

Austrian Technology in Space

An Overview of Austrian Space Industry and Research





Austrian Technology in Space

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Preface

With this brochure the Ministry of Transport, Innovation and Technology presents Austrian companies and research institutes, their research areas, competencies, products and services with the goal to increase the international visibility and to support networking of national and international players.

Austrian space activities are supported by the Ministry through the Austrian Space Applications Programme (ASAP) as well as through membership in international organisations such as the European Space Agency (ESA) and through EU programmes, such as Copernicus and Galileo.

The Ministry invites all Austrian companies, research organisations and institutes involved in space technology, which are not yet listed on www.spacetechnology.at, to register and present themselves on the web portal.





Every day of my life is a day on earth and in the universe. It's good to know that my support comes from far, far away – and Austrian technology helps make it happen!



Austria in Space

Austria is an active player in space activities since many years. This approach stimulated the development of Austrian space technology, space-based applications, space industry and space exploration.

Austria is a recognized partner in the space world. The Federal Ministry for Transport, Innovation and Technology (bmvit), as the responsible governmental department and policy maker, directly invests around 70 M EUR in the space sector per year, most of it for programmes and projects within the framework of the European Space Agency (ESA).

Austria participates in ESA programmes for Earth observation, telecommunications, technology development, scientific instruments and exploration, launchers, satellite navigation and space situational awareness.

In addition, Austria invests around 30 M EUR per year as a co-owner of the EU's space infrastructures such as Copernicus (Earth observation) and Galileo (navigation), as well as for SST (Space Surveillance and Tracking) and Horizon 2020 (research and innovation on space technologies).

Austria's Space History

Research / Event

1950

First space research activities conducted in Austria (plasma physics, ionospheric physics)

1969

First Austrian space measuring instrument on board of the high-altitude research rocket F21 launched in Norway

1982

VEGA 1 and 2 fly-by of Halley's comet with two Austrian-Soviet magnetometer on board

1983

European Space Laboratory Spacelab launched, equipped with Austrian windows and three Austrian experiments on board

Institutional

1968

First United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE) in Vienna

1970

Institute for Space Research of the Austrian Academy of Sciences founded

1972

Austrian Space Agency founded

1975

Summer School Alpbach takes place for the first time

1981

Austria becomes ESA associated member state

1982

Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE) in Vienna

1987

- ESA Council meeting in Vienna
- Austria becomes full ESA member state

1989

PHOBOS 2 in Mars orbit with Austrian magnetometer on board

1991

First Austrian astronaut in space – AUSTRUMIR-91



The European Earth observation satellite Sentinel-2 has Austrian technology on board.

2003

Ground station in Vienna supports Canadian Nanosat-MOST

2005

Funding of development of nano-sat TUGSAT-1 / BRITE-Austria in ASAP decided by bmvit

2007

Austria celebrates 20 years of ESA membership

2011

Austrian technology on board of Galileo satellite

2013

- First Austrian satellite TUGSAT-1 launched
- Second Austrian satellite UniBRITE launched
- Funding of studies on new nano satellites in ASAP11 decided

2015

Austrian technology on board of Earth observation satellite Sentinel-1A

2017

Third Austrian satellite PEGASUS launched on 23th June 2017

2018

Fourth Austrian satellite OPS-SAT scheduled for launch

1993

United Nations Office for Outer Space Affairs (UNOOSA) relocated to Vienna

1999

- Austrian space activities evaluated
- Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE) in Vienna

2001

National Point of Contact for Space Law (NPOC Austria) of the European Centre for Space Law (ECSL) founded

2002

Austrian Space Applications Programme ASAP and dedicated test bed for applications in the field of satellite navigation ARTIST initiated

2003

European Space Policy Institute (ESPI) founded in Vienna

2006

Austrian EU presidency conference "A Market for GMES in Europe and its Regions"

2008

Austrian space activities evaluated

2011

- Austrian Space Law adopted
- ESA Technology Transfer Broker Austria inaugurated

2012

Austrian space strategy adopted

2014

- Austrian elected chair of ESA Council
- Earth Observation Data Centre for Water Resources Monitoring (EODC) founded in Vienna

2015

Regulation implementing the Austrian space law adopted

2016

- European Space Education Resource Office in Austria inaugurated
- ESA Business Incubation Centre Austria inaugurated
- TEC-Laboratory (radiation hardness assurance) in Austria inaugurated

Austrian Space Strategy

After developing the space expertise of industry and research institutes in Austria, the future development of Austrian space activities has been charted through a robust dialogue among Austrian stakeholders, resulting in an Austrian space strategy in 2012. Four defined objectives and related indicators guide the scope of action of the bmvit until 2020. The objectives are monitored and evaluated on a regular basis.

www.bmvit.gv.at/en/service/publications/transport/downloads/space_strategy_bmvit.pdf

Objective 1

Recognised and Visible Partner



Based on the successes achieved so far in science, research, technology and applications, Austria will endeavour to take a position in the European Space Policy in a thematically focused fashion, corresponding to its economic power and its status as a medium-sized space nation. Austria will seek to assume international leadership in selected areas and thus support the research, technology and innovation strategy of the "Innovation Leader" in the overall system of innovation policy in Austria. In joint space activities, Austrian actors will attempt to increasingly take over leading and coordinating roles.

Objective 2

Competitive Space Sector



Competitive Austrian companies will continue to be active along the entire industrial value chain in all segments of space activity. Particular attention will be paid to the potential of space applications in creating high-quality jobs, and to technologies that enable a strategically advantageous positioning of Austrian companies in the international competitive environment. For Austria to position itself in the operational phases of the European space infrastructure programmes, it will need to build on existing competencies of companies and research institutions.

Objective 3

Orientation Towards Application Potentials



The potential of space applications will be sustainably used for the commercialisation of high-class products and services and for the improvement of the quality of life and the safety of Austrian citizens. Austrian public authorities will seek to use European space infrastructures.

Objective 4

Sustainable Bases for Space Activities

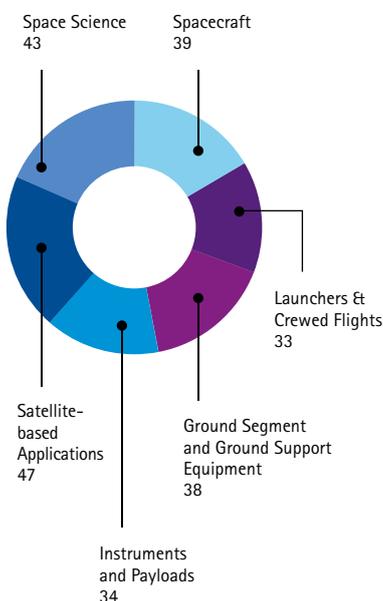


Austrian competencies and the high level of expertise in the field of fundamental and application-oriented space science and research will be further strengthened through capacity building, networking and internationalisation. The fascination of science and space will be used to arouse the spirit of research and curiosity and the interest in natural sciences of young people in particular.

Austrian Space Industry and Research

www.spacetechnology.at

This portal gives an overview of Austrian space industry and research. It helps with searching and finding organisations by their technological competences and products. According to their fields of activity, the companies and research institutes represented here may be divided into the following market segments.



Segments by number of Austrian organisations (multiple mentions)

More than 120 Austrian organisations are active in the space sector with an annual turnover of about 125M EUR and about 1,000 employees. Austria is represented in both, the up-stream and the down-stream sector. In the meanwhile, the majority is active in the satellite-based applications segment. Intellectual capital is reflected by an average of about 20 patents and slightly more than 1,000 publications per year. Austria is one of the most cited nations in the field of exploration of the solar system.

Austrian companies and research institutes are involved in many ESA missions, such as the Rosetta Mission, the historic European comet orbiter and lander, ExoMars for the search for life on Mars, and BepiColombo for the exploration of the Sun's closest planet Mercury. There is also Austrian technology in the EU space infrastructures for satellite navigation (Galileo) and Earth observation (Copernicus).

International Leadership Positions

In recent years, Austria has developed internationally recognised and visible skills, especially in the areas of space technology and scientific data analysis, as well as in the following technology areas:

Space Technology

- Thermal and mechanical subsystems for satellites and launcher systems
- Electronics for control and signal processing tasks
- Subsystems for testing and operating satellites
- Mechanical and electrical ground support equipment

Applications

- Earth observation for spatial planning, hydrology, environmental monitoring
- Satellite navigation for interference resistance and accurate systems, and automatic aircraft precision landing facilities
- Satellite-based communication for fixed and mobile applications

Space Science

- Space physics
- Astrophysics
- Earth observation
- Quantum physics in space

Space Institutions in Austria and Austrian Initiatives

ESA Business Incubation Centre and ESA Ambassador Platform



The ESA Business Incubation Centre in Austria (ESA BIC Austria) is the place for entrepreneurs from research centres, universities, space and non-space business seeking to realise their innovative ideas and transfer technologies from space (e.g. navigation, telecommunications, satellite data) to other areas of the economy (e.g. logistics, health, tourism, environment, energy). Launched in 2016 the ESA BIC Austria is managed and coordinated by Science Park Graz in close partnership with accent Wiener Neustadt.

www.esa-bic.at



With the objective of creating new and sustainable businesses, the ESA Ambassador Platform in Austria (ESA AP Austria) fosters the engagement between both space and non-space players from industry and academia into national and international partnerships. In addition, it serves as a starting point to perform business and technical feasibility checks, undertake demonstrators and pilots, and to obtain both technical expertise and funding from ESA and industry partners.

business.esa.int/ambassador-platforms/apaustralia

European Space Education Resource Office



The European Space Education Resource Office (ESERO) project is ESA's main way of supporting the education of sciences in primary and secondary schools. The Austrian office is hosted at Ars Electronica in Linz. ESERO Austria uses the space context to awaken and increase interest in science, technology, engineering and mathematics. It provides training sessions for teacher and innovative teaching materials and tools and thus inspires young people to pursue science-related studies and careers, particularly in the space domain.

www.aec.at/esero

ESA Broker Austria



ESA has established a network of technology brokers aiming at assessing the market needs in areas where there is a potential for exploitation of space technologies. Brimatech Services is the ESA technology broker for Austria. Brimatech conducts market analysis and mediates technology transfers between space sector and non-space industry. The goal is to make Austrian technologies and intellectual property accessible for European non-space industry and start-ups.

web1.esa.cyso.net/technology-transfer/esa-broker-austria



European Space Policy Institute

The European Space Policy Institute (ESPI) aims to provide decision-makers with an independent view on mid- to long-term issues relevant to the use of space with the aim of supporting space as a strategic policy area for Europe. To this effect, it provides recommendations, policy options and forward vision as to how Europe's engagement in space can bring maximum benefit to society. ESPI's work also reflects how space can sensibly contribute to Europe's unique role in global politics as a strong actor.

www.espi.or.at



National Point of Contact for Space Law Austria

The National Point of Contact for Space Law Austria (NPOC Austria), located at the law faculty of the University of Vienna, is part of the European Centre for Space Law. NPOC Austria aims at the promotion and development of space law in Austria. It pursues an interdisciplinary approach reflecting not only the legal but also the technical and political perspectives. NPOC's work programme focuses on enhancing space law in research, teaching of space law and increasing public awareness through events and conferences as well as publishing an annual space law newsletter.

www.spacelaw.at

Summer School Alpbach

Held annually since 1975, the Alpbach Summer School is a talent incubator for European space issues. Each year about 60 selected participants from among the member and cooperating states of the European Space Agency work out in-depth studies on different topics of space research. Within ten days graduates, post-graduate students, young scientists and engineers develop concepts for future, innovative satellite missions.

www.summerschoolalpbach.at

Austrian Space Activities

Austrian space activities are under the jurisdiction of the Federal Ministry for Transport, Innovation and Technology (bmvit) and are implemented by the Aeronautics and Space Agency of the Austrian Research Promotion Agency, FFG.

The main pillars of the Austrian space activities are the Austrian contributions to the programmes of the European Space Agency (ESA) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the contributions to EU space activities and the national space programme ASAP. The annual Austrian total space budget for ESA, EUMETSAT and ASAP amounts to 70 M EUR.

European Space Agency

The European Space Agency (ESA) is an international organisation with 22 member states (status 2017). Austria has been a member state since 1987. ESA's purpose is to provide for, and to promote for exclusively peaceful purposes, cooperation among European states in space research and technology and their space applications, with a view to their being used for scientific purposes and for operational space applications systems.

Austria's contributions to ESA amount to 50 M EUR annually for optional and mandatory programmes. About 90% of the contributions are awarded to Austrian research institutions and companies in terms of contracts.

EUMETSAT

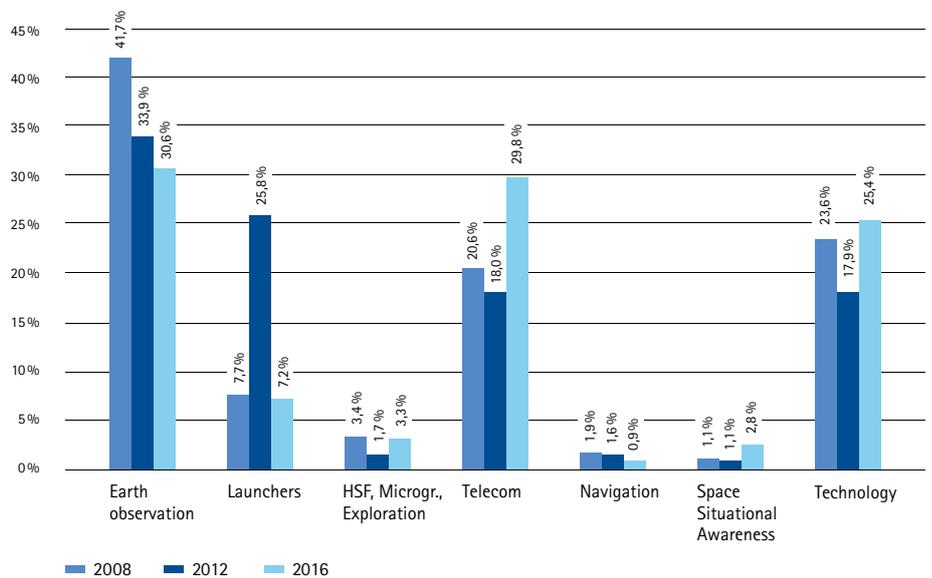
The European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) is an intergovernmental organisation and was founded in 1986. The purpose is to supply weather and climate-related satellite data, images and products to the National Meteorological Services of the member and cooperating states in Europe, and other users worldwide. Austria has been a member state since 1993. In 2016, the total budget of the organisation was 532 M EUR, and Austria's contribution amounted to 9 M EUR.

www.eumetsat.int/website/home/index.html

At the ESA Council at ministerial level, member states including Austria subscribe to optional and mandatory programmes usually for four year periods. Austria's total volumes for the years 2008, 2012 and 2016 amounted to approximately 110 M EUR.

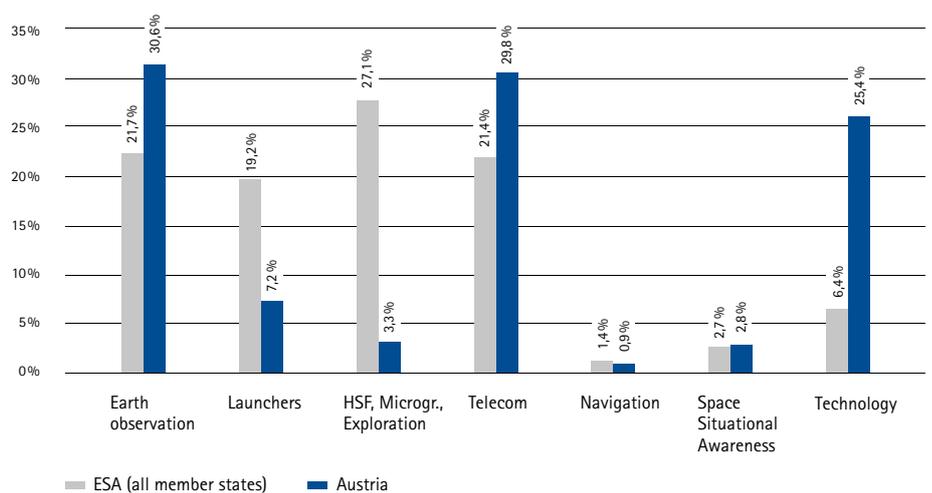
Austria's participation in ESA programmes reflects the national strengths on Earth observation, telecommunications and technology development.

Austrian Priorities in ESA



The relative distribution of the subscriptions at a programme level of all ESA member states compared to those of Austria in 2016 shows the targeted focus of Austria.

Comparison ESA (all Member States)/Austria



Space Programmes

Between 2014 and 2020, the European Union is investing over 12B EUR in the following four pillars:

1

Satellite navigation programme Galileo / European GNSS Overlay System (EGNOS)

2

Earth observation programme Copernicus

3

Space Surveillance and Tracking (SST)

4

Space research under the Horizon 2020 research programme

European Union Space Programmes

Galileo/EGNOS

Galileo is the European Union's Global Satellite Navigation System (GNSS). Together with the European Geostationary Navigation Overlay Service (EGNOS), Galileo provides accurate positioning and timing information. Galileo is a programme under civilian control and its data can be used for a broad range of applications. It is autonomous but also interoperable with existing satellite navigation systems. At the moment, the Galileo constellation consists of 18 satellites.

www.gsa.europa.eu

Copernicus

The other EU space flagship programme Copernicus is the world's most comprehensive Earth observation system. Based on satellite and in situ (non-space) data it delivers near-real-time information on the state of our planet. The services can also be used for local and regional needs to sustainably manage the environment we live in. Copernicus addresses six main thematic areas: atmosphere, marine, land, climate, emergency and security. The access to Copernicus data is open and free.

www.copernicus.eu

Space Surveillance and Tracking

Space Surveillance and Tracking (SST) is the ability to detect and predict the movement of space objects in orbit. At present five European member states – France, Germany, Italy, Spain and United Kingdom – are working together in a consortium to develop an European SST capability. This includes networking ground-based and/or space-based sensors, processing and analysing SST data and providing SST services to the EU user community. Austria participates in the establishment of a SST capability through the Satellite Laser Ranging Station at the Lustbühel Observatory in Graz/Styria, which is one of the world leading stations in this area.

www.iwf.oeaw.ac.at/en/research/satellite-laser-ranging



The new Ariane 6 launcher will be built with technology developed in Austria.

Horizon 2020

Horizon 2020 is the biggest EU research and innovation programme ever with nearly 80B EUR of funding available over 7 years (2014 to 2020). Space research supported by Horizon 2020 focuses on increasing competitiveness of the European space sector by accompanying research on European programmes in the areas of satellite navigation, Earth observation, and protection of the European space assets. The programme enables the European space research community to develop innovative space technologies and operational concepts "from idea to demonstration in space", and to use space data for scientific, public, or commercial purposes. ec.europa.eu/programmes/horizon2020/en/h2020-section/space

National Space Programme

Austrian Space Applications Programme

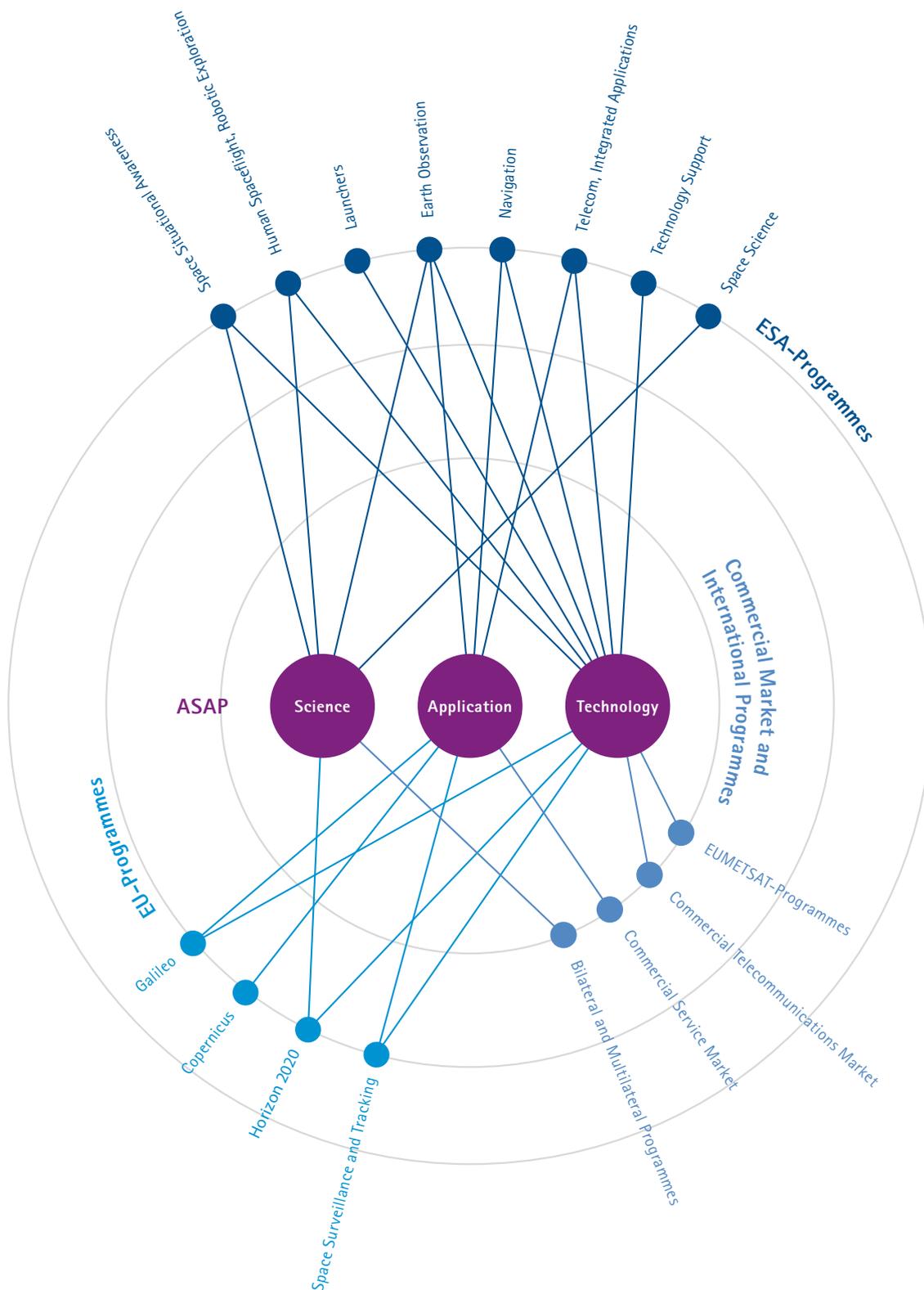
The Austrian Space Applications Programme (ASAP) is a well-established supporting instrument for the higher qualification of Austrian space competences. ASAP was initiated by the Federal Ministry for Transport, Innovation and Technology in 2002. Since 2002, about 590 projects with a total funding of 95M EUR were funded in 13 tenders. ASAP is a bottom-up research funding programme targeted at space science, technology and applications. The programme enables bilateral cooperation, supports scientific participation in ESA and bilateral projects and complements development in the application domain.

www.bmvit.gv.at/innovation/raumfahrt/weltraumprogramm.html

www.ffg.at/en/austrian-space-applications-programme

The Austrian Space Applications Programme as lever to international and European programmes

The Austrian Space Applications Programme ASAP has a leverage effect on the international programmes of the EU and ESA, on bilateral programmes and on the commercial market. Thus, it facilitates bilateral cooperation with industrial companies and other national space agencies.



Austrian Nano Satellites

Within the last decade, a new field of competence has emerged in Austria, the so-called nano satellites. They are small satellites with a weight between 1 and 10 kg.

Since 2013, three nano satellites have been launched for scientific purposes. They transmit data of very bright stars (TUGSAT-1, UniBRITE), or explore the thermosphere (PEGASUS). The fourth, launch planned for 2018, will test and validate new techniques in mission control and on-board systems (OPS-SAT). The increasing expertise in nano satellites goes along with the adoption of the Austrian space law in 2012.



TUGSAT-1

MOST

Since 2003, ground station in Vienna. Developed by Technische Universität Wien. Operated by Technische Universität Wien. Programme: supports Canadian nano-sat MOST (Microvariability and Oscillations of STars)

TUGSAT-1 / BRITE-Austria

Since 2013, an optical astronomy spacecraft. Developed by Graz University of Technology, University of Vienna and Technische Universität Wien. Operated by Graz University of Technology. Programme: BRITE (BRiGht Target Explorer) Constellation. Funding: Austrian Space Applications Programme

UniBRITE

Since 2013, an optical astronomy spacecraft. Developed by Graz University of Technology, University of Vienna and Technische Universität Wien. Operated by the University of Vienna. Programme: BRITE (BRiGht Target Explorer) Constellation. Funding: Austrian Space Applications Programme (operations)

PEGASUS

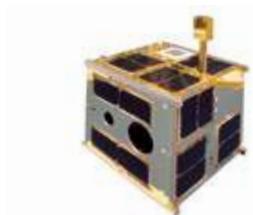
Since 2017, an Earth observation spacecraft. Developed by University of Applied Sciences Wiener Neustadt, Technische Universität Wien, University of Vienna and Austrian Space Forum. Programme: QB50 a network of 36 nanosatellites built by university teams all over the world. Funding: EU H2020, Austrian Space Applications Programme (pulsed plasma thruster)

OPS-SAT

Launch planned for 2018, an in orbit test bed for innovation. Developed by Graz University of Technology. Programme and funding: European Space Agency, General Science and Technology Programme

Austrian CubeSat Initiative

Since 2017. Implemented within ESA's General Science and Technology Programme



UniBRITE



PEGASUS



OPS-SAT

Austrospace



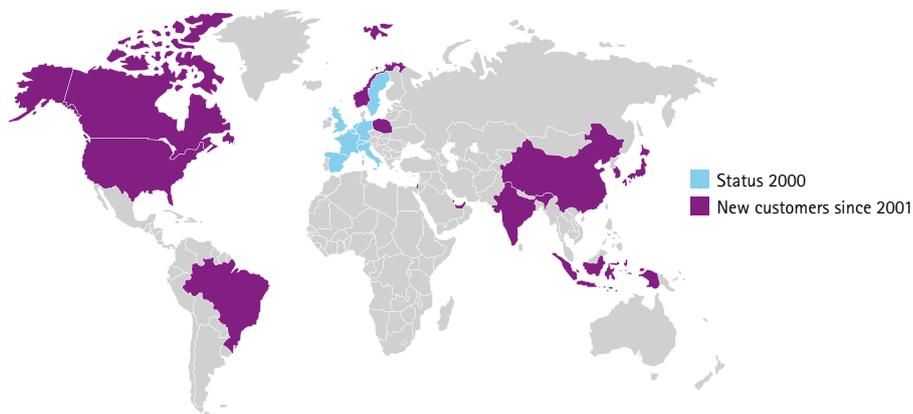
Association of Austrian Space Industries

www.austrospace.at

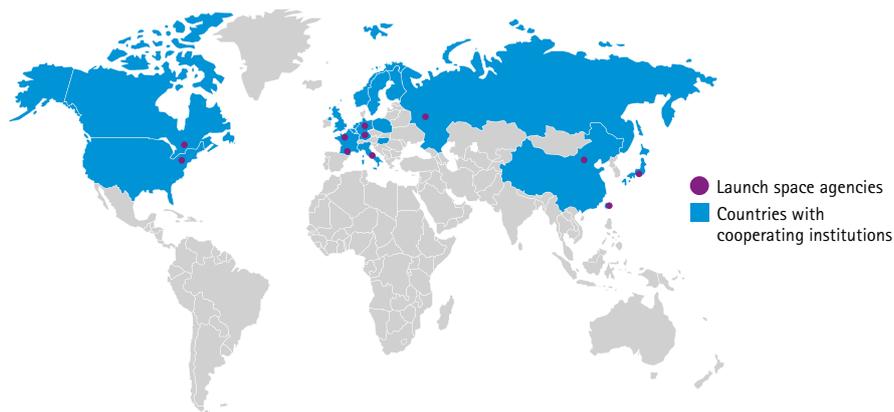
Austrospace, the association of Austrian space industries and research institutions, is a non-profit organisation focusing on:

- Comprehensive information about Austrian space activities
- Representation of common interests of Austrian suppliers and users of space technologies vis-à-vis Austrian authorities and international organisations

The members of Austrospace account for the predominant part of Austrian contributions to space programmes and cover a broad spectrum of space technologies and applications in the areas of telecommunications, navigation, Earth observation, meteorology, space transportation and space science.



During the last 15 years, the Austrian space industry has successfully expanded the customer network from Europe to the global space market.



Scientific co-operations have been established with all major space agencies worldwide.

Aeronautics and Space Agency



The Aeronautics and Space Agency (ALR) of FFG (Austrian Research Promotion Agency) is the docking station to the international space world for Austrian science and industry.

On behalf of the Federal Ministry for Transport, Innovation and Technology, the Agency implements the national space policy and represents Austria on an international level, in particular in the bodies of the European Space Agency (ESA).



Federal Ministry
for Transport,
Innovation and Technology

www.bmvit.gv.at

The Agency's core objectives lie in the international positioning and networking of Austrian industry, economy and science, and in securing Austria's competitiveness at the international level. It is a central contact point for coordination activities in the area of space and represents Austria in EU bodies, ESA and EUMETSAT.

Importantly, the Aeronautics and Space Agency manages the participation in bilateral and international aerospace programmes and aims at developing and strengthening the Austrian aeronautics and space cluster. Education and outreach are also important tasks, which are fulfilled through special initiatives that aim at fostering children's interest in technical and scientific topics via space technology and research.

Space Industry

Space Industry

Products and Services

Spacecraft

Aerospace & Advanced Composites
 ALPEX Technologies
 Böhler Edelstahl
 Cleanroom Technology Austria
 DEWETRON
 Electrovac
 Fuchshofer
 Global TCAD Solutions
 HES
 Intales
 Langzauner
 Liquifer
 Magna Steyr
 MCE
 Orlik
 Pichler & Strobl
 Rejlek
 RHP
 RUAG Space
 RÜBIG
 Schmechtig
 Secar
 Siemens Convergence Creators
 SYENTEC
 TechComp
 TEST-FUCHS
 TTech
 x.test
 Zoerkler

Launcher and Manned Flight

Aerospace & Advanced Composites
 ALPEX Technologies
 Andritz
 Böhler Edelstahl
 Böhler Schmiedetechnik
 DEWETRON
 Fuchshofer
 Global TCAD Solutions
 HES
 HET Verkehrstechnik
 Intales
 Langzauner
 Liquifer
 Magna Steyr
 Orbspace
 Pichler & Strobl
 Rejlek
 RHP
 RUAG Space
 RÜBIG
 Secar
 SYENTEC
 TechComp
 TEST-FUCHS
 TTech
 Zoerkler

Ground Segment

[AlpinaTec](#)
[ASA Astrosysteme](#)
[AWST](#)
[BEV](#)
[Cleanroom Technology Austria](#)
[DEWETRON](#)
[Frequentis](#)
[Fuchshofer](#)
[Global TCAD Solutions](#)
[HET Verkehrstechnik](#)
[MCE](#)
[Orlik](#)
[Pamminger](#)
[Pichler & Strobl](#)
[Rejlek](#)
[RHP](#)
[RISC Software](#)
[Schmechtig](#)
[Siemens Convergence Creators](#)
[SISTEMA](#)
[SYENTEC](#)
[TCA](#)
[TechComp](#)
[TEST-FUCHS](#)
[TTTech](#)
[Weatherpark](#)
[x.test](#)
[Zoerkler](#)

Instruments and Payloads

[Aerospace & Advanced Composites](#)
[Airborne Technologies](#)
[AlpinaTec](#)
[ASA Astrosysteme](#)
[Electrovac](#)
[Fuchshofer](#)
[Global TCAD Solutions](#)
[Liquifer](#)
[LuftBlick](#)
[Pichler & Strobl](#)
[Rejlek](#)
[RHP](#)
[RUAG Space](#)
[Schmechtig](#)
[Siemens Convergence Creators](#)
[SISTEMA](#)
[SYENTEC](#)
[TechComp](#)
[TTTech](#)
[x.test](#)
[ZAMG](#)
[Zoerkler](#)

Satellite-based Services

[Airborne Technologies](#)
[BEV](#)
[Bike Citizens](#)
[creative BITS](#)
[Electrovac](#)
[ENVEO](#)
[EODC](#)
[eoVision](#)
[EOX](#)
[Frequentis](#)
[GeoVille](#)
[Global TCAD Solutions](#)
[GRID-IT](#)
[HES](#)
[LuftBlick](#)
[Orlik](#)
[Pichler & Strobl](#)
[Rejlek](#)
[RISC Software](#)
[Schmechtig](#)
[Siemens Convergence Creators](#)
[SISTEMA](#)
[Space Analyses](#)
[SpaSe](#)
[SYENTEC](#)
[TCA](#)
[Tebkom](#)
[TechComp](#)
[Umweltbundesamt](#)
[Umweltdata](#)
[via donau](#)
[ZAMG](#)

Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•		
Launcher and Manned Flight		•		
Ground Segment				
Instruments and Payloads		•		
Satellite-based Services				

Aerospace & Advanced Composites

Space related test benches, laboratories, etc.

Special space related testing devices are:

- Outgassing/sublimation up to 600 °C
- Thermal vacuum chamber up to 1m³
- Re-entry-test chamber
- Vacuum-tribometers
- Cold welding and component test rigs
- CME testing
- Mechanical testing from LHe (-263 °C) to 2000 °C incl. acoustic emission and fatigue
- Microstructure analysis with HR-SEM, FIB and EBSD, NDT
- Production facilities for composites and functionalisation of nanoparticles

AAC was founded in 2010 as a spin-off from the AIT Austrian Institute of Technology during restructuring. AAC acts as a service provider in the field of application-oriented research and technology development of materials combining a broad interdisciplinary catalogue of skills with specialised know-how. AAC offers its services for B2B contracts as well as assistance for the application of funded projects.

Technologies and competences

AAC is active in the development and qualification of materials. Its main business case covers testing services to European space industry, but also to ESA itself. The "Space Materials testhouse" under ESTEC contract has been running since 1989. AAC is also involved in the development of high-performance materials and composites for space applications, e.g. cryogenic structures, thermal protection (re-entry) and mechanism.

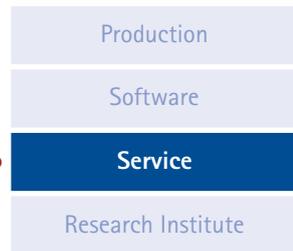
Products and services in space

- Consulting services for materials towards space applications (structural, mechanisms, thermal)
- Space testing services from materials to components, Bake-out of space hardware
- Special experience in composites (polymer, metal and ceramics): development, consulting and testing (mechanical, tribo)
- Structural Health Monitoring (development of SHM systems)



Aerospace & Advanced Composites GmbH
 Viktor-Kaplan-Straße 2
 2700 Wiener Neustadt
 +43 2622 90550-300
 andreas.merstallinger@aac-research.at
 www.aac-research.at
 Contact: Andreas Merstallinger





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads	•	•		
Satellite-based Services			•	•

Airborne Technologies

Airborne Technologies excels in three business areas: ISR Turnkey Solutions, Sensor Integration and Data Solutions. Airborne Technologies Data Acquisition & Processing Department provides services in the field of remote sensing and geophysics processing, exploitation and dissemination that covers a wide range of applications, e.g. Police, Military, Environmental Mapping and Exploration.

Technologies and competences

The knowledge of our employees, the availability of different sensors and expertise in data processing allows us to offer applications to various business divisions e.g.:

- Planning Work & Construction Process
- Precision Farming & Agriculture Management
- Geophysical Surveys
- Environmental & Infrastructure Monitoring
- Forest Management
- Research and Development
- Archaeology
- Hydrography
- Pipeline Monitoring

Products and services in space

- Pipeline Monitoring
- LIDAR and Image Data for Planning Work & Construction Process
- Power Line Mapping
- Vegetation analysis



Airborne Technologies GmbH
 Viktor Lang Straße 8
 2700 Wiener Neustadt
 +43 2622 34718
 office@airbornetechnologies.at
 www.airbornetechnologies.at
 Contact: Benjamin Kabelik



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•	•	•
Launcher and Manned Flight		•	•	•
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

ALPEX Technologies

ALPEX Technologies is a world leader in the design and manufacture of high-precision tooling, moulding and assembly solutions for aerospace and automotive industries. We support our customers in establishing an effective and reliable production process for their CFRP parts. Our capabilities reach from design and engineering to manufacturing, assembling and quality inspection.

Technologies and competences

Our core competence is the design and manufacturing of tooling solutions for composite components for our customers. They value ALPEX Technologies GmbH as a competent project partner. The designed moulds, tools and fixtures are manufactured from materials like aluminium, steel, INVAR and enable our customers to produce composite components in an efficient and reliable way.

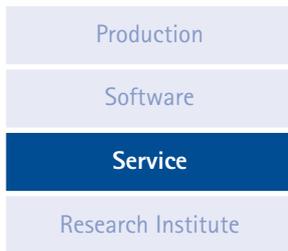
Products and services in space

- Tooling for the production of composite parts
- Manufacturing of metal parts



ALPEX Technologies GmbH
 Gewerbepark 38
 6068 Miils
 +43 5223 46664-0
 rola@alpex-tec.com
 www.alpex-tec.com
 Contact: Romed Ladstätter





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment		•		•
Instruments and Payloads				•
Satellite-based Services				

AlpinaTec

AlpinaTec – Technical Products GmbH is an engineering provider located in Köstendorf near Salzburg (Austria). AlpinaTec relies on long-lasting experience in the domain of research and development of space-domain related devices and provides engineering services for customer specific automation and software systems featuring concept design, mechanical and software engineering.

Technologies and competences

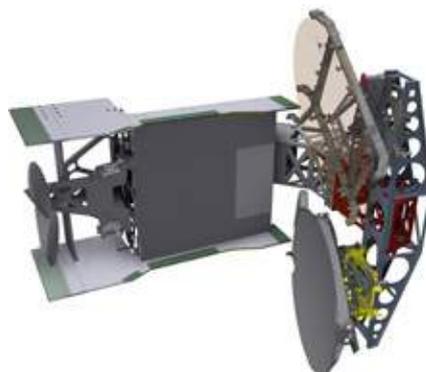
AlpinaTec covers the full development process considering requirements engineering, product design and development as well as project management. Key products from the space domain are automation and software solutions for antenna measurement systems and positioner systems used for satellite measurement applications. Key products from the automation domain are design and implementation of custom production plants.

Products and services in space

- Ground station controllers
- DUT positioner systems
- Mechanical Ground Support Equipment (MGSE)
- Software engineering



AlpinaTec Technical Products GmbH
 Enhartingerstraße 20
 5203 Köstendorf bei Salzburg
 +43 6216 40440
 office@alpinatec.at
 www.alpinatec.at
 Contact: Peter Burger



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight		●	●	●
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

Andritz

Publicly listed Andritz Group is a global market leader for customised plants, systems and services for the hydropower, pulp and paper, steel and other specialised industries.

Technologies and competences

In the area of space technology, Andritz develops, engineers and manufactures retaining rings between the main stage and the solid rocket boosters.

Products and services in space

- Engineering and manufacturing of mechanical components



Andritz AG
 Statteggerstraße 18, 8045 Graz
 +43 316 6902-2399
 viktor.harb@andritz.com
 www.andritz.com
 Contact: Viktor Harb



● Production

Software

Service

Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment		•	•	•
Instruments and Payloads			•	•
Satellite-based Services				

ASA Astrosysteme

ASA Astrosysteme GmbH devotes itself to creating innovative technologies for astronomy professionals, astrophotographers & agencies in need of high-precision optical tracking systems. ASA's objective is to provide exactly these components, optical devices, fully automatic mountings and tracking systems, corresponding to the latest requirements in astrophotography. ASA produces optics up to 1.7 m in diameter.

Technologies and competences

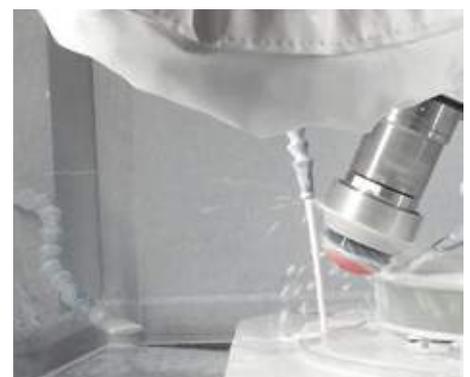
ASA Astrosysteme GmbH offers expertise in all areas relating to telescopes. Competences include: Infrastructure, Coordination and Project management, Building, Optic design, Construction, Mount and tube hardware, Direct Drive technology, Electronic and Control systems, Optic fabrication, Mechatronics, Metrology sensors, Cameras, Commission and Service.

Products and services in space

- Turnkey observatories solutions
- High-precision tracking systems
- Robotic optical telescopes
- Optics

ASA
ASTROSYSTEME GMBH

ASA Astrosysteme GmbH
Galgenau 19, 4212 Neumarkt i. M.
+43 7942 7781153
office@astrosysteme.at
www.astrosysteme.com
Contact: Dietmar Weininger





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment		•		•
Instruments and Payloads				
Satellite-based Services				

AWST

Angewandte Wissenschaft Software und Technologie

AWST consists of a dedicated team of IT specialists and scientists with wide-ranging experience in all areas of the software lifecycle. AWST was founded in 1997 and has its headquarters in Vienna. Typical AWST projects are tailored to the specific requirements of the customers.

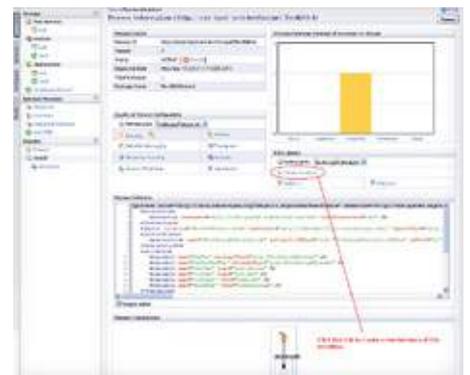
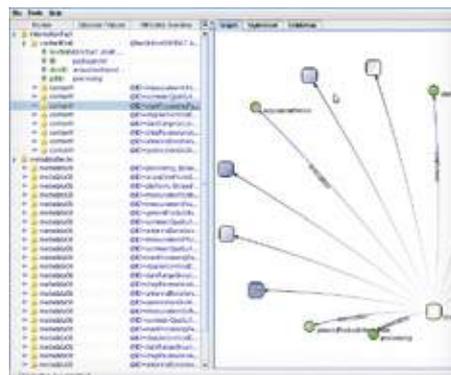
Technologies and competences

AWST specialises in software projects for international organisations. Most projects have a scientific background, for example in earth observation, nuclear safeguards monitoring and seismology. AWST's competencies range from short-term support engagements to complete development projects.

Products and services in space

- Configuration management, maintenance, operation and data management of development and test platforms for complex software systems
- Software development from requirements analysis, architectural and detailed design, implementation, test planning and testing, and on to operations, maintenance and system re-engineering and replacement
- Services in the area of system administration and IT consulting
- Documentation of newly developed or already existing software systems

**Angewandte Wissenschaft
Software und Technologie GmbH**
 Mariahilfer Straße 47/Stg. 3, 1060 Wien
 +43 1 5861314
 urban@awst.at
 www.awst.at
 Contact: Kristine Urban





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment		•	•	•
Instruments and Payloads				
Satellite-based Services		•	•	•

BEV

Federal Office of Metrology and Surveying

Space related test benches, laboratories, etc.

GNSS augmentation system APOS Austrian Positioning Service (75 reference stations domestically and abroad)

BEV is a national authority that is subordinate to the Federal Ministry of Science, Research and Economy with its scope of duties covering surveying, geoinformation as well as metrology and verification. Surveying and geoinformation form one part within BEV which deals with basic surveying, setup and management of the cadastral information and topographic surveying.

Technologies and competences

In accordance with the Survey Act, BEV is responsible for Austrian-wide provision of foundations for the determination of gravity, height and 3D position information in national and international reference systems. To provide 3D positions in real time, BEV operates the GNSS Augmentation Service APOS (Austrian Positioning Service).

Products and services in space

- Determination of coordinates in real time with cm accuracy for all of Austria
- Monitoring of the stability of regional geological units
- Realisation of the ETRS89 reference system

**Bundesamt für
Eich- und Vermessungswesen**
Schiffamtsgasse 1–3, 1020 Wien
+43 664 8011742620
erich.imrek@bev.gv.at
www.bev.gv.at
Contact: Erich Imrek



Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	

Bike Citizens

Bike Citizens is an Austrian company which develops apps and provides wider concepts for promoting cycling in urban areas. Bike Citizens is an expert partner for bike-related projects and demonstrates how to effectively benefit from current trends.

Technologies and competences

Bike Citizens offers reliable software solutions and applications that help cyclists to find their way by bike. To cities, businesses and organisations wishing to strengthen their sustainable image, Bike Citizens offers communication and marketing concepts that are assessed regularly.

Products and services in space

- Bike navigation apps
- Bike Citizens analytics
- Bike promotions and campaigns



BikeCityGuide Apps GmbH
 Kinkgasse 7, 8020 Graz
 +43 316 228724
 office@bikecitizens.net
 www.bikecitizens.net
 Contact: Steffen Wirth



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft			•	
Launcher and Manned Flight			•	
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

Böhler Edelstahl

Böhler Edelstahl is a fully integrated steel mill. We start production with melting and re-melting process, doing hot-forming – rolling and forging – and perform heat treatment up to the finishing machining and testing. Our focus on research and development in cooperation with universities and research centres keeps us one step ahead. Böhler Edelstahl is your partner for the most demanding applications in metallurgy.

Technologies and competences

Our unique combination of melting and remelting facilities consists of EAF (Electric Arc Furnace), AOD (Argon Oxygen Decarburisation), VID (Vacuum Induction Decarburisation), VIM (Vacuum Induction Melting), P-ESR (Protective/Pressurised Electroslag Remelting), ESR (Electroslag Remelting), and VAR (Vacuum Arc Remelting). Our Hot Forming aggregates are cogging- and multiline rolling mills (round, flat, square), rotary forging and forging press. We offer powders BÖHLER-AMPO with the right properties for every application and printing technology.

Products and services in space

- Casing Turbine pump starter Ariane V



BÖHLER
EDELSTAHL

Böhler Edelstahl GmbH & Co KG
 Mariazeller Straße 25, 8605 Kapfenberg
 +43 3862 207493
 hannes.konrad@bohler-edelstahl.at
 www.boehler-edelstahl.com
 Contact: Hannes Konrad



- Production

- Software

- Service

- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight		•	•	
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

Böhler Schmiedetechnik

Böhler Schmiedetechnik is one of the leading manufacturers of high-quality parts (mainly die forgings) for aerospace applications, power generation and other high-tech industries. Die Forgings (open die forgings) can be produced up to 1200 kg with a length of up to 2800 mm or a diameter of up to 1200 mm (discs) in steel, titanium or nickel-base alloys.

Technologies and competences

Computer simulation/modelling is used extensively in the development of the forging processes. Together with all micro-structural and mechanical product achievements, the modelling enables the design of stable forging process. Additionally, modelling of mechanical properties in cooperative design is possible for selected materials, like those used for engine discs.

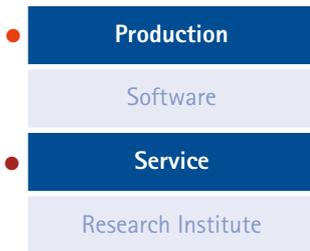
Products and services in space

- Computer modelling
- Die forgings
- Forging design



Böhler Schmiedetechnik GmbH & Co KG
 Mariazellerstraße 25, 8605 Kapfenberg
 +43 3862 207166
 martin.stockinger@bohler-forging.com
 www.boehler-forging.com
 Contact: Martin Stockinger





Segment	Research	Development	Production	Engineering
Spacecraft		•	•	•
Launcher and Manned Flight				
Ground Segment		•	•	•
Instruments and Payloads				
Satellite-based Services				

Cleanroom Technology Austria

Cleanroom Technology Austria GmbH is specialised in high-quality equipment and measuring services within the clean room technology industry. The range of products and services covers the engineering, manufacturing, assembly, auditing and maintenance of clean rooms for industry and OR's for surgical units, clean room components and air conditioning as well as ventilation plants.

Technologies and competences

Engineering, manufacturing and assembling of clean rooms for industry and hospital units. Applied research and development of ultra clean and particle-free air systems, components and products. Measuring services for ultra clean air systems and components. Trainings for "how to work and behave" in clean rooms and operation room units.

Products and services in space

- Clean room engineering and manufacturing
- Particle free air filter systems and components
- Air flow measuring services



Cleanroom Technology Austria

Cleanroom Technology Austria GmbH
 IZ-NÖ-Süd, Straße 10, Objekt 60
 2355 Wiener Neudorf
 +43 2236 320053-0
 office@cta.at
 www.cta.at
 Contact: Roman Czech





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	•

creative BITS

Space related test benches, laboratories, etc.

Test bench for intense testing of electronic components

creative BITS (CB) was founded in 1998. The company produces special software and electronic products for industry and various organisations. A main focus is on secure IoT (Internet of Things) devices as well as sensor networks. The company also produces advance prototypes for other high-tech companies.

Technologies and competences

Web-based technologies

- IoT architecture
- Simulation and big data analysis
- Sensor networks
- Location-based services
- Programming and developing electronics
- System design: from electronics to Smartphones
- App development
- Networks.

Products and services in space

- IoT Devices
- Location-based services
- Web applications
- GPS applications

IT Beratung
Schwicklitz
creative BITS
group

creative BITS OG
Zaunermühlstraße 2, 4050 Traun
+43 50 3344-100
roth@creativeBITS.com
www.creativeBITS.com
Contact: Markus Roth



- **Production**
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•		
Launcher and Manned Flight		•		
Ground Segment		•		
Instruments and Payloads				
Satellite-based Services				

DEWETRON

Space related test benches, laboratories, etc.

DEWETRON offers test and measurement systems for third party test benches and laboratories.

DEWETRON is an Austrian manufacturer of highly intuitive, comprehensive test & measurement systems designed to deliver needs-based data acquisition capability to the aerospace and other industries. DEWETRON measurement systems are used in test facilities, on proving grounds, in wind tunnels and even inside manned aircraft undergoing flight tests.

Technologies and competences

DEWETRON's core competence is synchronous data acquisition. A high number of analog inputs like strain, pressure, acceleration, temperature, etc. can be acquired synchronously with vastly different signals like rotation sensors, ARINC-429 or MIL-1553 bus parameters, video, GPS or telemetry data. Our software is independent of the operating system.

Products and services in space

- DEWE2-A4: the most compact measurement system with built-in display
- DEWE2-M13s: high channel count system with 104 analog inputs – also expandable
- TRIONet: a small and compact data acquisition system for distributed and synchronised aerospace applications



DEWETRON

DEWETRON GmbH
 Parking 4, 8074 Grambach
 +43 316 30700
 info@dewetron.com
 www.dewetron.com



- Production

- Software

- Service

- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft			•	•
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads			•	•
Satellite-based Services			•	•

Electrovac

Space related test benches, laboratories, etc.

- Ovens
- Electroplating shop
- Vacuum ovens
- CNC Center

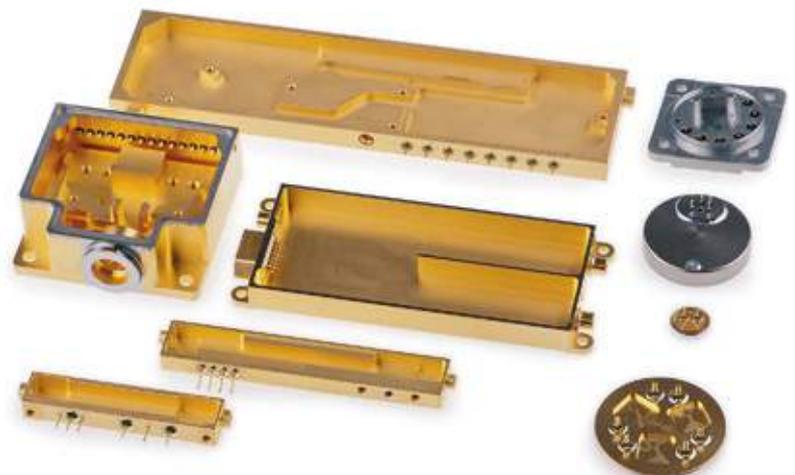
Electrovac produces hermetically sealed housings. These housings are made from special materials and used in satellite technology, for applications in telecommunications and the packaging of integrated circuits.

Technologies and competences

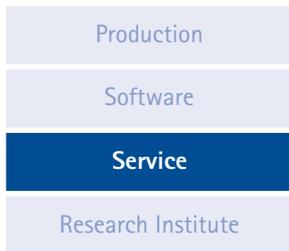
In the assembly of hermetically sealed housings, mainly glass-to-metal-sealing technologies are used. Further main competences are various surface finishing technologies.

Products and services in space

- Housings for transmitters
- Housings for receivers
- Laser housings



Electrovac
 Metall- Glaseinschmelzungs GmbH
 Aufeldgasse 37-39, 3400 Klosterneuburg
 +43 2243 450-0
 info@electrovac.com
 www.electrovac.com
 Contact: Christian Bauer



Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	•

ENVEO

Environmental Earth Observation

ENVEO is an internationally operating engineering company licensed for services in meteorology and remote sensing. The main business activities comprise research and development for extracting information from Earth observation (EO) satellite data, transfer of EO tools from research to applications, and consultancy and services in environmental monitoring tailored to customer needs.

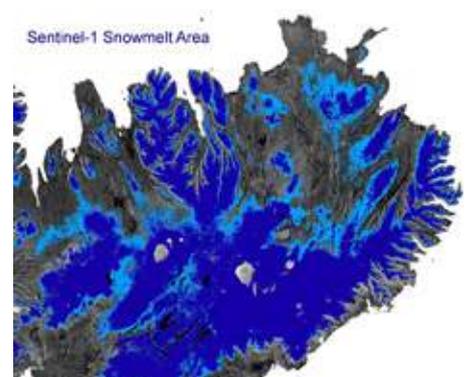
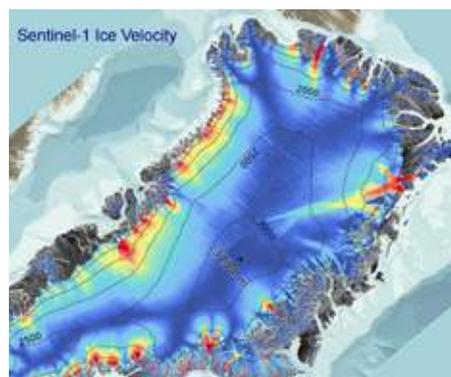
Technologies and competences

Core activities of ENVEO include the development of tools for exploitation of EO data, satellite-based products and services in cryosphere and land surface monitoring, and the integration of EO data in environmental process models. Main applications fields are climate change monitoring, hydrology, surveys of seasonal snow cover, glaciers and ice sheets, land cover mapping, and monitoring of geo-hazard phenomena.

Products and services in space

- Tools for retrieval of land surface parameters from radar and optical sensors
- Customized products on snow, glacier and ice sheet parameters from satellite data
- High resolution maps on land cover, surface topography, and deformation of unstable ground
- Development of concepts for advanced Earth observation systems

ENVEO Environmental
 Earth Observation IT GmbH
 Technikerstraße 21a, 6020 Innsbruck
 +43 512 50748-300
 thomas.nagler@enveo.at
 www.enveo.at
 Contact: Thomas Nagler





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	•

EODC

Space related test benches, laboratories, etc.

The basic infrastructure components include (i) a platform for 24/7 processing, (ii) a virtual environment for collaborative algorithm development, (iii) Petabyte-scale storage, and (iv) access to the Vienna Scientific Cluster 3 (VSC-3) (a facility for big data processing).

The EODC (Earth Observation Data Centre) for Water Resources Monitoring GmbH (EODC GmbH, <https://www.eodc.eu>) is a public-private partnership (PPP). The mission of the EODC is to work together with its shareholders and multi-national partners from science, the public and private sectors in order to foster the use of earth observation (EO) data.

Technologies and competences

The EODC provides a cloud computing environment for the Earth Observation (EO) ground segment for deriving geophysical parameters and land cover properties from Sentinel-1 (synthetic aperture radar), Sentinel-2 (high-resolution optical imaging) and other EO missions.

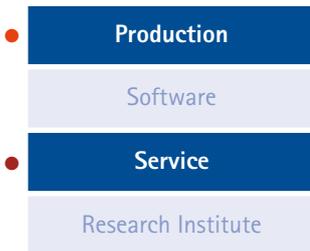
Products and services in space

- Big EO data
- Cloud computing environment
- Supercomputing

eodc

EODC Earth Observation Data Centre for
Water Resources Monitoring GmbH
Gusshausstraße 27-29/CA0206,
1040 Wien
+43 699 16687510
christian.briese@eodc.eu
www.eodc.eu





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	

eoVision

eoVision is a SME focusing on services and products based on Earth observation data and geoinformation. The company's services cover the full production chain (data search and order, processing and analysis), and the publication of results by web mapping services and high-quality printed and digital multimedia products.

Technologies and competences

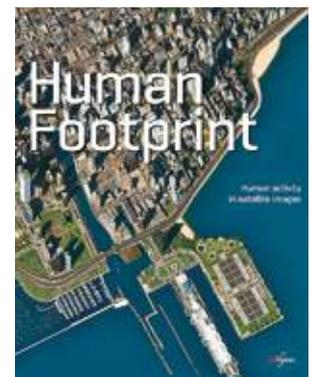
eoVision applies state-of-the-art technologies for processing and analysing Earth observation data, including pixel-based and object-based image analysis methods. For visualisation products, techniques allowing the preparation of 2D and 3D products as well as animations are used. With the interactive globe "Vision Globe", eoVision offers a unique platform for the presentation of multimedia content.

Products and services in space

- Multimedia visualisation based on Earth observation and other geodata for edutainment/infotainment
- Systems for integration of Earth observation data and geoinformation
- Earth observation data related geoinformation distribution based on web map services
- Earth observation data acquisition and analysis, focus on land use mapping and cartography



eoVision GmbH
 Franz-Josef-Straße 19, 5020 Salzburg
 +43 662 243217
 office@eovision.at
 www.eovision.at
 Contact: Markus Eisl





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	•

EOX

EOX is an innovative company, founded in 2008 by people with a strong will to realise the market perspectives in the field of spatial observation information technology. The founders are the shareholders and key personnel of EOX. Main customers are ESA and EU Copernicus. EOX maintains excellent business relations with R&D, institutional and commercial stakeholders.

Technologies and competences

Main activities and competences lie in the areas of networked infrastructure for harmonised access to data from Earth Observation (EO) satellites, satellite cartography server technology, land cover monitoring applications and integrated applications combining remote sensing, satellite navigation, and mobile communication technologies.

Products and services in space

- Virtual workspaces for EO data exploitation
- ESA project management in earth observation
- User services & archive platform operations for earth observation
- Open source software (eoxserver.org) providing user-centred EO data view & download (OGC EO-WCS & EO-WMS server framework integrating MapServer, GDAL, Python & Django)

EOX
Spatial Data & Information Technologies

EOX IT Services GmbH
Thurgasse 8/4, 1090 Wien
+43 664 6207655
gerhard.triebnieg@eox.at
www.eox.at
Contact: Gerhard Triebnieg



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment	●	●	●	●
Instruments and Payloads				
Satellite-based Services	●	●	●	●

Frequentis

Frequentis is an Austrian company that operates in areas related to safety-of-life decision making. While the core business lies in the ATM sector, the company also builds voice and data communication and information systems for defence, public safety, public transport and maritime markets.

Technologies and competences

Frequentis' core competences lie in the provision of extremely reliable solutions for safety-critical areas, such as air traffic management, public safety and transport.

Products and services in space

- ATN/IPS Air Ground Router
- Ground Segment Networking



Frequentis AG
 Innovationsstraße 1, 1100 Wien
 +43 1 81150-1425
 saadan.ansari@frequentis.com
 www.frequentis.com
 Contact: Saadan Ansari



Production

Software

Service

Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft			•	•
Launcher and Manned Flight			•	•
Ground Segment			•	•
Instruments and Payloads			•	•
Satellite-based Services				

Fuchshofer

Our company is specialised in the manufacture of high-precision turned and milled parts (CNC precision technology) and additive manufacturing. Our main tasks include 2D and 3D machining (3, 4, 5 axis machining in milling), multi-axis turning machining, grinding and complete processing of materials of different quality.

Technologies and competences

Our strengths include many years of experience with a great variety of material qualities, such as: stainless steel, case hardened steel and tempered steel, aluminium, titanium, non-ferrous metals like bronze or brass, plastics. The most recent possibility in our company is the processing of so-called advanced materials such as ceramics, glass, and hard metals, on state-of-the-art machining centres.

Products and services in space

- Mechanical production of high-precision components for satellites
- Additive manufacturing
- Small parts
- Small series



FUCHSHOFER
CAM-CNC Präzisionstechnik
Additive Manufacturing • Turning & Milling • Ultra-precision Machining

Fuchshofer Präzisionstechnik GmbH
Haselbach 100, 8552 Eibiswald
+43 3466 47025-0
info@fuchshofer.at
www.fuchshofer.at
Contact: Hannes Fuchshofer



- Production
- Software
- Service**
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	•

GeoVille

GeoVille is dedicated to providing cutting edge spatial data by extracting information from satellite imagery meeting exactly our customer's needs. We have international project experience in project management and consultancy – GIS and image processing systems, environmental and international development applications and integration in information systems.

Technologies and competences

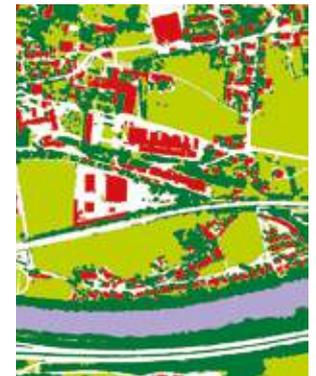
GeoVille uses innovative technologies to provide processing, consultancy, development and analytical information provision capacities for major governmental, institutional and commercial organisations. The developed processing chains, high-end IT infrastructure and services are designed to provide customer-oriented Earth observation application solutions with an excellent quality/price ratio.

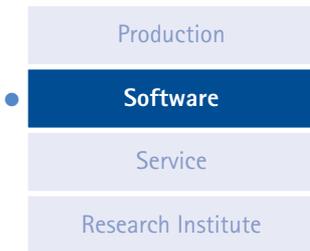
Products and services in space

- Satellite Data and Geoinformation Products
- Geospatial Information Systems and Platform Interfaces
- EO Data Analytics
- Data Handling and Processing



GeoVille
 GeoVille Information Systems and
 Data Processing GmbH
 Sparkassenplatz 2, 6020 Innsbruck
 +43 512 56201-0
 info@geoville.com
 www.geoville.com
 Contact: Christian Hoffmann





Segment	Research	Development	Production	Engineering
Spacecraft	•			•
Launcher and Manned Flight	•			•
Ground Segment	•			•
Instruments and Payloads	•			•
Satellite-based Services	•			•

Global TCAD Solutions

Global TCAD Solutions (GTS) offers an innovative simulation environment for semiconductor components based on the latest scientific research results. Our "Technology Computer Aided Design Framework" (TCAD-Framework) is used in the semiconductor industry and by research institutes in order to successfully make use of new technologies and to be the first to put new products in the market, or to optimise existing designs.

Technologies and competences

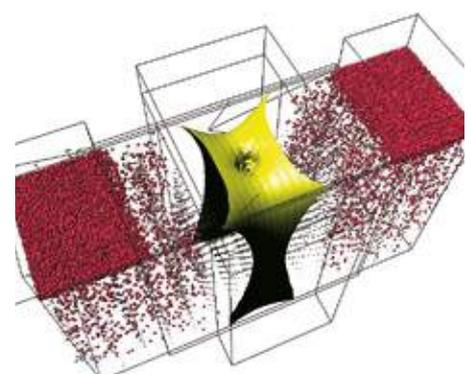
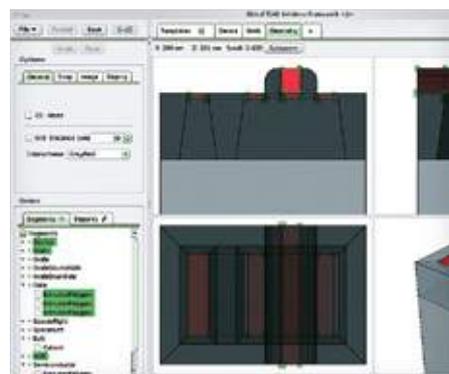
With the GTS TCAD-Framework, we offer simulation solutions for conventional semiconductor technology (irradiation in CMOS, space applications, wide bandgap materials), nano-transistors (high-performance logic, ultra-low power applications, optical devices), reliability analyses (degradation, time-to-failure estimation) and green technology applications (e.g. power electronics for eMobility and solar cells).

Products and services in space

- GTS TCAD-framework



Global TCAD Solutions GmbH
 Bösendorferstraße 1/12, 1010 Wien
 +43 1 9255049
 info@globaltcad.com
 www.globaltcad.com
 Contact: Markus Karner





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•		

GRID-IT

GRID-IT is a geo-informatics and remote sensing specialist. The main focus is on remote sensing data analysis in combination with UAV based data acquisition, development and application of numerical simulation models and database-driven data and information management. GRID-IT provides technical solutions, consulting and training. GRID-IT is the Austrian reseller for ERDAS products.

Technologies and competences

The main focus of GRID-IT services is on analysis and management of earth observation data as well as software development dealing with data management and numerical simulation models. Change detection, object-oriented classification and photogrammetric analysis are the areas of specialisation in the earth observation domain.

Products and services in space

- Automation of workflows
- Mapping of natural hazards
- Object-based feature extraction
- Hexagon Geospatial Software



GRID-IT Gesellschaft
für angewandte Geoinformatik mbH
Technikerstraße 21a, 6020 Innsbruck
+43 512 5074860
office@grid-it.at
www.grid-it.at
Contact: Hannes Kleindienst





Segment	Research	Development	Production	Engineering
Spacecraft	•	•	•	
Launcher and Manned Flight	•	•	•	
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	

Space related test benches, laboratories, etc.

Pulsed Plasma Electrolytic Oxidation (PEO) for light weight materials like Ti, Mg, Al, and similar.

HES

We are E2E process provider and technical partner for innovative functional metallic surfaces. Based on extensive research and many years of development work, we offer smart production processes for electrochemical surface finishing that go beyond the limitations of even state-of-the-art galvanic coatings. Our surface modification technologies are ideal for space used light weight metal parts.

Technologies and competences

Smart processes for electrochemical surface finishing, application of new processes to industrial facilities, process control, layer characterisation and failure analysis (Austria's largest galvanic lab). Products are multifunctional coatings by pulse plating, high-quality nanowires, processes and finishing modules for additive manufactured metal parts, and part-integrated sensor surfaces.

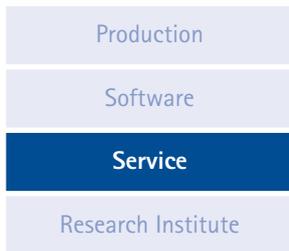
Products and services in space

- Hirtisation of metal AM parts
- Electrochemical pulse plating
- Pulsed Plasma Electrolytic Oxidation



Hirtenberger Engineered Surfaces GmbH
 Leobersdorfer Straße 31-33,
 2552 Hirtenberg
 +43 2256 81184820
hes@hirtenberger.com
hes.hirtenberger.com
 Contact: Wolfgang Hansal





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight	•	•		•
Ground Segment	•	•		•
Instruments and Payloads				
Satellite-based Services				

HET Verkehrstechnik

Space related test benches, laboratories, etc.

HET has a laboratory for further development of the fuel cell, like using it for the railway or for agriculture – and also for space. With HET’s mobile biogas container, you can create hydrogen for use in space or on earth. This will also be tested at the laboratory.

HET Verkehrstechnik is an R&D competence centre for the fields of structure mechanics, engineering, propulsion systems (especially fuel cells) and hydraulic systems. The company was founded in 2006 with 2 men, today there are about 15 employees. National and international companies are customers of HET. There are cooperations with prestigious universities and research institutes like DLR Stuttgart (specialising in space, air and energy).

Technologies and competences

The competences and experiences of HET can be used for earth as well as for space. Together with the University of Innsbruck, HET developed a new software called 'Cossan-X'. It's a software for quantification of structure dependability / failure probability of satellites or engineering strength of airplane wings etc. Main competences for the space area are the propulsion systems, especially the fuel cell (used for Citylog EMF).

Products and services in space

- Citylog EMF (fuel cell driven transportation vehicle)
- Mobigas (mobile biogas container for generation of hydrogen and biogas)



HET Hochleistungs- Eisenbahn- und Transporttechnik Entwicklungs-GmbH
 Eisenhutstraße 3, 5202 Neumarkt a.W.
 +43 6216 21136
 sonja.kern@het-engineering.com
 www.het-engineering.com
 Contact: Sonja Kern



Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				•
Launcher and Manned Flight	•	•		•
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

Intales

Founded in 2004 in Innsbruck by highly experienced engineers from the Austrian and German aerospace industry, Intales offers the full spectrum of aerospace structural analyses. In cooperation with the University of Innsbruck and other European research institutes, we develop advanced strategies, methodologies and software tools for the use of our international customers.

Technologies and competences

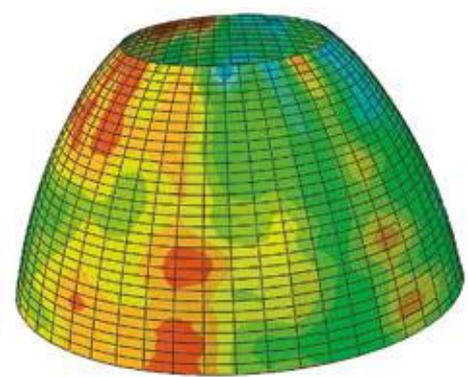
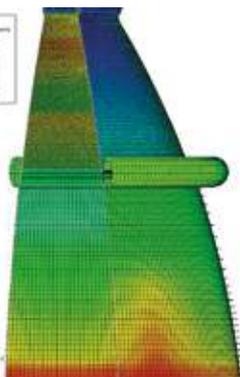
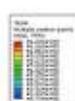
With our team consisting of analysis specialists and excellently educated young engineers, we provide innovative solutions for the analysis of highly loaded and complex light weight structures. Intales processes extremely large FE models, e.g. for non-linear analysis, by automation of the complete analysis sequence. In-house sensitivity and random field analysis tools are available for the optimisation of structures.

Products and services in space

- Design optimisation
- Structural analysis
- Analysis software
- Risk based design

INTALES

Intales GmbH
 Innsbrucker Straße 1, 6161 Natters
 +43 512 546111
 starmans@intales.com
 www.intales.com
 Contact: Hermann-Josef Starmans



Production

Software

Service

Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft			•	•
Launcher and Manned Flight			•	•
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

Langzauner

Langzauner produces hydraulic presses and automation systems for the production of light weight designed parts made out of fiber reinforced plastics.

Technologies and competences

Langzauner works constantly on refining its hydraulic systems and has without doubt the last word in current state-of-the-art when it comes to hydraulic drives for speed-regulated, and massive energy-saving hydraulic presses with the highest accuracy. With heating systems up to 400 °C and more, combined with process development for all customer requirements (e.g. RTM, gap-injection), Langzauner has the perfect solution.

Products and services in space

- RTM
- SMC, BMC, Pultrusion
- Composite components equipment
- Hydraulic presses



Langzauner GmbH
 Lambrechten 52, 4772 Lambrechten
 +43 7765 2310
 office@langzauner.at
 www.langzauner.at
 Contact: Thomas Witzmann



Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft	•	•		
Launcher and Manned Flight	•	•		•
Ground Segment				
Instruments and Payloads	•	•		
Satellite-based Services				

Liquifer

The privately owned Liquifer Systems Group was established in 2004 with the objective of creating a multidisciplinary task force that can take on space systems design and engineering projects for ESA, the EU and the European space industry. We combine a wide range of expertise and our profile combines earth and space R&D and demonstrates a unique constitution for innovative research and product development.

Technologies and competences

Our core competence is systems design. Our expertise comprises future work & life (design & human factors), systems engineering, payload integration and robotic design. Through our expertise, we offer the following services: surveys, studies, concepts, design (Phases: A, B, C, D), breadboard, prototype, management, organisation and proposal writing.

Products and services in space

- Robotics
- Systems engineering
- Systems design and architecture
- Human factors

LIQUIFER
SYSTEMS GROUP

Liquifer Systems Group GmbH
Obere Donaustraße 97–99/1/62, 1020 Wien
+43 699 10275036
barbara.imhof@liquifer.com
www.liquifer.com
Contact: Barbara Imhof



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads	●	●		
Satellite-based Services	●	●		

LuftBlick

Space related test benches, laboratories, etc.

Optical laboratory with calibration lamps (tungsten FEL, gas discharge) and lasers

LuftBlick is an internationally operating science and engineering company. The core business is atmospheric remote sensing in the UV, visible and NIR from ground and space. Our key personnel have had many years of experience in atmospheric research and are serving as consultants or collaborators for institutions like ESA and NASA.

Technologies and competences

Design and development of ground-based and satellite instrumentation, instrument control software, laboratory and field calibration, retrieval algorithms for atmospheric trace gases (e.g. O3, NO2), instrument network hosting, operational network data and image processing, satellite validation support, data harmonisation, quality control, analysis and conversion.

Products and services in space

- Design of remote sensing instruments
- Remote sensing trace gas retrievals
- Calibration of remote sensing instruments



LuftBlick OG
 Kreith 39a, 6162 Mutters
 +43 512 583103
 office@luftblick.at
 www.luftblick.at
 Contact: Alexander Cede





Segment	Research	Development	Production	Engineering
Spacecraft		•	•	•
Launcher and Manned Flight		•	•	•
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

Magna Steyr

Space related test benches, laboratories, etc.

- Welding, riveting, bonding
- CFRP winding
- X-Ray, dye penetrant, eddy current, pressure, burst and leakage testing
- Insulation (polyurethane, polyimide, MLI ...)
- Clean room, precision cleaning and cleanliness verification

Magna Aerospace is part of the Magna Steyr Fuel Systems group. The business unit is divided into the engineering, manufacturing and quality assurance departments. To work in project-oriented matrix organisations with car industry people and European and overseas customers is standard for Magna Aerospace

Technologies and competences

The aerospace main competences have been the cryogenic technologies for the liquid hydrogen and liquid oxygen propellant feed lines for the European launcher Ariane 5 since 1990. These technologies are transferred into the automotive and aviation field of business especially for storage systems. In the satellite equipment section, the main technologies are thermal protection systems and pyrotechnic hold down and release mechanisms.

Products and services in space

- Cryogenic and high pressure piping's for aerospace
- Cryogenic and high pressure gas storage systems
- Satellite components



Magna Steyr Engineering AG & Co KG
 Liebenauer Hauptstraße 317, 8041 Graz
 +43 316 404-3136
 kurt.irmberger@magna.com
 www.magnasteyr.com
 Contact: Kurt Irmberger



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft			•	•
Launcher and Manned Flight				
Ground Segment			•	•
Instruments and Payloads				
Satellite-based Services				

MCE

Based on long years of experience and expertise in the field of machinery and steel construction, we combine structural steel engineering with the necessary mechanical and control technology, thus ensuring a functional whole. Coordination – from draft planning to execution and including the integration of all plant-specific systems and components – is our major strength.

Technologies and competences

Engineering, production and installation of production lines (jigs & tools) for structural parts, structural assembly and equipment of aircrafts. Our typical products are pre-final assembly lines, assembly lines, equipment lines, flap assembly jigs, etc. MCE is also able to participate on big turn-key projects in the field of telescopes/antennas and test facilities.

Products and services in space

- Launcher assembly jigs
- Telescopes/Antennas
- Satellite transport containers



MCE GmbH
 Lunzerstraße 63, 4031 Linz
 +43 732 69875843
 michal.prochazka@mce-hg.com
 www.mce-hg.com
 Contact: Michal Prochazka



Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight	•	•		•
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

OrbSpace

OrbSpace is a young research and development company and represents a new generation of aerospace companies. Since its foundation in the year 2006, OrbSpace has been bringing new competences to Austria and tries to position itself in new and emerging markets such as suborbital space flight. OrbSpace has a strong European network and is part of several national and European research projects.

Technologies and competences

Our competences cover three business lines: engineering, aerospace medicine, and space law. In engineering, our core competences are in propulsion (ignition systems, ceramic components, numerical flow analysis, propulsion testing), vehicle systems (conceptual design, combined system and trajectory optimisation, system risk and flight safety analysis) and EU project management.

Products and services in space

- System optimisation and flight safety
- Laser ignition
- Flight and space medicine
- Space law



OrbSpace

Frauenkirchner Straße 1, 7141 Podersdorf
+43 2177 21710
aron.lentsch@orbSpace.com
www.orbSpace.com
Contact: Aron Lentsch

● Production

Software

Service

Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft			•	•
Launcher and Manned Flight				
Ground Segment			•	
Instruments and Payloads				
Satellite-based Services			•	

Orlik

Mechatronik und Fertigung

The company Orlik & Co GmbH is developing, constructing and producing special tools and machinery. Such testing and mounting equipment is usually customized for small and medium enterprises in the area of production, handling and automation. Furthermore, CNC-precision, turned and milling parts are produced according to client requirements – from single pieces to large volume production. Certified to DIN EN ISO 9001:2015.

Technologies and competences

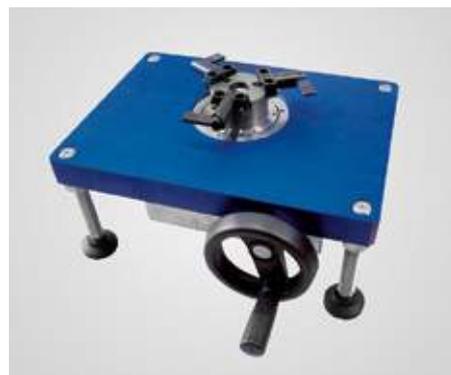
Machining of precision parts (milling & turning parts) out of metallic materials and technical synthetics, and assembling of mechatronic components. Designing, constructing and manufacturing of smart, user-friendly, durable devices, special machinery and automation solutions for efficient production, assembling and verification processes & machinery components and functionally demanding solutions

Products and services in space

- Manufacturing consulting
- Mechanical manufacturing of component
- Production of components for satellite assembly

ORLIK

Orlik & Co GmbH
 Mechatronik & Fertigung
 Industriestraße 9, 2752 Woellersdorf
 +43 2622 42500-0
 mechanik@orlik.at
 www.orlik.at
 Contact: Wolfgang Orlik



● Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment			●	●
Instruments and Payloads				
Satellite-based Services				

Pamminger

Pamminger is an owner-managed company with a history that goes back 85 years, and has been a supplier to the space industry for the past 10 years. Pamminger is ISO 9001 and EN 1090 certified and specialised in the production and assembly of systems for satellite transport, as well as assembly systems, assembly devices, test benches and hoisting machines. Welding assemblies of all types can be manufactured as well.

Technologies and competences

Competences include the mechanical machining and measurement of building elements of up to 12 metres length and 4.1 metres height, final assembly of units of up to 70 tonnes in weight, comprehensive welding equipment and know-how for carbon steel, fine grained steel, stainless steel and aluminium.

Products and services in space

- Production of test benches for space technology
- Production of hoisting machines for satellite assembly
- Production of ground transport systems for satellite assembly

PAMMINGER
MASCHINENBAU

Pamminger Maschinenbau
Ges.m.b.H. & Co KG
Petzoldstraße 24, 4020 Linz
+43 732 770388
thomas.faltner@pamminger.at
www.pamminger.at
Contact: Thomas Faltner



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft			•	
Launcher and Manned Flight			•	
Ground Segment			•	
Instruments and Payloads			•	
Satellite-based Services			•	

Pichler & Strobl

Pichler & Strobl produces and assembles mechanical components for the aerospace industry, for medical technologies, and for the semiconductor and racing industry.

Technologies and competences

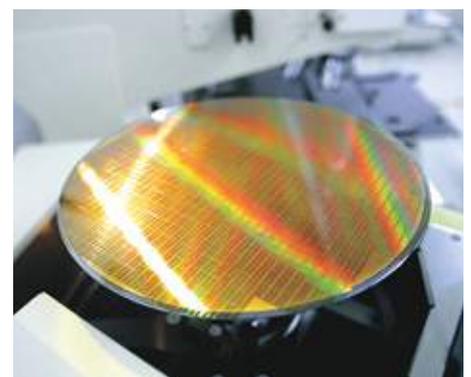
Our areas of competence are industrial engineering, milling, turning, drilling, grinding, part assembling in clean-room quality, digital measuring technology, ultrasonic cleaning, logistics, support and surface treatment of titanium, steel, stainless steel, aluminium, plastic and various special materials.

Products and services in space

- Mechanical components for landing gear
- Mechanical components for spoilers
- Mechanical components for aircraft interiors
- Mechanical components for aircraft exteriors



Pichler & Strobl
 Pichler & Strobl GmbH
 Landstraße 20, 5102 Anthering
 +43 6223 29900
 m.schroeger@pichler-strobl.at
 www.pichler-strobl.at
 Contact: Markus Schröger



● Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•	•	•
Launcher and Manned Flight		•	•	•
Ground Segment			•	
Instruments and Payloads				•
Satellite-based Services			•	

Rejlek

Space related test benches, laboratories, etc.

- Magnetic gear and drive test equipment

Karl Rejlek GmbH is part of the Rejlek Metal & Plastics Group which processes metal and plastic materials for supply to the automotive, electronics, medical and machining industries. The Group has 900 employees at production sites in Austria, Hungary and Slovakia and has a joint venture with a U.S.-based company, giving it a global footprint.

Technologies and competences

Our core competence is in the magnetic gear and drive area: Machining of metal components; design and construction of moulds, tools, and automation solutions; single/multi material injection moulding; stamping; laser and ultrasonic welding; painting; foiling; laser treatment; assemblies.

Products and services in space

- Metal structure parts
- Plastic parts
- Magnetic gears and drives

REJLEK
METAL & PLASTICS *Group*

Rejlek Metal & Plastics Group
Kirchfeldgasse 69, 1230 Wien
+43 1 9821678
r.rejlek@rejlek.at
www.rejlek.at
Contact: Gregor Puchhammer



● Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft	•	•	•	
Launcher and Manned Flight	•	•	•	
Ground Segment	•	•		
Instruments and Payloads	•	•		
Satellite-based Services				

Space related test benches, laboratories, etc.

- Additive manufacturing (blown powder/wire feed) up to a size of 1.5 m x 1.8 m
- Complete process chain for metal injection moulding
- Inductive hot pressing up to 1800 °C
- Direct hot pressing with diameter up to 350 mm and 2400 °C
- Conventional hot pressing and sintering
- Gas pressure sintering (up to 100 bar, 2400 °C)

RHP is a solution provider for customized materials and advanced processing techniques based on powder technology. The space relevant materials include composite materials such as high thermal conductive metal diamond composites, Invar based materials as well self-lubricating compositions or high temperature ceramics. Additionally, we provide services/R&D on additive manufacturing for large structures.

Technologies and competences

Advanced materials such as:

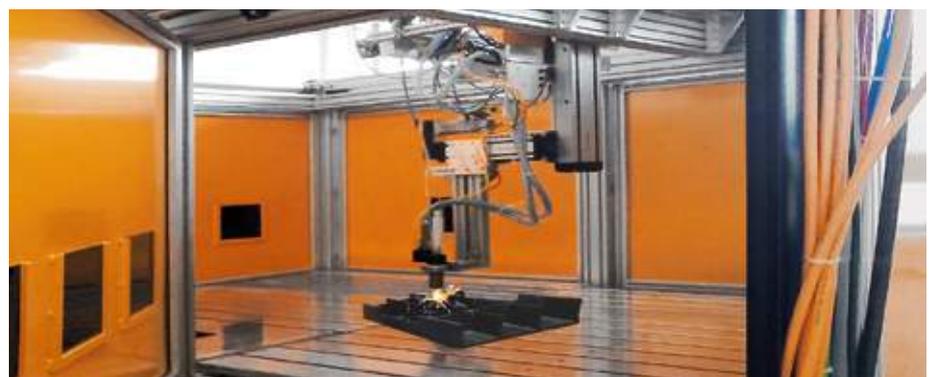
- Composites with tailored thermophysical properties (metal-diamond, Invar based materials ...)
- Self-lubricating composites
- R&D in Additive Manufacturing for large metallic structures
- Metal Injection Molding of parts for thrusters
- Multi-Material Processing/Joining of Materials, e.g. Invar-Titanium
- Diffusion Bonding Services for Flow Path Board Manufacturing

Products and services in space

- Metal Diamond Composites for Thermal Management of Electronics
- R&D and services on additive Manufacturing of large structures
- Material Development/Screening of new Material concepts
- Micro Parts/Components for Thrusters and Pressure Regulation systems



RHP-Technology GmbH
 Forschungszentrum, 2444 Seibersdorf
 +43 2255 20600-10
 erich.neubauer@rhp-technology.com
 www.rhp-technology.com
 Contact: Erich Neubauer





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment	•	•		•
Instruments and Payloads				
Satellite-based Services		•		•

RISC Software

Space related test benches, laboratories, etc.

Completely equipped PC workstations and private cloud environment. Access to Austrian and European High Performance Computing (HPC) and cloud infrastructure

RISC Software was founded in 1992 as a spin-off of the Johannes Kepler University of Linz. The core competences, i.e. symbolic calculations, mathematics and IT, are applied within the context of the competence areas of logistics IT, applied scientific calculations and medical IT for the development of practical software solutions.

Technologies and competences

RISC Software is specialised in the development of individual software solutions and has a high affinity for mathematics due to its roots in the RISC Institute of the Johannes Kepler University of Linz. Experience with Satellite Navigation for more than 10 years and especially the competence in the area of structural analysis and optimisation of aircraft components has led to projects with the aerospace industry.

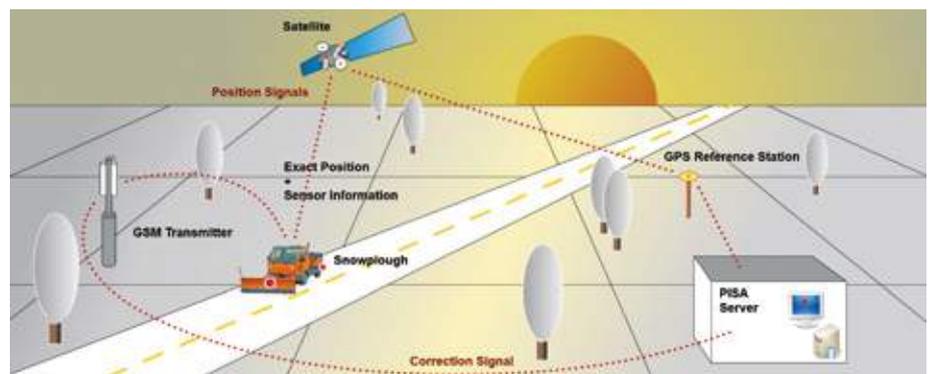
Products and services in space

- Satellite navigation
- Analysis and optimisation of aircraft components
- Software engineering
- High performance-, grid- and cloud computing



RISC
Software GmbH

Risc Software GmbH
Softwarepark 35, 4232 Hagenberg
+43 7236 3343-234
office@risc-software.at
www.risc-software.at
Contact: Wolfgang Freiseisen



- **Production**
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft	•	•	•	•
Launcher and Manned Flight		•	•	•
Ground Segment				
Instruments and Payloads	•	•	•	•
Satellite-based Services				

RUAG Space

Space related test benches, laboratories, etc.

- Clean rooms class 10,000 and 100,000
- Automatic pick and place machine
- Automatic solder paste dispensing
- Automatic vapour phase soldering
- Thermal vacuum chambers
- Vibration and shock test system
- Conducted EMC test chamber
- Automated multilayer insulation lay-up and cutting machine
- Electrical, mechanical and thermal analysis and simulation tools
- ASIC and FPGA design tools
- PCB layout system

RUAG Space GmbH (RSA) is the leading space company in Austria and the Austrian branch of RUAG Space, the largest independent space equipment supplier in Europe, which was formed by merging the space activities of RUAG Aerospace in Switzerland with Saab Space in Sweden, Austrian Aerospace in Austria and Oerlikon Space in Switzerland as well as Patria Space in Finland and HTS in Germany. In 2017 the activities have been further expanded with the establishment of manufacturing and design facilities in the USA.

Technologies and competences

The product portfolio of RUAG Space in Austria focuses on the following areas of expertise:

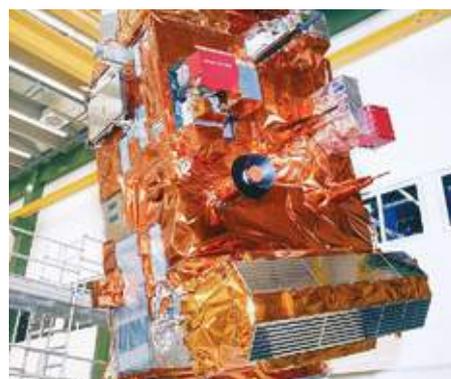
- On-board electronics, particularly navigation receivers
- On-board mechanics, particularly pointing and deployment mechanisms
- Thermal hardware, particularly multilayer insulation
- Ground support equipment, particularly containers and trolleys.

Products and services in space

- On-board electronics
- On-board mechanisms
- Thermal hardware
- Mechanical ground support equipment

Together ahead. RUAG

RUAG Space GmbH
 Stachegasse 16, 1120 Wien
 +43 1 80199-5734
 max.kowatsch@ruag.com
 www.ruag.com/space
 Contact: Max Kowatsch



Production

Software

Service

Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•	•	
Launcher and Manned Flight		•	•	
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

RÜBIG

With over 70 years experience, RÜBIG heat treatment remains a renowned specialist for the heat treatment of steel and aluminum materials. We offer ultra-customised solutions through our extensive range of services, from expert material consulting provided by our in-house materials laboratory to a large spectrum of processes for any type of heat treatment challenge.

Technologies and competences

Heat treatment development and upscaling to serial production by our R&D department for the technologies of quench and tempering in vacuum and inert gas chambers, including low pressure carburizing. Gas- and plasma nitriding processes and carburizing in automated heat treatment line. Large investigation possibilities within our own material laboratory.

Products and services in space

- Quench and temper (vacuum or inert gas chamber)
- Low pressure carburizing (vacuum chamber)
- Nitriding of steel parts (gas nitriding and plasma nitriding, RÜBIG Competence Center)
- Process development and laboratory services

RÜBIG
DRIVING SUCCESS

RÜBIG GmbH & Co KG
Griesmühlstraße 10, 4614 Marchtrenk
+43 7242 66060
christian.dipolt@rubig.com
www.rubig.com
Contact: Christian Dipolt





Segment	Research	Development	Production	Engineering
Spacecraft				•
Launcher and Manned Flight				
Ground Segment				•
Instruments and Payloads				•
Satellite-based Services	•	•		•

Schmechtig

Civil Technicians for Surveying

Ingenieurbüro Schmechtig is a service provider in all areas of geodesy and its interdisciplinary fields.

Technologies and competences

We offer high-quality services in all areas of exact positioning and the determination of three-dimensional coordinates. This applies to both stationary as well as kinematic applications and solutions. Besides standard solutions, we also use software solutions that we have adapted ourselves.

Products and services in space

- Precise positioning
- Precision and reference point networks
- Precise navigation services
- Hybrid measurement systems


Ingenieurbüro Schmechtig
 Brunnhäuslsiedlung 66
 5531 Eben im Pongau
 +43 664 4553593
 zt@schmechtig.com
 www.schmechtig.com
 Contact: Oliver Schmechtig



Production

Software

Service

Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•	•	
Launcher and Manned Flight		•	•	
Ground Segment				
Instruments and Payloads				
Satellite-based Services				

Secar

Secar is a highly qualified development and production company that focuses on components made of composite fibre materials. We realise customer-specific carbon plates, carbon tubes, carbon profiles as well as precision milled parts or alternatively CNC milled parts and CNC wire erosion work.

Technologies and competences

We process composite fibre materials such as carbon fibre, glass fibre and aramid. In addition, we process all metallic materials as well as thermoplastic materials. All manufacturing steps from the project planning up to the development and on up to production are carried out in our company. A special advantage for space travel is the newly developed technology for manufacturing high-temperature systems.

Products and services in space

- GRP profiles
- High-temperature systems
- GRP stringers for satellites
- R&D of high-temperature systems with cork



carbon is our business

Secar Technologie GmbH
 Industriepark 14
 8682 Hönigsberg-Mürzzuschlag
 +43 3852 5200-15
 kh.semlitsch@secar.at
 www.secar.at
 Contact: Karl-Heinz Semlitsch



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•		•
Launcher and Manned Flight				
Ground Segment		•	•	•
Instruments and Payloads		•		•
Satellite-based Services		•	•	

Space related test benches, laboratories, etc.

- We have more than 300m² of manufacturing space for the integration and testing of our products.
- The production hall is equipped with measuring equipment from well-known manufacturers such as Keysight and Rohde and Schwarz.

Siemens Convergence Creators

Siemens Convergence Creators is the global partner for communication and media demands within a broad range of market segments (e.g. space). Siemens Convergence Creators Space offers standard solutions in the area of EGSE (Electrical Ground Support Equipment), Ground Segment Systems, Carrier Monitoring and Satellite Interference Localisation.

Technologies and competences

Siemens Convergence Creators Space has unique expertise in the fields of RF, power, payload and instrument test system technologies and RF suitcases. The innovative FPGA-based ProUST family of products was enhanced with ProUST Frontend for satellite instrument and payload tests. In the field of satellite signal monitoring, we offer our DSP-based product SIECAMS® on the global market. In the ground segment, we offer SCOS2000-based mission control solutions and test automation services.

Products and services in space

- Electric Ground Support Equipment (EGSE), including RF SCOE, Power SCOE, and Payload and Instrument EGSE
- Carrier Monitoring and Interference Localization Systems (SIECAMS®)
- RF Suitcases
- Mission Control Systems

SIEMENS

Siemens Convergence Creators GmbH
 Autokaderstraße 29, 1211 Wien
 +43 664 8011742620
 hans-martin.steiner@siemens-convergence.com
 www.convergence-creators.siemens.com
 Contact: Hans Martin Steiner





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment	•	•		
Instruments and Payloads	•			
Satellite-based Services	•	•	•	•

SISTEMA

SISTEMA is a privately-held company focused on the development of new data processing systems for environmental monitoring based on satellite data. The strict contact with university and research institutes is the philosophy that SISTEMA pursues to ensure the maximum level of knowledge transfer and on-the-edge technology availability.

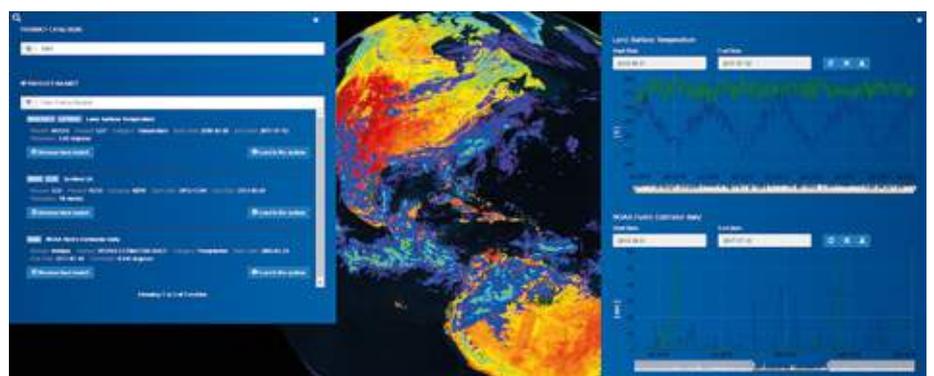
Technologies and competences

SISTEMA makes use of satellite data (optical, SAR, passive microwaves), numerical modelling and in-situ measurements to provide environmental monitoring products and services. SISTEMA thematic focus is on atmospheric parameters monitoring. SISTEMA owns also a strong background on cross-domain technologies, such as data fusion and geospatial data exploitation of large amount of heterogenous data. <http://eodataservice.org/>

Products and services in space

- MEA: Multi-sensor multi-temporal data management platform
- PM MAPPER: Monitoring of air quality parameters from satellite data
- SIMS – Solar irradiance mapping using accurate geometric modelling and satellite observation

Sistema GmbH
 Tiefer Graben 19/2, 1010 Wien
 +43 1 8908788
 natali@sistema.at
 www.sistema.at
 Contact: Stefano Natali





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•	•	

Space Analyses

Space related test benches, laboratories, etc.

- Own in-house data centre
- Workshop for prototypes

Space Analyses is a SME founded in Vienna in 2014 with the aim of bringing the know-how of Satellite Communication and Earth Observation together in one structure to serve both branches with analytic know-how and data services. It works with a group of partners in the IT, Informatics, Research Institutes and Weather data providers to provide a bundle of services for their operation.

Technologies and competences

Data analysis for Satellite Communication and Earth Observation

- Robotics and electronics for prototypes
- Geographical Information Systems
- Broadcasting, Music and Film Industry
- Project Financing and Fund Raising (EU Projects and ESA Projects)

Products and services in space

- Satcom Weather
- Form Weather to Attenuation in NRT
- Satcom Network Analyses



SPACE ANALYSES

Space Analyses GmbH
 Marxergasse 24/2/602, 1030 Wien
 +43 650 3684828
 valentin.eder@spaceanalyses.at
 www.spaceanalyses.at
 Contact: Valentin Eder

Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services		•	•	

SpaSe

Spatial Services GmbH (SpaSe) is a spin-off of the University of Salzburg, Austria with a focus on Earth observation data exploitation, stationary/mobile/wearable sensor systems, as well as spatial indicator integration. We offer advanced geospatial information products to tackle global challenges in the society-environment nexus.

Technologies and competences

Analysis of the change dynamics of objects and their relevant features through automated and integrated image processing based on remote sensing data from satellites, LiDAR or UAS.

Products and services in space

- Earth Observation



Spatial Services GmbH
 Schillerstraße 30, 5020 Salzburg
 +43 662 276084
 office@spatial-services.com
 www.spatial-services.com
 Contact: Hubert Schöndorfer



Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft	•	•		•
Launcher and Manned Flight	•	•		•
Ground Segment		•		•
Instruments and Payloads	•	•		•
Satellite-based Services	•	•		•

SYENTEC

SYENTEC specialises in systems engineering applying these tools and techniques across many industries. We provide both engineering and management services for technological programmes, in which teams of specialists are concurrently working on new products and developing principles for new standards.

Technologies and competences

Systems Engineering: Interdisciplinary engineering support for engineering teams to deliver products conforming to customer requirements – development planning, product and process engineering, requirements management, system analysis, technical documentation, and industrialisation.

Management services: Support for strategic programmes – ITTs, engineering cost calculations, technical audits, interim management of engineering teams and departments.

Products and services in space

- Mechanical Engineering
- Systems Engineering
- Industrialisation
- Launchers and satellite structures



SYENTEC GmbH

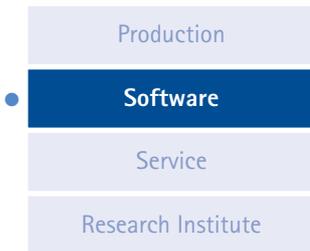
Geitenedt 8, 4202 Kirchschlag bei Linz

+43 664 3172446

s.oschkera@syentec.at

www.syentec.at

Contact: Stefan Oschkera



Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment	•	•		•
Instruments and Payloads				
Satellite-based Services	•	•	•	•

TCA

Space related test benches, laboratories, etc.

GNSS simulation & test tools: GNSS constellation and signal simulation software (GIPSIE®), GNSS PVT software (single- and multiple-frequency), GNSS multi-system, multi-frequency software defined radio, GNSS test range incl. geodetic referenced antennas, GNSS performance analysis tools, Multi-GNSS Simulation and Test Environment (MGSE®).

TeleConsult Austria (TCA) was founded in 1999. Its major activities cover the field of precise positioning and reliable navigation, particularly the areas of software development and the combination of navigation, telecommunications, and information technologies, and services for transport and mobility. Main topics include algorithms and system design, concepts and data analysis, and mobile computing.

Technologies and competences

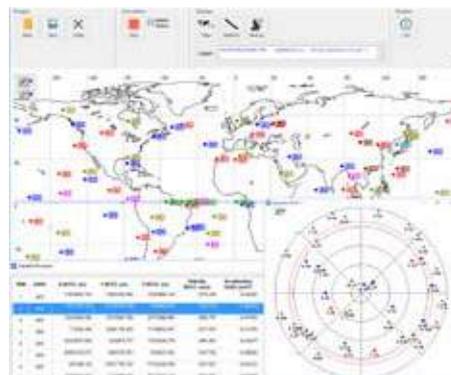
TCA expertise is based on numerous successfully completed national and international projects in the field of positioning, navigation, and simulation, which generated today's range of products and services. TCA provides satellite constellation & signal simulation tools including ionospheric and tropospheric models, interference analysis tools, single & multiple frequency PVT software and services.

Products and services in space

- MODIS®/SAWOS®: GNSS based personal mobility and emergency systems
- SARONTAR: Search and Rescues live tracking and coordination in the mountains
- GNSS PVT: multi-system and multi-frequency position, velocity and time software
- MGSE®/GIPSIE®: Multi-GNSS Simulation & Test Environment incl. GNSS constellation, signal and performance simulator

TeleConsult
AUSTRIA

TeleConsult Austria GmbH
Schwarzbauerweg 3, 8043 Graz
+43 316 381015-10
juergen.seybold@tca.at
www.tca.at
Contact: Jürgen Seybold



- Production
- **Software**
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services		•	•	

Tebkom

Tebkom was founded in October 2012 by a group of five highly skilled university graduate experts and a senior sales manager previously having successfully worked together as a team for several years. They combine more than 10 years of personal experience in innovative high-end products and solutions for telecommunication networks and the satellite communication market.

Technologies and competences

Tebkom is specialised in the fields of digital telecom and information systems covering transmitting, receiving, measuring, and distributing digital data in the areas of:

- Design, implementation, testing of custom software solutions
- Network-design, -management, and -simulation,
- Digital communication networks focused on DVB-based systems
- Prime- and subcontracting in ESA- and EU-projects

Products and services in space

- ODG200 - DVB-S/S2X GSE/ULE/MPE encapsulator/modulator
- DVB quality measurement system
- Ground segment software development
- Software specification, design, development and validation following ECSS standards



TEBKOM
engineering progress

Tebkom GmbH & Co.KG
 Jakob-Haringer-Straße 1, 5020 Salzburg
 +43 662 243672
 office@tebkom.at
 www.tebkom.at
 Contact: Klaus Würflinger



Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft	•			•
Launcher and Manned Flight	•			•
Ground Segment	•			•
Instruments and Payloads	•			•
Satellite-based Services	•			•

TechComp

TechComp offers consulting and services in mechanical engineering, including mechanical modelling and data evaluation with an emphasis on structural reliability and condition monitoring. A special focus is on knowledge transfer and industrial implementation of academic research results.

Technologies and competences

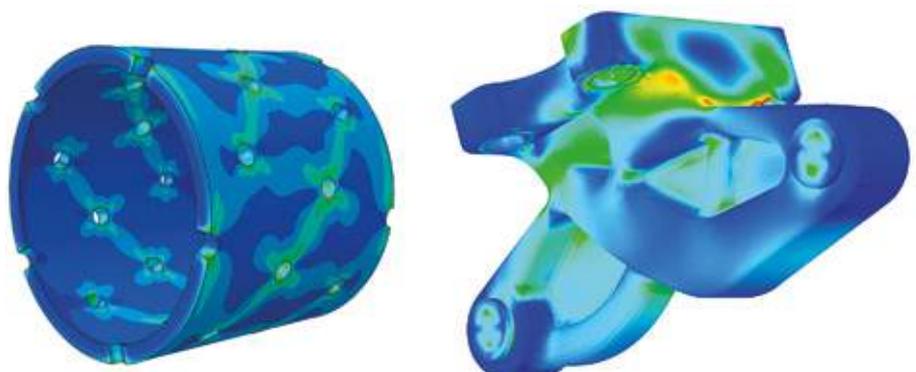
TechComp stands for engineering consulting and simulation services beyond the application of standard methods. The ability to develop novel assessment concepts and to implement them into customised software tools forms the basis for our services.

Products and services in space

- Reliability
- Structural simulation
- Mechanical modelling
- Condition monitoring



TECHCOMP - Ingenieurbüro für
 Maschinenbau Dr. Hans-Peter Gänser
 Baumgasse 2, 8045 Graz
 +43 676 5752063
 hp.gaenser@techcomp.at
 www.techcomp.at
 Contact: Hans-Peter Gänser



● Production

Software

Service

Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•	•	•
Launcher and Manned Flight		•	•	•
Ground Segment		•	•	•
Instruments and Payloads				
Satellite-based Services				

TEST-FUCHS

TEST-FUCHS Aerospace is an ISO 9100 certified division of TEST-FUCHS GmbH, which has been active in the aerospace sector for the past decades with a focus on cryogenic valves and actuators. We have been developing and producing components for space for more than 30 years.

Technologies and competences

We develop and produce components for cryogenic and safety-critical applications for the various environmental conditions of carrier systems and satellites. We are specialised in electromagnetically controlled regulating valves, pressure regulation valves, control valves and actuators for customer-specified applications. Our engineering provides know-how of mechanics, electric & electronics, hydraulics and pneumatics.

Products and services in space

- Research and development of safety relief valves, checkvalves, boil-off valves, H₂-valves automotive
- Mono and bi-stable actuators for satellite positioning action
- Complex electromagnetic regulation valves for cryogenic applications
- Research and development of various cryogenic valves, electric drives, actuators and coupling systems



TEST-FUCHS GmbH

Test-Fuchs Straße 1–5

3812 Groß-Siegharts

+43 2847 9001-0

office@test-fuchs.com

www.test-fuchs.com

Contact: Martin Böhm



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft	●	●	●	
Launcher and Manned Flight	●	●	●	●
Ground Segment		●		
Instruments and Payloads		●		●
Satellite-based Services				

TTTech

Space related test benches, laboratories, etc.
NI Labview based test-bed for TTEthernet interfaces

TTTech Group with its headquarters in Vienna stands for reliability, robustness and safety. Our embedded solutions considerably improve dependable data communication and help customers deploy their solutions more efficiently and profitably. Active in space for more than a decade with customers worldwide. Able to spin-in high-performance computing platforms from the most advanced automotive applications.

Technologies and competences

TTTech has worked with the world's most important space agencies in R&D projects regarding advanced on-board computing and high-speed data communication. It provides fully synchronized TTEthernet solutions for space exploration (e.g. NASA MPCV), launchers (e.g. Ariane 6) and re-configurable satellites.

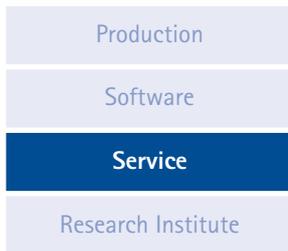
Products and services in space

- Hi-rel TTEthernet Controller ASIC ("TTC") in different packages
- Switches and innovative OBC
- Development and Test Equipment
- TTEthernet/AFDX Configuration Tools

TTTech

TTTECH Computertechnik AG
 Schönbrunner Straße 7, 1040 Wien
 +43 1 5853434-848
 matthias.maeke-kail@tttech.com
 www.tttech.com
 Contact: Matthias Mäke-Kail





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•		

Umweltbundesamt

The Umweltbundesamt (Environment Agency Austria) was established in 1985 and is Austria's leading organisation of experts for all environmental issues. It provides expertise on climate, pollutants and resources and undertakes environmental monitoring, assessment and evaluation. Its experts advise and support public and private customers as well as institutions of the European Union and EU candidate countries.

Technologies and competences

The focus lies on the development of Earth observation applications in the environmental domain with special focus on land monitoring applications. This includes standardised user requirements analysis and feasibility studies for the environmental application of new sensors (Sentinel 2) and new services. The Umweltbundesamt plays a key part in national and European Copernicus projects and relevant user involvements.

Products and services in space

- Land monitoring using Earth observation-data
- Application development environmental domain
- Production of Copernicus & Corine land cover
- User consultation



Umweltbundesamt GmbH
 Spittelauer Lände 5, 1090 Wien
 +43 1 31304
 gebhard.banko@umweltbundesamt.at
 www.umweltbundesamt.at
 Contact: Gebhard Banko





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services		•		•

Umweltdata

Umweltdata is specialised in the procurement, refinement, interpretation and analysis of remote sensing data. Consulting services are mainly provided in the field of forestry resources and their sustainable utilisation. The portfolio is completed by satellite navigation and mobile geodata acquisition. Within the scope of larger projects, we also supply hardware and software.

Technologies and competences

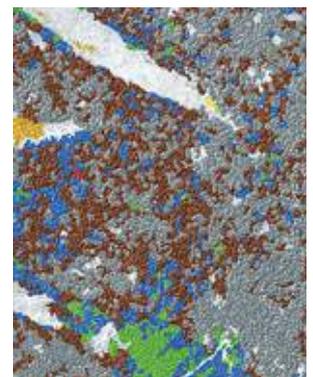
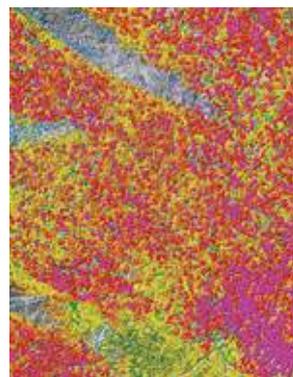
Based on remote sensing and terrestrial surveys, we develop concepts for the acquisition, mapping, monitoring and modelling of the biological resources in the area of agriculture, forestry, nature conservation, and water management.

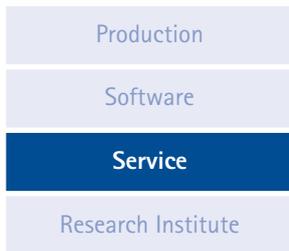
Products and services in space

- Forest inventories
- Geodata
- Management plans and consulting
- Hardware and software

umwelt  data

Umweltdata Ges.m.b.H
Hauptstraße 3c, 3012 Wolfsgraben
+43 676 84333-2222
office@umweltdata.at
www.umweltdata.at
Contact: Günther Bronner





Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads				
Satellite-based Services	•	•		

via donau

Space related test benches, laboratories, etc.

RIS test system that provides all RIS technologies (AIS, GPS, Galileo, EGNOS) used in operations.

As the Austrian waterway operator, viadonau is also responsible for the expansion and operation of River Information Services (RIS). GNSS is decisively important for safety-critical and navigation-related services. Here, viadonau researches and tests the added value and possibilities of Galileo and DGNSS.

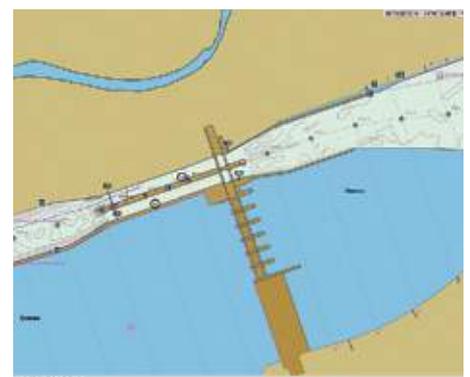
Technologies and competences

viadonau is actively involved with GNSS (GPS and Galileo) and DGNSS (EGNOS and DGNSS over AIS) and their use in inland navigation. Further, viadonau is operating a VRS (Virtual Reference Station network) providing accurate DGNSS corrections for the Danube area in Austria.

Products and services in space

- Donau River Information Services (DoRIS)
- DGNSS usage
- Automatic Identification System (AIS)

via donau – Österreichische Wasserstraßen-Gesellschaft mbH
 Donau-City-Straße 1, 1220 Wien
 +43 5 04321-1615
 juergen.troegl@viadonau.org
 www.viadonau.org
 Contact: Jürgen Trögl



Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment	•			•
Instruments and Payloads				
Satellite-based Services				

Weatherpark

Weatherpark works with wind research and micro-climates, provides consulting services and prepares studies and expert reports for developers of telescopes, property developers and city planners. The team of experienced meteorologists and technicians and the use of the latest methods guarantee the high-quality of the consulting services.

Technologies and competences

Weatherpark conducts meteorological and climatological measurements in-situ at ground level. With the help of computational fluid dynamics models, the company investigates (wind) flows and provides advisory services for the design of buildings, domes and observation sites.

Products and services in space

- Advisory service for the design of telescope domes
- Seeing calculation from turbulence induced by wind and thermodynamics



Weatherpark GmbH – Meteorologische
Forschung und Dienstleistungen
Gardegasse 3/3, 1070 Wien
+43 1 5223729
simon.tschannett@weatherpark.com
www.weatherpark.com
Contact: Simon Tschannett

Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•		•
Launcher and Manned Flight				
Ground Segment		•		•
Instruments and Payloads		•		•
Satellite-based Services				

x.test

x.test is the leading supplier of electronic measurement equipment in the fields of education, automotive and satellite.

Technologies and competences

x.test provides measurement consulting and instruments for satellite microwave and mm wave, high-speed digital and solar power test systems in Austria.

Products and services in space

- Oscilloscopes & logic analysers for digital tests
- Microwave and mm wave test & measurement equipment
- Test & measurement consulting
- Solar array simulators



x.test GmbH
 Amalienstraße 48, 1130 Wien
 +43 1 8778171-0
 info@xtest.at
 www.xtest.at
 Contact: Christian Bauer



Production
Software
Service
Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft				
Launcher and Manned Flight				
Ground Segment				
Instruments and Payloads	•			
Satellite-based Services	•			

ZAMG

Central Institute for Meteorology and Geodynamics

Space related test benches, laboratories, etc.

- Subterranean measurement stations for sensor tests
- Magnetic calibration equipment (coil system) for magnetometers
- Supergradiometer system and geomagnetic ground truth

Founded in 1851, ZAMG is the state meteorological and geophysical service of Austria. The Conrad Observatorium of ZAMG is a geophysical measurement station that supplies ground truth values for geophysical parameters. In addition, there is also research infrastructure for testing and developing sensor technology.

Technologies and competences

Competences that are used in the area of space technology are the calculation of ground truth values for magnetic and gravimetric data and the test station for sensor technology.

Products and services in space

- Geomagnetism
- Gravimetry



Zentralanstalt für Meteorologie
und Geodynamik
Hohe Warte 38, 1190 Wien
+43 1 36026-2507
roman.leonhardt@zamg.ac.at
www.conrad-observatory.at
Contact: Roman Leonhardt



●	Production
	Software
●	Service
	Research Institute

Segment	Research	Development	Production	Engineering
Spacecraft		•	•	•
Launcher and Manned Flight		•	•	•
Ground Segment		•	•	•
Instruments and Payloads		•	•	•
Satellite-based Services				

Zoerkler

Space related test benches, laboratories, etc.

The drive systems are manufactured in the high-tech machine park and tested in Zoerkler's own test stand centre – one of the most modern worldwide with transmission, hydraulics, shaft and fatigue test stands.

The Spirit of precision. As a specialist in the aerospace sector, Zoerkler offers development, production and testing of transmissions and complete drive systems for helicopters and fixed wing aircraft, precision parts as well as spur and bevel gears according to customer's requirements.

Technologies and competences

All steps are covered in-house – engineering, prototypes and small series production, assembly, testing and documentation. Zoerkler's team comprises design engineers for transmission development and FEM analyses, specialists for manufacturing, quality assurance, assembly and testing.

Products and services in space

- Complete transmission system (main and tail gearbox, main and tail shaft)
- Pistons, rotor parts, rotor shafts, crank shafts
- Machining of gearbox housings
- High-precision gears, bevel gears, landing gears, valves



Zoerkler Gears GmbH & Co KG
 Friedrich Zoerkler Straße 1, 7093 Jois
 +43 2160 20400
 office@zoerkler.at
 www.zoerkler.at
 Contact: Bernhard Wagner



Space Research

Space Research

Research Topics

Applied Research: Spacecraft

Carinthian Tech Research

Graz University of Technology – Institute of Communication Networks and Satellite Communications

Graz University of Technology – Institute of Microwave and Photonic Engineering

Österreichisches Gießerei-Institut

Seibersdorf Laboratory

Technische Universität Wien – Institute for Sensor and Actuator Systems

Technische Universität Wien – Institute of Atomic and Subatomic Physics

Technische Universität Wien – Institute of Mechanics and Mechatronics

University of Applied Sciences Wiener Neustadt

Applied Research: Launcher and Manned Flight

Carinthian Tech Research

Österreichisches Gießerei-Institut

Seibersdorf Laboratory

Technische Universität Wien – Institute for Construction Science and Technical Logistics

Technische Universität Wien – Institute for Sensor and Actuator Systems

Technische Universität Wien – Institute of Mechanics and Mechatronics

Applied Research: Ground Segment

Austrian Academy of Sciences – Space Research Institute

Carinthian Tech Research

Graz University of Technology – Institute of Communication Networks and Satellite Communications

Graz University of Technology – Institute of Microwave and Photonic Engineering

Joanneum Research – DIGITAL – Institute for Information and Communication Technologies

Technische Universität Wien – Department of Geodesy and Geoinformation – Research Area Advanced Geodasy

Technische Universität Wien – Department of Geodesy and Geoinformation – Research Area Remote Sensing and Photogrammetry

University of Vienna – Department of Astrophysics

Applied Research: Instruments and Payloads

Austrian Academy of Sciences – Space Research Institute
 Graz University of Technology – Institute for Experimental Physics
 Graz University of Technology – Institute of Microwave and Photonic Engineering
 Joanneum Research – DIGITAL – Institute for Information and Communication Technologies
 Seibersdorf Laboratory
 Technische Universität Wien – Institute of Atomic and Subatomic Physics
 University of Graz – Institute for Geophysics, Astrophysics and Meteorology
 University of Vienna – Department of Astrophysics
 VRVis – Center for Virtual Reality and Visualisation

Applied Research: Satellite-based Services

Austrian Academy of Sciences – Space Research Institute
 Graz University of Technology – Institute of Communication Networks and Satellite Communications
 Graz University of Technology – Institute of Geodesy/ Working Group Navigation
 Graz University of Technology – Institute of Geodesy/ Working Group Remote Sensing and Photogrammetry
 Graz University of Technology – Institute of Microwave and Photonic Engineering
 Joanneum Research – DIGITAL – Institute for Information and Communication Technologies
 Salzburg Research
 Seibersdorf Laboratory
 Technische Universität Wien – Department of Geodesy and Geoinformation – Research Area Advanced Geodasy
 Technische Universität Wien – Department of Geodesy and Geoinformation – Research Area Remote Sensing and Photogrammetry
 University of Graz – Wegener Center for Climate and Global Change
 University of Natural Resources & Life Sciences Vienna – Institute of Surveying, Remote Sensing and Land Information
 University of Salzburg – Department for Geoinformatics - Z_GIS
 University of Vienna – Department of Meteorology and Geophysics
 VRVis – Center for Virtual Reality and Visualisation

Basic Research for Space Technology

Austrian Academy of Sciences – Space Research Institute
 Carinthian Tech Research
 Graz University of Technology – Institute of Communication Networks and Satellite Communications
 Seibersdorf Laboratory
 Technische Universität Wien – Institute of Atomic and Subatomic Physics
 Technische Universität Wien – Institute of Mechanics and Mechatronics
 University of Vienna – Department of Astrophysics

Exploration

Austrian Academy of Sciences – Space Research Institute
 Joanneum Research – DIGITAL – Institute for Information and Communication Technologies
 Seibersdorf Laboratory
 Technische Universität Wien – Department of Geodesy and Geoinformation – Research Area Remote Sensing and Photogrammetry
 Technische Universität Wien – Institute for Construction Science and Technical Logistics
 VRVis – Center for Virtual Reality and Visualisation

Microgravity

Joanneum Research – DIGITAL – Institute for Information and Communication Technologies
 Montanuniversität Leoben – Chair of Simulation and Modelling of Metallurgical Processes
 Seibersdorf Laboratory
 Technische Universität Wien – Institute for Construction Science and Technical Logistics

Simulation

Graz University of Technology – Institute of Communication Networks and Satellite Communications
 Joanneum Research – DIGITAL – Institute for Information and Communication Technologies
 Österreichisches Gießerei-Institut
 Seibersdorf Laboratory
 Technische Universität Wien – Department of Geodesy and Geoinformation – Research Area Advanced Geodasy
 Technische Universität Wien – Institute of Mechanics and Mechatronics
 University of Applied Sciences Wiener Neustadt
 University of Graz – Institute for Geophysics, Astrophysics and Meteorology
 University of Vienna – Department of Astrophysics

Other Experimental Research

Carinthian Tech Research
 Graz University of Technology – Institute for Experimental Physics
 Österreichisches Gießerei-Institut
 Seibersdorf Laboratory
 Technische Universität Wien – Department of Geodesy and Geoinformation – Research Area Remote Sensing and Photogrammetry
 Technische Universität Wien – Institute of Atomic and Subatomic Physics
 University of Innsbruck – Institute for Ion Physics and Applied Physics
 University of Natural Resources & Life Sciences Vienna – Institute of Surveying, Remote Sensing and Land Information
 University of Salzburg – Department for Geoinformatics - Z_GIS

Production
Software
Service
Research Institute

Segment	Research	Development	Production
Applied Research: Spacecraft			
Applied Research: Launcher and Manned Flight			
Applied Research: Ground Segment	•	•	
Applied Research: Instruments and Payloads	•	•	•
Applied Research: Satellite-based Services	•	•	•
Basic Research for Space Technology	•	•	•
Exploration	•	•	•
Microgravity			
Simulation			
Other Experimental Research			

Austrian Academy of Sciences

Space Research Institute

Space related test benches, laboratories, etc.

For manufacturing and testing, IWF operates five thermal vacuum chambers of different sizes, a magnetometer temperature test facility, a clean room, and other test facilities.

The Space Research Institute (IWF) focuses on the physics and exploration of the Solar System. It develops and builds space-qualified instruments and analyses and interprets the data returned by them. In terms of science, IWF concentrates on dynamical processes in space plasma physics and on the upper atmospheres of planets and exoplanets.

Technologies and competences

The Institute's core expertise is in building magnetometers and on-board computers, as well as in satellite laser ranging, in particular to space debris. IWF is currently involved in 16 international space missions, led by ESA, NASA or other national space agencies. The missions cover fleets of satellites in near-Earth space, observation of the Sun as well as exploration of planets such as Mercury, Mars, Jupiter and exoplanets.

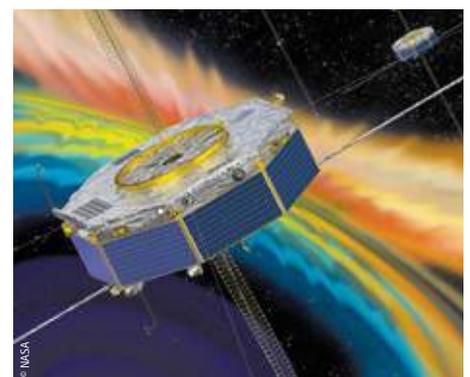
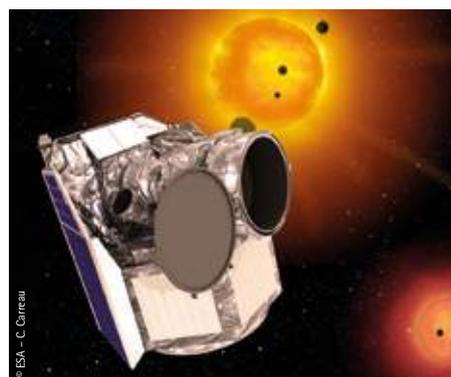
Research topics in space

- Instrument development
- Scientific analysis

ÖAW ÖSTERREICHISCHE AKADEMIE DER WISSENSCHAFTEN

IWF INSTITUT FÜR WELTRAUMFORSCHUNG

Austrian Academy of Sciences
 Space Research Institute
 Schmiedlstraße 6, 8042 Graz
 +43 316 4120-501
 baumjohann@oeaw.ac.at
 www.iwf.oeaw.ac.at
 Contact: Wolfgang Baumjohann



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production
Applied Research: Spacecraft	•	•	
Applied Research: Launcher and Manned Flight	•	•	
Applied Research: Ground Segment	•	•	
Applied Research: Instruments and Payloads			
Applied Research: Satellite-based Services			
Basic Research for Space Technology	•	•	
Exploration			
Microgravity			
Simulation			
Other Experimental Research	•	•	

Carinthian Tech Research

Space related test benches, laboratories, etc.

- Cleanroom facilities (class 8, class 5)
- Laser laboratory
- Electronics laboratory
- Chemistry laboratory
- Mechanics laboratory

As one of Austria's established industry-oriented research centres, CTR is focusing on smart sensors and system integration research. Following this strategy, the team has achieved a number of innovations and established an extensive network of academic and industrial partners.

Technologies and competences

R&D areas are microsystems, heterogeneous integration, and photonic & smart systems. Our competences range from multi-physics simulations and analytical devices development to systems engineering for space applications, sensor development & integration, and electronics engineering to experience in technical documentation and space project management.

Research topics in space

- Laser ignition for space applications



Carinthian Tech Research AG
 Europastraße 12
 9524 Villach/St.Magdalen
 +43 4242 56300
 simon.grasser@ctr.at
 www.ctr.at
 Contact: Simon Grasser



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Segment	Research	Development	Production
Applied Research: Spacecraft			
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Other Experimental Research	•		

Graz University of Technology

Institute for Experimental Physics

Space related test benches, laboratories, etc.

Optical laboratory with all the associated equipment for the development and characterisation of laser sources (diode lasers), as well as equipment for the characterisation of low-noise amplifiers and low-noise laser power sources, and generators and spectrum analysers for measurements in the GHz range.

Research is currently being conducted at the Institute for Experimental Physics in the areas of spectroscopy and quantum optics as well as molecular physics.

Technologies and competences

A sub-research field of quantum optics is the study of coherent effects in the optical stimulation of atoms with laser light. This results in the development of optical, pumped magnetometers with applications in space technology (instruments and payloads). Competences include the development of laser sources, fibre-optical systems and microwave technology in connection with the modulation of lasers.

Research topics in space

- Optically pumped, scalar magnetometer based on a quantum interference effect



Graz University of Technology –
Institute for Experimental Physics
Petersgasse 16, 8010 Graz
+43 316 873-8141
roland.lammegger@tugraz.at
portal.tugraz.at
Contact: Roland Lammegger

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● Research Institute

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Applied Research: Spacecraft	•	•	•
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Simulation	•		
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Graz University of Technology

Institute of Communication Networks and Satellite Communications

Space related test benches, laboratories, etc.

- Fixed and transportable satellite ground stations for Ku- and Ka-Band (10-14, 20-30 GHz)
- AIV: clean rooms (class 10.000 and 100.000), vibration test facility, thermal and vacuum chambers for environmental tests
- 2 tracking ground station for LEO satellites
- Satellite and ground station simulator
- Time and frequency laboratory with caesium clock - Simulation test-bed for satcom baseband systems

The Institute (IKS) is specialised in design, development, AIV and operations of nanosatellites, advanced satellite communications systems, microwave propagation, space applications (esp. emergency communications and disaster management) and field trials. An extensive infrastructure of satellite ground stations for GEO and LEO satellites, test and simulation facilities allows the verification of systems in a realistic environment.

Technologies and competences

Design, development & testing of space-qualified hard- and software, especially small satellites

- Payloads for nanosatellites (on-board computers, RF and optical transceivers)
- Advanced modulation, synchronisation and coding techniques
- Wave propagation at frequencies above 10 GHz
- Adaptive transmission and fade mitigation techniques
- Advanced communications protocols for Space applications

Research topics in space

- Space and ground segment systems
- Advanced modulation, synchronisation, forward error correcting coding systems
- Satellite communications systems
- Flight-ready nanosatellites



Graz University of Technology – Institute of Communication Networks and Satellite Communications
 Inffeldgasse 12, 8010 Graz
 +43 316 873-7440
 koudelka@tugraz.at
 www.iks.tugraz.at
 Contact: Otto Koudelka



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Graz University of Technology

Institute of Geodesy/Working Group Navigation

Space related test benches, laboratories, etc.

The Institute of Geodesy owns a highly accurate Inertial Measurement Unit (IMU) which can be used as a sensor in multi-sensor environments. Mounted on a vehicle-based measurement platform, the existing IMU provides a way to verify cheaper and smaller sensors (MEMS, etc.) for their quality.

Teaching and research focuses on the complete aspect of navigation, which means that the thematic work goes beyond the determination of positions and trajectories, and also covers the sub-aspects of route planning and guidance. As far as Global Navigation Satellite Systems (GNSS) are concerned, the Institute of Geodesy was involved in research and development from the very beginning.

Technologies and competences

Regarding trajectory determination, the current topics mainly cover multi-sensor systems, e.g. the fusion of GNSS, INS including Kalman and particle filtering. Specific applications are autonomous driving, drone steering, pedestrian navigation, etc. Another research area is the determination of the Earth's gravitational field with the necessity of the provision of geoid heights with high accuracy for local to regional applications.

Research topics in space

- Earth gravity field determination
- Precise Point Positioning (PPP)
- GNSS applications (GPS, GLONASS, Galileo)
- Sensor integration of GNSS and INS




Graz University of Technology -
 Institute of Geodesy/Working Group
 Navigation
 Steyrergasse 30, 8010 Graz
 +43 316 873-6348
 manfred.wieser@tugraz.at
 www.ifg.tugraz.at
 Contact: Manfred Wieser



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- Research Institute

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Graz University of Technology

Institute of Geodesy/Working Group Remote Sensing and Photogrammetry

The Institute covers a wide range of expertise in the field of remote sensing and photogrammetry. This includes terrestrial, airborne and space borne remotely sensed data. Major applications are forest monitoring, mountain cartography, hazard mapping, monitoring of glaciers and rock glaciers. Another field of expertise is the documentation of cultural heritage.

Technologies and competences

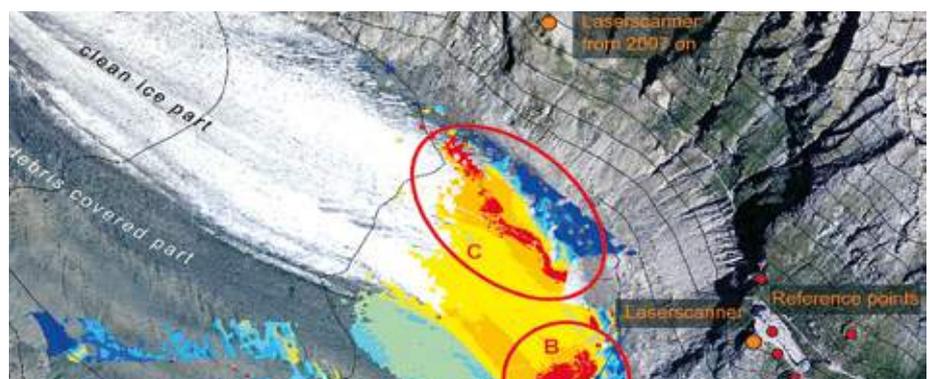
Competences include terrestrial and airborne laser scanning, photogrammetry, satellite remote sensing, processing and analyses of all kinds of remote sensing data, 3D visualisation of results derived from remote sensing, Web – GIS, GIS – Modelling and semantic data models.

Research topics in space

- Time series of glacier and block glacier movements
- Documentation of historical buildings
- Forest inventory statistics and forest maps



Graz University of Technology –
Institute of Geodesy/Working Group
Remote Sensing and Photogrammetry
 Steyrergasse 30, 8010 Graz
 +43 316 873-6331
 mathias.schardt@tugraz.at
 www.geoimaging.tugraz.at
 Contact: Mathias Schardt



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Graz University of Technology

Institute of Microwave and Photonic Engineering

Space related test benches, laboratories, etc.

IHF worked on the ESA project "Feasibility Assessment of Optical Technologies and Techniques for Reliable High Capacity Feeder Links". In 2015 IHF joined the COST MP1401 "Advanced fibre laser and coherent source as tools" and is developing a Hybridized RF/optical Payload Data Transmitter for Deep Space mission for ESA's Hybrid_PDT. Currently the IHF is also active with RF modules for ESA, see TUG-online.

In 2010 at TU Graz the Institute of Microwave and Photonic Engineering (Institut für Hochfrequenztechnik, IHF) was established as a 4th institute of the former large Department of Communications and Wave Propagation. The Institute (IHF) focuses on Wireless Technologies (including Free Space Optics (FSO)), radar techniques and microwaves. The relevant research group has high-quality experience in Atmospheric Wave Propagation with RF and Light.

Technologies and competences

Special programmes enabled the researchers to gain considerable expertise in the areas of advanced modulation and coding, multiple access schemes, free-space optics and fade-countermeasure techniques. The IHF is also very experienced at conducting trials and demonstrations. The institute was a participant of Network of Excellence called SatNEx, COST IC0802, IC1101 and MP1401 (since 2015), and of ESA projects (like Hybrid_PDT).

Research topics in space

- Communications for Deep Space Missions
- Propagation Experiments (RF and Light)
- Optical Wireless Links
- RF Modules



Graz University of Technology –
Institute of Microwave and Photonic
Engineering

Inffeldgasse 12, 8010 Graz

+43 316 873-7442

erich.leitgeb@tugraz.at

www.tugraz.at/institute/ihf

Contact: Erich Leitgeb

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Joanneum Research

Joanneum Research – DIGITAL Institute for Information and Communication Technologies

DIGITAL is a leading applied research centre in Austria and has more than 30 years of experience in space technology. Its field of expertise in space research is in advanced satellite communication and navigation, processing of remote sensing data from both active and passive sensors as well as from airborne and space-borne systems, and mobile vision systems for space robotics.

Technologies and competences

Advanced modulation, coding, and access techniques are core competences of satellite communication systems and networks activities at DIGITAL. Developments are mainly based on software-defined radio platforms. Profound knowledge in microwave propagation, interference modelling, and fade mitigation techniques complete the portfolio in that area. Architectures for satellite navigation receivers are designed and evaluated. Processing lines for image pre-processing and data analyses of remote sensing data were developed as well as methods and workflows for geometric image processing. Computer vision in multiple dimensions is used for mobile robotic space applications.

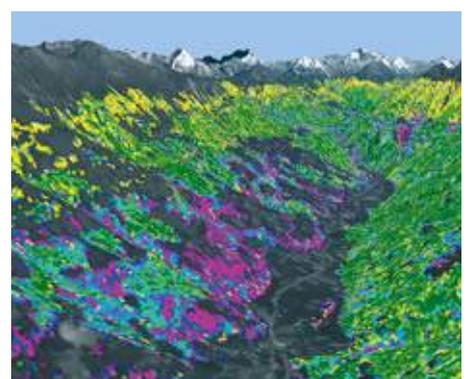
Research topics in space

- Q/V band satellite communication investigations and prototype equipment
- Satellite communications and navigation for disaster management
- Environmental monitoring (forest monitoring and inventories, land use/cover mapping, ice monitoring), hazard risk mapping
- Mars rover vision system



JOANNEUM RESEARCH

Joanneum Research ForschungsgesmbH
 DIGITAL – Institute for Information and
 Communication Technologies
 Steyrergasse 17, 8010 Graz
 +43 316 876-5001
 heinz.mayer@joanneum.at
 www.joanneum.at/digital
 Contact: Heinz Mayer



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Montanuniversität Leoben

Chair of Simulation and Modelling of Metallurgical Processes

Space related test benches, laboratories, etc.

For optical investigations of the dynamics of the solidification morphology, a ZEISS microscope with a micro Bridgman furnace is connected to a self-developed recording system, called Dynamic Imaging of Solidification. During solidification experiments, this system records images simultaneously with relevant process conditions from the furnace.

The Chair is working on numerical modelling of metallurgical processes, such as Continuous Casting, Ingot Casting, and Electro-Slag-Remelting. In addition, we are doing basic research on the interaction between turbulence and solidification, flow through dendritic mushy zones and coupled and/or oscillatory growth of peritectics. The last topic will lead to an experiment on the International Space Station (ISS).

Technologies and competences

Using transparent organic compounds and their alloys as a model substance that allows in-situ and real time observation of metal-like solidification phenomena.

Research topics in space

- Solidification under diffusive conditions



Montanuniversität Leoben
 Chair of Simulation and Modelling of Metallurgical Processes
 Franz Josef Straße 18, 8700 Leoben
 +43 3842 402-3101
 smmp@unileoben.ac.at
 smmp.unileoben.ac.at
 Contact: Johann P. Mogeritsch



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Österreichisches Gießerei-Institut

Space related test benches, laboratories, etc.

- Thermo-physical laboratory determining properties for materials (re-entry) and modelling of thermal heat transport and fluid flow phenomena
- Accredited materials testing of space materials within a wide temperature range.

The Austrian Foundry Research Institute is focused on applications of castings in transport applications (automotive, rail aerospace). Particular focus is on light metals (Mg, Al, Ti) and their material properties and processing by casting. Space activities have been in the fields of thermal-physical characterisation of re-entry materials and mechanical material characterisation.

Technologies and competences

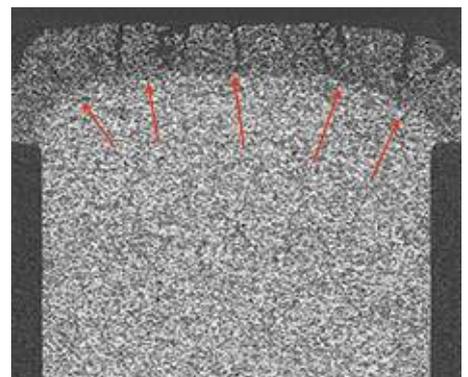
The ÖGI has facilities to produce prototype castings, simulation and modelling, mechanical characterisation of static and dynamic properties at low (-80 °C) and high (900 °C) temperatures, as well as the capacity to determine thermo-physical properties (Cp, thermal expansion, thermal diffusivity, poison-, young- coefficients over temperature), chemical analysis and is accredited to ISO 17025.

Research topics in space

- Materials testing
- Modelling and simulation
- Materials evaluation



Österreichisches Gießerei-Institut
 Parkstraße 21, 8700 Leoben
 +43 3842 43101-0
 office@ogi.at
 www.ogi.at
 Contact: Peter Schumacher



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Segment	Research	Development	Production
Applied Research: Spacecraft			
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Salzburg Research

As a research and technology organisation, Salzburg Research specialises in applied research and development in the field of information and communication technologies (ICT) and new media. Regional as well as national and international business partners benefit from the high-quality expertise our team of interdisciplinary and globally renowned experts has to offer.

Technologies and competences

The MOWI (mobile and web-based information systems) research group focuses on location-based information systems that provide and optimise the mobility of users in their everyday life. MOWI designs, develops and evaluates location-based services and technologies for spatio-temporal data analyses.

Research topics in space

- LBS software

salzburgresearch

Salzburg Research ForschungsgesmbH
 Jakob Haringer Straße 5, 5020 Salzburg
 +43 662 2288-200
 siegfried.reich@salzburgresearch.at
 www.salzburgresearch.at
 Contact: Siegfried Reich



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Segment	Research	Development	Production
Applied Research: Spacecraft	•	•	
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Basic Research for Space Technology	•	•	•
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Seibersdorf Laboratory

Space related test benches, laboratories, etc.

- Several radiation exposure laboratories for EEE components, materials and systems (TEC-Laboratory, Cobalt-60, X-ray, vacuum, different temperatures)
- TEC-Laboratory for radiation hardness testing and characterisation of EEE components under different temperatures
- Non-ionising radiation testing laboratories (electromagnetic compatibility and interference)
- Production workshop of radiation sensor technology

Seibersdorf Labor GmbH is a subsidiary of the AIT Austrian Institute of Technology GmbH, founded as a spin-off in 2009. The company provides high-quality laboratory and analysis work, application-oriented research and development as well as consulting and training. The fields of expertise are chemical analysis, pharmaceuticals, radio frequency engineering, electromagnetic compatibility and ionising and non-ionising radiation.

Technologies and competences

Seibersdorf Laboratories actively contributes to the European space industry. Seibersdorf Laboratories provides scientific, engineering and R&D services as well as production of sensor technologies. Seibersdorf Laboratories works in the fields of radiation hardness assurance of EEE components and systems due to ionising and non-ionising space radiation as well as in space weather effects to avionics and to humans.

Research topics in space

- AVIDOS - Aviation Dosimetry Services
- TEC-Laboratory - Ionising radiation testing of EEE components and systems
- EMC and EMI - non-ionising radiation testing of systems
- Radiation sensor technologies

Seibersdorf Labor GmbH

Forschungszentrum, 2444 Seibersdorf
 +43 50 550-2500
 office@seibersdorf-laboratories.at
 www.seibersdorf-laboratories.at
 Contact: Peter Beck



Radiation sensor for space

Production
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Applied Research: Spacecraft			
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Technische Universität Wien

Department of Geodesy and Geoinformation – Research Area Advanced Geodesy

Space related test benches, laboratories, etc.

- Multi-frequency tracking GNSS receivers
- Permanent GNSS site
- Various software for scientific GNSS data processing and simulation
- Software for GNSS signal quality control
- Software for satellite orbit determination at the cm level
- Vienna VLBI and Satellite software
- Ray tracing software

The research area "Advanced Geodesy" is divided in 3 sub-sections, namely Satellite Geodesy (GNSS, Navigation), Very Long Baseline Interferometry (VLBI), and New Technologies. Atmosphere monitoring by GNSS and VLBI is a major scientific field. The research area is active in global and regional GNSS services (IGS, EPN) as well as a partner of industry, e.g. in joint research and development of RTK GNSS networks, and in GNSS PPP Point Positioning.

Technologies and competences

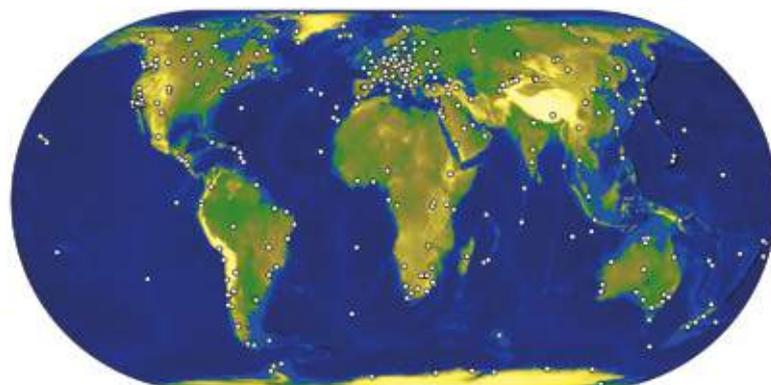
The Department of Geodesy and Geoinformation (research area Advanced Geodesy) is experienced in software development in the fields of satellite geodesy, VLBI and ground based atmosphere monitoring. In detail, data processing and simulation software for satellite orbit determination, troposphere and ionosphere modelling (including ray-tracing) as well as monitoring of crustal deformation is available.

Research topics in space

- GNSS reference station networks and PPP, reference systems and frames
- Space and ground based atmospheric monitoring
- Satellite orbit determination
- Earth rotation



Technische Universität Wien – Department
of Geodesy and Geoinformation –
Research Area Advanced Geodesy
Gusshausstraße 27-29/120-4, 1040 Wien
+43 1 58801-12865
robert.weber@tuwien.ac.at
hg.geo.tuwien.ac.at
Contact: Robert Weber



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Technische Universität Wien

Department of Geodesy and Geoinformation – Research Area Remote Sensing and Photogrammetry

Space related test benches, laboratories, etc.

The IT infrastructure of the GEO Department is closely connected to the EODC Earth Observation Data Centre for Water Resources Monitoring. It allows to store and process Petabyte-scale satellite data sets, including a global archive of Sentinel-1 data. The processing is mostly done with in-house developed sensor-specific software.

The Department of Geodesy and Geoinformation of the Vienna University of Technology belongs to the Faculty for Mathematics and Geoinformation. It conducts research and education in the fields of photogrammetry and remote sensing.

Technologies and competences

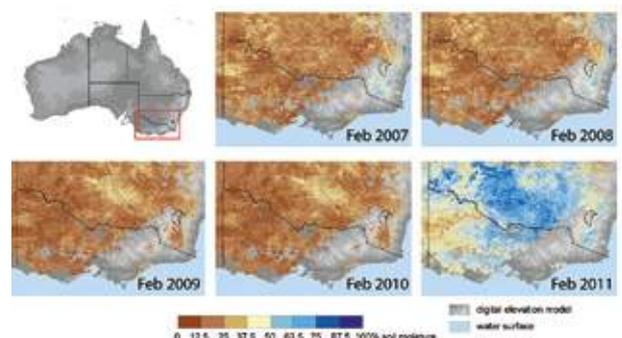
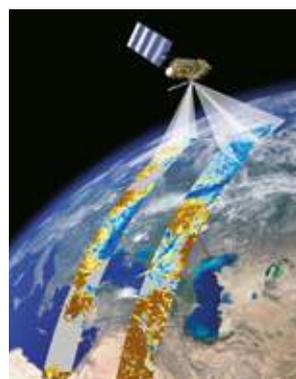
The GEO Department has research groups dealing with photogrammetry and laser scanning, microwave remote sensing, and climate- and environmental remote sensing. One research focus is to use radar satellite technology for monitoring soil moisture and vegetation on a global scale in support to monitoring hydrologic extremes and climate change studies.

Research topics in space

- Soil moisture and vegetation from Sentinel-1 and METOP ASCAT
- Climate change and environmental monitoring
- 3D models of terrain, vegetation, and buildings



Technische Universität Wien – Dept. of Geodesy and Geoinformation – Research Area Remote Sensing and Photogrammetry
 Gusshausstraße 27–29, 1040 Wien
 +43 1 58801-12201
 wolfgang.wagner@geo.tuwien.ac.at,
 www.geo.tuwien.ac.at
 Contact: Wolfgang Wagner



- Production
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Technische Universität Wien

Institute for Construction Science and Technical Logistics

Space related test benches, laboratories, etc.

Laboratories with equipment for movement analysis (videometry, dynamometer, EMG) and functional electro-stimulation.

The device developed at the institute, which is intended to be used as a training and diagnostics device in zero gravity, can also be used as a terrestrial test unit.

The Machine Elements and Rehabilitation Technology research area deals with biomechanical questions in the area of rehabilitation, among other things.

Technologies and competences

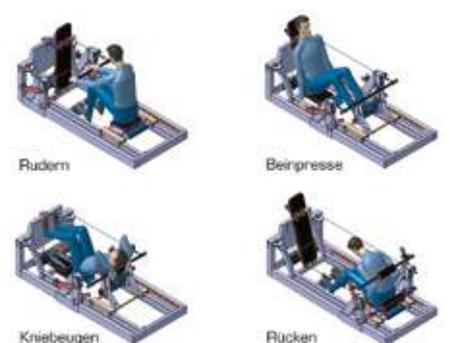
In the "Multifunctional Dynamometer for Application in Space" (MDS) project, a multifunctional training device was developed to counteract the effects of muscle and bone atrophy as it occurs under micro-gravitation conditions.

Research topics in space

- Muscle and bone preservation in zero gravity



Technische Universität Wien –
 Institute for Construction Science
 and Technical Logistics
 Getreidemarkt 6, 1060 Wien
 +43 1 58801-30620
 thomas.angeli@tuwien.ac.at
 www.ikl.tuwien.ac.at/mel
 Contact: Thomas Angeli



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Technische Universität Wien

Institute for Sensor and Actuator Systems

Space related test benches, laboratories, etc.

- Clean room for the fabrication of micro- and nanomachined devices and systems (i.e. wet and dry etching techniques, deposition of thin films (PVD, CVD) packaging of devices and systems, etc.)
- Specific measurement equipment (e.g. thermal conductivity, electrical properties up to 300 °C and 700 °C)
- Laser Doppler vibrometer
- Scanning electron microscopy plus further equipment for material characterisation purposes

The Institute of Sensor and Actuator Systems is grouped in three research departments: Micro- and Nanosensors, Applied Electronic Materials and Microsystems Technology. As Prof. U. Schmid, Head of Institute, was with the research labs of EADS (European Aeronautic Defense and Space Company) near Munich for several years, there is a strong focus on micro- and nanomachined devices and systems for airborne and space applications.

Technologies and competences

Long-term expertise in the design, realisation, characterisation and evaluation of micro- and nanomachined devices and systems (i.e. MOSFETS, ring oscillators in 6H-SiC, RF-MEMS switches, high-temperature pressure sensor for operating temperatures up to 700 °C, MEMS/NEMS resonators based on piezoelectric aluminium nitride). Energy harvesting devices for the realisation of self-sustaining sensor nodes.

Research topics in space

- Micro- and nanomachined devices and systems for space (i.e. sensors, actuators)
- Energy harvesting devices for space | Material characterization (thin films, substrates, etc.)



Technische Universität Wien – Institute
for Sensor and Actuator Systems
Gußhausstraße 27–29, 1040 Wien
+43 1 58801–36689
schmid@isas.tuwien.ac.at
www.isas.tuwien.ac.at
Contact: Ulrich Schmid

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Microgravity			
Simulation			
Other Experimental Research	•	•	

Technische Universität Wien

Institute of Atomic and Subatomic Physics

The Institute comprises several central units, including reactor operation, radiation protection and dosimetry, applied quantum-, atomic physics and quantum optics, nuclear physics and nuclear particle physics, neutron and quantum physics, radiation physics, low temperature physics and superconductivity. The radiation physics includes medical radiation physics, space dosimetry and life science related to deep space exploration.

Technologies and competences

Our emphasis in space technology is found in the development and testing of dosimetric systems, performing space dosimetry, evaluate and simulate the radiation environment inside space craft, including the human body. We are also studying DNA damage caused by GCR and SPE.

Research topics in space

- Radiobiology
- MC Simulations
- Dosimetry
- Material sciences



Technische Universität Wien – Institute
of Atomic and Subatomic Physics
Stadionallee 2, 1020 Wien
+43 1 58801-1410
lembit.sihver@tuwien.ac.at
www.ati.ac.at
Contact: Lembit Sihver



Production
Software
Service
Research Institute

Segment	Research	Development	Production
Applied Research: Spacecraft	•		
Applied Research: Launcher and Manned Flight	•		
Applied Research: Ground Segment			
Applied Research: Instruments and Payloads			
Applied Research: Satellite-based Services			
Basic Research for Space Technology	•		
Exploration			
Microgravity			
Simulation	•		
Other Experimental Research			

Technische Universität Wien

Institute of Mechanics and Mechatronics

The Institute is divided into workgroups for technical dynamics and vehicle dynamics, solid body mechanics, measurement engineering and actuating elements, and control systems as well as process automation. Special attention is paid to the modelling and simulation of malleable and rigid bodies.

Technologies and competences

Modelling and simulation of wired satellite systems, determination of the stability of a space elevator and control of the extension and retraction procedure of wired satellites are in the foreground of the Institute's space activities.

Research topics in space

- Stability calculation of a space elevator
- Simulation of wired satellites
- Control of the extension and retraction procedure



Technische Universität Wien –
 Institute of Mechanics and Mechatronics
 Getreidemarkt 9, 1060 Wien
 +43 1 58801-325208
 alois.steindl@tuwien.ac.at
 www.mec.tuwien.ac.at
 Contact: Alois Steindl

Production
Software
Service
● Research Institute

Segment	Research	Development	Production
Applied Research: Spacecraft	•	•	
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Applied Research: Satellite-based Services			
Basic Research for Space Technology			
Exploration			
Microgravity			
Simulation	•	•	
Other Experimental Research			

University of Applied Sciences Wiener Neustadt

Space related test benches, laboratories, etc.

- Electric propulsion laboratory: 3 medium (about 3 cubic metres each) and one large (~20 cubic metres) vacuum chambers, environmental testing (TVT, vibration and shock), plasma diagnostic facilities, μN thrust balance, etc.
- Chemical propulsion laboratory: thrust test stand, thrust balance (100 mN – 10 N range), propellant characterisation facility
- Gas storage laboratory: Test facilities for high-pressure gas storage of helium and hydrogen

The University of Applied Sciences Wiener Neustadt GmbH (FHWN) is the largest university of applied sciences campus in Austria (3000 students). Major fields of studies include microsystems technology, bioengineering, electrical engineering, mechatronics and information technology. Together with its research cooperation FOTEC GmbH, the University has conducted a large number of space related research projects and developments.

Technologies and competences

- Development of in-space propulsion system in the low (1 N) to ultra-low thrust (50 nN) range. FOTEC and FHWN are the worldwide unique producers of LMIS charge balance devices for satellite applications (MMS, Cluster I, II etc.) and Field Emission Electric Propulsion systems.
- Development of low toxicity propellants for replacement of hydrazine in various projects funded by ESA and EC.
- R&D in additive layer manufacturing methods

Research topics in space

- Engineering, manufacturing and test of charge balance devices (see e.g. recent MMS mission)
- Engineering, manufacturing and test of gas storage devices (hydrogen and helium)
- Development and test of low-toxicity propellants (green propellants)
Satellite System Engineering (Nanosatellites)




University of Applied Sciences Wiener Neustadt GmbH / FOTEC GmbH
 Johannes Gutenberg Straße 3,
 2700 Wiener Neustadt
 +43 2622 89084-235
 carsten.scharlemann@fhwn.ac.at
 www.fhwn.ac.at
 Contact: Carsten Scharlemann



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production
Applied Research: Spacecraft			
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Applied Research: Instruments and Payloads	•		
Applied Research: Satellite-based Services			
Basic Research for Space Technology			
Exploration			
Microgravity			
Simulation	•		
Other Experimental Research			

University of Graz

Institute for Geophysics, Astrophysics and Meteorology

The Institute for Geophysics, Astrophysics and Meteorology (IGAM) is specialised in solar physics research including the physics of the space weather at Earth, and in modern satellite-based methods for remote sensing of the atmosphere and the climate system. IGAM operates the Kanzelhöhe Observatory for Solar and Environmental Research (www.kso.ac.at), which performs state-of-the art solar and environmental observations.

Technologies and competences

The institute conducts research in the areas of solar physics, the physics of our space weather, stellar physics, and climate and environmental physics. Solar and environmental observations are carried out by its Kanzelhöhe Observatory.

Research topics in space

- Solar physics
- Space weather physics
- Earth observation from space



University of Graz – Institute for Geophysics, Astrophysics and Meteorology
 Universitätsplatz 5, 8010 Graz
 +43 316 380-5255
igam.mail@uni-graz.at
www.uni-graz.at/igam
 Contact: Astrid Veronig



- Production
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- Research Institute

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Applied Research: Spacecraft			
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Applied Research: Satellite-based Services	●	●	
Basic Research for Space Technology			
Exploration			
Microgravity			
Simulation			
Other Experimental Research			

University of Graz

Wegener Center for Climate and Global Change

Space related test benches, laboratories, etc.
EUMETCAST satellite data reception

The Wegener Center for Climate and Global Change is an interdisciplinary, internationally oriented research institute of the University of Graz, which combines the competences of the University in the research areas of "Climate, Environmental, and Global Change". The Earth observation research group investigates modern satellite-based methods for remote sensing of the atmosphere and the climate system.

Technologies and competences

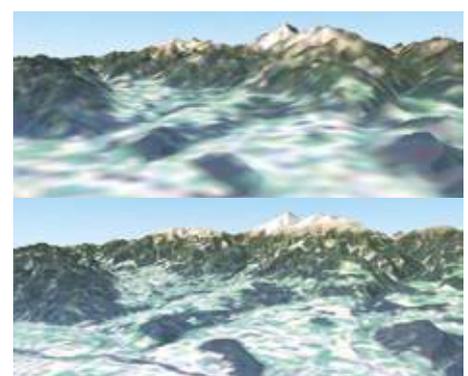
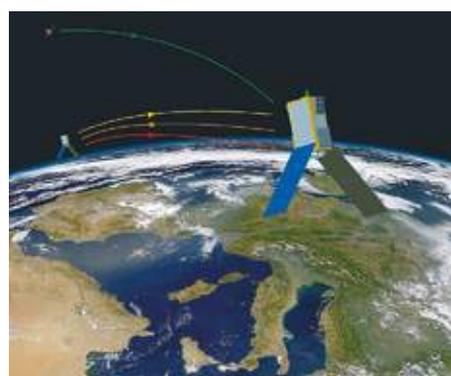
The Center conducts research in remote sensing by occultation methods (like GNSS radio occultation and LEO-LEO occultation) and other coherent signal and spectroradiometric methods (infrared and microwave). The main aim is to conceive and advance methods and algorithms for weather and climate. Research includes topics such as atmospheric change, climate modelling, climate change detection and attribution, integrated climate analysis.

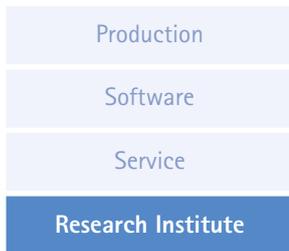
Research topics in space

- New Earth observation methods
- New satellite data processing algorithms
- Earth observation software systems
- Cal/val and climate change research



University of Graz – Wegener Center
for Climate and Global Change
Brandhofgasse 5, 8010 Graz
+43 316 380-8430
wegcenter@uni-graz.at
www.wegcenter.at
Contact: Gottfried Kirchengast





Segment	Research	Development	Production
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Applied Research: Launcher and Manned Flight			
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Applied Research: Satellite-based Services			
Basic Research for Space Technology			
Exploration			
Microgravity			
Simulation			
Other Experimental Research	•		

University of Innsbruck

Institute for Ion Physics and Applied Physics

Space related test benches, laboratories, etc.

Optical and mass spectrometry, ultra-high vacuum and cryogenic temperatures

Basic phenomena of atomic, molecular and plasma physics are investigated at the Institute. The application-oriented perspectives of the branches mentioned above led to the spin-off of 10 high-tech companies in Tyrol by members and former students of this research area up to now. More than 1500 jobs have been created by these companies that decisively enable physicists to practice their profession in Tyrol.

Technologies and competences

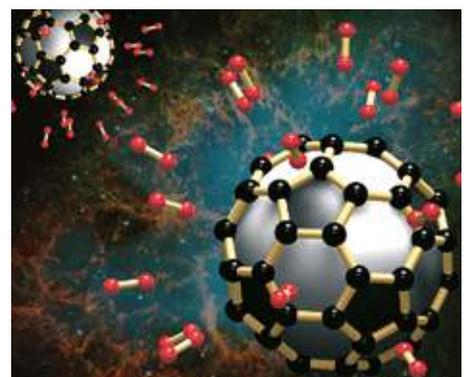
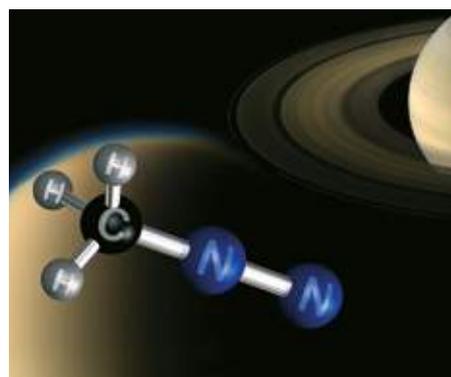
The research of the Institute covers bio-, nano- and cluster-, environmental, plasma and energy physics, computational and food chemistry, thin films and high-frequency technology and signal processing. Basic research is performed theoretically and experimentally in the field of attosecond physics, elementary molecular and atomic processes, gas analysis, mass spectrometry, plasma simulations and nuclear fusion.

Research topics in space

- Atmospheric chemistry
- Molecular spectroscopy
- Astrochemistry



University of Innsbruck – Institute for Ion Physics and Applied Physics
 Technikerstraße 25, 6020 Innsbruck
 +43 512 507-52660
 paul.scheier@uibk.ac.at
 www.uibk.ac.at/ionen-angewandte-physik
 Contact: Paul Scheier



Production
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Research Institute

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Applied Research: Satellite-based Services	•	•	
Basic Research for Space Technology			
Exploration			
Microgravity			
Simulation			
Other Experimental Research	•		

University of Natural Resources & Life Sciences Vienna

Institute of Surveying, Remote Sensing and Land Information

Space related test benches, laboratories, etc.

ASD field spectrometer (ASD full range), total stations GPS soft-copy stations and photogrammetric equipment, laboratories for image processing

The Institute focuses on applied remote sensing and GIS technologies related to agriculture, forestry and environment, such as land use mapping, forest monitoring, vegetation phenology and ecological interpretation. It has large expertise in quantitative Earth observation modelling and in geoinformation systems. Further activities include automatic knowledge-based satellite image analysis and GPS surveying techniques.

Technologies and competences

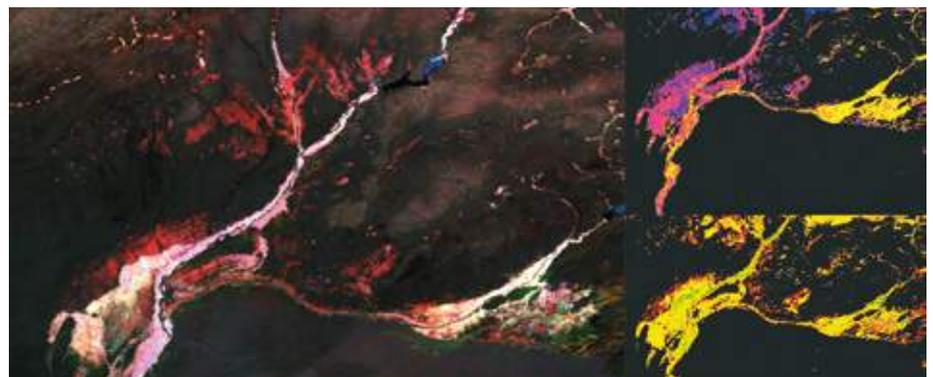
The Institute has strong expertise in the following fields: 1) Radiative transfer modelling for the retrieval of vegetation biophysical variables (direct & inverse modelling, object based approaches), 2) Assimilation of Earth observation data into process-driven dynamic process models for the simulation of energy and water exchange between land and atmosphere, and 3) Mapping of past and actual land cover/land use.

Research topics in space

- Land use/land cover mapping and change detection
- Mapping of vegetation biophysical variables
- Drought monitoring and irrigation management
- Detection of vegetation anomalies



University of Natural Resources and Life Sciences – Institute of Surveying Remote Sensing and Land Information
 Peter Jordan-Straße 82, 1190 Wien
 +43 1 47654-5101
 clement.atzberger@boku.ac.at
 www.rali.boku.ac.at/ivfl.html
 Contact: Clement Atzberger



Production
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Research Institute

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Applied Research: Spacecraft			
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Microgravity			
Simulation			
Other Experimental Research	•		

University of Salzburg

Department of Geoinformatics – Z_GIS

Space related test benches, laboratories, etc.

The OBIA lab fosters advanced image understanding, pooling methods and techniques from remote sensing, image processing and spatial analysis. The approach gained international attention and widespread use in various application fields. We work in a multi-scale and multi-purpose application environment, dealing with the challenges of data and semantic interoperability, automated classification, and multi-temporal change assessments.

Z_GIS is an interdisciplinary department (80 scientific and technical staff) established at Paris-Lodron University, Salzburg. It is dedicated to fundamental and applied research, integrated spatial analysis, outreach activities and networking, professional education (www.unigis.net) and training. As experts for the spatial view, Z_GIS focuses on interoperable GIS, spatial modelling, satellite remote sensing, image analysis, etc.

Technologies and competences

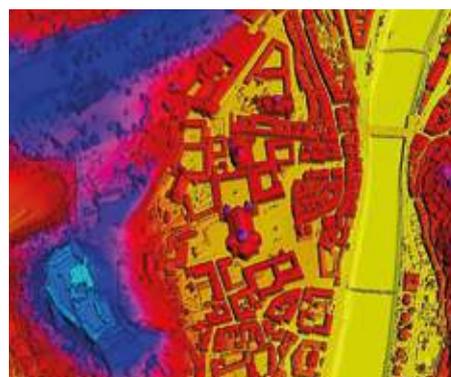
Z_GIS is strongly involved in EU-funded RTD activities, development cooperation and educational projects and is actively supporting and promoting the Copernicus initiative in an interdisciplinary research and communication scheme by fostering new technologies for EO-based spatial decision support and policy implementation. Z_GIS is inextricably linked with the OBIA (object-based image analysis) approach.

Products and services in space

- Spatio-temporal, fully automated image understanding routines
- Research for Copernicus service development and validation of information products
- Research topics: humanitarian action, disaster risk reduction, environmental management, climate change adaptation
- Data integration (multi-source, multi-temporal, multi-sensor), including socio-economic data



University of Salzburg –
 Department of Geoinformatics
 Schillerstraße 30, 5020 Salzburg
 +43 662 8044-7510
stefan.lang@sbg.ac.at
www.zgis.at
 Contact: Stefan Lang



Production
Software
Service
● Research Institute

Segment	Research	Development	Production
Applied Research: Spacecraft			
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Applied Research: Ground Segment	•	•	•
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Applied Research: Satellite-based Services			
Basic Research for Space Technology	•		
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Microgravity			
Simulation	•		
Other Experimental Research			

University of Vienna

Department of Astrophysics

Space related test benches, laboratories, etc.

To support flight software development, we run an electronics lab with space related EGSE including simulators and analysers for common interfaces used in space. Moreover, several breadboards of current and future processing platforms are in use.

The Department of Astrophysics concentrates its activities on basic research in astrophysics and development of science payload. We make use of astrophysical data observed by various satellites (e.g., from ESA or NASA). Members of the institute participate as consortium members in ongoing or planned astrophysical space observatories, often by providing flight software to instruments.

Technologies and competences

The Department of Astrophysics supports and participates in international instrumentation projects for astrophysical research in space. The principal focus is on the development of data reduction pipelines, on-board software development for data processing, and on-board computer systems.

Research topics in space

- Embedded operating system
- Test software and simulators
- Data processing pipeline, ground segment
- On-board data processing software



University of Vienna –
Department of Astrophysics

Türkenschanzstraße 17, 1180 Wien

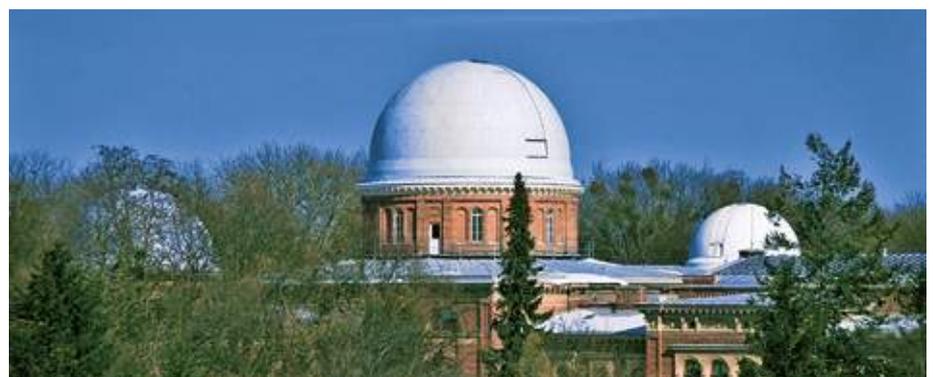
+43 1 4277-53814

space@univie.ac.at

space.univie.ac.at

astro.univie.ac.at

Contact: Manuel Güdel



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production
Applied Research: Spacecraft			
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Other Experimental Research			

University of Vienna

Department of Meteorology and Geophysics

Space related test benches, laboratories, etc.
Instruments for ground truth observation

The Department of Meteorology and Geophysics works with the application of meteorological satellite data for determination of the condition of the atmosphere and on the ground.

Technologies and competences

Competences lie in the evaluation of vertical temperature profiles of the atmosphere, radiative temperature of the Earth's surface and microwave technology for precipitation estimates.

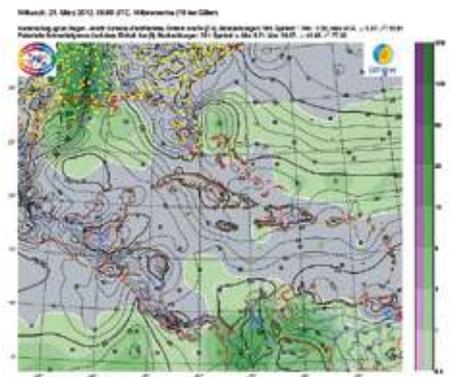
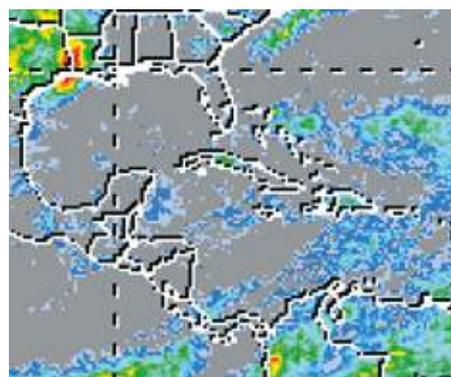
Research topics in space

- QMS – Quality Measurement System allows the measurement of the IP payload of a IP/DVB carrier on a IP flow basis directly from the satellite



universität wien
imgw
 Institut für Meteorologie und Geophysik
 Universität Wien

University of Vienna – Department of Meteorology and Geophysics
 Althanstraße 14, 1090 Wien
 +43 1 4277-53701
 reinhold.steinacker@univie.ac.at
 img.univie.ac.at
 Contact: Reinhold Steinacker



- Production
- Software
- Service
- Research Institute

Segment	Research	Development	Production
Applied Research: Spacecraft			
Applied Research: Launcher and Manned Flight			
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Applied Research: Instruments and Payloads	•	•	
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Basic Research for Space Technology			
Exploration	•	•	
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Simulation			
Other Experimental Research			

VRVis

Center for Virtual Reality and Visualisation

Our primary objective is to build a bridge between research and its practical implementation in industry. Today, VRVis Forschungs-GmbH is Austria's leading institute for application-led research in visual computing and has received international acclaim for its work. Together with the TU Vienna, the TU Graz and the University of Vienna, it forms one of the largest research clusters in Europe.

Technologies and competences

Our R&D projects focus on the very problems that the industry is currently facing. Our visualisation solutions enable our partners and customers to present their data in a way that is easily understandable, allowing them to identify patterns and relationships and gain insights into particular areas in order to facilitate decision making.

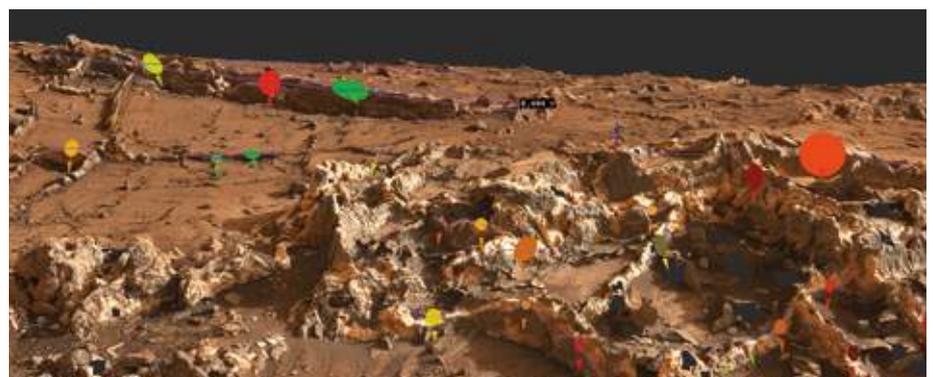
Research topics in space

- Virtual exploration of planetary surfaces
- Geospatial visualisation
- Geologic visual analysis

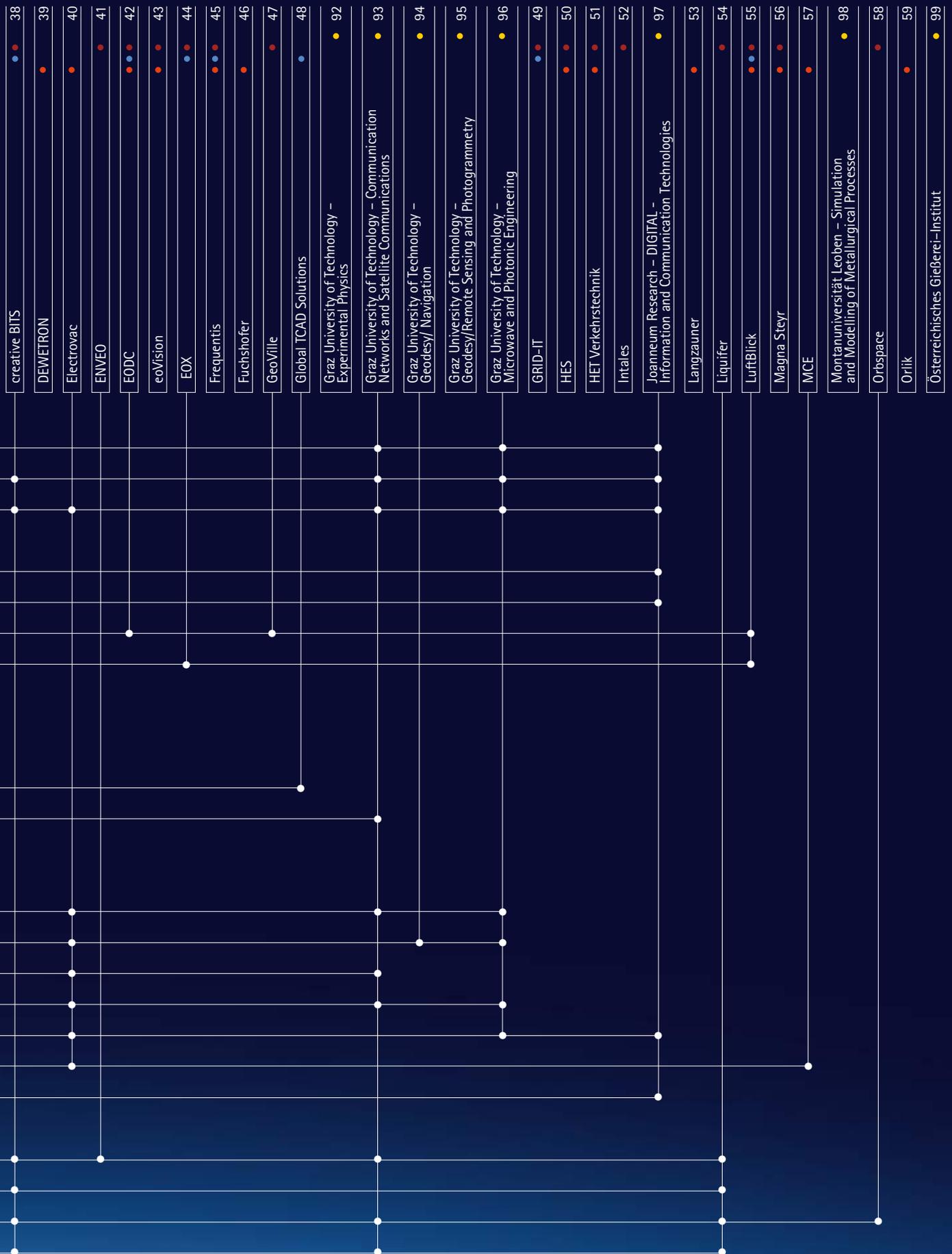
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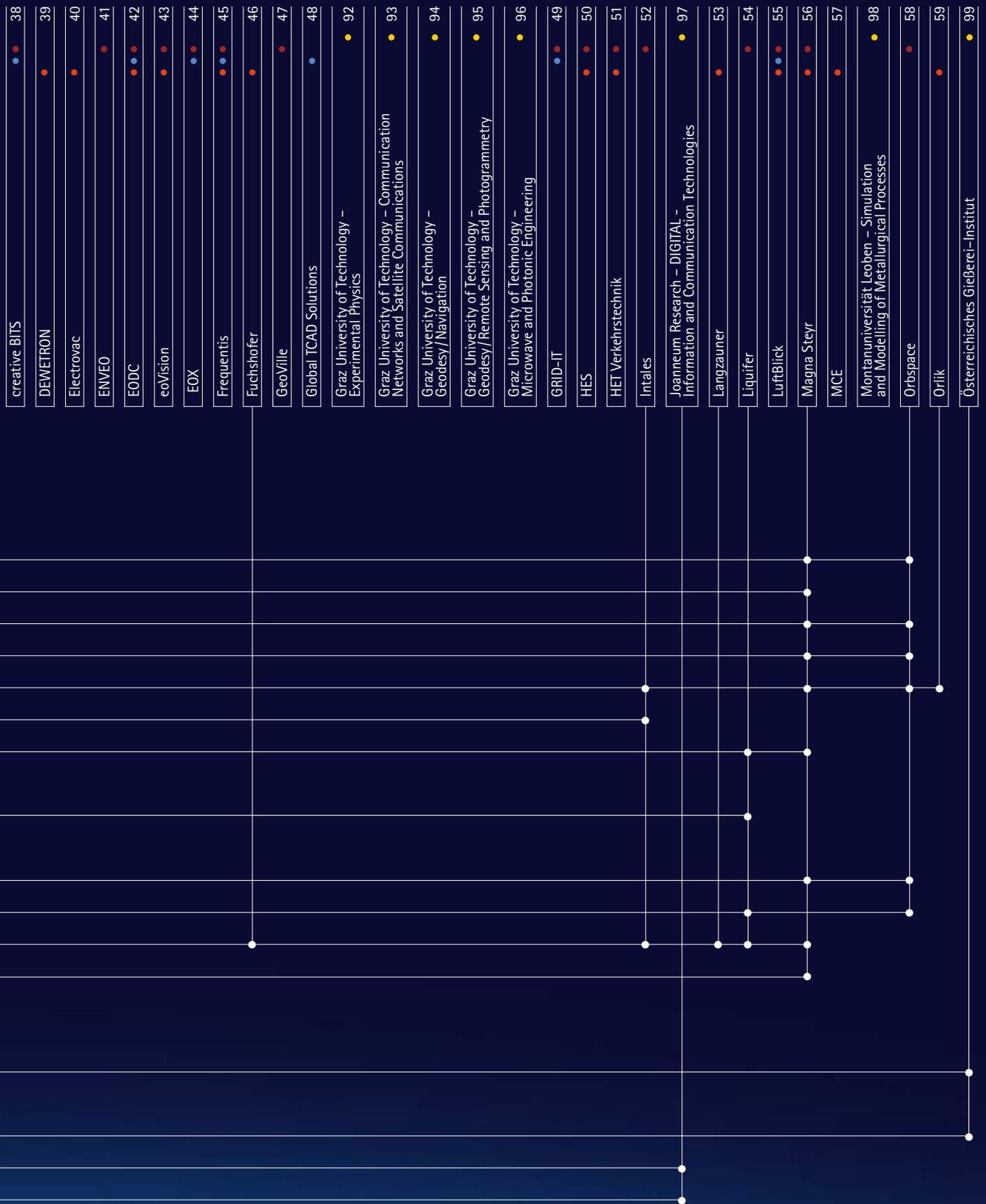
zentrum für
 virtual reality und visualisierung
 forschungs-gmbh

VRVis Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH
 Donau-City-Straße 11, 1220 Wien
 +43 1 9089892-520
 traxler@vrvis.at
 www.vrvis.at
 Contact: Christoph Traxler



Austrian Competences in Space Technology

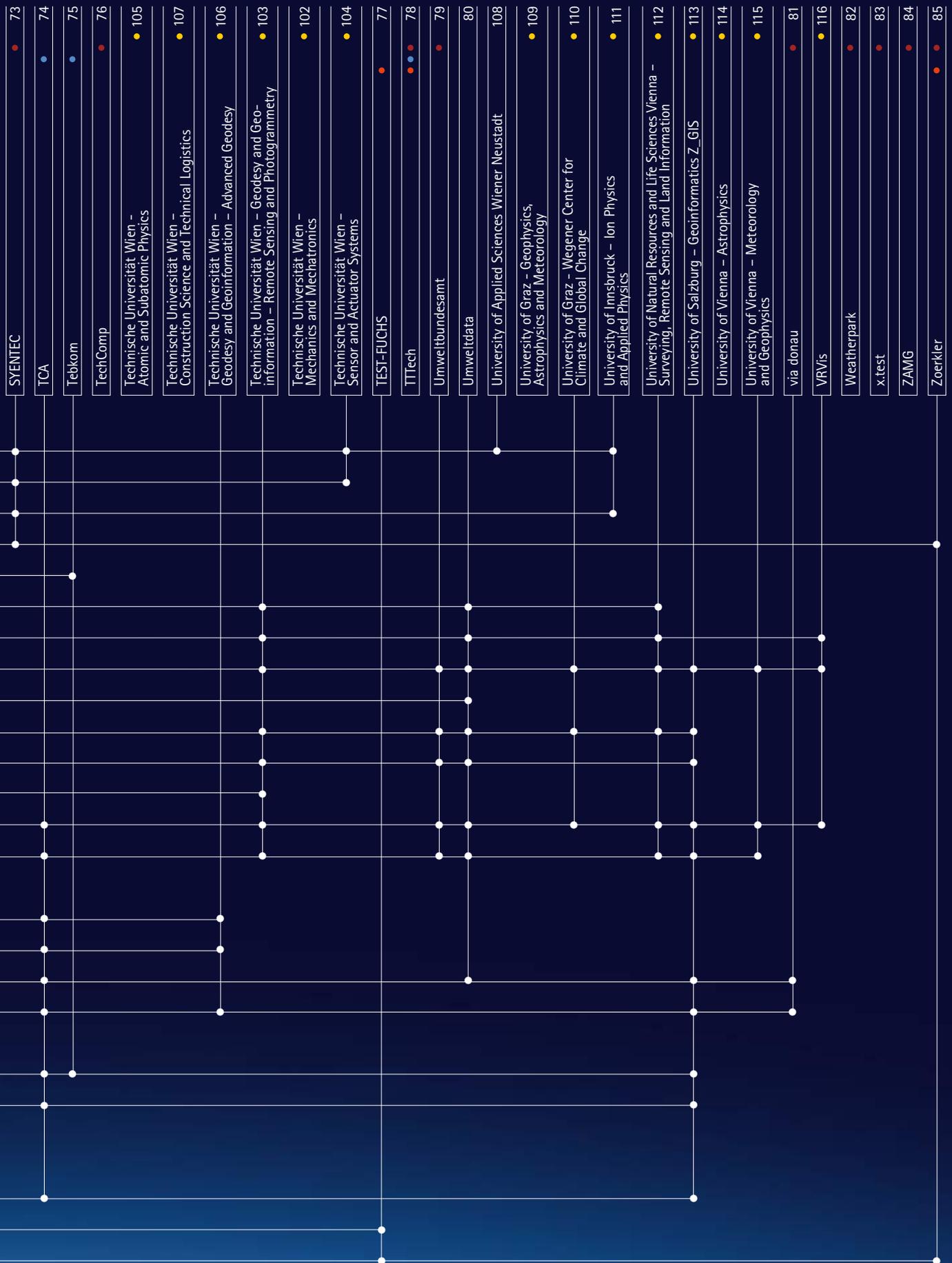




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Companies and Research Institutes

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