Ideas for a Future Worth Living
What is it that makes an apple a healthy snack? What makes a nursing robot the ultimate caregiver? And what makes a passenger capsule a trustworthy means of transportation? Today’s engineers are considering people’s needs and the benefits for society as early as the development stage of their innovations. In this issue, you can find out why this is so important.

At the Round Table on the topic, TUM President Thomas F. Hofmann discussed with four TUM Alumni how responsibility can be instilled in young engineers. Additionally, we will introduce you to a TUM team that is developing a transport pod that travels at just under the speed of sound. In the second part of the issue, you will find, as usual, TUM events to which we would like to extend a warm welcome to you as alumni.

We look forward to catching up with you and wish you an inspiring read.
As many events had to be postponed or cancelled at short notice due to the coronavirus pandemic, this KontakTUM issue does not provide an index of events and offers. Updated information can always be found here:

Alumni & Career events and online services: www.community.tum.de/en/events

TUM calendar of events: www.tum.de/en/about-tum/news/events

University operations at TUM during the pandemic: www.tum.de/en/about-tum/news/coronavirus

Internationally Connected
TUM is collaborating with universities all around the world – you too can expand your international network!

Women of TUM
The Women of TUM Network connects, encourages and creates space for the exchange of experiences – let them inspire you!

Dialogues
TUM considers itself a trading hub of knowledge and a servant to society – lifelong learning with TUM!

Alumni Ticker
ENGINEERS ARE SHAPING THE FUTURE

HOSTED BY TUM PRESIDENT THOMAS F. HOFMANN

THE KONTAKTUM ROUND TABLE
The Round Table is set for the beginning of March 2021. The COVID-19 pandemic and its restrictions still have a firm grip on Germany. By now, we have all become used to all the rescheduling and spontaneous decision-making. Therefore, it comes as no surprise to any of the participants that in the end our meeting has to take place online. TUM President Thomas F. Hofmann is the first to login.

Good afternoon Mr. President, nice to have you here. Where have you just been?

Prof. Dr. Thomas F. Hofmann: In another Zoom meeting (laughs). At the moment, one online meeting is chasing the next. The digital daily schedule is intense and exhausting. I miss the personal exchange face to face. That’s why it was nice to see my Vice Presidents in person again recently. In the process, we realized that for weeks we had only been exchanging information digitally.

During your inaugural speech in October 2019, you emphasized the importance you place on engaging directly with all university members.

Hofmann: Yes, that is something I now really miss. But I’m trying to cover a lot digitally – for example, by holding the TUM Presidential Student Lunch as a virtual event. This is a format in which I meet with our students at lunchtime to discuss their individual visions for the future and their expectations of “their TUM”. Or a meeting like this one, at which I get together with our alumni. This is a source of inspiration, new strength and motivation for me, and is very important to me personally.

The Round Table on Engineers for the Future, TUM President Thomas F. Hofmann invited four alumni who are deeply involved with this issue on a daily basis – whether it is as a globally recognized researcher in Robotics, as an entrepreneur, as President of VDI – The Association of German Engineers, or as a doctoral student in the Hyperloop research program. They talk about how they personally experience social responsibility as engineers, how creative thinking can be promoted and why diversity plays a key role here.

A
n ultra-fast transport pod that nobody wants to get into. A power plant whose electricity nobody buys. A robot nurse that nobody trusts. Nowadays, our engineers are able to develop the most exciting of innovations, but if no one wants them, they are pretty much useless. That is why it is important to think about whether or not – and how – each new technology can be introduced in a socially acceptable way.

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Haddadin: Pretty straightforward. We let them interact with the robot. In the beginning, the seniors often approach it with a rather negative attitude, but once they have interacted with the robot assistant for a while, it clicks and we get very good feedback from them. They tell us what they like, what they don’t like so much; and which of their problems we developers may not have thought of at all. As a result, we know exactly what our next step needs to be. In the process, we have gained much more than we initially had expected.

Why is this exchange so important for you?

Hofmann: It is the people who make our university successful. This applies to university management just as much as to research, teaching and innovation at TUM. And we have now incorporated this into our mission statement. In line with our missions Responsible Research and Innovation, our research and innovation processes are aligned with the values, needs and expectations of society. We don’t develop innovations just for the sake of technology, but for the benefit of the people and their environment. Human-Centered Engineering is therefore our guiding principle.

How does this impact on the education of engineers in practical terms?

Hofmann: On the way to becoming resourceful engineers, our students will of course still need in-depth specialist knowledge, but they will increasingly need to combine their expertise with that of other disciplines. That’s why we are designing our teaching in a way that allows students to explore how their subject might interact with other disciplines, and to take advantage of exciting opportunities at the interfaces with, for example, Informatics and Medicine.

Professor Dr. Sami Haddadin is joining us. The alumni is one of the world’s leading experts in Robotics and Director of the Munich School of Robotics and Machine Intelligence at TUM, and holds the Chair of Robotics and Systems Intelligence.

Hofmann: Good afternoon, Professor Haddadin. We were just talking about research at the interface of disciplines. You are currently developing a robot assistant for the elderly, which is also able to perform ultrasounds, for example.

Prof. Dr. Sami Haddadin: Yes, its name is GARMI, it has two arms and can assist elderly people in their everyday activities. It uses artificial senses to learn, for example, how to help them stand up, make meals or clear the table. Also, doctors can communicate with it, connect via video call, make a remote diagnosis and even carry out sensitive rehabilitation interventions using Teletouch.

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The starting point of our innovations is a shared vision, which is the first thing we develop. We use tangible visual storyboards, which we create with the stakeholders, to try to show by way of examples what the benefits of a development will be in the end. When it comes to the actual implementation of the project, we then first need hard-core technical input and progress. This means we need robot developers, electrical engineers, informatics experts, AI experts and programmers. After that, the non-technical specifications come in: Early on and again and again, the vision is calibrated with the future users.

In Gerotronics, we also often work with design prototypes to do this, or even more unconventional methods, such as trying out and testing human–robot interaction in scenarios with people and people in cardboard robot costumes.

Putting engineers in cardboard boxes: isn’t that taking things a bit too far?

Haddadin: Perhaps we should first take a step back and look at what an engineer actually is. The term derives from the Latin ingenium, which means creative talent or the ability to invent something meaningful. In my understanding, engineers are the ones shaping the future. And here I include computer scientists, so all scientists involved in developing technology. After all, it’s not as if someone shows up with an idea of what the future should look like, and then we engineers simply make it happen. On the contrary, we are the ones who influence this future, and so in order to be able to do this in the most positive sense of all and for the benefit of people, we need a broad education that includes technical content as well as, for example, philosophical-ethical content.

A philosophical engineer?

Haddadin: Why not? If we are to secure our future as a center of innovation in Germany, it is not enough to tread the well-trodden paths of recent decades over and over again. In the future, engineers will need sociopolitical intuition in addition to their technical expertise, in order to align their innovations with the values, needs and expectations of society.

What exactly would this entail at TUM?

Haddadin: For example: We will replace some of the numerous classroom formats with team projects in which students from different disciplines work together on technological challenges. However, these will not only include their own community of engineers and natural scientists, but will also integrate other disciplines, such as the Humanities and Social Sciences. After all, ethical implications can be better understood by looking at actual research objects in interdisciplinary teams than in theoretical lectures.

Sofía Ramirez is joining the online discussion from Costa Rica. She is visiting family in her home country. The doctoral student is conducting research in TUM’s Hyperloop project: This transport system involves a high-speed train traveling just under the speed of sound in partially evacuated tubes. Sofía Ramirez is in charge of developing the passenger cabin.

Ms. Ramirez, the President has just reported how important team projects are when it comes to training engineers. How did you experience collaboration in the Hyperloop team?

Sofía Ramirez: Our team is the bedrock of our success. Four times in a row, we have built the world’s fastest pod and were able to claim victory in the international competition in California. Before the project, I wouldn’t have guessed what is possible – even within a limited period of time – if everyone pulls together. We love the project and give everything. Let’s not forget, it’s also a lot of fun. Meanwhile, what was once a student project has become a real research program funded by Hightech Agenda Bayern.

The project team is very interdisciplinary in nature.

Sofía Ramirez: Our 85 members are from 29 different countries and a wide range of faculties. We have computer scientists, physicists, electrical engineers, mechanical engineers, people from Business Administration and we need all this expertise to build our pod. We need hard-ware, software, electronics, mechanical engineering. Add to that the people who support us to run the business. All the events, the sponsorship and so on.

Native to Costa Rica, she came to TUM for her bachelor’s and master’s degrees in Physics. During her studies, she joined the student initiative WARR Hyperloop. It had been launched at TUM to participate in the SpaceX Hyperloop Pod Competition initiated by Elon Musk. The goal of the competition was to develop and build a pod prototype. The students taking part in the initiative were able to win all four Hyperloop competitions in a row, reaching top speeds of up to 467 km/h with their 80-kg pod they developed. Sofía Ramirez initially supported the team as a power supply engineer, but she is now in charge of developing the driver’s cabin for the Hyperloop pod. She is one of a total of nine doctoral students in the TUM Hyperloop research program, which is funded by the Hightech Agenda Bayern.

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Katharina van Delden is CEO and founder of innovabi, one of the leading providers of software for Agile Innovation. In 2020, she received the TUM Entrepreneur of Excellence award from TUM President Thomas F. Hofmann. The award honors significant and committed entrepreneurs who serve as role models.

Catharina van Delden: I can only agree to how important an interdisciplinary team can be for a business. My three co-founders and I are all from different faculties, even though we are all from TUM. We have four very different personalities, different perspectives, contrasting approaches. That was often challenging, but today I would say that this interdisciplinarity was the cornerstone of our success.

How so?

van Delden: For any kind of innovation and unconventional thinking, it is pivotal to be willing to look beyond your own nose, to be open, to make space for new things and to remain curious. Only then can we be truly visionary. I personally get the best ideas when interacting with other people. I love meeting new people, getting to know other people’s perspectives and different ways of life. This helps me to develop my own new ideas. In the same way, our software is helping companies to look beyond their own walls and find people in their environment with whom they have not previously had a business relationship when developing their products and services.

You are supporting companies in incorporating user opinions into product development at an early stage. Why is that important?

van Delden: A product has to be technically flawless, but above all it should be tailored to the user. If it doesn’t match, people won’t buy it. That’s how the market works. That’s why you need a holistic approach when developing new products, one that doesn’t only consider the technical aspects. You should be asking yourself the question: Why am I doing what I’m doing? For whom am I developing this product?

Hofmann: We are trying to implement something similar in research. In the future, we will need formats along the lines of an expanded process of co-creation. This means integrating the expertise of people outside our university – including that of our alumni – directly into the design process of new technologies, for example, to make them more intuitive and easier to use. This is an outstanding opportunity to let the public participate in processes of innovation. Furthermore, we already have numerous formats for dialogue at TUM that aim to bring scientific research into discourse with society. These events are held, for example, at the TUM Institute for Advanced Study or the Munich Center for Technology in Society.

Our fifth guest is Dr. Volker Kefer. The TUM Alumni holds a doctorate in Mechanical Engineering and has been President of VDI – Association of German Engineers since 2019. Previously, he served as a member of the Board of Management at Deutsche Bahn for several years.

Hello, Dr. Kefer. We were just talking to Ms. van Delden about the fact that a product is actually only any good if it meets someone’s need. What do you think that means with regard to the skills of an engineer?

Dr. Volker Kefer: I believe that the technical content of an engineer’s education is key and extremely important. He or she simply has to know what they are doing. Beyond that, however, I see a few additional requirements for engineers that have become much more important recently. I’m talking about a whole range of skills that are necessary to perform certain jobs. For example, jobs that require convincing people, communicating on a large scale, or participating in decision-making processes.

Could you give us an example?

Kefer: I believe that engineers, i.e. people with a technical education, should be on the management boards of large or important companies. But they will only be able to do this job properly if they have an understanding of how to run large companies. In other words, leadership, the communication involved and the ability to develop sound decision-making within a team are just as important as personal integrity, the ability to work under pressure, dealing with stress and so on.

And outside the executive level?

Kefer: If you intend to be a member of any social, public or political body today, you need a lot more than knowledge of technology, because otherwise you won’t be heard. In this context, I always remember the saying: “Not everything that is technically possible is worth striving for or socially desirable.” There are some projects that forced us to realize that social and political acceptance are indeed strong influencing factors. An example here is nuclear power. Society’s rejection of nuclear power and the commitment of engineers have led to the emergence of many alternative approaches to generating power. Time will tell whether these will prevail. In any
Haddadin: This is true. When I was a student at the Center for Digital Technology and Management, we had seminars on presentation technique. Our lecturer gave us a topic that was not part of our field of study and asked us to give a short ad hoc presentation on it. I had been given an offspring topic and, as a technologist, of course had no idea. I thought very carefully about what I wanted to say, but to be honest felt that I was superficial and that a lot of half-knowledge was involved. However, after the presentation and to my great incomprehension, the course instructor said to me, “Dear Sami, when you speak, we all feel like fools in comparison.” I found that very hard to believe, because I perceived myself to be utterly uninformed. At the same time, I realized that I obviously had to work on my way of communicating. In the meantime, I have to and am also lucky to have many opportunities to communicate a lot, but it’s still not easy for me. I often try to get feedback from my children and my wife beforehand on whether what I am saying can be understood.

Ms. Ramirez, have you experienced challenges like this too when presenting the Hyperloop project to the public?

Ramírez: It is completely new technology and there is indeed some apprehension. Many people think that humans cannot tolerate the speed. There is this anecdote that in the past people were warned against traveling by train because it was believed that the rapid movements would cause mental unrest in passengers. At that time, the speed was 60 kilometers per hour at best. The TUM Hyperloop does more than 460 kilometers per hour (laughs). We actually have to deal with the fact that we as engineers ourselves don’t yet know everything about the implications of the technology. That’s why it’s only natural for us to look at aspects of feasibility, sustainability, cost-effectiveness and, of course, health compatibility as early as in the development phase. If we make this clear, we are able to meet most people where they are at.

How was it that TUM’s Hyperloop project was so successful? After all, numerous teams from all over the world have participated in the competitions.

Ramírez: We benefited tremendously from the knowledge that was available at TUM and had massive support from professors and industry partners. But I think that our freedom in the development stage was also a particularly crucial factor. Nobody told us what to do. We always had the freedom to decide for ourselves. A lot of things we didn’t know, a lot of things were new to us, but we always had this freedom to try everything ourselves. That was pretty nice and gave us self-confidence in our own abilities.

Do you think there should be more freedom like this for students at the university?

Ramírez: Comparing TUM with other universities, for example, in the U.S., we’re doing pretty well. Universities in the U.S. are very expensive and students can’t afford to take a semester off and devote themselves fully to case, it is not enough to approach these challenges from a technical point of view alone; when making decisions of this kind, we have to keep everyone’s interests in mind. And we need to be able to provide information on the respective projects.

You once said in an interview that engineers are not necessarily naturally gifted with communication skills.

Kefer: That might have been slightly exaggerated (laughs). But this statement is based on my own experience. For example, one of my tasks as a member of the Board of Management at Deutsche Bahn was to communicate with and for the general public. It so happens that people at Deutsche Bahn like to talk about what they call “grade-separated junctions” in construction projects. A complicated and incomprehensible word that basically refers to nothing more than a bridge. Why not just say bridge? When dealing with topics in a certain degree of depth, we tend to detach ourselves somewhat from normal reality and speak in a jargon that is no longer comprehensible to most people.

Is it possible to learn to communicate more clearly?

Kefer: Communication is something that needs to be practiced and it should be part of university education. If someone aims to present a complicated issue to a broader audience in a way that is comprehensible, they have to be able to significantly simplify things. Unfortunately, nothing is more challenging than explaining a difficult issue in three sentences. As engineers, we tend to always point out some kind of caveat. When we are asked “Is that correct?” we say “Yes, provided such and such applies or as long as so and so exists as a qualifier.” Most people either don’t understand such relativization or even find it dubious. It gives the impression that the engineer is not quite sure either. If someone is really good, they dare to say yes or no in the end, knowing full well that there are limiting conditions and caveats. That is the whole secret.

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Ramírez: Comparing TUM with other universities, for example, in the U.S., we’re doing pretty well. Universities in the U.S. are very expensive and students can’t afford to take a semester off and devote themselves fully to
a student project, like we did. But what would be even better would be if the project was recognized as course credit. Then no one would have to take a semester off. But it was definitely worth it. I would recommend everyone to have this experience.

Haddadin: I would support recognizing such projects as course work. We are now setting up a new international master’s program in Robotics and Artificial Intelligence, which will be largely project-based. Let me illustrate this by using the Cybathlon as an example. This is a competition for people wearing prostheses who, supported by state-of-the-art technical assistance systems, compete against each other in solving everyday tasks. Project teams are challenged to develop their own completely novel prostheses and equip the competitors. This is relatively complex and also costs a lot of money. We have now decided to cover those costs so that our students have the opportunity to participate. And we have made it possible at TUM for the project to be officially recognized as course work.

Ramírez: That is so cool.

Haddadin: I know, right? (laughs).

van Delden: I have to say that I have always found TUM to be very progressive in this regard – especially when it came to the development of our business idea and the support we received during the start-up process. We got a lot of practical help in setting up our company, but the most important thing for me was that we had the freedom to develop our ideas and continuously received positive encouragement. When I started studying, I didn’t have any intention of starting a business, but at TUM I was shown that entrepreneurship was a realistic path to take.

Hofmann: This is a core aspect of the entire topic we have been discussing today. We need to encourage our young talent to go their own way and implement their individual visions. As a university, we can and should lend them a helping hand. We can do this by encouraging free thinking across disciplinary divides and by not just letting students memorize what’s in the standard textbooks. We need to point out where there are exciting interfaces between disciplines. And we need to take away their fear of failure and also encourage them, for example, to start their own business if that’s where their path takes them. I believe that this kind of promoting creativity, new ways of thinking, and entrepreneurial spirit, is a key element of the ability to innovate.

We would like to thank you very much for the interesting conversation.

The online meeting is over. One by one, the participants say goodbye to the panel.

In the wake of the meeting, the fascinating discussion and the wide range of opinions stimulate further reflection. The participants agreed on how important it is for them personally to take social responsibility and that technology should not be developed just for its own sake. TUM is taking a forward-looking approach to this issue. Many new projects will be launched in the coming months and weeks. TUM wants to transcend boundaries – between disciplines as well as between science and society.
This is how TUM implements responsibility

Autonomous driving systems, sustainable solutions for urban energy and robots that support us in our everyday lives: At TUM, research on important issues of the future is being conducted at all levels. People, with their thoughts and behaviors, always take center stage here.

Find out more about TUM’s Mission Statement in the latest brochure at mediatum.ub.tum.de/1584084
How do pedestrians behave when it comes to autonomous vehicles? How should a nursing robot be designed in order for people to appreciate it as a caregiver? Nowadays, there are many questions that can no longer be answered by just one field of research. This is why TUM is relying on strong interdisciplinary cooperation. The TUM.Mobility platform with more than 40 professors conducting research on sustainable mobility, for example, pools the university’s expertise in the field of Mobility. TUM’s great strength here is the close collaboration among disciplines from Engineering, Natural Sciences, Economics and Social Sciences.

The trailblazing initiative Geriatronics, under the leadership of TUM Professor Dr. Sami Haddadin, is based at the Munich School of Robotics and Machine Intelligence (MSRM). The MSRM scientists have developed a two-armed robotic assistant called GARMI to help elderly people in everyday situations. Its tasks range from communicating with their relatives to clearing the table. Furthermore, doctors can perform examinations and make diagnoses remotely using GARMI. But GARMI is also designed to relieve caregivers by taking over tedious tasks, thereby leaving more time for the carers to have human interaction with those they care for. This will enable seniors to live a more self-determined life within their own homes.

EXAMPLE 1
Robotics – Ethically Appropriate

The use of innovations such as surgical and nursing robots will be accompanied by a large number of ethical, social, political and legal challenges. These need to be addressed early in the research and development processes. The Responsible Robotics project led by TUM Professor Dr. Ruth Müller aims at establishing interdisciplinary methods that allow for this to happen. More specifically, she is right now investigating the social, ethical and legal dimensions of GARMI, the robotic assistant, in collaboration with Prof. Dr. Alena Buyx and Prof. Dr. Sami Haddadin. On the basis of this research, recommendations and methods for the responsible design of future developments will be drafted.

EXAMPLE 2
Enabling Autonomous Driving

Vehicle automation has been identified as a game-changer in transportation, promising to significantly reduce traffic fatalities while improving mobility. To achieve this goal, it is vital to understand how the users of such vehicles interact with them and utilize them in their everyday lives. This is what the EU project SHAPE-IT is dedicated to investigate. A total of fifteen doctoral students in Europe are researching these topics together with experts from academia and industry; two of them from South Africa and Taiwan at TUM Professor Dr. Klaus Bengler’s Chair of Ergonomics. The overall goal is to develop safe and user-centered automated vehicles that are also suitable for urban environments.

EXAMPLE 3
Lighthouse Research Initiative Geriatronics

The trailblazing initiative Geriatronics, under the leadership of TUM Professor Dr. Sami Haddadin, is based at the Munich School of Robotics and Machine Intelligence (MSRM). The MSRM scientists have developed a two-armed robotic assistant called GARMI to help elderly people in everyday situations. Its tasks range from communicating with their relatives to clearing the table. Furthermore, doctors can perform examinations and make diagnoses remotely using GARMI. But GARMI is also designed to relieve caregivers by taking over tedious tasks, thereby leaving more time for the carers to have human interaction with those they care for. This will enable seniors to live a more self-determined life within their own homes.

EXAMPLE 4

Much More Than Just Technological Developments

The Munich Cluster for the Future of Mobility in Metropolitan Regions (M Cube), under the leadership of TUM, will pursue this goal. It will be launched in October 2021 and will receive up to 45 million euros in funding over a nine-year period. The regional network brings together an interdisciplinary research team and partners from business and society to work on solutions to the major challenges facing the mobility sector. “We cover a broad spectrum of players – from NGOs and the City of Munich to high-tech start-ups and three DAX-listed companies. Our approach therefore covers much more than just technological developments,” Sebastian Pfotenhauer, one of the heads of the M Cube strategy team, says.
TUM’s NEW STRUCTURE

Only those who are able to link the expertise of Data Science, Psychology, Neuroscience and Business Administration will be able to better understand human decision-making processes. Only those combining tools and knowledge from Political Science, Climate and Environmental Research, Geodesy, Social Networks and Artificial Intelligence will be able to improve the prediction of regional conflicts. And only those who succeed in integrating methods from Social Sciences and Design Thinking into innovation processes in Engineering Sciences will be able to better align the functionality of technical systems with human needs. After 150 successful years, TUM is now fundamentally changing its structure and will move from a department system to a matrix structure in order to promote a networked way of thinking. As a result, experts and students from all departments will be able to systematically network with each other in the future. The previously existing departments will be converted into a total of seven schools.

The transition of the Weihenstephan Science Centre (Wissenschaftszentrums Weihenstephan – WZW) into the TUM School of Life Sciences, which was launched on the 1st of October, 2020, has already begun. With a holistic research and teaching approach, it focuses on the entire ecosystem: humans – animals – plants – soil – climate. The next step will be the establishment of the TUM School of Engineering Sciences on the 1st of October, 2021. A new format bringing together students and faculty from different disciplines in interdisciplinary project teams. The open scope of the task, the human-centered way of working, and the individual skill sets of the team members result in a wide variety of solutions: a product service approach, a new format democratizing the process of renewable resources, but also acquire knowledge of consumer behavior and the political and economic framework, to name just a few.

Interdisciplinary degree programs at TUM combine several subjects in order to study, for example, sustainable technologies or the relationship of technology and the Natural Sciences to society. The master’s program Responsibility in Science, Engineering and Technology, for instance, inquires how social, ethical and environmental consequences of scientific and technological change can be regulated or how expert knowledge and technological development could be democratized. Graduates of the master’s program in Renewable Resources are not only familiar with the central aspects of the value-added process of renewable resources, but also acquire knowledge of consumer behavior and the political and economic framework, to name just a few.

The master’s program Responsibility in Science, Engineering and Technology, for instance, inquires how social, ethical and environmental consequences of scientific and technological change could be regulated or how expert knowledge and technological development could be democratized. Graduates of the master’s program in Renewable Resources are not only familiar with the central aspects of the value-added process of renewable resources, but also acquire knowledge of consumer behavior and the political and economic framework, to name just a few.

“Breaking down the historical departmental structure is tantamount to a revolution in the German university system. Together the TUM Family is now setting out on an exciting journey into the future.”

TUM President Thomas F. Hofmann

Rethinking Teaching

TUM has made it its mission to educate its students in such a way that they are equipped to apply their skills in the best possible way in future fields relevant to society. To this end, the degree programs are designed to include opportunities and prompts for interdisciplinary teaching and research. TUM also attaches great importance to innovative and compelling teaching concepts. In 2020, it was awarded the Genius Loci Award for Excellence in Teaching. TUM impressed the jury in particular with a well-structured teaching concept and the corresponding practical measures.
Rethinking Innovation

TUM is one of the most successful start-up universities in Europe and in this way wants to contribute to bringing innovations to society – especially those that sustainably improve people’s lives and coexistence. To this end, TUM is supporting start-ups primarily in four future-oriented fields: Information and Communication Technology, Medical Engineering, Cleantech and Life Sciences. They offer added value for society and potential for economic growth.

EXAMPLE 1
Robots for Scaffolding
TUM Alumni Leonidas Pozikidis and Artem Kuchukov (both Master Advanced Construction and Building Technology 2017) have successfully launched their start-up KEWAZO. Developed by the co-founders in collaboration with TUM Alumni Sebastian Weitzel (Master Informatics 2017), Ekaterina Grib (Master Consumer Affairs 2017), Eirini Psallida (Master Informatics 2017) and Alimzhan Rakhmatulin (Master ESPACE 2018), the intelligent robotic system improves work on construction sites and in industrial facilities. In scaffolding, transporting materials with their robotic elevators saves up to 44 percent of labor costs and improves the safety of construction sites.

EXAMPLE 2
Surgical Navigation System
Stella Medical has developed a surgical navigation system for spine stabilization operations. The system uses computer vision technology to enable precise placement of pedicle screws in vertebrae and provides a user-friendly, manageable and cost-effective alternative to existing solutions. The idea for Stella Medical emerged in the context of the MedInnovate Graduate Program, an interactive laboratory course at TUM’s Chair of Computer Aided Medical Procedures & Augmented Reality. The interdisciplinary team is composed of alumni and students from the fields Informatics, Industrial Design and Finance and Information Management and is accompanied by a surgeon on staff at the university hospital TUM Klinikum rechts der Isar.

EXAMPLE 3
Electric Air Taxi
Their all-electric air taxi is intended to make its mark on the future of mobility: it is quiet, zero-emission, fast. The start-up Lilium was founded in 2015 by TUM Alumni Daniel Wiegand (Master Energy and Process Engineering 2015) and Patrick Nathen (Master Energy and Process Engineering 2012, Doctorate 2019), Sebastian Born (Master Product Development and Engineering Design 2012) and Matthias Meiner (Diploma Mechatronics and Information Technology 2014). With its vertical take-off and landing jet, Lilium caused quite a stir right from the start. A total of 36 propellers mounted on the wings power the jet. Rechargeable batteries supply the energy. Based on its technology and the success of the latest round of financing, the company has now been valued at over one billion US dollars.

TUM Venture Lab Built Environment’s mission is to support start-up ideas that relate to the “built environment”. These can be about technologies and solutions for the urban environments of the future, the construction and maintenance of buildings and infrastructure, and socio-technical systems in the context of Design and Architecture. This image depicts a collaborative design platform that enables interactive design planning.

TUM Innovation Networks
Transdisciplinary teams, collective creativity, new ideas – and the freedom to chase them: The new TUM Innovation Networks bring together top researchers and young talent spanning disciplines and subjects. They establish new connections between schools and departments and open up trend-setting research questions in high-potential fields of innovation. With the TUM Innovation Networks, TUM promotes innovative “High Risk = High Gain” research projects with a transdisciplinary profile.
**Who?**
The initiative has emerged from the EuroTech Universities Alliance: Technical University of Denmark (DTU), École Polytechnique (L’X), Eindhoven University of Technology (TU/e) and TUM have brought two more strong partners on board: Tallinn University of Technology (TalTech) and the Technical University in Prague (CTU). As part of its European Universities program, the EU will be funding the project over the next three years with around five million euros from Horizon 2020. The project will also integrate two EuroTech members that are not located in the EU, the École polytechnique fédérale de Lausanne (EPFL) and the Technion – Israel Institute of Technology.

**What?**
The partners will establish a joint Engineering Sciences study program across different disciplines as well as across national and institutional boundaries, reaching well beyond the scope of individual technologies. Within the program, all target groups will be taught on the basis of individually designed curricula and new digital formats, and will undergo continuous training in the spirit of lifelong learning. Through a EuroTeQ Teaching Fund tender starting in spring 2021, new teaching formats are to be developed and tested in a bottom-up approach. Specific project weeks have been scheduled for as early as fall: Here, students and professionals will work on issues and challenges they have identified themselves.

**Why?**
Purpose of the alliance is to look at technology developments in a new, holistic way. “Today, it is impossible to think about mobility without considering its impact on the climate, and Robotics and Artificial Intelligence cannot be successful without the trust of the people,” says TUM President Thomas F. Hofmann. “In addition to technical depth, a modern education in Engineering has to provide students with a broader educational horizon, an entrepreneurial mindset and socio-political sensibility.”

**For whom?**
To promote this approach throughout Europe, the degree programs will not only be offered to students enrolled in the partnering universities but will also be open to interested parties who do not yet have an academic degree but play important roles in value creation and communication processes. In addition, the alliance will bring its students together with trainees from technical professions as well as with a wide range of stakeholders from industry, associations and various sectors of society in order to investigate the challenges of the 21st century and to develop projects for potential solutions. Already, the project has the support of 45 partners. In the ecosystem Munich, these include BMW, Siemens, In neon, the Bavarian Chamber of Civil Engineers and VDI – The Association of German Engineers.

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TUM embraces its responsibility to develop innovations for the benefit of the people and society, also on an international level. As a core member of an alliance of leading European technical universities, it has therefore initiated the establishment of the EuroTeQ Engineering University. Not only will the program be open to students from the partnering universities, it will also enable lifelong learning for engineers and the skilled crafts and trades, and will foster mutual understanding of sustainable value creation and systems in a holistic manner.

"What unites us with our regional and European partners is an in-depth and responsible reflection on competencies that engineers will have to bring to the table in the future. Based on this and on a common understanding of European values, we immediately had great chemistry at our first meeting in Brussels. Resulting from the convergence of our different perspectives, an incredibly inspiring exchange on the future of the education of engineers ensued. The first meeting was a firework of ideas, which soon led to a very viable concept for teaching formats, teaching content and the involvement of social stakeholders. I am very excited that our grand vision has become reality so quickly."

Prof. Dr. Gerhard Müller, Senior Vice President for Academic and Student Affairs at TUM

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EUROTECH UNIVERSITIES ALLIANCE

In 2006, TUM founded the EuroTech Universities Alliance together with the Technical University of Denmark (DTU). Today, the alliance is a strategic partnership between six of the best technical universities. Together, they have set themselves the goal of finding technical solutions to the major challenges of modern societies. With its cross-cooperation, the alliance contributes to achieving the goal of smart, sustainable and inclusive growth in Europe. The alliance combines the complementary strengths of its partner universities to jointly drive initiatives of high impact for society and industry in an international context. From left to right: Danmarks Tekniske Universitet (DTU, since 2006), Technische Universität Eindhoven (TU/e, since 2008), École polytechnique fédérale de Lausanne (EPFL, since 2011), École Polytechnique (L’X, since 2018), Technion – Israel Institute of Technology (since 2019) and TUM (since 2006).
It is probably one of the most high-profile projects currently underway at TUM. Nine doctoral candidates and around 80 students are collaborating with TUM scientists to develop their vision of a passenger cabin that will travel almost at the speed of sound. But it’s not just about speed: The team of inventors is also investigating how the Hyperloop can become a safe, affordable and sustainable means of transport for the future.
The Hyperloop is the concept of a transport system in which an ultra-high-speed train travels in a partially evacuated tube almost at the speed of sound. Based on this idea, SpaceX founder Elon Musk announced a competition, the SpaceX Hyperloop Pod Competition. Student teams from all over the world were called upon to compete with their own designed and built pods – the capsules carrying passengers through the tube. A student initiative at TUM took up the challenge and was able to leave the competing teams trailing in its wake in every single one of the four races. With a speed of 482 kilometers per hour, the pod from Munich set the current record at the last competition in July 2019.

...and the call for a challenge.

The goal of the TUM Hyperloop research program is to develop a carbon-neutral, ground-based transportation system that meets the need for ultra-fast connections between mobility hubs.

From the very beginning, it was important to the students...

Increasing speed was not the only goal for the students. “We want to develop a means of transport that has a future and is socially acceptable. In short, we don’t just want to build a fast tin can. We also want it to be comfortable and appealing, safe, affordable and sustainable,” says TUM Alumni Gabriele Semino (Bachelor Physics 2016, Master 2019), who has been involved almost from the beginning. The students’ dedication was convincing: In 2020, the TUM Hyperloop research program was launched at TUM’s Department of Aerospace and Geodesy.

The program is being funded by the Bavarian government’s Hightech Agenda Bayern. In an initial phase, concept analyses will be carried out to evaluate the feasibility and potential of the concept for Germany. To this end, a 24-meter test tube and a prototype capsule will be built on a 1:1 scale. This will incorporate expertise from various disciplines, such as Materials Science, Civil Engineering and Propulsion Systems.

An Interdisciplinary Success

“Our 85 members are from 29 different countries and many different faculties. If we are to be truly innovative in our development, we need the expertise of each and every one discipline,” Gabriele Semino says, “and we also need to keep our focus on the benefits for society and the people.”

During their visit at TUM in September 2019, Minister President Dr. Markus Söder and Bernd Sibler, Bavarian Minister of State for Science and the Arts, examine the interior of the Pod IV prototype.
The Hyperloop team is creating computational tools and models to evaluate the system holistically, providing input for decisions in the development process.

The Hyperloop team is building a scalable, 24-meter-long, full-scale demonstrator to validate the design and collect data for models and future iterations.

The Hyperloop team is analyzing the system’s potential, taking into account financial, market, environmental and safety aspects.

Following the success of the past Hyperloop competitions, the next research project involving TUM students is now underway. In his “Not-a-Boring Competition,” SpaceX founder Elon Musk is challenging teams from all over the world to bore a 30-meter-long and 50-centimeter-wide tunnel as quickly and precisely as possible.

A team of TUM students has now joined forces with the aim of once again succeeding in this competition by building the world’s fastest tunnel-boring machine. A major motivation here is the students’ desire to work on a sustainable future in which less time is wasted in traffic. “We believe that building tunnels is a forward-thinking technology and we want to help shape it with our innovation. Tunnels enable us to become better connected and increase the quality of urban life,” says Jona Roßmann of the team TUM Boring – Innovation in Tunneling.

The team has already qualified for the finals of the competition to be held in California in the summer of 2021. The TUM Boring – Innovation in Tunneling initiative consists of a team of over 60 highly motivated students from 16 different departments of TUM, LMU and the Munich University of Applied Sciences. It is sponsored by Bund der Freunde der TUM.

More info at go.tum.de/083653
Due to the coronavirus pandemic, many of the following events are scheduled as online events. In the case of in-class events, these may have to be postponed or cancelled at short notice. We kindly ask you to check the respective website in advance to see if there are any changes to the event.
In the fall of 2019, students and doctoral candidates at TUM have formed the HORYZN group. Some of them are from the Department of Aerospace Engineering, others from Chemistry, Physics, Mechanical Engineering, Informatics or Business Administration. Their common goal is to build a vertical take-off and landing aircraft. They have spent an entire year developing the prototype. The result is impressive: Silencio Gamma is the largest vertical take-off and landing aircraft ever built at TUM that is capable of flying. What makes HORYZN special is the fact that its drone has wings: four hover motors are mounted on the wings, and two more on the wingtips. This makes it easier to control and thus safer. The drone is intended for use in the medical sector, for example to transport blood products, medicines or defibrillators.

A video on the project is available at: go.tum.de/813823

TUM students and alumni have an opportunity for mutual learning at the regular Career Lounges, at webinars, or at TUM Mentoring events, where they can seek advice on career issues from experienced TUM Alumni. Share your own experience or benefit from the insights of others. No matter in which phase of your life you find yourself, you are cordially invited.
Kontakt/U M Program LEARNING FROM EACH OTHER

C A R E E R  L O U N G E S

Precious
Insider Knowledge

Insider knowledge is always worth its weight in gold. This is what the TUM Network thrives on. At the Career Lounges during the TUM Career Days, experienced TUM Alumni share their knowledge and insights. They open the panel on a certain topic, talk about their professional and personal life and invite you to exchange experiences. Why not take the opportunity to get to know different career paths and expand your network?

WEBINAR

Gehalt verhandeln


WEBINAR

Netzwerken mit Social Media

Networking and zielgerichtetes Selbstmarketing sind die Basis für einen guten Start und die erfolgreiche Positionierung im Job. Wichtig dabei ist es, sich auf unterschiedliche Menschen einzustellen, um mit diesen eine Beziehung aufzubauen und erfolgreich zusammenzuarbeiten. Die Portale XING und LinkedIn sind hilfreiche Tools, die Sie für Ihre Karrierplanung heranziehen können. In diesem Webinar erfahren Sie, wie Sie eine gute Sichtbarkeit im beruflichen Kontext erreichen und für ein zielgerichtetes Personal Branding sorgen können.

WEBINAR

Rechte und Pflichten im Job

Wenn Sie einen Arbeitsvertrag unterschrieben haben, sollten Sie sich im Klaren darüber sein, welche Rechte und Pflichten sowohl Ihnen als auch Ihrem Arbeitgeber zustehen. Der Arbeitsvertrag sollte alle relevanten Bausteine enthalten, die Ihnen wichtig sind und die Sie bereits im Vorfeld beibringen sollten. Für jede Arbeitsverhältnis ist heute ein Arbeitszynis von großer Bedeutung. Sie erfahren in diesem Webinar auch, wie ein gutes Zeugnis aussehen sollte und welche Tücken der Zeugniscode hat.

WEBINAR

Doctorate – And Then What? (in German)

A wide range of career opportunities are available to you after your doctorate. However, we recommend that you already set the course for your further career during the final phase of your doctorate. Alumni from academia and industry who have completed their doctorates offer tips as to how to launch your individual career.

WEBINAR

CAREERS IN CONSULTING (in German)

Career prospects for the consulting industry are deemed to be promising. But how can you make a successful entry? TUM Alumni share their insights into the job market and talk about the current challenges.

WEBINAR

ADVICE FROM COLLEAGUES

At these events, former TUM students and successful TUM Alumni share their insights into the job market and talk about the current challenges. They open the panel on a certain topic, talk about their professional and personal life and invite you to exchange experiences. Why not take the opportunity to gain insights into different career paths and expand your network?

WEBINAR

Mutual Support

Are you looking for a career that suits you? Do you have questions about a specific industry? Are you interested in changing jobs? The Career Assistance Network of the TUM Family aims to connect alumni and students. career-relevant questions can be clarified, or industry and business contacts be established in a mutual exchange. This protected TUM Community group offers space for confidential exchange and the opportunity to get in touch with each other and discuss career-related topics.

WEBINAR

ADVENTURE MANAGEMENT

People in leadership positions have a lot of questions, too! A group of managers has formed amongst the TUM Alumni, which regularly meets up to exchange ideas and information. This semester this will once again happen online. Whether you want to talk about managing staff or new challenges you are facing in your everyday work-life: the members share their issues with each other and benefit from talking to like-minded people, sharing their experience and ideas. Inexperienced people who have only recently taken on a management position are welcome, as well.

WEBINAR

ADVENTURE: STARTING A CAREER

The first 100 days on the job, the challenges of everyday work life, and considerations on further career planning – when starting out in professional life, many things are new and unfamiliar. We are inviting young alumni in their first year of work to exchange ideas and experiences with other young professionals. The group offers a safe space to discuss problems with like-minded people, to pass on experiences and to develop possible solutions.

WEBINAR

TUM CAREER DAYS

This summer semester, the TUM Career Days will once again take place in the virtual space. Webinars and other online formats will provide you with comprehensive information on topics related to careers, applications, and career entry.
NEW OFFER

Alumni Group Stuttgart

Since fall 2020, the greater Stuttgart area has had its own group for alumni and students. The local network was initiated by two highly committed TUM Alumni. With their initiative, Dr. Viktoria Leonhard (Diploma Management & Technology 2008, Postdoc 2013) and Kai-Olaf Dammenhain (Diploma Mechanical Engineering 1989) want to make a contribution to the TUM spirit. “Our goal is to support each other, learn from each other, spend time together and grow together,” Viktoria Leonhard explains.

To get to the Alumni Group Stuttgart: go.tum.de/900002

MENTORING

MUTUAL GROWTH

TUM MENTORING ONLINE STAMMTISCH

Finally it’s Back!

The TUM Mentoring Stammtisch is back! TUM mentor Seyfried Weigert (Diploma Electrical and Computer Engineering 1985) is reviving the long-standing tradition and is looking forward to the first online Stammtisch. There he will provide insights into the theory of inventive problem solving (TRIZ): how does a structured approach help to overcome mental blocks, how to find ideas in a systematic manner, and how to solve even the most complex problems with the help of contradictions. In the future, the regulars’ table will take place four times a year and bring together active and former mentees and mentors.

DATE
Thur. 20.05.2021
6.30 pm – 8 pm
PLACE
Online
REGISTRATION/INFO
Exclusively for members of TUM Mentoring
www.community.tum.de/en/events

TUM MENTORING ONLINE NETWORKING EVENT

Mein Tag im Homeoffice


DATE
Tue. 11.05.2021
7 pm – 8 pm
PLACE
Online
REGISTRATION/INFO
www.community.tum.de/en/events

TUM MENTORING NETWORK MEETING ONLINE

Future Skills


DATE
Tue. 08.06.2021
6 pm – 7 pm
PLACE
Online
REGISTRATION/INFO
www.community.tum.de/en/events

BEST PRACTICE

Meet-up for Entrepreneurs

The Meet-up brings together aspiring and experienced entrepreneurs in order to meet online, exchange best practices, discuss and collaborate. It is aimed at TUM members who have already set up a company and generated initial sales. Initiated by TUM Alumni Vincent Hommel (Master Industrial Engineering 2018), the event will take place every last Wednesday of the month in small groups. Share your topics and get feedback on any ideas relating to your business!

DATE
Wed. 28.04.2021 i. a.
7 pm – 8 pm
PLACE
Online
REGISTRATION/INFO
www.community.tum.de/en/events

MEET TUM STARTUPS

Insights From Felix Haas

The new event series of TUM Mentoring and TUMentrepreneurship offers insights into the personal stories of TUM start-ups in a casual atmosphere, facilitating the exchange of ideas on the topic of start-ups and allowing participants to be inspired by the start-up spirit of the founding teams. TUM Alumni and mentor Felix Haas, co-founder of the start-up IDnow, will kick things off. IDnow is a platform for identity verification in the digital sector.

DATE
Mid-July 2021
6 pm – 7 pm
PLACE
Munich, if necessary online
REGISTRATION/INFO
www.community.tum.de/en/events

TUM Alumni Felix Haas (Diploma Electrical and Computer Engineering 2006) is a successful entrepreneur. In 2019, he was awarded the title “TUM Entrepreneur of Excellence” by TUM President Thomas F. Hofmann.

Further reading at www.150.alumni.tum.de/en/felix-haas-en

KontaktTUM Program LEARNING FROM EACH OTHER
After their doctorate, about half of the young scientists work in industry, often with staff responsibility. In many cases, TUM doctorates are in demand in industry precisely because they have already carried out applied research or worked with the industry during their doctorates. TUM is supporting doctoral students on this path with tailor-made events and contacts with experienced alumni.

**WEBINAR**

**Convincing CVs**

Rarely do the career paths of doctorate students and postdocs fit into standard CV templates. Doctorate, research work – all this needs to be included in a concise manner on a few pages. In this webinar you will learn how to convincingly present your extra skills and experience. The webinar is available in German and English.

**WEBINAR**

**Promovieren mit Industriebezug**


**WEBINAR**

**Efficient Job Hunting for Doctorates and Postdocs**

Finding an industry job after having completed a doctorate can be challenging – especially for candidates with an interdisciplinary background. This webinar will provide you with valuable advice on how to go about finding possible careers, labor markets and companies. We will also look at how to use keywords effectively for job hunting. The webinar is available in both English and German.
The TUM Shop has your back.
You can order stationery and beverage containers, accessories, clothing and much more contact-free at www.shop.tum.de.

Home Office With Style!
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START-UPS WITH POTENTIAL

TUM ENTREPRENEURSHIP DAY 2021
It’s all about Entrepreneurship!
The TUM Entrepreneurship Day has existed since 2013 and it offers young businesses of TUM a platform. Even though it will take place online this year, there will be plenty of opportunity for the exchange of ideas with start-up consultants and other start-ups – something to look forward to. As an annual highlight, the TUM Presidential Entrepreneurship Award will be presented to an outstanding TUM spin-off.

DATE
Thur. 24.06.2021
All day
PLACE
Online
REGISTRATION/INFO

FOR A PERFECT START
Support for Start-ups
TUM has made it its goal to be one of the most successful start-up universities in Europe. Therefore, it offers a wide range of support such as start-up consulting, research and qualifications as well as a strong network for entrepreneurs. More at www.tum.de/en/innovation/entrepreneurship

START-UP CONSULTING
TUM supports students, alumni and scientists who want to start a business with their idea or technology - and does so in all phases of company development: from concept development and generation of the business model, to guidance on suitable funding, to the actual launch and market entry.

START-UP MENTORING
Start-up mentoring at TUM provides support for start-ups in the market entry phase. Young entrepreneurs can benefit from the extensive experience of senior entrepreneurs. We would like to invite TUM Alumni to share their experience with young entrepreneurs and become part of a new success story.

START-UP INDEX A-Z
The Start-Up Index reflects the diversity of TUM’s spin-offs. Here you will find short profiles of recent and already established TUM spin-offs. The majority of these companies have been founded by TUM Alumni, such as Celonis, Lilium and Personio, which have already been valued at over one billion US dollars.

TUM ONCE MORE THE BEST LAUNCHING PAD FOR START-UPS
TUM offers excellent support for the creation of start-ups. This is what Stifterverband’s “Start-up Radar” concludes. For the fourth time in a row, TUM is ranked first among the major German universities. Every year, around 80 companies are founded here.

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Presidents Prof. Thomas F. Hofmann and Prof. Qiu Yong signed the partnership agreement during a video conference.

NO UNIVERSITY, NO COUNTRY CAN SOLVE TODAY’S SCIENTIFIC CHALLENGES ON ITS OWN. TUM THEREFORE WORKS CLOSELY WITH PARTNER UNIVERSITIES AROUND THE WORLD AND IS ACTIVELY INVOLVED IN INTERNATIONAL NETWORKS.

A new standard of cooperation is being achieved with selected international partners within the framework of strategic alliances. An example is TUM’s collaboration with the high-profile partners of the European EuroTech Universities Alliance on joint research strategies addressing important topics of the future. Since 2018, there has been a flagship partnership with the renowned Imperial College in London, and since 2020 with China’s Tsinghua University.

Based on their long-standing cooperation, TUM and the Imperial College London (ICL) have agreed on a strategic partnership with a focus on sustainability. The ICL is one of the best technical universities in Europe and is linked to TUM through numerous research collaborations. Since 2020, TUM has now also been deepening its collaboration with China’s Tsinghua University. The two presidents Prof. Thomas F. Hofmann and Prof. Qiu Yong have agreed on a strategic partnership in research, teaching and innovation. TUM also maintains extensive exchange with other Chinese universities and has been present in Beijing with its own office since 2006.

STRATEGIC PARTNERSHIPS

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Read more at go.tum.de/159968

Presidents Prof. Thomas F. Hofmann and Prof. Qiu Yong signed the partnership agreement during a video conference.
**TUM’s International Network**

Every year the TUM Global & Alumni Office organizes the TUM Global Week, a platform for the exchange of ideas on the topics of internationalization and international experience for the entire TUM Community. In addition to numerous information and networking events for students, scientists, administrative staff, TUM alumni and TUM’s international partners, the week is the occasion for the annual meeting of the TUM Liaison Officers with the TUM Community. Look forward to a varied program and the exchange with our Liaison Officers from the five liaison offices in Beijing, Brussels, Munich, San Francisco and São Paulo as well as with the campus in Singapore (TUM Asia).

**Registration:** [www.international.tum.de/tumglobalweek](http://www.international.tum.de/tumglobalweek)

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**LIAISON OFFICE TUM BRUSSELS**

**Strengthening European Partnerships**

Since 2012, TUM has had a liaison office in the capital of the European Union and is integrated into the Brussels office of the EuroTech Universities Alliance. TUM is hereby strengthening its cooperation with the EuroTech partners and the other European institutions, its participation in EU funding programs and initiatives, and also the transfer of knowledge with key players on site. Additionally, Liaison Officer Maria-Valerie Schegk is connecting excellent researchers from all over Europe and is paving the ground for joint projects.

More information at: [www.international.tum.de/en/brussels](http://www.international.tum.de/en/brussels)

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**EUROPEAN UNION WEEK**

**The Future of the European Union**

As part of this year’s European Union Week, the TUM School of Management, in cooperation with the HEC Paris, is going to organize a three-day conference. Each of the conference days will address a major topic of contemporary relevance for the European continent and aims to inform alumni and students all over Europe about the state of the European Union, ultimately providing a perspective about the EU’s present and future.

**Registration:** [www.wi.tum.de/faculty-research/european-union-week](http://www.wi.tum.de/faculty-research/european-union-week)

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**ENTREPRENEURSHIP DAY**

**EuroTech Innovation Day**

Powered by the motto “Transcending Borders – Striving for Excellence” the EuroTech Innovation Day will be an online celebration of entrepreneurship and innovation to provide audiences with a unique interactive exposure. In the opening panel talk the six presidents of the EuroTech Universities will talk about, how universities support scientific spin-offs and the audiences with a unique interactive exposure. In the opening panel talk the six presidents of the EuroTech Universities will talk about, how universities support scientific spin-offs and the

**Registration:** [www.community.tum.de/en/events](http://www.community.tum.de/en/events)

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**TUM AFRICA NEWSLETTER**

**Connecting Experts on Africa**

Four times a year, the newsletter provides updates on projects on the African continent and in particular on TUM’s partnership with the Keneame Nkrumah University of Science and Technology (KNUST) in Ghana, one of Africa’s leading universities.

Subscribe to the newsletter here: [go.tum.de/803800](http://go.tum.de/803800)

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**GLOBAL MINDS ONLINE**

**Interkulturelle Kompetenzen**


**Registration:** [www.community.tum.de/en/events](http://www.community.tum.de/en/events)

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**NIGHTWATCHMAN TOUR**

**On Tour with our Guests**

TUM welcomes many international postdocs and guest researchers and provides them with numerous services that support them in everyday life, including a special cultural program. This summer, TUM’s international guests are invited to a Nightwatchman Tour through Munich, and TUM alumni can join them for this tour. You get to know Munich via its stories and what life was like as a nightwatchman. At the same time you get to know TUM’s international guests and experience the TUM family.

**Registration:** [www.community.tum.de/en/events](http://www.community.tum.de/en/events)
The Women of TUM Network is also meeting online in the TUM Community. It is one of the most active among the TUM Community groups. The hashtag #womenofTUM makes the Women of TUM visible on social media. As important role models, the Women of TUM support the women of TUM for the future – both in the workplace and at home.

In her laboratory at the Weizmann Institute of Science in Israel, TUM Ambassador Maya Schuldiner intends to close gaps in our understanding of yeast proteins – and thus save human lives.

**FAMILY-FRIENDLY SCIENCE – IS THAT POSSIBLE?**

TUM Ambassador Maya Schuldiner is a multi-award winning molecular geneticist who researches and teaches at the Weizmann Institute of Science in Israel. For a one-year research visit, she went to Munich to work with Prof. Dr. Thomas Misgeld, Head of the Scientific Institute for Cell Biology of the Nervous System at the TUM School of Medicine. Her husband Oren Schuldiner, who is also a scientist, and her three children accompanied her. “Without my husband, I would not be able to be the scientist I want to be,” the renowned researcher emphasizes. “If you are happy in your private life, it enables you to do good research.” This is why she also places great importance on gender equality in her own laboratory in Israel.

At a Women of TUM afterwork event on the 9th of June, 2021, Maya Schuldiner will offer insights into the course of her outstanding career in science and will show that an active family life and international professional success are not mutually exclusive.

Further reading
www.150.alumni.tum.de/en/maya-schuldiner-en
**COMMITMENT**

**Women of TUM-Taskforce**

More and more women from all over the world are getting involved in the Women of TUM Network and are embracing the services offered to empower each other. As of this year, there is the Women of TUM Taskforce, which assists in approaching female speakers, organizing and promoting events, and works to put the Women of TUM even more into the international spotlight. One of them is TUM student Ananya Bordoloi from India (see right). After attending one of the Women of TUM events, she immediately knew that she wanted to get involved with the Women of TUM on a larger scale. Her mission now is to tell other female students about the Women of TUM and encourage them to join the network.

You also feel inspired to support the Women of TUM Network with your time and energy? Get in touch with us at alumniundcareer@tum.de

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**How to Change Career as a Physician**

How does a clinically active physician come to trade in her medical specialty for a digital health start-up? TUM alumna Lara Maier (State Examination in Medicine 2014, Doctorate 2018) shares her career path, which led her from Medical Studies at TUM through several clinical stations and projects to her own company. She gives tips on what matters in one’s own career and shows the benefits of listening to one’s inner voice. Afterwards, there will be time for questions and exchange.

**DATE**
Wed. 12.06.2021
7 pm – 8:30 pm

**PLACE**
Online

**REGISTRATION/INFO**
www.community.tum.de/en/events

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**Doing Science like a Woman**

“Being a scientist is not a job. It’s a passion, a way of life.” With her keynote speech, TUM Ambassador Maya Schuldiner opens the Afterwork and provides insights into the course “Being a scientist is not a job. It’s a passion, a way of life.” A few years ago, she was the first female Israeli to be appointed as a professor and woman, answer questions and discuss with the participants. Afterwards, she will give tips on how to have a successful career of her outstanding career in science, which clearly shows how family life and professional success are possible at the same time. She will give tips on how to have a successful career as a professor and woman, answer questions and discuss with the participants. Afterwards, there will be the opportunity to network and exchange ideas and experiences.

**DATE**
Wed. 09.06.2021
7 pm – 8:30 pm

**PLACE**
Online

**REGISTRATION/INFO**
www.community.tum.de/en/events

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**Female (Self-)Leadership**


**DATE**
Tue. 14.09.2021
7 pm – 9 pm

**PLACE**
Online

**REGISTRATION/INFO**
www.community.tum.de/en/events

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**New Digital Modes of Entrepreneurial Work**

The afterwork will be opened by Dr. Katrin Hahn from the MCTS at TUM. Her research interests relate to the reorganization of industrial innovation through digital technologies and the increasing importance of addressing societal challenges in technology and policy. In the afterwork she will present her research findings and explain how the Covid-19 pandemic has affected the digitalization of companies. Afterwards, there will be time to network.

**DATE**
Wed. 10.11.2021
7 pm – 9 pm

**PLACE**
Online

**REGISTRATION/INFO**
www.community.tum.de/en/events

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**TASTER COURSE DURING THE SUMMER HOLIDAYS**

**MINT-Erlebnis an der Uni**


**DATE**
Mon. – Fri. 02. – 20.08.2021
All day

**PLACE**
All TUM Campuses

**REGISTRATION/INFO**
For female pupils from 10 years and up
www.explore.tum.de/minterlebnis

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**MAY WE OFFER YOU SOME MOTIVATION?**

Why are people motivated differently? Can motivation be learned? How do I motivate others? At the Women of TUM Talk 2020, three alumnae from Science and Business discussed the topic of “Motivation”.

The recording of the event in German language is available at www.community.tum.de/en/women
TUM sees itself as a place where knowledge is exchanged, and as a servant to society. It strives to supply people with expertise, improve their lives with new technologies, educate and inspire, and thus prepare them for the future.

As a TUM Alumni, you not only have the privilege of regularly coming back to TUM to attend lectures or participate in seminars – such as the public lecture series hosted by the Chair of Ergonomics. Additionally, you can continue your education by using online learning tools, webinars or further education programs. The newly established TUM Institute for LifeLong Learning is celebrating the TUM Learning Festival 2021, and among TUM’s Massive Open Online Courses (MOOCs) are many exciting courses for TUM Alumni.

LIFELONG LEARNING

AN EYE ON THE DRIVERS

How do drivers behave on multi-lane big city roads and what do they do on small country roads? With the help of the static driving simulator, the researchers at the Chair of Ergonomics are able to answer such questions. A BMW 6-series chassis forms the basis of the driving simulator. The SILAB software developed by the WIVV Center for Traffic Sciences in Würzburg is used as the simulation environment for displaying the scenarios.

Further reading at
www.mw.tum.de/en/lfe/research/labs/static-driving-simulator
Seit mehreren Jahren bietet Prof. Dr. Klaus Bengler seinen Doktoranden die Möglichkeit, Ergonomie aktuell referieren zu können. Die Seminarreihe hat sich zu einem Forum für Besucherinnen und Besucher entwickelt, die an ergonomischen Erkenntnissen interessiert sind. Alumna der TUM sind herzlich willkommen.


Vortrag "Algen als Treibstoff"


LECTURE SERIES
Lecture Series ‘Environment’

The lecture series organized by the Environmental Department of the TUM Student Representation has a tradition going back more than 35 years. Speakers from research, organizations, authorities and corporations will talk about technical solutions to environmental problems, health or climate protection under one central theme. The lecture series is also a wonderful opportunity for alumni to visit TUM, provided the current situation allows it. For those who prefer to catch up on current environmental topics from home: The lectures will be recorded and are available on the website of the Environmental Department.
ONLINE COURSES

Trauma Surgery or Digitalization in Aeronautics

Massive Open Online Courses (MOOCs) are interactive online courses that are accessible worldwide and free of charge. TUM was quick to recognize their potential and was the first German university to publish its own MOOCs on reputable American platforms. The ever-growing portfolio has since added to our university’s curriculum and provides an international audience with access to top-level education. Current courses include topics such as Trauma Surgery, Digitalization in Aeronautics and Space, and Communication Acoustics.

ONLINE LECTURE SERIES

Mobilität in der Stadt

Das Mobilitätsverhalten der Menschen ändert sich. Diesen Wandel zu begreifen und mitzugeben – das ist eine Herausforderung der Stadtentwicklung für die kommenden Jahre. Die Vortragsreihe, organisiert vom Lehrstuhl für Raumentwicklung der TUM, wirft einen Blick auf Bedingungen und Folgen der digitalen Transformation für die städtische Mobilität.

EXHIBITIONS

The Role of Computers in Architecture

For the first time in the German-speaking world, the exhibition “The Architecture Machine” at Architekturmuseum der TUM in der Pinakothek der Moderne takes a comprehensive look at digital development in Architecture. From its beginnings in the 1950s to the present day, the architecture museum tells this exciting story. The fundamental question behind it: has the computer changed Architecture, and if so, how?

TUM’S MUSEUM OF ARCHITECTURE

The history of TUM’s Museum of Architecture goes back to 1868 – at that time it was still a teaching collection for architectural education at the New Polytechnic College. In the first half of the 20th century, the field of Architecture changed and so the historical model collection was transformed into an archive, which since 1975 has gradually taken on the functions of a teaching collection for architectural education at the New Polytechnic College. In the first half of the 20th century, the field of Architecture changed and so the historical model collection was transformed into an archive, which since 1975 has gradually taken on the functions of a teaching collection for architectural education at the New Polytechnic College.
TUM AT HOME
WITH YOU

ANNUAL ACADEMIC CELEBRATION

Dies Academicus 2020

TUM President Prof. Thomas F. Hofmann invites you to look back on the year 2020 and will give an outlook on how TUM will maintain its successful course in the future. In order to reach as many people as possible while adhering to the required hygiene and social distancing rules, the Dies Academicus 2020 took place online for the first time in the university’s history.

INFO
Presidential speech, academic honors, round table discussion on the Bavarian University Reform, TUM Startup pitches

LECTURE SERIES

Covid-19 Lectures

The pandemic has shown how essential Science is for many parts of society: researchers acquire new knowledge about the virus, they develop vaccines and possible treatments, and they advise policy-makers and industry. In this online lecture series, leading scientists from TUM and TUM’s university hospital Klinikum rechts der Isar provide insights into their current research on the pandemic – and in doing so shed light on various scientific disciplines.

All lectures can be found at wiki.tum.de/display/COVID19Lectures

LECTURE SERIES

Wissenschaft für jedermann

Erfahren Sie, wie der Hyperloop funktioniert und wie Roboter unsere Welt verändern werden. Bei der Vortragsreihe, die gewöhnlich im Deutschen Museum stattfindet, waren im Wintersemester die TUM Alumni Prof. Dr. Agnes Jocher und Prof. Dr. Sami Haddadin sowie viele andere Forschende aus der TUM eingeladen, um Wissenschaft für alle zu erklären. Schauen Sie rein.

INFO
Prof. Dr. Sami Haddadin: Robotics and Artificial Intelligence and many more lectures
Available on the YouTube channel of Deutsches Museum, Playlist "Wissenschaft für jedermann"

LECTURE SERIES

Munich Talks

Under the motto of „Bringing Politics and Technology Together“, the Hochschule für Politik München / TUM School of Governance examines the interactions among politics, the economy, society, and technology, seeking a multi- and transdisciplinary social scientific understanding of these interactions. The signature event Munich Talks was established to breathe life into this approach. Amongst the guests were José Manuel Barroso, Martha Nussbaum and, most recently, Lothar Wieler, president of the RKI.

INFO
Available at www.munich-talks.de
Munich Talk with RKI President Lothar H. Wieler: go.tum.de/865564

LECTURE SERIES

TUM Speakers Series

Bill Gates, Tony Blair, Ban-ki Moon or Kofi Annan: prominent public figures share first-hand information and discuss current issues as well. They give often valuable insights. All lectures were recorded and are now also available online.

INFO
Watch the TUM Speakers Series’ YouTube Channel via speakersseries.de
Dr. Hans-Jürgen Heidebrecht (Diploma Food Technology and Biotechnology 2010, Master Brewing 2012, Doctorate Food and Bioprocess Engineering 2019) was awarded the Bayerischer Energiepreis 2020 in the category “Energieforschung – Nachwuchsförderpreis”. The award is in recognition of his research associate at TUM and founder of the company Heidebrecht Byotec.

Maria Katharina Minzlaff (State Examination Medicine 2005, Doctorate 2007) has been in charge of the cardiac catheter laboratory.

Manuel Millahn (Diploma Mechanical Engineering 2006) is Technical Managing Director of informax web-solutions GmbH. He comes with over ten years of professional and management experience. After his studies, he ran his own business as a full-stack developer.

Christian Lau (Doctorate Mechanical Engineering 1995, Doctorate 1999) is currently responsible for company-wide quality management and, among other things, oversaw all software development processes as well as technical partner management.

Dr. Peter Keil (Diploma Mechanical Engineering 2010, Doctorate Electrical and Computer Engineering 2017) has been awarded the Bayerischer Energiepreis 2020 in the category „Energieforschung – Nachwuchsförderpreis“. The award is in recognition of his doctoral thesis on the aging of lithium-ion batteries.

Volker Kirchgeorg (Diploma Mechanical Engineering and Management) has been responsible for company-wide quality management and, among other things, oversaw all software development processes as well as technical partner management.

The Chairman of the Presiding Board of Deutsches Verkehrsforum, Prof. Dr. Raimund Kinkeln (Diploma Mechanical Engineering 1991), was awarded the Cross of the Order of Merit of the Federal Republic of Germany at the suggestion of the Bavarian Minister President, Dr. Markus Söder. In his professional career, he held leading positions at MAN and BMW as well as at the Volkswagen AG, and has been a member of the Board of Directors of the Munich-based battery researcher and entrepreneur Dr. Peter Minzläff (Diploma Biology 1971, President Emeritus of TUM, was awarded the title of TUM Emeriti of Excellence by TUM President Thomas F. Hofmann in December 2020. TUM Emeriti of Excellence are primarily awarded to outstanding and dedicated retired professors with the honorary title “TUM Emeriti of Excellence” and involves them in the university’s tasks as members of the TUM Senior Excellence Faculty. Prof. Dr. Dr. h.c. mult. Wolfgang A. Herrmann (Diploma Chemistry 1971), President Emeritus of TUM, was awarded the title of TUM Emeriti of Excellence by TUM President Thomas F. Hofmann in December 2020. TUM Emeriti of Excellence are primarily volunteering their time and expertise in organizing, coordinating, and representing Science.

Uwe Zickert (Diploma Mechanical Engineering 1996) has moved up to the Executive Board of MVV Umwelt GmbH as of October 2020. He has been with the company since 2003 and was involved in, among other things, building up the environmental energy business in the UK.

Every year, TUM honors outstanding and dedicated retired professors with the honorary title “TUM Emeriti of Excellence” and involves them in the university’s tasks as members of the TUM Senior Excellence Faculty. Prof. Dr. Dr. h.c. mult. Wolfgang A. Herrmann (Diploma Chemistry 1971), President Emeritus of TUM, was awarded the title of TUM Emeriti of Excellence by TUM President Thomas F. Hofmann in December 2020. TUM Emeriti of Excellence are primarily volunteering their time and expertise in organizing, coordinating, and representing Science.

Get to know the members of the TUM Senior Excellence Faculty and find out more about their exciting research at:

www.t150.alumni.tum.de/en/category/tum-emeriti-of-excellence-en
The Deutschlandstipendium enabled me to study free of financial constraints. This allowed me to work on the TUM Hyperloop project and thus on the future of mobility alongside my studies.

Gabriele Semino
Recipient of ‘Deutschlandstipendium’ Scholarship, Master Physics 2019
Amadeus, moving travel forward

Travel broadens horizons, creates connections and builds economies. Travel powers progress. And Amadeus powers travel.

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We’ve been doing it for more than 30 years, and we’re just getting started. Innovating. Moving fast. Working with customers and partners to power better, more rewarding journeys. Leading the industry forward to shape a better future of travel.

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What our employees say

“My adventure started almost 10 years ago as a Software Development Intern. At the time, I knew little about the travel industry, except that I loved to travel. What makes a career at Amadeus really special is the diversity. In every team, you’ll find great, committed and fun people from all over the world. I’ve also had the chance to work in a variety of areas, working in London and Sydney to my current role in Munich.”

Pierre-Luc Noel,
Service Reliability Engineer - Senior Manager, Germany

“It’s thrilling to work at Amadeus. There are so many exciting projects to work on, so many interesting people meet. You’re constantly learning.”

Celine Giorla,
Technical Solution Management - Director, Dallas

“It’s wonderful to work for Amadeus. I’m an avid traveller, so interacting with people all over the globe and working in a domain that’s so close to my heart is really rewarding.”

Garima Jain,
Associate Product Manager, India

“People, because I’m constantly surrounded by talented people from all around the world with fantastic backgrounds and stories. Trust because every leader I’ve worked with has given me opportunities to make a difference and contribute to critical projects from Day 1.”

Antoine Ligier,
Air Content Sourcing Strategy Management, USA