



## Dear limes international Readers,

For an environmentally compatible, resource conservative, economic and reliable energy supply of the future, not only sustainable energy production plays an important role, but also the increase of energy efficiency in all domains. For that reason, Aalen University researches multiple areas of this important topic. So, for example, production processes are analyzed to determine their energy consumption, the energy efficiency by machining is increased or the energy consumption of electrical machines or lighting systems is decreased.

Energy efficiency in meanwhile a key question in the competitive environment of enterprises.

Also, we are internally investigating with our representatives for sustainability constant possible savings in building management or in other areas. Then we would also like to continue to steadily improve our energy balance.

In the new issue of the limes we will show you how the different areas of the university advance this important theme of the future.

Many joys in reading.

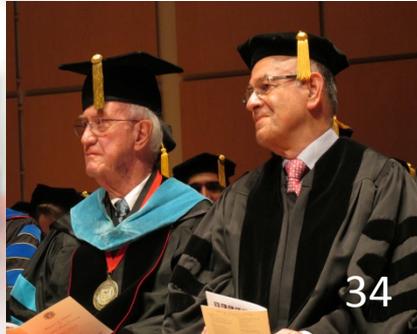


**Prof. Dr. Gerhard Schneider**  
Rector of Aalen University





26



34



41



53

Page	Title
4	<a href="#">The Energy of the Future – efficient and climate friends use</a>
7	<a href="#">Cognitive System Reduces the Scrap Rate in Die Casting</a>
9	<a href="#">Biogas Plant</a>
10	<a href="#">FINO Investigates Other New Applications in Battery Technology</a>
16	<a href="#">University Receives Excellent Quality Certification</a>
13	<a href="#">Contactless Data Acquisition in 3-D</a>
15	<a href="#">3 Questions with Maren Klement</a>
17	<a href="#">New Large Equipment for Research</a>
18	<a href="#">Sabbatical with Industry 4.0 Research with and for the Region</a>
19	<a href="#">Demonstrator Introduced at Hannover Trade Fair</a>

Page	Title
20	<a href="#">Honorary Doctorate for Professor Kümme!</a>
22	<a href="#">Business Plan Competition Motivates Students to Tacle their Business Ideas</a>
23	<a href="#">New Exchange Project of the East Württemberg Universities</a>
26	<a href="#">Brazilian Scholarship Holders Visit Carl Zeiss AG</a>
28	<a href="#">A Letter from Detroit</a>

# theme

## The Energy of the Future – Efficient and Climate-Friendly Established

Energy that should not run dry: sun, wind, geothermal, water and bioenergy stand as energy sources for heat, electricity, and fuel with virtually unlimited availability, in contrast to the fossil resources such as crude oil, natural gasoline, and coal as energy suppliers. They are becoming scarcer and thus more expensive. The future trend “Energy efficiency / raw material poverty” provides research in interesting challenges with numerous issues in a variety of disciplines.

This opportunity will – not only by Aalen University - be used extensively. New technologies and projections for the saving of energy or the recycling and effective introduction of scarce resources are the result of research projects that all have one thing in common: Efficient use of the energy of the future and to help shape climate-friendly practices.

The importance of the theme of energy efficiency / lack of raw materials has become very great for us humans. The large economic growth since the Industrial Revolution in the 18<sup>th</sup> century is characterized by a high energy consumption. Our affluence and our productivity depends strongly upon energy usage. As we are not improving our energy and resource efficiency, this dependence can, at last, be reduced.

Energy efficiency /lack of raw materials is one of the themes that can not only cause worry in the coming years, but also numerous innovations. Why? The fossil energy resources of our planet will no longer be sufficiently available in the foreseeable future. But not only that. We as humans also feel the issue of energy efficiency, as opposed to more general issues of the future like sustainability, on our own wallets. This is currently seen in the construction and automobile industry, that experiences a unique innovations dynamic: The energy consumption of the products is a decisive purchasing criteria for the customers.

The increasing energy costs are also the reason that the future-theme stands in the focus of research and industry since 2008. In the face of the long-term rising energy costs, but also concerning the too high CO<sub>2</sub> output and the energy revolution, the future trend of energy efficiency has a high importance for society and industry.

Even before, the home environment reached the theme of industrial applications. There lays the largest potential to raise energy efficiency. Fundamental for energy efficiency and lack of raw materials, as well as mentioned resource efficiency, is the saving of energy and raw materials without producing less. Economy is especially engaged, that it has a large percentage on energy consumption.

The increasing energy costs cause the corporations often time worry lines. Therefore, the industry has recognized the theme early and has been rethinking. The corporations achieve long-term success by integrating the challenge into their strategy and combining economic and ecological benefits at the same time through more efficient use of resources and energy.

The future theme of energy efficiency / lack of raw materials has already arrived in many specialty fields and has had numerous research projects at Aalen University towards different efficiency

approaches. Whether in the areas of production, electrical engineering, materialography, light-weight construction, energy storage – overall, professors and staff work towards a solution for energy and resources efficiency of the future.

Aalen University actually offers courses in the faculties of Electrical Engineering and Informatics by the name of “Energy Efficiency” with Prof. Dr. Martina Hoffmann that all-around illuminates this theme. The central question: “How can one start as much as possible with little power?”

- **Stefanie Schmid and Monika Theiss**  
With Prof. Dr. Martina Hoffman and Prof. Dr. Eckehard Kalhöfer

# Cognitive System Reduces the Scrap Rate in Die Casting

The European research project MUSIC (Multi-layer control and cognitive System to drive metal and plastic production line for Injected Components) has developed an intelligent cognitive system that aims to reduce the scrap rate in the die casting process. Less waste also means less material and use of energy. For this reason, the project supports the increase of energy efficiency. 1 of 16 project partners works in the foundry lab of Aalen University under the guidance of Prof. Dr. Lothar Kallien on recording and analyzing process data. This contributes to optimizing the quality of the cast parts.

## How do castings contribute to the light weight constructions of vehicles?

Die casting parts are being increasingly used in the chassis to reduce the overall weight of the vehicle. At AUDI, a MacPherson strut tower, which previously consisted of ten steel parts, is replaced by a single die-cast aluminium part. Which this, vehicle manufacturers can achieve a weight reduction of 10.9 kilograms.

The die casting process is a highly productive process in which complex castings can be constructed near net shape in short cycle times. Die cast parts have a good surface finish, size accuracy, and a highly stable weight



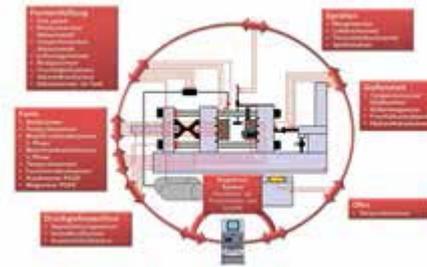
Weight reduction through aluminium die-cast at AUDI AG

## What is the goal of MUSIC?

The goal of the project MUSIC is to reduce the very high reject rates in this process by developing a cognitive system that can predict the casting quality. As a result, the die casting process is monitored by new, innovative sensors (see picture top right). The sensor signals and the pre-set process parameters become the frame of the project which correlated to the quality of the die cast parts. The cognitive system will be “taught” with the results of the correlation whereby a prognosis of the potential quality will be expected before the cast part is taken out of the form.

The cold melting ranges in the simulation would be apparent on the real part in the cold run.

■ Prof. Dr. Lothar Kallien  
Mechanical Engineering / Production and Management



Monitoring the die casting process with new, innovative sensors

## What roll does the simulation play in this project?

With simulation technology, both the mold filling and the solidification will be simulated in advance of the part design to predict the occurrence of casting defects. The picture at the bottom right shows an example comparison of the demonstration component in the project with simulated temperature distribution at the end of the form filling.

Comparison between simulation and reality with regard to cold run



# Improved Biogas Plant and More Efficient use of Energy Storage

In The Federal Ministry for Economics (BMWi) supported ZIM-Project, EMAKO Biogas occupied itself intensively with the Department for Renewable Energy on the improvement of existing Biogas plants and their efficient use as additional storage of excess volatile energy. Jointly with the firm Rohtech-GST GmbH Göppingen as well as the firm HST Systemtechnik GmbH and Co. KG Meschede, will review different Biogas plants concerning their usage of electrical and thermal energy and appropriate actual technical possibilities to design them more efficiently.

Furthermore, organic residues and sewage sludge will be used intensively in the project, which is rarely used on grounds of legal requirements for farmers. The optimal use of sewage sludge and organic residues, such as food waste, will be used in the project. The goal is to insert in the largest possible amount of waste products and the smallest amount of NAWAROs (renewable raw materials) in Biogas plants. To facilitate this waste recycling, there should be a combination of an additional Biogas

plant with an existing waste water treatment plant. Benefits: a digestion tower for small towns is too expensive, thus the biogas plant can still be used for energy recovery of waste materials.

A further important component of “EMAKO Biogas” is the optimal integration of a biogas plant in the public power supply. There it should serve as the primary repository of excess volatile energy and refine biogas with the help from bacteria from bio-methane. The methane produced from biological methanation can be stored in the gas repository and at time when energy is lacking, be converted into electrical and thermal energy.

■ Julia Stelzenmüller, Prof. Dr. Martina Hofmann  
Electronics / Renewable Energy

## FINO Investigates other new Applications in Battery Technology

The electroplating work group with Professor Dr. Timo Sörgel has busied themselves with research and development in the area of dispersion deposition. Currently new applications are being investigated in the area of battery technology. However, the next generation of rechargeable lithium batteries and lithium/sulphur technology, stand in focus. This distinguished itself through a clearly increased energy density, whereby it has become, for example in the area of electric mobility, a possible considerable increase of range. Sulfur belongs to the 20 most commonly used elements in the crust of the Earth and at the same time is toxicologically harmless.

In this context, the Federal Ministry of Education and Research (BMBF) sponsored the project “OSTSTROM” with the micro- and nano-structuring of the cathode-side current collector and the direct construction of sulphur as the active material. Through this worldwide unique approach, a completely new cathode architecture will be possible. So the energy density and cycle stability of lithium/sulphur cells can be further increased.

One of the AiF (Consortium of Industrial Research Associations “Otto von Guericke” e.V.) aided the IGF-Project (Industrial Collective Research) “Construction of a new three-dimensional cathode for Lithium-sulphur batteries with increase capacitance, energy efficiency, and cycle stability” which will be executed together with the Research Institute for Precious Metals and Metallochemistry (fem) in Schwäbisch Gmünd, uses the experiences of “OSTSTROM” and combines them with functionalized, three-dimensional substrates. Likewise, BMBF aided project “GaLiLeA”, is dedicated to the production of electro-formed lithium alloy anodes, also for the use of lithium/sulphur cells. Next to battery technology, the work group busied themselves outside of the direct industry project with functional layers of improvements of energy efficiency and aviation.

■ Claudia Erhardt, Oliver Kersten, Prof. Dr. Timo Sörgel  
Research Institute of Innovative Surfaces (FINO)

# new

## University Receives Excellent Quality Certification

Aalen University is one of the first 30 of a total of 430 universities in Germany that has been able to successfully manage the procedure of system accreditation. With the seal of “system accreditation” the university, as well as the study programmes, will be certified as having a very good and effective quality assurance system. In the future, the university can involve their Bachelor’s and Master’s programmes with external expertise to accredit itself.

As with successful products in the market, the quality of the degree programmes must be guaranteed. In doing so, the system accreditation

offers a complex alternative assessment of individual graduate school programmes. Their philosophy reads: is the quality of the entire system of the university, as well as the degree programmes, warranted to satisfy the requirements in high dimensions. Now the Agency for Quality Assurance through Accreditation of Study Programmes (AQAS) has finished the examination of the quality management system of Aalen University and confirmed that the university, as a whole, is accredited. This seal is effective for six years.

Within the frame of the tri-annual accreditation process, the university grappled intensively with the theme of quality assurance. The processes and structures within the degree programmes were quality oriented and strongly enhanced. By two inspections through an external consultant in December 2013 and October 2014, the university proved that the instruments for quality assurance cooperated university-wide and the system as a whole fulfilled the requirements.

The internal review set certain, that the system of the university met the formal guidelines of the Accreditation Council for Bachelor and Master degree programmes to produce qualified graduates. Thereby, the same quality standards were warranted like those by the accreditation of individual degree programmes, through external agencies. Rector Prof. Dr. Gerhard Schneider is pleased with the success of the system: “The seal of quality confirmed for us, that the quality control system accreditation means more personal responsibility and autonomy for us as well as cost savings. Furthermore, they promote the process of quality development”.

In 2008, a strategy development process was already under integration into the well-

established degree programmes. The annual conferences between the degree programmes and the university administration were intensive about discussing goals and the development of the degree programmes. For this reason, the university can react early to changes like, for example, the interests of prospective students and the demands made by the industry. Experts of economics and science advised degree programmes in the 2014 nationwide arranged advisory board, about concept of rotation internal inspections concerning the technical orientation of the degree programmes.

“The professors and colleagues of the university have united to achieve the method of systematic accreditation.” said Nadine Ruß, manager of the administrative department’s quality management, and to add to that: “The systematic accreditation supported the quality awareness of the university. The basis is for this to form clearly defined organizational processes and structures. This the quality of the study organizations increased itself”. An example of that is another more intensive debate about the work and testing load of the students.

 Nadine Ruß  
Quality Management Director



## Contactless Data Acquisition in 3-D

Contactless data acquisition, like that of the unpopular high speed cameras on the street, can manage speeding with the unpleasant characteristic of a fine. The non-contact, spatial recording, so the 3-D recording of the environment, represents one of the keys for safer, possibly at ones, autonomous driving. "What is likely to lead to pleasant fine-avoiding technology." said Prof. Dr. Matthias Haag. He is the manager of the lab for robotics and virtual systems. The lab dealt with contactless 3-D data acquisition for many years. The goal here, is

Accurate digital images of technical and artistic objects, as well as natural objects. Last but not least, 3-D data records of real structures introduce versatile possibilities. Whether it's the digital comparison between "should" and "is", the integration process of replication, or, for example, the detection and automated calibration of a shoe imprint in Forensic Science.

Since last year, the lab is the owner of new mobile 3-D scanner, the Comet L3D 2M from the firm Steinbichler. Therefore, to suit the students

for their projects, in addition to the current standing state-of-the-art 3-D-Scanner Konica Minolta Vivid 9i, now a second alternative technology 3-D-Scanner with a total value of 50,000 Euros, is available to digitalize objects. Professor Haag encouraged to turn up with ambitious duties at Aalen University

In cooperation with Mercedes-Benz, the approach would be developed towards fabrication of spare parts for vintage cars, for example. Current working students in the project are reconstructing small parts of a 20-year-old Fiat. The highest precision and excellent data quality are the starting point to establishing alternatives. At the given case through simulation technology and selective structural improvement, the stability of the spare parts will be better than the original. For this, the surfaces in multiple views would be scanned, imported to 3-D image editing software, assembled, and fine details for the manufacturing digitally fitted in order to generate a final form for production.

An exciting use of the 3-D-Scanner came from Bächlingen-Lagenburg: The ancient relief of the knights of Bächlingen should have served as a template for chocolate bars. Due to the size of the two-meter-high-tombstone, it was necessary to digitalize this location in the church with 60 single images. The powerful 3-D-sensor, with its innovative BLUE-LED technology, enabled pictures of up to a million points in only 1.5 seconds. Generative moulds were created from a special rubber, with which 200-gram chocolate bars were cast from. These will be available for purchase shortly in Bächlingen as a tasty souvenir.

■ Prof. Dr. Matthias Haag, Gaby Keil  
Mechanical Engineering / Production and Management  
Lab for Robotics and Virtual Systems

## 3 Questions with Maren Klement

Maren Klement graduated from the institute of material research Aalen (IMFAA) in cooperation with the Glasgow Caledonian University (GCU), Scotland. Limes talks with her about her studies, doctorate work, and the future.

### How did you come upon IMFAA in Aalen?

I had studied surface and materials engineering at Aalen University. After my practical semester, I was on the search for interesting student research projects – at IMFAA I hit the jackpot. There they dealt with topics particularly in the area of composite material technology and production, which I still find exciting. My supervisor offered me a bachelor thesis in the same subject area. My work in the research master of “Advanced Materials and Manufacturing” that followed involved copper-granite-composites. This year I had the opportunity at the institute, to engage myself with different synthesis and characteristic variations and finally, my doctoral thesis.



## With what subject matter do you focus on in your doctoral thesis and how far have you gotten?

My work focused on the production and characterization of composite materials with a penetrating structure of ceramic, for example silicon carbide, primarily in connection with a copper matrix. The purpose is investigating new materials and developing a better understanding of those materials. These materials can be tailored for specific applications in a wide range of areas. That is, for instance, interesting for power electronics or for energy technology applications.

They can withstand other combinations of higher electrical and thermal conductivity under simultaneously higher thermal and/or mechanical loads. I have been enrolled at GCU since February, after I met my supervisor in Scotland face-to-face for the first time in Autumn 2014. That is a big part of the necessary bureaucracy to check off, like the recognition of my Masters or the official recognition of the title, or rather, the topic, of my doctoral thesis.

## What are your plans for the future?

I hope my doctorate will be complete in a little more than 3 years. After that I would like to continue my research. Whether it's within a company, further within an area at the University, or an institute involved with the university, is not clear. At the moment, I can imagine myself going either way.

## Thank you very much!

■ **Katja Nowotny**  
Department of Mechanical and Material Engineering

# Current Research



## New Large Equipment for Research

To carry out research and ensure the practical training of students, the equipment infrastructure of the university must be maintained and constantly up to date. Through the Federal Procedures of Major Research Instrumentation of the DFG, grant approval was issued for a machine with a purchase price of over 100,000 Euro to Professor Dr. Gerhard Schneider (IMFAA) and Dr. Rainer Börret (ZOT). A powerful scanning electron microscope system with fast laser and ion preparation as well as analysis (SEM / FIB system) and a 5-axis high-speed milling machine, should be ready for use by mid-year.



Scanning electron microscope at IMFAA



## Current Research News

### Sabbatical with Industry 4.0

Prof. Dr. Peter Eichinger of the mechatronics department conducted a sabbatical last winter semester about Industry 4.0 at Wittenstein AG. With approximately 1,900 employees worldwide, Wittenstein is an innovative company in the field of mechatronic drive systems and coordinates the BMBF-Joint-Cyber-physical production systems. In CyProS, methods and tools are being developed that will contribute to productivity and enhanced flexibility through the networking of intelligent systems in the factory.

With the “showcase factory” opened in 2013 in Fellbach, it is possible to test research results in a real production environment. By staying with Wittenstein, Peter Eichinger has received numerous impulses to promote the theme of Industry 4.0 further.

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### Research with and for the Region

Technology transfer in the region is a central concern of Aalen University. Such as in 2014, more than 20 projects in the “Central Innovations Programme Middle-Class” (ZIM) of the government, were promoted. The Majority of the enterprises for the development of an innovative method or product present were conducted with small regional corporations. An example is a new project for laser polishing of aluminium surfaces that will be arranged with Prof. Dr. Harald Riegel of the Laser Applications Centre and with the Aalen company Scholz.

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# Current Research News

## Demonstrator Introduced at Hannover Trade Fair

The development of the new drive units for electric vehicles stands in the centre of the BMBF-sponsored joint research project ESKAM. Prof. Dr. Markus Merkel from the department of Mechanical Engineering is in charge of the complete construction, or rather the integration of, the individual components in the drive units of the project. The research assistants, Stephan Burger and Enes Sert, presented the first demonstrator at the Hannover Trade Fair. Enes Sert reported, "The rust on our status was immense. It turned out in talks with companies in various sectors, that there is currently no direct comparable solutions on the market". Stephan Burger commented further: "The combination of 97 percent effectiveness and series flexible input for variable vehicle sizes and performance classes, are the outstanding characteristics of our demonstrator which we want to develop now with partners, to market".

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Stefan Burger and Enes Sert at the Hannover Trade Fair



Professor Kümmel (right) at the presentation of his honorary doctorate at Pacific University, Oregon (USA)

# People

I sincerely congratulate Prof. Kümmel with the distinction of an honorary doctorate. This is for his extraordinary commitment in the field of eye optics and optometry, not only at Aalen University, but appreciated fittingly worldwide. Prof. Kümmel has made it possible these days, for students of the optometry course to complete one semester in the USA.

He has, together with Prof. Dr. Anna Nagl, framed the way for occupational optometry master's programs at Pacific University and New England College. In addition, Prof. Kümmel was the former vice-rector for the development of the university and rendered outstanding services in a variety of ways. I would like to thank him for his outstanding commitment and I hope that Prof. Kümmel and the university remain closely linked in the future.

■ Rector Prof. Dr. Gerhard Schneider

## Honorary Doctorate for Professor Kümmel

Prof. Dietmar Kümmel has become distinguished with his honorary doctorate from Pacific University Oregon in the USA, for his trendsetting vision and his merits about the developments of Optometry in Europe as well as for the organization and expansion of the international cooperation from universities, professors, and students. At Pacific University this recognition is very rarely granted, so this is an outstanding honour for professor Kümmel as well as for Aalen University at the time of 2002, when he was initiated as the "first international" and since then is highly recognized outside German borders as running the occupational optometry master's programme part time.

After primary school, a mechanic apprenticeship, a year of working at Alfing, as well as a pre-semester in Furtwangen, Dietmar Kümmel studied light engineering at the then Public Engineering School Heilbronn, in the affiliation with Electrical Engineering at the University of Stuttgart. His following eleven working years saw him as chief designer at ITT-Dunkermotoren and as development manager of "Dental Appliances" at KAVO. In 1983, Dietmar Kümmel would be appointed as professor for the departments of "design, production engineering, and measurement instrumentation" in the optometry programme of Aalen University.

From 1989 to 1993 and 1996 until 2003, he was dean of the study programme and from 1993 to 1995 he was the prorector of the University. Periods abroad, where students can get to know the practice of eye optics and optometry outside of Germany, were a major concern of Professor Kümmel. As a long-time person in charge of practical semesters, he could therefore build worldwide contacts. The internationalization of the degree programme through abroad semester also belongs to him.

To offer study abroad courses in the USA and Canada, Professor Kümmel and Prof. Dr. Anna Nagl traveled to the United States in December of 1999. In addition to visits to the New England College in Boston and the University of Waterloo in Canada, they were at the “Academy” in Seattle where they first encountered Prof. Dr. Willard Bleything from Pacific University in Oregon. This trip resulted in partnership agreements with these three universities. The colleagues also came back from the US with the first concept for a part-time optometry master’s degree programme.

This resulted in a close cooperation with the New England College and Prof. Bleything that earned Pacific University the concept of specific professions.

In 2001, Prof. Bleything and Prof. Cooper from Pacific University, launched the part-time master’s degree programme of children’s optometry and vision therapy in Aalen in cooperation with Pacific University and New England College. Today, this is a model of success. Since 2000, students of today’s bachelor programme are regularly at Pacific University for study abroad semester, dissertation, and bachelor theses. They are excellently supervised and come back enthusiastic with life experiences.

■ Prof. Dr. Anna Nagl  
Vision Science and Business (Optometry)

# Business Plan Competition Motivates Students to Tackle Their Own Business Ideas

“Every great business achievement starts with a small entrepreneurial idea.” This quote from Peter Drucker makes it clear what the business plan competition of Aalen University should want to achieve: encourage students in all departments to think about their own business ideas, have fun by deepening and elaborating ideas, and then finding the courage to implement those ideas into the first step of a business plan.

Often an enterprise begins with a rough idea. A business plan helps not only the presentation of the business idea to third parties but, it is primarily used to help formulate their own business ideas and to think it through critically and in detail, to screen the potential sales market and to transfer the business idea into numbers. In addition, the suitability can be reviewed by an entrepreneur. The need is to deal with the future of the potential company and in this way, obtain a more accurate understanding about the expected results. Leading experience has repeatedly shown surprising insights and findings. This will later help secure the successful start as an entrepreneur.

Numerous interesting projects will be presented under the motto “Your idea - Your future” at the business plan competition in 2015 and perhaps, later consequently develop into an actual establishment.

Thanks to the support of the external sponsors Kreissparkasse Ostalb, Pegasus e.V., and the city of Aalen, the prize money for the student teams can be additionally increased compared to previous years. The best rated business plan receives a prize of 2,00 Euro, the second 1,500 Euro, the third place 1,000 Euro, and the fourth 500 Euro. Furthermore, student teams who have created a qualified business plan each obtain workload hours for general studies which can be counted in their degree course.

At the occasion of the award presentation for the teams in July 2015, their members and interested students were beckoned to the new innovation centre of Aalen University – to join in generating ideas and having fun.

■ fm

# international



## New Exchange Project of the East Württemberg Universities

The four public universities of East Württemberg involve themselves more intensively with students that go abroad with a scholarship through the Baden-Württemberg Foundation or come to East Württemberg. Here students are prepared with appropriate measures on their upcoming time abroad. Scholarship holders from abroad are given the best possible integration into their new temporary home.

Aalen University, the DHBW Heidenheim, the HfG Schwäbisch Gmünd, and the PH Schwäbisch Gmünd have driven this purpose since the summer semester pilot support events that have also served

as networking events for scholarship holders as well as strengthening the ties in the region of East-Württemberg. The project “TOP – Talents Ostwürttemberg Plus” is promoted across a time period of three years but the Baden-Württemberg Foundation.

In the framework of the programme “Baden-Württemberg-STIPENDIUM for students – BWS plus” the Baden-Württemberg Foundation supports international exchange and especially the structure and development of strategic partnerships of universities with their partner universities abroad.

In 2014, new project plans were selected from a total of 56 proposals of the external advisory committee under the “TOP” project. The four universities in East Württemberg had around 120,000 Euros available for the next three years in order to provide intensive support to their foreign and German Baden-Württemberg Scholarship holders. A special highlight of the programme is the involvement of the business development corporation of the East Württemberg Region (WiRO), the office for immigration and integration of Aalen, as well as numerous corporations.

As a kick-off event for the “TOP” Project, around 30 participants met at a student conference in Ellwangen. The participants of 13 nations gathered with the university project partners in joint workshop arrangements around the support of foreign students to improve the welcoming culture and the networking of the Baden-Württemberg scholarship holders in the region.

The scholarship holders of the Baden-Württemberg Scholarship from abroad should take notice of additional offers like language courses, orientation weeks, excursions, company visits, and application training sessions in the framework of the “TOP” Project. Also to be further featured is cooperation with companies in East Württemberg so that the outstanding regional potential of professional opportunities can also be optimally experienced by foreign students.



The 30 participants at the opening event



Participants from 13 nations were represented

The implementation of the results of the conference started in the summer semester. In July 2015, for example, a workshop about the East Württemberg region as well as intercultural training took place. Consequently, German scholarship holders are intensely prepared for their role as ambassadors during their time abroad.



Brainstorming at the joint workshop.

Through the integration of scholarship holders from abroad, the network of the Baden-Württemberg Foundation will be strengthened at the same time. Also as a part of the programme, many different company excursions for the summer semester are planned. In the spring, more events will take place that are particularly in line with the needs of foreign students. In the framework of technical excursions, company visits, and application training sessions will also deepen contact with companies of the region.

- **Elsa von Tronchin, Pascal Cromm**  
International Relations Office



Measures to encourage improvements were worked out.

# Brazilian Scholarship Holders visit Carl Zeiss AG

Currently, there are 17 Brazilian scholarship holders of the programme “Ciência sem Fronteiras” (CsF – Engineering without Borders) studying at Aalen University in the areas of mechanical engineering, electronics and informatics, polymer technology, optoelectronics, industrial engineering, and surface technology for a duration of one academic year. In addition, they visit language courses in order to deepen besides their professional knowledge as well their German knowledge. Besides this, numerous participants of the CsF programme want to take part in an internship at a German company during their stay in Germany.



Brazilian scholarship holders visit Carl Zeiss AG.



The International Relations Office of Aalen University (IRO) supports the scholarship holders in all occurring issues regarding their application and also offers further training of the scholarship holders in addition to an excursion to a company. As an example, a dozen Brazilian students together with the CsF coordinator Elsa von Tronchin and the CsF advisor Maria Knobelspieß of the IRO visited Carl Zeiss AG in Oberkochen. There, the scholarship holders received a factory tour as well as a paper about the industrial measurement instrumentation and the production processes of the corporation. The programme also included a museum tour with a visit of the planetarium as well as a question and answer session about occupational opportunities at Zeiss.

A further excursion took the Brazilian scholarship holders 2015 to Porsche in Stuttgart-Zuffenhausen to learn more about motor construction. The IRO also organized an application training session for the young scholarship holders to assist for their search for a suitable internship.

Around 60 Brazilians have come to Aalen University since August 2012 and are here to study for 12 to 18 months in the framework of the government programme “Ciência sem Fronteiras”. Aalen University offers these Brazilian guest numerous possibilities of education in engineering through this connection.

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## A Letter from Detroit

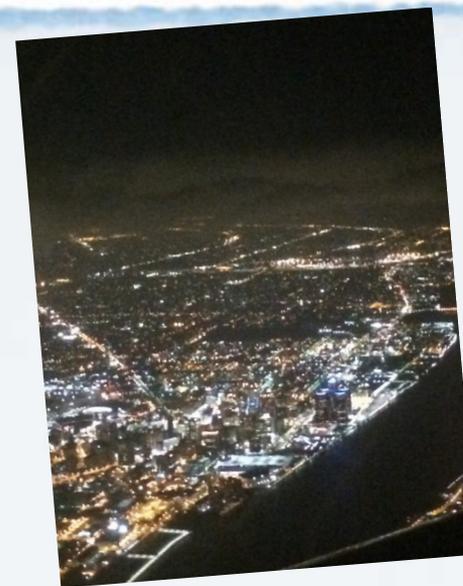
*Dear Limes Reader,*

I never would have thought that half of a year could be over so quickly. It seems to me as if I had just landed at the Detroit airport – the beginning of the internship before me. Actually, I have already been back in Germany for a few weeks.

I am an international business student at the university in Aalen and I was able, in the framework of my studies, to become acquainted with the American working world and the culture of the country. For me, it was already certain at the beginning that I would complete my internship in an English speaking country outside of Europe. I have family in Ottawa (Canada). I had never been to the USA.

Eventually I decided on the Marketing & Communications department of the international corporation Rolls-Royce-Power-Systems AG. Perhaps they are better known under the name MTU Friedrichshafen AG. The American headquarters of the German enterprise can be found in Detroit, Michigan USA. Rolls-Royce-Power Systems AG has, since the beginning of last year, been 100 percent in ownership of the turbine manufacturer Rolls-Royce Plc., headquartered in London, Great Britain.

During the internship, I was able to receive a look into the many facets of marketing and communications. A part of my tasks and projects was couples with public relations, external communications, as well as the motivation and internal communication with staff. I undertook frequent tasks with larger personal responsibilities in the area of event management. A project in the area of internal communication and event management was the organization of the Christmas party for approximately 300 co-workers of the headquarters. I was involved from the beginning until the end. In this project I was assigned very many responsibilities, and it was expected that I work independently and make decisions discretely. The Christmas party was a great success.



In the training centre in Canton, Michigan, every intern was allowed to participate in a four day motor training session. We were shown exactly how the different motors functioned, the difference between gasoline and diesel motors, and were told what was worth knowing about the company structures. The highlight of the training was the schooling on the motor itself. Together with instructors, we took apart the motor and then put it back together.

Detroit itself is a very interesting city and differs in many ways compared to the few larger American cities that I saw. After the crisis, Detroit had developed a large music and art-culture festival. Also when the city isn't a main tourist destination in America, it really pays to stop by.

My passion for the trip came shortly during these six months. In the autumn months I ventured on many road trips in a group with other interns. We drove by car to Chicago and Toronto, saw Niagara Falls and went sightseeing in northern Michigan at Mackinac Island and the Sleeping-Bear-Dunes by Traverse City. I visited a fellow student in Washington D.C. and drove a rental car along the entire East Coast – from Miami to Boston.

Over Christmas I also had the opportunity to visit relatives in Ottawa and spend two amazing weeks in the snowy Canadian capital.



The internship was a great success and without a doubt, I miss the time I spent in the USA. I am happy that I got such an opportunity and would do it all over again the next time.

*Sunny Greetings,  
Lisa Isenmann  
International Business*

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**In the next issue:**

**Innovation, Research,  
Start-Ups  
and many more!**

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