

# IPPW-12 at DLR in Cologne

**Ali Gülhan**  
**German Aerospace Center (DLR)**

Knowledge for Tomorrow



# The DLR

German Aerospace Research Center &  
Space Agency of the Federal Republic of Germany



**Aeronautics**

**Space**

**Transport**

**Energy**



**Space Administration**



**Space R&T**



## Locations and employees

7300 employees across  
33 institutes and facilities at  
■ 16 sites.

Offices in Brussels,  
Paris, Washington and Tokyo.

Research facilities in Qatar (in  
progress) and in Almeria (Spain)



# DLR Executive Board



Prof. Dr-Ing. Johann-Dietrich Wörner  
Chairman

- Overall strategy and development
  - External relations
- Corporate Communication
  - ESA Council



Klaus Hamacher  
Vice Chairman

- Human Resources, Finance, Corporate Org.
- Quality Assurance and Infrastructure
  - Technology Marketing
  - Information technology



Dr. Gerd Gruppe

- Project Management Agency
  - Space Administration
  - National/ESA program



Prof. Hans-Jörg Dittus

- Space Research and Technology  
research, programs, projects, technology transfer



Prof. Dipl.-Ing. Rolf Henke

- Aeronautics:  
research, programs, projects, technology transfer
- Approved Design Organisation



Prof. Dr-Ing. Ulrich Wagner

- Energy and Transportation:  
research, programs, projects, technology transfer



# DLR Cologne site from the ISS



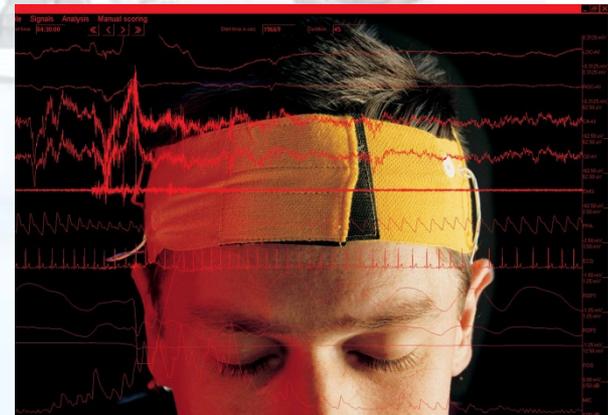
Bild: ESA / Nespoli



# Institute of Aerospace Medicine

Prof. Dr. Rupert Gerzer

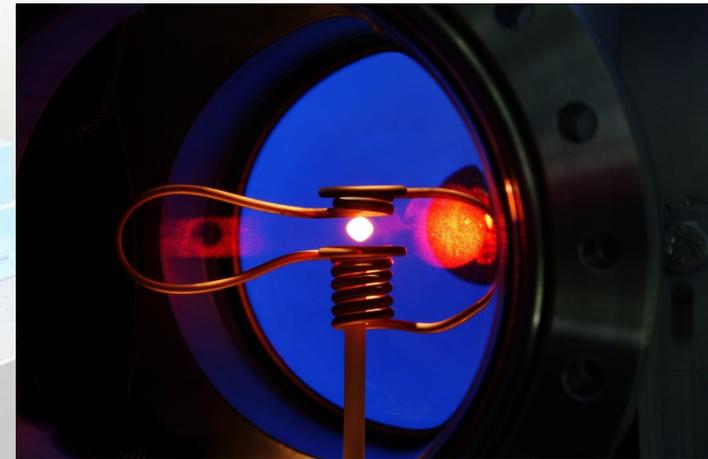
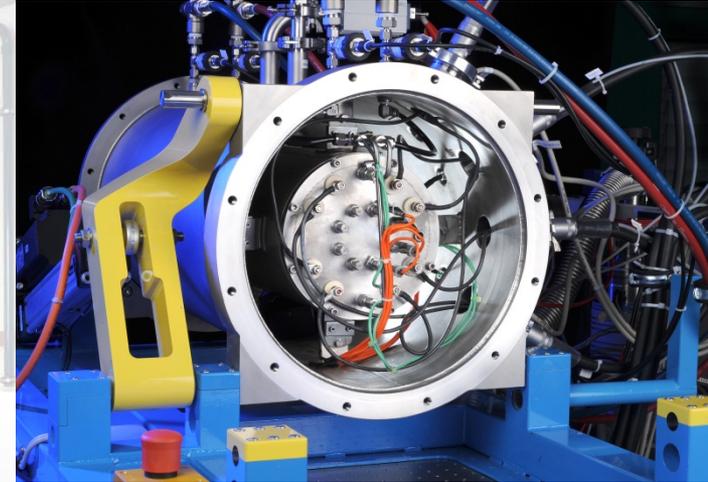
- Research on human health and performance in the mobile society.
- Impact of microgravity on the human health
- Medical consultancy for European Astronauts (in cooperation with the ESA)
- Medical and psychological check and selection of aeronautic employees
- Impact of aeronautics and transport on human behaviour
- Impact of radiation
- Adjustment of the life to severe environments
- Search of life in space



# Institute of Material Physics in Space

Prof. Dr. Andreas Meyer

- Research on liquid properties and solidification processes
- Objective: Prediction of material properties
- Experiments in the absence of gravitationally driven phenomena such as convection and sedimentation, investigations in weightlessness providing well-defined experimental conditions needed for accurate measurements

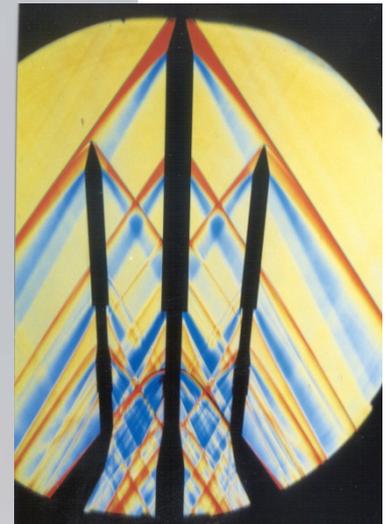
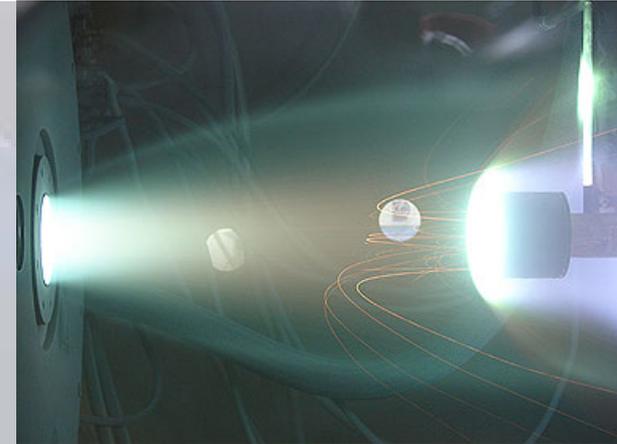


# Institute of Aerodynamics and Flow Technology

## Supersonic and Hypersonic Technology Department

Dr. Ali Gülhan

- Health Monitoring Instrumentation for Spacecraft and high speed flight demonstrators
- Aerothermal design, qualification of spacecraft and high speed flight vehicles
- Qualification of thermal protection systems in high enthalpy facilities
- Thermal management systems
- Research on launcher base flow plume flow interactions and resulting thermomechanical problems
- Optical diagnostics for high enthalpy flows



# Microgravity User Support Center (MUSC)

Prof. Dr. Rainer Willnecker

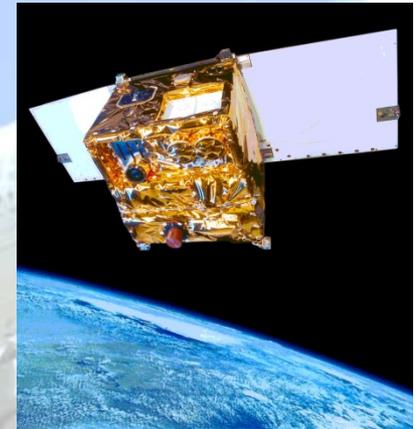
- Operation of ground control units for monitoring and control of space experiments
- Certification of space experiments with respect to flight readiness
- Coordination of space missions
- Use of European experimental facilities on the ISS
- Operation of comet lander Philae in the frame of ESA mission Rosetta.
- Preparation of experiments or missions for microgravity environment and development of new experiments and measurement methods



# Simulation und Software Technology (SISTEC)

Rolf Hempel

- Participation on software development in the frame of national and international.
- Integration of simulation applications for virtual product development
- Visualisation and management of scientific data
- High-Performance-Computing
- Onboard Software for satellite attitude control.
- Development of software engineering methods
- Tools and techniques for software development
- Courses for users





## European Astronaut Centre (EAC)

Since 1990 the European Space Agency ESA has been training European Astronauts for future missions at its center EAC on the DLR site in Cologne

- 110 employees from 19 ESA member states
- Place of European astronaut corps
- Responsible for ESA astronauts before, during and after each mission
- Education of non-european astronauts in european modules of Internationalen Space Station (Columbus, A

