

# CURRICULUM VITAE

## GEORG HERDRICH

### PERSONAL INFORMATION

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Georg Herdrich  
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Family Status: married with Andrea Herdrich,  
Mathematician, no children  
Citizenship: German  
Date of birth, place of birth: 06.04.1969, Ettenheim

### EDUCATION

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05.1988	Higher Education Entrance Qualification at „Städtisches Gymnasium“ in Ettenheim
10.1989-07.1996	Aerospace-Engineering, Universität Stuttgart Special Subjects: Flight Mechanics and Control, Space Systems and Applications
07.1991-11.1991	Working stay Dornier GmbH: Material- and Process data base (space technology product assurance)
12.2004	Dissertation: „Aufbau, Qualifikation und Charakterisierung einer induktiv beheizten Plasmawindkanalanlage zur Simulation atmosphärischer Eintrittsmanöver“, Institut für Raumfahrtssysteme, Universität Stuttgart, URN: urn:nbn:de:bsz:93-opus-21478, URL: <a href="http://elib.uni-stuttgart.de/opus/volltexte/2005/2147/">http://elib.uni-stuttgart.de/opus/volltexte/2005/2147/</a> , and in extended print run with Shaker Publishing Company ISBN 3-8322-4338-0 Dezember 2004 Certification: very good

### MILITARY

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10.1988-12.1989	Military Service, Rommel Barracks, Dornstadt near Ulm
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### PRIZES AND AWARDS

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1997	Reinhardt Abraham - Lufthansa - Price for „Emissionsspektroskopische Untersuchung der Stickstoff-Molekülstrahlung im Plasmawindkanal“ (diploma thesis at Institut für Raumfahrtssysteme of Universität Stuttgart)
1997	Price of “Freunde der Universität Stuttgart“ for best diploma thesis
2006	<i>NESC (NASA Engineering and Safety Center) Group Achievement Award</i> : “In recognition of outstanding technical contributions to the NESC Stardust Hypervelocity Entry Observing Campaign Team”
2007	<i>Du Pont Plunkett Award</i> (together with Dipl.-Ing. A. Nawaz, IRS, and Dipl.-Chem. M. Schlipf, EtringKlinger GmbH) for the development of a Teflon <sup>®</sup> helix propellant feeding system for the pulsed magnetoplasmadynamic thruster SIMPLEX

### STAYS ABROAD

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01.1992-02.1992	Stay at Imperial College, London: Analysis of ROSAT data (Supernova SN1987A)
12.1994-05.1995	Politecnico di Torino, Italy: Optimization of a Rocket's Ascent Trajectory
11.2000-12.2000	Stay at “Complexe de Recherche Interprofessionnel en Aérothermochimie / Centre National de la Recherche Scientifique (CORIA / CNRS)“, Rouen, France: Experimental Investigations using the inductive Plasma Wind Tunnel of CORIA
Since 04.2007	Visiting Professor at the University of Tokyo: Research stay at the Graduate School of Frontier Sciences, Department of Advanced Energy, Japan: Investigation of the arcjet Facility of the University of Tokyo

## EXPERIENCE

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Since 10.1996	Scientist, Divison "Space Transportation Systems", Institut für Raumfahrtsysteme, Universität Stuttgart
Since 12.2004	Managing Director / Deputy Chief of Steinbeis Transfer Centre Plasma and Space Technology (STZ PRT, <a href="http://www.plasma-raumfahrt.de">www.plasma-raumfahrt.de</a> )
Since 02.2007	<i>Visiting Associate Professor</i> for Plasma Technology and Atmospheric Entry Technology at the University of Tokyo, Graduate School of Frontier Sciences, Department of Advanced Energy

## WORKSCOPES AT "INSTITUT FÜR RAUMFAHRTSYSTEME"

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Section Lead Space Transportation, Head Plasma Wind Tunnels and Plasma Technology:

PWT Simulation of Atmospheric Entry Manoeuvres, Plasma Propulsion Systems for Space Application, Development Leader for Entry Vehicle In-flight Instrumentations as well as industrial plasma technology (technology transfer), Numerical Simulation of Entry Manoeuvres, Industrial Plasma Technology (Technology Transfer)

## PROJECTS (1996-2007)

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1996-2002	Researcher in Special Collaboration Centre SFB 259: "Hochtemperaturprobleme rückkehrfähiger Raumtransportsysteme"
1996	Participation in SEPCORE test (High Enthalpy Re-entry Simulation), (SEP, France)
1996	Investigation of MAN Technology SA thermal protection system material samples in IRS Plasma Wind Tunnel PWK1
1996-1997	"PYREX-HX Initiation Study": Concept of a temperature measurement system for Japanese space-plane HOPE-X (NASDA, Kawasaki Heavy Industries)
1997-1998	Re-calibration and post-flight analysis of thermal protection system temperature measurement system PYREX-M on re-entry capsule MIRKA (flown in 1997)
1999-2001	"FESTIP: Future Space Transportation Investigation Program": Qualification of inductively heated plasma wind tunnel PWK3. Pure oxygen plasma tests using Silicon Carbide thermal protection material (ESA and SENER, Spain)
1998-2003	TETRA (DLR): "Catalysis of Thermal Protection Systems", "Aerothermodynamic Experiment"
1998-2003	"PYREX-KAT38": Development, Qualification and Integration of thermal protection system instrumentation for technology demonstrator X-38 (NASA, ESA, DLR, MAN-Technology SA)
2002-2004	Investigation of DLR and MAN-Technology SA heat shield materials within the German space program ASTRA, Investigation of TPS sub-structures in the plasma wind tunnel of IRS (DLR, DLR Stuttgart, MAN).
2002-2004	Project Engineer / Scientist in research program „Experimental Investigation of Inductively Heated Radiofrequency Plasma Generators and their Flows for the Simulation of Atmospheric Re-Entries of Spacecrafts“, DFG
Since 2003	Supervision of Project: „Power Optimization of Hybrid Plasma Generators“; Modelling of MHD Effects in Inductively Heated High Power Plasma Generators
2004	Responsible for "Standard Model Testing". ESA-Project of harmonization of European Plasma Wind Tunnel Facilities (DLR Cologne, VKI, EADS, CIRA)
Since 2004	System and Development lead for instrumentations PYREX and PHLUX (ESA re-entry capsule EXPERT), Phases B/C/D (ESA)
Since 2004	Supervision of Project: „Development, Realization and Qualification of a unsteady pulsed MPD-Thruster for Primary Propulsion and Position Control of small Satellites“ (DLR)
Since 2004	Supervision of Project: „Development of a numerical Program System for the Design of an Applied Field Magnetoplasmadynamic Thruster“ (DFG)
Since 2004	Supervision of Project: „Coupled electrodynamic / electrostatic Propulsion System“
Since 2004	Supervision of Project: „Development of a Thermal Arcjet Propulsion System for the Moon Probe BW1“

2005-2007	Responsible for Project „Investigation of Catalysis and Emissivity of TPS Materials for Re-entry Vehicles“ / „STARDUST“ (DLR)
2005	Investigation of ablation heat shield materials for Fluid Gravity Engineering Ltd, Great Britain
2005-2006	Catalysis based sensor system for the test of the HYFLEX nose structure mock-up in plasma wind tunnel SCIROCCO (Cooperation with JAXA and CIRA)
2006	STARDUST DC-8: Measurement of Highly resolved Spectra during Re-entry of the comet capsule. (DLR, STW, NASA, SETI, STZ PRT)
2006	PARES Nose structure test in PWK1 (EADS, ESA)
Since 2006	Responsible for Project “Design of a European Standard Heat Flux Probe for Plasma Wind Tunnels“. ESA-Project within Harmonization of European Plasma Wind Tunnels (DLR Cologne, VKI, EADS, CIRA)
Since 2007	“CO <sub>2</sub> Validation“ within the ESA Aurora Program: Simulation of Mars entry using the inductively heated Plasma Wind Tunnel Facility PWK3

## PUBLICATIONS

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12 reviewed articles in scientific Journals and 4 contributions in books, more than 80 articles for conferences, thereof more than 40 in proceedings, more than 30 reports for industrial projects

## LECTURES

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1997-2005	Lecturer for Physics, Open University of Applied Sciences Hamburg: Industrial Engineering with Business Studies (1 Semester)
Since 2000	Unconventional Space Propulsion Systems (Universität Stuttgart, 2h weekly in WS, different lecturers)
Since 2004	Plasma Technology for industrial Applications (Universität Stuttgart, 2h weekly in SS, different lecturers)
Since 2005	Re-Entry Technology (Universität Stuttgart, 2h weekly in WS)
Since 2005	Lecturer for Technical Thermodynamics, Open University of Applied Sciences Hamburg: Industrial Engineering with Business Studies (1 Semester)
Since 2005	Lecturer for Kraft- und Arbeitsmaschinen, Open University of Applied Sciences Hamburg: Industrial Engineering with Business Studies (1 Semester)
Since 2006	Measurement Techniques for Plasma Flows as well as tutorials (Universität Stuttgart, 3h weekly in WS, 3 lecturers)
Since 2007	Electrical Propulsion Systems (Universität Stuttgart, 2h weekly in SS)
Since 04.2007	“Atmospheric Entry Technology“ (University of Tokyo, ca. 2h weekly in SS)

## REVIEWER AND CONSULTANT FUNCTIONS

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Since 2000	Permanent Member of study commission of the faculty aerospace engineering and geodesy
Since 2005	Reviewer AIAA Journal (American Institute of Aeronautics and Astronautics)
Since 2005	Reviewer Vacuum Journal
Since 2005	ESA-Consultant for Catalysis and Emissivity of Thermal Protection Materials
Since 2006	Member of “Aerothermodynamic Technical Committee of CEAS (Council of European Aerospace Societies)”
Since 2006	Delegate of the Federal Republic of Germany in the United Nation’s working group “Nuclear Power in Space”
Since 2006	Chair Member of the Executive Committee of ISAPS (International Symposium on Applied Plasma Science)
Since 2007	Member of the working group “Nuclear Power in Space“ (European Commission and European Space Agency, ESA)
Since 2007	Member of the joint expert group of UNO and IAEA: Development of an international safety standard for nuclear space technologies
Since 2007	Program Committee Member of the International Symposium on Space Technology and Science (ISTS), Japan

## MEMBERSHIPS OF PROFESSIONAL ASSOCIATIONS

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Deutsche Gesellschaft für Luft- und Raumfahrt (DGLR)

American Institute of Aeronautics and Astronautics (AIAA)

Verein der Freunde der Universität Stuttgart

Verein der Freunde der Luft- und Raumfahrttechnik der Universität Stuttgart e.V.

## LANGUAGES

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English                      Business Fluent

French                        Fluent

Italian                        Fluent

Esslingen, 27.07.2007

Dr.-Ing. Georg Herdrich