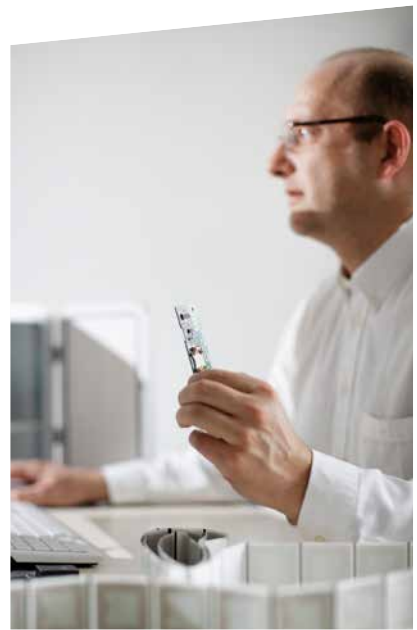


JOANNEUM RESEARCH

Annual Report 2017



JOANNEUM RESEARCH
Forschungsgesellschaft mbH
Leonhardstraße 59
8010 Graz
Phone +43 316 876-0
Fax +43 316 876-1181
prm@joanneum.at
www.joanneum.at

Contents

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Prefaces	4–6
JOANNEUM RESEARCH at a glance / Locations	8–9
Company history	10–11
Research units	12–25
MATERIALS – Institute for Surface Technologies and Photonics	14–15
HEALTH – Institute for Biomedicine and Health Sciences	16–17
DIGITAL – Institute for Information and Communication Technologies	18–19
POLICIES – Institute for Economic and Innovation Research	20–21
ROBOTICS – Institute for Robotics and Mechatronics	22–23
LIFE – Centre for Climate, Energy and Society	24–25
Events and conferences	26–27
Media	28–29
Annual financial statements	30–55
Audit certificate	30–31
Balance sheet	32–33
Income statement	34–35
Notes	36–46
Non-current assets movement schedule	47
Management report	48–55
Excellence Report of the financial year 2017	56–57
Contact details	58–59
Organisational charts	60–61
Legal information	62

New opportunities for the company



Prof. Dr. Wolfgang Pribyl, MBA
Chief Executive Officer

The financial year 2017 was the first one in the new planning period covered by the strategy document for 2017 to 2021. Against the background of international and national economic and social developments our tasks were to align the R&D portfolio and the strategic goals accordingly and to take concrete measures.

In financial 2017 in particular the area of 3-D metal printing at the MATERIALS institute in Niklasdorf and the area of (partially) automated driving at the DIGITAL institute were further expanded in cooperation with local businesses and universities. The content-wise organisation of the ROBOTICS institute in Klagenfurt was also continued in close internal cooperation and coordination with Carinthian businesses and research partners. The existing high-quality research infrastructure as the basis of scientific activities was constantly renewed and improved. Moving into the new premises of LIFE in the Science Tower also served enhancement of the

research potential. International activities were also promoted by the contribution of POLICIES to the Joint Institute for Innovation Policy (JIIP) in Brussels and co-designing the Austrian positions for the 9th EU Framework Programme.

Commitments to new initiatives such as „Silicon Austria Labs“ and the Styrian-Carinthian initiative „Silicon Alps - Microelectronic Cluster“ were also intensified both to contribute inputs to portfolio enhancement and to open up new opportunities for the entire business.

In taking stock of the financial year of 2017 of JOANNEUM RESEARCH we can say that it was a successful year. The strategic goals for the current financial year 2018 have already been set on a sound financial basis. 2018 started with pioneering innovations and the company's 50th anniversary. In close cooperation with the Medical University of Graz the new COREMED Centre will be established in the field of regenerative medicine in wound healing in coordination with HEALTH. Due to its increasing importance a new „Cyber Security and Defence“ competence group will be set up at DIGITAL. In Carinthia construction of the new research building for ROBOTICS will commence. That research laboratory will create the infrastructure required for an expansion of ROBOTICS' research activities.

The success story of JOANNEUM RESEARCH in the past 50 years is no matter of course but has mainly been written by our staff, stakeholders and owners. I am pleased to actively contribute to this development of the company and to set the course for JOANNEUM RESEARCH's future.

National and international attention

As the second largest non-university research institution of Austria JOANNEUM RESEARCH has become a firmly established part of the Styrian and Austrian research landscape. With more than 500 projects and an annual research output of 40 million euros JOANNEUM RESEARCH has, in the now 50 years of its existence, considerably contributed to the positive development of Styria as one of Europe's most innovative regions. Also Styria's position as the Austrian state with the highest R&D share by far (5.14 per cent) would not be conceivable without the achievements of about 430 staff members in the areas of basic research and applied research. Financial 2017 was a particularly successful year for JOANNEUM RESEARCH. At the impressive „JR Future Conference“ in March around 600 attendees set a new attendance record. Once more, JOANNEUM RESEARCH attracted national and international attention also due

to large-scale projects. Thanks to the acoustic tunnel monitoring AKUT, the establishment of LIFE and its relocation to the Science Tower, the expansion of the 3-D metal printing area at the MATERIALS institute in Niklasdorf and (partially) automated driving at the DIGITAL institute JOANNEUM RESEARCH's position as the „Styrian lighthouse“ in science and research was strengthened. In the course of a delegation's visit to Brussels, organised by JOANNEUM RESEARCH, Styria's visibility as Austria's no. 1 research state was made visible. Together with representatives of the state of Carinthia we were able to present the „southern research axis“ to the European Commission as Austria's leading innovation region. This is owed to the managing director and his entire team, who make this development possible by their commitment and dedication to science and research in the south of Austria.



Photo: Teresa Rothwangl

Barbara Eibinger-Miedl
Member of the Styrian Government
for Economy, Tourism, Europe,
Science and Research

A highly successful year

Investing in JOANNEUM RESEARCH was a great opportunity for the state of Carinthia to implement its strategy of expanding research and development. Together with the state of Styria we established the southern research axis and, by investing in JOANNEUM RESEARCH we massively strengthened and broadened that axis. With the ROBOTICS research unit we have been able to establish a research area in Klagenfurt that is perfectly in line with Carinthia's future strategy. I am very pleased that we will be able to give the ROBOTICS institute more room to grow with the next expansion phase of the Lakeside Park. Last year the

settlement of another research centre at the Wörthersee Lakeside was initiated: LIFE, the Centre for Climate, Energy and Society of JOANNEUM RESEARCH, will bring the „Innovative Mobility Modelling“ competence group to Klagenfurt with the support of the state of Carinthia, which deals with current issues related to mobility behaviour and spatial development.

I want to congratulate JOANNEUM RESEARCH to another highly successful year 2017 and look forward to continued positive cooperation.



Photo: Martin Rauchenwald

Dr Gaby Schaunig
Deputy Governor, Carinthia

Research – not only in the ivory tower

As the chairman of the supervisory board of JOANNEUM RESEARCH I am pleased that the year of 2017 was not only successful financially but also scientifically. The company's research output is reflected by more than 500 national and international projects that are implemented every year. Numerous patent applications also demonstrate the high innovative power of JOANNEUM RESEARCH. Increasing exploitation of research results proves that research not only takes place in the ivory tower but also generates direct benefits for the general public. Numerous innovative products, such as acoustic tunnel monitoring, the OFM pump or the tablet-based „amicasa“ training game in the field of Alzheimer's disease research were developed in a cooperation

and exploited commercially.

By strengthening the southern axis the effectiveness of the locations of JOANNEUM RESEARCH in Carinthia and Styria was strengthened successfully. Cooperation across the states sets a positive example for the future.

The basis for a successful year 2018 was created already in financial 2017. As the chairman of the supervisory board of one of Austria's leading R&D enterprises it is always exciting to become part of and co-design future developments and to create optimal framework conditions for the company's R&D.



Photo: Martin Steinthaler / tinefoto.com

Dr Martin Wiedenbauer
Chairman Supervisory Board

No standstill in the company's history

The strategy document for the years 2017 to 2021, which was developed in 2016, includes the company's content-wise and financial planning for the coming financial years in six strategic thematic corridors. The strategies, measures and milestones were defined jointly and are tailored to meet the challenges and also to the actual potentials and framework conditions.

Ultimately, it is all about implementing the plans and seriously pursuing the set goals. From the perspective of the scientific advisory board it is all the more pleasing to find that JOANNEUM RESEARCH and its research units have with excellence implemented the projects planned in the strategy document 2017 to 2021 so far. Due to the proven system of the trustees there is a regular exchange between the scientific

advisory board and the research units which gives the board a very clear picture not only of the status quo but also of any changes that may become necessary, and allows the board to contribute actively.

In the 50 years of the company's history there has never been a standstill, which is why also for the coming financial year 2018 numerous measures are being prepared which will be of great significance to the R&D portfolio in the medium and long term. From the scientific advisory board's view we can look to the coming financial year 2018 with great confidence.

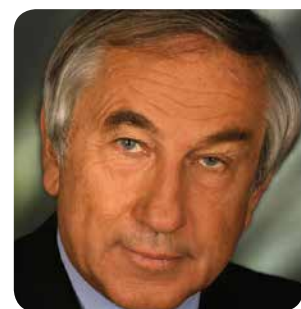


Photo: Sissi Furgler

Prof. Dr Dr Gerald Schöpfer
Chairman
Scientific Advisory Board



JOANNEUM RESEARCH Forschungsgesellschaft mbH develops solutions and technologies for a broad spectrum of industries and is engaged in top research at an international level.

With its focus on applied research and technology development the INNOVATION COMPANY exercises a key function in technology and knowledge transfer.

research units **6**

437 employees

State of Styria (85 %),
BABEG – Kärntner Betriebsansiedlungs- &
Beteiligungsgesellschaft m.b.H. (15 %)

2 owners

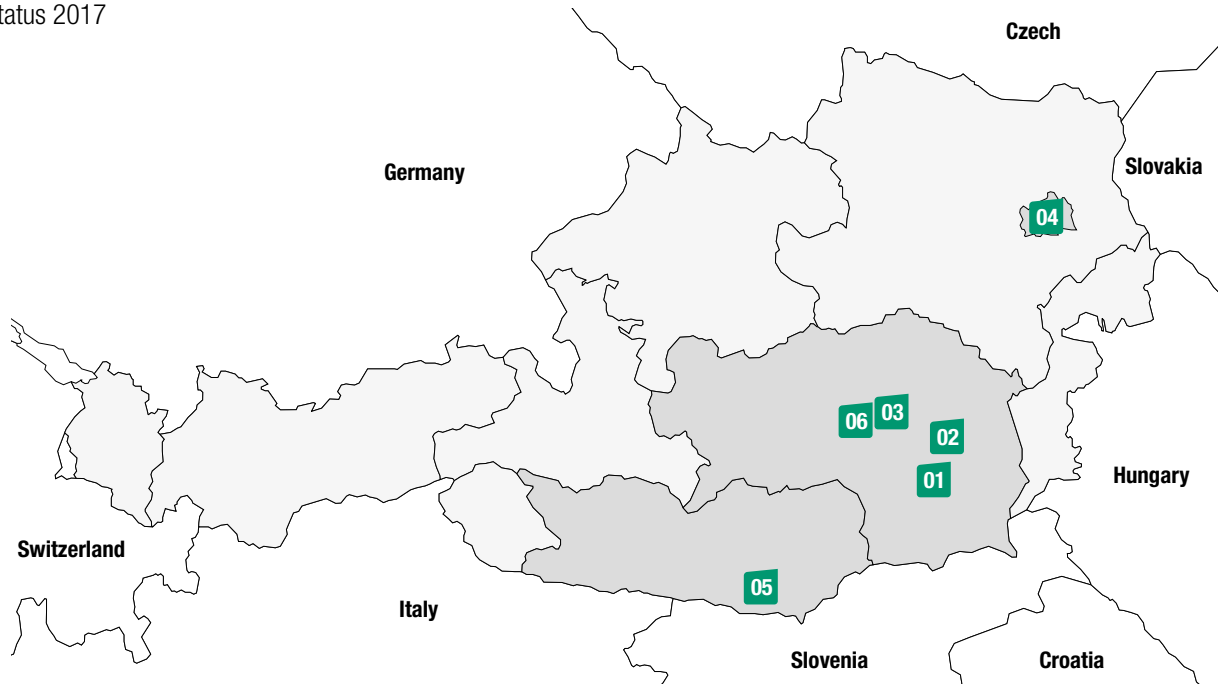
EUR **8.8** million
shareholder contribution

80% self-financing ratio

EUR **41.6** million
research output

Company Sites

Status 2017



01 GRAZ

Leonhardstraße 59
8010 Graz

- Management
- Corporate services
- Corporate departments
- POLICIES

Neue Stiftingtalstraße 2
8010 Graz

- HEALTH

Steyrergasse 17
8010 Graz

- Data Centre
- DIGITAL

Hilmwarte
Roseggerweg 31
8010 Graz

- DIGITAL

Wagner-Biro-Straße 100
A-8020 Graz

- LIFE

02 WEIZ

Franz-Pichler-Straße 30
8160 Weiz

- MATERIALS

03 KLAGENFURT

Lakeside B08a, EG
9020 Klagenfurt am Wörthersee

- POLICIES
- ROBOTICS

04 VIENNA

Haus der Forschung
Sensengasse 1
1090 Vienna

- HEALTH
- LIFE
- POLICIES

05 NIKLASDORF

Leobner Straße 94
8712 Niklasdorf

- MATERIALS

06 LEOBEN

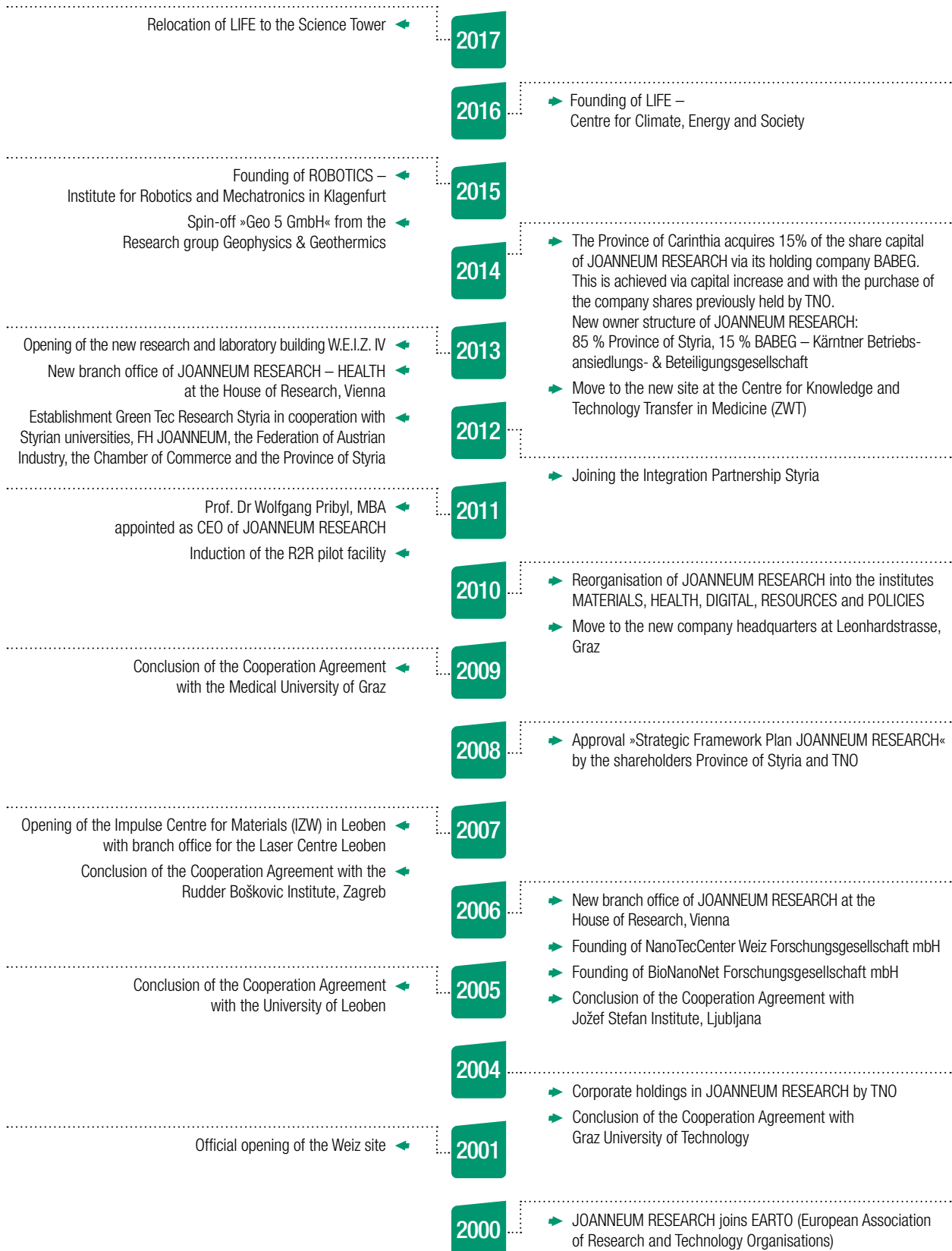
Roseggerstraße 12
8700 Leoben

- MATERIALS



Navigate to the complete
history of the company

Company history



Company history



2017

Relocation of LIFE - Centre for Climate, Energy, and Society to the Science



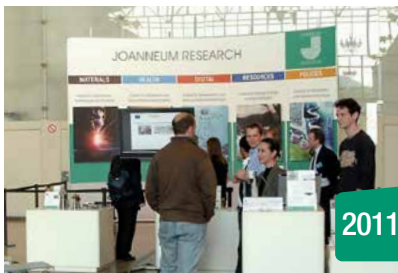
2015

Founding of the new institute ROBOTICS at the Klagenfurt site



2012

Groundbreaking for the research building W.E.I.Z. IV



2011

1st Future Conference of JOANNEUM RESEARCH



2011

1st Forum DIGITAL with Tanja Oppitz, IBM



2010

Woman Award 2010 in the category
»Job and Children«



2008

1st Long Night of Research with participation from
JOANNEUM RESEARCH



2003

1st research prize of the Province of Styria for
nanosciences and nanotechnology



2002

EARTO Conference »Internationalisation in
Research and Technology«, Graz



2001

10 years Laser Centre Leoben



1991

AUSTROMIR – the first flight of an Austrian
cosmonaut into space



1987

Disposal of UNIVAC (Universal Automatic
Computer) 494 by the Data Centre



MATERIALS – Institute for Surface Technologies and Photonics:

Hybrid Electronics and Patterning
Light and Optical Technologies
Laser and Plasma Processing
Sensors and Functional Printing
Smart Connected Lighting (Newly founded – in development since May 2018)

HEALTH – Institute for Biomedicine and Health Sciences:

Biomedical Tissue Monitoring
Bioanalysis and Metabolomics
Health Sciences
Competence group Clinical Decision
Competence group Medical Sensors

DIGITAL – Institute for Information and Communication Technologies:

Remote Sensing and Geoinformation
Machine Vision Applications
Space and Communication Technology
Connected Computing
Intelligent Acoustic Solutions
Competence Group Cyber Security and Defence

POLICIES – Institute for Economic and Innovation Research:

Technology, Innovation and Policy Consulting
Data Analytics and Statistical Modelling
Regional Economics and Structural Policy

ROBOTICS – Institute for Robotics and Mechatronics:

Cognitive Robotics
Mechatronic Systems
Robotic Systems

LIFE – Centre for Climate, Energy & Society:

Weather and Climate Risk Management
Future Energy Systems and Lifestyle
International Climate Policy and Economics
Urban Living Lab
Innovative Mobility Modelling

COREMED - Cooperative Centre for Regenerative Medicine:

Newly founded – in development since January 2018



Navigate to the
JOANNEUM RESEARCH Media Centre

MATERIALS

Projects



3D-MEOD project comes to an end

The Austrian Research Promotion Agency (FFG) project „3D-MEOD“, implemented in collaboration of 14 project partners, was successfully completed three years after its launch. The project's research focus was on smart plastics, i.e. new materials and processes that allow electronic, optical and sensory components to be embedded on inexpensive films and subsequently integrated in injection-moulded, 3D-shaped plastic parts. This new technology allows, for instance, the production of very thin, flexible user interfaces for cars.



Establishment of a 3D printing centre for metals

After forging specific strategic collaborations with Styrian businesses, MATERIALS succeeded in establishing the 3D printing centre for metals at Leoben-Niklasdorf. MATERIALS thus expanded its expertise in the area of laser-based 3D printing methods for metals, in particular with selective laser sintering, and is now in a position to offer bespoke solutions for the Austrian mechanical engineering industry.

The financial year 2017 saw an intensification of strategically important collaborations with partners from industry and science, notably with the Technical University of Graz, in the areas of materials sciences and nanotechnology. By approaching businesses with very specific offers, we succeeded in bringing applied research and development to an even higher level of sophistication.



Institute for Surface Technologies and Photonics



Dr Paul Hartmann
Director MATERIALS

Status 2017

RESEARCH GROUPS

- HEP – Hybrid Electronics and Patterning
- LOT – Light and Optical Technologies
- LPP – Laser and Plasma Processing
- SFP – Sensors and Functional Printing

CONTACT

Franz-Pichler-Strasse 30, 8160 Weiz

Phone +43 316 876-30 00

Fax +43 316 876-30 10

Leobner Strasse 94, 8712 Niklasdorf

Roseggerstrasse 12, 8700 Leoben

Phone +43 316 876-33 04

Fax +43 316 876-33 10

materials@joanneum.at

www.joanneum.at/materials



Projects



BASi markets the OFM method in America

Open microperfusion (OFM) is a biotechnology method in which a thin tube is inserted into the tissue and continuously collects tissue fluid. This helps analyse tissue fluid and monitor processes within the tissue. Bioanalytical Systems, Inc. (BASi) has been marketing OFM in America since September 2017. The OFM technology fits perfectly into the product portfolio of BASi, so HEALTH is expecting a successful rollout.



SPIDIMAN successfully completed

The SPIDIMAN diabetes research project, a winner of several awards, came to a successful completion in 2017. HEALTH has demonstrated that blood glucose measurement and insulin administration can take place at the same position in the lower skin layer without having an influence on each other. This allows for insulin administration and glucose measurement to be carried out with just one needle, a great relief especially for children and young persons.

2017 was an exciting year. In our areas of strength we are simply unique: services by HEALTH are in great demand worldwide and products by HEALTH are sold around the globe. In the medium term we expect investments in technological development to generate revenue from royalties.



Institute for Biomedicine and Health Sciences

Status 2017

RESEARCH GROUPS

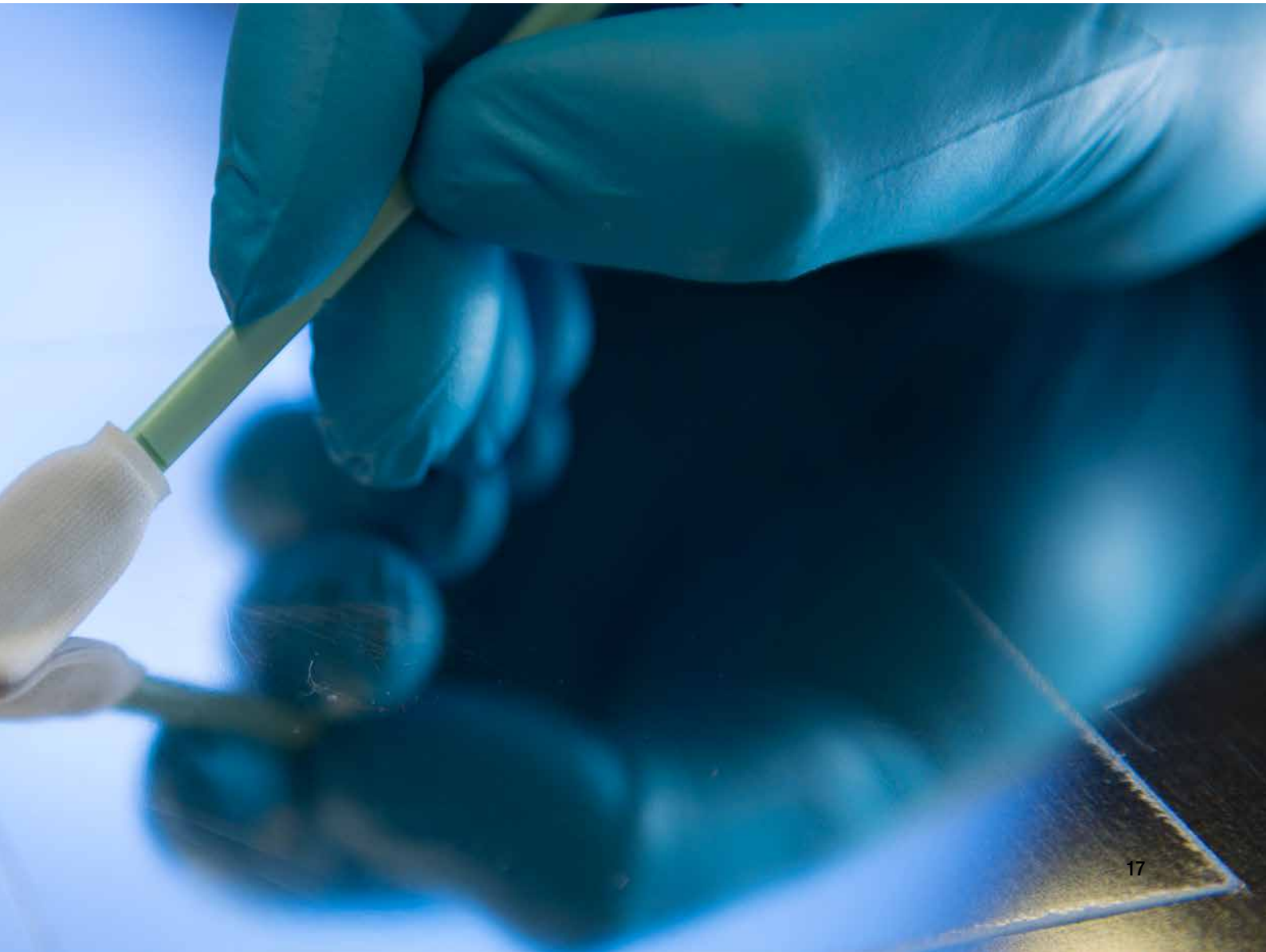
- BTM –
Biomedical Tissue Monitoring
- BAM – Bioanalytik und
Metabolomics
- GWS – Health Sciences
- CDS – Competence group
Clinical Decision Support
- MES – Competence
group Medical Sensors

CONTACT

Neue Stiftingtalstraße 2, 8010 Graz
Phone +43 316 876-40 00
Fax +43 316 876 9-40 00
health@joanneum.at
www.joanneum.at/health



**Prof. Dr Thomas Pieber
and Dr Frank Sinner**
Directors HEALTH



Projects



AKUT goes global

Since December 2017, tunnels in Southern England can „hear“ too. AKUT, the acoustic tunnel monitoring system, is now being used in a tunnel in Southern England for the first time. This security system, also known as „tunnel ears“, recognises unusual sounds like a tyre blowout or voices and can trigger an alarm much quicker than CCTV systems alone. This innovation by JOANNEUM RESEARCH was developed in collaboration with ASFINAG all the way through to serial production.



Photo: Alfred Rinnhofer

voestalpine Wire Rod Austria and DIGITAL

Technology for the world's most advanced wire rod mill: the most sophisticated wire rod mill in the world recently opened in St. Peter-Freienstein in Styria. The VISION+ cooperation project allows for digital quality control at very high material speeds and temperatures - in real time. This is achieved by using additional information such as multi-modal sensors, spatial-temporal analyses, as well as human interaction.

DIGITAL's research portfolio is at the forefront of progress. The numerous products which have emerged from research projects at the DIGITAL institute are used by customers around the world today and demonstrate the great benefit and high commercial relevance of our work.



Institute for Information and Communication Technologies

Status 2017



Dr Heinz Mayer
Director DIGITAL

RESEARCH GROUPS

- FER – Remote Sensing and Geoinformation
- MVA – Machine Vision Applications
- WKT – Space and Communication Technology
- CCM – Connected Computing
- IAL – Intelligent Acoustic Solutions

CONTACT

Steyrergasse 17, 8010 Graz

Phone +43 316 876-5000

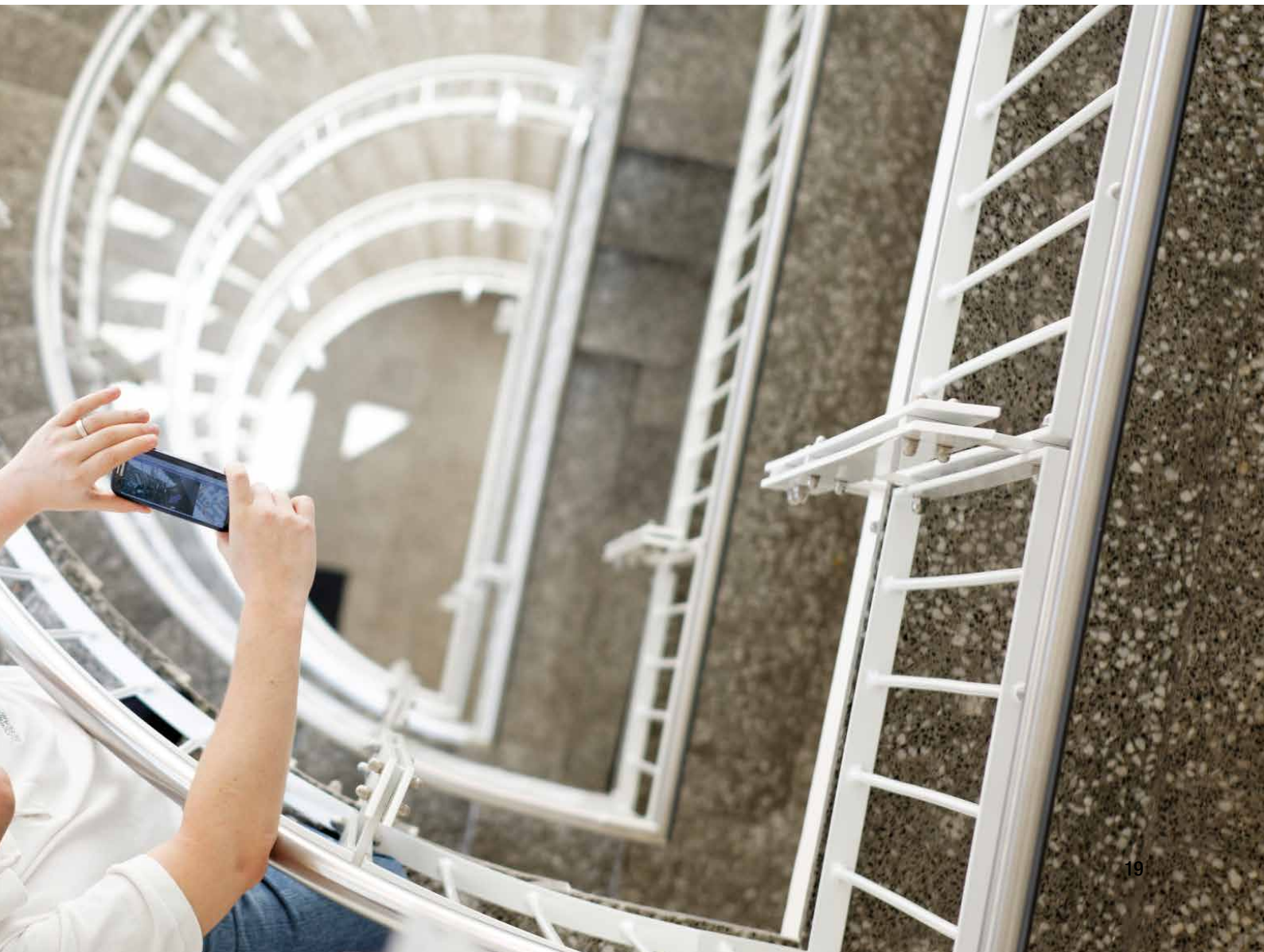
Fax +43 316 876-5010

Hilfswarte

Roseggerweg 31, 8010 Graz

digital@joanneum.at

www.joanneum.at/digital



Projects



REBEKKA – Viticulture in Carinthia and South Tyrol

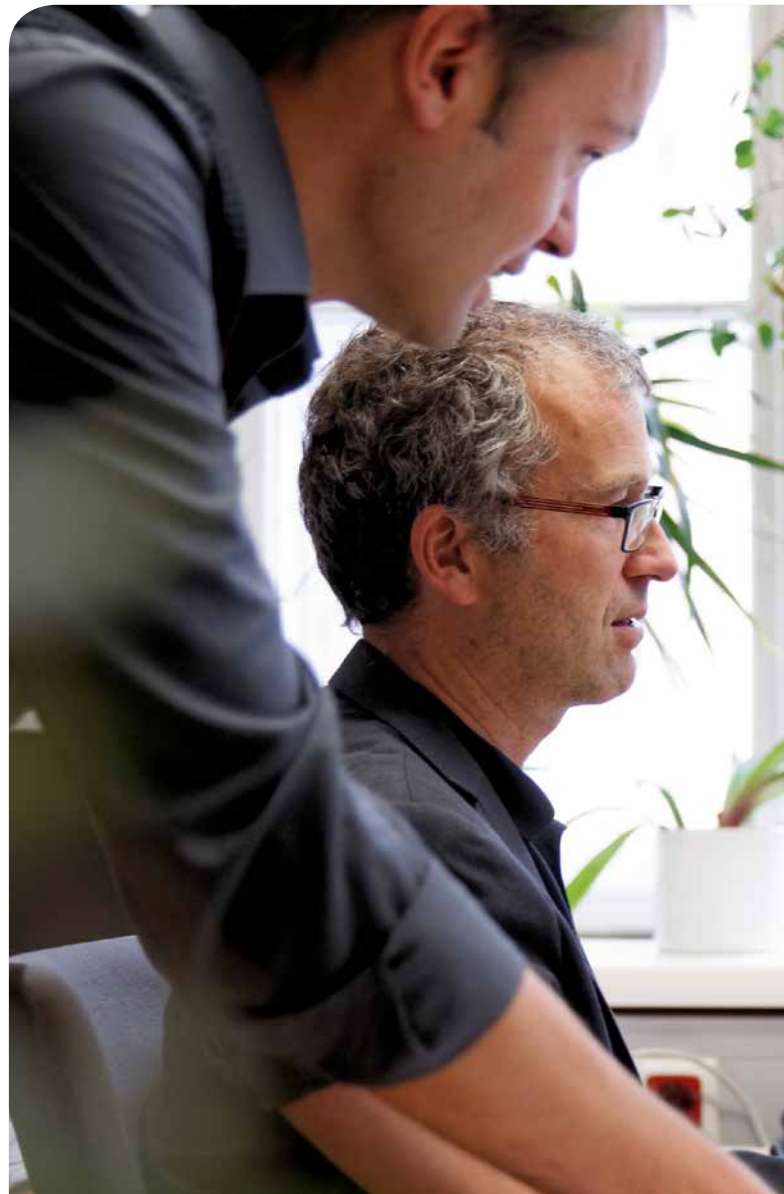
As part of the EU Interreg project led by the Laimburg Research Centre (Interreg V-A Italy-Austria programme 2014-2020) POLICIES is working on an objective assessment system for South Tyrol and Carinthia that can comprehensively identify wine-growing regions. POLICIES analyses and evaluates data relating to viticulture from the last 20 years for South Tyrol and the last six years for Carinthia. Partner EURAC is in charge of processing data on the microclimate.



Digitalisation is not to blame for inequality

A study conducted by POLICIES and the Economics of Inequality research institute at the Vienna University of Economics and Business illustrates how increasing digitalisation impacts on the factors of wealth distribution and employment level. The study was commissioned by Municipal Department 23 of the City of Vienna (economic affairs, labour and statistics), the Federal Ministry for Transport, Innovation and Technology and the Vienna Chamber of Labour. The results were presented in Vienna in September 2017.

In a time in which empirical research is becoming ever more differentiated while its interpretation is becoming less equivocal, POLICIES and its projects for the world of politics and business are making indispensable contributions towards identifying facts and empirical evidence.



Institute for Economic and Innovation Research



Wolfgang Polt
Director POLICIES

Status 2017

RESEARCH GROUPS

- TIP – Technology, Innovation and Policy Consulting
- STA – Statistical Applications
- REG – Regional Economics and Structural Policy

CONTACT

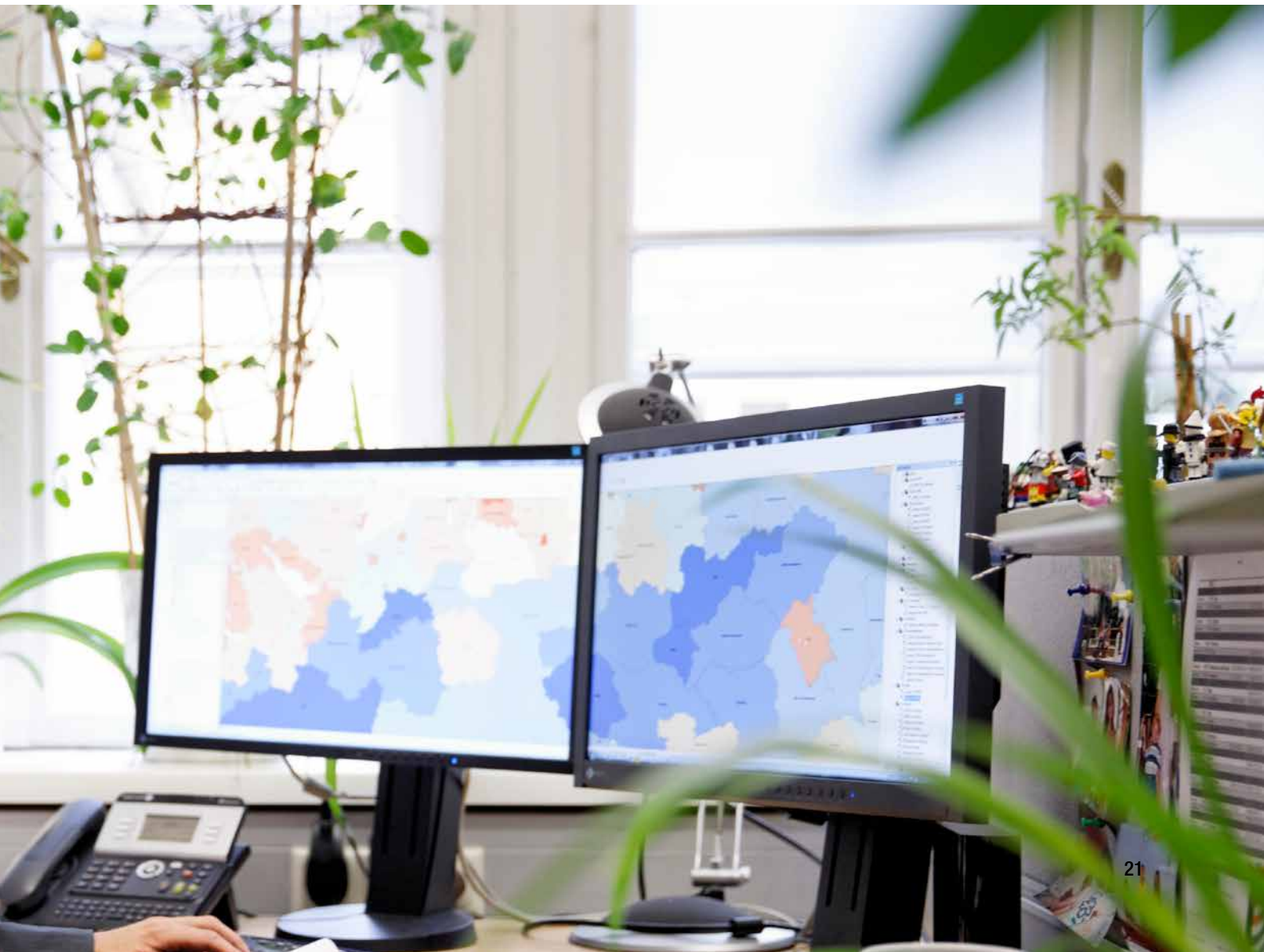
Leonhardstraße 59, 8010 Graz
Phone +43 316 876-1488
Fax +43 316 876-1480

Haus der Forschung
Sensengasse 1, 1090 Vienna
Phone +43 1 581 75 20
Fax +43 1 581 75 20-28 20

Lakeside B08a
9020 Klagenfurt am Wörthersee

Phone +43 316 876-20 00
Fax +43 316 876-20 10

policies@joanneum.at
www.joanneum.at/policies



ROBOTICS

Projects



FlexIFF – Flexible Intralogistics for future factories

FlexIFF introduces intralogistics task teams consisting of people, mobile robots and mobile manipulators. These cyber-physical systems are capable of handling the transport steps necessary to execute the production plan in a coordinated manner. The project is coordinated by ROBOTICS under the leadership of Bernhard Reiterer. In addition to ROBOTICS, project partners include DIGITAL, FLEX, the Know-Center and ProAutomation GmbH.



CHIMERA – sensitive mobile manipulator

CHIMERA is a sensitive mobile manipulator developed by ROBOTICS. This hybrid system, a combination of sensitive robots and an autonomous driverless transport system unites the advantages of each „species“, creating a new, flexible automation tool. In addition to numerous autonomous tasks, CHIMERA can also be used in cooperative activities together with humans in future.

ROBOTICS, based in Klagenfurt am Wörthersee, is a forward-looking scientific expansion of JOANNEUM RESEARCH and, in the long run, has helped cement its role as an attractive work and innovation base for scientists in the southeast of Austria.



Institute for Robotics and Mechatronics

Status 2017

RESEARCH GROUPS

- COR – Cognitive Robotics
- MES – Mechatronic Systems
- ROS – Robotic Systems



Dr Michael Hofbaur
Director ROBOTICS

CONTACT

Lakeside B08a, EG
9020 Klagenfurt am Wörthersee
Phone +43 316 876-2000
Fax +43 316 876-2010
robotics@joanneum.at
www.joanneum.at/robotics



Projects



The Paris lifestyle at the European Forum Alpbach

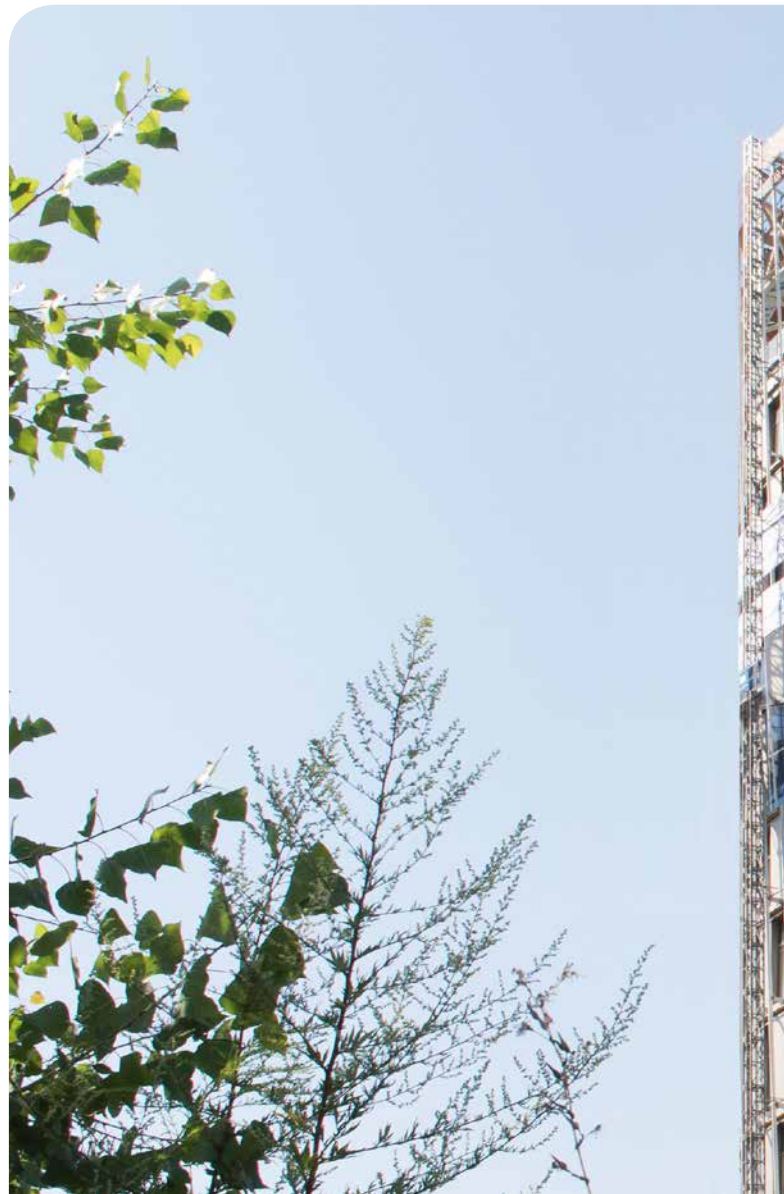
The breakout session entitled „The Paris lifestyle – technologies and opportunities for climate protection“ held by the LIFE centre attracted more than 70 visitors to the Alpbach Secondary School as part of the 2017 Technology Symposium of the European Forum Alpbach. International experts presented a future-oriented technology portfolio and climate-friendly lifestyles aimed at reaching the goals of the 2015 Paris Agreement.



Styria's climate adaptation strategy

Natural disasters are no longer a rare occurrence. For this reason a clear strategy with targeted measures is required to secure the subsistence of numerous businesses and employees. That is why the State of Styria awarded LIFE a research project over a period of three years, which is also seen as a kind of climate adaptation strategy. A sum of EUR 300,000 was earmarked for the entire package over a period of three years.

Our relocation to the Science Tower in 2017 resulted in additional visibility and a record level of incoming orders. Though climate change has not yet come to a halt, we do feel there is a lot of confidence in our solution expertise.



Centre for Climate, Energy & Society

Status 2017

RESEARCH GROUPS

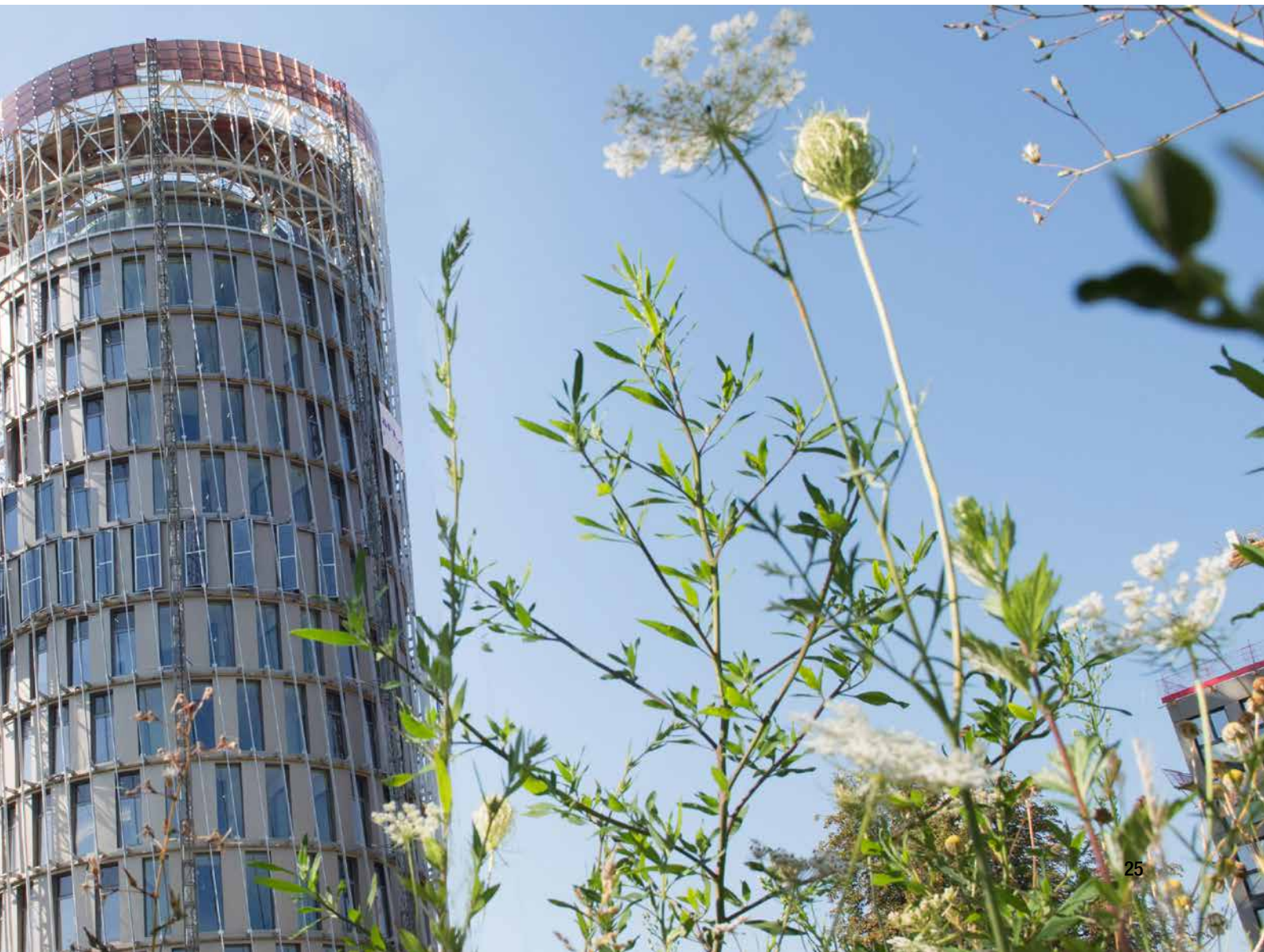
- CRM – Weather and Climate Risk Management
- SYS – Future Energy Systems and Lifestyle
- CPE – International Climate Policy and Economics

CONTACT

Science Tower
Waagner-Biro-Straße 100
8020 Graz
Phone +43 316 876-76 00
Fax +43 316 876-76 10
life@joanneum.at
www.joanneum.at/life



Dr Franz Prettenthaler, M.Litt
Director LIFE



Events and conferences



25 January 2017

Federation of Carinthian Industries at ROBOTICS

The Federation of Carinthian Industries organised an „Innovation Workgroup“ on the premises of ROBOTICS. The event served as a platform where representatives of renowned Carinthian enterprises were able to exchange their views on current Industry 4.0 topics and were introduced to the research activities of ROBOTICS through a speech delivered by university lecturer Dr. Michael Hofbaur and a guided tour through the laboratory.

1 March 2017

7th Future Conference

The function's general theme of „Light and Mobility“ was reflected both in the keynote speech by Dr. Wolfgang Huhn from Audi AG as well as the sessions and the exhibition of the research units. Managing Director Professor Dr. Wolfgang Pribyl, MBA, was delighted to welcome over 600 participants to the event at the Messe Congress Graz.



24 to 28 April 2017

Hanover Trade Fair

The DIGITAL and MATERIALS institutes presented „PyzoFlex® – The intelligent surface“, a technology that allows cost-effective production of large-scale, flexible, and energy-independent sensors for the detection of changes in pressure and temperature. The „intelligent floor“ was one of the highlights of the booth, attracting countless visitors from business and industry.

20 to 26 August 2017

European Forum Alpbach

Hundreds of experts from the world of science, politics, business and culture came together at the European Forum Alpbach between 16 August and 1 September 2017 to discuss questions around the issue of „Conflict & Cooperation“. JOANNEUM RESEARCH presented the latest ideas from the areas of health and technology as part of this long-established forum.



Events and conferences



4 to 7 September 2017

UN/A Symposium

The event took place on the premises of the Technical University of Graz (Institute of Microwave and Photonic Engineering) at the invitation of the United Nations and offered information, lectures, and discussions around the topic of „Access to Space. Holistic Capacity Building for the 21st Century“. Some 120 participants from 33 countries attended the numerous expert lectures held at the symposium, which was organised by JOANNEUM RESEARCH.

14 September 2017

Forum JOANNEUM RESEARCH

Around 60 participants discussed issues dealing with European research policy as part of the „Forum JOANNEUM RESEARCH“ event series. The keynote speech entitled „European Research Policy: Interaction between EU Commission, European Parliament and Nation States“ was delivered by European Parliament Member Dr. Paul Rübig.



18 September 2017

Research Market Day of the Austrian Armed Forces

Cooperation partners Austrian Institute of Technology (AIT), JOANNEUM RESEARCH and the University of Applied Sciences Wiener Neustadt each set up their own market stall as part of the exhibition. DIGITAL presented its first concrete and successfully implemented activities on the topic of „UAV - Challenges posed by drone missions, safe operation and defence“.

22 September 2017

Opening of new LIFE offices

The relocation of the LIFE centre to the premises of the Science Tower at Waagner-Biro-Strasse 100 in Graz was officially celebrated with a family party. The some 70 guests, including State Counsellor Barbara Eibinger-Miedl and Municipal Counsellor Dr. Peter Piffli-Percevic, explored the modern offices of this high-tech building by staging a tower rally.



Faszination Roboter

Summer of Robots

Drei Tage lang widmet sich Joanneum Research den Fragen, wie Roboter in Zukunft aussehen werden, wie sie unser Leben beeinflussen, was sie können werden, sollen und dürfen. Zudem gibt JR Robotics einen umfangreichen Einblick in die Arbeit ihrer Roboter-Wissenschaftler und der laufenden Forschungsprojekte im Bereich der Robotik.

28.-30. August 2017, 10 bis 16 Uhr, JR Robotics im Lakeside Park B08a, Klagenfurt.

www.joanneum.at



Hans Seitinger (l.) und Michael Schickhofer
LAND STEIERMARK/BEKTAŠ

Masterplan zum Klimawandel

Die Steiermark ist immer häufiger von Naturkatastrophen betroffen. Die Schäden durch Hochwasser, Hagel etc. summierten sich in den letzten 15 Jahren auf zwei Milliarden Euro. Der für Katastrophenschutz zuständige Vize-LH Michael Schickhofer und Agrarlandesrat Hans Seitinger haben jetzt einen 300.000 Euro schweren Forschungsauftrag an Joanneum Research vergeben. Ziel ist ein Masterplan mit Maßnahmen gegen Klimawandel und Naturkatastrophen.

Schallplatte neu erfunden

Neues Verfahren | Mittels Laser-Schneidetechnik will der Tullner Günter Loibl die klassische Schallplatte verbessern und als „HD Vinyl“ fit für die Zukunft machen.

TULLN, LOS ANGELES | Totgesagte leben länger: Trotz Siegeszug der CD in den 1980/90er-Jahren und der digitalen (Download-) Musikformate nach der Jahrtausendwende erfreut sich die gute, alte Schallplatte aus Vinyl wieder steigender Beliebtheit. Der Tullner Günter Loibl tritt mit seiner Firma Rebeat an, die klassischen Scheiben zu revolutionieren und (noch) fitter für die Zukunft zu machen.

„HD Vinyl“ heißt die Zauberkombination. Gemeinsam mit Grazer Forschern vom Joanneum Research Institut entwickelte Loibl ein Verfahren, bei dem die Plattenrillen nicht mehr mit einem hochpräzisen Schneidestichel in den Rohling

geritzt, sondern mittels Laser hineingeschnitten werden.

„Unser Verfahren kann viele Schwächen der herkömmlichen Vinyl-LP ausgleichen“, betont Loibl. So können etwa die Rillen enger aneinandergereiht werden, was mehr Information und mehr Grundlautstärke ermöglicht. Aber auch die Lebensdauer der Scheiben soll drastisch erhöht werden.

Eine große Herausforderung in der klassischen Vinyl-Plattenherstellung ist das Mastering, stark vereinfacht gesagt, das Schneiden des Rohlings mit dem dann die LPs gepresst werden, die in den Verkauf gelangen. Einer der wenigen wahren Meister dieser Kunst, ist - no-

men est omen - Ron McMaster.

Genau diesen besuchte Loibl vor einiger Zeit in den heiligen Hallen von Capitol Records wo McMaster seit mehr als 30 Jahren seinem Handwerk nachgeht. Jahrzehntelange Erfahrung kann man nicht einfach so weitergeben, aber die neue Laser-Technologie wäre auch leichter zu erlernen. „Das Feedback eines echten Meisters war uns wichtig“, betont Loibl, „und

McMaster war nicht nur total nett und geehrt, dass wir an ihn gedacht haben. Er war begeistert von unserer Idee.“

Das Patent ist angemeldet, die Finanzierung soll in den nächsten Wochen unter Dach und Fach gebracht werden. „Wenn alles nach Plan läuft, werden wir Ende des Jahres erste Samples haben, mit denen wir zeigen können, in welche Richtung HD Vinyl geht.“



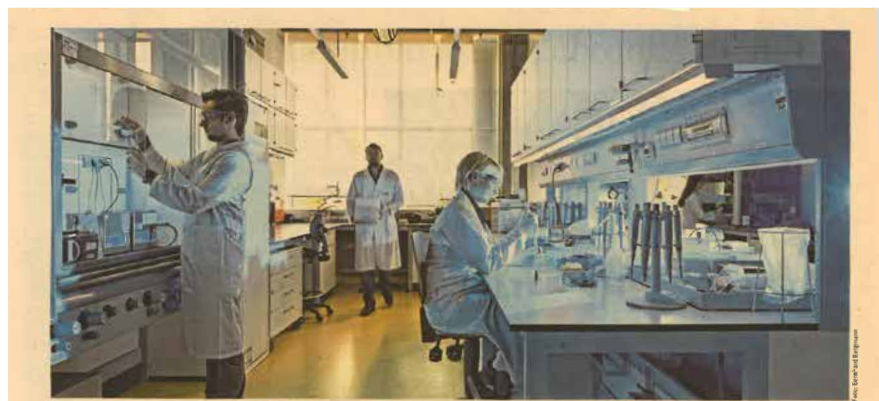
Günter Loibl, CEO der Firma Rebeat Digital GmbH, hofft bis zum Jahresende über erste Muster seiner „HD Vinyl“ zu verfügen. Foto: privat



Ron McMaster, lebende Legende in Sachen Vinyl-Schneidekunst, zeigte sich bei einem Besuch angetan von Loibls neuem Konzept. Foto: G. Loibl

10.-12.3.2017
VAZ St. Pölten
FR 10-18 Uhr
SA 9-18 Uhr
SO 9-17 Uhr

NÖN



Das Grazer Zentrum für Biomarkerforschung in der Medizin widmet sich der Identifikation und Validierung von personalisierten Biomarkern für Krebs und andere Krankheiten.

Die Suche nach Warnsignalen für Krebs

Die Menge und die Verteilung von Molekülen in einer Probe sagen viel über den Gesundheitszustand des zugehörigen Organismus aus. Das Grazer Zentrum für Biomarkerforschung CBMed befasst sich mit diesem noch wenig entschlüsselten Wissensschatz.

Doris Griesner

Graz - Im Februar 2013 ließ sich die amerikanische Schauspielerin Angelina Jolie beide Brüste entfernen, weil Genetika auf ein stark erhöhtes Brustkrebsrisiko hindeuteten - eine Entscheidung, die sie ohne Zurückhaltung in den Medien ausbreitete. Vielleicht hat ihr die vorwegliche Amputation das Leben gespart. Möglich ist aber auch, dass sich gar nie ein Brustkrebs entwickelt hätte. „Gebe es für diese Erkrankung bereits einen Biomarker auf molekularer Ebene, hätte Angelina Jolie ihre Brüste länger belassen können“, ist Natali Bording überzeugt. Die promovierte Biophysikerin ist Projektleiterin für Metabolomik am Grazer Zentrum für Biomarkerforschung in der Medizin (CBMed) - ein Fachgebiet, das sich mit der Messung kleiner Moleküle in einer biologischen Probe befasst. Bording: „Das Wissen um diese Stoffwechselprodukte und die im Urstadium Blut, Speichel, Urin, Gewebe, Plasma oder sonstigen frischen biologischen Material erkennbaren Muster erlaubt tiefe Einblicke in den Zustand eines Organismus.“ Das Metabolom - also die Gesamtheit dieser Moleküle von Lipiden und Fetten bis zu Hormonen oder Zucker - zeigt an, ob der Organismus gesund oder krank ist, ob sich eine bestimmte Krankheit anbahnt oder auf welches Medikament er anspricht. In der Biomarkerforschung wird die Metabolomik für die gezielte und ungelernte Suche nach neuen Biomarkern sowie für deren Validierung in verschiedenen Probenmaterialien verwendet.

Im Gegensatz zu Genetika, die auf ein gewisses Risiko verweisen können, spiegelt sich im Metabolom der aktuelle biologische Zustand eines Organismus, so Bording. In Fällen wie jenen der US-Schauspielerin müsste man nicht auf Verdacht hin amputieren, sondern würde regionale Metabolom-Messungen durchführen und erst bei konkreten Hinweisen auf den Eintritt der Erkrankung entsprechende Schritte setzen.

Veränderte Muster

Im Metabolom lassen sich Krankheitsentwicklungen bereits erkennen, wenn aufgrund von Kompensationsmechanismen im Körper noch keine sichtbaren Symptome vorhanden sind. So kann man beispielsweise lange vor Ausbruch von Diabetes veränderte Muster im Metabolom sehen und damit die Erkrankung hinauszuverfolgen oder überhaupt verhindern. „Man kann sich das Metabolom wie eine Stadtkarte mit Haupt- und Nebenstraßen, Sackgassen und Einbahnstraßen vorstellen“, sagt Bording. Gibt es Unfälle oder neue Baustellen, kommt

es zum Stau.“ Durch das Studieren des Metaboloms können frühzeitig Problemstellen erkannt und neue Therapiemöglichkeiten entwickelt werden. Parallel zur Identifizierung von Biomarkern geht es den Forschern am CBMed um die Erhellung neuer Messmethoden, um immer bessere und genauere Informationen aus immer kleineren Proben zu gewinnen.

Das vom der Forschungsförderungsgesellschaft FFG geförderte CBMed-Zentrum wurde 2015 in Graz etabliert und widmet sich der Identifikation und Validierung von personalisierten Biomarkern. Mittlerweile wurden bereits drei Patente angemeldet, die Verbesserungen für die Diagnose und Prognose von Krebs und Lungenerkrankungen bringen sollen. Zuerst arbeitet Natali Bording gemeinsam mit ihrem Team - Andreas Olaschewski vom Ludwig-Böhmern-Institut für Lungengenerkrankungen, Horst Olaschewski von der Med-Unit Graz und Christoph Magnes vom Joanneum Research - an der Entwicklung einer Biomarkeranalyse zur Diagnose von Lungenerkrankungen.

Diese schwere und seltene Lungenerkrankung geht mit unspezifischen Symptomen wie Luftnot bei Belastung einher, weshalb sie meist lange nicht erkannt wird. Unbehandelt sterben Patienten im Schnitt in weniger als drei Jahren. Nun ist es den Forschern gelungen, eine Gruppe von chemisch sehr ähnlichen Molekülen als Marker zu identifizieren. „Damit wäre es erstmals möglich, an Lungenerkrankung Erkrankte mit einem Labortest von Geweben zu unterscheiden“, sagt Bording. Eine retrospektive Patientenanalyse wurde bereits vor einem Jahr eingeleitet, die Forschung zur frühzeitigen Diagnose dieser Krankheit, die Menschen jeden Alters und auch Kinder treffen kann, geht aber weiter. Am Ende der Arbeit soll ein leicht anwendbarer, gezielter und minimalinvasiver Biomarker zur Verfügung stehen. Da ein Verdacht auf Lungenerkrankung zumeist nur mit dem sehr invasiven und nicht ungefährlichen Einsatz eines Herz-Katheters überprüft werden kann, knüpfen sich große Hoffnungen an die neue Diagnosemethode.

**NATUR UND
FORSCHUNG**

Wie Mikro- und Nano auf die Folie kommen

Großtechnisches Druckverfahren für winzige Strukturen auf Folien

Von Norbert Dwehola

Immer schon hat die Natur Ingenieuren und technischen Erfindungen als Vorbild gedient. So auch im Institut für Oberflächentechnologien und Photonik der Rheinisch-Westfälischen Technischen Hochschule Aachen. Am Standort Würz beschäftigt sich seit einigen Jahren ein vielfältiges Forschungsteam unter der Leitung von Barbara Stadler mit dem Thema: „Wie sind Strukturen, die man auf Folien bringen will, aus der Natur zu verstehen.“

„So, wie die Natur die Blätter der Haisfischhaut mit den Haisfischhaut-Effekt“, fragt man Folien so wie eine Haisfischhaut, dann bekommt man paradoxerweise glattere Oberflächen. In diesem Falle, die man beispielsweise bei Folien für Windturbinen oder bei Surfboards einsetzen könnte, verringert sich die Turbulenz und damit der Widerstand.“

Auch das Abspülen von Wasser von Oberflächen kann man durch rippartige Strukturen

Forschungsleiter Barbara Stadler

noch verstärken – das Schwerkett ist hier der Lottulienblätter. Damit wären schmutzresistente Folien für Hauswände denkbar. Eine andere Anwendung sind „Mottenaugen-Strukturen“. Das sind kleine, eingepigelte Spitzen, die die Reflexionseigenschaften von Oberflächen beeinflussen und daher für Displays oder auch bei Fotovoltaik von großem Interesse sind. Gefragt sind Technologien, die präzise, effizient und in-

novativ sind. Die Weitzer Gruppe hat einen Lack entwickelt, der in einem Druckverfahren erst auf Folien aufgebracht und dann mit Sonogenie geprägt wird. UV-Bestrahlung sorgt dabei, dass die eingepigelten Strukturen nach hinten werden. Der Lack ist bereits patentiert, das Verfahren wurde zusammen von Firmen, darunter auch Bionik Surface Technologies, weiterentwickelt.

„Gewöhnliche Drucktechnik“ druckt Strukturen von etwa 100 Mikrometern aufwärts. Wir brauchen uns mit Strukturen, die kleiner als ein Mikrometer

sind. Zugleich können wir so genannten Nanostrukturen oder auch mit Mikrostrukturen umgehen“, sagt Stadler.

Die Auswirkungen, die erforscht werden, sind um Kooperationen mit der Industrie möglich sind, sind vielfältig. Oberflächenveränderungen können als Sicherheitsfunktionen dienen. Wie etwa geringe Barriereigenschaften. Ein anderes Beispiel, hochaktuell: Die Technologien können dazu dienen, Oberflächen zu vergrößern. „Und das kann beispielsweise im Bereich neuer Batterietechnologien genutzt werden.“

Vorbild Natur am Beispiel der Haisfischhaut: Forscher entwickelten daraus Folien mit Beschichtungen im Nano- und Mikrobereich, die effizienter sind

ARND BRONKHORST/STADLER
DRESSLER GROUP
KUNZ

Industrie Die vielfältigen Verarbeitungsverfahren bei der Produktion des Kiefern Zettens



Datenanalyst Hermann Katz sieht im Weinbau in Kärnten eine Zukunftsbranche FOTOLIA/HASSLER

Zum Projekt

Rebecka. Der Name steht für „Rebsorten- und Weinbauflächen-Bewertungsmodell unter Berücksichtigung der Auswirkungen und Chancen des Klimawandels in den Alpen“. **Laufzeit.** Anfang 2018 dürften die Daten unter Berücksichtigung des Klimas fertig ausgewertet sein.

Welche Gebiete eignen sich für den Anbau bestimmter Weinsorten am besten? Mit einem Forschungsprojekt, das sich mit dieser Frage beschäftigt, will Hermann Katz sprichwörtlich auf fruchtbaren Boden stoßen. Der Bleiburger entwickelt zusammen mit seinem Team eine „Weinzonierungskarte“, die auf Basis historischer Daten und Klimawerten ausschüttet, wo welche Traube am besten gedeiht. Das Projekt läuft unter dem Namen „Rebecka“; geforscht wird in Kärnten und Südtirol. „In Südtirol habe ich die notwendigen Kontakte geknüpft. Dort gab es schon länger Bestrebungen, eine solche Karte zu entwickeln“, sagt Katz, der stellvertretende Direktor von „Policies“ ist, dem Wirtschafts- und Innovationsforschungsinstitut des Joanneum Research in Graz. Konkret besteht das Projekt aus zwei Schritten. Eine der Aufgaben

von Katz ist es, Daten der vergangenen Jahre auszuwerten: „Wir schauen uns an, wie sich der Weinanbau und die -ernte in dieser Zeit entwickelt hat.“ Zweiter Schritt ist die Errichtung von 40 Wetterstationen, die das Mikroklima in Südtirol und Kärnten messen: „So soll ein geeignetes Bewertungssystem etabliert werden.“ Das Vorhaben basiert auf der Annahme, dass Klimaänderungen den Weinbau in niedrigen Lagen erschweren. „Sind die Trauben zu lange der Sonne

ausgesetzt, bekommt der Wein einen für seinen Charakter zu hohen Alkoholgehalt. Folglich kann man entweder einen anderen Wein anbauen oder in die Höhe wandern", erklärt Katz, der technische Mathematik studiert hat und mit seiner Familie in Graz wohnt. Aus beruflichen Gründen kehrt er aber regelmäßig in seine Heimat zurück: „Wir haben mehrere Zuden und Projekte in Kärnten.“ Auch in seiner Freizeit reist der 48-Jährige gerne: natürlich zusammen mit Frau und Tochter. „Außerdem versuche ich, wie es sich als Österreicher gehört, im Winter oft Ski zu fahren“, sagt Katz lachend. „Im Sommer bin ich mit dem Rad unterwegs.“

Von seinem aktuellen Forschungsprojekt sollen beide Regionen, Kärnten und Südtirol, profitieren. Katz glaubt: „Der Weinbau ist in Kärnten definitiv eine Zukunftsbranche.“



Schwermetalle
sowie für die
Industrie und im
Laborbereich im
schweren
Schmelzen



**SCHNITZPUNKT
SIMULATION**



Wald und Roboterarm
werden genutzt, damit ein geladener und empfindlicher

am Institut für
Mechanik und
Mechatronik der
Forschungsgesellschaft Jointforum
Research geht es um die Zusammenarbeit
zwischen Mensch
und Roboterarm.

Mit Simulation dem Roboterarm zur Hand gehen



Zwei Menschen
wären ver-
wendet. Physikalische Simula-
tionen ersparten sich es am
realen Test. Simulationen haben
den Menschen vor den
Schwierigkeiten der Indus-
trie und Roboterarm
werden genutzt, damit ein
geladener und empfindlicher

Von Herbert Boudale

Am Institut für Me-
chanik und Mechatronik
der Forschungsgesellschaft
Jointforum Research ist
es um die Zusammenarbeit
zwischen Mensch und
Roboterarm. Der Mensch
steht im Zentrum der In-
dustrie und des schwe-
ren Schmelzens. Die
Industrie und der Roboter-
arm werden genutzt, damit
ein geladener und empfind-
licher



**SCHNITZPUNKT
SIMULATION**

Wald und Roboterarm
werden genutzt, damit ein
geladener und empfindlicher

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**SCHNITZPUNKT
SIMULATION**

Wald und Roboterarm
werden genutzt, damit ein
geladener und empfindlicher

Forscher liefern „Tunnelohren“ in die Welt

Software alarmiert bis zu
viereinhalb Minuten früher.

Das Prinzip ist einfach, aber wirkungsvoll: In einem Tunnel werden mit jeweils rund 125 Meter Abstand Mikrofone angebracht. Eine Software unterscheidet Verkehrslärm von Unfallgeräuschen, etwa, wenn zwei Fahrzeuge kollidieren oder ein Reifen platzt, und löst in weniger als einer Sekunde Alarm aus. Das spart zwei bis vier innerhalb Minuten bei der Meldung an die Überwachungszentrale.

Das von der sterischen Forschungsgesellschaft Joanneum Research mit der Asina entwickelte Tunnelüberwachungssystem „Akut“ wurde 2010 erstmals auf der Brucker Schnellstraße getestet. Mittlerweile ist es in 17 österreichischen Tunnels in Betrieb. Nun gibt es zunehmend Interesse aus dem Ausland: **Siidengland** startet kommandes Jahr einen Pilotversuch, Gespräche mit Norwegen, Schweden, Dänemark und China laufen. (APA)

„Silicon Austria“: Bald sollen erste Projekte anlaufen

Graz. (apa/red) Das Hauptquartier des Forschungsdreiecks „Silicon Austria“ wird ab dem Frühjahr 2018 in Graz gebaut, soll 2019 in Betrieb gehen und rund 200 Mitarbeitern Platz bieten. Infrastrukturminister Jörg Leichtfried (SPÖ) und Wissenschaftslandesrätin Barbara Eibinger-Miedl (ÖVP) stellten am Dienstag in einer Pressekonferenz den Zeitplan vor. Bereits zu Jahresende sollen erste Projekte anlaufen.

Zusammen mit den beiden anderen Standorten des Forschungszentrums Mikroelektronik Villach und Linz – weil „Silicon Austria“ an die Weltspitze und den beteiligten Unternehmen „Spitzenforschung“ bieten. Durch die Zusammenarbeit der Niederlassungen in den drei Bundesländern sollen Doppelgeleistungen vermieden werden. „Die Eckpfeiler sind gesetzt, jetzt müssen noch die Details ausgearbeitet werden“, sagte Josef Affenzeller, Chef der ECESEL Austria, stellvertretend für die mitwirkenden Betriebe. Von den rund 200 Mitarbeitern in Graz soll der Großteil forschen und sich um Patentwesen und ähnliche Bereiche kümmern.

„Austria Inside“

In den kommenden fünf Jahren sollen laut Leichtfried rund 100 Millionen Euro in die Steiermark fließen. Insgesamt wollen Infrastrukturministerium, Länder und Industrie 280 Millionen Euro investieren.

Graz ist als Hauptquartier ausgesucht worden, weil kurzfristig in einem Gebäude der TU Graz Platz für 50 Mitarbeiter geschaffen werden kann, bis der Neubau 2019 in Betrieb geht. In der steirischen Landeshauptstadt sollen die Komponenten der drei Standorte bei der System-Integration zusammengeführt werden.

Projektleiter Wolfgang Pribyl schwärmt für die Zukunft – analog zum Logo „Intel Inside“ – der Schriftzug „Austria Inside“ oder „Styria Inside“ vor. Ohne dass es die Menschen wüssten, so Pribyl weiter, seien schon heute in vielen Alltagsgegenständen Entwicklungen aus der Steiermark enthalten – etwa Chips in Reisepässen und Smartphones. 📱



Bürger zur Teilnahme eingeladen

Bürger zur Teilnahme eingeladen
**Das Flughafen-Areal
wird zur »SmartAIRea«**

Ein Projekt soll das Gebiet rund um den Flughafen lebenswerter gestalten.

Graz. „Das Area östlich der Grazer Flughafenröhre ist ein riesiges Potenzial. Wir zeigen hier, wie man es menschenrecht entwickeln kann“, eröffnet Projektleiterin Erika Pansinger die Präsentation der neuen SmartAIRe im Umfeld des Grazer Flughafens. Konkret geht es dabei um

40 Hektar, die ein interdisziplinäres Team von Joanneum Research und der TU Wien ein Jahr lang analysiert hat. Hier die SmartAIRe von nun an aufsucht, ist dazu eingeladen, seine Meinung abzugeben und Ideen für eine smarte Gestaltung einzubringen.

Nachhaltig. Transparent, vernetzt, gestalterisch nachhaltig: So soll die Umgestaltung aussehen.

Audit certificate

■ Report on the annual financial statements

Audit opinion

We have audited the annual financial statements of **JOANNEUM RESEARCH Forschungsgesellschaft mbH Graz** which are comprised of the balance sheet as at 31 December 2017 showing equity of EUR 8,966,941.47, the income statement for the financial year ended 31 December 2017 and the Notes.

In our opinion the attached annual financial statements are in compliance with the statutory provisions and present a true and fair view of the financial position of the Company as at 31 December 2017 and of the Company's financial performance for the financial year ended 31 December 2017 in accordance with Austrian business law provisions.

■ Basis for the audit opinion

We have conducted our audit in accordance with the professional auditing principles applicable in Austria. Those principles require application of the International Standards on Auditing (ISA). Our responsibilities under those provisions and standards are described under the heading „Responsibilities of the auditor for the audit of the annual financial statements“ of our audit certificate. We are independent of the Company in accordance with the Austrian business law and professional law provisions and we have fulfilled our other professional duties in compliance with those requirements. In our opinion the evidence obtained by us in the course of our procedures is sufficient and appropriate to serve as the basis for our audit opinion.

■ Responsibilities of the legal representatives and the audit committee for the annual financial statements

The legal representatives of the Company are responsible for preparation of annual financial statements and for ensuring that they present a true and fair view of the financial position and financial performance of the Company in accordance with Austrian business law provisions. In addition, the legal representatives are responsible for internal controls which they deem necessary in order to enable preparation of annual financial statements that are free from material misrepresentations, be they deliberate or inadvertent.

When preparing annual financial statements the legal representatives are responsible for assessing the Company's ability to continue its business as a going concern, for stating facts and circumstances relating to continuation as a going concern, if applicable, and for applying the going concern accounting principle, unless the legal representatives intend either to liquidate the Company or to discontinue its business activities, or have no realistic alternative.

The audit committee is responsible for supervising the Company's accounting process.






■ Responsibilities of the auditor for the audit of the annual financial statements


Our aims are to obtain sufficient certainty as to whether the annual financial statements as a whole are free from material misrepresentations, be they deliberate or inadvertent ones, and to issue an audit certificate that includes our audit opinion. Sufficient certainty means a high degree of certainty which, however, cannot guarantee that an audit conducted in accordance with the professional auditing principles applicable in Austria, which require application of ISA, will reveal a material misrepresentation, if any, in any case. Misrepresentation may result from fraudulent actions or mistakes and are considered to be material if one might reasonably expect that any or all of them influence the financial decisions made by users on the basis of these annual financial statements.

As part of an audit in accordance with the professional auditing principles applicable in Austria, which require application of ISA, we exercise dutiful discretion throughout the audit and maintain a critical attitude.

Audit certificate

In addition, the following applies:

-  We identify and assess the risks of material misrepresentations, be they deliberate or inadvertent, in the financial statements, plan and carry out audit procedures in answer to those risks and obtain audit evidence that is sufficient and appropriate to serve as the basis for our audit opinion. The risk that material misrepresentations resulting from fraudulent actions will not be uncovered is higher than that resulting from mistakes because fraudulent actions may include fraudulent collusion, falsifications, deliberate incompleteness, misleading presentations or rendering internal controls inoperative.
-  We become familiar with the internal control system that is relevant to the audit in order to plan audit procedures that are reasonable under the given circumstances, but not with the objective of providing an audit opinion on the effectiveness of the Company's internal control system.
-  We give an opinion on the appropriateness of the accounting methods used and the plausibility of the amounts estimated by the legal representatives, including the related disclosures.
-  We draw conclusions as to whether application of the going-concern principle by the legal representatives is appropriate and, on the basis of the audit evidence obtained, whether there is material uncertainty in connection with events or circumstances that may give rise to significant doubts about the Company's ability to continue its business as a going concern. If we arrive at the conclusion that there is material uncertainty, we are obliged to draw attention to the related disclosures in the annual financial statements in our audit certificate, or, if such disclosure is inappropriate, to modify our audit opinion. We draw our conclusions on the basis of the audit evidence obtained by the date our audit certificate is issued. However, future events or circumstances may lead to the Company's departure from continuation of its business as going concern.
-  We give an opinion on the overall presentation, structure and content of the annual financial statements, including disclosures, and on whether the annual financial statements present a true and fair view of the underlying transactions and events.

-  We communicate with the audit committee, inter alia about the planned scope and the planned timeline of the audit as well as about significant findings made during the audit, including any significant defects in the internal control system we might identify during our audit.

Report on the management report

The management report must be audited on the basis of Austrian business law provisions as to whether it is in line with the annual financial statements and whether it has been prepared in compliance with applicable legal requirements.

The legal representatives are responsible for preparing the management report in accordance with Austrian business law provisions.

We have conducted our audit in accordance with the professional auditing principles for audits of management reports.

Opinion

In our opinion the management report has been prepared in compliance with applicable legal requirements and is in line with the annual financial statements.

Statement

Based on the findings obtained in the course of the audit of the annual financial statements and on the understanding we gained of the Company and its environment no material faulty information was found in the management report.

Vienna, 6 March 2018

 
SOT Wirtschaftsprüfung GmbH
SOT Wirtschaftsprüfung GmbH
Dr. Anton Schmid Mag. Andreas Maier
Wirtschaftsprüfer
im Netzwerk von
Crowe Horwath International

Balance Sheet

Assets	as at 31.12.2017 EUR	as at 31.12.2016 EUR
A. Non-current assets		
I. Intangible assets		
1. Rights and licences	345,303.00	243,143.00
II. Property, plant and equipment		
1. Land and buildings	9,558,082.66	9,015,560.66
<i>thereof land value</i>	<i>2,656,523.66</i>	<i>2,656,523.66</i>
<i>thereof capital expenditure for buildings owned by others</i>	<i>2,097,540.00</i>	<i>2,158,879.00</i>
2. Technical plant and machinery	4,344,864.00	3,777,528.00
3. Other plant, furniture and fixtures	625,117.00	663,272.00
4. Advances made and construction in progress	347,605.20	1,028,888.37
	14,875,668.86	14,485,249.03
III. Financial assets		
1. Shares in affiliates	150,000.00	150,000.00
2. Participating interests	260,638.25	255,038.25
3. Investment securities (book-entry securities)	1,406,750.00	1,350,675.00
	1,817,388.25	1,755,713.25
	17,038,360.11	16,484,105.28
B. Current assets		
I. Inventories		
1. Raw materials and supplies	3,894.90	5,178.20
2. Services not yet chargeable	9,357,580.24	8,746,242.57
3. Advances made	15,071.00	18,854.30
	9,376,546.14	8,770,275.07
II. Receivables and other assets		
1. Trade receivables	1,464,834.82	1,892,095.64
<i>thereof due within 1 year</i>	<i>1,464,834.82</i>	<i>1,892,095.64</i>
2. Receivables from affiliates	64,938.36	132,436.03
<i>thereof due within 1 year</i>	<i>30,138.36</i>	<i>80,236.03</i>
<i>thereof due after more than 1 year</i>	<i>34,800.00</i>	<i>52,200.00</i>
3. Receivables from undertakings with which the company is linked by virtue of participating interests	179,414.63	211,585.42
<i>thereof due within 1 year</i>	<i>139,132.07</i>	<i>129,161.58</i>
<i>thereof due after more than 1 year</i>	<i>40,282.56</i>	<i>82,423.84</i>
4. Receivables from proprietor	0.00	156,492.78
<i>thereof due within 1 year</i>	<i>0.00</i>	<i>156,492.78</i>
5. Receivables from subsidies and project grants	4,414,364.06	3,622,356.47
<i>thereof due within 1 year</i>	<i>4,414,364.06</i>	<i>3,622,356.47</i>
6. Other receivables and assets	11,975,729.60	13,044,784.98
<i>thereof due within 1 year</i>	<i>11,975,729.60</i>	<i>7,444,784.98</i>
<i>thereof due after more than 1 year</i>	<i>0.00</i>	<i>5,600,000.00</i>
	18,099,281.47	19,059,751.32
<i>thereof due within 1 year</i>	<i>18,024,198.91</i>	<i>13,325,127.48</i>
<i>thereof due after more than 1 year</i>	<i>75,082.56</i>	<i>5,734,623.84</i>
III. Securities and shares		
1. Other securities and shares	1,950,000.00	2,000,000.00
IV. Cash and balances at banks	7,514,629.81	4,703,696.44
	36,940,457.42	34,533,722.83
C. Prepayments and accrued income	466,445.70	608,544.97
D. Escrow funds	768,739.66	1,941,558.95
Total assets	55,214,002.89	53,567,932.03

Balance Sheet

Liabilities and shareholders' equity	as at 31.12.2017 EUR	as at 31.12.2016 EUR
A. Equity		
I. Share capital called in and paid up	3,420,000.00	3,420,000.00
II. Capital reserves		
1. Appropriated	3,504,800.34	3,741,292.71
2. Unappropriated	362,637.44	362,637.44
	3,867,437.78	4,103,930.15
III. Retained earnings		
1. Statutory reserves	159,571.25	159,571.25
2. Other reserves (free reserves)	750,910.22	763,630.22
	910,481.47	923,201.47
IV. Net profit for the year	769,022.22	508,771.61
<i>thereof profit carried forward</i>	508,771.61	448,938.15
	8,966,941.47	8,955,903.23
B. Investment grants	1,635,711.73	1,819,187.00
C. Provisions		
1. Provisions for severance pay	4,315,100.00	3,992,400.00
2. Provisions for pensions	4,692,330.00	4,556,360.00
3. Tax provisions	3,363,000.00	2,846,800.00
4. Other provisions	10,439,600.00	10,270,470.00
	22,810,030.00	21,666,030.00
D. Liabilities		
1. Bank borrowings	712,193.77	2,712,193.77
<i>thereof due within 1 year</i>	712,193.77	2,712,193.77
<i>thereof due after more than 1 year</i>	0.00	0.00
2. Advances received on orders	14,267,171.87	10,246,854.20
<i>thereof due within 1 year</i>	8,266,737.38	9,018,782.69
<i>thereof due after more than 1 year</i>	6,000,434.49	1,228,071.51
3. Trade payables	2,199,623.71	2,185,001.42
<i>thereof due within 1 year</i>	1,281,383.71	1,584,659.06
<i>thereof due after more than 1 year</i>	918,240.00	600,342.36
4. Payables to affiliates	574,943.99	850,402.75
<i>thereof due within 1 year</i>	20,160.00	197,387.00
<i>thereof due after more than 1 year</i>	554,783.99	653,015.75
5. Payables to undertakings with which the company is linked by virtue of participating interests	8,414.64	15,480.00
<i>thereof due within 1 year</i>	8,414.64	15,480.00
<i>thereof due after more than 1 year</i>	0.00	0.00
6. Other liabilities	2,960,036.61	2,731,098.12
<i>thereof due within 1 year</i>	1,572,559.61	1,343,621.12
<i>thereof due after more than 1 year</i>	1,387,477.00	1,387,477.00
<i>thereof for taxes</i>	527,894.75	355,824.20
<i>thereof for social security</i>	806,689.19	680,680.44
	20,722,384.59	18,741,030.26
<i>thereof due within 1 year</i>	11,861,449.11	14,872,123.64
<i>thereof due after more than 1 year</i>	8,860,935.48	3,868,906.62
E. Accruals and deferred income	310,195.44	444,222.59
F. Escrow liabilities	768,739.66	1,941,558.95
Total liabilities	55,214,002.89	53,567,932.03
Contingencies	326,252.96	292,509.11

Income Statement

Income Statement	31.12.2017 EUR	31.12.2016 EUR
1. Revenue	14,674,334.87	7,670,452.59
2. Changes in the amount of services not yet chargeable	611,337.67	-560,233.81
3. Project-related other income	14,561,922.72	7,410,314.15
4. Shareholder contribution	8,833,813.74	4,412,000.00
5. Other own work capitalised	19,869.94	27,264.28
6. Other operating income		
a. Income from disposal of non-current assets except for financial assets	11,891.83	57,408.66
b. Income from reversal of provisions	381,225.88	308,005.44
c. Income from reversal of investment grants	254,006.80	228,837.22
d. Other	2,825,523.77	1,395,043.15
	3,472,648.28	1,989,294.47
7. Cost of materials and other services purchased		
a. Cost of materials	1,389,172.60	785,820.47
b. Costs of services purchased	1,843,689.69	898,731.01
	3,232,862.29	1,684,551.48
8. Cost of staff		
a. Salaries	20,864,596.59	9,844,295.02
b. Social benefits		
aa) Expenses for old-age provision	435,933.52	187,204.12
bb) Expenses for severance pay and contributions to Severance Pay and Pension Funds	846,621.93	641,300.87
cc) Expenses for statutory social security contributions and payroll-related taxes and compulsory contributions	5,869,932.55	2,801,932.57
dd) Other social benefits	146,028.56	57,704.83
	28,163,113.15	13,532,437.41
9. Amortisation of intangible non-current assets and depreciation of property, plant and equipment	2,561,838.95	1,233,280.53

Income Statement

Income Statement	31.12.2017 EUR	31.12.2016 EUR
10. Other operating expenses		
a. Taxes, other than taxes stated in line 19	7,868.43	3,934.32
b. Other	7,631,134.47	4,183,305.64
	7,639,002.90	4,187,239.96
11. Subtotal lines 1 to 10 (Operating result)	577,109.93	311,582.30
12. Income from other securities	28,371.35	22,893.76
13. Other interest and similar income	36,091.15	84,057.60
14. Income from disposal and write-up of financial assets and securities held as current assets	0.00	45,399.00
15. Expenses for financial assets and securities held as current assets		
a. Write-downs	675.00	0.00
b. Expenses for affiliates	516,750.00	410,000.00
c. Other	51,614.70	58,899.32
	569,039.70	468,899.32
16. Interest and similar expenses	59,744.49	35,426.19
17. Subtotal lines 12 to 16 (Financial result)	-564,321.69	-351,975.15
18. Profit or loss before tax (Subtotal lines 11 and 17)	12,788.24	-40,392.85
19. Income taxes	1,750.00	876.00
20. Income from the merger	0.00	342,825.62
21. Profit or loss for the year = profit or loss after tax	11,038.24	301,556.77
22. Reversal of capital reserves		
a. Appropriated	236,492.37	94,742.31
23. Reversal of retained earnings		
a. Other reserves (free reserves)	12,720.00	6,360.00
24. Profit carried forward from previous year	508,771.61	106,112.53
25. Net profit for the year	769,022.22	508,771.61

Notes

Accounting and Valuation Policies

General principles

The annual financial statements of JOANNEUM RESEARCH Forschungsgesellschaft mbH were prepared in accordance with the provisions of the Austrian Business Code [Unternehmensgesetzbuch/UGB] as amended in accordance with generally accepted accounting principles and the general principle of presenting a true and fair view of the Company's financial position and financial performance.

When preparing the annual financial statements the principle of completeness was complied with.

Assets and liabilities were measured on a going concern basis according to the principle of item-by-item valuation.

The principle of prudent valuation was taken account of by recognising only the profits realised as at the balance sheet date. All recognisable risks and anticipated losses were taken into consideration.

It should be put on record that due to the change of the balance sheet date to 31 December and the resulting short financial year from July to December 2016 the previous year's figures are only comparable to the current figures

for the financial year 2017 to a limited extent. Unless clearly marked as such, comparative figures are stated in brackets.

Non-current assets

Intangible assets

Intangible assets are recognised at cost plus incidental acquisition costs less cash discounts deducted and after amortisation on a straight-line basis. The useful life applied is three to five years (20%-33%).

Property, plant and equipment

Property, plant and equipment is recognised at cost plus incidental acquisition costs less cash discounts deducted and after depreciation.

Public subsidies for non-current assets are presented on the liabilities side as investment grants from public funds. Those investment grants are used for the non-current assets analogously to the depreciation of non-current assets.

Depreciation is calculated on a straight-line basis according to the following useful lives and rates:

	Useful life in years	rate in %
Buildings, including buildings on land owned by others	10 – 40	2.5 % – 10 %
Machinery, scientific equipment and electronic data processing systems	3 – 10	10 % – 33 %
Other plant, furniture and fixtures	4 – 10	10 % – 25 %

The full annual depreciation is applied to additions in the first half of the financial year and half the yearly rate is applied to additions during the second half of the year.

Low-value assets as defined in Section 13 of the Austrian Personal Income Tax Act [Einkommensteuergesetz/ESTG] 1988, i.e. the cost of acquisition of which is up to EUR 400 per asset, are fully written off in the year of acquisition and presented as additions and disposals in the non-current assets movement schedule.

Notes

➤ Financial assets

Shares in affiliates and participating interests are measured at cost less impairment losses, where appropriate.

Investment securities are recognised at the lower of cost or fair value at the balance sheet date.

In the reporting year no write-downs of financial assets were made.

■ Current assets

➤ Inventories

Services not yet chargeable in connection with contract research are calculated on the basis of cost accounting. Project costs are recognised on the basis of an itemisation by cost centre and direct cost statements. Item-by-item valuation at cost of production or acquisition as defined in Section 203 UGB is applied. Apart from the costs that are attributable according to the costs-by-cause principle, production costs also include pro rata capitalisable production overheads and portions of social expenses as defined in the second to last sentence of Section 203 (3) UGB. Interest expenses and the research risk are not accounted for.

Due to the Company's project structure administrative overheads must be capitalised for projects with a term of more than twelve months. In order to give a true and fair view of the Company's financial position and financial performance, the option right (cf. Section 206 (3) UGB) was exercised.

If losses are anticipated in connection with orders or if additional costs are expected to be incurred for services that have already been invoiced, semi-finished products are discounted or provisions are set up. For contingent warranty obligations in connection with contract research provisions are recognised in the balance sheet as well.

➤ Receivables and other assets

Receivables and other assets are measured at nominal value, unless the lower fair value is recognised in the case of specific recognisable risks. Provisions for general credit risks are made in the form of general allowances at a rate of 2% (previous year: 2%) of the total net amount of receivables.

■ Provisions

Provisions for severance pay are calculated according to principles of financial mathematics on the basis of the 10-year average interest rate with a term of twelve years. Calculation of the provision for severance pay was based on an interest rate of 3.5% (previous year: 4.01%) as at 31 December 2017, a salary trend of 2% (previous year: 2%) and a retirement age of 65 years on a going-concern basis.

No fluctuation discount was recognised. The allocation amount resulting from a change in measurement due to the Austrian Act on Changes in Accounting Practices [Rechnungslegungs-Änderungsgesetz/RÄG] 2014 is allocated over 5 years.

The pension provision is calculated in the amount of the actuarial cover requirement on the basis of the provisions of Section 198 and Section 211 UGB as amended by RÄG 2014 in compliance with the AFRAC Opinion on „Provisions for pension, severance pay, long-service bonus and comparable long-term obligations under UGB provisions“ of June 2016. The calculation was based on the Pagler & Pagler reference tables. The calculatory interest rate used was the 10-year average interest rate of 3.42% (previous year: 3.75%) with an average remaining term of eleven years.

Other provisions take into account all recognisable risks and liabilities the amount of which is not known and are recognised in the amount which, according to best estimate, is required to fulfil the obligation. No provisions other than those provided for by law are set up.

■ Liabilities

Liabilities are recognised at the settlement amount in compliance with the principle of prudence.

■ Currency translation

Receivables and payables are measured at the mean rate of exchange at the date of the transaction and according to the lower of cost or market principle or higher of cost or market principle at the balance sheet date, respectively.

Notes

Notes to the Balance Sheet

ASSETS

■ Non Current Assets

As regards the development of the individual items of non-current assets and the breakdown of annual amortisation and depreciation reference is made to the non-current assets movement schedule (Annex to the Notes). As at the balance sheet date non-current assets amounted to EUR 17,038,360.11 (previous year: kEUR 16,484.1) in total. In the financial year 2017 capital expenditure amounted to a total of EUR 4,524,547.78 (previous year: kEUR 1,642.5) and amortisation and depreciation amounted to EUR 2,561,838.95 (previous year: kEUR 1,233.3). In the financial year 2017 disposals at historical cost amounted to EUR 3,990,974.64 (previous year: kEUR 1,770.3).

Intangible assets include software and data transmission rights of a carrying amount of EUR 345,303.00 (previous year: kEUR 243.1). Additions in the amount of EUR 317,379.77 (previous year: kEUR 128.1) are attributable to the acquisition of licences and various software.

As at the balance sheet date **property, plant and equipment** amounted to EUR 14,875,668.86 (previous year: kEUR 14,485.2). The land value was EUR 2,656,523.66 (previous year: kEUR 2,656.5). The building value of land with buildings and buildings on land owned by others of EUR 6,901,559.00 (previous year: kEUR 6,359.0) is made up of the net building value of EUR 2,826,806.00 (previous year: kEUR 2,916.1) and structural improvements worth EUR 1,977,213.00 (previous year: kEUR 1,284.1), i.e. EUR 4,804,019.00 (previous year: kEUR 4,200.2) are attributable to buildings on land owned by the Company and an amount of EUR 2,097,540.00 (previous year: kEUR 2,158.9) is attributable to capital expenditure on buildings owned by others. Additions in the total amount of EUR 2,794,818.01 (previous year: kEUR 1,514.4) mainly concern the provision of modern scientific equipment for the Company's research activities and further expansion of the IT infrastructure. Disposals at historical cost in the amount of EUR 2,416,188.39 (previous year: kEUR 1,720.3) mainly

concern disposals or, to a small extent, sale of scientific equipment, electronic data processing systems and various office equipment. No impairment losses were recognised.

Shares in affiliates in the amount of EUR 150,000.00 (previous year: kEUR 150.0) concern the shares in JR-AquaConSol GmbH in Graz.

As at the balance sheet date the carrying amount of **investment securities** was EUR 1,406,750.00 (previous year: kEUR 1,350.7).

➔ Write-up or revaluation

In the reporting year no write-downs of financial assets were made.

Amortisation and depreciation of the remaining non-current assets completely result from ordinary amortisation and depreciation.

■ Current Assets

➔ Inventories

Under **consumables** mainly paper, inked ribbons, computer network cards, laser printer spare parts and small items of equipment were capitalised in an amount of EUR 3,894.90 (previous year: kEUR 5.2).

The item services **not yet chargeable** of contract research includes work in progress and services not yet chargeable in the amount of EUR 9,357,580.24 (previous year: kEUR 8,746.2), under which administrative overheads of EUR 1,957,627.85 (previous year: kEUR 1,753.8) were capitalised for contracts the execution of which lasts more than twelve months. The Company's project structure requires capitalisation of administrative overheads in order to present a true and fair as well as continuous view of the Company.

Advances made on inventories amounted to EUR 15,071.00 (previous year: kEUR 18.9).

Notes

According to the statement of investments the following participating interests are held:

Statement of Investments as at 31 December 2017	Interest		Equity EUR	Net profit or loss in EUR	Balance sheet date
	EUR	%			
ACIB GmbH	16,000.00	8.00 %	3.703.983.27	295,306.16	31 Dec 2016
ALP.Lab GmbH	5,600.00	16.00 %	k.A.	k.A.	founded in 2017
Bioenergy 2020+ GmbH	20,000.00	10.00 %	662.278.73	426,924.80	31 Mar 2017
Cbmed GmbH	25,000.00	12.50 %	681,445.03	481,445.03	31 Dec 2016
Decide Clinical Software GmbH	42,500.00	10.00 %	383,470.44	-41,529.56	31 Dec 2016
EPIG GmbH	8,750.00	25.00 %	51,382.87	16,382.87	31 Dec 2016
FH Joanneum GmbH	10,828.25	14.90 %	4,000,000.00	0.00	30 Jun 2017
Geo5 GmbH	8,000.00	10.00 %	43,819.50	-36,180.50	31 Dec 2016
Holz.Bau Forschungs GmbH	3,500.00	8.68 %	167,895.22	127,575.22	31 Dec 2016
Human.technology Styria GmbH	2,450.00	7.00 %	200,691.64	27.81	31 Dec 2016
KNOW-Center Kompetenzzentrum für Wissensbasierte Anwendungen und Systeme Forschungs- und Entwicklungsgesellschaft mbH	14,540.00	10.00 %	1,481,806.96	0.00	31 Dec 2016
Kompetenzzentrum – Das virtuelle Fahrzeug Forschungsgesellschaft mbH	10,640.00	10.00 %	4,438,167.00	689,229.33	31 Dec 2016
Materials Center Leoben Forschung GmbH	51,100.00	17.50 %	5,217,153.38	282,895.57	31 Dec 2016
Polymer Competence Center Leoben GmbH	34,000.00	17.00 %	3,924,857.74	423,896.31	31 Dec 2016
RCPE GmbH	15,000.00	15.00 %	4,120,874.79	520,874.79	30 Jun 2017

Notes

➔ Receivables and other assets

Itemised allowances in the amount of EUR 59,929.87 (previous year: kEUR 69.5) were made for expected losses of **trade receivables** and deducted from the assets.

The item **receivables from affiliates** concerns trade receivables.

Receivables from subsidies and project grants

concern grant approvals from various funding agencies. Due to the fact that processing, including receipt of payments, takes more than three months, a discount in the amount of EUR 26,500.00 (previous year: kEUR 28.4) was made. The calculatory interest rate was 1.33% (previous year: 1.67%).

Other receivables and assets mainly include entitlements to insurance benefits, claims vis-à-vis the Tax Office Graz-Stadt, various accrued interest as well as refunds and aids. This item also includes a liability commitment of the state of Styria in the amount of EUR 5,600,000.00 (previous year: kEUR 5,600.0) to cover the loss from the tax audit by the Tax Office Graz-Stadt.

	Receivables as at 31 Dec 2017 (31 Dec 2016)	thereof due after more than 1 year EUR	thereof evi- denced by bills of exchange EUR	Capitalised ac- cruals Section § 225 (3) UGB EUR	General allowance EUR
Trade receivables	1,464,834.82 (1,892,095.64)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	33,200.00 (41,300.00)
Receivables from affiliates	64,938.36 (132,436.03)	34,800.00 (52,200.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Receivables from undertakings with which the undertaking is linked by virtue of participating interests or book-entry securities	179,414.63 (211,585.42)	40,282.56 (82,423.84)	0.0 (0.00)	0.00 (0.00)	0.00 (0.00)
Receivables from the proprietors	0.00 (156,492.78)	0.00 (0.00)	0.00 (0.00)	0.00 (15,492.78)	0.00 (0.00)
Receivables from subsidies and project grants	4,414,364.06 (3,622,356.47)	0.00 (0.00)	0.00 (0.00)	4,414,364.06 (3,622,356.47)	0.00 (0.00)
Receivable from the liability commitment of the state of Styria	5,600,000.00 (5,600,000.00)	0.00 (5,600,000.00)	0.00 (0.00)	5,600,000.00 (5,600,000.00)	0.00 (0.00)
Other receivables and assets	6,375,729.60 (7,444,784.98)	0.00 (0.00)	0.00 (0.00)	6,296,702.96 (7,322,618.35)	0.00 (0.00)
TOTAL	18,099,281.47 (19,059,751.32)	75,082.56 (5,734,623.84)	0.00 (0.00)	16,311,067.02 (16,701,467.60)	33,200.00 (41,300.00)

Notes

► Securities held as current assets

Securities held as current assets in the amount of EUR 1,950,000.00 (previous year: kEUR 2,000.0) concern bank bonds with a term until the end of September 2020.

► Cash and balances at banks

This item in the amount of EUR 7,514,629.81 (previous year: kEUR 4,703.7) is made up of cash in the amount of EUR 7,850.09 (previous year: kEUR 9.2) and a bank balance of EUR 7,506,779.72 (previous year: kEUR 4,694.5).

■ Prepayments and accrued income

Prepayments and accrued income in the amount of EUR 466,445.70 (previous year: kEUR 608.5) include payments made in the financial year 2017 which have to be charged to the following year as expenses and mainly concern prepayments of maintenance expenses, various subscriptions and membership fees, insurance premiums, travel expenses and congress fees. In addition, this item includes the additional expenses of EUR 175,759.40 (previous year: kEUR 234.3) resulting from the change in the calculation of both the provision for severance pay and the pension provision.

■ Escrow funds

Escrow funds include balances at banks for projects with Österreichische Forschungsförderungsgesellschaft mbH and/ or the European Commission where JOANNEUM RESEARCH Forschungsgesellschaft mbH acts as the coordinator and holds the funds in escrow and manages payments for the project partners (see escrow liabilities).

Liabilities and Shareholders' Equity

■ Equity

The Company's share capital amounts to EUR 3,420,000.00, of which 85% or EUR 2,907,000.00 (previous year: kEUR 2,907.0) are held by the state of Styria and 15% or EUR 513,000.00 (previous year: kEUR 513.0) are held by Kärntner Betriebsansiedlungs- und Beteiligungsgesellschaft m.b.H. Taking into account the profit for the year of EUR 260,250.61 (previous year: EUR 402,659.08; [income from the merger was inserted in the previous year as a special

item in the amount of EUR 342,825.62 above the profit for the year]) and the profit carryforward in the amount of EUR 508,771.61 (previous year: EUR 106,112.53) the resulting **net profit for the year** is EUR 769,022.22 (previous year: EUR 508,771.61).

■ Appropriated Capital Reserve

The shareholders have agreed that the amount of the appropriated capital reserve defined in the Participation and Cooperation Agreement of 18 December 2014 will be reversed.

Therefore, it is an appropriated capital reserve. This clarification seems to be reasonable because the underlying agreement provides for an appropriated reversal credited to the net profit for the year that was reduced due to the expense. The German term used in the statement („zweckgebunden“ instead of „gebunden“ [translator's note: both German terms and the English term „appropriated“ indicate use for a specific purpose, which is why the term „appropriated“ is used here]) was adjusted for the annual financial statements for the year ended 31 December 2017 and for reasons of consistency also in the previous year.

Notes

Special Items for Investment Grants from Public Funds

In the reporting year **investment grants from public funds** developed as follows:

investment grants from public funds	As at 1 Jan 2017 EUR	Additions EUR	Consumption according to depreciation EUR	Reversal EUR	Reclassification or corrections EUR	As at 31 Dec 2017 EUR
Property, plant and equipment						
1. Buildings, including buildings on land owned by others	1,558,651.00	23,574.80	-190,723.80	-2,585.00	0.00	1,388,917.00
2. Machinery, scientific equipment and electronic data processing systems	60,172.00	11,840.81	-17,398.00	0.00	0.00	54,614.81
3. Other plant, furniture and fixtures	200,364.00	35,115.92	-43,300.00	0.00	0.00	192,179.92
Financial assets						
1. Financial assets	0.00	0.00	0.00	0.00	0.00	0.00
Total	1,819,187.00	70,531.53	-251,421.80	-2,585.00	0.00	1,635,711.73

Provisions

An amount of EUR 42,264.00 (previous year: kEUR 90.7) of the **provisions for severance pay** was used. In order to meet the cover requirement of EUR 4,315,100.00 (previous year: kEUR 3,992.4), an amount of EUR 364,964.00 (previous year: kEUR 567.3) was allocated to the provision.

An amount of EUR 251,866.88 (previous year: kEUR 124.2) of the **pension provisions** was used for pension payments. In order to meet the actuarial cover requirement of EUR 4,692,330.00 (previous year: kEUR 4,556.4), an amount of EUR 387,836.88 (previous year: kEUR 310.8) had to be allocated to the provision.

The item **provision for taxes** concerns additional tax claims resulting from the tax audit in connection with the temporary loss of the status of a non-profit organisation in the amount of EUR 3,363,000.00 (previous year: kEUR 2,846.8). The item was restated accordingly for the previous year.

Other provisions include as main items the provision for unconsumed leave in the amount of EUR 2,133,300.00 (previous year: kEUR 2,028.8), provisions for potential claims for refund of various funding parties in the amount of EUR 728,300.00 (previous year: kEUR 761.6), the provision for working time credits in the amount of EUR 824,800.00 (previous year: kEUR 713.5) and the

Notes

provision for anticipated losses or costs of work in progress in the amount of EUR 955,200.00 (previous year: kEUR 679.8).

This item also includes the **provision for the tax audit** by the Tax Office Graz-Stadt in the amount of EUR 4,847,700.00 (previous year: kEUR 4,847.7).

Liabilities

Bank borrowings include an export fund credit line of EUR 712,193.77 (previous year: kEUR 712.2). The cash advance of 31 December 2016 in the amount of EUR 2,000,000.00 was redeemed in full.

Advances received on orders that may be deducted from inventories amounted to a net amount of EUR 14,267,171.87 (previous year: kEUR 10,246.9). This item also includes advances made by funding parties of EUR 5,976,071.47 (previous year: kEUR 3,788.9).

As at the balance sheet date the trade payables were EUR 2,199,623.71 (previous year: kEUR 2,185.0), predominantly vis-à-vis Austrian suppliers.

Other liabilities include the profit-participating loan granted by the state of Styria on 1 November 2004 in the amount of EUR 1,387,477.00 (previous year: kEUR 1,387.5) with a remaining term of more than five years. In addition, this item mainly includes clearing funds with the Health Insurance Fund of the State of Styria [Steiermärkische Gebietskrankenkasse] and other necessary deferrals.

Other financial obligations

Based on the business plan of JR-AquaConSol GmbH and the resolution of the supervisory board of JOANNEUM RESEARCH Forschungsgesellschaft mbH of 6 June 2016 the financial obligations for the financial year 2017 were EUR 516,750.00 (previous year: kEUR 410.0). In addition, JR-AquaConSol GmbH has been granted a declining shareholder contribution in the maximum amount of EUR 1,660,000.00 until 31 December 2020.

Obligations arising from use of property, plant and equipment not presented in the balance sheet: (see table below)

Accruals and Deferred Income

Accruals and deferred income in the amount of EUR 310,195.44 (previous year: kEUR 444.2) mainly concern royalties.

Escrow Liabilities

Escrow liabilities are due to projects with Österreichische Forschungsförderungsgesellschaft mbH and/or the European Commission where JOANNEUM RESEARCH Forschungsgesellschaft mbH acts as the coordinator and holds the funds in escrow and manages payments for the project partners (see escrow funds).

Contingent Liabilities

(cf. in this respect Other disclosures, contingencies).

	for the next financial year EUR	for financial years 2018 to 2022 EUR
Room rents (previous year)	943,564.00 (903,777.00)	4,717,820.00 (4,611,771.00)
Equipment rents (previous year)	55,512.00 (32,760.00)	277,560.00 (163,800.00)
Lease payments (previous year)	198,674.00 (191,947.00)	326,384.00 (293,572.00)
Total (previous year)	1,197,750.00 (1,128,484.00)	5,321,764.00 (5,069,143.00)

Notes

Notes to the Income Statement

The **revenues** generated in the financial year 2017 are classified according to areas of activity and divided into domestic and international revenues:

Domestic revenues	Financial year 2017 EUR	Short financial year 7-12/2016 EUR
Research	6,121,613.68	4,248,950.74
Royalties	743,057.24	1,027,969.05
Congress fees	17,142.63	54,625.39
Other	687,107.44	358,306.80
Total domestic revenues	7,568,920.99	5,689,851.98
International revenues		
Research	7,029,879.88	1,962,496.35
Royalties	73,444.00	17,886.01
Congress fees	0.00	0.00
Other	2,090.00	218.25
Total international revenues	7,105,413.88	1,980,600.61
Total revenues	14,674,334.87	7,670,452.59

The expenses of EUR 846,621.93 (previous year: kEUR 641.3) stated in item 8.(b) include contributions to Severance Pay and Pensions Funds in the amount of EUR 205,163.21 (previous year: kEUR 98.9) and expenses for severance payments in the amount of EUR 641,458.72 (previous year: kEUR 542.4) and severance compensation in the amount of EUR 51,632.80 (previous year: kEUR 0.0).

Other Disclosures

■ Shares in affiliates and participating interests

As at the balance sheet date 31 December 2017 the Company held 100% of the shares or EUR 150,000.00 (previous year: kEUR 150.0) in JR-AquaConSol GmbH.

The annual financial statements for the year ended

31 December 2016 showed equity of EUR 225,944.48 (previous year: kEUR 0.0) including a profit for the year of EUR 75,944.48 (previous year: EUR 0.0).

In addition, the Company held another investment of 25% of the shares or EUR 8,750.00 in EPIG GmbH as at the balance sheet date 31 December.

The annual financial statements for the year ended 31 December 2016 showed equity of EUR 51,382.87 (previous year: EUR 0.00) including a profit for the year of EUR 16,382.87 (previous year: EUR 0.00).

All other participating interests were below 20%.

■ Staff

As at the balance sheet date the Company had 437 (previous year: 445) employees; taking part-time employees into account on a pro rata basis, the number of staff was 374.6 (previous year: 378.1). Taking part-time employees into account on a pro rata basis the average number of employees was 371.1 (previous year: 369.0).

In application of the provisions of Section 242(4) UGB no itemisation of salaries, severance payments or pensions for the management as defined in Section 241(4) UGB was made.

No loans or advances were granted to members of the management or of the supervisory board. No liability in favour of that group of persons was assumed either.

The cost of remuneration of members of the scientific advisory board and of the supervisory board amounted to EUR 97,011.42 (previous year: kEUR 43.0) in total.

■ Results after the balance sheet date

After the closing of accounts for the financial year 2017 no other significant events have occurred which would have affected the financial position or financial performance in the financial year 2017.

Notes/Executive Bodies

Officers of the Company in the financial year 2017:

Scientific Advisory Board

Prof. Dr Dr Gerald **SCHÖPFER**
Chairman

Prof. Dr Gerhard **FRIEDRICH**
Deputy Chairman

Prof. Dr Hansjörg **ALBRECHER**

Prof Dr. Horst **BISCHOF**

Dr Michaela **FRITZ**

Prof. Dr Günter **GETZINGER**

Prof. Dr Dr Manfred **HUSTY**

Prof. Dr Joachim **KRENN**

Dr Mario **MÜLLER**

Michael **PATAK**

Reinhard **PETSCHACHER**

Herbert **RITTER**

Prof. Dr Karin **SCHAUPP**

Dr Stefan **TASCH**

Supervisory Board

Dr Martin **WIEDENBAUER** (from 13 June 2017)
Chairman

Prof. Dr Wolf **RAUCH** (until 13 June 2017)
Chairman

Prof. Fritz **SPERL**, MAS MBA (from 13 June 2017)
Deputy Chairman

Brigitte **HASEWEND** (until 13 June 2017)
Deputy Chairwoman

Dr Ertfried **TAURER**
Deputy Chairman

Prof. Dr Werner **HAUSER**

Sonja **JÖBSTL-FINDEIS** (until 13 June 2017)

Prof. Dr Thomas **KRAUTZER**

Christoph **LUDWIG** (from 13 June 2017)

Martin **PÖLZL** (until 13 June 2017)

Ingolf **SCHÄDLER**

Dr Birgit **STRIMITZER-RIEDLER** (from 13 June 2017)

Ursula **STROHMAYER** (from 13 June 2017)

Members of the works council delegated to the supervisory board:

Ferdinand **GOLJA**
Chairman of the works council

Clemens **HABSBURG-LOTHRINGEN**, MAS

Helen **HASENAUER**

Gertrude **MATZER**, Ba MsC

Gerhard **PROBST**

Management

Prof. Dr Wolfgang **PRIBYL**, MBA

Notes

■ Contingencies

Pursuant to Section 199 UGB advance payment guarantees for rent security deposits issued to Zentrum für Wissens- und Technologietransfer in der Medizin GmbH (EUR 110,890.00), W.E.I.Z. Immobilien GmbH (EUR 38,019.46), Lakeside Science & Technology Park GmbH (EUR 36,746.67) and SFL technologies Science Tower GmbH (EUR 36,000.00) as well as retention guarantees vis-à-vis Autobahnen- und Schnellstraßen-Finanzierungs Aktiengesellschaft (EUR 104,596.83) are presented below the balance sheet.

Pursuant to Section 199 UGB advance payment guarantees vis-à-vis Voestalpine Schienen GmbH (EUR 15,290.00) and rent security deposits concerning Zentrum für Wissens- und Technologietransfer in der Medizin GmbH (EUR 110,890.00), W.E.I.Z. Immobilien GmbH (EUR 35,554.36), Lakeside Science & Technology Park GmbH (EUR 24,924.36) and SFL technologies Science Tower GmbH (EUR 36,000.00) as well as retention guarantees vis-à-vis Autobahnen- und Schnellstraßen-Finanzierungs Aktiengesellschaft (EUR 69,850.39) were presented below the balance sheet for the previous year.

■ Other information

Based on the objectives stipulated in Article 1(3) of the Articles of Association the Company furthers the general public in the fields of research, development and science exclusively and directly in the interest of public welfare. No net profit for the year that may be generated will be distributed.

By decision dated 16 January 1995, reference 29/31-10/94, the finance authority for the state of Styria ruled that JOANNEUM RESEARCH Forschungsgesellschaft mbH belongs to the group of preferential recipients as defined in Section 4(4) No. 5 (e) of the Austrian Personal Income Tax Act [Einkommensteuergesetz/EStG] of 1988 as amended by Art. I No. 4 (a) of the Austrian Tax Reform Act [Steuerreformgesetz] of 1993.

The expenses for the statutory auditor for the audit of the annual financial statements amounted to EUR 11,500.00 (previous year: EUR 10,950.00). No other certification services, tax advisory services or other services of the statutory auditor were incurred in the reporting year or in the previous year.

Graz, 6 March 2018



Prof. Dr. Wolfgang Pribyl, MBA
Chief Executive Officer

Development of non-current assets	Cost of acquisition				Accumulated amortisation and depreciation				Carrying amounts		
	1 Jan 2017	Additions	Disposals	Reclassification	31 Dec 2017	1 Jan 2017	Additions	Write-ups	Disposals	31 Dec 2017	31 Dec 2017
I) Intangible assets											
Software, data transmission rights and other rights	2,304,828.42	317,379.77	220,736.25	3,970.00	2,405,441.94	2,061,685.42	219,189.77	0.00	220,736.25	2,060,138.94	243,143.00
Total intangible assets	2,304,828.42	317,379.77	220,736.25	3,970.00	2,405,441.94	2,061,685.42	219,189.77	0.00	220,736.25	2,060,138.94	243,143.00
II) Property, plant and equipment											
1) Land, rights equivalent to land and buildings, including buildings on land owned by others											
a) Land value	2,656,523.66	0.00	0.00	0.00	2,656,523.66	0.00	0.00	0.00	0.00	0.00	2,656,523.66
b) Building value	14,643,003.50	558,583.38	654,771.49	595,829.93	15,142,645.32	8,283,966.50	559,409.31	0.00	602,289.49	8,241,086.32	6,359,037.00
Subtotal land and buildings	17,299,527.16	558,583.38	654,771.49	595,829.93	17,799,168.98	8,283,966.50	559,409.31	0.00	602,289.49	8,241,086.32	9,015,560.66
2) Machinery, scientific equipment and EDP systems	25,029,193.34	1,693,623.87	1,434,779.56	354,351.72	25,642,389.37	21,251,665.34	1,477,200.59	0.00	1,431,340.56	21,297,525.37	3,777,528.00
3) Other plant, furniture and fixtures	3,236,982.43	193,824.49	257,487.27	6,767.72	3,180,087.37	2,573,710.43	236,889.21	0.00	255,629.27	2,554,970.37	663,272.00
4) Advances made and construction in progress	1,108,048.86	284,486.20	0.00	-1,040,079.86	352,455.20	0.00	0.00	0.00	0.00	0.00	1,108,048.86
Offsetting of input tax on advances for non-current assets	-79,160.49	-4,850.00	0.00	79,160.49	-4,850.00	0.00	0.00	0.00	0.00	0.00	-79,160.49
Subtotal advances made and construction in progress	1,028,888.37	279,636.20	0.00	-960,919.37	347,605.20	0.00	0.00	0.00	0.00	0.00	1,028,888.37
5) Low-cost assets	0.00	69,150.07	69,150.07	0.00	0.00	0.00	69,150.07	0.00	69,150.07	0.00	0.00
Low-cost assets	46,594,591.30	2,794,818.01	2,416,188.39	-3,970.00	46,969,250.92	32,109,342.27	2,342,649.18	0.00	2,358,409.39	32,093,582.06	14,485,249.03
III) Financial assets											
1) Shares in affiliates	150,000.00	0.00	0.00	0.00	150,000.00	0.00	0.00	0.00	0.00	0.00	150,000.00
2) Participating interests	255,038.25	5,600.00	0.00	0.00	260,638.25	0.00	0.00	0.00	0.00	0.00	255,038.25
3) Investment securities (book-entry securities)	1,354,050.00	1,406,750.00	1,354,050.00	0.00	1,406,750.00	3,375.00	0.00	0.00	3,375.00	0.00	1,350,675.00
Total financial assets	1,759,088.25	1,412,350.00	1,354,050.00	0.00	1,817,388.25	3,375.00	0.00	0.00	3,375.00	0.00	1,755,713.25
Total non-current assets	50,658,507.97	4,524,547.78	3,990,974.64	0.00	51,192,081.11	34,174,402.69	2,561,838.95	0.00	2,582,520.64	34,153,721.00	16,484,105.28
											17,038,360.11

Management Report

The Management Report covers the reporting period of the financial year 2017 from 1 January 2017 to 31 December 2017 and is divided into three sections, I. Report on the Company's course of business and financial position, II. Report on prospective developments and risks of the Company and III. Report on research and development.

I. Report on the Company's course of business and financial position

I.1 Business organisation

As at 31 December 2017 JOANNEUM RESEARCH was organised in six research units, which represent the main areas of activities.

Research units

MATERIALS	Institute for Surface Technologies and Photonics
HEALTH	Institute for Biomedicine and Health Sciences
DIGITAL	Institute for Information and Communication Technologies
POLICIES	Institute for Economic and Innovation Research
ROBOTICS	Institute for Robotics and Mechatronics
LIFE	Centre for Climate, Energy and Society

I.2 Investment report

As at 31 December 2017 JOANNEUM RESEARCH held corporate investments in the following companies:

➔ I.2.1 Shares in affiliates

In the balance sheet the limited liability company JR-AquaConSol GmbH, Graz, is presented as an affiliate.

	Share in %
JR-AquaConSol GmbH	100,0 %

➔ I.2.2 Corporate investments

	Share in %
ALP.Lab GmbH	16.0 %
decide Clinical Software GmbH	10.0 %
EPIG GmbH	25.0 %
FH JOANNEUM Gesellschaft mbH	14.9 %
Geo5 GmbH	10.0 %
Holz.Bau Forschungs GmbH	8.7 %
Human.technology Styria GmbH	7.0 %

➔ I.2.3 Corporate investments - COMET (K1, K2) Competence Centre Programme

As at 31 December 2017 the Company owned shares in the following companies, which are funded through the COMET (Competence Centers for Excellent Technologies) Programme of the Federal Ministry for Transport, Innovation and Technology (bmvit) and the Federal Ministry for Digital and Economic Affairs (BMDW):

Management Report

	Share in %
ACIB GmbH	8.0 %
BIOENERGY 2020+ GmbH	10.0 %
CBmed GmbH	12.5 %
Kompetenzzentrum – Das virtuelle Fahrzeug, Forschungsgesellschaft mbH	10.0 %
Know-Center GmbH Research Center for Data-Driven Business & Big Data Analytics	10.0 %
Materials Center Leoben Forschung GmbH	17.5 %
Polymer Competence Center Leoben GmbH	17.0 %
Research Center Pharmaceutical Engineering GmbH	15.0 %

The main objective of those investments is to support the central business tasks and objectives as well as to enhance the competitiveness of JOANNEUM RESEARCH. Another important aspect besides the activities for the COMET competence centre programme is the exploitation of technologies and products developed by JOANNEUM RESEARCH.

■ I.3 Branches

The Company has no branches.

■ I.4 Course of business

It should be put on record that due to the change of the balance sheet date to 31 December and the resulting short financial year from July to December 2016 the previous year's figures are only comparable to the current figures for the financial year 2017 to a limited extent.

As at 31 December 2017 the orders on hand amounted to EUR 64.3 million and corresponded approximately to the previous year's figure. The work on hand amounted to EUR 29.4 million, the value of offers submitted was approximately EUR 35.3 million. The profit for the financial year 2017 amounted to kEUR 260.3 (short financial year 7-12/2016: profit for the year of approximately

kEUR 59.8). Accordingly, the self-financing ratio (operating result / total expenses) was calculated at 80% (short financial year 7-12/2016: 80%).

In the area of contract research the operating result for the financial year 2017 was approximately EUR 15.4 million (short financial year 7-12/2016: approximately EUR 7.3 million). In funded research the Company was able to generate an operating result of approximately EUR 14.8 million (short financial year 7-12/2016: approximately EUR 7.7 million).

At an international level JOANNEUM RESEARCH was able to solicit contract research projects and funded research projects worth approximately EUR 10.7 million in the aggregate in the reporting year (short financial year 7-12/2016: approximately EUR 3.9 million). An amount of EUR 3.6 million thereof (short financial year 7-12/2016: approximately EUR 1.9 million) is attributable to projects with the European Union and EUR 7.1 million (short financial year 7-12/2016: approximately EUR 2.0 million) to contract research projects. Due to the participation of JOANNEUM RESEARCH in the programmes of the European Union and calls for proposals by the European Space Agency (ESA) the Company was able to generate revenues in the approximate amount of EUR 5.6 million in the aggregate in the financial year 2017. Under the Horizon 2020 programme projects with a funding volume of approximately EUR 4.4 million were awarded and in connection with ESA projects an order volume of approximately EUR 0.6 million was solicited.

In the financial year 2017 revenues of approximately EUR 7.0 million (short financial year 7-12/2016: approximately EUR 3.6 million) were achieved through national cooperative research projects related to Österreichische Forschungsförderungs-gesellschaft mbH (FFG).

Under a 2015-2018 funding agreement with the Federal Ministry for Transport, Innovation and Technology (bmvit) funds in the amount of EUR 9.4 million were granted. In the reporting period JOANNEUM RESEARCH achieved revenues totalling approximately EUR 1.9 million from bmvit.

In the financial year 2017 the attributable business share amounted to EUR 13.3 million.

Management Report

➔ I.4.1 Financial position

The Company's assets and financing structure developed as follows:

As at the balance sheet date 31 December 2017 JOANNEUM RESEARCH had a balance sheet total of approximately EUR 55.2 million (short financial year 7-12/2016: approximately EUR 53.6 million). This is comprised of non-current assets in the amount of approximately EUR 17.0 million and current assets (inclusive of prepayments and accrued income and escrow funds) of approximately EUR 38.2 million.

As at 31 December 2017 shareholders' equity including investment grants amounted to EUR 10.6 million (thereof investment grants of approximately EUR 1.6 million) or 19% of the balance sheet total compared to approximately EUR 10.8 million or 20% of the previous year's balance sheet total. Borrowings (inclusive of accruals and deferred income and escrow liabilities) increased by approximately EUR 1.8 million to approximately EUR 44.6 million (short financial year 7-12/2016: EUR 42.8 million) and amounted to 81% (short financial year 7-12/2016: 80%) of the balance sheet total.

In the financial year 2017 the cash flows from the result as the sum of generated profit for the year and the income and expense items (the Company's internal financing potential) amounted to approximately EUR 2.8 million. The working capital (current assets minus short-term borrowings) was approximately EUR 8.4 million (short financial year 7-12/2016: approximately EUR 6.1 million).

No derivative financial instruments were used in the past financial year 2017. The financial instruments recognised in the balance sheet are part of the Company's general risk management, which is reflected in the book-keeping and accounting policies.

➔ I.4.2 Financial performance

In the financial year 2017 the operating result including own work capitalised and other operating income net of shareholder contribution and research tax premium amounted to approximately EUR 33.3 million (short financial year 7-12/2016: approximately EUR 16.5 million).

Domestic revenues account for 64% and international

revenues account for 36% of the operating result. The share of the operating result attributable to Styria of 13% decreased by 3 percentage points compared to the short financial year 7-12/2016.

The amount of services not yet chargeable increased by approximately EUR 0.6 million compared to the short financial year 7-12/2016 and amounted to approximately EUR 9.4 million as at 31 December 2017.

The expenses in the amount of approximately EUR 41.6 million (short financial year 7-12/2016: approximately EUR 20.6 million) are made up of staff costs including statutory social security charges and voluntary social benefits plus allocations to pension provisions (former managing director) and severance payments of approximately EUR 28.2 million (short financial year 7-12/2016: approximately EUR 13.5 million), cost of materials and other services purchased of approximately EUR 3.2 million (short financial year 7-12/2016: approximately EUR 1.7 million), amortisation and depreciation of approximately EUR 2.6 million (short financial year 7-12/2016: approximately EUR 1.2 million) and other operating expenses of approximately EUR 7.6 million (short financial year 7-12/2016: approximately EUR 4.2 million).

As at the balance sheet date the self-financing ratio was 80% (short financial year 7-12/2016: 80%). The shareholder contributions of the state of Styria, of the state of Carinthia through Kärntner Betriebsansiedlungs- und Beteiligungsgesellschaft m.b.H. (BABEG) and the Grant Agreement with the Federal Ministry for Transport, Innovation and Technology (bmvit) constitute material parts of corporate financing and secure accomplishment of the Company's mission.

The Company closed the financial year 2017 with a profit before taxes (formerly profit or loss on ordinary activities) of EUR 12,788.24. Taking into account income taxes of EUR 1,750.00, reversal of provisions in the amount of EUR 249,212.37 and the profit of EUR 508,771.61 carried forward from the previous year, the net profit for the year is EUR 769,022.22. After the closing of accounts for the financial year 2017 no other significant events occurred which would have affected the financial position or financial performance in the financial year 2017.

Management Report

► I.4.3 Capital expenditure report

In the financial year 2017 approximately EUR 3.1 million (short financial year 7-12/2016: approximately EUR 1.6 million) were spent on property, plant and equipment (scientific equipment, electronic data processing systems, furniture and fixtures, land with buildings).

► I.4.4 Staff report

As at the balance sheet date the Company had 437 employees (164 women and 273 men), -1.80% (+0.61% women and -3.19% men) compared to the previous year. This corresponds to 374.6 full-time equivalents as at 31 December 2017, i.e. a reduction by -0.93% compared to the previous year.

With 77 new employees (36 women and 41 men) and 85 employees leaving the Company (35 women and 50 men) in the reporting period the fluctuation regarding active employees was approximately 19.45% (21.34% regarding women and 18.32% regarding men). This figure has increased compared to the previous year (14.38%).

The average age of the Company's employees is 41.1 years and has therefore only changed slightly compared to the previous year (40.5 years).

As at 31 December 2017 the share of graduates from universities and universities of applied sciences was 68.19%, thereof 31.88% women; the share of grammar school graduates was 20.14%.

As at the balance sheet date 11 apprentices, 6 female and 5 male, were undergoing training at JOANNEUM RESEARCH.

In the reporting period a total of 25 interns (15 women, 10 men) were employed, who completed their compulsory internships in connection with their studies at universities of applied sciences, universities or international exchange programmes. In addition, 25 students (11 female and 14 male) were granted an opportunity to write their diploma or doctoral theses in an employment relationship with JOANNEUM RESEARCH in cooperation with the relevant universities.

II. Report on prospective developments and risks of the Company

■ Economic policy framework conditions for research and development (R&D)

Despite the previous year's forecast a clear economic upturn is to be expected for the first half of 2018, which will have a sustainably positive effect on the economic development of material global economies. The continuing uncertainties in an international context, such as the Middle East conflict or the aggravated political situation on the Korean Peninsula, have not changed this so far. In particular, the US economy shows a strong growth of 0.8% in Q3/2017 in terms of the gross domestic product (GDP) compared to the previous quarter (monthly report of the Austrian Institute of Economic Research (WIFO) 12/2017). This is attributable to a combination of high consumer demand and an above-average industrial output.

A similar significant increase in GDP by 0.6% compared to the previous quarter applies to the EURO zone. The good news is that this increase is underpinned by favourable developments in all major countries of the EURO zone, in particular the strong German economy and upswings in France and Italy. This will also have positive effects on the unemployment rate in the EURO zone, which decreased to 8.8% in autumn 2017.

Also the Austrian economy showed substantial growth in the second half of 2017. The seasonally adjusted GDP for the third quarter increased by 0.9% compared to the previous quarter, overall economic output was therefore 3.2% higher than in 2016. This increase was due to a significant expansion in all areas, above all in the production of physical goods. Apart from the industrial sector's high level of propensity to invest, Austria's economy is currently also driven by private consumption and exports, which increased by 8% compared to the previous year.

According to current estimates the research share in Austria will amount to 3.14% of GDP (STATISTICS AUSTRIA press release 11.516-076/17), equalling approximately EUR 11.33 billion and constituting only a very slight improvement compared to 2016 (3.12%; EUR 10.91 billion). The European target figure of 3% for 2020 was achieved as

Management Report

early as in 2014, but it remains open whether the national target of 3.76% will be reached by 2020. With a research share of 5.14% Styria is currently holding a top position in Europe.

Shareholder contribution from Kärntner Betriebsansiedlungs- und Beteiligungs-gesellschaft m.b.H. (BABEG)

The shareholder contribution agreement between BABEG and JOANNEUM RESEARCH will still be in force until 2020.

Shareholder contribution from the state of Styria

The Government of the State of Styria decided to grant JOANNEUM RESEARCH a shareholder contribution of EUR 7,750,000.00 for 2018 to implement the objectives stipulated in the Articles of Association.

Federal Ministry for Transport, Innovation and Technology (bmvit)

On 13 July 2015 the Grant Agreement 2015-2018 was signed between the Federal Ministry for Transport, Innovation and Technology (bmvit) and JOANNEUM RESEARCH. Under the Grant Agreement 2015-2018 the Federal Ministry for Transport, Innovation and Technology (bmvit) provides funding in the total amount of EUR 9.40 million for near-basic research projects with total project costs of approximately EUR 11.02 million. Negotiations about a continuation of the Grant Agreement with bmvit have started already.

The shareholder contributions from the state of Styria and from Kärntner Betriebsansiedlungs- und Beteiligungs-gesellschaft m.b.H. (BABEG) and the Grant Agreement with the Federal Ministry for Transport, Innovation and Technology (bmvit) are material financing instruments of JOANNEUM RESEARCH.

■ Risks and prospective developments

As a research company JOANNEUM RESEARCH constantly has to face changing national and international framework conditions of research funding. The competition for available funds is becoming more and more difficult.

Starting new research focuses and topics requires

adequate resources taking into account the development risk inherent in research.

The Company's financial performance is expected to be stable in the financial year 2018.

■ IT security at JOANNEUM RESEARCH

Since the previous year a massive increase in damage suffered by Austrian business entities due to attacks on IT and communications systems had to be recorded. In 2016 a study on this subject showed that half of the 263 surveyed entities had been victims of cyber attacks. In 2017 almost three fourths of the entities had been affected, an increase by 50% (comparison in the KPMG study „Cyber security in Austria“ for 2016 and 2017). In half of the cases the attacks caused interruptions of business processes and sometimes serious consequences. The estimated number of undetected cases is much higher, as only one third of all attacks are being reported.

Technical threats are manifold and constantly develop further. In terms of the human factor credulity on the part of the victims, lack of awareness of the need for security measures and the increasing prominence of digital equipment in everyday life constitute the attack vectors. Nowadays it is hardly possible to check which recording devices (e.g. cameras, microphones) are recording constantly. Recently, another internet-based intelligent personal assistant was announced „for business“ to „save time“ in the office; however, this equipment monitors all conversations.

In May 2018 both the General Data Protection Regulation of the European Union (GDPR) and the Austrian Data Protection Amendment Act [Datenschutz-Anpassungsgesetz] 2018 will enter into force. At the same time the transposition period for the „EU Network and Information Security (NIS) Directive“ will end. All of such legislation requires additional documentation and security measures and provides for massively increased fines of up to EUR 20 million.

To date JOANNEUM RESEARCH has continuously improved security measures in the area of IT and has established more controls in the quality management system already before. In implementation of the new legislation

Management Report

measures will be taken throughout the Company to enhance security, which will also mean capital expenditure.

Thanks to regular trainings and the raising of awareness among staff many threats (e.g. ransomware) are detected early and damage is prevented. The systems used, both in the area of IT and for access controls, are continuously being improved and adapted to the state of the art.

III. Report on research and development

■ III.1 Research units

➤ MATERIALS – Institute for Surface Technologies and Photonics

Activities planned for financial 2018:

Due to the excellent R&D projects in the different fields of competence and the ensuing strong economic demand, the focus of future activities will be on an expansion of the research portfolio with a „Smart Connected Lighting“ research group, which is planned to be based in Burgenland. Other important goals for the financial year 2018 are an intensification of cooperation with the University of Technology of Graz, establishing a spin-off in the field of piezoelectric sensors (Pyzoflex®) and an expansion of the laboratory space at the facility in Weiz. In the field of funded research, expansion of contract research and generation of new royalties new challenges will have to be faced. The strategic focuses of the research groups will be optimised continuously for the Company to be an attractive research business partner also in future.

➤ HEALTH – Institute for Biomedicine and Health Science

Activities planned for financial 2018:

HEALTH has a strong local, national and international network of scientific and business institutions. In the financial year 2018 HEALTH will continue to strengthen its position as an interdisciplinary provider of holistic solutions in the areas of medicine, pharmacy, medical engineering and research in the field of health care provision. Current activities will be continued and professionalised and spe-

cific scientific services will be raised to a Food and Drug Administration (FDA) quality level. In addition, the following areas will be put into the focus: bioequivalence studies for topical dermatological medicines, regenerative medicine, exploitation of existing IP, development of integrated supply concepts, also taking ICT applications into account. Top-class publications remain an important goal also for 2018. The foundation of the new Cooperative Centre for Regenerative Medicine - COREMED in close coordination and cooperation with the Medical University of Graz and HEALTH will provide new impetus in medical research.

Management Report

➔ DIGITAL – Institute for Information and Communication Technologies

Activities planned for financial 2018:

DIGITAL represents an R&D portfolio which comprises intelligent sensor technology (image, video, acoustic and radar) as well as remote sensing, communication and navigation technologies and modern internet and cloud technologies in fields of economic and social relevance, such as production, transportation, security and health. The global trend of using AI-based (artificial intelligence) technologies and data analytics in almost all electronic systems was noticed by DIGITAL at an early stage and will thus be pursued consistently also in the financial year 2018. This also concerns strong efforts in the field of highly-automated driving. DIGITAL is prepared to meet the massively increased security awareness in industry, politics and the society by establishing a new „Cyber Security and Defence“ competence group. Space technologies provide radically new solutions not only for the flood of digital media and data to be processed all over the world. DIGITAL has been appreciated as a partner in this field for decades.

➔ POLICIES – Institute for Economic and Innovation Research

Activities planned for financial 2018:

In the financial year 2018 POLICIES wants to maintain its scientific output, which has increased since 2017, in particular through conference contributions and publications under the current FP7 and Horizon 2020 projects. Another focus is on building competence in two central areas: on the one hand, building a regional input-output model, which is planned to be used across research groups for various analyses; on the other hand, in the area of big data analytics where apart from use in an industrial environment also application options in a socio-scientific and economic environment will be developed.

In Austria, strategic cooperation with important Austrian partners, such as WIFO, WIIW, AIT and EUTEMA in the areas of economics of digitisation, analysis of global value-added chains and mission-oriented research and innovation policies will be continued and intensified. In Europe, POLICIES 2018 wants to further expand cooperation with important

partners in other fields and markets of strategic relevance (in particular in Germany) beyond the institutionalised cooperation under the Joint Institute for Innovation Policy (JIIP).

➔ ROBOTICS – Institute for Robotics and Mechatronics

Activities planned for financial 2018

In the financial year 2018 ROBOTICS will continue to drive the expansion of the innovation location in terms of contents and topics and support the regional and supraregional economy and industry in their sustainable use of robotics and automation. Expansion activities will include the new-build which is planned at the Lakeside Science & Technology Park location for 2018 and the targeted enhancement of the research portfolio and concurrent further development of the research team. In addition to the established areas of man-robot collaboration and robot safety & security ROBOTICS plans to intensify its activities in the areas of robot sensor technology, software quality, applied artificial intelligence and industrial service robotics. Thanks to the accreditation of the ROBOTICS Evaluation Lab that is planned for 2018 ROBOTICS will also position itself as a test centre for robot safety & security.

➔ LIFE – Centre for Climate, Energy and Society

Activities planned for financial 2018:

In the „Urban LIFE“ research area the Centre will be enlarged by further expansion of the „Urban Living Lab“ competence group and an additional „Innovative Mobility Modeling“ competence group at a location in Klagenfurt. In 2018 the group will answer questions of urban and spatial development (e.g. mobility behaviour) in national and international projects and develop new methods of analysis and evaluation in this regard to study the interactions between new mobility technologies and services. Collaboration with current cooperation partners will be further intensified in financial 2018 and mainly supported by the increasing number of preferential business partners. They will, in addition, be supported by concrete cooperation agreements with science institutions (preferential research partners).

Management Report

► COREMED – Cooperative Centre for Regenerative Medicine

Activities planned for financial 2018:

COREMED plans to build a strong local, national and international network with science and business facilities and to intensify existing cooperation in the year of its foundation. In this context the main focus will naturally be on cooperation projects with the Medical University of Graz and with HEALTH. However, it also plans to start joint projects and developments with other institutes (e.g. MATERIALS). The central topic in 2018 will be wound healing with a focus on preclinical research and product developments (e.g. smart dressings). Other major topics will be preclinical and clinical trials and studies on the effect of medicines and medical devices.

The financial year 2017 is coming to an end, the strategic course for 2018 has been set. The research portfolio will continuously be adapted to research-policy requirements and economic demand. In 2017 JOANNEUM RESEARCH co-designed numerous new initiatives and innovative projects (e.g. Silicon Austria, Silicon Alps, ALP.Lab GmbH in the field of highly-automated driving). Operational implementation of other pioneering research topics will start in 2018. In close cooperation with the Medical University of Graz a new centre will be established in the field of regenerative medicine in wound healing in coordination with HEALTH. Due to its increasing importance a new „Cyber Security and Defence“ competence group will be set up at

DIGITAL. A „Smart Connected Lighting“ branch is planned to be set up in Burgenland. In Carinthia construction of the new research building for ROBOTICS will commence. That research laboratory will create the infrastructure required for an expansion of ROBOTICS' research activities. Exploiting the technologies developed by the Company will be of importance also in future; numerous innovative products, e.g. acoustic tunnel monitoring, the OFM pump, the tablet-based „amicasa“ training game in the field of Alzheimer's disease research were developed under a cooperation and are now exploited on a commercial basis. Spin-offs will be founded for suitable innovations also in future.

Graz, 6 March 2018



Prof. Dr Wolfgang Pribyl, MBA

Chief Executive Officer

Excellence report for the financial year 2017

The task of JOANNEUM RESEARCH is to guarantee and advance the competitiveness of the research, innovation, and business location with a focus on applied research and technology development. The scientific excellence and performance of the staff of JOANNEUM RESEARCH play a decisive role in achieving the corporate targets assigned to it by its owners and the company's success.

194 publications in journals, books and proceedings, etc.

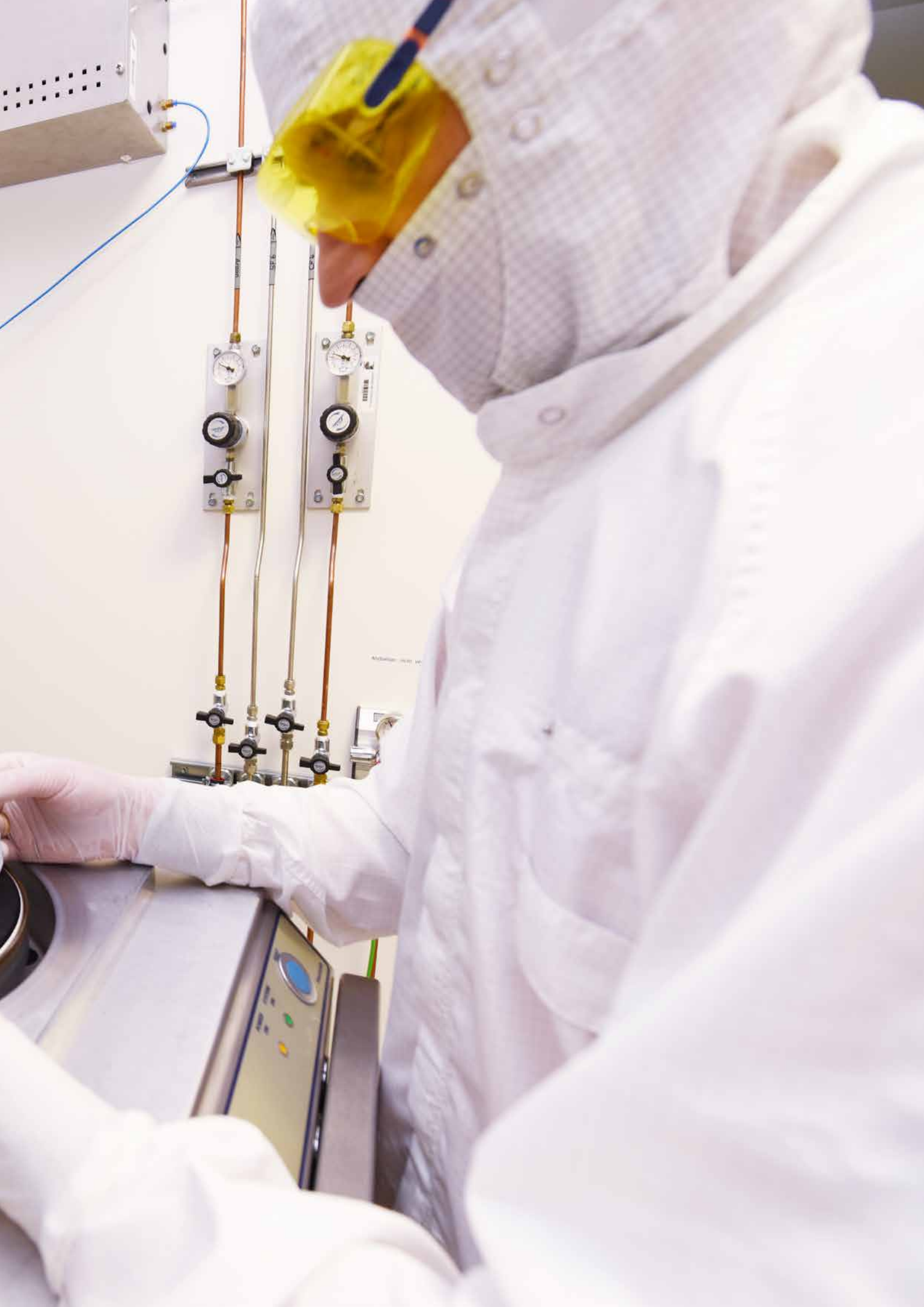
257 scientific lectures

36 patents
(of which 8 granted, 28 filed)

17 prizes and awards
(of which 4 international, 13 national)

82 scientific theses
(bachelor, master, doctoral)





Contact Information

Board of Management

Prof. Dr Wolfgang Pribyl, MBA

Leonhardstraße 59

8010 Graz

Phone +43 316 876-11 90

Fax +43 316 8769-11 30

gef@joanneum.at

Corporate services

- AGF – Assistance to the Management and internal coordination
- INR – Internal Audit
- PEM – Human Resources and Training
- IUR – Legal
- ZQS – Central Quality Assurance
- SFE – Safety, Health and Ergonomics
- ISP – IT Strategy and Process Management

Corporate departments

- STP – Strategic Planning
- IMM – Innovation Management and Marketing
- FLA – Future Lab
- FCO – Finance and Controlling
- RZJ – Data Centre
- IFS – Infrastructure und Facility Services
- PRM – Public Relations & Marketing

Contact

EXECUTIVE BOARD

Leonhardstraße 59, 8010 Graz
Tel. +43 316 876-1190
Fax +43 316 876-1130
gef@joanneum.at

MATERIALS

Institute for Surface Technologies and Photonics

- Hybrid Electronics and Patterning
- Light and Optical Technologies
- Laser and Plasma Processing
- Sensors and Functional Printing
- Smart Connected Lighting

Franz-Pichler-Straße 30, 8160 Weiz
Phone +43 316 876-3000
Fax +43 316 876-3010
Roseggerstraße 12, 8700 Leoben
Leobner Straße 94, 8712 Niklasdorf
Tel. +43 316 876-3304
Fax +43 316 876-3310
materials@joanneum.at

HEALTH

Institute for Biomedicine and Health Sciences

- Biomedical Tissue Monitoring
- Bioanalysis and Metabolomics
- Health Sciences
- Competence Group Clinical Decision Support
- Competence Group Medical Sensors

Neue Stiftingtalstraße 2, 8010 Graz
Phone +43 316 876-4000
Fax +43 316 876-4000
health@joanneum.at

DIGITAL

Institute for Information and Communication Technologies

- Remote Sensing and Geoinformation
- Machine Vision Applications
- Space and Communication Technology
- Connected Computing
- Intelligent Acoustic Solutions
- Competence Group Cyber Security and Defence

Steyrergasse 17, 8010 Graz
Hilfswarte
Roseggerweg 31, 8010 Graz
Phone +43 316 876-5000
Fax +43 316 876-5010
digital@joanneum.at

Alle Informationen finden Sie auch online unter
www.joanneum.at



POLICIES

Institute for Economic and Innovation Research

- Technology, Innovation and Policy Consulting
- Data analytics and Statistical Modelling
- Regional Economics and Structural Policy

Leonhardstraße 59, 8010 Graz
Phone +43 316 876-1488
Fax +43 316 876-1480

Haus der Forschung
Sensengasse 1, 1090 Vienna
Phone +43 1 581 7520
Fax +43 1 581 7520-2820

Lakeside B08a
9020 Klagenfurt am Wörthersee
Phone +43 316 876-7553
Fax +43 316 876-7553
policies@joanneum.at

ROBOTICS

Institute for Robotics and Mechatronics

- Cognitive Robotics
- Mechatronic Systems
- Robotic Systems

Lakeside B08a
9020 Klagenfurt am Wörthersee
Phone +43 316 876-2000
Fax +43 316 876-2010
robotics@joanneum.at

LIFE

Centre for Climate, Energy and Society

- Weather and Climate Risk Management
- Future Energy Systems and Lifestyle
- International Climate Policy and Economics
- Competence Group Urban Living Lab
- Competence Group Innovative Mobility Modelling

Science Tower
Waagner-Biro-Straße 100
8020 Graz
Phone +43 316 876-7600
Fax +43 316 876-7699

Haus der Forschung
Sensengasse 1, 1090 Vienna
Phone +43 316 876-7651
Fax +43 316 876-7699
life@joanneum.at

Lakeside B08a
9020 Klagenfurt am Wörthersee
Phone +43 316 876-2000
Fax +43 316 876-2010
life@joanneum.at

COREMED

Cooperative Centre for Regenerative Medicine

Neue Stiftingtalstraße 2, 8010 Graz
Phone +43 316 876-6000
Fax +43 316 876-6010
coremed@joanneum.at

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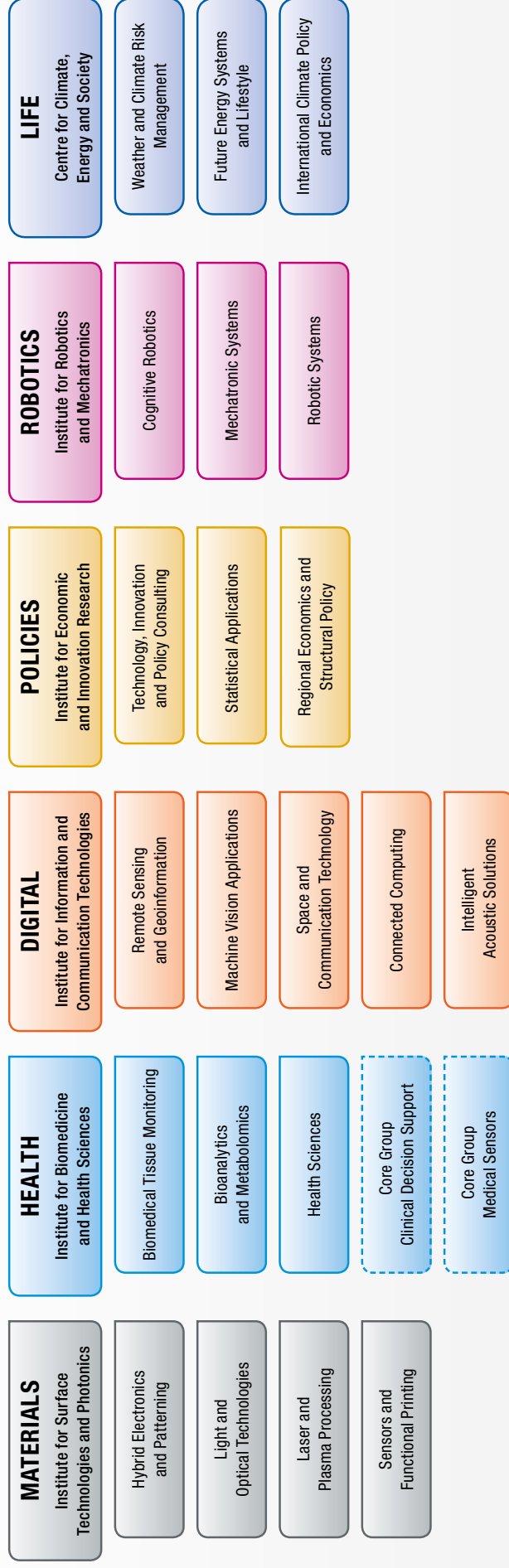
Executive Board, Corporate Staff and Departments



As of: December 2017

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Research Units



Equity Holdings

Affiliated Company	Shareholdings	In the frame of COMET K1 programme	In the frame of COMET K2 programme
<ul style="list-style-type: none"> JP-AquaConSol GmbH 	<ul style="list-style-type: none"> ALP.Lab GmbH decide Clinical Software GmbH EPiG GmbH FH JOANNEUM Gesellschaft mbH 	<ul style="list-style-type: none"> BIOENERGY 2020+ GmbH CBmed GmbH Know-Center GmbH Research Center for Data-Driven Business & Big Data Analytics 	<ul style="list-style-type: none"> ACIB GmbH Kompetenzzentrum – Das virtuelle Fahrzeug, Forschungsgesellschaft mbH Materials Center Leoben Forschung GmbH

JOANNEUM RESEARCH Forschungsgesellschaft mbH

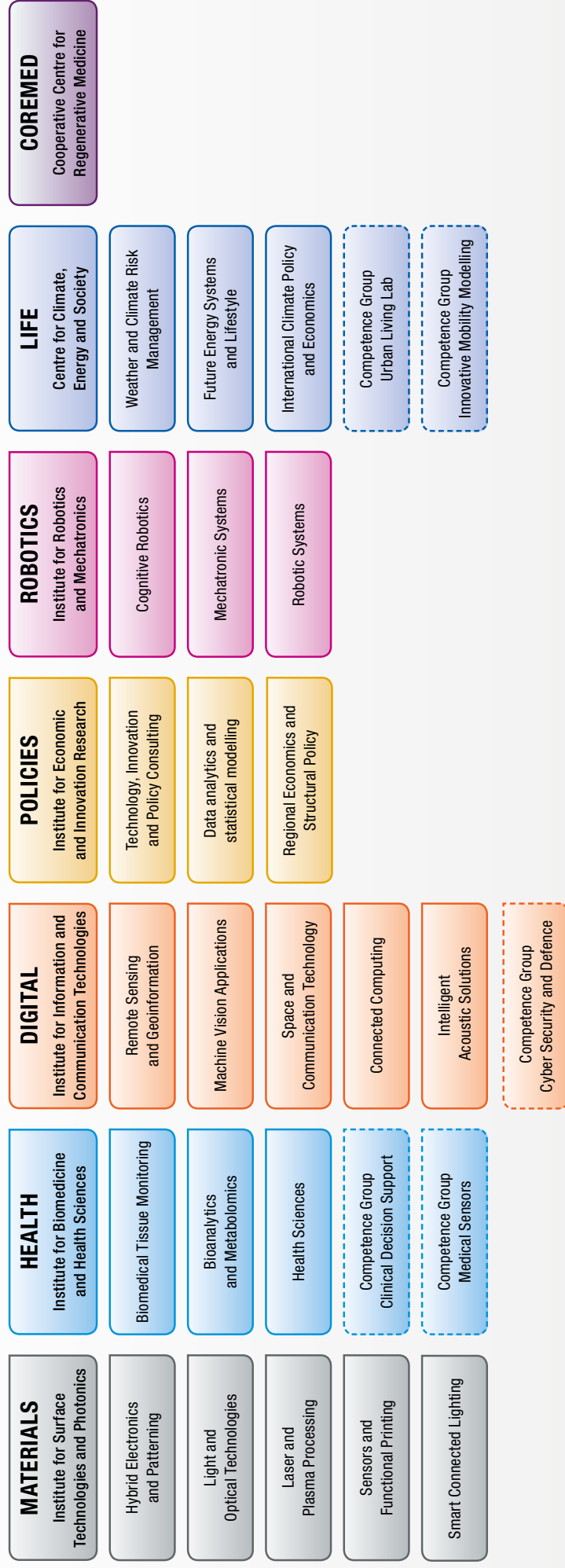
Executive Board, Corporate Staff and Departments



As of: May 2018

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Research Units



Equity Holdings

Affiliated Company

- JPR-AquaConSol GmbH

Shareholdings

- ALP-Lab GmbH
- decide Clinical Software GmbH
- EP/G GmbH
- FH JOANNEUM Gesellschaft mbH

Shareholdings COMET-Centres

- ACIB GmbH
- BIOENERGY 2020+ GmbH
- CBmed GmbH
- Know-Center GmbH
- Research Center for Data-Driven Business & Big Data Analytics

- Kompetenzzentrum – Das virtuelle Fahrzeug, Forschungsgesellschaft mbH
- Materials Center Leoben
- Polymer Competence Center Leoben GmbH
- Research Center Pharmaceutical Engineering GmbH

Media owner, editor, publisher:

JOANNEUM RESEARCH
Forschungsgesellschaft mbH

Leonhardstraße 59
8010 Graz

Tel. +43 316 876-0
Fax +43 316 876-11 81

prm@joanneum.at
www.joanneum.at

Responsible for the contents:

Prof. Dr Wolfgang Pribyl, MBA
Chief Executive Officer

Contact and editor:

Gabriele Katz

Tel. +43 316 876-12 05
Fax +43 316 8769-12 05

gabriele.katz@joanneum.at

Alexandra Reischl

Tel. +43 316 876-11 70
Fax +43 316 8769-1170

alexandra.reischl@joanneum.at

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JOANNEUM RESEARCH
Forschungsgesellschaft mbH
Leonhardstraße 59
8010 Graz
Tel. +43 316 876-0
Fax +43 316 876-1181
prm@joanneum.at
www.joanneum.at