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# The Science of Creating Businesses

A good business idea is by no means enough. But what makes ongoing entrepreneurs successful? An interdisciplinary team of scholars at TUM's Entrepreneurship Research Institute is determined to find out.

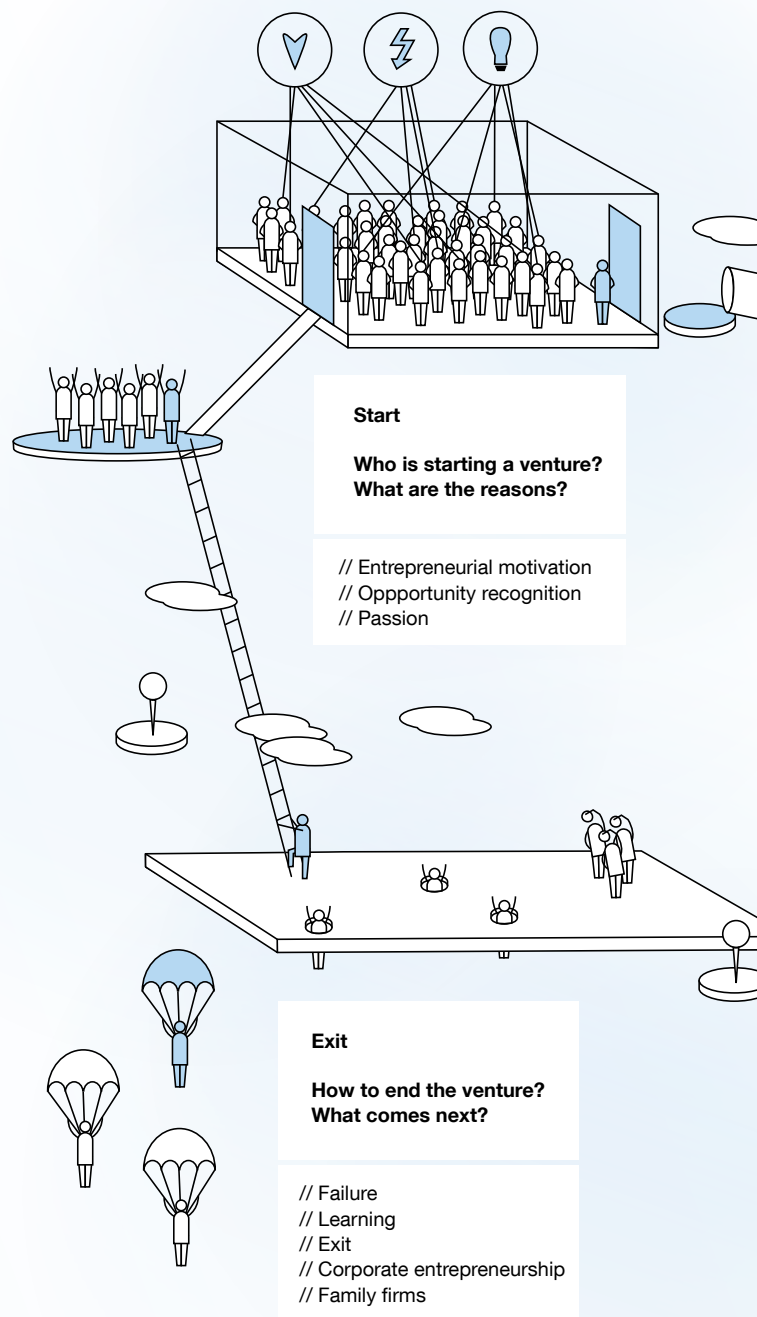
Gitta Rohling

## Die Wissenschaft vom Gründen

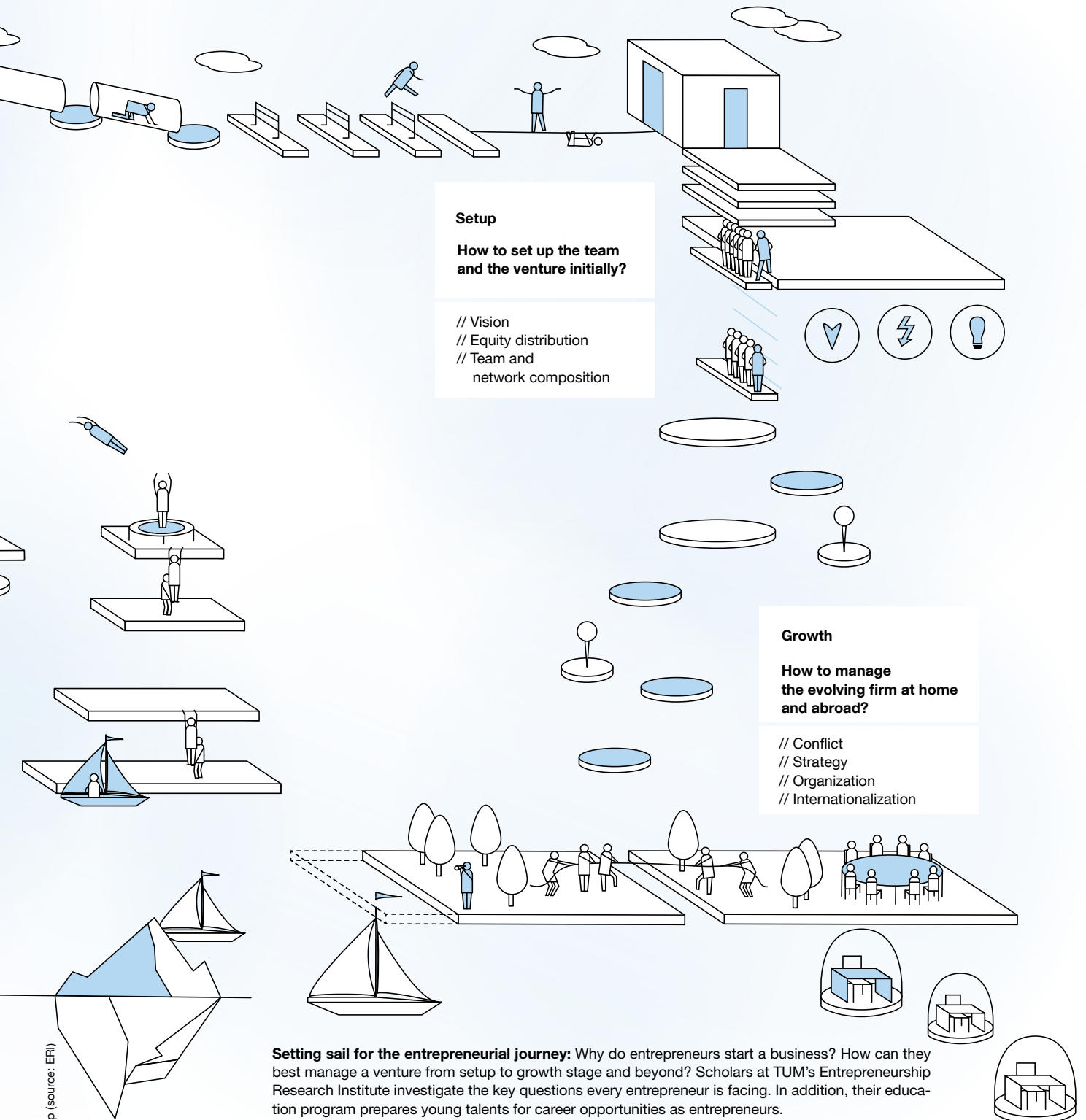
Prof. Holger Patzelt beginnt seine Erstsemestervorlesungen immer mit derselben Frage: „Wer von Ihnen kann sich vorstellen, ein Unternehmen zu gründen?“ Als der Professor für Entrepreneurship 2010 an der TUM anfang, meldete sich üblicherweise ein Dutzend. Heute hebt bei dieser Frage rund die Hälfte der 600 Studierenden die Hand.

Der Molekularbiologe und Betriebswirtschaftler Patzelt forscht und lehrt gemeinsam mit der Psychologin Prof. Nicola Breugst, dem Wirtschaftsinformatiker Prof. Oliver Alexy und der Wirtschaftswissenschaftlerin Prof. Hana Milanov am Entrepreneurship Research Institute (ERI) der TUM.

Seit 2015 ist das ERI Teil eines einzigartigen Gründungsumfelds auf dem Campus Garching: Wissenschaft, Gründungsteams und UnternehmerTUM, das Zentrum für Innovation und Gründung, teilen sich ein Gebäude. Die Wissenschaftlerinnen und Wissenschaftler des ERI decken die Erforschung des gesamten unternehmerischen Prozesses ab: vom Start über den Aufbau und das Wachstum bis hin – auch das ist wichtig – zum Ausstieg. Ihr Ziel ist es, das Verständnis sowohl für unternehmerische Persönlichkeiten als auch für unternehmerische Organisationen zu verbessern.



Auf Basis der Forschungserkenntnisse können angehende Gründerinnen und Gründer lernen, von anderen gemachte Fehler zu vermeiden und Chancen zu erkennen – sowohl auf individueller als auch auf organisatorischer Ebene. „Wir wollen einen unternehmerischen Spirit in die Lehrstühle und Fakultäten der TUM hineintragen“, sagt Nicola Breugst. Sicherlich entscheiden sich dann einige von denen, die in der Erstsemestervorlesung die Hand gehoben haben, tatsächlich für das Abenteuer Gründung. □





**P**rof. Holger Patzelt always kicks off his first-semester lectures with the same question: “Can any of you imagine starting your own company?” When he first joined TUM in 2010 as a Professor of Entrepreneurship, only a dozen students would typically answer “yes”. Today, around half of his six hundred students indicate that they can imagine doing so. The majority are studying business management, but students from engineering, computer sciences and other disciplines also take his courses.

“We want to bring an entrepreneurial spirit into the TUM departments and faculties,” reveals Prof. Nicola Breugst, Professor of Entrepreneurial Behavior with a background in psychology. Together with Prof. Patzelt (a molecular biologist and business economist), Prof. Oliver Alexy (with an innovation and information management background) and Prof. Hana Milanov (with a management background), they form the core of TUM’s Entrepreneurship Research Institute (ERI). The team holds lectures, seminars, and workshops for students across various faculties. “Our courses and research insights are intended to ensure that young people are open to the rich and diverse career opportunities that are out there, and are equipped with the entrepreneurial mindset they need to launch a startup,” Breugst explains.

### **Unique environment for startups**

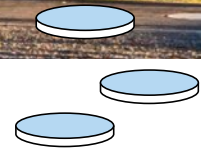
Around seventy technology-driven, growth-oriented startups emerge from the TUM ecosystem each year. According to the German Startup Monitor (DSM), more business founders come from TUM than from any other German university.


Founded in 2012, the ERI certainly plays a role in this success. The institute forms part of a unique startup environment on the Garching campus (see graphic on p. 45). In the modern building of the TUM Entrepreneurship Center, the ERI researchers share the west wing with around twenty startup teams, all advancing their ideas in the entrepreneurship incubator. The east wing houses UnternehmerTUM – the Center for Innovation and Business Creation at TUM – which offers founders and startups a complete service from the initial spark of an idea all the way to an initial public offering. This includes a high-tech prototype workshop, MakerSpace.

“You can really sense the creative energy of technology-based startups here,” reflects Nicola Breugst. She particularly appreciates the special atmosphere at the TUM Entrepreneurship Center: “Collaborating directly with startup teams inspires our research endeavors. In turn, we can then use our study findings to develop hands-on startup tools.” ▷



The Entrepreneurship Research Institute is part of a unique startup environment on the Garching campus, where science, startup teams and UnternehmerTUM, the Center for Innovation and Business Creation, all share a building.



150+ 

curricular courses covering all aspects of Entrepreneurship Education per academic year at TUM

*“Carefully weigh up potential partnerships, especially at the beginning. Your first partners continue to shape your opportunities for a long time to come.”*

**Startup advice #1** – Hana Milanov

### **Starting a business is just like dating!**

A role-play exercise on sharing equity is a good example of such a learning tool based on research findings. It prepares entrepreneurs to navigate one of the key challenges of setting up a new venture by guiding them through equity allocation. Who gets which “piece of the pie” if one founder had the initial idea and invests more time, while another contributes more business expertise and brings in the customers? Breugst explored the journey of various startup teams and developed a role-play exercise from the results. Based on these insights, students distribute hypothetical shares, and so deal with this potentially challenging topic before even founding their startup.

Together with her colleagues, Breugst investigates the entire entrepreneurial process in her research: from founding a venture, via development and growth, all the way to the equally-important exit phase. Breugst compares the experiences of startup teams to those of a couple in a romantic relationship. At the outset, the participants discover if they are a good match and whether their joint vision has potential. When establishing a startup, they clarify who will contribute what to the partnership. In a relationship, a prenuptial agreement might not necessarily be the right route to take – but when founding a business venture, Breugst views the use of contracts as indispensable. In the growth stage, the initial excitement gradually gives way to everyday life. At that point, for instance, rituals can be helpful to keep the spark alive and sustain the partnership. And, just like a couple, a business team can split up. To avoid this escalating into a long “war of roses”, a shared approach to conflict management is crucial – and external advice can also be very helpful.

*“Don’t patent just for the sake of patenting. Your patent is only worth as much as your ability to defend it.”*

**Startup advice #2** – Oliver Alexy

### **Startup and growth in an uncertain environment**

The ERI team aims to provide knowledge for entrepreneurial thinkers in new as well as in established organizations. In addition to the individual and team-level perspective that Breugst and Patzelt bring to the table through their research, this also calls for the business management insights contributed by Oliver Alexy.

As Professor of Strategic Entrepreneurship, Alexy investigates how companies can successfully position themselves in an uncertain environment. Why do companies make their data or algorithms publicly available? What are the benefits of open and flexible organizational models at a time of increasing digitalization? Alexy and an international research team found answers to these questions in an extraordinarily complex project: the Hyperloop. The Hyperloop is a proposed mode of passenger and freight transportation based on a fully-enclosed partial vacuum tube with a levitated capsule running inside at roughly the speed of sound. Explicitly designed as an open-source project by its initiator Elon Musk, several companies as well as interdisciplinary student-led teams, including a highly successful one at TUM, are now working on making the Hyperloop concept a reality.

In infrastructure projects of this magnitude, the work is usually first divided into small subprojects that are then handled by teams or individual staff members. “We looked at a company that took a totally different approach,” reports Alexy. Hyperloop Transportation Technologies (HTT), based in Los Angeles County, California, has a core team of around 50 people and a community of about 30,000 volunteers. “For as long as the scope and structure of the work remains unclear, HTT keeps the tasks that volunteers can work on broad and vague,” Alexy observes. Since many people are involved, there are many possible solution proposals, and HTT wants to remain open to all of these for as long as possible. “Only gradually does it become clear how different strands of the work need to be connected and how well – or whether at all – one solution to a particular problem fits into the picture,” he says. This type of approach can prove particularly useful for startups, also enabling them to manage large, complex projects with a small core team by opening up their innovation process and integrating wider volunteer communities. “Instead of protecting all intellectual property with patents – which are often expensive – startups should likewise consider sharing knowledge with the community and so gain project partners,” advises Alexy. ▶

**TUM's Entrepreneurship Center** offers extensive services to technology-oriented entrepreneurs, from their initial ideas to the growth phase. Here, TUM and its affiliated institute UnternehmerTUM are housed together to provide a one-stop shop for these services.



### Entrepreneurship Research Institute

The Entrepreneurship Research Institute conducts research into individual and organizational entrepreneurship, harnessing its findings to support young people keen to seize the opportunity to start their own venture.

### UnternehmerTUM MakerSpace

UnternehmerTUM MakerSpace is a 1,500 m<sup>2</sup> high-tech workshop that enables companies and creatives to produce prototypes by offering access to equipment, tools and software, as well as a creative community.



### Entrepreneurship Incubator

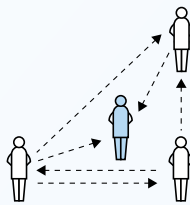
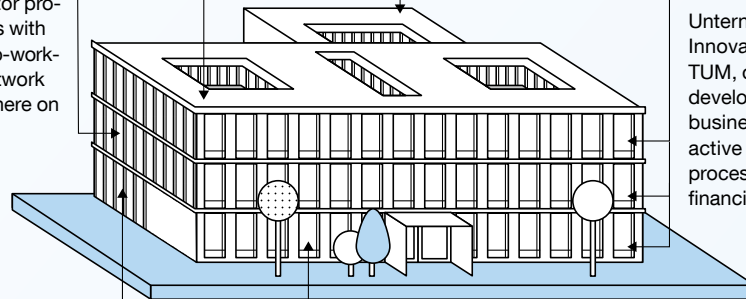
The TUM Entrepreneurship Incubator provides TUM academics and students with free startup coaching, offices and co-working space as well as access to a network of experts. Around 20 teams work here on their ideas.



### UnternehmerTUM GmbH

including UnternehmerTUM Projekt GmbH and Unternehmertum Venture Capital Partners GmbH

UnternehmerTUM GmbH, the Center for Innovation and Business Creation at TUM, offers startup teams assistance with developing their products, services and business models. Here, experts provide active support throughout the launch process, as well as with market entry and financing.



### Open Space for Entrepreneurship Community

The ground floor offers plenty of space for knowledge exchange, for instance through seminars, workshops and even hackathons.



### Entrepreneurship Lecture Halls

At the Entrepreneurship Center, TUM and UnternehmerTUM offer a wide range of lectures, seminars and entrepreneurial training for TUM students as well as an EMBA degree program.



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**Prof. Holger Patzelt**

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## **What makes entrepreneurs tick?**

During the boom in biotech startups at the turn of the millennium, Holger Patzelt wondered: “How do business founders think? How do they make decisions?” So, when it came to writing a dissertation for his postgraduate program at the University of Bamberg, he naturally turned his attention to startup success factors. As a chemistry graduate, Patzelt earned his doctorates in molecular biology at the University of Heidelberg and in management and entrepreneurship at the University of Bamberg. He also held positions at the University of Colorado at Boulder (US), the Max Planck Institute for Economics in Jena, and the European Business School in Oestrich-Winkel. Since 2010, Patzelt has been a Professor of Business Administration with a focus on entrepreneurship at TUM. His research at TUM’s ERI focuses in particular on the motivational and decision-making processes of entrepreneurs, on handling failure, and on social and sustainable entrepreneurship.

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**Prof. Nicola Breugst**

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## **The people side of entrepreneurship**

During her psychology studies, Nicola Breugst could find no satisfactory answer to the question of how people form companies – a topic that has driven her work ever since. She therefore wrote her dissertation on entrepreneurship at the University of Jena. After completing her doctorate, Breugst worked at the Kelley School of Business at Indiana University in Bloomington (US) and the National University of Singapore. As Professor of Entrepreneurial Behavior at TUM, her research focuses on the people side of the entrepreneurial process, in particular analyzing factors surrounding motivation and collaboration in startup teams. “Founding a business venture is an emotional rollercoaster – which makes it exciting to study,” is how Breugst explains her passion for her work.

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### Networking for success

Prof. Hana Milanov also investigates how companies navigate uncertainty, highlighting the role of alliances and networks, especially for startups that have yet to gain a foothold in the market. These young firms face a dual challenge – namely the need to secure vital resources and simultaneously establish recognition in the market. “This means we often see time-pressed entrepreneurs making rushed decisions on their first partnerships, which can be very costly,” Milanov says. Her work in the venture capital and biotech sectors shows that the effects of early partnering decisions endure much longer than originally thought. “An alliance has a major influence on the way stakeholders assess a startup’s capabilities – and a lasting one, even if the network changes over time,” concludes Milanov.

At the same time, networks can be vital “pipes” to resources for startups navigating complex situations – internationalization being one of them. Here, young companies need knowledge both about the new country they wish to enter and the actual process of internationalization. “Prior research emphasized the importance of international partners for new ventures – but we know those partnerships can be difficult to manage and result in high costs,” according to Milanov. Her research shows that domestic partners that internationalized their operations can be extremely helpful for new ventures trying to navigate the complexities of internationalization, es-

pecially if the entrepreneurial team lacks international experience. Her advice: “Startups should weigh up potential alliance partners very carefully, especially at the beginning, and remember that aspects of their partners’ experiences – even beyond the formal purpose of the alliance – may unlock additional learning opportunities.”

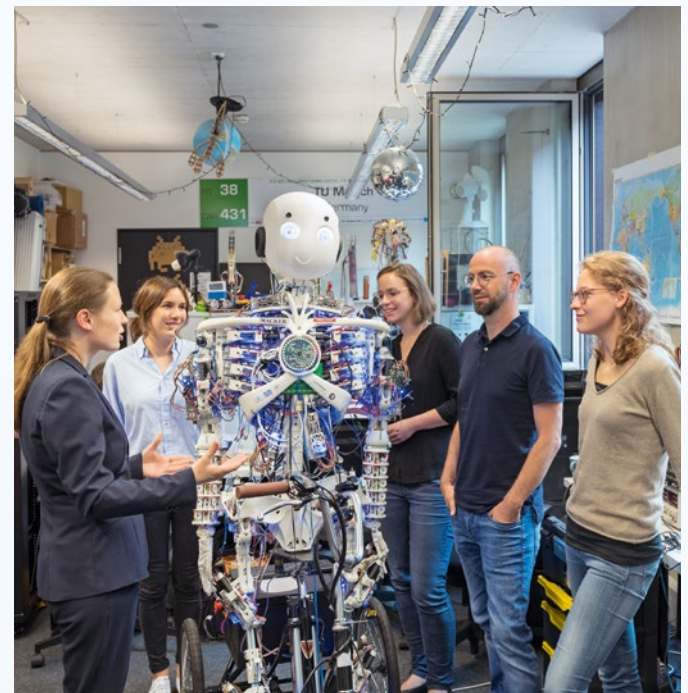
### Learning entrepreneurship

On the basis of the research findings, aspiring founders can learn to avoid others’ mistakes and to identify opportunities – both on individual and organizational levels. “Founders as individuals are certainly crucial to the success of a company,” emphasizes Breugst. “But we can also equip them with knowledge and tools to support the entire entrepreneurial journey.”

In fact, the ERI team already starts its work in the pre-founding phase, attaching great importance to hands-on experience for students. How do we identify opportunities? How do we turn an idea into a business model? How can we make effective decisions when we are overloaded with information? Interactive, hands-on exercises based on concrete questions help students working in small groups learn how to develop original ideas and find their own solutions. Certainly, some of those raising their hands in the first-semester lecture will actually begin their own startup adventure. *Gitta Rohling*

*“Let yourselves get emotional, but stick to the contract and shared values which you define together as early as you can.”*

*Startup advice #3 – Nicola Breugst*



**The Entrepreneurship Center is dedicated to experimenting** with new ideas. Academics, students and entrepreneurs share this vibrant space to explore technologies, found startups and work on innovative projects, such as Roboy – an open source platform for robot development.





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**Prof. Hana Milanov**

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## **It's not just who you are and who you know, but how you're known**

After studying business administration in Zagreb (Croatia), Hana Milanov went to the US as a doctoral student and was immediately fascinated by the subject of entrepreneurship. She received her doctorate in entrepreneurship and strategy from the Kelley School of Business at Indiana University in Bloomington (US). Following her doctorate, she worked as a professor at IE Business School in Madrid (Spain). Her research seeks to understand the dynamics of networks and communication, and their role in entrepreneurs' (and their firms') resource acquisition, opportunity exploitation and ultimate performance – at home and across borders. “No entrepreneur ever succeeded alone – partners are a key factor in understanding the roots of startup outcomes,” she concludes.

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**Prof. Oliver Alexy**

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## **Shaping a successful future**

How can companies position themselves successfully in an uncertain environment and develop effective structures? This is an area of particular interest for Oliver Alexy, Professor of Strategic Entrepreneurship at TUM. He researches organizations that work in high-uncertainty environments – including startups as well as medium-sized and large high-tech firms. Here, Alexy's focus lies on organizational design, collaboration and knowledge transfer between companies. Originally trained in management information systems, he received his doctorate in innovation management from TUM. Prior to his appointment as a professor there, he held various positions in the Innovation & Entrepreneurship Group at London's Imperial College Business School (UK).

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*“Don’t tackle something new straight away, but first reflect on what’s failed. Don’t ruminate on it too much, however, or the negative emotions will gather momentum. A good balance between reflection and distraction is the key.”*

*Startup advice #4 – Holger Patzelt*

**Entrepreneurship at TUM**

