

## PRESS RELEASE

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## MUNICH AEROSPACE FUNDS TEN NEW RESEARCH GROUPS AND 19 YOUNG RESEARCHERS

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München, Taufkirchen, Ottobrunn, Neubiberg, Oberpfaffenhofen, Garching – The Bavarian research network Munich Aerospace is setting up ten new research groups with 19 doctoral scholarships for young researchers in aerospace. The collaborative project focuses on satellite-based innovations and the future field of “Green Aerospace”. For the first time, two research groups are to be sponsored by the analysis and testing services company IABG mbH.

The research groups of Munich Aerospace are enabling researchers from at least two of the four member institutions, the Technical University of Munich (TUM), German Aerospace Center, Bundeswehr University Munich (UniBwM) and Bauhaus Luftfahrt, to address current issues in aerospace. Over a funding period of up to four years, the joint projects will use regional synergies and increase the international visibility of the “Aerospace Region Munich” as a centre of innovation. The Executive Board of Munich Aerospace decides on the admission of the research groups in consultation with a scientific advisory board.

### RESEARCH GROUPS INTEGRATE RESEARCH AND INDUSTRY

“The new research groups are demonstrating the broad scientific expertise of the Bavarian aerospace sector. Many researchers are pursuing a clear application in this funding round,” says Chairman of the Executive Board of Munich Aerospace Prof Dr Günter W. Hein. Industrieanlagen-Betriebsgesellschaft mbH (abbreviated to IABG) is funding four doctoral scholarships as part of the joint projects. Two research groups are therefore being financed completely by an industry company for the first time. “With the research groups, we are not only able to support excellent talent but also prepare for swift technology transfer. Research and industry have scarcely been so close,” says IABG Managing Director Prof Dr Rudolf F. Schwarz.

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## FOCUS ON ENVIRONMENTALLY COMPATIBLE FLIGHT AND SATELLITE TECHNOLOGIES

A large number of researchers are investigating scientific questions surrounding the future field of “Green Aerospace” as well as “Aerospace Communications and Navigation”. For instance, new production methods in lightweight construction (Prof Eric Jäggle, UniBwM) or sustainable helicopter fuels (Dr Christian Helcig, TUM) are intended to contribute to environmentally compatible aviation in line with the European vision Flightpath 2050.

The new research groups in satellite communication will improve data security and digital infrastructure. This is possible with the use of quantum computer-resistant encryption technology (Prof Antonia Wachter-Zeh, TUM) or the more efficient organisation of satellite systems (Prof Andreas Knopp, UniBwM), for example. The latter aims to achieve constant availability of the latest wireless communication standards such as 5G&beyond and the related Internet of Things.

Satellite navigation already forms the backbone of digital transformation – from routing to the time synchronisation of telecommunication networks. For innovative areas of application including highly automated transport systems (Dr Stefan Baumann, IABG), new services for the European satellite navigation system „Galileo“ are being evaluated and tested in navigation (Prof. Thomas Pany, UniBwM) and geodesy (Prof. Urs Hugentobler, TUM).

## PROMOTING DOCTORAL TALENT IN THE NETWORK

In connection with the new research groups, 19 young researchers are examining selected doctoral topics. They will be closely integrated in the research network of Munich Aerospace and will be able to access the research infrastructure of the network partner. The doctoral candidates will go through the Munich Aerospace Graduate School – including the graduate programme of the Technical University of Munich and the German Aerospace Center – and gain access to the international e-learning and conference programme “Global Aerospace Campus”. Since Munich Aerospace was founded in 2010, 27 research projects have been funded over three application rounds.

## LIST OF THE NEW MUNICH AEROSPACE RESEARCH GROUPS:

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Future field: Cyber and Public Security

### **MULTI-ACCESS AND SECURITY CODING FOR MASSIVE IOT SATELLITE SYSTEMS**

**Management:** Prof Gerhard Kramer (TUM)

**Partners involved:**

- TUM (Institute for Communications Engineering)
- DLR (Satellite Networks Department)



Future field: Green Aerospace

### **SMALL AERO ENGINES – PERFORMANCE AND EMISSIONS USING DROP-IN FUELS**

**Management:** Dr Christian Helcig (TUM)

**Partners involved:**

- TUM (Chair of Turbomachinery and Flight Propulsion)
- UniBwM (Institute of Aeronautical Engineering)

### **HYBRID LIGHTWEIGHT CONSTRUCTION USING ADDITIVE MANUFACTURING**

**Management:** Prof Eric Jägler (UniBwM)

**Partners involved:**

- UniBwM (Institute of Materials Science)
- TUM (Institute of Materials Engineering of Additive Manufacturing)



Future field: Autonomous Flight

### **INTELLIGENT CONTROL OF HIGHLY OVER-ACTUATED FLIGHT SYSTEMS**

**Management:** Dr Gertjan Looye (DLR)

**Partners involved:**

- DLR (Institute of System Dynamics and Control)
- TUM (Institute of Flight System Dynamics)
- UniBwM (Institute of Flight Systems)

### **ROBUST AND EFFICIENT REAL-TIME FLIGHTPATH OPTIMISATION**

**Management:** Prof Matthias Gerdtts (UniBwM)

**Partners involved:**

- UniBwM (Institute of Mathematics and Applied Computing)
- TUM (Institute of Flight System Dynamics)

### **FORMAL VERIFICATION FOR CONTROL OF SAFETY-CRITICAL SYSTEMS**

**Management:** Prof Gunther Reißig (UniBwM)

**Partners involved:**

- UniBwM (Institute of Control Engineering)
- DLR (Institute of Robotics and Mechatronics)



Future field: Earth Observation

### **I-MONITOR: AI FOR MONITORING CHANGES AND FOOD SUPPLY FROM SPACE**

**Management:** Prof Xiaoxiang Zhu (TUM)

**Partners involved:**

- TUM (Professorship for Data Science in Earth Observation)
- DLR (Remote Sensing Technology Institute)
- IABG (Innovation Center and Geodata Factory)



Future field: Aerospace Communications and Navigation

#### MACHINE LEARNING FOR NETWORK MANAGEMENT AND RESOURCE ALLOCATION IN FUTURE SATELLITE SYSTEMS (NEMARA-AI)

**Management:** Prof Andreas Knopp (UniBwM)

**Partners involved:**

- UniBwM (Chair of Signal Processing)
- DLR (Institute of Communications and Navigation)

#### GNSS RECEIVER ALGORITHMS FOR EXTENDED GALILEO SERVICES

**Management:** Dr Stefan Baumann (IABG)

**Partners involved:**

- UniBwM (Institute of Space Technology and Applications)
- TUM (Institute of Astronomical and Physical Geodesy)
- IABG (Department InfoCom)



Future field: Safety in Orbit

#### AUTONOMOUS COLLISION AVOIDANCE FOR MULTI-SPACECRAFT SYSTEMS

**Management:** Prof Roger Förstner (UniBwM)

**Partners involved:**

- UniBwM (Institute of Space Technology and Space Applications)
- DLR (Institute for Space Operations and Astronaut Training, Space Situational Awareness)

Details about the research groups:

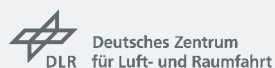
<https://www.munich-aerospace.de/en/research/research-groups>

#### About Munich Aerospace

As the interface between science, industry and politics, Munich Aerospace brings together regional aerospace research and increases the importance of the metropolitan region of Munich as an international centre for research, technology and education. The non-profit association is an initiative of the Technical University of Munich, the German Aerospace Center, the Bundeswehr University Munich and Bauhaus Luftfahrt. Munich Aerospace is funded by the Free State of Bavaria.

#### About IABG mbH

Industrieanlagen-Betriebsgesellschaft mbH (IABG) was founded in 1961 at the initiative of the Federal Republic of Germany as a central analysis and test institution for aviation and has been an owner-managed European technology company since 1993, with the core competencies of analysis, simulation and testing, and system operations. IABG takes its business and societal responsibility seriously and is committed to promoting technological innovation.



Technical  
University  
of Munich

