

Founding at TUM

From Ideas to High-Tech Ventures





**»WE SUPPORT PIONEERS
STARTING UP HIGH-TECH
COMPANIES.«**

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TUM Start-Ups – Facts & Figures

	Entrepreneurial talents mentored p.a.	> 5,000
	Patent applications p.a.	> 50
	Partner companies	> 100
	Scalable start-ups p.a.	> 75
	Financing acquired by start-ups p.a.	> 1 Bn. €
	Newly created jobs p.a.	> 1,000

TUM Start-Up Gallery (selection)



Foreword



**TUM President Thomas F. Hofmann
with assistant robot "Garmi"**

Photo: Astrid Eckert/TUM

Technical University of Munich (TUM) is dedicated to the innovative advancement of people, nature, and society. With a pioneering spirit, creativity, and a keen awareness of our responsibility, we combine our highly varied areas of expertise in mechanical engineering, the natural and life sciences, and medicine with the disciplines of economics, the humanities, sociology, and political science to strengthen the excellence of our research and teaching and effectively convert our results, discoveries, and developments into market-oriented innovation processes for the sustainable development of the economy and society.

We promote and support the entrepreneurial spirit in all areas of the university and encourage students and talented researchers in the sciences to think outside the box, be creative and innovative, accept challenges, seize opportunities, take risks, and learn from their mistakes. We promote sustainable, growth-oriented, and technology-based start-ups by our members and support them from initial idea development all the way to successful positioning in the market. Our institutional activities are systematically focused on working closely with our affiliated institute UnternehmerTUM to assume a leading role across Europe in developing

sustainable technology start-ups with growth potential emerging from among our students and our cutting-edge scientific research.

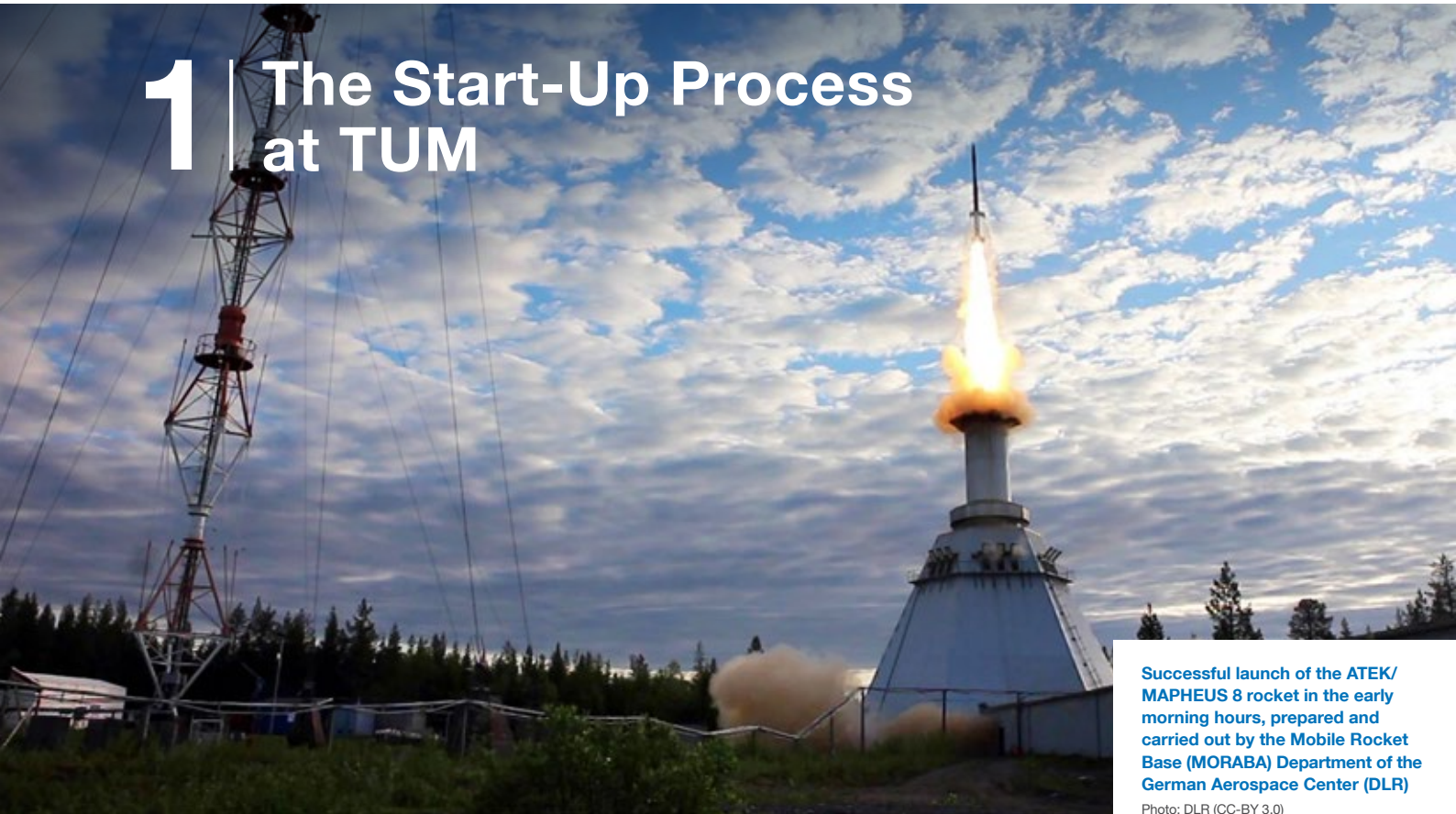
We actively support our members in founding technology-based, growth-oriented enterprises from the initial business idea all the way to market entry. We emphasize creating optimal conditions for science-based start-ups. TUM entrepreneurs who start up a company are supported by their university as they establish their own company. Together with UnternehmerTUM GmbH, the Center for Innovation and Business Creation at TUM, and the TUM Venture Labs, TUM offers start-up consulting to entrepreneurs in all key phases – from the business plan and selection of the start-up team through to choosing the company's legal form and acquiring financing. With the following brochure, we offer our support to our members interested in starting up a company at TUM. This brochure provides guidance regarding the various entrepreneurial activities involved in such an undertaking.

We hope you will be inspired and wish you every success for your start-up initiative!

Thomas F. Hofmann

President of TUM (Technical University of Munich)

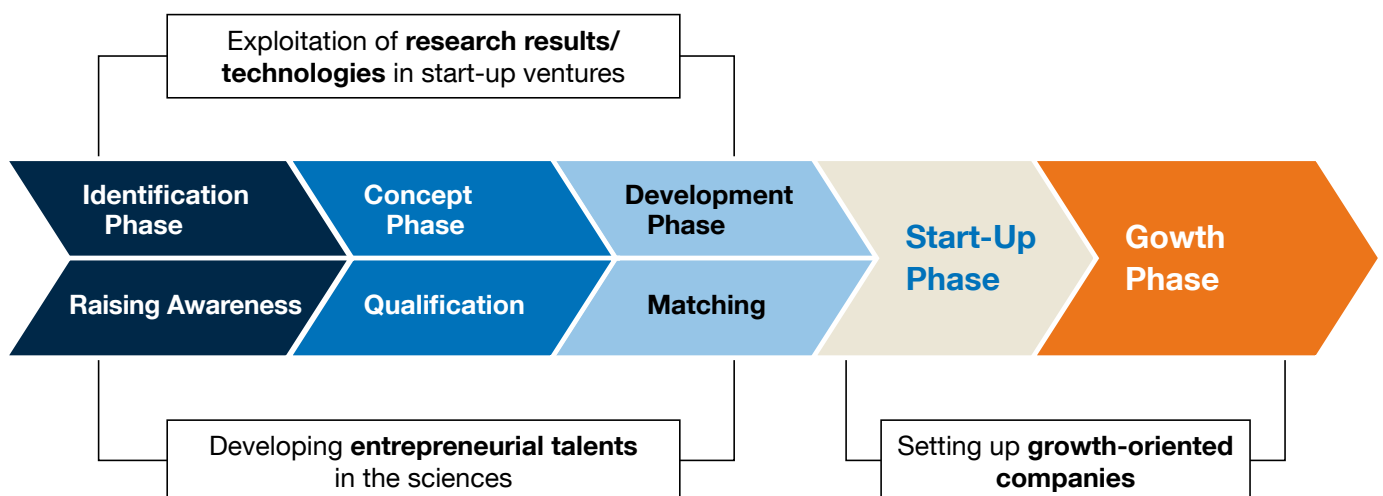
1 | The Start-Up Process at TUM



Successful launch of the ATEK/ MAPHEUS 8 rocket in the early morning hours, prepared and carried out by the Mobile Rocket Base (MORABA) Department of the German Aerospace Center (DLR)

Photo: DLR (CC-BY 3.0)

Start-up consulting offered by the TUM Office for Research and Innovation (TUM ForTe) accompanies start-up teams at TUM through the entire start-up process, from talent development and technology exploitation to setting up and successfully positioning growth-oriented, high-tech start-up enterprises in the market.



TUM offers its members interested in starting up a new company active support in all phases of the start-up process. This support is tailored to the specific needs of the individual initiative. Together with UnternehmerTUM GmbH, TUM has developed a unique support network with a central, one-stop agency:

TUM Start-Up Consulting.

**»WE SUPPORT START-UP
TALENTS FROM THE
INITIAL IDEA THROUGH TO
SUCCESSFUL POSITIONING
IN THE MARKET.«**

- TUM Start-Up Consulting offers founders in-depth orientation and concrete support in all matters related to the topic of start-ups. As needed, TUM Start-Up Consulting mediates contacts with coaches, establishes contact with internal partners (such as TUM ForTe Patents & Licenses), or external partners, and provides a broad range of entrepreneurship support services, including identifying funding opportunities.
- A network of domain-specific structures was set up to further promote spin-offs from science: the TUM Venture Labs. Eight future markets are currently being targeted:

Software/AI, Quantum and Chemistry (TUM research campus in Garching), Robotics/AI (Munich-UrbanCoLab and TUM MSRM), Healthcare (TUM Klinikum Rechts der Isar), Food/Agro/BioTech (TUM Campus Weihenstephan), Aerospace (TUM Campus Ottobrunn and the TUM research campus in Garching) and Built Environment (TUM Campus in downtown Munich). > www.venturelabs.tum.de/en/venturelabs/home/

In close cooperation with TUM Start-Up Consulting and TUM Venture Labs, entrepreneurs launching a company are given continuous support within their specific departments throughout all phases of the start-up and within the uniquely tailored qualification formats available from UnternehmerTUM. This ensures the necessary continuity of guidance and the most comprehensive support of start-up teams at TUM.

Contact:

TUM Start-Up Consulting c/o
TUM Entrepreneurship
Office for Research and Innovation
(TUM ForTe)
Arcisstraße 21
80333 München

Address for visitors:

TUM Incubator
Lichtenbergstraße 6
85748 Garching

gruendungsberatung@tum.de
[www.tum.de/en/innovation/entrepreneurship/
for-founders-start-ups/consulting-mentoring](http://www.tum.de/en/innovation/entrepreneurship/for-founders-start-ups/consulting-mentoring)



Campus Garching

Photo: Astrid Eckert / TUM

2 | Arranging for Extra Time to Launch Your Start-Up



TUM HELIOP - Helicopter Shipdeck Operations 2020: The fixed-base Rotorcraft / Simulation Environment (ROSIE) visualization system at the TUM Chair of Helicopter Technology

Photo: Daniel Delang/TUM

TUM supports staff in making effective progress with their company start-up without impairing research and teaching commitments at the university. TUM offers the following ways to arrange time for company start-ups.

2.1 Reduction of Individual Teaching Load

Researchers wishing to start up an enterprise can make a formal request to reduce their individual teaching loads for a limited time of no more than two years and by no more than 50% until the company is actually founded and begins operations.^{1,2} When submitting their applications, TUM academic staff members are required to show explicitly that the reduction is to support a company start-up and that the teaching commitments of the department will not be impaired.³ To this end, applicants are required to arrange for a substitute during the semester for the relevant teaching unit to cover their

reduced teaching load and thus ensure there is no shortfall in teaching operations.

With the approval of their supervisor, researchers interested in starting up a company apply to the relevant department to have their teaching load reduced, stating the reasons for their business venture. The request is then forwarded by the department (for professors, via HR 1 – Controlling, Organization, and Planning) to the ZA 2 – Human Resources⁴ for review. In the case of professors, a decision is made on the request by the president and, in the case of non-professorial academic staff, by the president and additional advisors from the consulting team.⁵

¹ Legal source: § 7 (8) Lehrverpflichtungsverordnung (Directive on Academic Teaching Load, LUFV)

² Since they are qualifying positions, W2-TT professorships are exempted, because the teaching load is already reduced to 5 hours per week.

³ Legal source: Art. 2 (5) sentence 1 of the Bavarian Higher Education act (BayHSchG)

⁴ See overview on page 10

⁵ See also information in the TUM Services Directory (Dienstleistungskompass, DLK) under the heading "Teaching load" (Lehrverpflichtung).

2.2 Reduction of Working Hours

To ensure that requests for reduced working hours are not rejected on official grounds (e.g., substantial impairment of organizational function, work procedures operational reliability, or disproportionately high costs incurred by the employer),⁶ plans to submit such an application should, as a rule, be discussed and clarified with the applicant's direct supervisor in a timely manner (generally at least three months prior to the planned reduction).

This allows any restructuring and redistribution within the organizational unit that may become necessary to be effectively planned and a reduction of working hours to be made possible in a responsible manner. As soon as the employee and his or her supervisor have reached agreement, the employee should submit a request for a reduction in working hours. This request is forwarded by the supervisor to Human Resources, which authorizes the reduction in working hours by modifying the employment contract or by officially authorizing the reduction.

In accordance with legal regulations, the working hours of a civil servant not related to a family-related, part-time workload can be reduced by no more than half the regular working hours and the scope of the outside professional activities may not exceed eight hours a week or one single workday (see Chapter 3 below). Deviations from this require a strategic decision regarding individual cases that balances the individual's interest in a start-up and the official interests of TUM.

Further information on the topic of working hours and their reduction can be found in the TUM Services Directory (Dienstleistungskompass, DLK) under **> Arbeitszeit (working hours)**.

2.3 Sabbaticals

A sabbatical is particularly appropriate for scientists whose research generates the idea for founding a start-up that will make a temporary leave from work necessary at a later point in time. The sabbatical is a special form of reduction in working hours⁷ where in work time is initially accumulated for a specified period in order to apply this time credit at a later



Else Kröner-Fresenius-Center for Nutritional Medicine at the TUM School of Life Sciences in Weihenstephan

Photo: Andreas Heddergott / TUM

date for a longer leave of absence from official and work duties. The accumulated work time is achieved by switching to part-time employment with a work phase and leave-of-absence phase, with the accumulated working time compensated for during the leave of absence. A sabbatical can only be granted during an ongoing period of employment. For temporary employees, only a brief leave-of-absence phase is usually possible, so that other arrangements for a company start-up are more appropriate for such employees. It should be noted that the leave-of-absence phase in each case comes at the end of the approved period of time and must be taken without any interruption between the reduced work phase and the sabbatical.

With the sabbatical, TUM provides support to start-up activities both for civil servants and employees working on the basis of a collective bargaining agreement (TV-L, Tarifvertrag der Länder), as long as normal university operations can be ensured during the leave of absence, or no impairment of work organization or genuine additional burden is placed upon colleagues.

Further information and sample calculations are available in the TUM Services Directory under **> Sabbatical**.

⁶ Legal source: § 8 Act on Part-time and Temporary Work (TzBfG) or Art. 88 Bavarian Civil Service Act (Bayerisches Beamtengesetz)

⁷ Legal source: § 6(2) TV-L, Art. 88(4) Bavarian Civil Service Act (Bayerisches Beamtengesetz)

2.4 Leaves of Absence

TUM can grant special unpaid leave to its employees for the purpose of a company start-up.

In this case, Human Resources confers with TUM Start-Up Consulting to review the possible approval of special unpaid leave for up to two years, while bearing in mind operational interests and arrangements for cover by a replacement. In the case of fixed-term employees, the granting of special leave does not automatically extend the period of employment or status as a civil servant. If the company start-up at TUM contributes to technology transfer⁸ and is thus in the official interest of the university, the period of the interruption of employment for special leave is counted towards the term of employment/ period of service and credited to the period of service in a given pay grade. The duration of recreational leave is reduced by 1/12 for each month during which employment or employment as a civil servant is suspended.

What employees must consider:

Employees apply for special leave pursuant to § 28 TV-L⁹ and state reasons, while also waiving continuation of salary payment and other remuneration by the employer.

Information on social insurance and supplementary benefits:

When special leave begins, insurance and compulsory payments to all forms of social security end:

- Health insurance coverage during special leave must be settled with the individual health care provider. To the extent that employees are not entitled to family insurance, they can arrange voluntary insurance coverage for the period of the unpaid special leave with a statutory health care provider. This right only exists for those who left the mandatory insurance coverage scheme and in the last five years prior to doing so had insurance coverage for at least 24 months or were insured for at least 12 months directly before opting out.¹⁰

»EMPLOYEES CAN FOCUS COMPLETELY ON FOUNDING A START-UP BY TAKING SPECIAL LEAVE ... AND LATER RESUMING WORK WITH THE UNIVERSITY.«

In all other cases, employees must obtain private health insurance during their special leave.

- Employees can take out voluntary insurance in the statutory pension insurance scheme for the period of their special leave. Contributions must be paid by the insured persons themselves. No compensation is paid by the employer for any additional costs.
- During special leave without remuneration, the employment relationship continues and thus also the mandatory insurance with the Versorgungsanstalt des Bundes und der Länder (Federal and State Pension Office, VBL). No installments are paid for this period. The VBL¹¹ must be contacted if voluntary insurance is arranged.

What *Beamte*¹² must consider:

- While on unpaid leave, *Beamte* are not entitled to support payments (*Beihilfe*) in the case of illness.
- Periods on a leave of absence without a basic salary do not qualify as pensionable service time.

Further information is available in the Services Directory under **> Sonderurlaub (special leave)**.

⁸ In these guidelines, technology transfer is understood in the sense of "the transfer of technology knowledge from its point of origination through to its use in the production process. In an institutional sense, technology transfer means the carefully planned process of disseminating or distributing technology over a limited period with the support of the private or public sector for economic utilization by third parties. Transfer is generally carried out using legal instruments (e.g., licensing contracts). The transfer of technology can take place between universities, research institutions, inventors or companies." (source: <http://wirtschaftslexikon.gabler.de/Definition/technologietransfer.html>).

⁹ Legal source: Collective Agreement for the Public Service of the Länder (TV-L)

¹⁰ Commencement and modes of entry are in accordance with §188 SGB V.

¹¹ www.vbl.de

¹² See § 18 Holiday Ordinance (UrlV).



»WE MAKE IT POSSIBLE FOR STUDENTS TO TAKE UP TO TWO SEMESTERS LEAVE, SO THEY CAN FOCUS ENTIRELY ON THEIR COMPANY START-UP.«

Students at the library of the TUM Campus Heilbronn.

Photo: Matt Stark / TUM



TUM promotes research-based business ideas and start-ups (2018)

Photo: Astrid Eckert/TUM

2.5 Free Semesters for Student Founders

As a rule, students may be granted up to two semesters leave from their studies to start up a company.

During this leave, students may not attend courses for credit or complete examinations at TUM. However, it is possible to repeat failed exams during this leave of absence. These free semesters for start-ups do not count as part of studies; however, student union fees for the semester must continue to be paid.

Requests for a leave must be submitted on time for each semester individually and can be submitted from the start of the registration period through to the first day of classes.¹³

The following documents must be included when submitting a request for a semester off for start-ups to the TUM CST – Admissions and Enrollment:

- Request for leave of absence
- A brief statement explaining the reason
- An extract from the commercial register or, if an entry had not yet been made, a draft of the business plan and positive assessment by TUM Start-Up Consulting based on a consultation

For more information, please see the TUM Services Directory:

> https://portal.mytum.de/login_form

Brochures with information on leaves of absence and reduction in work hours:

> *Teilzeitbeschäftigung und Beurlaubung für Arbeitnehmerinnen und Arbeitnehmer des Freistaats Bayern (Part-Time Employment and Leave of Absence for Employees of the Free State of Bavaria, in German only)*

> *Teilzeitbeschäftigung, Beurlaubung und Altersteilzeit für Beamtinnen und Beamte des Freistaats Bayern (Part-Time Employment, Leave of Absence and Phased Retirement, in German only)*

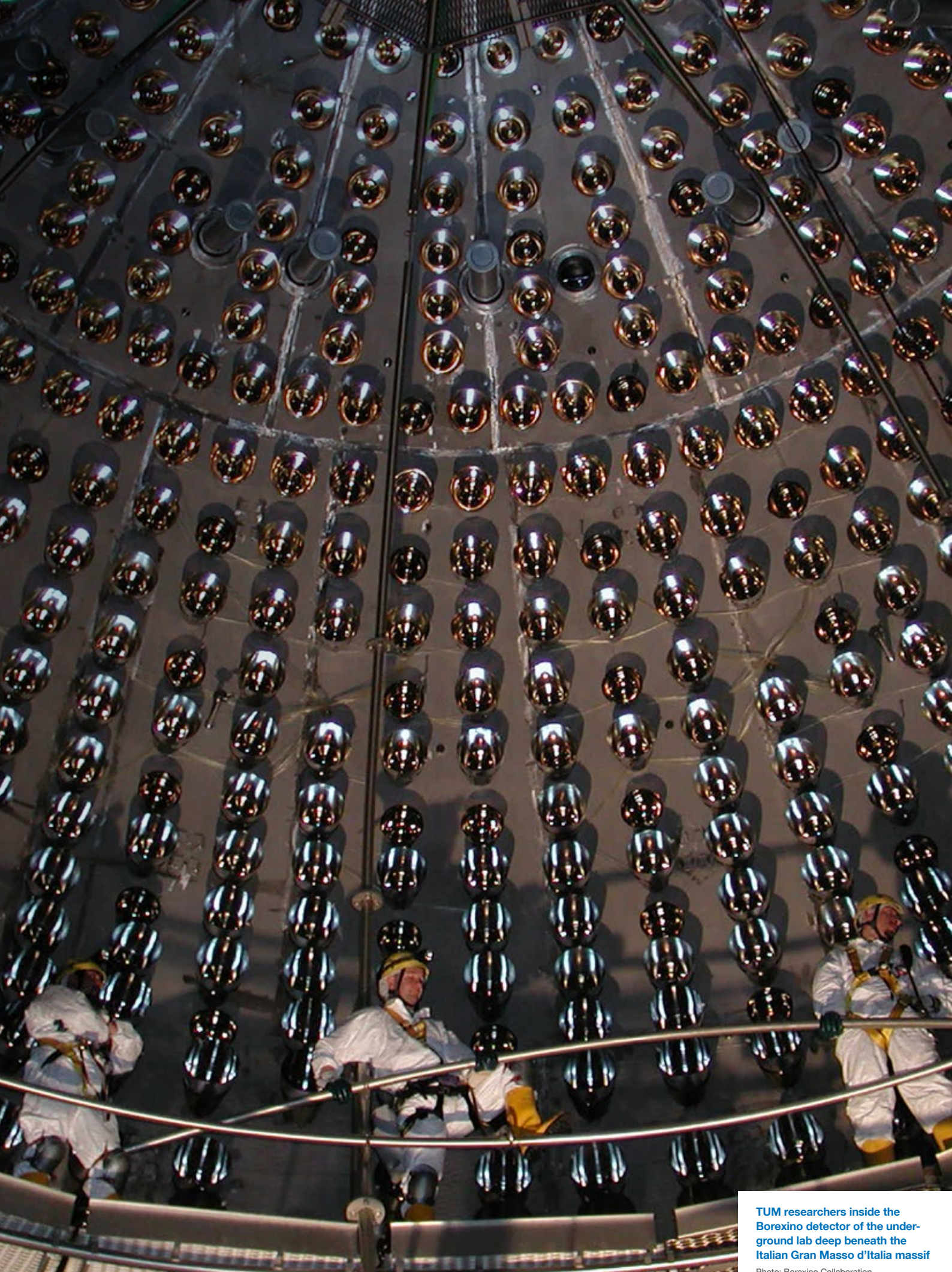
In addition to TUM Start-Up Consulting, our ZA 2 – Human Resources can provide advice at the respective TUM campus:

Munich Campus: Unit 21 or 22

Garching Campus: Unit 23

Weihenstephan Campus: Unit 24

¹³ Exact deadlines can be found at: <https://www.tum.de/en/studies/application>



TUM researchers inside the Borexino detector of the underground lab deep beneath the Italian Gran Masso d'Italia massif
Photo: Borexino Collaboration

3 | Regulations on Outside Professional Activities¹⁴



An experiment at the TUM Chair of Cognitive Systems (2018)

Photo: Astrid Eckert / TUM

As part of outside professional activities, it is possible for TUM professors and employees to carry out tasks outside the university, such as at a company. When there is a clear intention to start up a company, TUM professors and employees must give notification regarding all outside professional activities related to the start-up and have such activity approved; this also includes disclosing any equity holdings or shareholdings in the company. Shareholdings without further involvement in the company are exempted from this regulation.

3.1 General information

For an accelerated start-up process, after final consultation with TUM Start-Up Consulting, all required information about planned outside professional activities must be submitted in full, transparently, and on time, i.e. prior to the founding of the company, to Human Resources.¹⁵ This way, further open questions related to other service units within central administration can be resolved swiftly, before the

company is founded.¹⁶ The scope of outside professional activities is not to exceed an average of eight hours a week, or a single workday in the case of professors; this also applies to civil servants working part-time.¹⁷

TUM scholarship holders must clarify the scope of their activities not related to their scholarship with the institution that granted the scholarship. As a rule,

¹⁴ These guidelines serve as an orientation for other entrepreneurial activities.

¹⁵ See infobox on page 18.

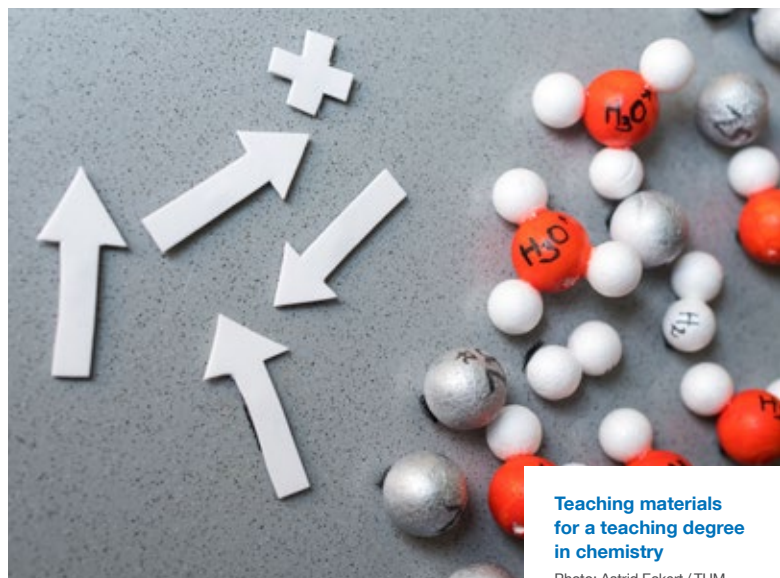
¹⁶ Regulations on outside professional activities are intended to prevent corruption and safeguard against possible suspicion of unfair competition, subsidy fraud or prosecution of criminal offenses, in particular those constituting accepting or granting an unfair advantage (§§ 331 ff. of the German Criminal Code (StGB)) and embezzlement (§ 266 StGB) and thus, among other things, protect TUM as well as the company start-up from lawsuits by competitors.

¹⁷ See 2.2 above, next-to-last sentence.

such outside professional activities may amount to five hours a week. If the scholarship is for scientific work, the time involved may not exceed ten hours a week, and for the FLÜGGE program no more than 5 hours a week.

As a rule, the holding of shares or equity in a company purely as an investment without further (planned) collaboration with the Chair/institute where the start-up originated is subject to mandatory disclosure. However, TUM foregoes this obligation on grounds of administrative efficiency.

The forms for submitting a request for approval/notification of outside professional activities are available under the keyword > **Nebentätigkeit (outside professional activities)** in the Services Directory.



3.2 General Principles for Outside Professional Activities

When beginning outside professional activities, the following principles must be observed with particular care and objectivity. This applies in particular to collaboration between a start-up and TUM.

- **Principle of separation:**

Formal and content-related distinction between outside professional activities and duties at TUM

TUM employees are not allowed to pursue tasks that form part of their core areas of work at the university as part of outside professional activities, nor are they permitted to carry out work at the university that is related to the start-up company.

In the event that a start-up emerges from a research project that continues in parallel, activities in the research project and the start-up are to be kept separate. This must also be communicated externally in a transparent and verifiable manner, especially to supporting and third-party funding agencies and other project partners. Establishing contact with TUM ForTe at an early stage to resolve open questions in relation to the individual constellation of research projects and company start-ups as well as relevant provisions governing publicly funded research projects is recommended.

Special case for company management: *If a business relationship between the company start-up and one or more TUM Professorships is planned, because of the duty of loyalty and possible conflicts*

of interest arising from such a double function, TUM professors or employees involved in or working on the company start-up are not permitted to serve as managing director of the start-up.

TUM professors and employees involved in the company start-up or working for the start-up cannot be involved as part of the start-up by entering into contracts with one or more TUM Professorships participating in founding the company. With regard to the company start-up, only such persons may be involved in such contracts who do not at the same time hold the Professorship or are an employee of the Professorship.

Special cases for test engineers/technical testing experts: *Exceptions to this arise from legal regulations applicable to test engineers and technical testing experts.*

- **Principle of Transparency:**

Notification or disclosure of tasks and functions in the company start-up as well as interest in a company when collaboration is planned

The intention of assuming a business management role, consultancy activities, membership in a body or board of the start-up must be disclosed when submitting a request for outside professional activities. The role of partner or silent partner with an equity holding in the start-up – also through an intermediary company – must only be disclosed or approved as an outside professional activity in the event of a (planned) collaboration with TUM.



Immunology research at the
Klinikum rechts der Isar and
TransaTUM (2021)

Photo: Astrid Eckert / TUM

Disclosing existing and planned relationships between TUM and a company start-up

Personal relationships of TUM professors or employees to a start-up must be disclosed as part of the application for outside professional activities. The business relationship between TUM and the start-up makes it indispensable to draft the contract transparently within the framework of what is permitted by law.

- **Principle of Documentation:**

Written and full documentation of all decisions and records

Collaboration between the university and the start-up must be completely documented by TUM ForTe and the responsible Professorship. This includes correspondence between the partners and TUM central administrative departments.

- **Multiple Controls Principle:**

Involvement of a (further) unit of TUM that is not involved in the company start-up in the above-mentioned exceptions

Notification of business relationships of the start-up with its own Professorship must be made to the Dean of the particular department or to the relevant School Executive Board.

3.3 Requirements for Approval of Outside Professional Activities

Approval for outside professional activities for a start-up can only be given if the activities are clearly differentiated from official TUM duties, i.e. research work or further scientific qualification.

The following applies:

- In the interest of avoiding conflicts with official duties, it must be ensured there is a formal and content-based separation of tasks of the pertinent employee at TUM and in the company being founded or tasks done during the start-up phase.
- When outside professional activities are being carried out, negative effects on official duties or conflict with official interests must be strictly avoided.
- When carrying out outside professional activities any impression must be avoided that these involve TUM or a TUM institution. For example, this excludes the advertising of products or services or other activities of the start-up on the website of the TUM Professorship.
- Effects on the full-time activity at TUM on grounds of personal connections are to be avoided.¹⁸ Business contacts arising out of the role of company founder, for instance, should have no effect on special discounted offers or on the transparent placement of orders outside provisions regulating public procurement applicable to the Professorship.¹⁹
- In the service of university-related tasks, the start-up and TUM may work together based on written contracts in accordance with TUM standards. Collaboration must be appropriate, for a limited time, and of a reasonable scope. This includes such matters as:
 - Research and development projects (TUM research and development contract or framework agreement on research and development)
 - Routine activities (TUM contract work or framework contract work)
 - Renting of rooms and infrastructure

¹⁸ For more information, visit: https://portal.mytum.de/tum/verwaltung/korruptionsvorsorge/KorruR_neu.pdf

¹⁹ For more information, visit: <https://portal.mytum.de/kompass/index.html>

3.4 Involvement of Professors and Senior Staff in Company Start-Ups

Outside professional activities by TUM professors and senior staff in company start-ups are possible if they have been “organically” involved in the early stages of the start-up process and made specific contributions, such as sharing parts of inventions,

contributing to the development of technologies, or providing valuable know-how.

If such specific contributions are not made, this poses the risk of being accused of accepting or granting an advantage while in office (§§ 331ff. StGB) or gaining an advantage in competition.

The guiding principles for possible collaboration when professors or senior staff join a start-up are summarized in the following overview.

GUIDANCE ON INVOLVEMENT IN A COMPANY START-UP²⁰

TUM professors/senior staff ²¹ joining company start-ups initiated by their staff/students and collaboration with the professorship		TUM professors/senior staff ²² joining other companies
Company start-ups with specific contributions of substance in the start-up by those joining the start-up	Company start-ups without specific contributions of substance to the start-up by those joining the start-up	
<p>The basic requirement for working with the staff member’s own Professorship is that there is no supervisory relationship in the sense of examination regulations (e.g., BSc/MSc and doctoral theses) in place.</p> <p>It is possible to assume an advisory role with restrictions and/or to be involved in the company without having a managerial role <u>if the contracts are also signed by a neutral party</u> (preferably the Dean, School Executive Board or a member of university management responsible for the relevant discipline).</p>	<p>A constellation like this is not possible due to the inadmissibility of involvement/participation in the start-up without a substantive contribution to the company start-up.</p> <p><i>Note: As soon as the status of student/employee ends, then the provision on “other companies” applies (see right-hand column).</i></p>	<p>The basic requirement for working with the staff member’s own Professorship is that there is no supervisory relationship in the sense of examination regulations (e.g., BSc-/MSc and doctoral theses) in place.</p> <p>It is possible to assume an advisory role with restrictions and/or to be involved in the company without having a managerial role <u>if the contracts are also signed by a neutral party</u> (preferably the Dean, School Executive Board or a member of university management responsible for the relevant discipline).</p>

²⁰ Otherwise, the outline conditions of these guidelines apply.

²¹ This applies analogously to the involvement of relatives and close family members.

²² This applies analogously to the involvement of relatives and close family members.



The lead authors of a work on “immunity” to mechanisms of action of the cancer medication imiquimod: TUM Institute of Clinical Chemistry and Pathobiochemistry
 Photo: Andreas Heddergott / TUM

To the extent that professors or senior staff and other persons involved in the start-up enterprise (students, doctoral candidates) have no supervisory relationship in the sense of exam regulations (e.g., BSc/MSc or doctoral theses), collaboration with the relevant Professorship is possible subject to the following conditions:

- **Activity as an advisor to the company start-up (scientific advisor or similar role):**

As a rule, outside professional activities as an advisor are subject to compliance with statutory provisions governing such outside activities (in particular, the principle of separation, see section 3.2 above). In the case of planned contractual relationships with TUM, professors/senior staff intending to serve in an advisory capacity must notify the relevant TUM units (TUM ForTe) and, if necessary, funding agencies and other partners, as early as the bidding phase, or when submitting the application.

- **Holding an interest in the business and thus influencing the company’s behavior as an organ of the company:**

Working with the employee’s own Professorship can be approved, as a rule, provided that such collaboration – in order to prevent conflicts of interest – is not connected with management of the company (as managing director, head of R&D, etc.) and no responsibility exists for the actions of either side.

In both cases, the contracts must also be signed by another neutral party such as the Dean, the School Executive Board or spokesperson of the Institute. The general principles of collaboration between a start-up company and TUM can in no way be avoided by involving relatives or close family members or using a trusteeship arrangement.

For more information, please see the TUM Services Directory:

Applications for outside professional activities:

> https://portal.mytum.de/kompass/index_html

In addition to TUM Start-Up Consulting, our staff in Human Resources can provide advice at the respective TUM campus:

Munich Campus: Unit 21 or 22

Garching Campus: Unit 23

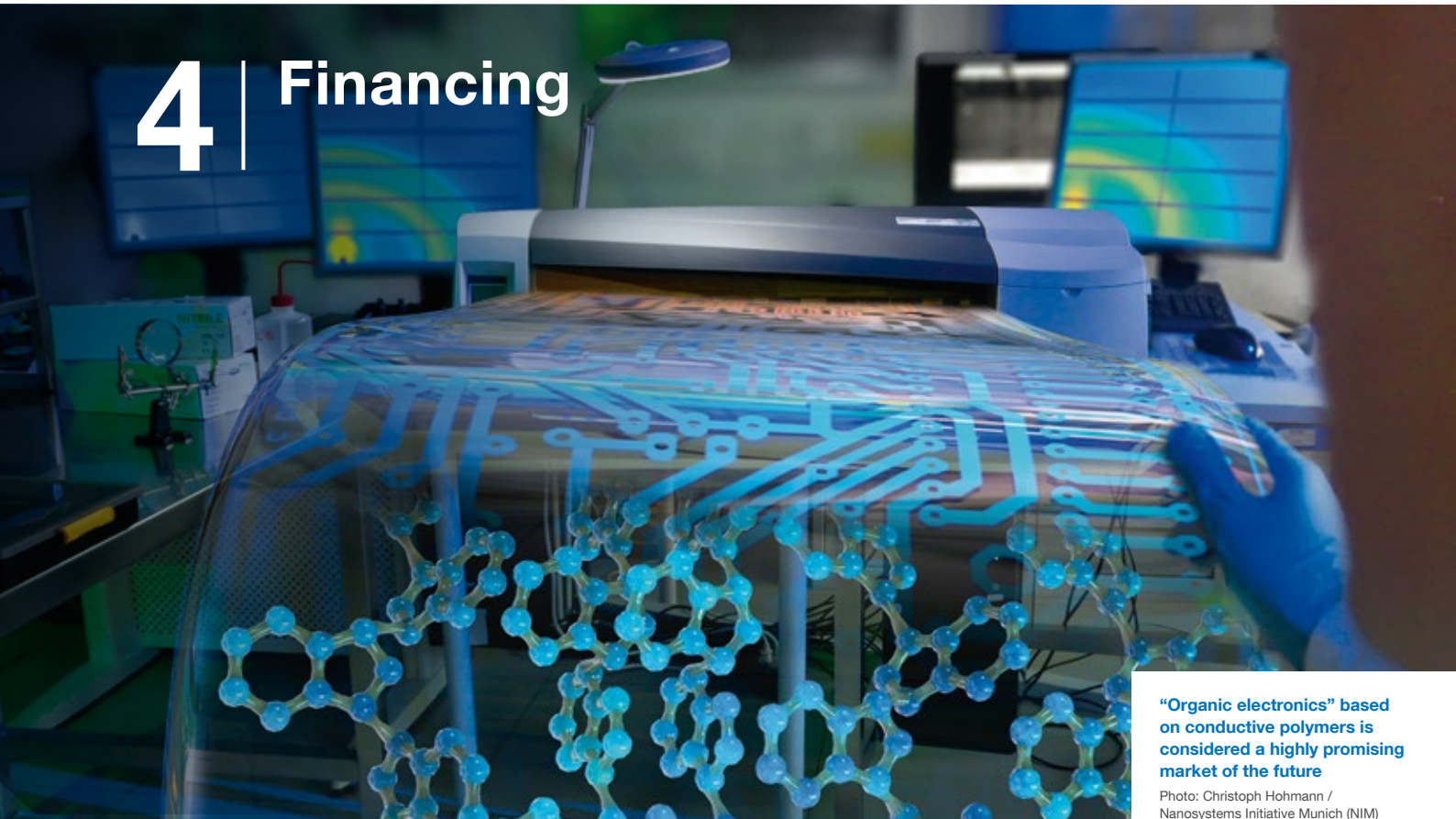
Weihenstephan Campus: Unit 24



Innovative building envelope at the TUM Chair of Architectural Design and Conception

Photo: Andreas Heddergott / TUM

4 | Financing



“Organic electronics” based on conductive polymers is considered a highly promising market of the future

Photo: Christoph Hohmann / Nanosystems Initiative Munich (NIM)

TUM advises and supports company founders in the area of financing and when applying for state-subsidized funding programs or private sector funding.

4.1 State Funding Programs

People interested in starting up a new company can obtain support from the following state funding programs:²³

- **EXIST Start-Up Grant Program**

The EXIST Start-Up Grant program provides support to innovative, technology-based or knowledge-based start-up initiatives originating within the university. The grants are limited to a period of up to 12 months. Funding is provided for personnel expenses in the form of grants for up to three individuals, as well as for administrative expenditures and business coaching, entrepreneurial qualification measures, and consulting services for founders of start-ups.

Contact:

Send inquiries to TUM Start-Up Consulting at:
> gruendungsberatung@tum.de

Please note when submitting an application that:

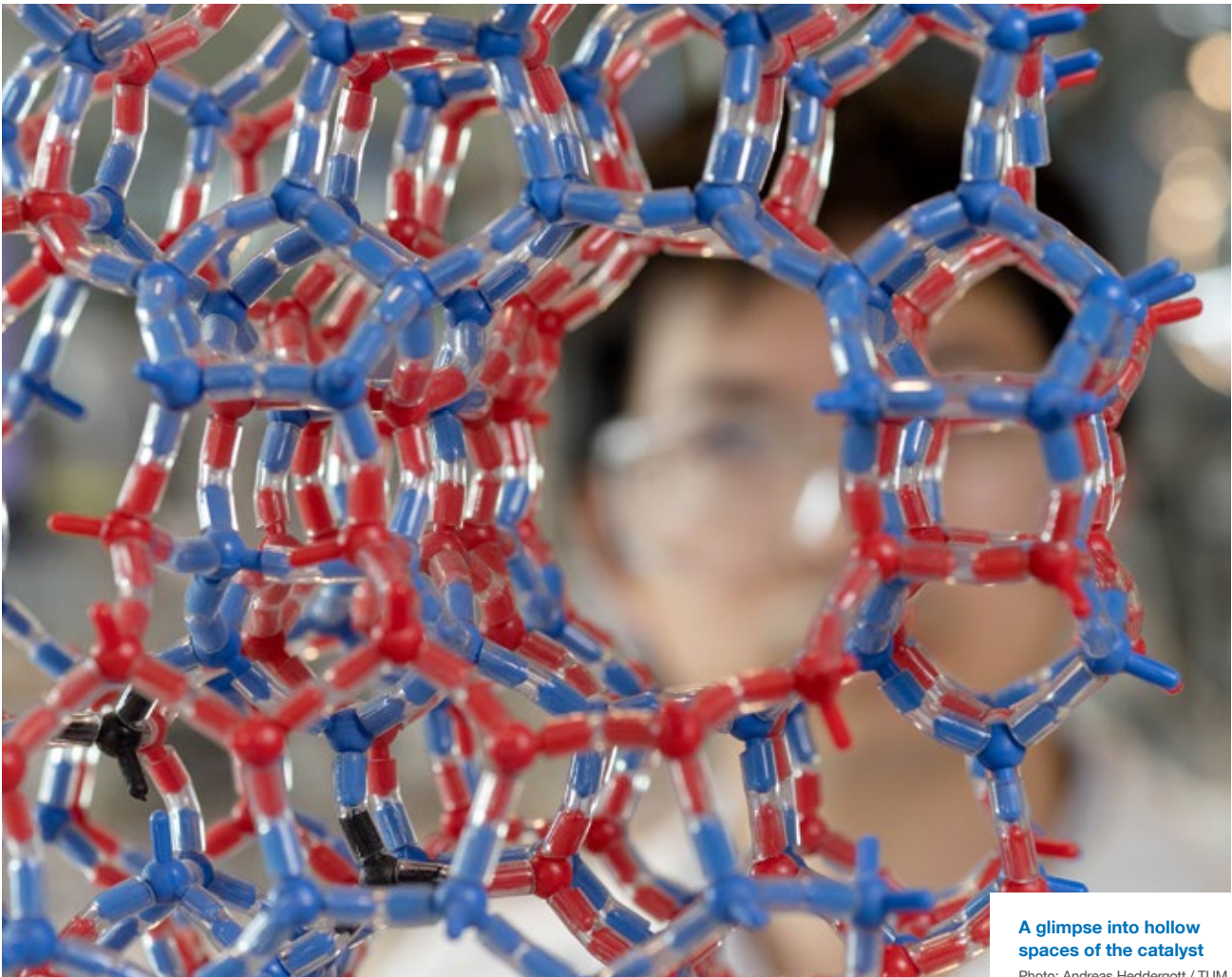
- Prior consultation with TUM Start-Up Consulting is mandatory.
- Applicants must have a TUM professor as their mentor.
- TUM assumes the role of applicant.
- The application is submitted to Project Management Jülich (PTJ).
- Intellectual property (IP) and background issues must be settled with TUM ForTe Patents & Licenses prior to submitting an application.

The application forms can be accessed under
> www.exist.de/EXIST/Navigation/EN

²³ The list is only an excerpt, and the description of the funding regulations only a temporary example. Regular changes are made not only to funding regulations but also to requirements for applicants, both of which must be taken into account when submitting an application.

Execution:

- TUM is the recipient of funding.
- The grant contract is entered into by the start-up founder and the Professorship of the EXIST mentor. The administration of the mentor's Professorship carries out the related budgetary and financial calculations.
- TUM Finance (ZA 3) sends written information material regarding the administration of resources to the mentor's Professorship.
- EXIST grant funds are treated as external funding when allocating performance-related funds of the mentor's Professorship.
- Taxes on EXIST grant funds must be paid by the grant recipient, who is directly responsible for social security contributions.



A glimpse into hollow spaces of the catalyst

Photo: Andreas Heddergott / TUM

• EXIST Transfer of Research

EXIST Transfer of Research provides support during **phase I funding** for a period of up to 18 months for exceptional research-based start-up projects that involve resource-intensive and high-risk development. With the approval of an expert jury, funding is possible for up to 36 months for highly innovative projects that are demonstrably highly time-intensive. Funding is available for personnel expenditures or costs for a start-up team of up to four members. This group must be the original team of researchers, consisting of three academic staff, or two academic staff and a technical/lab assistant, plus a colleague with managerial competence. In addition, personnel expenditures for student assistants and administration costs of up to €250,000 qualify for funding. In exceptional, well-founded cases, these expenses or a budgeted sum of €250,000 may be exceeded, if the funds are the decisive factor for the success of phase I funding (demonstration of technical feasibility) and express approval has been given by the jury of experts. An application for **phase II funding** may be submitted after completion of phase I funding.

Contact:

Send inquiries to TUM Start-Up Consulting at:
> gruendungsberatung@tum.de

Please note when submitting an application that:

Phase I funding:

- Consultation is carried out by TUM Start-Up Consulting together with TUM ForTe Patents & Licenses
- Application submission:
 - The application is submitted by the relevant academic unit.
 - Step 1 – Project sketch:
 - In Phase 1, the project sketches of the start-up teams are submitted by the university/research institute (Professorship).
 - Step 2 – Fully completed application forms:
 - After a positive evaluation of the project sketch, applicants are asked to present the business idea to an expert jury and submit a formal application via a TUM Professorship.

Phase II funding:

- The application is submitted by the newly founded company.

Execution:

Phase I funding:

- TUM is the recipient of funding.
- The founders are TUM employees. The TUM employees continue to work as full-time TV-L employees during the period of funding in accordance with the Fixed-Term Academic Employment Law (*Wiss-ZeitVG*) or the Act on Part-Time and Fixed-Term Work (*TzBfG*).
- TUM Finance (ZA 3) sends written information material regarding the administration of resources to the mentor's Professorship.
- EXIST grant funds are treated as external funding when allocating performance-related funds of the mentor's Professorship.
- Intellectual property (IP) and background issues must be settled with TUM ForTe Patents & Licenses prior to submitting an application.
- A statement of intention (Appendix 1) is submitted in accordance with the TUM standard regarding
 - Further use of technical equipment that has been purchased or its acquisition (TUM Start-Up Consulting)
 - Project-specific intellectual property rights (TUM ForTe Patents & Licenses)

Phase II funding:

The preparation of phase II funding should begin six months prior to the end of phase I funding. The application for phase II funding is not submitted by TUM but by the newly founded company itself.

Application forms can be accessed under

> www.exist.de/EXIST/Navigation/EN



PUMA three-axis spectrometer of TUM
Photo: Volker Lannert / DAAD



A lab at TUM Campus
Straubing for Biotechnology
and Sustainability

Photo: Andreas Heddergott / TUM

• Start-Up Initiative for Biotechnology (GO-Bio)

Through the GO-Bio Competition, the Federal Ministry for Education and Research supports teams of researchers prepared to start up a company with high commercial or clinical potential in the field of life sciences. The GO-Bio funding measure initially identifies and develops existing life-science research approaches that clearly demonstrate potential for innovation.

Contact:

Send inquiries to TUM Start-Up Consulting at:
> gruendungsberatung@tum.de

Please note when submitting an application that:

Phase 1:

- A proof-of-concept is drafted with specific information about commercialization.
- Founders at TUM are authorized to file an application.
- A prerequisite for submitting an application is written confirmation by the TUM school, department, or research center of its willingness to accept the start-up team and to take account of technology transfer activities when measuring performance.
- The founders are TUM employees. The TUM employees continue to work as full-time TV-L employees during the period of funding in accordance with the Fixed-Term Academic Employment Law (*Wiss-ZeitVG*) or the Act on Part-Time and Fixed-Term Work (*TzBfG*).

- A further prerequisite is that IP issues have been clarified with TUM ForTe Patents & Licenses.
- TUM Start-Up Consulting arranges for a letter of support from the TUM Board of Management, which must be requested at least four weeks before the application deadline.

Phase 2:

- A proof-of-technology document is prepared and a draft version for proof-of-market strategies developed.
- Both TUM and the start-up company resulting from phase I funding are authorized to submit an application.
- Funding is granted to individual proposals of the start-up enterprise or partner-based initiatives of the start-up enterprise with the founding university.
- TUM Start-Up Consulting should be contacted at least six months prior to submitting the application in order to obtain agreement with TUM on the required intellectual property rights and other types of collaboration.

Application forms can be accessed under
> www.go-bio.de/gobio/en



Research at the Transla-TUM – Central Institute for Translational Cancer Research

Photo: Andreas Heddergott / TUM

• FLÜGGE

With FLÜGGE (Förderprogramm zum leichteren Übergang in eine Gründerexistenz / Funding Program Facilitating the Transition into a Start-Up Venture) the Bavarian State Ministry of Economic Affairs, State Development and Energy (StMWLE) supports start-up founders

- In securing their innovative (digital) business model that may become a sustainable business start-up
- Who have not been able to complete their start-up project within the framework of EXIST funding due to particular technological challenges and have not yet been able to establish a company, or
- Whose technologically innovative, advanced high-risk project was not granted funding in the EXIST Start-Up Grant program.

Limited to a maximum period of 18 months, the funding includes a scholarship for those intending to start up a company and the assumption of the university's material expenses including licenses, software and similar costs, fees and other start-up-related expenses for consulting services, such as start-up specific support from start-up support networks, as well as investments.

Contact:

Send inquiries to TUM Start-Up Consulting at:
> gruendungsberatung@tum.de

Please note when submitting an application that:

- TUM is authorized to submit the application. The (two-stage) application must be overseen by TUM Start-Up Consulting.

- The application must be completed using the required form and submitted in writing through TUM Start-Up Consulting by the deadlines published by the project sponsors.²⁴ There are generally up to two such deadlines each year.
- The grant contract is entered into between the start-up founder and the Senior Vice President for Research and Innovation. The administration of the mentor's Professorship carries out the related budgetary and financial calculations.
- If a contract of employment with TUM exists in addition to the scholarship award, the contract may not exceed a half-time position. The planned start-up activities must be clearly separated from official duties with TUM.

Application forms are available on the project sponsor's website > www.bayern-innovativ.de/en/fluegge

Execution:

- Decisions on granting funds are made based on the recommendation of an expert commission.
- The expert commission compares and assesses the submitted proposals. The decisive factor for a positive decision are the prospects of the start-up being successful over a longer period of time.
- The Bavarian Ministry of Economic Affairs, Regional Development and Energy (StMWLE) makes its decision on this basis and grants funding to approved applications.

²⁴ The project sponsor is Bayern Innovativ – Bayerische Gesellschaft für Innovation und Wissenstransfer mbH, Am Tullnaupark 8, 90402 Nuernberg. E-mail: kontakt@projektraeger-bayern.de, Tel. 0800-0268724

4.2 Private Sector Funding

In addition to state-funded support programs, TUM provides support to business start-up founders through numerous other programs:

• TUM IdeAward

The TUM IdeAward is an internal idea competition for academic staff and the student body at TUM designed to encourage the implementation of innovative and competitive start-ups. The three award winners of the competition receive financial support from the Zeidler Research Foundation and coaching from TUM Start-Up Consulting and UnternehmerTUM. Competition prize awards amount to 1st place €15,000, 2nd place €12,500 and 3rd place €10,000.

Contact:

Send inquiries to TUM Entrepreneurship at
> ideaward@tum.de

• BayStartUP

BayStartUP is an association for founding, financing and growth in Bavaria funded by the Bavarian State Ministry of Economic Affairs, State Development and Energy (StMWLE) and Bavarian industry. Among other things, BayStartUP organizes special business plan competitions. As participants in the business plan competitions, the start-up founders complete an analysis of their situation prior to starting up a company and receive feedback from the competition's jury of experts.

> www.baystartup.de

• ERC – Proof of Concept

The ERC Proof of Concept Grant (European Research Council-funded PoC) provides support to researchers who have already received an ERC grant. Recipients of ERC funding can submit an application for this additional financial support in order to determine the innovative potential of ideas resulting from their ERC-funded frontier research project.

Contact:

TUM ForTe European and International
> **Research funding support**
(Forschungsförderung)

Please note when submitting an application that:

- Only scientists who have already received an ERC Starting Grant, ERC Consolidated Grant or ERC Advanced Grant are authorized to submit an application.
- These scientists submit the application themselves but must do so in connection with a host institution – in this case, TUM.

Required application documents:

- PoC-Proposal (Part B)
- PoC-Host Institution Commitment Letter
- PoC-Ethical Issues Annex

The application forms are available at

> erc.europa.eu/funding/proof-concept

TUM ForTe offers support with the ERC – Proof of Concept together with TUM Finance (ZA 3) and the TUM Legal Office (ZA 5).

Further information on selected funding opportunities:

EXIST Business Start-Up Grant

> www.exist.de/EXIST/Navigation/EN/Home/home.html

EXIST Transfer of Research

> www.exist.de/EXIST/Navigation/EN

GO-Bio > www.go-bio.de/gobio/en

FLÜGGE

> www.bayern-innovativ.de/en/fluegge

ERC – Proof of concept

> erc.europa.eu/funding/proof-concept

TUM IdeAward > www.tum.de/en/innovation/entrepreneurship/news-events/tum-ideaward

Initiative für Industrial Innovators

> www.industrialinnovators.eu

Selected financing opportunities:

UnternehmerTUM Venture Capital Partners

> www.unternehmertum.de/en/services/uvc-partners

High-Tech Gründerfonds

> www.htgf.de/en

TUM Start-Up Consulting advises on financing and provides support in preparing applications for the various programs.

5 | Use of Facilities and Equipment



Research at the TUM Chair of Carbon Composites in the Processing Lab on the Ludwig Bölkow Campus in the area of additive manufacturing

Photo: Andreas Heddergott / TUM

TUM makes it possible for students and researchers planning to launch a new business to have access to university facilities for their start-up venture. A distinction must be made when accessing TUM facilities, whether the university-based start-up initiative is being carried out within or outside a state-subsidized funding program and whether a company has already been founded. Access to technical equipment is granted in accordance with the applicable financing conditions. A TUM postal address should never be used as a business address. Whether they are state-subsidized or not, doing so is not possible for company start-ups, not even temporarily.

5.1 Use of Facilities in State-Subsidized Start-Up Programs

Depending on the funding sponsor, there are various requirements for the use of TUM facilities for state-subsidized start-up funding programs.

- **FLÜGGE Scholarship, EXIST Start-Up Grant, and EXIST Transfer of Research:**

Activity connected with starting up a business is considered an official duty at TUM. This is why regulations governing outside professional activities when using TUM facilities do not apply to company founders.

However, state-subsidized funding programs based on employment contracts do not include the use of further TUM staffing resources free of charge.



Acoustofluidics lab,
cell trapping device for
translational cancer
research, TUM

Photo: Andreas Heddergott / TUM

If TUM employees who are not part of the founder team carry out work outside working hours for FLÜGGE/EXIT start-ups, for instance as advisors or research supervisors, notification to or approval from the Human Resources (ZA 2) is required.

During the first year:

- The use of facilities and equipment free of charge (rooms, labs, workshops, computer centers, technical equipment, etc.) is permitted as long as the company has not yet been founded.
- A written agreement on use is entered into with TUM through TUM Start-Up Consulting.
- Notification of outside professional activities is not required if the purpose of employment is a start-up and thus part of an employee's official duties.

Starting in the second year:

- A contractual agreement must be entered into for continued use of facilities – either by means of a lease agreement (Contact: TUM ForTe) or as part of an additional written agreement. A prerequisite for the agreement is presentation of confirmation from the relevant TUM school, department, or research institute that during the start-up phase the department/school does not require the space involved.

- Agreements on use and similar agreements with those starting up a company must be based on normal written contracts based on prevailing market conditions. More detailed information on this is available from the TUM department/school administration or TUM Finance (ZA 3).
- The start-up activities and start-up ventures as part of state-subsidized programs based on employment contracts are official duties and not outside professional activities. Regulations on using resources in relation to outside professional activities are not applicable.

• GO-Bio:

Use of facilities is agreed with TUM Forte based on the TUM standard. A statement about use of facilities is required when submitting the application.

Contact:

Send inquiries to TUM Start-Up Consulting at:
> gruendungsberatung@tum.de

A use agreement for rooms is drawn up via
TUM ForTe: > research-cooperations@tum.de

5.2 Use of Facilities Prior to Submitting an Application or Outside a State-Subsidized Start-Up Program

A formal arrangement for the use of rooms and additional infrastructure (labs, workshops, computer centers, technical equipment, etc.) by TUM employees in their capacity as company founders (see Chapter 3 above) outside their official duties must be contractually regulated in accordance with TUM standards under appropriate, prevailing market conditions.

A prerequisite for such an agreement is presentation of confirmation from the relevant TUM school, department, or research institute that during the start-up phase the department, school, or research institute does not require the space or infrastructure resources involved. In principle, the Temporary Employment Law (AÜG) prohibits the temporary hiring out of personnel.

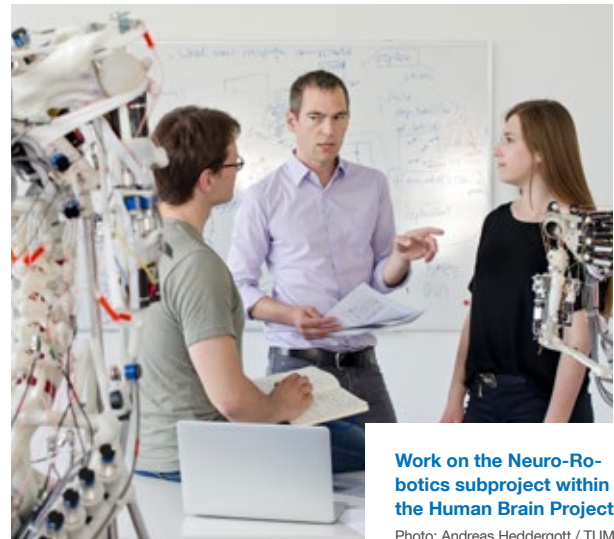
Preferential treatment for the use of resources for outside professional activities is in itself already ruled out in light of equal treatment or avoiding discrimination toward company founders supported by program funding. Once the company has been founded, a standard written contract is entered into between TUM and the start-up (see 5.3 below).

Contact:

Send inquiries to TUM ForTe at:

> research-cooperations@tum.de

»BUSINESS START-UPS ARE SUPPORTED IN THE ONGOING DEVELOPMENT OF THEIR TECHNOLOGIES THROUGH ACCESS TO EXCELLENT TUM INFRASTRUCTURE.«



Work on the Neuro-Robotics subproject within the Human Brain Project
Photo: Andreas Heddergott / TUM

5.3 Use of Infrastructure by a Company after Foundation

If a company has already been founded, TUM assists start-up founders by providing access to its facilities subject to the following conditions:

- Use is only possible if capacity is available and neither TUM research nor teaching are adversely affected by such use and if the source of financing of the facilities to be used allow third-party use.
- Presentation of confirmation from the relevant TUM school, department or research institute that they do not require the resources involved is a prerequisite for a use agreement with appropriate conditions, including compensation for use at prevailing market prices subject to VAT.

In principle, the Temporary Employment Law (AÜG) precludes the temporary hiring out of personnel. In light of this, it is only possible for TUM personnel to work for the newly founded start-up as part of the respective relevant TUM contracts or as part of outside professional activities by staff members not within normal working hours.

Contact:

TUM ForTe at this e-mail address

> research-cooperations@tum.de

5.4 Transfer of Acquired Inventory/Equipment

Transfer of equipment purchased using state-subsidized funds to the company is possible depending on the particular conditions of the grant funding.

- **EXIST Start-Up Grant:**

After successful completion of the funded phase, technical equipment acquired using resources from the respective start-up grant having a value of up to €50,000 can be passed onto the newly founded company with permission to use it free of charge.

A decision in this regard is normally made by the TUM Professorship in question. In this context, it is necessary for the founder team to present a *de minimis* self-declaration. If the amount exceeds the contribution limit, the approval of the Bavarian State Ministry of Science and the Arts (*StMWK*) is required.

- **EXIST Transfer of Research:**

After successful completion of EXIST Transfer of Research phase I funding, the newly founded company can procure equipment acquired with program funds at prevailing market rates up to a value of €50,000. Rates prevailing in the market are determined by TUM ForTe together with TUM Finance (ZA 3). A deviation from such rates favoring the founder team is allowed by the university or research Institute if the difference from prevailing market conditions is allowed by the university or research institute as *de minimis* aid.²⁵

In this context, it is necessary for the founder team to present a *de minimis* declaration. If the amount exceeds the contribution limit, the approval of the Bavarian State Ministry of Science and the Arts (*StMWK*) is required.

- **FLÜGGE:**

Assets having a value of up to €50,000 that have been procured using FLÜGGE funding, including licenses, software, and similar items, can be handed over to the founders or the newly founded company without consideration only in a few individual cases as *de minimis* aid in accordance with *de minimis* regulations applicable in the given case, or passed on to them for further use free of charge.

In exceptional cases, this *de minimis* aid may be a larger amount with the prior consent of the Bavarian State Ministry of Science and the Arts.

»AFTER SUCCESSFUL COMPLETION OF THE FUNDED PHASE, ACQUIRED EQUIPMENT WORTH UP TO €50,000 CAN BE PASSED ON TO THE NEWLY FOUNDED COMPANY BASED ON AN AGREEMENT GRANTING PERMISSION TO USE IT FREE OF CHARGE.«

- **GO-Bio:**

The transfer of technical equipment must be negotiated with the specific TUM department and project sponsor separately.

Contact:

Send inquiries to TUM ForTe at:

> research-cooperations@tum.de

Further information on the use of facilities:

> [Remuneration for use of state resources](#)

TUM Start-Up Consulting is the first contact for questions about permitting the use or transfer of TUM facilities and equipment.

As centers of knowledge exchange, networking and prototyping, **TUM Venture Labs** have office and seminar rooms, as well as laboratory space and workshops, available for use by those interested in starting up a company and by founder teams.

For more information about our offer, visit

> www.venturelabs.tum.de/en/venturelabs/home/

²⁵ Commission Regulation (EU) No 1407/2013 of 18 December 2013

6 | Communication on Collaborating with TUM



A scientist behind a glass separation screen on the premises of TranslaTUM
Photo: Andreas Heddergott / TUM

TUM works with start-up ventures and other companies in scientific and technology collaborations to ensure the successful and sustainable development of TUM start-ups.

Collaboration between TUM and a company is conducted while complying with statutory conditions and observance of TUM standards on the basis of a written contract.²⁶

All questions and issues related to companies cooperating with TUM are dealt with in the brochure
> **TUM Research and Commercial Cooperations**

Employees of the start-up who are also still employed at TUM must clearly document a strict separation of work for the start-up and official duties carried out for TUM (see also section 3 above).

TUM ForTe is the initial contact for any inquiries about collaboration between start-ups and TUM.

Contact:

Send inquiries to TUM ForTe at:

> research-cooperations@tum.de

• External Links to a Company on the TUM Website:

As a state institution, TUM is allowed to advertise companies on its website as part of its commercial operations. This form of sponsoring is fee-based (plus any applicable statutory VAT) while observing the principle of impartiality for state-run institutions. The TUM “Sponsoring Agreement” template is available for such an arrangement.

TUM supports its founders by featuring excellent start-up ventures on the TUM website (see “TUM Founders Gallery”).²⁷

²⁶ <https://www.tum.de/en/innovation/industry-liason-office>

²⁷ <https://www.tum.de/en/innovation/entrepreneurship/for-alumni-corporates/companies-founded-a-z>



The TUM Boring team – Innovation in Tunneling e.V presents its prototypes for a tunnel boring machine

Photo: Andreas Heddergott / TUM

• **Links to TUM on a Company Website:**

For reasons related to taxation and legal liability, direct URL links to TUM website pages on the (business) homepage of a company is not permissible.

• **Using the TUM Logo:**

The special TUM logo for use by its partners²⁸ may be used by start-up ventures that were/are being mentored or advised within the TUM entrepreneurship founder network, subject to compliance with the following conditions:

- Requests must be submitted in writing to research-cooperations@tum.de
- Confirmation from TUM Start-Up Consulting about mentoring/advice provided by the TUM entrepreneurship founder network

As its owner, TUM can withdraw permission to use the logo at any time.

Contact:

Send inquiries to TUM Start-Up Consulting at: gruendungsberatung@tum.de

More information on collaborating with TUM is available in the “TUM Research and Commercial Cooperations” brochure:

> www.tum.de/fileadmin/w00bfo/www/Wirtschaft/Broschueren_Kooperationen/130318_TUM_CCC_Forsch-Wirt_Brosch-en.pdf

For questions regarding research cooperation, initial contact with TUM is via

> research-cooperations@tum.de

²⁸ www.tum.de/cd

7 | Use of Intellectual Property



TUM research on
human-machine
communication (2014)

Photo: Andreas Heddergott / TUM

TUM employees and students planning a start-up and needing to use TUM intellectual property, such as inventions, patents, or software, must contact TUM ForTe Patents & Licenses (P&L) in good time. TUM has prepared a founder-friendly IP road map to provide support to potential entrepreneurs with their start-up venture. TUM ForTe P&L markets TUM technologies in collaboration with exploitation partners, such as the Bayerische Patentallianz GmbH (BayPAT), and is responsible for drawing up the commercial conditions of exploitation contracts (licensing and sales contracts) in accordance with TUM patent policy.²⁹

7.1 General Information

The TUM Inventor Guidelines³⁰ lay out detailed rules and answer the most important questions:

Who is the inventor?

An inventor is a person who has made an invention and fulfills the criteria to qualify as an inventor in accordance with the Patent Act³¹ and the Employee Inventions Act³² as enacted by the Federal Republic of Germany.

What is an invention?

An invention describes all patentable or potentially patentable ideas, developments and/or corresponding know-how, and underlying or associated technology needed for the application of the idea.

What is a patent?

A patent is an exchange agreement between the inventor and the public governing the disclosure of the

²⁹ <https://www.forte.tum.de/en/forte/technology-transfer/patents-and-licenses/tum-ip-policy/>

³⁰ <https://www.forte.tum.de/en/forte/technology-transfer/patents-and-licenses/>

³¹ See: www.gesetze-im-internet.de/patg/

³² See: www.gesetze-im-internet.de/arbnerfg/

invention to the general public (disclosure function) and the exclusive right to commercial exploitation of the invention for a specified period (monopoly effect). This essentially means that the proprietor of the patent completely and to the best of his or her knowledge discloses information about the creation and use of an invention and in return is granted exclusivity rights for the commercial exploitation of this invention by the patent office. Patent protection of proprietary rights is often the prerequisite for successful commercialization. When a given patent expires, so does the proprietor's exclusive right, and the disclosed information remains accessible to the general public.

Why must an invention be reported to TUM ForTe P&L?

All inventions made by TUM employees serving in their official capacity and/or arising as a result of experience gained therein must be reported to TUM ForTe P&L by the inventor in a timely manner prior to publication. TUM is entitled to secure and exploit the intellectual property rights to such an invention resulting from official work on behalf of the university.³³

Inventors do not assume a financial risk in this regard, because all costs related to applying for a patent are borne by TUM. The inventor is entitled to remuneration for an invention.

Inventions defined as free inventions need only to be reported to TUM ForTe P&L. The most important prerequisites for patentability of an invention are:

- **Novelty:**

The invention must be distinct from the state of the art in technology and must go beyond the knowledge made available to the public by written or verbal description, use, or any other means.

- **Commercial applicability:**

It must be possible to use the invention commercially.

- **Inventive step:**

The invention is not allowed to be obvious to a person skilled in the art in the light of the technical field in question.



In the virtual wind tunnel, TUM Chair of Ergonomics/Sport Equipment and Sport Material Research Group, Garching (2014)

Photo: Strömungsgrafik: TUM/FluidDyna, Bildbearbeitung: Mladen Penev, CGI: Christo Penev

³³ An invention that results from activity (as an order or assignment) at the university or is materially based on experience from working at the university. (§4(2) ArbNErFG)



The anechoic chamber at the Professorship for audio signal processing at the TUM Department of Electrical and Computer Engineering

Photo: Astrid Eckert / TUM

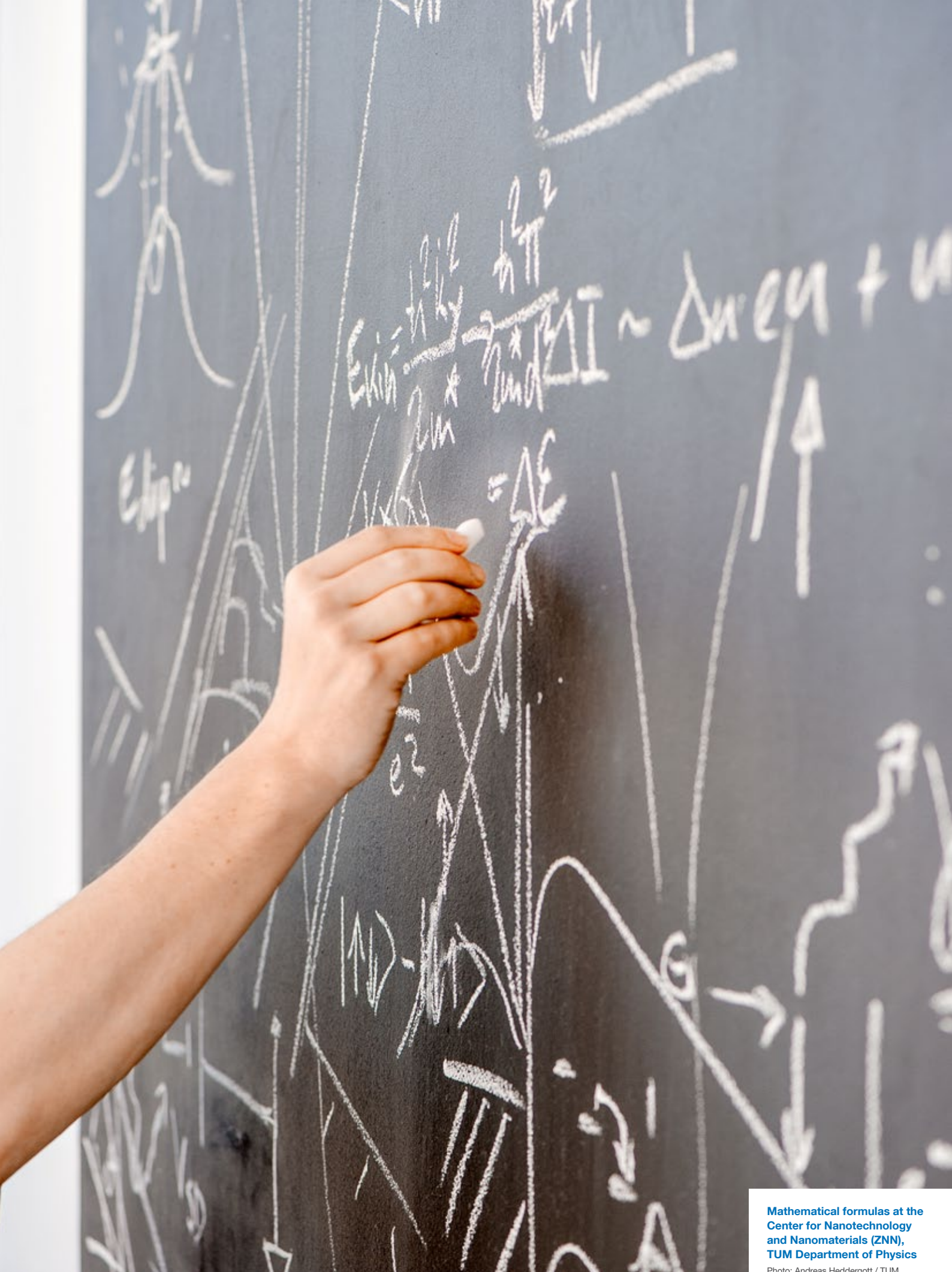
**»THANKS TO TUM'S IP POLICY,
THE OFTEN COMPLEX
NEGOTIATIONS WITH
START-UPS ARE STREAMLINED
AND SHORTENED.«**

7.2 IP Road Map for Founders

TUM has prepared an IP road map as a structured approach for handling intellectual property (IP) for university-based company start-ups. The IP road map balances the interests of founders, of TUM, and also those of financial backers. At the same time, the frequently complex negotiations with start-up and due diligence related to the topic of IP are considerably simplified.

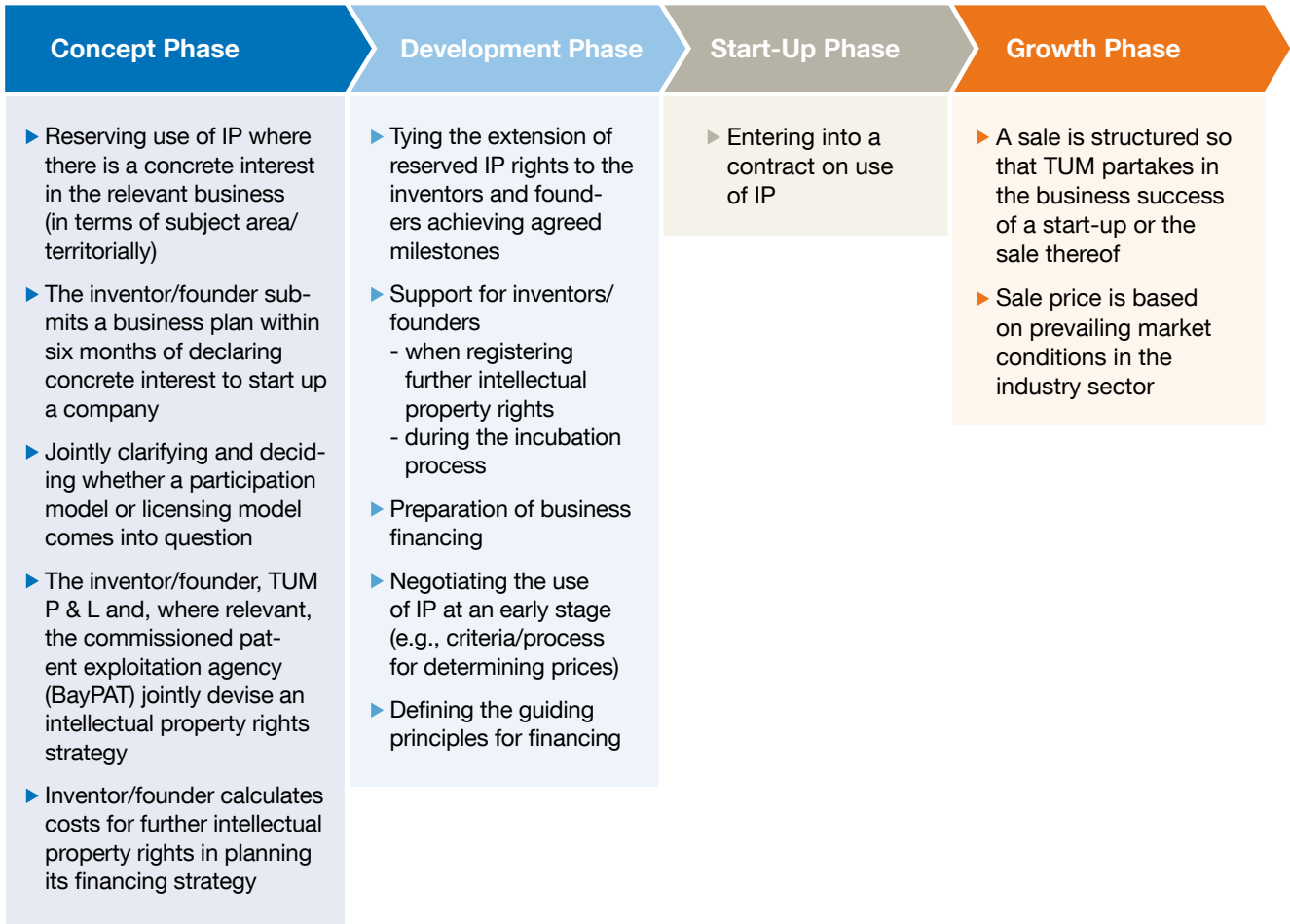
TUM is required by law to commercialize intellectual property based on prevailing market rates. That is why when agreeing on pricing, no distinction is made between licensing or the sale of IPRs to a start-up company or an established company.

Payment terms can be negotiated as necessary in consideration of the founders' interests. There are various models for remuneration which can also be combined. The multi-stage process described below regulates the cooperation between the founders, TUM (as the IP holder), and financial backers in a sequence of phases in the start-up process:



Mathematical formulas at the Center for Nanotechnology and Nanomaterials (ZNN), TUM Department of Physics
Photo: Andreas Heddergott / TUM

THE TUM START-UP PROCESS



• Concept Phase:

In dialog with TUM Start-Up Consulting, TUM Venture Labs, TUM ForTe P&L, and the relevant Chair/ Professorship, inventors/founders assess the feasibility of their start-up venture. The IP is reserved for the start-up, subject to the following conditions:

- There is concrete interest in starting up a company by the founder
- There are no third-party rights to the IP
- The founder regularly provides evidence of ongoing progress of the start-up project (e.g., via a pitch deck, public funding, status updates)

As an entrepreneurial university, TUM re-invests a substantial portion of financial returns from IP exploitation in funds for start-up ventures and in further

development of TUM IP made available to these business ventures. There are two models (with pilot phase testing starting 01/2022) for the start-up initiative for providing access to IP from which the founder can choose:³⁴

1. Fast-Track Model

A distinction is made here between patents and copyrights as underlying IP:

Patents:

- TUM holds 7% virtual shares during the first priced round of financing
- An appropriate, low initial upfront-payment
- Revenue or per-unit licenses at the lower range of industry-specific royalty rates in relation to

³⁴ Further comments on the individual models are found in the TUM IP Policy. <https://www.forte.tum.de/en/forte/technology-transfer/patents-and-licenses/tum-ip-policy/>

product sales revenue based on licensed IP (see TUM IP Policy).

- For products requiring regulatory approval (especially in the field of healthcare), appropriate milestone payments
- The immediate transfer of the IP upon presenting a sustainable business plan and the mutual consent of TUM and the start-up venture.

Copyrights:

- TUM holds 5% virtual shares during the first priced round of financing
- An appropriate, low initial upfront-payment
- The immediate transfer of the IP upon presenting a sustainable business plan and the mutual consent of TUM and the startup venture.

2. Individual Model

Individually negotiated licensing and participation model after an in-depth assessment.

In both models, TUM ForTe P&L or, where applicable, a service provider chosen by TUM ForTe, assumes responsibility for operational implementation. Conditions are specified in two separate contracts (a shareholder and a licensing agreement).

• Development Phase:

Concrete implementation of the start-up venture begins in the development phase. This generally commences when initial financing from a funding program begins. Founders undertake to develop the venture based on individual milestones. In return, TUM ForTe P&L extends the reservation on exclusive rights to IP for the start-up venture as appropriate for the particular industry sector and subject to third-party rights. If the agreed milestones fail to be reached, reservation of the IP can be withdrawn by TUM ForTe P&L. However, all parties involved agree that milestone planning in the early phase of an entrepreneurial venture is characterized by considerable uncertainty and due consideration must be given to this factor.

The next steps for founders are:

- If necessary, registering further TUM IP rights with the assistance of TUM ForTe P&L
- Preparation of company financing
- Starting the incubation process – with the support of UnternehmerTUM to the extent that this is reasonable
- Negotiations on IP use



Wire arc additive manufacturing
Photo: iw / TUM

- Determining the financial guiding principles in accordance with TUM IP Policy for the shareholding or licensing model
 - Applicable milestones
 - Royalty rates

• Start-Up Phase:

At the time of start-up, a contract in accordance with the chosen model is entered into for the use of the IP. When involving investors, the founders commit themselves to acting in the best interests of the IP holders. If the contract contains an option for acquisition of intellectual property rights, a prerequisite is that TUM continues to partake in the enterprise's success or in its sale.

• Growth Phase:

In later rounds of financing, or at the time of the sale of the enterprise, ownership of IP can be a decisive criterion. For this reason, the enterprise can exercise its option to acquire these intellectual property rights. At this point, the start-up must take great care in formulating the particular contract in order to ensure that TUM continues to partake in the enterprise's success or in the sale thereof.

7.3 Special Cases

Non-Patented Material:

Material for which patent applications have not been filed includes cell lines, organisms, proteins, plasmids, DNA/RNA, chemical compounds, transgenic animals, and various material that has value in research or commercial purposes, for which no patent application has been filed or for which no patent has been granted.

To the extent TUM retains the rights to non-patented material, it may, in consultation with the scientists involved and within the framework of a written agreement, transfer or license its rights for research or commercial purposes in accordance with TUM standards or in return for a fee based on prevailing market rates. The researcher partakes in exploitation income based on TUM patent policy.



Digital Medicine: Smart glasses give surgeons the impression that they are looking through the skin into the different layers of the body – in three dimensions and in color. What seems like science fiction is already reality

Photo: Computer Aided Medical Procedures & Augmented Reality/TUM

Computer Software:

Traditional patents involve technical inventions, whereas computer software or various algorithms can only be patented in connection with a technological device. Due to the complex nature of filing a patent application for computer software, newly invented software should always be reported to TUM ForTe P&L. To the extent that TUM holds the rights to the software, it may, in consultation with the scientists involved and within the framework of a written agreement, transfer or license its rights for research or commercial purposes in accordance with TUM standards or in return for a fee based on prevailing market rates. The researcher partakes in exploitation income based on TUM patent policy.

Special Conditions of Funding:

If IP was generated as part of a project supported by third-party funding, or such funding was used to support the start-up, changes to the TUM start-up process described above and additional licensing fees to third parties may be required. In such cases, it is advisable to coordinate with TUM ForTe P&L.

Further information on relevant law:

Patent Act:

> www.gesetze-im-internet.de/patg/
(in German)

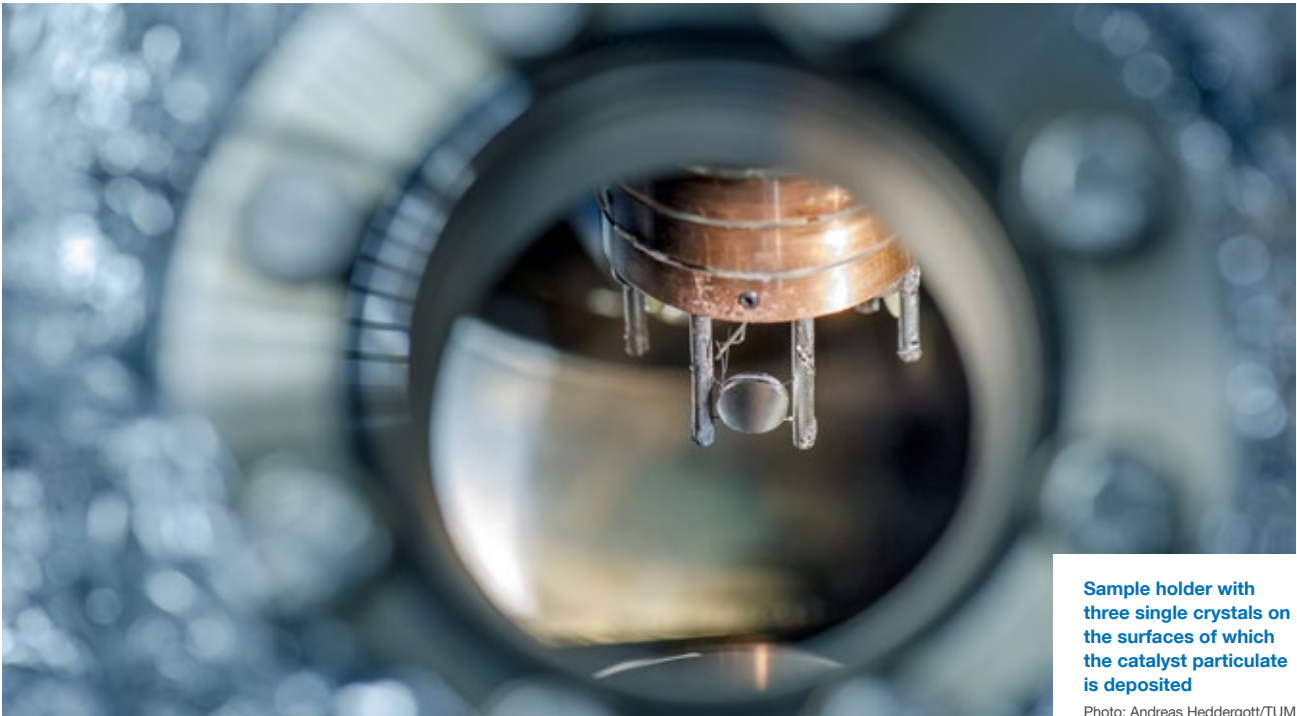
German Employee Inventions Act (in German):

> www.gesetze-im-internet.de/arbnerfg/

TUM IP Policy:

> www.forte.tum.de/en/forte/technology-transfer/patents-and-licences/tum-ip-policy/

TUM ForTe Patents and Licences is the first point of contact in these matters.



Sample holder with three single crystals on the surfaces of which the catalyst particulate is deposited

Photo: Andreas Heddergott/TUM

Sources and URLs

All sources listed here can be found on the internet using the respective keywords:

> *Part-time Employment, Leaves of Absence and Phased Retirement for Beamtinnen and Beamte of the Free State of Bavaria*

> *Part-time Employment and Leave of Absence for Employees of the Free State of Bavaria*

> *Bavarian Beamten Act*

The TUM Service Directory: > *Act on Part-Time Work and Limited Employment*

TUM Entrepreneurship: > <https://www.tum.de/en/innovation/entrepreneurship>

TUM Start-Up Consulting:

> www.tum.de/en/innovation/entrepreneurship/for-founders-start-ups

TUM Start-Up Ambassadors:

> www.tum.de/innovation/entrepreneurship/fuer-gruendungsinteressierte/gruendungsbotschafterinnen

TUM Office for Research and Innovation (TUM ForTe): > www.forte.tum.de/en/forte

Brochure > www.tum.de/fileadmin/w00bfo/www/Wirtschaft/Broschueren_Kooperationen/130318_TUM_CCC_Forsch-Wirt_Brosch-en.pdf

TUM ForTe Patents & Licenses:

> www.forte.tum.de/en/forte/technology-transfer/patents-and-licenses

TUM IP Policy:

> www.forte.tum.de/en/forte/technology-transfer/patents-and-licenses/tum-ip-policy/

TUM IdeAward: > www.tum.de/en/innovation/entrepreneurship/news-events/tum-ideaward

TUM Venture Labs:

> www.venturelabs.tum.de/en/venturelabs/

UnternehmerTUM: > www.unternehmertum.de/en

UnternehmerTUM Venture:

> www.uvcpartners.com

High-Tech Gründerfonds: > www.htgf.de/en

ERC – Proof of Concept:

> <https://erc.europa.eu/proof-concept#>

EXIST funding programs:

> www.exist.de/EXIST/Navigation/EN

FLÜGGE:

> www.bayern-innovativ.de/en/fluegge

GO-Bio: > www.go-bio.de/gobio/en

Initiative for Industrial Innovators:

> www.industrialinnovators.eu

