

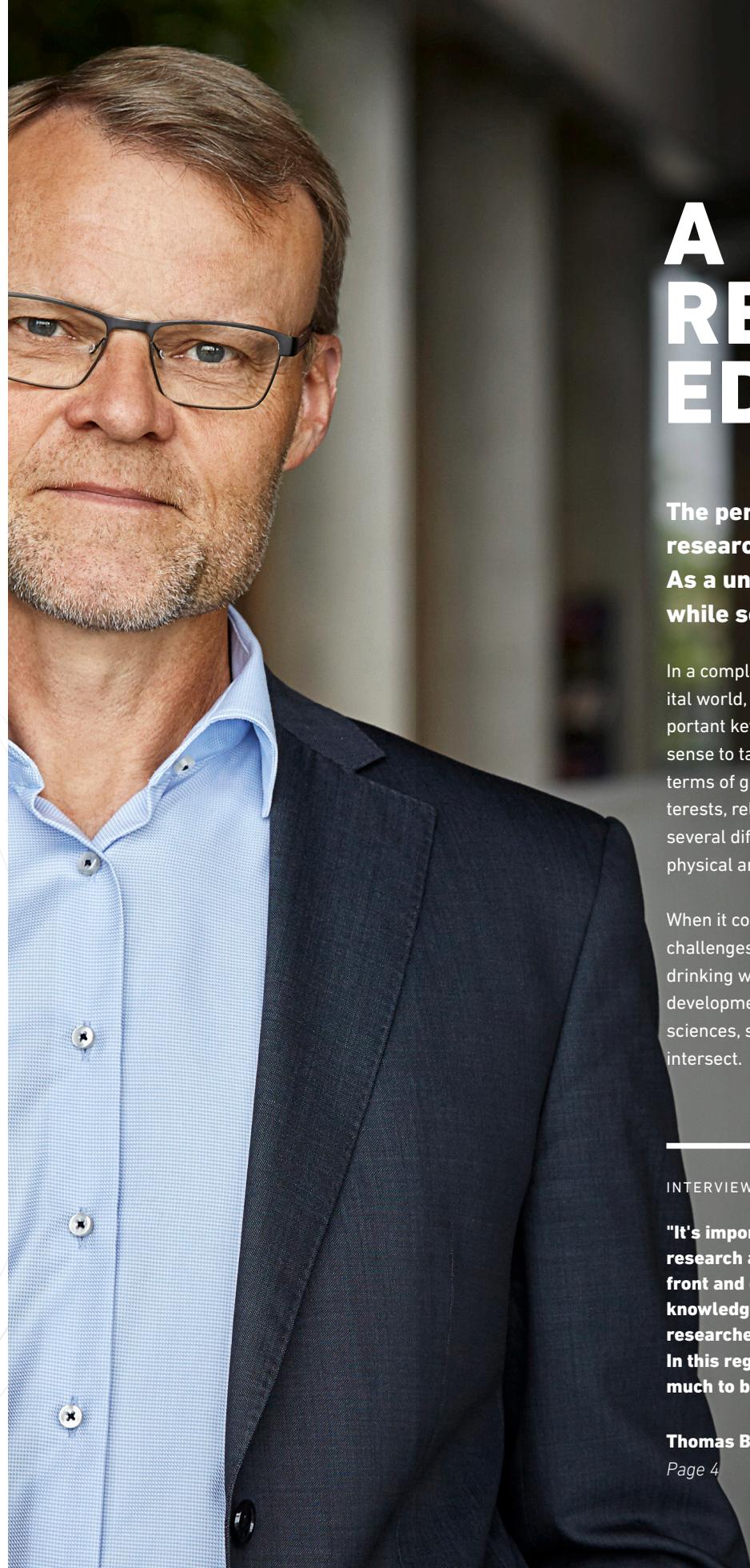


TOGETHER WE CREATE  
**KNOWLEDGE FOR  
THE WORLD**

EDUCATION, RESEARCH AND  
COOPERATION AT AAU



AALBORG UNIVERSITET



# A LOT MORE THAN RESEARCH AND EDUCATION

**The perception of a university as an institution that merely conducts research and provides education is a narrow and unambitious view. As a university, it is also our job to help to advance knowledge while solving the major challenges facing society.**

In a complex, globalised and increasingly digital world, cooperation is one of our most important key competences. It no longer makes sense to talk about societies exclusively in terms of geographic size. Our professions, interests, relationships, etc., involve all of us in several different communities that cut across physical and disciplinary boundaries.

When it comes to addressing the major challenges – climate change, inequality, clean drinking water, equal opportunity, sustainable development – the natural sciences, health sciences, social sciences and the humanities intersect.

They are all part of a solution to be found through cooperation.

And at Aalborg University we embrace all disciplines and place great importance on cooperation, both inside and outside the university walls. We are doing so much more than conducting research and providing education. We are creating solutions, advancing knowledge and fostering development. For all types of societies and for the world as a whole.

Welcome to Aalborg University.

**Per Michael Johansen**  
Rector, AAU

INTERVIEW

**"It's important to do research across a broad front and constantly share knowledge with the best researchers in the world. In this regard, AAU has much to be proud of."**

**Thomas Bjørnholm**  
Page 4

INTERVIEW

**"AAU graduates are top level. They are excellent academically, but they are also humble, and proud to be part of a collaborative team"**

**André Rogaczewski**  
PAGE 12

INTERVIEW

**"AAU has a culture where researchers and companies always meet as equals and on common ground"**

**Mette Fjord Sørensen**  
Page 18

- 4** **THOMAS BJØRNHOLM, VILLUM FOUNDATION**  
**WORLD-CLASS KNOWLEDGE MEANS INFLUENCE**
- 6** Future batteries are made from mould
- 7** AAU robots help those with acquired brain injury
- 8** AAU antenna plays an important role in the 5G network
- 9** Cross-disciplinary research tackles the world's major challenges
- 10** AAU facts and figures
- 12** **ANDRÉ ROGACZEWSKI, NETCOMPANY:**  
**AAU GRADUATES ARE TOP LEVEL**
- 14** PBL: Aalborg model prepares students for working life
- 15** Syllabus with patient contact creates unique physicians
- 16** Economics programme with good career prospects
- 17** Students tackle global challenges in megaprojects
- 18** **METTE FJORD SØRENSEN, CONFEDERATION OF DANISH INDUSTRY:**  
**AAU IS INDUSTRY'S FAVORITE EXAMPLE**

THOMAS  
BJØRNHOLM

# WORLD- CLASS KNOWLEDGE MEANS INFLUENCE



**Knowledge equals influence. If Denmark wants to play a significant role in the world, Danish universities must be in the upper echelon of the global knowledge society, says Thomas Bjørnholm, CSO of VILLUM FONDEN, one of the country's largest private foundations.**

- This position is not easy to achieve or to maintain. Because we can never be sure what knowledge we will need in 10 years time. So it is important to do research on a broad front and at the same time make sure to forge relationships and share knowledge with the best researchers around the world.

- In this regard, Aalborg University has much to be proud of. An excellent example is Frede Blaabjerg, who does research on power electronics in areas including wind turbines, and who received the prestigious, international Global Energy Prize in 2019. His research has been crucial to the development of the wind turbine industry and brilliantly demonstrates how curiosity and the quest for new knowledge can help transform the world.

- Wind turbines also testify to the importance of world-class research. Products based on a high degree of knowledge are a major factor in the success of Danish companies in the global market.

And when people in the rest of the world use products or technologies developed in Denmark, new knowledge is generating benefits far beyond the country's borders.

#### **ABOUT THOMAS BJØRNHOLM**

- MSc in Chemistry and Physics
- Professor, PhD in Materials Chemistry
- Presiding member of the Danish Academy of Technical Sciences
- CSO, VILLUM FONDEN

***"IT'S IMPORTANT TO DO RESEARCH ACROSS A BROAD FRONT AND CONTINUALLY SHARE KNOWLEDGE WITH THE BEST RESEARCHERS IN THE WORLD. IN THIS REGARD, AAU HAS MUCH TO BE PROUD OF."***

#### **AAU INVESTS IN RESEARCH TALENT**

In 2016, AAU established a talent management program to support talented researchers who are making a mark. With financial support, 28 talented researchers cultivate their budding research ideas, build their CVs and networks, and develop their competencies as research managers. The researchers selected are studying areas such as welfare systems, nerve inflammation in patients with diabetes, the role of education in globalisation, use of sound in robots, and identification of unknown bacteria through DNA sequencing.

# FUTURE BATTERIES ARE MADE FROM MOULD

**At Aalborg University Esbjerg, Jens Muff and Jens Laurids Sørensen have launched a revolution in how to store power. They are the first researchers in the world to build a sustainable battery of biological material derived from mould.**

Thus far, the production of batteries has left a large carbon footprint. But with a biological battery, the active fungi can be cultivated in sugar water in a laboratory rather than conventional production with metals such as lithium or residues from the oil industry.

In addition, when its capacity is exhausted, the battery can be disposed of without environmental damage. The liquid in the battery simply passes through a sewage treatment plant out to the sea and the solid biological material is burned.

Aalborg University received a grant of 2 million euro from the Novo Nordisk Foundation to further develop the battery and the entire concept. The researchers have produced a prototype, but the aim is to develop a large battery within three years that can store electricity from wind turbines and photovoltaic systems as well as supply electricity to the grid.



# AAU ROBOTS HELP PEOPLE WITH ACQUIRED BRAIN INJURY

**Students and researchers at Aalborg University are helping to ease everyday life for people with delayed brain injury in conjunction with the Centre for Acquired Brain Injury. When you suffer a brain injury as a result of a blood clot, traffic accident or tumour, the most common everyday activities can present a challenge. But with specially designed robots, brain injury sufferers can regain some control over their daily lives.**

The advanced robots are personal in the sense that the brain-injured person co-designs the robot to suit his or her needs. The researchers behind the project have involved users throughout the process, from identifying needs, to design and production, to programming the individual robot. Thus, the researchers and the brain injury sufferer can jointly develop a customised, assistive aid for the individual user.

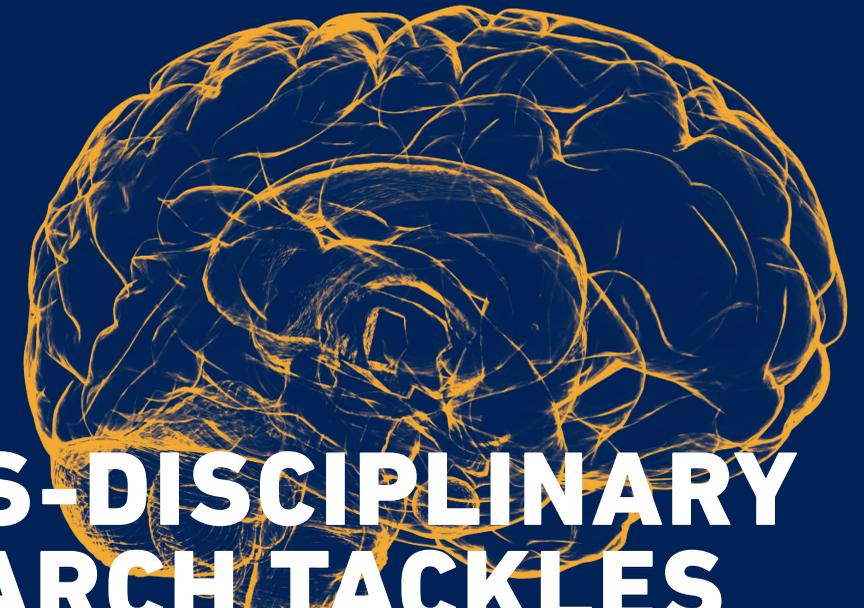


# AAU ANTENNA PLAYS AN IMPORTANT ROLE IN THE 5G-NETWORK

**Professor Gert Frølund has studied wireless signals since mobile phones were still rare and expensive. Through many years of research at Aalborg University, he has managed to incorporate his research results and innovative ideas into products we all use every single day.**

Gert Frølund is the father of the built-in antenna in our mobile phones that has led to design freedom and better communication in the use of mobile phones. In addition, in conjunction with his colleagues at Aalborg University, he has developed a method to measure the efficiency of mobile antennas, and today this method is used as a standard test worldwide.

The wireless antenna will be extremely important when the 5G network is implemented in the coming years. The 5G network base stations will likely consist of hundreds of small antennas that will ensure higher transfer speeds, lower energy consumption, better security and wider coverage.



# CROSS-DISCIPLINARY RESEARCH TACKLES THE WORLD'S MAJOR CHALLENGES

**Climate change. Data misuse. Migration.  
Resource shortages.**

**In a globalised world, our problems are more complex than ever before. So complex that we can only solve them if we work together across institutions and boundaries.**

This also applies to academic boundaries. The engineer has to draw on the knowledge of anthropologists to be able to develop technical innovations that people can trust. The climate scientist must confer with the sociologist to figure out how sustainable measures can be implemented in practice.

With five major faculties, AAU is particularly well positioned to help solve the world's foremost challenges.

In the university's five large interdisciplinary research projects, researchers work together across the university on issues that require knowledge from several, very different areas.

## **AAU'S FIVE INTERDISCIPLINARY RESEARCH PROJECTS:**

- **Secure** – Secure use and storage of data from water and power supplies that the public can and will trust
- **Flow** – Migration flows in conjunction with climate change as well as their impact on northern European societies
- **InterHUB** – Energy-smart buildings that take into account people's behaviour and desires
- **Exotic** – Higher quality of life for people with paralysis using an external skeleton
- **Community Drive** – New skills for children in the increasingly complex society of the future

# AAU FACTS AND FIGURES



AAU has  
**four major faculties:**

- Technical Faculty of IT and Design
- Faculty of Engineering and Science
- Faculty of Social Sciences and Humanities
- Faculty of Medicine

AAU has a total of  
**20,200 students:**

- 16,900 in Aalborg
- 2,800 in Copenhagen
- 500 in Esbjerg

AAU also has a cross-cutting unit, **AAU Innovation**, tasked with strengthening entrepreneurship and innovation, and promoting the university's knowledge cooperation with society.

AAU has a total of  
**3,500 full-time staff members:**

- 2,230 academic staff
- 1,270 technical and administrative staff

AAU produces:

- 2,800 Bachelor's graduates
- 3,400 Master's graduates
- 200 PhDs

In 2018, an analysis by the elite US university MIT placed the AAU engineering programmes as **the best in Europe and fourth best in the world.**

**Approximately 50% of all Master's theses at AAU are done in collaboration with external partners.** On average, 61% of AAU graduates find jobs in the private sector.

Annually, AAU signs 500-600 cooperation agreements with public and private actors. **In 2018, an analysis by the Confederation of Danish Industry named AAU as the Danish university best at working with the business community**

In 2019, the Times Higher Education World University Rankings placed AAU at number 207. **Among younger universities (under 50 years) AAU is number 18 in the world.**

ANDRÉ ROGACZEWSKI:

# AAU GRADUATES ARE TOP LEVEL

One of Denmark's most successful IT entrepreneurs readily acknowledges the role of Aalborg University's learning model in his success. During his education at AAU, André Rogaczewski, co-founder and CEO of Netcompany, acquired a range of skills that he often draws on today as head of one of Denmark's fastest growing IT companies.

- At Aalborg University I acquired the problem-based method, and I learned to work effectively with others and to structure and define a project. I also learned to respect the fact that your own ideas are not always the best; they may need to be adjusted and developed in conjunction with others, explains André Rogaczewski.

- Graduates of AAU are top level. They are excellent academically, but they are also humble, and proud to be part of a collaborative team. They gain experience working collaboratively during their studies, and even as new graduates, they are trained to deliver results as part of a team. They have the right attitude: There's still more I can learn, concludes André Rogaczewski.

Rogaczewski's own experience with AAU has had a major impact on how he recruits staff. He is very enthusiastic about AAU graduates:

## AAU IMPACTS THE BUSINESS COMMUNITY

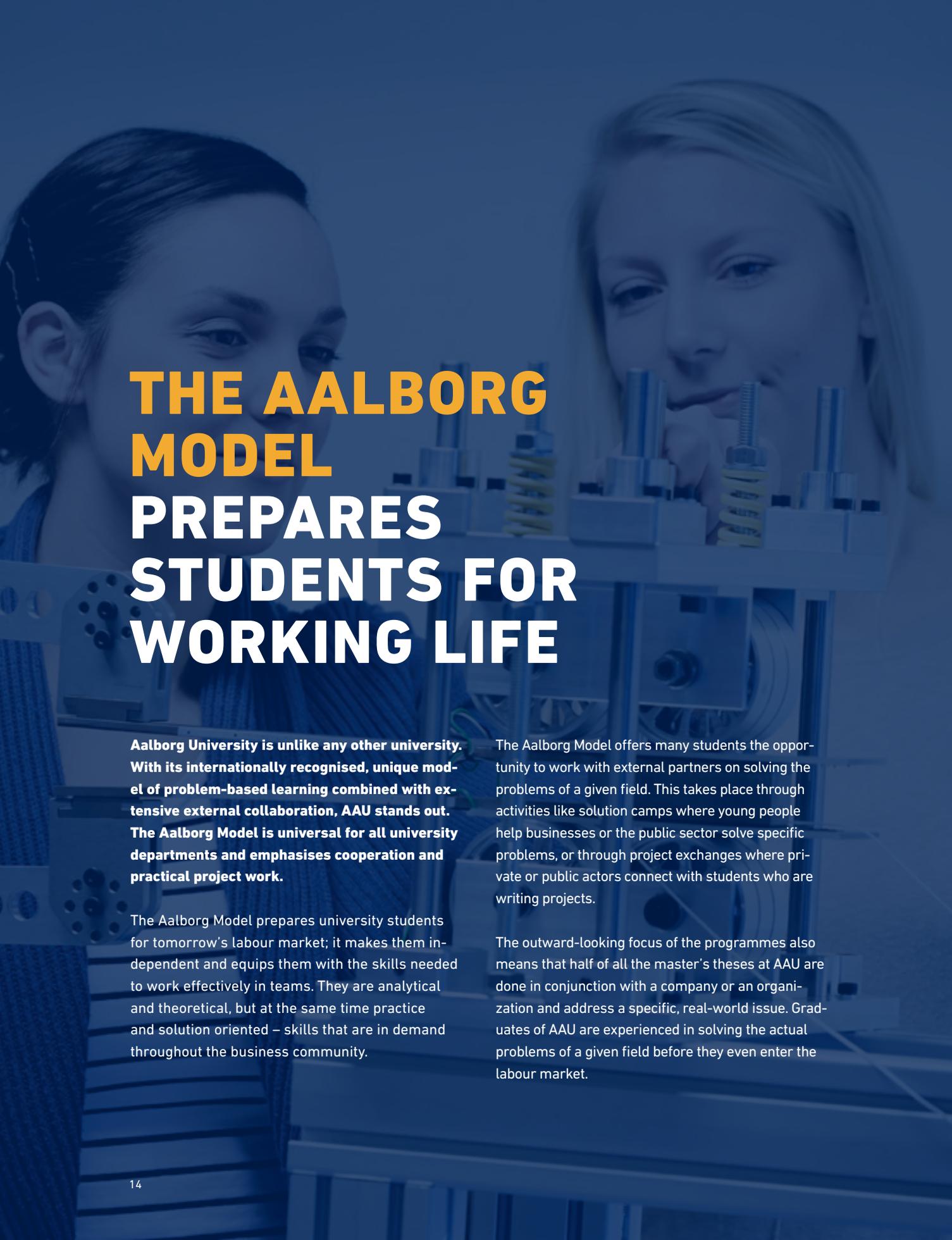
Entrepreneurship and innovation are strategic action areas for AAU. Targeted actions such as incubator programmes and support for commercialisation have helped create a number of business successes that win both innovation competitions and major contracts. Among the greatest success stories are GomSpace which produces nanosatellites, Solar Sack which designed a bag to purify drinking water, and finally SmartGurlz and its robot doll that teaches girls to program.

THEY ARE EXCELLENT ACADEMICALLY, BUT THEY ARE ALSO HUMBLE, AND PROUD TO BE PART OF A COLLABORATIVE TEAM.

ANDRÉ ROGACZEWSKI  
Netcompany

## ABOUT ANDRÉ ROGACZEWSKI

- MSc in Computer Science, AAU, 1993
- Co-founder of Netcompany, 2000
- CEO of Netcompany since 2014
- Netcompany provides IT solutions for large and medium-sized businesses across northern Europe and has branches in six countries. The company was listed on the stock exchange in 2018 and had 2,000 employees the following year.



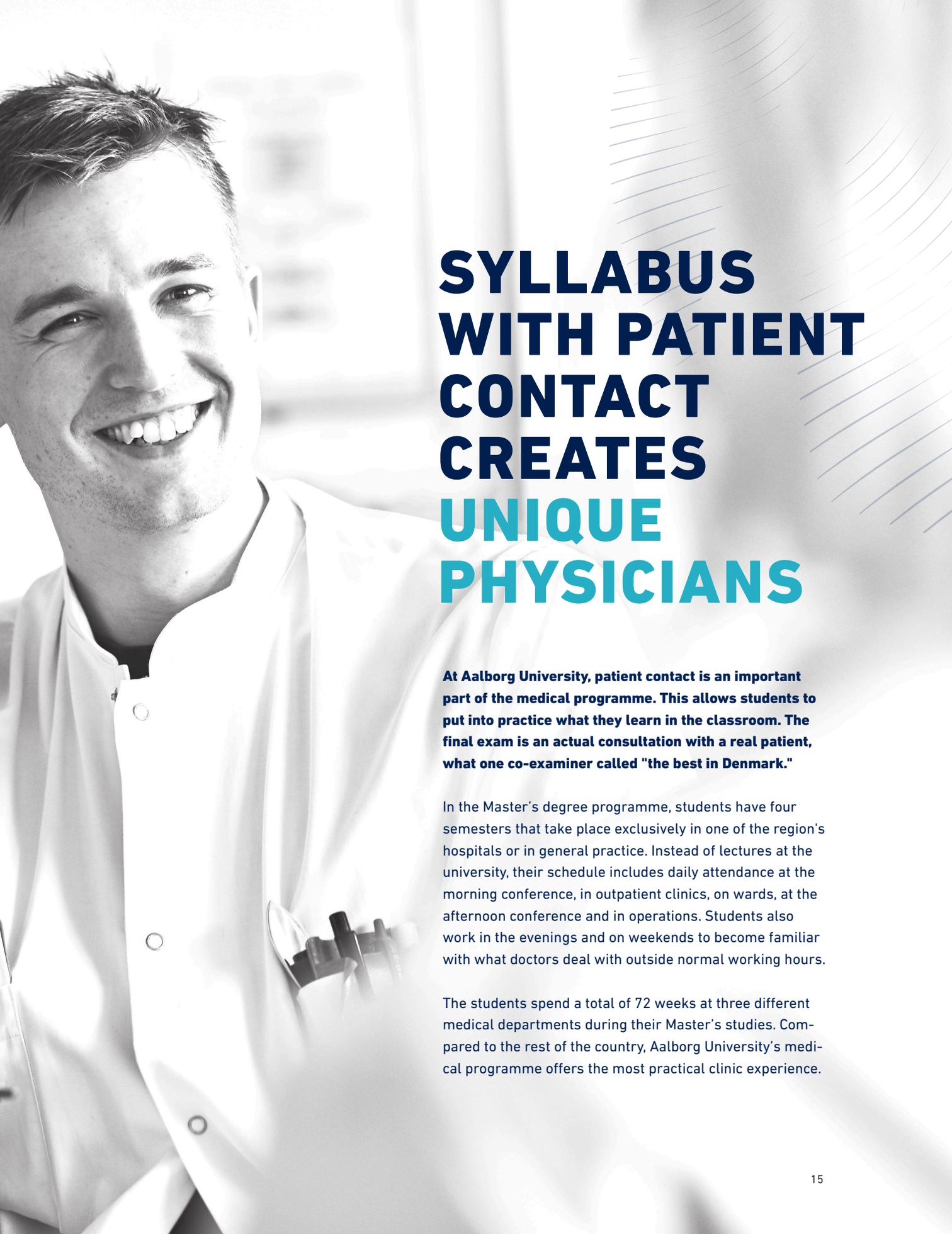
## THE AALBORG MODEL PREPARES STUDENTS FOR WORKING LIFE

**Aalborg University is unlike any other university. With its internationally recognised, unique model of problem-based learning combined with extensive external collaboration, AAU stands out. The Aalborg Model is universal for all university departments and emphasises cooperation and practical project work.**

The Aalborg Model prepares university students for tomorrow's labour market; it makes them independent and equips them with the skills needed to work effectively in teams. They are analytical and theoretical, but at the same time practice and solution oriented – skills that are in demand throughout the business community.

The Aalborg Model offers many students the opportunity to work with external partners on solving the problems of a given field. This takes place through activities like solution camps where young people help businesses or the public sector solve specific problems, or through project exchanges where private or public actors connect with students who are writing projects.

The outward-looking focus of the programmes also means that half of all the master's theses at AAU are done in conjunction with a company or an organization and address a specific, real-world issue. Graduates of AAU are experienced in solving the actual problems of a given field before they even enter the labour market.



## SYLLABUS WITH PATIENT CONTACT CREATES UNIQUE PHYSICIANS

**At Aalborg University, patient contact is an important part of the medical programme. This allows students to put into practice what they learn in the classroom. The final exam is an actual consultation with a real patient, what one co-examiner called "the best in Denmark."**

In the Master's degree programme, students have four semesters that take place exclusively in one of the region's hospitals or in general practice. Instead of lectures at the university, their schedule includes daily attendance at the morning conference, in outpatient clinics, on wards, at the afternoon conference and in operations. Students also work in the evenings and on weekends to become familiar with what doctors deal with outside normal working hours.

The students spend a total of 72 weeks at three different medical departments during their Master's studies. Compared to the rest of the country, Aalborg University's medical programme offers the most practical clinic experience.



# ECONOMICS PROGRAMME WITH GOOD CAREER PROSPECTS

**New graduates in economics from Aalborg University are in demand on the labour market. An MSc in Economics from AAU means not only substantial theoretical knowledge in the field. These graduates can also link their research-based knowledge with real-life issues and can thus function independently starting on their first day of work.**

The Aalborg Model's problem-based approach means that students learn to work in a solution-

oriented and practical way. They understand that solutions are often found by working with others, and during their studies, students in many cases work with companies to solve actual problems.

Employers – the public sector, interest organisations and larger or smaller companies – specifically mention that a great asset of the new AAU economists is their ability to apply theory in practice from day one on the job.

**THE MEGA PROJECTS ARE BASED ON AN OVERALL PROBLEM GROUNDED IN THE UN SUSTAINABLE DEVELOPMENT GOALS**

## STUDENTS TACKLE GLOBAL CHALLENGES IN MEGAPROJECTS

**The world is faced with several global issues that are so complex and voluminous so as to be critically important to our future. If we are to find workable solutions to the planet's most serious problems, new methods are vital.**

This is the starting point for AAU's megaprojects that involve students from different disciplines in solving global challenges and provide them with unique, sought-after collaborative skills across disciplines.

Megaprojects span several semesters and are based on an overarching problem grounded in the

UN Sustainable Development Goals – often defined in conjunction with an external partner. The problem is then broken down into smaller parts that are addressed in student projects. The results of each sub-project continually add new insights to the overall knowledge of the megaprojects.

The first megaprojects were launched in the autumn of 2019. They are being done in partnership with the City of Aalborg that has defined the overall focus of the projects: 'Sustainable Living' and 'The Circular Region'.

A close-up portrait of Mette Fjord Sørensen, a woman with long, wavy blonde hair and blue eyes, smiling slightly. She is wearing a dark grey or black collared shirt. The background is a blurred indoor setting.

**METTE FJORD SØRENSEN**

# AAU IS INDUSTRY'S FAVOURITE EXAMPLE

**The business community and researchers joining forces is a source of development and new possibilities. Working with universities is essential for Danish companies, says Mette Fjord Sørensen, Head of Research, Diversity and Higher Education at the Confederation of Danish Industry:**

- Danish companies can't compete on price. Instead, we have to focus on offering more advanced products. Better products based on better knowledge. That's what we're good at. Fifty percent of the products that Danish companies sell on the world market are up-market products.

- University collaboration is essential for us to be able to maintain that position. Interaction and dialogue between researchers and companies makes for faster innovative processes that evolve into business potential.

- It's important for companies that such collaboration be based on a common understanding. Researchers need to be aware that companies are not joining a research project to publish scientific articles; rather, they are looking for new knowledge that they can use in their business.

***"AAU HAS A CULTURE WHERE PATENTS AREN'T SIMPLY COMMERCIALISED JUST LIKE THAT."***

- In this context, Aalborg University is our favourite example. AAU has a culture where there is an understanding that patents aren't simply commercialised just like that. It's also a culture where researchers and companies always meet as equals and on common ground.

#### **ABOUT METTE FJORD SØRENSEN**

- MSc in Political Science, 2006
- Head of Research, Diversity and Higher Education at the Confederation of Danish Industry

#### **AAU RESEARCH IMPROVES THE PUBLIC SECTOR**

AAU is the Danish university doing the most to develop the public sector. About half of the 500-600 annual university external collaborations are with the public sector. For instance, AAU researchers are working with Local Government Denmark and several municipalities on developing new welfare solutions to put marginalized people into jobs more quickly.



CONTACT

## **WANT TO LEARN MORE ABOUT WORKING WITH AAU?**

**CONTACT AAU INNOVATION  
TEL: +45 9940 2015**

EMAIL

[aauintnovation@adm.aau.dk](mailto:aauintnovation@adm.aau.dk)

WEB

[www.aau.dk/samarbejde](http://www.aau.dk/samarbejde)



**AALBORG UNIVERSITET**