



M.Eng. René Schwarz
IT & Engineering Services



Kurzvorstellung

für Auftraggeber und Agenturen



Darf ich mich vorstellen?

Mein Name ist René Schwarz. Hauptberuflich bin ich seit mehr als 14 Jahren als Forschungs- und Entwicklungsingenieur in den Bereichen Raumfahrt und Militärtechnik tätig. Seit 2023 biete ich nebenberuflich IT- und Ingenieursdienstleistungen für Organisationen, Unternehmen und Privatkunden in selbstständiger gewerblicher Tätigkeit an und helfe hauptsächlich dabei, komplexe technische Systeme zu entwerfen und erfolgreich zu implementieren, Digitalisierung voranzutreiben, IT-Sicherheit und Cybersecurity zu stärken sowie IT-Infrastrukturen zu planen, aufzubauen, zu betreiben und zu optimieren. Mediengestaltung (z.B. das Erstellen und Hosten von Webseiten und Webapplikationen, Corporate Design, Gestaltung von Online- und Printmedien) sowie die Erstellung technischer Dokumentation ergänzen mein Leistungsportfolio.

Eckpunkte zur Person:

- Master of Engineering (M.Eng.) in Informatik und Kommunikationssysteme
- Bachelor of Engineering (B.Eng.) in Mechatronik, Industrie- und Physiktechnik
- mehr als 20 Jahre Erfahrung mit Planung, Implementierung und Betrieb von IT-Infrastrukturen und -Services
- über 14 Jahre Berufserfahrung in der Raumfahrt- und Militärtechnik mit dem Fokus auf Systems Engineering (Systemdesign, Produktrealisierung, technisches Management), Entwicklung von sicherheitskritischen eingebetteten Systemen, Simulation & Verifikation
- 9+ Jahre Erfahrung mit der technischen und administrativen Leitung von interdisziplinären, multinationalen, geografisch verteilten Teams von Ingenieuren und Wissenschaftlern in unterschiedlichen Teamgrößen
- Zertifizierungen:
 - Certified Systems Engineer (GfSE) – Level C
 - IREB Certified Professional for Requirements Engineering (CPRE) – Foundation Level
 - ISC2 Certified in Cybersecurity (CC)
 - Microsoft IT Support Specialist
 - ISTQB Certified Tester – Foundation Level (CTFL)
 - ISTQB Certified Tester – Advanced Level – Test Automation Engineer (CTAL-TAE)



IT-CONSULTING

- Planung und Optimierung von IT-Infrastruktur und IT-Services
- Digitalisierung & Automatisierung von Geschäfts- und Engineering-Prozessen
- IT- und Cybersecurity



CORPORATE DESIGN & MARKETING

- Entwicklung von Corporate Designs inkl. der zugehörigen Elemente (Logos, Farbgestaltung, Geschäftspapiere etc.)
- Gestaltung von Online- und Printmedien
- Social Media



IT-OPERATIONS

- Implementierung, Betrieb, Überwachung von IT-Infrastruktur und IT-Services (Server & Clients, Netzwerke, kundenspezifische Anwendungen etc.)
- Hosting, Betrieb und Wartung von Webseiten und Webapplikationen
- Betriebsunterstützung, Wartung und Störungsbeseitigung
- Anwendersupport



TECHNISCHE DOKUMENTATION

- Erstellung technischer Dokumentation
- Gestaltung von technischen Darstellungen (z.B. Informationsgrafiken, Schaubilder)
- Entwicklung von E-Learning-Modulen



SYSTEMS ENGINEERING & TECHNISCHES MANAGEMENT

- Projektplanung und -steuerung
- Erhebung, Analyse, Dokumentation und Management von Anforderungen
- Systemanalyse und -dekomposition
- Validierung und Verifikation
- technische Planung
- Schnittstellenmanagement
- technisches Risikomanagement
- Konfigurationsmanagement
- technisches Datenmanagement
- technische Bewertung und Entscheidungsanalysen
- Qualitätsmanagement
- Änderungsmanagement



IT-ENTWICKLUNG

- Webseiten und Webapplikationen
- kundenspezifische Anwendungen (von einfachen Skripten bis hin zu komplexen Anwendungen)



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IT & Engineering Services

Unternehmensangaben

Art des Unternehmens

Gewerbebetrieb in Rechtsform eines
nicht eingetragenen Einzelunternehmens

Fokus

Erbringung von Dienstleistungen in den Bereichen
Informationstechnologie und Ingenieurwesen

Gründung

Februar 2023

Geschäftssitz

Syke (bei Bremen), Deutschland

Versicherungen

Berufshaftpflicht (Vermögensschäden): 1 Mio. €
Betriebshaftpflicht: 1 Mio. €

Mitarbeiter (neben Inhaber)

1 Angestellter in Vollzeit

Projektrelevante Informationen

Verfügbarkeit

in der Regel innerhalb weniger Tage,
je nach Projektumfang und Absprache

Kapazität

10 bis 46+ Stunden pro Woche*

* Inhaber steht mit bis zu 10 Stunden pro Woche zur Verfügung; je nach Projektumfang und benötigter Expertise werden für die Projektabwicklung ein weiterer, fest angestellter Mitarbeiter mit bis zu 36 Stunden pro Woche und/oder Partner und Unterauftragnehmer hinzugezogen. Dabei fungiert der Auftragnehmer gegenüber dem Auftraggeber als Hauptauftragnehmer.

Standard-Stundensatz

78 €/h netto remote innerhalb regulärer Geschäftszeiten;
andere Preise siehe [Preisliste](#)

Standortpräferenz

in der Regel vollständig remote;
Abrechnung Auswärtseinsätze gem. [Preisliste](#)



Kontakt

Sie können mich über die nachfolgenden Wege erreichen. Ich melde mich dann schnellstmöglich bei Ihnen zurück. Bitte beachten Sie, dass ich ohne vorherige Terminabsprache üblicherweise von Montag bis Freitag erst ab 15 Uhr telefonisch erreichbar bin.



+49 - 176 - 552 - 53051



mail@schwarz-it.biz





M.Eng. René Schwarz — Curriculum Vitæ

PROFILE SUMMARY

- Master of Engineering (M.Eng.) in Computer Science and Communication Systems; Bachelor of Engineering (B.Eng.) in Mechatronics, Industrial and Physics Technology
- 20+ years experience in planning, implementation, and operation of IT infrastructure and services
 - administration of servers and clients based on Linux and Windows, manually and with automated system configuration management tools such as Puppet
 - virtualization technologies: VMware vSphere & ESXi, VirtualBox, VMware Workstation, Docker
 - setup and operation of web servers with Apache and PHP; MySQL, PostgreSQL, and IBM Db2 database servers; e-mail servers with Postfix and Dovecot; DNS servers with BIND; DHCP servers with ISC DHCP; SVN servers; SMB/CIFS file servers with Samba; Docker container registries with VMware Harbor
 - installation and administration of various web applications, among others: Confluence, DOORS Next Generation, Etherpad, Gitea, GitLab, ILIAS, Matomo (formerly Piwik), MediaWiki, Nextcloud, Overleaf (formerly ShareLaTeX), Owncloud, phpMyAdmin, Roundcube, WordPress
 - planning and administration of networks (Cisco equipment) and firewalls based on pfSense & OPNsense
 - setup and operation of Synology iSCSI NAS systems in high availability settings
 - IT infrastructure monitoring with Zabbix
 - conception and programming of own software, contributions to several open source projects
- 10+ years of professional experience in space systems engineering, research & development with a focus on Guidance, Navigation, and Control (GNC) systems in international project contexts with globally distributed teams of engineers and scientists with medium to large team sizes (up to 200 team members)
 - main fields of work and expertise: systems engineering (system design, product realization, technical management); MiL/SiL/PiL/HiL (real-time) simulation & verification; (model-based) software engineering; safety-critical embedded systems development; lab setups and software toolchains for development and verification
 - familiar with associated civil and military norms & standards as well as legal frameworks
 - strong affinity to technical documentation
- 9+ years of technical and administrative management experience of interdisciplinary, multinational, geographically distributed teams of engineers and scientists in varying team sizes (3–25 persons)

PROFESSIONAL EXPERIENCE

since October 1, 2023

System Developer for Networked Soldier Systems



Rheinmetall Electronics GmbH, Bremen, Germany
Business Unit Integrated Electronic Systems
Department of Networked Land Combat Systems

since April 1, 2025
direct employment

October 1, 2023 – March 31, 2025
temporary employment via **SThree Temp Experts GmbH**,
Frankfurt am Main, Germany

Fields of Work and Expertise:

- develop concepts for systems and subsystems
- perform requirements analysis and management
- prepare system and subsystem specifications
- conduct system integration and troubleshooting
- execute system testing activities
- support the preparation of cost estimates and schedules
- deliver technical proposal presentations to customers on-site
- support the negotiation of technical content with customers, partners, and suppliers
- assist in defining, planning, and monitoring work packages (target vs. actual)
- coordinate and/or prepare key system documentation
- conduct technical reviews and audits
- prepare technical decision-making documents (e. g., make-or-buy analyses)
- develop test concepts and documentation
- monitor current technological trends in the market
- report development progress and present results in project status meetings

May 21, 2012 –
September 31, 2023

Research Group Leader (since January 1, 2014) and **Research Engineer**



German Aerospace Center (DLR)
Institute of Space Systems, Bremen, Germany
Department of Guidance, Navigation and Control Systems

Roles:

- **Head of GNC Appliances Group** (since January 1, 2014)
Technical and administrative management of a research group (permanently established organizational unit) consisting of 5 team members with the main focus on holistic research, design, development, simulation, implementation, test, and verification of Guidance, Navigation, and Control (GNC) appliances for space applications.
 - responsible and independent professional representation of the whole subject area “GNC Appliances” for the entire department, both internally and externally
 - overall technical and scientific responsibility for all group activities
 - partial disciplinary management responsibilities towards employees: goal agreements; appraisal interviews; business travel permits; holiday/flextime permits; right to make suggestions for further training measures; involvement in hiring processes (job descriptions, requirements for applicants, selection of candidates); right to have a say in decision processes to extend or terminate employment contracts and the payment of allowances/bonuses

- planning and assignment of tasks to individual team members
- coordination and monitoring of the implementation of research and development projects and tasks; assumption of overall professional responsibility for all project and work package managers within the group
- planning of professional development of the research group
- independent initiation, preparation, and planning of new research projects and projects with national and international partners in science and industry
- accountability for scientific results and their dissemination
- coordination of knowledge management
- ensuring occupational health and safety in the area of responsibility
- **Deputy Head of the GNC Systems Department** (ex officio since January 1, 2014)
- **Head of the Hardware-in-the-Loop Technology Laboratory** (Feb. 2014 – Feb. 2023)
Laboratory for developing and testing GNC sensors, electronics, hardware, and embedded software in distributed real-time simulations.
- **Deputy Head of the GPS/INS Test & Verification Facility** (Dec. 2014 – Feb. 2016)
Facility for test and verification of GPS and inertial navigation sensors; equipped with a 3-axis rotation table, thermal chamber, and an L1/L2/L5 GPS constellation simulator.
- **Department IT Manager** (since June 2013)
- Further **project-related roles**: see section “Research & Development Experience”

Fields of Work and Expertise:

systems engineering; simulation & verification of GNC appliances; software engineering for GNC systems; embedded systems development; real-time data acquisition and handling; distributed reliable systems design; reliability and fault tolerance; model-based design, code generation, and verification; lab setups and software toolchains for development and verification; IT infrastructure planning and administration

Projects: see section “Research & Development Experience”

SECONDARY AND FREELANCE ACTIVITIES

since March 1, 2024

Sole Proprietor (secondary occupation)

M.Eng. René Schwarz
International Goods Trading
Syke, Germany

Business Focus:

Online retail of various goods from international origins, with a focus on products from Latin America and distribution of products with own designs (e. g., textiles, pins, stickers).

since February 1, 2023

Sole Proprietor (secondary occupation)

M.Eng. René Schwarz
Information Technology & Engineering Services
Syke, Germany



M.Eng. René Schwarz
IT & Engineering Services

Business Focus:

- IT consulting:
 - digitalization/automation of business and engineering processes
 - network technology

- servers, user-specific applications
- IT security
- creation, hosting, operation, and maintenance of websites and web applications
- advertising/marketing and technical documentation:
 - design of online and print media
 - corporate design and public relations
 - conceptualization and creation of technical documentation
- consulting and support in systems engineering:
 - elicitation, analysis, documentation, and management of requirements
 - system analysis and decomposition
 - validation and verification
 - technical planning
 - interface management
 - technical risk management
 - configuration management
 - technical data management
 - technical evaluation and decision analysis

Jun. 2011 – Dec. 2011

Consultant and Proposal Writer

Merseburg University of Applied Sciences, Merseburg, Germany
Prof. Dr. phil. Hardy GEYER, Vice-Rector for Teaching and Learning
Multiple work contracts for the university management for the development of a concept for the increase of application-oriented teaching and the improvement of supervision of beginning students

**Oct. 2009 – Sep. 2010 &
Oct. 2007 – Mar. 2009**

Student Assistant

Merseburg University of Applied Sciences, Merseburg, Germany
Faculty of Computer Science and Communication Systems
Prof. Dr.-Ing. Karsten HARTMANN, Dean
Research Project “Virtual Places”

Oct. 2009 – Mar. 2010

Student Assistant

Merseburg University of Applied Sciences, Merseburg, Germany
Faculty of Computer Science and Communication Systems
Prof. Dr. rer. pol. Ronny WEINKAUF
Development of an E-Learning Module

Mar. 2009 – Nov. 2009

Intern

German Aerospace Center (DLR), Institute of Space Systems, Bremen, Germany
Department of Guidance, Navigation and Control Systems
Experimental setup, protocol and software implementation for the system identification of reaction wheels of type RW90

Apr. 2007 – Sep. 2007

Student Assistant

Merseburg University of Applied Sciences, Merseburg, Germany
Faculty of Computer Science and Communication Systems
Prof. Dr.-Ing. Monika TRUNDT
Preparation of teaching materials in the field of electrical engineering

PROFESSIONAL & GENERAL COMPETENCIES

Development Methods & Tools

- embedded C/C++ software development using (cross-)compiler toolchains based on GCC on Linux and Windows (Cygwin, MinGW) systems
- version control of source code, documentation, and other data using Git and Subversion (SVN), both on CLI and using graphical interfaces such as TortoiseSVN/TortoiseGit
- collaborative development and management of source code, documentation, and other versioned data with GitLab and GitHub
- extensive use of collaboration tools such as Confluence, Jira, Mattermost, SharePoint
- software development automation using Jenkins and GitLab CI
- model-based C/C++ code generation using MATLAB/Simulink/Embedded Coder
- implementation of real-time software on RTEMS, FreeRTOS, and µC/OS-II RTOSs
- technical documentation writing with $\LaTeX$ (XeLaTeX, LuaLaTeX) utilizing MiKTeX and TeX Live on Windows and Linux systems; in-code documentation with Doxygen
- real-time simulations (PiL and HiL) with dSPACE SCALEXIO and PHS real-time simulation platforms and dSPACE ConfigurationDesk/ControlDesk
- static C/C++ code analyses using MathWorks Polyspace Bug Finder and Code Prover
- software architecture modeling with UML and Enterprise Architect
- requirements management with DOORS Classic & Next Generation, among others
- tailoring of relevant civil and military norms & standards to specific applications
- establishment of verification programs with the definition of associated verification methods, planning, tools, control methodology, documentation as well as verification management and organization based on ECSS-E-ST-10-02C

Programming/Scripting Languages

Bash, Basic, C, C++, C#, CSS, HTML, JavaScript, $\LaTeX$, Lua, Mathematica, (Embedded) MATLAB, Pascal, Perl, PHP, Python, R, XML

Project & Technical Management

- used traditional (waterfall, V model) and agile methods for project management
- held product owner, subsystem manager, and technical manager roles in various projects: responsibility for coordination of engineering teams; completion of work on budget and schedule; compliance to technical and legal requirements; management of stakeholder expectations; fulfillment of quality, reliability, and safety objectives; risk management
- prepared and supported several hundreds of public procurement processes, including national and international tendering processes, with a cumulative order value of several million euros with responsibility for the statement of work definition, technical specification definition, supplier selection, acceptance of deliverables, and supervision in technical officer role throughout the entire procurement process
- knowledge of relevant German, European, and international legal regulations such as AWG, AWV, KrWaffKontrG, Regulation (EU) 2021/821 (EU Dual Use Regulation), Regulation (EC) No 765/2008 (CE Marking), Directive 2011/65/EU (RoHS), Regulation (EC) No 1907/2006 (REACH), EAR, ITAR

Systems Engineering

- held systems engineering roles in the context of the development of complex, safety- and mission-critical avionics systems for space applications in various projects; responsibilities:
 - system design: stakeholder expectations definition; technical requirements elicitation; logical/functional system decomposition; design solution definition & trade-offs
 - product realization: product implementation; product integration; product verification; product validation
 - technical management: technical planning; requirements management; interface management; technical risk management; configuration management; change management; technical data management; technical assessment; decision analyses
- Certified Systems Engineer (GfSE) – Level C
- IREB Certified Professional for Requirements Engineering (CPRE) – Foundation Level
- ISTQB Certified Tester – Advanced Level – Test Automation Engineer (CTAL-TAE)

IT Competencies

- extensive knowledge and over 20 years of experience with planning, implementation, administration, and operation of IT infrastructure and services
 - administration of servers and clients based on Linux (mainly Ubuntu and Debian) and Windows, manually and with automated system configuration management tools such as Puppet
 - virtualization with classical (VMware vSphere & ESXi, VirtualBox, VMware Workstation) and container-based (Docker) approaches
 - setup and operation of web servers with Apache and PHP; MySQL, PostgreSQL, and IBM Db2 database servers; e-mail servers with Postfix and Dovecot; DNS servers with BIND; DHCP servers with ISC DHCP; SVN servers; SMB/CIFS file servers with Samba; Docker container registries with VMware Harbor
 - installation and administration of various web applications, among others: Confluence, DOORS Next Generation, Etherpad, Gitea, GitLab, ILIAS, Matomo (formerly Piwik), MediaWiki, Nextcloud, Overleaf (formerly ShareLaTeX), Owncloud, phpMyAdmin, Roundcube, WordPress
 - setup and operation of computer networks utilizing Cisco equipment with IOS (XE)
 - planning and administration of network firewalls based on pfSense & OPNsense
 - setup and operation of Synology iSCSI NAS systems in high availability settings
 - IT infrastructure monitoring with Zabbix
- certifications: ISTQB Certified Tester – Foundation Level (CTFL); ISC2 Certified in Cybersecurity (CC); Microsoft IT Support Specialist
- conception and programming of own software, contributions to several open source projects (e. g. Drupal CMS, Mozilla Firefox)
- developed own software to support professional activities in space engineering, e. g., in the domains of requirements management, verification control, automated documentation

Norms & Standards

- ECSS standards for verification (E-ST-10-02C), testing (E-ST-10-03C), systems engineering & requirements management (E-ST-10C, E-ST-10-06C), project lifecycle management (M-ST-10C), software engineering (E-ST-40C, Q-ST-80C), AOCS/GNC (E-ST-60-30C), dependability (Q-ST-30C), safety (Q-ST-40C)
- RTCA DO-178C/254/330/331/332 (EUROCAE ED-12C/80/215/218/217) for safety-critical software engineering and avionics development for aerospace applications
- IEC 60812/61025 and ECSS-Q-ST-30-02C for FMEA/FMECA/FTA for technical risk management and reliability & dependability engineering
- various IEEE standards in the context of software engineering and inertial sensors
- MIL-STD-810 for environmental qualification of U. S. military equipment
- various NASA standards and handbooks for verification and systems engineering
- CCSDS standards for Space Packet Protocol and XTCE
- MISRA-C/MISRA-C++ as coding guidelines for C/C++ programming

Software

Coding & Software Engineering:

Cygwin, Docker, Eclipse, Enterprise Architect, GCC, GDB, Oxygen XML Editor, Polyspace Bug Finder & Code Prover, Visual Studio, Visual Studio Code

Documentation, Illustration, and Publishing:

Adobe Illustrator, InDesign & Photoshop, Affinity Designer & Photo, Doxygen, GIMP, Inkscape, $\LaTeX$ /XeLaTeX/LuaLaTeX (MiKTeX and TeX Live), LibreOffice, Microsoft Office, pandoc

Engineering Tools:

Altium Designer, CATIA V5-6, dSPACE ConfigurationDesk & ControlDesk, IBM Rational DOORS, IBM Rational DOORS Next Generation, KiCad

Operating Systems:

Windows, Linux (especially Debian-based derivatives), VMware ESXi, Cisco IOS (XE), μ C/OS-II, RTEMS

Scientific Computing and Simulation:

Mathematica, MATLAB/Simulink, R, Scilab/Scicos, SPICE (NASA), Statistica, STK

Business Administration & Enterprise Resource Planning (ERP):
Sage Lohnabrechnung, SAP ECC

Other Software:

Citrix Workspace, VirtualBox, VMware vCenter Server, VMware Workstation Pro

Accreditations

Under the Laws of the Federal Republic of Germany:

- Driver's License, Classes AM, A1 (79.05), A2, A (79.03, 79.04), B, L
- Security Clearance for Pilots and Aircrew According to § 7 Abs. 1 Nr. 4 Luftsicherheitsgesetz (LuftSiG)
- Restricted Flight Radiotelephone Operator's Certificate II (BZF II)
- Emergency Responder According to § 10 Arbeitsschutzgesetz (ArbSchG) and § 21 Sozialgesetzbuch VII (SGB VII) — *expired*
- Permission to Operate Bridge and Pillar-Mounted Slewing Cranes According to the Regulations of the German Employer's Liability Insurance Association

Under the Laws of the European Union:

- Medical Certificate for Pilots, Class 2 (pertaining to an EASA Part-FCL license, issued in accordance with EASA Part-MED, complying with ICAO standards)
- EU Certificate of Competency A1/A3 for UAS Remote Pilots according to Implementing Regulation (EU) 2019/947

Languages

- German (native)
- English (proficient)
- Spanish (novice)
- Russian (learned in school, but never actively used)

GRADUATIONS & CERTIFICATIONS

January 8, 2026	Certified Systems Engineer (GfSE) — Level C Gesellschaft für Systems Engineering e. V. (GfSE)
October 2, 2025	ISTQB Certified Tester — Advanced Level — Test Automation Engineer (CTAL-TAE) International Software Testing Qualifications Board (ISTQB) certified by Certible
July 14, 2025	ISTQB Certified Tester — Foundation Level (CTFL) International Software Testing Qualifications Board (ISTQB) certified by Certible
July 1, 2025	ISC2 Certified in Cybersecurity (CC) International Information System Security Certification Consortium (ISC2)
June 23, 2025	Microsoft IT Support Specialist Microsoft
September 18, 2024	Certified Professional for Requirements Engineering (CPRE) Foundation Level International Requirements Engineering Board (IREB) certified by Certible
May 4, 2012	Master of Engineering (M.Eng.) in Computer Science and Communication Systems, Specialization in Artificial Intelligence Merseburg University of Applied Sciences, Merseburg, Germany

Master's Thesis:

*Development of an illumination simulation software for the Moon's surface:
An approach to illumination direction estimation on pictures of solid planetary
surfaces with a significant number of craters*

in cooperation with the Institute of Space Systems of the German Aerospace Center (DLR)

	German Grade	ECTS Grade	U. S. Grade
Thesis Grade	1.0 (very good)	A (excellent)	A
Overall Grade	1.0 (very good)	A (excellent)	GPA: 3.97/4.00

Supervisors:

- Prof. Dr. rer. nat. Hartmut KRÖNER (Merseburg University of Applied Sciences)
- Dipl. Math.-Techn. Bolko MAASS (DLR)

November 13, 2009

Bachelor of Engineering (B.Eng.)

in Mechatronics, Industrial and Physics Technology, Specialization in Mechatronics

Merseburg University of Applied Sciences, Merseburg, Germany

Bachelor's Thesis:

Simulationsmodell eines Reaktionsrades für den Satelliten „AsteroidFinder/SSB“

in cooperation with the Institute of Space Systems of the German Aerospace Center (DLR)

	German Grade	ECTS Grade	U. S. Grade
Thesis Grade	1.0 (very good)	A (excellent)	A
Overall Grade	2.0 (good)	B (very good)	GPA: 3.67/4.00

Supervisors:

- Prof. Dr.-Ing. Karsten HARTMANN (Merseburg University of Applied Sciences)
- Prof. Dr.-Ing. Rainer WINZ (Merseburg University of Applied Sciences)
- Dr.-Ing. Markus SCHLOTTERER (DLR)
- Dipl.-Ing. Ansgar HEIDECKER (DLR)

July 7, 2006

Higher Education Entrance Qualification with Honors (overall German grade 1.3)

July 9, 2003

Secondary School Certificate with Permission to Attendance at Senior Classes with Honors (overall German grade 1.22)

EDUCATION

since Oct. 2016

Undergraduate Student

FernUniversität in Hagen — University of Hagen, Germany
Faculty of Law, Bachelor of Laws (LL.B.) Degree Program

Oct. 2009 – May 2012

Graduate Student

Merseburg University of Applied Sciences, Merseburg, Germany
Faculty of Computer Science and Communication Systems
Master of Engineering Degree Program in Computer Science and Communication Systems,
Specialization in Artificial Intelligence

Oct. 2006 – Nov. 2009	Undergraduate Student Merseburg University of Applied Sciences, Merseburg, Germany Faculty of Engineering and Natural Sciences Bachelor of Engineering Degree Program in Mechatronics, Industrial and Physics Technology, Specialization in Mechatronics
Aug. 2003 – Jul. 2006	Student Technical High School, Merseburg, Germany Major: Electrical Engineering
Aug. 1997 – Jun. 2003	Student “Bertolt Brecht” Secondary School, Zöschen, Germany
Sep. 1993 – Jun. 1997	Student Elementary School, Wallendorf, Germany

ADVANCED TRAINING

September – December 2025	Preparation Course SE-ZERT Level C , oose eG, Bremen, Germany. <u>Instructor:</u> Björn SCHORRE, Germany
March 2021	Training “Polyspace for C/C++ Code Verification” (Certified Training) , MathWorks Online Training. <u>Instructor:</u> Nicolas SCHOONBROODT, MathWorks, France
February/March 2021	Training “C++ Programming for Embedded Systems” (Certified Training) , Doulos Online Training, United Kingdom. <u>Instructor:</u> Des HOWLETT, Doulos, United Kingdom
December 2020	Training “C Programming for Embedded Systems” (Certified Training) , Doulos Online Training, United Kingdom. <u>Instructor:</u> David LONG, Doulos, United Kingdom
October 2020	Training “Legally Compliant Design of DLR Websites for Content Responsibles” , German Aerospace Center (DLR), Internal Online Training.
June 2018	Training “Requirements Management with DOORS Next Generation” , German Aerospace Center (DLR), Bremen. <u>Instructor:</u> Jan JANCAR, Softacus GmbH, Germany
November 2017	Training “Business Management Processes” , German Aerospace Center (DLR), Internal Training for Executives, Cologne, Germany. Contents: Business Control Processes; Strategy and Key Figures; Programmatic Control; Specific Management Instruments (Innovation Management, Process Management, etc.)
November 2017	Training “Labor Law” , German Aerospace Center (DLR), Internal Training for Executives, Cologne, Germany.
September 2017	Training “Successful Acquisition of Third-Party Funding” , German Aerospace Center (DLR), Internal Training, Bremen, Germany. <u>Instructor:</u> Dr. rer. nat. Wilma SIMOLEIT, Förderungsberatung Simoleit, Germany
July 2017	Training “Personnel Responsibility” , German Aerospace Center (DLR), Internal Training for Executives, Rösrath, Germany.

- September 2016** **Training “Leadership and Team Management”**, German Aerospace Center (DLR), Internal Training for Executives, Rösraht, Germany.
Instructor: Dipl.-Psych. Ulrike WÖRRLE, Cologne
Contents:
DLR Requirements Profile for Managers; Management of Groups; Tools for Efficient Leading of Meetings; Phases of Team Development; Team Building; Systematic Decision Making and Problem Solving in Teams; Conflict Management in Groups and Teams: Emergence of Conflicts, Conflict Prevention and Resolution
- June 2016** **Training “Peer-Reviewed Publishing”**, German Aerospace Center (DLR), Internal Training for Scientific Personnel, Stuttgart, Germany.
Instructor: Prof. Dr. Gordon MÜLLER-SEITZ, Dahlem Research & Consulting Group GmbH
- June 2016** **Training “Personnel Management Through Efficient Communication”**, German Aerospace Center (DLR), Internal Training for Executives, Rösraht, Germany.
Instructor: Dipl.-Psych. Ulrike WÖRRLE, Cologne
Contents:
DLR Requirements Profile for Executive Personnel; Situational Leadership Style; Leading with Goals; Appraisal Interviews; Motivation and Job Satisfaction; Basics of Communication; Providing and Receiving Feedback; Emotion Control in Conflict-Ridden Situations
- May 2016** **Seminar “Liability Pitfalls”**, German Aerospace Center (DLR), Internal Training for Project Managers, DLR Headquarters, Cologne, Germany.
- May 2016** **Seminar “Export Control Laws”**, German Aerospace Center (DLR), Internal Training for Project Managers, DLR Headquarters, Cologne, Germany.
- March 2016** **Seminar “Project Management Compact” (Certified Training)**, German Aerospace Center (DLR), Bad Neuenahr, Germany.
Instructor: Dr. Ralf BRAUNE, Dr. Braune + Partner Project Management, Essen
Contents:
Project Management Terms and Definitions; Project Initiation; Project Planning; Risks and Risk Management; Project Controlling; Leading of Project Teams; Claim Management
24 Professional Development Units according to the guidelines of the Project Management Institute (PMI) have been earned with this training.
- February 2016** **Seminar “Copyright Law”**, German Aerospace Center (DLR), DLR Headquarters, Cologne, Germany.
- November 2015** Attendance at the **Space Tech Expo Europe**, November 17–19, 2015, Bremen, Germany.
- October 2015** Attendance at the **9th ESA Workshop on Avionics, Data, Control and Software Systems (ADCSS 2015)**, European Space Research and Technology Centre (ESTEC), European Space Agency (ESA) in Noordwijk, Netherlands.
- June 2015** Participant in the **Dialog between the Executive Board and Junior Managers** as Part of the Training for Young Executives. German Aerospace Center (DLR), DLR Headquarters, Cologne, Germany.

May 2015	ESA Level 2 Standardization Training Program: “Multidisciplinary Program on the Application of ESA List of Approved Standards”, ESA Internal Training, European Space Research and Technology Centre (ESTEC), European Space Agency (ESA) in Noordwijk, Netherlands. <u>Contents:</u> Training on Selected Disciplines of the ECSS Standards: • E10: System Engineering • E20: Electrical and Optical Engineering • E60: Control Engineering • Q60: Electrical, Electronic and Electro-Mechanical (EEE) Components
April 2015	ESA Level 1 Standardization Training Program: “Introduction to ESA Standardization System and its Implementation in the Agency’s Programs and Projects”, ESA Internal Training, European Space Research and Technology Centre (ESTEC), European Space Agency (ESA) in Noordwijk, Netherlands.
March 2015	Seminar “Preventing Espionage”, DLR-Internal Training for Executive Personnel, DLR Headquarters, Cologne, Germany.
October 2014	Laboratory Head Training, German Employer’s Liability Insurance Association, German Aerospace Center (DLR).
May 2014	Attendance at the 2014/May TEC-ED & TEC-SW Final Presentation Days, European Space Research and Technology Centre (ESTEC), European Space Agency (ESA) in Noordwijk, Netherlands.
March 2014	Seminar “Introduction to Patent Law”, German Aerospace Center (DLR).
January 2014	Attendance at the Workshop on ATD Experiment Flight Opportunities in the Frame of the German SHEFEX Program, European Space Research and Technology Centre (ESTEC), European Space Agency (ESA) in Noordwijk, Netherlands.
November 2013	Attendance at the 4th Astrium Space Transportation Research & Technology Days, November 28–29, 2013, Paris, France.
October 2013	Attendance at the 7th ESA Workshop on Avionics, Data, Control and Software Systems (ADCSS 2013), European Space Research and Technology Centre (ESTEC), European Space Agency (ESA) in Noordwijk, Netherlands.
May 2013	Seminar “Legal Aspects of Open Source Software”, German Aerospace Center (DLR), DLR Headquarters, Cologne, Germany.
April 2013	Seminar “Navigation and Data Fusion” (Certified Training), Technische Universität München (TUM) in Cooperation with MBDA Missile Systems, Garching, Germany.
	<u>Instructors:</u> Seminar Contents  https:// • Prof. Dr.-Ing. Florian HOLZAPFEL TUM, Chair of the Institute of Flight System Dynamics • Dr.-Ing. Johann DAMBECK, MBDA Missile Systems, TUM • Dipl.-Ing. Georg HERBOLD, MBDA Missile Systems, TUM • Dipl.-Ing. Benjamin BRAUN, TUM
October 2010	Seminar “Agil Extrem: Houston, we’ve had a problem. — Agile Methoden im Projektmanagement am Beispiel von Apollo 13” (Certified Training), Merseburg University of Applied Sciences, Merseburg, Germany. <u>Instructor:</u> Lucius BOBIKIEWICZ, MBA, Halle (Saale)

May 2010 **Seminar “Event Law” (Certified Training)**, Merseburg University of Applied Sciences, Merseburg, Germany.
Instructor: Mandy RISCH-KERST, Lawyer (eventlawyers.de), Berlin
Contents:
Contract and Liability Law; Employment Law; Business and Company Law; Industrial Property Protection; Entertainment and Internet Law; Law of GEMA; Insurance Law; Public Law; Fiscal Law (everything in the context of public events under the legislation of the Federal Republic of Germany)

AWARDS AND DISTINCTIONS

November 26, 2009 2009 Student Research Award of the Merseburg University of Applied Sciences (monetary award of 750.– €)

Research Paper:
*Versuchsaufbau, Protokoll- und Softwareimplementierung
zur Systemidentifikation von Reaktionsrädern des Typs RW90*

September 24, 2009 Certificate of Appreciation for the Contributions as Member of the Senate by the Principal of the Merseburg University of Applied Sciences

July 2006 Distinction — Valedictorian of the 2006 Class (3rd Place)

July 2004 Distinction — Valedictorian of the 2006 Class with Specialization in Engineering

July 9, 2003 Distinction — Valedictorian of the 2003 Class (3rd Place)

RESEARCH & DEVELOPMENT EXPERIENCE

Sept. 2017 – June 2022 **Cooperative Action Leading to Launcher Innovation for Stage Tossback Operation (CALLISTO)**
Development of a Vertical Takeoff, Vertical Landing (VTVL) reusable first stage of a space launcher, serving as technology demonstrator for future RLVs. CALLISTO is a joint project between the French National Center for Space Studies (CNES), DLR, and the Japan Aerospace Exploration Agency (JAXA). The development is carried out by a project team of ~200 engineers and scientists located at various sites across three continents.
Responsibilities & Fields of Work:
Hybrid Navigation System (HNS) and Vehicle On-Board Computer (OBC): work package manager; product owner (responsible for overall implementation of aforementioned systems); systems engineering; software engineering; avionics validation & verification; SiL/HiL test bench; ground support equipment

Jan. 2016 – June 2022**Reusability Flight Experiment (ReFEx)**

DLR-internal project for the research and development of technologies for reusable launch vehicles. The flight experiment shall demonstrate the capability to autonomously control the flight of a vehicle in hypersonic to transonic flight regimes.

Responsibilities & Fields of Work:

Hybrid Navigation System (HNS) and Guidance & Control Computer (GCC): work package manager and systems engineer; design of on-board computing and data handling architecture; highly reliable distributed systems design; software engineering; validation & verification; HiL test bench; ground support equipment

Feb. 2014 – July 2016**Euglena Combined Regenerative Organic-Food Production in Space (Eu:CROPIS)**

Astronauts must be supplied with air, water and food whilst in space. In order to recycle these vital resources over a long period of time and to make them available for several years, closed life support systems are needed. Eu:CROPIS was a biological life support system experiment to test the long-term stability and self-sustainability of a biological life support system for missions to the Moon or Mars. The satellite was launched on December 3, 2018 and was successfully operated with the AOCS working as planned.

Responsibilities & Fields of Work:

Attitude Control System Engineer (sensor front-end electronics, radiation test campaign)

Jan. 2013 – Dec. 2015**Sharp Edge Flight Experiment III (SHEFEX III)**

Third flight experiment mission within the Sharp Edge Flight Experiment (SHEFEX) program of DLR for the development of hypersonic flight and re-entry technologies. Project has been discontinued in favor of the new ReFEx project.

Responsibilities & Fields of Work:

Navigation System: work package manager and systems engineer, design of on-board computing and data handling architecture, highly reliable distributed systems design, software engineering

May 2012 – Dec. 2013**Simulation Model Library (SimMoLib)**

A simulation model library prototype for the exchange of validated, verified, and extensively documented simulation models between all DLR institutes.

Responsibilities & Fields of Work:

Ontology for the Linking of Simulation Models, Model Developer

May 2012 – Sept. 2023**Hybrid Simulation Platform for Space Systems (HPS)**

A MATLAB/Simulink-based simulation framework and library of simulation models for the simulation of AOCS and GNC systems for space applications. Developed in cooperation with the Center of Applied Space Technology and Microgravity (ZARM), Bremen, Germany. The HPS modules are the modular building blocks for GNC simulators; as of 2022, the HPS provides more than 90 interconnected modules out of the box, which are steadily used, extended, and improved throughout the DLR and ZARM projects. One major application focus of these modules are science missions with a high demand for measurement and control accuracy.

Responsibilities & Fields of Work:

Technical Manager, Developer

TEACHING EXPERIENCE

Courses

Summer Term 2010

Reliability and Quality Assurance

Merseburg University of Applied Sciences, Germany

Master Course, on behalf of Prof. Dr. rer. nat. habil. Eckhard LIEBSCHER

- Lecture “Accelerated Life Testing”
- Practical Courses “Systems Reliability”

Supervised Theses

Master’s Theses

- AYOUB, Samy: *Development of a Power Distribution Unit Controller for the SHEFEX III Navigation System*. Master of Science in Electrical Engineering. Cologne University of Applied Sciences, Cologne, Germany, July 13, 2015. **(Research Advisor)**
- KÖRNER, Felix: *Development of a Monitoring and Switchover System for Redundant Computers in a Fault-Tolerant Navigation System for Space Transportation Applications*. Master of Science in Electronic Systems for Automotive and Aerospace Systems. Braunschweig University, Germany, December 20, 2019. **(Research Advisor)**
- KWIATKOWSKI, Norbert: *Entwicklung von Test- und Verifikationsprozeduren für eine hochverfügbare Leistungsversorgungseinheit auf Basis einer Fehlermöglichkeits- und -einflussanalyse*. Master of Engineering in Electrical Engineering. Jade University of Applied Sciences, Wilhelmshaven Oldenburg Elsfleth, Germany, December 22, 2015. **(Research Co-Advisor)**
- REIGENBORN, Martin: *Development and Verification of a Power Distribution Unit Controller Software for a Hybrid Navigation System*. Master of Science in Space Engineering. Technische Universität Berlin, Germany, October 9, 2018. **(Research Advisor)**
- SCHNEIDER, Matthias Martin: *Development of a Real-Time Capable Ethernet Gateway for the SHEFEX III Navigation System*. Master of Science in Embedded Systems. Eindhoven University of Technology (TU/e), The Netherlands, August 7, 2015. **(Research Advisor)**

Bachelor’s Theses

- JOHANNSEN, Lars: *Erarbeitung eines Konzeptes zur aktiven Steuerung einer hochzuverlässigen Leistungsversorgungseinheit für ein hybrides Navigationssystem*. Bachelor of Engineering in Electrical Engineering. Bremen University of Applied Sciences, Bremen, Germany, July 13, 2015. **(Research Advisor)**
- KWIATKOWSKI, Norbert: *Entwicklung eines Referenzdesigns einer hochverfügbaren Leistungsversorgungseinheit für das SHEFEX III-Navigationssystem*. Bachelor of Engineering in Electrical Engineering. Jade University of Applied Sciences, Wilhelmshaven Oldenburg Elsfleth, Germany, January 27, 2014. **(Research Co-Advisor)**
- PROPPE, Myrthe: *Prototyp-Entwicklung einer Auswerteelektronik für Beschleunigungssensoren einer Inertialmesseinheit*. Bachelor of Engineering in Electrical Engineering. Bremen University of Applied Sciences, Faculty of Electrical Engineering and Computer Science, Bremen, Germany, July 18, 2014. **(Research Advisor)**

PROFESSIONAL AFFILIATIONS

since July 2025

International Information System Security Certification Consortium (ISC2)

Member

May 2007 – Dec. 2013

The Association of German Engineers (VDI)

Student Member

Mar. 2011 – Dec. 2012

Deutsche Physikalische Gesellschaft e. V. (DPG)

Member

PROFESSIONAL SERVICE TO SCIENTIFIC COMMUNITY

Organization of Events, Workshops, and Special Sessions

Feb. 2009 – Jun. 2009

Organizing Committee Member

2009 Whitsun Meeting. German Statistical Society (DStatG), Merseburg University and University of Halle, Germany, June 2009.

Academic Administration

Merseburg University
of Applied Sciences

- **Member of the Senate** (Oct. 2007 – Mar. 2009)
- **Chair of the Student Council** (Oct. 2007 – Sep. 2008)
- **Member of the Faculty Board** (Oct. 2008 – Mar. 2009)
Faculty of Engineering and Natural Sciences
- **Deputy Member of the Faculty Board** (Oct. 2007 – Sep. 2008)
Faculty of Engineering and Natural Sciences
- **Member of the Appointments Committee** (2007 – 2008)
Faculty of Engineering and Natural Sciences
Professor of Mechanical Engineering

VOLUNTARY AND SOCIAL ACTIVITIES

Promotion of
Open Source Software

- Supporter of the Free Software Foundation Europe e. V. (FSFE)
- Owner and Operator of the Comprehensive T_EX Archive Network (CTAN) Mirror (ctan.space-pro.be) for Germany and Europe
- Owner and Operator of a SpamAssassin Update Server (sa-update.space-pro.be)

streetracer
merseburg e. V.

Non-Profit Motorsports Association

- **Chairman** (Jan. 2006 – May 2009)
- **Foundation Member, Secretary** (2005)

Studentenclub
REAKTOR e. V.

Non-Profit Students' Association

- **Trustee, Legal Counselor** (November 2, 2012 – October 7, 2021)
- **Treasurer, Legal Representative** (Aug. 2008 – Nov. 2012)
- **Member** (April 2008 – October 2021)

Wikimedia
Deutschland e. V.

Local Chapter of the Wikimedia Foundation (Operator of Wikipedia) in Germany

- **Member** (2007 – 2013)

PRESENTATIONS

Conference Presentations

October 23/24, 2019

70th International Astronautical Congress (IAC)

Venue: Washington, D.C., United States

- Titles:
- *Architectures of Hybrid Navigation Systems (HNS) for Reusable Space Transportation Systems*
 - *The Hybrid Simulation Platform for Space Systems (HPS): A Modular MATLAB/Simulink-Based Simulation Library for GNC Systems Development*

July 1–4, 2019

8th European Conference for Aeronautics and Space Sciences (EUCASS), Conference on “Reusable Systems for Space Access”

Venue: Madrid, Spain

- Titles:
- *Overview of Flight Guidance, Navigation, and Control for the DLR Reusability Flight Experiment (ReFEx)*
 - *Preliminary Design of the Hybrid Navigation System (HNS) for the CALLISTO RLV Demonstrator*

May 8, 2014

13th International Conference on Space Operations (SpaceOps)

Venue: Pasadena, California, USA

Title: *A Fault-Tolerant On-Board Computing and Data Handling Architecture Incorporating a Concept for Failure Detection, Isolation, and Recovery for the SHEFEX III Navigation System*

PUBLICATIONS

Author Identifiers		
ORCID: 0000-0002-8255-9451	ResearcherID: D-4186-2015	Scopus Author ID: 56176660500

Refereed Scientific Publications

Articles in Scientific Journals

- DUMONT, Etienne; ISHIMOTO, Shinji; TATIOSSIAN, Pascal; KLEVANSKI, Josef; REIMANN, Bodo; ECKER, Tobias; WITTE, Lars; RIEHMER, Johannes; SAGLIANO, Marco; GIAGKOZOGLOU, Sofia; PETKOV, Ivaylo; ROTÄRMEL, Waldemar; **SCHWARZ, René**; SEELBINDER, David; MARKGRAF, Markus; SOMMER, Jan; PFAU, Dennis; MARTENS, Hauke: *CALLISTO: A Demonstrator for Reusable Launcher Key Technologies*, International Symposium on Space Technology and Science, June 15–21, 2019, Fukui, Japan. In: *Transactions of the Japan Society for Aeronautical and Space Sciences, Aerospace Technology Japan* **19**(1): 106–115. The Japan Society for Aeronautical and Space Sciences, January 4, 2021. ISSN 1884-0485. DOI 10.2322/tastj.19.106.
- BAUER, Waldemar; RICKMERS, Peter; KALLENBACH, Alexander; STAPPERT, Sven; WARTEMANN, Viola; MERREM, Clemens Hans-Joachim; **SCHWARZ, René**; SAGLIANO, Marco; GRUNDMANN, Jan Thimo; FLOCK, Andreas; THIELE, Thomas; KIEHN, Daniel; BIERIG, Andreas; WINDELBERG, Jens; KSENIK, Eugen; BRUNS, Thorben; RUHE, Tobias; ELSÄßER, Henning: *DLR Reusability Flight Experiment ReFEx*. In: *Acta Astronautica* **168**: 57–68. Elsevier, March 2020. DOI 10.1016/j.actaastro.2019.11.034.

Conference Proceedings

- DESHMUKH, Meenakshi; **SCHWARZ, René**; BRAUKHANE, Andy; LOPÉZ, Rosa París; GERNDT, Andreas: *Model Linking to Improve Visibility and Reusability of Models during Space System Development*. In: *Proceedings of the 35th IEEE Aerospace Conference*, March 1–8, 2014, Big Sky, Montana, USA. Institute of Electrical and Electronics Engineers (IEEE), March 2014. ISBN 978-1-4799-5582-4. DOI 10.1109/AERO.2014.6836287.

Non-Refereed Scientific Publications

Articles in Scientific Journals

- HALLMANN, Marcus; SCHLOTTERER, Markus; HEIDECKER, Ansgar; SAGLIANO, Marco; FUMENTI, Federico; MAIWALD, Volker; **SCHWARZ, René**: *GTOC 9: Results from the German Aerospace Center (Team DLR)*. In: *Acta Futura* (11): 47–53.

Advanced Concepts Team, European Space Technology Center (ESTEC), Noordwijk, Netherlands, 2018. ISSN 2309-1940. DOI: 10.5281/zenodo.1142857.

Books

- **SCHWARZ, René:** *Development of an illumination simulation software for the Moon's surface: An approach to illumination direction estimation on pictures of solid planetary surfaces with a significant number of craters.* Master's Thesis, Merseburg University of Applied Sciences, German Aerospace Center (DLR). Books on Demand, Norderstedt, Germany, 2012. ISBN 978-3-8482-1628-4.

Website with Supplemental Information • E-Book (PDF)

Book Chapters

- **SCHWARZ, René;** KRÖNER, Hartmut: *Wie weit ist es von Berlin bis Tokio? Entfernungsberechnung mit Quaternionen und Geodäten.* In: Hochschule Merseburg (ed.): *Forschungsbericht 2011:* 245–255. Hochschulverlag Merseburg, 2011. ISBN 978-3-942703-07-9. Online available at http://www.hs-merseburg.de/fileadmin/_migrated/content_uploads/FoBe_2011_HS_Merseburg_03.pdf.

Preprint (PDF) • Preprint (HTML)

Conference Proceedings

- TATIOSSIAN, Pascal; MILLET-LACOMBE, Laurent; IIZUKA, Nobuyuki; HÄSEKER, Janis Sebastian; **SCHWARZ, René;** GRIMM, Christian: *CALLISTO avionics development and Avionics Validation Facility.* 33rd International Symposium on Space Technology and Science (ISTS), February 28–March 4, 2022, Oita, Japan. Paper No. 2022-g-15.
- DUMONT, Etienne; ISHIMOTO, Shinji; ILLIG, Michel; SAGLIANO, Marco; SOLARI, Marco; ECKER, Tobias; MARTENS, Hauke; KRUMMEN, Sven; DESMARIAUX, Jean; SAITO, Yasuhiro; ERTL, Moritz; KLEVANSKI, Josef; REIMANN, Bodo; WOICKE, Svenja; **SCHWARZ, René;** SEELBINDER, David; MARKGRAF, Markus; RIEHMER, Johannes; BRAUN, Benjamin; AICHER, Moritz: *CALLISTO: towards reusability of a rocket stage: current status.* 33rd International Symposium on Space Technology and Science (ISTS), February 28–March 4, 2022, Oita, Japan. Paper No. 2022-g-13.
- KRUMMEN, Sven; DESMARIAUX, Jean; SAITO, Yasuhiro; BOLDT, Marcelo; BRIESE, Lale Evrim; CESCO, Nathalie; CHAVAGNAC, Christophe; CLIQUET-MORENO, Elisa; DUMONT, Etienne; ECKER, Tobias; EICHEL, Silas; ERTL, Moritz; GIAGKOZOGLOU, Sofia; GLASER, Thilo; GRIMM, Christian; ILLIG, Michel; ISHIMOTO, Shinji; KLEVANSKI, Josef; LIDON, Norbert; MIERHEIM, Olaf; NICCOLAI, Jean-François; REERSHEMIUS, Siebo; REIMANN, Bodo; RIEHMER, Johannes; SAGLIANO, Marco; SCHEUFLER, Henning; SCHNEIDER, Anton; SCHRÖDER, Silvio; **SCHWARZ, René;** SEELBINDER, David; STIEF, Malte; WINDELBERG, Jens; WOICKE, Svenja: *Towards a Reusable First Stage Demonstrator: CALLISTO — Technical Progresses & Challenges.* 72nd International Astronautical Congress (IAC), October 25–29, 2021, Dubai, United Arab Emirates. International Astronautical Federation (IAF). Paper No. IAC-21-D2.6.1.
- WINTER, Matthias; KRÜGER, Hans; FARI, Stefano; REDONDO GUTIERREZ, Jose Luis; RAZGUS, Bronislovas; WOICKE, Svenja; SEELBINDER, David; HERVIEU, Calum; VAN CAMP, Adriaen; MAGALHAES OLIVEIRA, Willem; SOLARI, Marco; WENZEL, Andreas; THEIL, Stephan; MAASS, Bolko; SAGLIANO, Marco; SCHLOTTERER, Markus; TRIGO, Guilherme Fragoso; HEIDECKER, Ansgar; **SCHWARZ, René;** BREMER, Stefanie: *ALINA Moon Lander GNC — Architecture, Design and Test Results.* 11th International ESA Conference on Guidance, Navigation & Control Systems, June 22–25, 2021, Virtual Event. European Space Agency (ESA).
- **SCHWARZ, René;** SOLARI, Marco; RAZGUS, Bronislovas; BESTARD KÖRNER, Matias; BRAUN, Benjamin; DUMKE, Michael; MARKGRAF, Markus; REIGENBORN, Martín; SOMMER, Jan; PFAU, Dennis; THIELE, Thomas; RIEHMER, Johannes: *Architectures of Hybrid Navigation Systems (HNS) for Reusable Space Transportation Systems.* 70th International Astronautical Congress (IAC), October 21–25, 2019, Washington, D.C., United States. International Astronautical Federation. Paper No. IAC-19.D2.5.3.
- **SCHWARZ, René;** BREMER, Stefanie; SEELBINDER, David; LIST, Meike; RIEVERS, Benny; KATO, Takahiro; WÖSKE, Florian: *The Hybrid Simulation Platform for Space Systems (HPS): A Modular MATLAB/Simulink-Based Simulation Library for GNC Systems Development.* 70th International Astronautical Congress (IAC), October 21–25, 2019, Washington, D.C., United States. International Astronautical Federation (IAF). Paper No. IAC-19.C1.IP.5.

- **SCHWARZ, René**; SOLARI, Marco; RAZGUS, Bronislovas; DUMKE, Michael; MARKGRAF, Markus; BESTARD KÖRNER, Matias; PFAU, Dennis; REIGENBORN, Martín; BRAUN, Benjamin; SOMMER, Jan: *Preliminary Design of the Hybrid Navigation System (HNS) for the CALLISTO RLV Demonstrator*. 8th European Conference for Aeronautics and Space Sciences (EUCASS), Conference on “Reusable Systems for Space Access”. July 1–4, 2019, Madrid, Spain. Paper No. 735. DOI 10.13009/EUCASS2019-735.
- **SCHWARZ, René**; KIEHN, Daniel; TRIGO, Guilherme Fragoso; RAZGUS, Bronislovas; WENZEL, Andreas; SEELBINDER, David; SOMMER, Jan; THEIL, Stephan; MARKGRAF, Markus; DUMKE, Michael; REIGENBORN, Martín; BESTARD KÖRNER, Matias; SOLARI, Marco; BRAUN, Benjamin; PFAU, Dennis: *Overview of Flight Guidance, Navigation, and Control for the DLR Reusability Flight Experiment (ReFEx)*. 8th European Conference for Aeronautics and Space Sciences (EUCASS), Conference on “Reusable Systems for Space Access”. July 1–4, 2019, Madrid, Spain. Paper No. 739. DOI 10.13009/EUCASS2019-739.
- DUMONT, Etienne; ISHIMOTO, Shinji; TATIOSSIAN, Pascal; KLEVANSKI, Josef; REIMANN, Bodo; ECKER, Tobias; WITTE, Lars; RIEHMER, Johannes; SAGLIANO, Marco; GIAGKOZOGLOU, Sofia; PETKOV, Ivaylo; ROTÄRMEL, Waldemar; **SCHWARZ, René**; SEELBINDER, David; MARKGRAF, Markus; SOMMER, Jan; PFAU, Dennis; MARTENS, Hauke: *CALLISTO: A Demonstrator for Reusable Launcher Key Technologies*. 32nd International Symposium on Space Technology and Science (ISTS), June 15–21, 2019, Fukui, Japan.
- SAGLIANO, Marco; TRIGO, Guilherme Fragoso; **SCHWARZ, René**: *Preliminary Guidance and Navigation Design for the Upcoming DLR Reusability Flight Experiment (ReFEx)*. 69th International Astronautical Congress (IAC), October 1–5, 2018, Bremen, Germany. International Astronautical Federation (IAF). Paper No. IAC-18.D2.5.9.
- RICKMERS, Peter; BAUER, Waldemar; SIPPEL, Martin; STAPPERT, Sven; **SCHWARZ, René**; SAGLIANO, Marco; TRIGO, Guilherme Fragoso; WÜBBELS, Guido; MARTENS, Hauke: *An Update of the Upcoming DLR Reusability Flight Experiment – ReFEx*. 69th International Astronautical Congress (IAC), October 1–5, 2018, Bremen, Germany. International Astronautical Federation (IAF). Paper No. IAC-18.D2.6.1.
- BAUER, Waldemar; RICKMERS, Peter; KALLENBACH, Alexander; STAPPERT, Sven; **SCHWARZ, René**; SAGLIANO, Marco; HÄSEKER, Janis S.; FLOCK, Andreas; THIELE, Thomas; BIERIG, Andreas; WINDELBERG, Jens; KSENIK, Eugen: *Upcoming DLR Reusability Flight Experiment*. 68th International Astronautical Congress (IAC), September 25–29, 2017, Adelaide, Australia. International Astronautical Federation (IAF). Paper No. IAC-17-D2.6.1.
- HALLMANN, Marcus; SCHLOTTERER, Markus; HEIDECKER, Ansgar; SAGLIANO, Marco; FUMENTI, Federico; MAIWALD, Volker; **SCHWARZ, René**: *GTOC 9, Multiple Space Debris Rendezvous Trajectory Design in the J2 environment*. In: *Proceedings of the 31st ISTS, 26th ISSFD & 8th NSAT Joint Conference*, June 2017, Pasadena, Matsuyama, Japan.
- **SCHWARZ, René**; THEIL, Stephan: *A Fault-Tolerant On-Board Computing and Data Handling Architecture Incorporating a Concept for Failure Detection, Isolation, and Recovery for the SHEFEX III Navigation System*. In: *Proceedings of the 13th International Conference on Space Operations (SpaceOps)*, May 5–9, 2014, Pasadena, California, USA. American Institute of Aeronautics and Astronautics (AIAA), May 8, 2014. AIAA Paper No. 2014-1874. DOI 10.2514/6.2014-1874.

LIST OF ABBREVIATIONS

AOCS	Attitude and Orbit Control System	FTA	Fault Tree Analysis
AWG	Foreign Trade and Payments Act <i>German: Außenwirtschaftsgesetz</i>	GCC	GNU Compiler Collection
AWV	Foreign Trade and Payments Ordinance <i>German: Außenwirtschaftsverordnung</i>	GCC	Guidance & Control Computer
B.Eng.	Bachelor of Engineering	GDB	GNU Debugger
BZF	Restricted Flight Radiotelephone Operator's Certificate <i>German: Beschränkt Gültiges Sprechfunkzeugnis für den Flugfunkdienst</i>	GfSE	Gesellschaft für Systems Engineering e. V.
CALLISTO	Cooperative Action Leading to Launcher Innovation for Stage Tossback Operation	GIMP	GNU Image Manipulation Program
CCSDS	Consultative Committee for Space Data Systems	GNC	Guidance, Navigation, and Control
CI	Continuous Integration	GPA	Grade Point Average
CIFS	Common Internet File System	GPS	Global Positioning System
CLI	Command-Line Interface	HiL	Hardware-in-the-Loop
CNES	French National Center for Space Studies <i>French: Centre National d'Etudes Spatiales</i>	HNS	Hybrid Navigation System
CPRE	Certified Professional for Requirements Engineering	HPS	Hybrid Simulation Platform for Space Systems
CTAL-TAE	Certified Tester — Advanced Level — Test Automation Engineer	ICAO	International Civil Aviation Organization
CTAN	Comprehensive T _E X Archive Network	IEC	International Electrotechnical Commission
CTFL	Certified Tester — Foundation Level	IEEE	Institute of Electrical and Electronics Engineers
DHCP	Dynamic Host Configuration Protocol	INS	Inertial Navigation System
DLR	German Aerospace Center <i>German: Deutsches Zentrum für Luft- und Raumfahrt e. V.</i>	IREB	International Requirements Engineering Board
DNS	Domain Name System	ISC	Internet Systems Consortium
EAR	Export Administration Regulations	ISC2	International Information System Security Certification Consortium
EASA	European Union Aviation Safety Agency	iSCSI	Internet Small Computer Systems Interface
EC	European Commission	ISTQB	International Software Testing Qualifications Board
ECSS	European Cooperation for Space Standardization	IT	Information Technology
ECTS	European Credit Transfer and Accumulation System	ITAR	International Traffic in Arms Regulations
ERP	Enterprise Resource Planning	JAXA	Japan Aerospace Exploration Agency <i>Japanese: 宇宙航空研究開発機構</i>
EU	European Union	KrWaffKontrG	War Weapons Control Act <i>German: Kriegswaffenkontrollgesetz</i>
Eu:CROPIS	Euglena Combined Regenerative Organic-Food Production in Space	M.Eng.	Master of Engineering
EUROCAE	European Organisation for Civil Aviation Equipment	MiL	Model-in-the-Loop
FMEA	Failure Modes and Effects Analysis	MISRA	Motor Industry Software Reliability Association
FMECA	Failure Modes, Effects, and Criticality Analysis	NAS	Network-Attached Storage
FSFE	Free Software Foundation Europe e. V.	NASA	National Aeronautics and Space Administration
		OBC	On-Board Computer

PiL	Processor-in-the-Loop
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
ReFEx	Reusability Flight Experiment
RLV	Reusable Launch Vehicle
RoHS	Restriction of Hazardous Substances Directive
RTCA	Radio Technical Commission for Aeronautics
RTEMS	Real-Time Operating System for Multiprocessor Systems
RTOS	Real-Time Operating System
SHEFEX	Sharp Edge Flight Experiment
SHEFEX III	SHEFEX III
SiL	Software-in-the-Loop
SimMoLib	Simulation Model Library
SMB	Server Message Block
STK	Systems Tool Kit
SVN	Subversion
U.S.	United States
UAS	Unmanned Aircraft Systems
UML	Unified Modeling Language
VTVL	Vertical Takeoff, Vertical Landing
XML	Extensible Markup Language
XTCE	XML Telemetric and Command Exchange
ZARM	Center of Applied Space Technology and Microgravity <i>German: Zentrum für angewandte Raumfahrttechnologie und Mikrogravitation</i>



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