for Logistics Research, Qingdao
- Scientific Advisory Board of the Chinese-German Institute „Industrial Engineering“, Qingdao University of Science and Technology
- Scientific Advisory Board of the Liuzhou Intelligent Construction and Safety Technology Research Institute of Huazhong University of Science and Technology, Liuzhou
- Scientific Advisory Board of the Institute of Machine Intelligence of the University of Shanghai for Science and Technology.

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### Internationalization ▲

## Research Collaboration with the Beijing Jiaotong University, China

Dr. Pei Wang (Beijing Jiaotong University, Department of Logistics Engineering, School of Traffic and Transportation) is a visiting researcher in Prof. Dr. Dr. h.c. Hans-Dietrich Haasis' working group "Maritime Business and Logistics" in the Faculty Business Studies and Economics. He will stay at the University of Bremen from January 15th, 2019 until January 14th, 2020. His research interests during the stay include the following:

- Logistics Operation and Organization Mode under International Multimodal Transportation
- Typical Logistics Facilities and Equipments' Parameter Standards and its Applications in Germany
- Research and Application of Advanced and Modern Logistics Technology in Germany.



The aim of Dr. Wang's visit is to strengthen the collaboration between the University of Bremen / LogDynamics and Beijing Jiaotong University, China.

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## Research Collaboration with the Beijing Jiaotong University, China

The Texas Tech University (TTU), Lubbock, USA, and the International Graduate School for Dynamics in Logistics (IGS) of the University of Bremen started a cooperation two years ago. Prof. Stephen Ekwaro-Osire was the initiator from TTU. Now a Memorandum of Understanding has been signed to intensify and extend the cooperation.



TTU is a comprehensive public research university. Currently more than 38,000 students were enrolled in the university. The Faculty of Engineering (Whitacre College of Engineering) is one of the largest faculty at TTU. The IGS hosted the TTU PhD SummerCamp twice and transferred the concept of continuous interdisciplinary cooperation - in USA they call it convergence education. LogDynamics and the University Bremen will provide TTU with collaboration opportunities with the top-notch research cluster in one of the top-ranked universities in Germany. The TTU offers the University of Bremen collaboration opportunities with the departments: electrical and computer engineering, physics, computer science, mathematics and statistics, mechanical engineering, and industrial, systems, and manufacturing engineering as well as with the College of Education. All these departments have internationally recognized professors with excellently equipped laboratories. The output of the cooperation will include funded joint-research projects, exchange of research professors, exchange of students, jointly organizing conferences, and co-authoring publications.

In March 2019 Prof. Ekwaro-Osire visited LogDynamics again. He shared ideas on “Convergence education and research” and agreed further exchange of people with LogDynamics and the International Office of the University of Bremen.

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## ISL is New Member of the Digital Transport and Logistics Forum of the EU

For the next five years the ISL will be a member of the Digital Transport and Logistics Forum (DTLF) of the EU. The DTLF is an expert group in the field of transport and logistics. It provides a platform where Member States and the relevant transport and logistics actors can exchange, collaborate and coordinate technical knowledge to support measures to promote efficient electronic information exchange in transport and logistics.



Through its membership, ISL will contribute to developing a common vision and roadmap for digital transport and logistics, identifying the necessary actions at EU level and advancing their development and implementation.

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Photo: pixabay

## 70 Logistics Ambassadors from 30 Nations for Bremen - Honour in the Cotton Exchange

An international flagship for Bremen - this is what the sixth cohort of BREMEN Logistics Ambassadors, awarded at the end of 2018, wants to be in the future. The fourteen logistics students and scientists from the University of Bremen (including four doctoral candidates from the IGS) and Jacobs University accepted the certificates signed by Economics and Port Senator Martin Günthner at the Bremen Cotton Exchange. With its still worldwide significance in the raw materials business today, this formed the harmonious framework for the awarding of certificates for the international program carried out by the Bremen Port Authority. The state of Bremen now has around 70 logistics ambassadors from 30 nations (including 11 doctoral candidates from the IGS). What they all have in common is the obligation to make the city state's logistics expertise known worldwide.



The young logisticians from Morocco, China, India, Pakistan, Iran, Kazakhstan, Kyrgyzstan and the Ukraine have acquired their knowledge of the logistics location on the Weser on various excursions. In addition to the classic city tour, the Ambassadors' Program offered a comprehensive look behind the scenes of numerous logistics companies. While the prospective ambassadors in Neustädter Hafen learned about the challenges of transporting XXL goods, they were introduced to the special features of coffee handling by J. Müller Weser. A visit to the IT service provider dbh Logistics provided an insight into the digitalization of worldwide export processes. At the Mercedes plant, the logistics of production processes could be examined in detail. A tour of BLG's impressive Tchibo high-bay warehouse and a trip across the spacious container and car terminals in Bremerhaven completed the program. A proven highlight for the prospective logistics managers was the testing of a forklift truck at the ma-co training company.

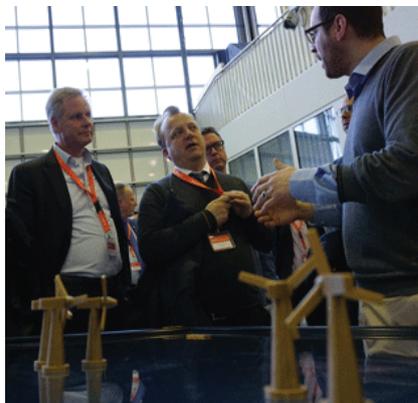
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Photo: BHV

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## BIBA Welcomes Offshorewind Delegation from the Netherlands

On March 5th, 2019 a Dutch Offshorewind delegation visited the BIBA - Bremer Institut für Produktion und Logistik. Between 4 p.m. and 6 p.m., around 75 representatives of Dutch business and politics gathered information about innovative approaches in the field of wind energy and digitalization. In addition to the cooperation talks, the focus of the visit was on hands-on technology - in the BIBA hall the participants were able to marvel at several demonstrations. Of particular interest were the results of the



[Prelno](#) project „Methods and Tools for the Predictive Maintenance of Offshore Wind Turbines“ and an autonomous assistance system to support man-machine collaboration in assembly processes (from the [MESA](#) and [AutARK](#) projects). In two further demonstrations under the motto „Digital Services“, the visitors experienced how sensors can support the loading of components in the digitalized port ([ProDis](#) project) and how they bring transparency into the

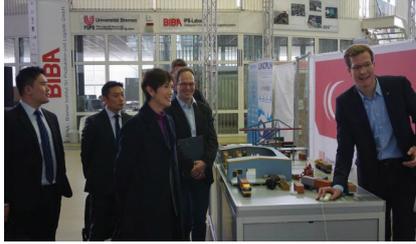
supply chain processes (SaSCh project).

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## Industry 4.0 and Digitalization - Research from Bremen of International Interest

On March 12th, 2019 BIBA - Bremer Institut für Produktion und Logistik welcomed a special guest. Together with an economic delegation from the region, the Labor Minister from Singapore informed herself about BIBA's research work on the topics of industry 4.0 and digitalization. Technologies and new developments from several projects were presented, e.g.:



- An autonomous assistance system to support human-machine collaboration in assembly processes
- Digital services in the port: use of sensors for loading components
- Digital services for the design of agile supply chains.

The Mittelstand 4.0-Kompetenzzentrum Bremen (in which BIBA and ISL, among others, are involved) was introduced as well. This initiative was also met with great interest, as it could serve as a best-practice example of a support tool for SMEs in Singapore.

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## Events

### Still Writing E-Mails or Already Communicating? - How Digitalization is Changing Corporate Communications

Date: **April 1st, 2019**

Venue: Bremen

The Mittelstand 4.0-Kompetenzzentrum Bremen, in which BIBA is involved, is offering a new event on the subject of digitalization in corporate communications. Digital change demands radical changes in companies - in work and role models, in business models and above all in communication. Today's „digital natives“ communicate differently than the traditional executive. Accordingly, communication with tomorrow's employees must also change - in the future, it will be less about the message than about the way it is transmitted. At this event you will receive suggestions and answers to all these and other questions from competent experts. As a participant, you will also find out what concrete offers and support options the Mittelstand 4.0-Kompetenzzentrum Bremen has in store for small and medium-sized enterprises. On the basis of current digitalization projects from small and medium-sized business practice, you will get an idea of the potential of digitalization tools and technologies if they are used efficiently and profitably in companies.



This free event is offered in cooperation with the Mittelstand 4.0-Kompetenzzentrum Bremen, the Bremen Chamber of Commerce and the Senator for Economics, Labour and Ports.

Contact: Lisa Buschan [lb@kompetenzzentrum-bremen.digital](mailto:lb@kompetenzzentrum-bremen.digital)

Details: [www.kompetenzzentrum-bremen.digital/events/schreiben-sie-noch-e-](http://www.kompetenzzentrum-bremen.digital/events/schreiben-sie-noch-e)

## Supply Chain Day: Digital Logistics

Date: **April 11th, 2019, 3-7 pm**

Venue: Bremen

On the occasion of the Supply Chain Day on April 11th, 2019 the LogDynamics research cluster, together with the BIBA – Bremer Institut für Produktion und Logistik and Mittelstand 4.0-Kompetenzzentrum Bremen, is organizing an innovation workshop on the subject of digital logistics.



An exciting program with lectures from practice and demonstrations of the latest research results on the topics of digital communication, digital service, digital transport, digital product and digital cargo handling will be offered. In a workshop, the guests will have the opportunity to identify the potential of digitalization for their company and to discuss the opportunities and challenges with experts from industry and research.

Get to know digital logistics and let yourself be inspired!

[Details and registration](#)

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Photo: Jan Meier, BVL

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## BIBA at Hannover Messe 2019

Date: **April 1st - 5th, 2019**

Venue: Hanover

The Hannover Messe is the world's leading trade fair for industrial production and shows a wide range of areas from research and development, industrial automation and IT to supply, production technologies and services to energy and mobility technologies. Together with its partner WSN Technologies AG from Braunschweig, BIBA - Bremer Institut für Produktion und Logistik is presenting an innovative IoT assistance system for intralogistics (LoRaLight), which enables pick-by-light picking with minimal installation effort and great adaptability. BIBA will also provide information on the STRATUS cooperation network, which focuses on the development of intelligent work systems using machine learning technologies. We look forward to welcoming you at our joint booth of Lower Saxony, booth D05 in Hall 5.



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Details: [www.hannovermesse.de/home](http://www.hannovermesse.de/home)

Photo: HMI

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## DFKI Presents New Generation of Autonomous Space Robots at Hannover Messe 2019

Date: **April 1st - 5th, 2019**

Venue: Hanover

Today, robots in space are mostly passive observers or are controlled by hu-



mans. However, soon they will be able to operate independently and over long periods of time under extreme conditions. In order to meet the high demands placed on the systems, the Robotics Innovation Center of the German Research Center for Artificial Intelligence (DFKI) is developing innovative hardware and software concepts that are testing on Earth as part of so-called analog missions. The scientists will be presenting their research work and robotic space systems at the DFKI booth (Hall 2, booth C59) at the Hannover Messe from April 1st - 5th, 2019.

The DFKI Robotics Innovation Center headed by Prof. Dr. Dr. h.c. Frank Kirchner develops autonomous robotic technologies for space applications, which can comprehensively perceive their environment thanks to a multitude of different sensors. The Bremen researchers also rely on methods and algorithms from artificial intelligence, e.g. machine learning methods, for the detection of the environment, localization and movement planning of the systems. These enable the robots not only to act independently and make decisions, but also to learn from their own behavior. This is the only way to enable the robots to be used on planetary and orbital missions over long periods of time and without human intervention.

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Details: [www.robotik.dfki-bremen.de/en/startpage.html](http://www.robotik.dfki-bremen.de/en/startpage.html)  
Photo: DFKI GmbH

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## LogDynamics at the transport logistic 2019

Date: **June 4th - 7th, 2019**  
Venue: Munich

LogDynamics is at the forefront of logistics research, both in terms of basic and applied research. An important aspect of applied research is the strengthening of cooperation with the logistics industry, to which international trade fairs are contributing a great deal. This year, the research cluster LogDynamics will once again be exhibiting at the Bremen / Bremerhaven joint booth at transport logistic, one of the largest logistics trade fairs in the world. The focus of the presence will be on the Mittelstand 4.0-Kompetenzzentrum Bremen, which offers support to small and medium-sized enterprises in their digital transformation. We look forward to your visit at the joint booth Bremen / Bremerhaven, No. 213/314, in Hall B4.



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## 4th LogDynamics Summer School - Digitalization in Logistics (LOGISS 2019)

Date: **July 22nd - 26th, 2019**  
Venue: Bremen

For the fourth time, the LogDynamics research cluster is organizing a summer school that brings together young scientists from the field of logistics. LOGISS 2019 will take place at BIBA from July 22nd to 26th, 2019. In addition to diverse lectures by renowned international scientists, the participants will also be offered lab sessions, field excursions and social events. The theme of this year's Summer School is: Digitalization in Logistics. LOGISS pursues the goal of establishing a network of young scientists in the field of logistics that promotes innovative ideas from various disciplines and enables new opportunities



and joint research. The target group are master's and doctoral students with research topics at the interface of logistics, information technology, industrial engineering or related disciplines.

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## Publications

### The Shipping Industry Still Suffers from Overcapacity in the Main Fleet Segments)

Even though the capacity growth of the world merchant fleet was only 2.6 % in 2018 – the smallest increase during the last 15 years, freight rates and ship prices have come down to very low levels. At the start of 2019, the dwt capacity on order is 4.2 % smaller than 2018. Consequently, the order book remains at a very low level in a historical perspective. Only half of the 287 yards worldwide engaged in commercial shipbuilding have received new orders in 2018, while 57 others received the last order before 2016.



The need to reduce ship emissions and to cope with the IMO sulphur regulations effective from 2020 is reflected in the newbuilding market: Over a third of all orders is equipped with a scrubber system, thereof 53 % of tanker, 25 % of bulker and 41 % of containership tonnage. Furthermore, around 14 % of the ordered tonnage is LNG-ready.

The complete publication including a huge number of statistics concerning the topics is available via the ISL Webshop: [www.shop.isl.org/isl-shipping-statistics-and-market-review-2019-issue01-02-digital.html](http://www.shop.isl.org/isl-shipping-statistics-and-market-review-2019-issue01-02-digital.html)

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Photo: ISL

### New ISL Position Paper: Entire Size Classes of Ships Will Disappear

How will the enlargement of the Panama Canal affect the future development of container fleets? Which size classes of container ships are still fit for the future and which are not? To what extent will trade lanes be influenced by this? - These and other questions are addressed by the ISL in the new position paper entitled „Impact of the Panama Canal, development of the fully cellular container ship fleet and cascade effect“.



The PDF document can be downloaded free of charge and forms the continuation of a series of position papers, which the ISL, in coordination with its Scientific Advisory Board, will publish on current topics from the fields of shipping and logistics and make them available to the interested public.

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Download: [www.isl.org/en/node/440](http://www.isl.org/en/node/440)  
Photo: ISL