

# intern Special issue

Special Issue on the Excellence Strategy 2018  
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Hannover

## Outstanding Victory in the Excellence Strategy!

### Clusters of Excellence pave the way for excellence consortium of LUH and MHH

Tremendous success for Leibniz University Hannover in the Excellence Strategy of the German federal and state governments: The independent research projects QuantumFrontiers (Light and Matter at the Quantum Frontier: Foundations of and Applications in Metrology) and PhoenixD (Photonics, Optics, and Engineering – Innovation

hearing deficits" and is led by Oldenburg University in close cooperation with LUH and MHH, has been reconfirmed. Leibniz University Hannover also congratulates MHH on the award of the Cluster of Excellence RESIST (Resolving Infection Susceptibility). Four out of five clusters in Hannover were awarded funding.

This paves the way for a joint proposal of LUH and MHH as an Excellence Consortium in the Excellence Strategy. An essential prerequisite for this was the approval of at least three Clusters of Excellence at the participating universities.

"We are very pleased about this enormous success", says Professor Volker Epping, President of Leibniz University Hannover. "It is a great day for Leibniz University Hannover! A fantastic success! The award for the projects PhoenixD and QuantumFrontiers will increase the international visibility of our key research areas and demonstrates that we are on the right track regarding the interdisciplinary consolidation of outstanding individual performance. I would like to thank all participating researchers and the staff who supported them for their outstanding commitment under an extremely tight schedule during the application phase and for their courage to enter this competition full of enthusiasm for their university."

The next vital step will be to prepare a conclusive joint proposal in collaboration with MHH.

The joint proposal must be submitted in December 2018 and will enable both universities to strengthen their cooperation in future research fields, as well as to increase the appeal of Hannover as a research location. Both universities are currently working on the proposal.



Across Disciplines) were confirmed as Clusters of Excellence and have been awarded funding worth several million euros, starting on 1 January 2019 for an initial period of seven years. The clusters will receive between 3 and 10 million euros of funding per year.

The existing Cluster of Excellence Hearing4all was also awarded funding. The cluster, which focuses on "Research for personalised treatment of

Unfortunately, the Cluster of Excellence REBIRTH on regenerative medicine was not reconfirmed after two funding periods. It will now be essential to pool resources in this cutting-edge research area and find other means to ensure the success of the outstanding projects in this cluster. LUH is particularly appreciative of the outstanding achievements of the involved researchers and of the effort they have put into the cluster over the past years.

## Excellence in figures

	LUH	MHH	Total
Third-party funds spent	113.3 million euros	87.2 million euros	200.5 million euros
Researchers (full-time)	2,105	884	2,989
Professorships	334	148	482
Doctorates	361	227	588
Employees (full-time)	3,832	7,607	11,439
Students	28,742	3,521	32,263
Female	11,537	2,228	13,765
Male	17,205	1,293	18,498
International	3,648	493	4,141
Nations	116	84	

## PhoenixD

Developing optical precision instruments in a quick and cost-efficient manner

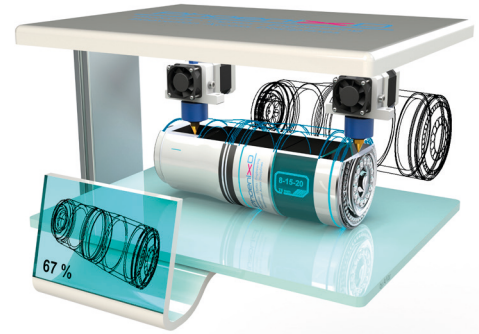
"The success in the Excellence Strategy is a fantastic recognition of our previous work, as well as for future projects", says Professor Uwe Morgner, spokesperson of the new Cluster of Excellence



PhoenixD (alongside Professor Ludger Overmeyer and Professor Wolfgang Kowalsky). The research collaboration aims at developing optical precision instruments in a quick and cost-efficient manner by using additive manufacturing technology.

Researchers from the fields mechanical engineering, physics, electrical engineering, computer science, and chemistry are working together on the simulation, manufacture, and implementation of optical systems. To date, optical glass lenses and the housing surrounding them are produced in several steps – often crafted by hand. In the research collaboration, experts across disciplines are collaborating to develop a digitised manufacturing system that produces customised products.

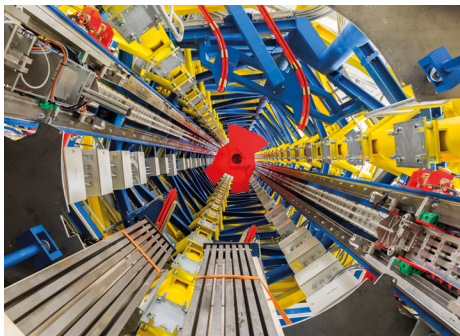
The system is exceptionally versatile and could be used in various scenarios. In agriculture, the use of chemicals against weeds could be reduced. Through precision optics, a sensor registers plants and detects weeds, which can then be destroyed systematically using a laser. Until now, manufacturing optical components for this purpose was too expensive. Manufacturing customised optics for medical devices is another area of application.



For example, blood tests for diagnosing diseases could be carried out quicker. PhoenixD was initiated by the Hannover Centre for Optical Technologies (HOT). The project is led by Leibniz University Hannover, in collaboration with TU Braunschweig, Laser Zentrum Hannover e.V., and Max Planck Institute for Gravitational Physics (Albert Einstein Institute).

## QuantumFrontiers

Light and matter at the quantum frontier



The Cluster of Excellence QuantumFrontiers, which was also confirmed, deals with light and matter at the quantum frontier. We are exceptionally pleased with this success", says Professor Karsten Danzmann, spokesperson of the cluster (alongside Professor Piet O. Schmidt and Professor Andreas Waag). "The funding from the

Excellence Strategy will provide us with an ideal framework for advancing our application-oriented fundamental research projects." The members of the research collaboration are developing new measurement technologies at nano-level. Basic physical quantities, such as mass, length, and time could be measured more precisely by using this extremely small scale. Researchers use quantum mechanical effects in order to improve the exactness of the measurements. To achieve this, experts from various fields, such as physics, astronomy, geodesy and geoinformatics, semiconductor research, as well as circuits and integrated systems contribute their know-how.

This fundamental research forms the basis for various innovations, such as improved earth observation and navigation. Additionally, the project will enable material development at nano-level and will foster progress in semiconductor

technology, which is a vital part of most electronic devices. QuantumFrontiers is a joint project of Leibniz University Hannover, TU Braunschweig,



Physikalisch-Technische Bundesanstalt in Braunschweig (Germany's national metrology institute), Laser Zentrum Hannover e. V., Center of Applied Space Technology and Microgravity (ZARM) in Bremen, and Max Planck Institute for Gravitational Physics (Albert Einstein Institute).

## Hearing4all

Providing "hearing for all"

The Cluster of Excellence Hearing4all, which started in 2012, was reconfirmed. The project is led by the University of Oldenburg, in collaboration with Leibniz University Hannover and Hannover Medical School (MHH). The cluster aims at providing "hearing for all". By improving audiological diagnostics and by providing customised hearing instruments, researchers want to make a significant change regarding the communication

situation of affected persons. Their work focusses on fundamental, model-based research for diagnostics and auditory profiling of normal hearing or severely impaired patients, in order to gain a better understanding of the individual sense of hearing. Additionally, researchers use these models to optimise the individualised treatment of hearing loss with adequate hearing instruments adapted to individual requirements.



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