

CURRICULUM VITAE

PRIV. DOZ. DR.-ING. GEORG HERDRICH

PERSONAL INFORMATION

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Family Status: married, one child
Citizenship: German
Date of birth: 06.04.1969
Place of birth: Ettenheim

EDUCATION

05.1988 Higher Education Entrance Qualification at „Städtisches Gymnasium“ in Ettenheim
10.1989-07.1996 Aerospace-Engineering, University of Stuttgart
Special Subjects: Flight Mechanics and Control, Space Systems and Applications
07.1991-11.1991 Graduate internship Dornier GmbH: Space Material- / Process data base (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: <http://elib.uni-stuttgart.de/opus/volltexte/2005/2147/>, and in extended print run with Shaker Publishing Company ISBN 3-8322-4338-0, Dec. 2004, Certification: very good
05.2012 Habilitation: „Raumfahrtrelevante Plasmen und deren anwendungsbezogene Klassifizierung“.

PRIZES AND AWARDS

1997 Reinhardt Abraham - Lufthansa - Prize for „Emissionsspektroskopische Untersuchung der Stickstoff-Molekülstrahlung im Plasmawindkanal“ (diploma thesis at Institute of Space Systems of University of Stuttgart)
1997 Price of “Freunde der Universität Stuttgart“ for best diploma thesis
2006 NESC (NASA Engineering and Safety Centre) Group Achievement Award: “In recognition of outstanding technical contributions to the NESC Stardust Hypervelocity Entry Observing Campaign Team”
2007 Du Pont Plunkett Award (together with Dipl.-Ing. A. Nawaz, IRS, and Dipl.-Chem. M. Schlipf, ElringKlinger GmbH) for the development of a Teflon[®] helix propellant feeding system for the pulsed magnetoplasmadynamic thruster ADD-SIMPLEX
2007 NASA Group Achievement Award: Recognition prize for the „Reentry observation of the STARDUST capsule“ (dust specimen from comet Wild 2)
2008 Land der Ideen: Teflon as solid propellant, Award in collaboration with ElringKlinger GmbH by the President of the Federal Republic of Germany
2009 IAPS Journal: Best Paper of the Year Award
2010 NASA Group Achievement Award in recognition of the achievements in the reentry observation of Hayabusa

PUBLICATIONS

More than 50 reviewed articles in scientific Journals and books, more than 100 conference articles, thereof more than 50 in proceedings, more than 50 reports for industrial projects. Co-authorship in internationally reviewed and adopted reports and papers (UN, RTO). Three patents (Electric Propulsion, Plasma Technology).

MILITARY

10.1988-12.1989 Military Service, Rommel Barracks, Dornstadt near Ulm

STAYS ABROAD

01.1992-02.1992 Research work 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 Research 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
02.2007-08.2007 Stay as 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, Lecture "Atmospheric Entry"

WORKING EXPERIENCE

Since 10.1996 Research scientist, Department "Space Transportation Systems", Institut für Raumfahrtssysteme, Universität Stuttgart
Since 12.2004 Managing Director / Deputy Head of Steinbeis Transfer Centre Plasma and Space Technology
Since 02.2007 Visiting Associate Professor for Plasma Technology and Atmospheric Entry at University of Tokyo, Graduate School of Frontier Sciences, Department of Advanced Energy
Since 03.2010 Adjunct Associate Professor in space sciences with focus on natural space plasmas at Baylor University, Waco, Texas, USA.

WORKSCOPES AT „INSTITUT FÜR RAUMFAHRTSYSTEME“

2006-2010 Acting Head Department of Space Transportation and Head Plasma Wind Tunnels and Plasma Technology:
PWT Simulation of Atmospheric Entry Manoeuvres, Plasma Space Propulsion Systems, Development Leader for Entry Vehicle In-flight Instrumentations, Numerical Simulation of Entry Manoeuvres, Industrial Plasma Technology (Technology Transfer)
Since 2010 Head Atmospheric Entry Technology and Electric Propulsion Groups (Experiment and Modelling), Deputy Head Department of Space Transportation (Head: Professor Fasoulas)

PROJECTS (SINCE 1996)

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
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
2003-2009	Supervision of Project: Power Optimization of Hybrid Plasma Generators; Modelling of MHD Effects in Inductively Heated High Power Plasma Generators
Since 2004	Principle Investigator for instrumentations PYREX, PHLUX and RESPECT (ESA re-entry capsule EXPERT), Phases B/C/D/E (ESA)
2004-2008	Supervision of Project: „Development, Realization and Qualification of a unsteady pulsed MPD-Thruster for small Satellites“ (DLR)
Since 2004	Supervision of Project: „Development of a numerical Program System for the Design of an Applied Field Magnetoplasma-dynamic Thruster“ (DFG)
Since 2004	Supervision of Project: „Coupled electrodynamic and 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 Emission Coefficients of TPS Materials for Re-entry Vehicles“ / „STARDUST“ (DLR)
2005	Ablation heat shield material investigation (Fluid Gravity Engineering Ltd, Great Britain)
2005-2006	Catalysis based sensors for a test model of HYFLEX nose structure in Plasma Wind Tunnels (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: Test of nose structure of the capsule PARES in PWK1 (EADS, ESA)
2006-2007	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 Köln, VKI, EADS, CIRA)
2006	Characterisation of ceramic, effusion-cooled combustion chambers using optical measurement methods (DLR Stuttgart, DLR Lampoldshausen)
2007-2008	CO ₂ Validation within the ESA Aurora Program: „Simulation of Mars entry using the inductively driven PWT PWK3“ (FGE)
2007	Analysis of ablation materials (Fluid Gravity Engineering Ltd., Lockheed Martin UK.)
2008-2009	Conception of the re-entry capsule RADFLIGHT for analysis of the high-enthalpy re-entry: Investigation and conception of radiation relevant instruments for the re-entry capsule (Astrium, FGE, ISA)
2008	<i>Principle Investigator</i> for the spectrometer system SLIT: Measurement of highly resolved spectra during controlled descent of ATV Jules Vernes. (NASA, SETI, etc.)
Since 2008	ESA Project Aerothermochemistry: Theoretical and experimental investigations of the high-enthalpy re-entry situation (FGE, Astrium GmbH, ISA, MIPT)
Since 2009	EU Project HIPER: MW electric propulsion systems for exploration missions (Alta, etc.)
Since 2009	ESA Project AF MPD: Development of a 100 kW Applied field MPD Thruster (Alta)
2009-2011	ESA Project LISE: Miniaturization of re-entry instruments (HPS, HTG, DLR Cologne)
2009-2011	ESA Project ATV Post-flight Analysis (in 2 ESA Teams)
Since 2009	Principle Investigator for the aerothermodynamic instrumentation COMPARE for SHEFEX2 (DLR)

Since 2010	Supervision of Project: „Flight capable unsteady pulsed MPD-Thruster for small Satellites“ (DLR)
Since 2010	Responsibility for Project “High energy atmospheric entry” (within cooperation DLR@University of Stuttgart)
Since 2012	EU Project HYDRA: Investigation of advanced ablator systems
Since 2012	Principle Investigator MIRKA2 Re-entry Capsule (NASA, ASA, Keltec)

PROJECTS – STZ PLASMA UND RAUMFAHRTTECHNOLOGIE (SINCE 2005)

2005	Experimental investigation of combustion chamber materials (Bayern Chemie Protac)
2005	Experimental characterization of intelligent structures for areas of high temperature (HPS GmbH)
2006	Experimental investigations of PM2000 material (Alta)
2006	Observation campaign of STARDUST Reentry (NASA, SETI Institute)
2006-2007	Alternative hardening processes for heavy duty alloys (EADS, MTU)
Since 2007	Development and performance of a laboratory for craft- and working machines (HFH)
Since 2010	Business plan development of Plasma Waste Treatment Technology for different applications (HFH)

LECTURES

1997-2005	Lecturer for Physics, Open University of Applied Sciences Hamburg (HFH: Industrial Engineering with Business Studies)
Since 2000	Unconventional Space Propulsion Systems (University of Stuttgart)
Since 2004	Plasma Technology for industrial Applications (University of Stuttgart)
Since 2005	Re-Entry Technology (University of Stuttgart)
2005-2006	Lecturer for Technical Thermodynamics (HFH: Industrial Engineering with Business Studies (as substitute))
Since 2005	Lecturer for craft- and working machines, (HFH: Industrial Engineering with Business Studies)
Since 2007	Electrical space propulsion (University of Stuttgart)
04.2007-08.2007	Atmospheric Entry Technology (University of Tokyo)
Since 2009	Innovation Management (HFH: Master of Business Administration)

MEMBERSHIPS, REVIEWER AND CONSULTANT FUNCTIONS

	Deutsche Gesellschaft für Luft- und Raumfahrt (DGLR)
	Senior Member 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.
	Regular Reviewer for the following journals: Acta Astronautica, Scientific Journals of AIAA, Open Journal of Plasma Physics, Vacuum, Transactions of JSASS, Europhysics-Letter, Sensors- MDPI Open Access Journal, Aircraft Engineering and Aerospace Technology, Plasma Chemistry and Plasma Processing
	Membership in Editorial Boards: Open Journal of Plasma Physics, Vacuum
Since 2000	Member of the study commission of the faculty Aerospace Engineering and Geodesy
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 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)
2007 - 2009	Member of Joint Expert Group of UN and IAEA: International safety standard for nuclear space technology.
2008-2010	European lead for RTO task group "Gas-surface-interaction"
Since 2007	Foundation member and Chairman of the "International iMPD/PPT Working Group" (BRD, Great-Britain, Italy, Japan, Russia, Austria)
2008	Program Committee Member of International Symposium on Space Technology and Science (ISTS), Japan
2008	<i>Guest Editor</i> , VACUUM Journal
2010	<i>Guest Editor</i> , VACUUM Journal
Since 2011	<i>European Lead and Chair of the RTO Specialist Meeting Catalysis</i>

COOPERATIONS

2006	MOU with JAXA for Internships
2007	Establishment of Joint-Study Researcher Formalism with JAXA
2007	Cooperation Contract with PTB, Berlin
Since 2008	Cooperation contract with FGE, United Kingdom (PARADE)
Since 2010	MOU with High-Enthalpy Plasma Research Center (HEPRC), Korea
Since 2011	Cooperation Agreement for Ablation Investigation (EADS Bordeaux)
Since 2011	Cooperation contract with NASA Ames, San Francisco, USA

LANGUAGES

English	Business Fluent
French	Fluent
Italian	Fluent

Esslingen, 21.06.2012

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