


Name	LUTZ RICHTER	
Expertise		
Project Management, Business Development, Systems Design, Cost Estimation Modeling, Planetary Landers & Rovers, Terramechanics, Planetary Science, International Cooperation		
Education		
<p>2001 PhD in Aerospace Engineering, Technical University of Munich (TUM), Munich, Germany; thesis: 'Mobility Performance of Small Planetary Rovers'</p> <p>1994 MSc in Aerospace Engineering, Technical University of Aachen (RWTH), Aachen, Germany; thesis: 'Descent and Landing Analysis for the Rosetta Lander'</p>		
Experience		
<p>2010 - present Associate, LIQUIFER Systems Group (LSG)</p> <p>Main areas of activity:</p> <ul style="list-style-type: none"> - Space systems engineering, space robotics, space exploration - Planetary rover vehicles: analysis and sizing of locomotion subsystem using terramechanics models; rover wheels mechanical design - Design of soil testing instrumentation - Planetary soil simulants: definition, production, evaluation <p>2002 - 2010 President, Utopia Consultancies</p> <p>Main areas of activity:</p> <ul style="list-style-type: none"> - Consulting on planetary terramechanics and space science payloads - Wheel-soil interaction modeling for planetary rovers - Design & development of wheels for robotic vehicles <p>2007 - 2010 Head of 'Exploration Technology' department, DLR Institute of Space Systems, Bremen, Germany</p> <p>Selected projects:</p> <ul style="list-style-type: none"> - Build-up of the department while acquiring business and running R&D projects as well as flight H/W developments (mostly from the European Space Agency); <u>Responsibilities</u>: Team leadership, supervising projects - Planetary landing systems (DLR landing test facility; ESA 'Lunar Lander'), planetary rover vehicles and 		

wheels (ESA ExoMars rover), space robotics; Responsibilities: Proposal preparation, project management, oversight of lab build-up, development of mathematical wheel-soil interaction models

- Pre-development of HP3 instrument ('Heat Flow and Physical Properties Package') as a payload on the ESA Mars mission 'ExoMars' and on the proposed NASA/JPL lunar mission 'Lunette'; Responsibilities: Project management and systems engineering, interfacing with project partners; definition and oversight of functional testing in simulated Mars and Moon soils

- Asteroid exploration missions; Responsibilities: pre-project manager for MASCOT surface science package of Japanese 'Hayabusa-2' near-Earth asteroid sample return mission, interfacing with project partners in Japan and from several European countries, managing concurrent design studies

1999 - 2007

Project manager and team leader, DLR Institute of Space Simulation, Cologne, Germany, and DLR Institute of Planetary Research, Berlin, Germany

Selected projects:

- Development of 'Planetary Underground Tool' (PLUTO) drill flown on the 'Beagle 2' Mars lander of the ESA 'Mars Express' mission; Responsibilities: Project management and systems engineering, interfacing with project partners at DLR and from the UK, Hong Kong, Russia, as well as interfacing with customer ESA

- Space exploration technology development contracts from ESA (mainly related to rover vehicles); Responsibilities: Proposal preparation, DLR study manager

- NASA 'Mars Exploration Rover' (MER) mission; Responsibilities: Selected as science team member for Mars soil mechanics; active participation (to this day) in MER mission planning and flight operations

1994 - 1999

Systems Engineer and Study Manager, DLR Institute of Space Simulation, Cologne, Germany

Selected projects:

- 'Rosetta lander ('Philae)'; Responsibilities: DLR responsible trajectory analyst for the lander descent, landing and operations phases; support to project management and systems engineering

- Planetary rover technology contracts for ESA; Responsibilities: Proposal preparation, DLR study manager and systems engineer, rover wheel sizing through development and validation (by test) of a mathematical wheel-soil interaction model

Relevant Projects Overview

With ESA, NASA, JAXA, Astrium, RUAG Space, SELEX Galileo and others.

1. Mobile Instrument Deployment Device (MIDD), part I (customer: ESA), 1995-1997, mobility mechanisms for small planetary rovers pre-development with environmental testing
2. Mobile Instrument Deployment Device (MIDD), part II (customer: ESA), 1999-2002, mobility mechanisms for small planetary rovers pre-development and development of Engineering Model
3. M-ROSA (Micro Robots for Scientific Applications) (customer: ESA), 1996-1999, breadboarding study for small planetary rovers
4. MSM (Mole with Sampling Mechanism) (customer: ESA), 1999-2002, pre-development of a subsurface soil sampling electro-mechanical 'mole' (technology maturation for PLUTO sampler on 'Beagle 2' Mars lander)
5. PLUTO (PLanetary Underground Tool), 1999-2004, drill payload for 'Beagle 2' Mars lander of ESA Mars Express mission
6. MER (NASA Mars Exploration Rover mission), 2002-present, scientific Co-Investigator for Mars soil physical properties investigations
7. IMS (Instrumented Mole System) (customer: ESA), 2003-2006, instrumented 'mole' pre-

- development with environmental testing
8. HP3 Sensor Package (customer: ESA), 2004-2006, breadboarding study for sensor package for instrumented 'mole'
 9. HP3, 2006-2010, pre-development of HP3 geophysical instrument for ESA ExoMars and NASA Lunette missions
 10. MOVE (customer: German ministry of research and education), 2002-2007, trade-off's and design & development of mobility subsystem for terrestrial ocean floor mobile vehicle for marine science
 11. RCET (Rover Chassis Evaluation Tools) (customer: ESA), 2004-2006, predictive wheel-soil model for planetary rovers
 12. ExoMars Rover Phase B1 (customer: ESA), 2007-2008, wheel concept trade-off and preliminary design of wheels for ESA ExoMars rover
 13. ExoMars Rover Phase B2 (customer: ESA), 2008-2009, wheel-soil modeling and wheel performance testing for ESA ExoMars rover
 14. Landing System Development (customer: ESA), 2009-2011, footpad-terrain interaction for ESA Lunar Lander through modeling and testing

Papers + Publications + Lectures

More than 100 publications in high profile journals and conference proceedings in the field of planetary soil mechanics, wheel-soil interactions and space exploration; invited visits to Japan, Poland, Hong Kong; more than 10 invited keynote presentations at conferences and symposia; co-author of textbook 'The Martian Surface' (Cambridge University Press); lead author of upcoming (2011) textbook 'Planetary Rovers' (Springer Publishing). Detailed publications list available upon request.

Memberships

- German Aerospace Society (DGLR)
- Corresponding member (elected), International Academy of Astronautics (IAA)
- International Society of Terrain-Vehicle Systems (ISTVS): General Secretary and head of planetary rovers working group
- Editorial board member of the ISTVS's Journal of Terramechanics
- NASA Group Achievement Award for Mars Exploration Rover mission Science Operations Team