

Dr.-Ing. Karl Peter Leibenguth

Key competencies: Industrial quality assurance in management systems & laboratories; leadership, project design & management; knowledge transfer & communication, international, interdisciplinary and on all hierarchical levels; budgeting of projects and large-scale equipment; coverage of wide areas in materials testing and failure analysis

Professional experience – Highlights in management and expert positions

- 09/2019-today **Senior Subject Matter Expert Manufacturing at NOI AG, Bozen (IT):**
- consulting services for industry & inventors at the interface university-industry for automotive/automation sectors
 - technical/quality expertise, project design, funding at local and EU level
- 09/2022-today **Contract lecturer 'Design with Composite Materials' at Free University of Bozen/Bolzano, Bozen (IT):** conception, class lectures and exercises
- 04/2021-today **Auditor** according to ISO 19011 for ISO/IEC 17025 laboratories
- 01/2018-09/2019 **Deputy manager Quality Testing Laboratories at Plansee SE, Reutte (AT):**
- responsible for personnel (35 employees) and budget
 - quality management of ISO/IEC 17025 accredited labs (mechanical & non-destructive testing, materialographic and chemical labs)
 - quality planning, documentation & management reporting
 - processing of audits, customer complaints & external inquiries
 - execution of tests for series production and R&D facilities
 - introduction & control of measures for process-optimization, LIMS
- 06/2014-09/2019 **Group leader and laboratory manager 'Metalphysics Laboratory', Plansee SE:**
- responsible for personnel (6 employees) and budget
 - materialography, microscopy, metallurgy and thermophysics
 - planning & coordination of lab operations and equipment
 - development of standard operating procedures SOP for quality control
 - consulting for R&D, Intellectual Property, and production units
 - personnel training for technical and engineering level employees
- 06/2009-05/2014 **Project leader at Steinbeis-research center Material Engineering Center Saarland, Saarbrücken (DE):**
- acquisition and coordination of industrial projects & cooperations
 - technical consulting: material selection, failure and corrosion analyses of metals, coatings, and polymers
- 12/2008-05/2014 **Head laboratory manager at Chair of functional materials, Saarland University (UdS), Saarbrücken (DE):**
- procurement of scientific major equipment (including funding and tenders)
 - laboratory design & setup (5M€ equipment)
 - responsible for personnel (2 technicians, 10 undergraduate assistants)
- 07/2006-05/2014 **Research associate at Chair of functional materials (UdS):**
- project manager for laser and coating technologies (CVD/PVD), non-destructive material testing, microscopy, and diffraction methods
 - lecturer since 09/2004

Professional training

2006-2013	PhD	Material Science and Technology: <i>„Evolution of phases and microstructure in rapidly solidified metallic multilayers‘</i> , Chair of functional materials (UdS): magna cum laude
1999-2006	Diploma	Material Science and Technology: <i>„Setup and verification of an instrumented bulge-test for thin film mechanical characterisation‘</i> , Chair of functional materials (UdS): final mark 1,3
1998-1999	Mil. service	National service in Army Medical Corps, Tauberbischofsheim
1989-1998	Education	Gymnasium am Krebsberg, Neunkirchen: Abitur mark 1,4

Language skills

German	First language
English	Proficient use in spoken and written
Italian	Intermediate knowledge in spoken and written
French	Intermediate knowledge in spoken and written
Spanish	Elementary knowledge in spoken and written

Qualifications

Topics	2004-	Analytical electron and focused ion beam microscopy for site-specific microstructural and chemical analyses; X-ray diffraction analyses of phases, texture and residual stresses; coatings; laser surface treatments; metals, polymers, composite materials
Publications	2005-	15 full and 6 conference papers (ORCID 0000-0002-8811-5114)
Conferences	2006-	10 talks and 4 posters at international conferences
Instructor	2006-	11 talks at advanced training courses
Moderator	2020-	3 official and 10 privately commissioned webinars
Memberships	2006-	German Society for Material Science (DGM)
	2006-	German Physical Society (DPG)
	2006-	Association of German Engineers (VDI)
	2013-	German Society for Electron Microscopy (DGE)
Software	Analysis	Origin, maple, LabView, VG Studio, Granta Selector, ImageJ
	Other	SAP, Microsoft Office, LaTeX (MiKTeX), CorelDraw, Presonus StudioOne, Magix Video deluxe

Awards

2008	<i>Best-Poster-Award</i> EU-Materials Research Society Spring Meeting, Strasbourg
2006	Nominee for DGM-Award <i>Best Diploma thesis 2006</i> , Berlin
1998	<i>Book award of chemical industry for best written Abitur exam in chemistry</i>

Private activities

Hobbies	Reading, sports (running, swimming, paragliding), astronomy, audio production
Qualification	DFB-Olympic fencing trainer license levels C (since 1997) and B (since 1999)
Engagement	Competitive athlete (state & national level): fencing, track and field (since 1985) Young athlete’s representative: fencing division TuS 1860 Neunkirchen (2001-2007) and Saarländischer Turnerbund Friesenkampf (1996-2007) Presenter and editor: FM/Internet-Radio <i>„allesOK‘</i> (1997-2007), podcast on contemporary, scientific and intercultural issues <i>‘Think outside the Lyonerring‘</i> (2022-today)

Peer-review publications (ORCID [0000-0002-8811-5114](https://orcid.org/0000-0002-8811-5114), SCOPUS [852388790](https://scopus.org/authorities/6102388790))

J. Braun, L. Kaserer, J. Stajkovic, K.-H. Leitz, B. Tabernig, P. Singer, P. Leibenguth, C. Gspan, H. Kestler, G. Leichtfried
„Molybdenum and tungsten manufactured by selective laser melting: Analysis of defect structure and solidification mechanisms“
International Journal of Refractory Metals & Hard Materials, **84**(2019), 104999

L. Karge, D. Lang, J. Schatte, R. Gilles, S. Busch P. Leibenguth, H. Clemens, W. Petry
„Characterization of anisotropic pores and spatially oriented precipitates in sintered Mo-base alloys using small-angle neutron scattering“
Journal of Applied Crystallography, **51**(2018), 1706-1714

E. Ramos-Moore, P. Leibenguth, S. Slawik, R.S. Coelho, D. Horwat, S. Migot, B. Lechtaler, F. Mücklich
„Estimation of residual stresses in perovskite films for capacitor applications“
Thin Solid Films, **648**(2018), 21-25

P. Schoderböck, P. Leibenguth, M. Tkadletz
„Pattern decomposition for residual stress analysis: A generalization taking into consideration elastic anisotropy and extension to higher-symmetry Laue classes“
Journal of Applied Crystallography, **50**(2017), 1011-1020

K. Woll, A. Bergamaschi, K. Avcharov, F. Djurabekova, S. Gier, C. Pauly, P. Leibenguth, C. Wagner, K. Nordlund, F. Mücklich
„Ru/Al multilayers integrate maximum energy density and ductility for reactive materials“
Scientific Reports, **6**(2016), 19535

P. Schoderböck, H. Köstenbauer, P. Leibenguth
„Whole powder pattern decomposition – An application for the evaluation of residual stress states in consideration of steep stress gradients“
Thin Solid Films, **615**(2016), 183-189

B. Mayr-Schmölzer, Th. Werninghaus, D. Wirges, P. Leibenguth, M. Kathrein, H. Kestler, L.S. Sigl
„Diffusion assisted reactive coating for plasma resistant tungsten surfaces“
Metal Powder Report (2016), [dx.doi.org/10.1016/j.mprp.2016.03.002](https://doi.org/10.1016/j.mprp.2016.03.002)

M.A. Guitar, H. Aboulfadl, C. Pauly, P. Leibenguth, S. Migot, F. Mücklich
„Production of single-phase intermetallic films from Ru-Al multilayers“
Surface and Coatings Technology, **244**(2014) , 210-216

B. Raillard, C. Gachot, M. Hans, P. Leibenguth, F. Mücklich
„Microstructural characterization of laser-irradiated bulk copper under dry sliding conditions“
Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology, (2012), 1-11

B. Bax, C. Pauly, P. Leibenguth, K. Woll, F. Mücklich
„Synthesis of B₂-RuAl coatings on mild steel by laser cladding“
Surface and Coatings Technology, **206**(2012), 19, 3931-3937

E. Detemple, P. Leibenguth, C. Gachot, F. Mücklich
„Large-Area Patterned Formation of Intermetallic Phases on Ti/Al Multilayer Systems by Laser Interference Metallurgy“, Thin Solid Films, **519**(2010), 736-741

H. Shanak, K.-H. Ehses, W. Götz, P. Leibenguth, R. Pelster
„X-Ray Diffraction Investigations of α - Polyamide 6 Films: Orientation and Structural Changes upon Uni- and Biaxial Drawing“, Journal of Materials Science, **44**(2009), 2, 655-663

D. Bruch, D. Henes, P. Leibenguth, C. Holzapfel
„Mechanical Properties and Corrosion Resistance of Duplex Stainless Steel Forgings with Large Wall Thicknesses“, La Metallurgica Italiana, (2008), 6, 7-13

A. Koblishka-Veneva, C. Gachot, P. Leibenguth, F. Mücklich
„Investigation of Microstructure of Bulk Ni₂MnGa Alloy by Means of Electron Backscatter Diffraction Analysis“, Journal of Magnetism and Magnetic Materials, **316**(2007), e431-e434

K. W. Liu, C. Gachot, P. Leibenguth, F. Mücklich
„Combinatorial Experiment in Ni-Ti Thin Films by Laser Interference Structuring“
Applied Surface Science, **247**(2005), 550-555

Other publications and contributions to books

J. Braun, L. Kaserer, K.-H. Leitz, B. Tabernig, P. Singer, P. Leibenguth, I. Letofsky-Papst, H. Kestler, G. Leichtfried
„The effect of oxygen and carbon on molybdenum in laser powder bed fusion“
EuroPM 2020 Session 42: AM of HM

P. Leibenguth, S. Slawik, F. Mücklich, H. Welsch, H. Junk, K. Weiss, B. Busskamp
„Erhöhung der Dauerfestigkeit bei Zylinderkurbelgehäusen aus GJL durch Festigkeitsstrahlen“
VDI-Berichte, **2189**(2013), 153-170

S. Slawik, P. Leibenguth, H. Welsch, H. Junk, K. Weiss, B. Busskamp, F. Mücklich
„Erhöhung der Dauerfestigkeit bei Zylinderkurbelgehäusen aus GJL durch Festigkeitsstrahlen“
Österreichische Gießereirundschau, **60**(2013), 348-355

C. Gachot, P. Leibenguth, F. Mücklich
„Tribological Properties of Laser Interference Induced Microstructural Architectures in Metallic Thin Film Systems“, Friction, Wear and Wear Protection, (2009), 9-66

A. Velichko, M. Engstler, P. Leibenguth, F. Mücklich
„FIB-Tomografie für die 3D-Charakterisierung von komplexen Mikrostrukturen am Beispiel der quantitativen Untersuchungen von Graphitkeimbildung und Wachstumsmorphologie“
Proceedings Industrielle Computertomografie Tagung, (2008), 81-87

D. Bruch, D. Henes, P. Leibenguth, C. Holzapfel
„Investigations on Microstructure, Mechanical Properties and Corrosion Resistance of Large Thickness Duplex Stainless Steel Forgings“, Proceedings Stainless Steel World 2007, (2007), Paper-No.7022

Activities in work-related committees, commissions and scientific journals

2020-	Reviewer funding applications <i>Office for Innovation, Province South Tyrol</i>
2019-	Reviewer teaching course design <i>MSc and BSc syllabi Material Science</i> , UdS
2019-	Reviewer journal <i>Zeitschrift Review of Scientific Instruments</i>
2013-	Reviewer journal <i>Applied Surface Science</i>
2009-2012	Representative of the research associates in the research commission of UdS
2009-2014	Representative of the research associates in examination board of EU-Master studies program AMASE, Department Material science and engineering, UdS
2007-2014	Acting member in the departmental commission for transition from Diploma to BSc/MSc-system, UdS
2006-	Reviewer journal <i>Praktische Metallographie/Practical Metalography</i>
2005-2006	Undergraduate member of the departmental examination board, UdS

Teaching

2022-	Conceptual design and teaching: lecture and exercises " <i>Design with Composite Materials</i> ", Master Industrial Mechanical Engineering, Free University of Bolzano
2017-2019	Conceptual design and teaching: internal training of sales personnel " <i>Material Testing</i> ", Plansee SE Reutte
2016-2019	Conceptual design and teaching: lecture for vocational trainees " <i>Microscopy techniques and metallography</i> ", Plansee SE Reutte
2016-2019	Conceptual design and teaching: lecture for engineers and technicians in development and production " <i>Metallography, microscopy and diffraction techniques in testing laboratories</i> ", Plansee SE Reutte
2012-2014	Conceptual design and teaching: lecture, exercises and practical course " <i>Diffraction methods in material science II</i> " (Master level), UdS
2009-2014	Conceptual design and teaching: lecture, exercises and practical course " <i>Diffraction methods in material science I</i> " (Bachelor level), UdS
2007-2009	Conceptual re-design and teaching: lecture, exercises and practical course " <i>Analysis of micro- and nanostructures by diffraction methods</i> " (Diploma level), UdS
2007-2014	Coordination of teaching activities at Chair of functional materials, UdS
2005-2014	Teaching: lecture and exercises " <i>Analyse von Mikro- und Nanostrukturen mit Beugungsmethoden</i> " (Diploma level), UdS
2004-2007	Engagement in student recruitment campaigns, cooperations school-university and as tutor of pupil's research projects (Jugend forscht), UdS

Conferences, stays abroad and advanced training instructor

03-05/2023	<u>Mentor</u> : Protochallenge, Topology Optimization Student Challenge, Hub Innovazione Trentino, Trient (Valland SpA on LinkedIn: #protochallenge #successtory)
11/2022	<u>Attendance</u> : <i>Formnext</i> , Messezentrum Frankfurt
09/2022	<u>Attendance</u> : <i>Internationales Forum der Mechatronik</i> , Augsburg
11/2021	<u>Organisation and moderation</u> : Webinar " <i>Additive Fertigung: Ausbildung und Normenwerke</i> " (https://www.youtube.com/watch?v=bHLwFZ0dADs), NOI AG
11/2021	<u>Attendance</u> : <i>Formnext</i> , Messezentrum Frankfurt
10/2021	<u>Attendance</u> : <i>Internationales Forum der Mechatronik</i> , JKU Linz
09/2021	<u>Attendance</u> : <i>IAA</i> , Messezentrum München
04/2021	<u>Attendance</u> : " <i>Fachausbildung zum Auditor für Konformitätsbewertungsstellen nach ISO 19011</i> ", Online-Kursus mit Prüfung, Metras GmbH
04/2021	<u>Organisation</u> : Webinar " <i>EMC: Challenges in electronics design & certification</i> " (https://www.youtube.com/watch?v=4uWCms1sR7E), NOI AG
02/2021	<u>Attendance</u> : " <i>Basiskurs VG Studio Cast&Mold</i> ", Online-teaching with examination, Volume Graphics GmbH

Conferences, stays abroad and advanced training instructor (continued)

11/2020	<u>Moderation:</u> Webinar „Drohntechnologie für die Vermessung im alpinen Gelände“ (https://www.youtube.com/watch?v=KsmQ0r5qZ_k), NOI AG
11/2020	<u>Attendance:</u> <i>Formnext virtual</i> , Messezentrum Frankfurt
10/2020	<u>Organisation and moderation:</u> „Additive Fertigung: 3D Druck in der Produktion“ (https://www.youtube.com/watch?v=RiYco34Eg3I), NOI AG
11/2019	<u>Attendance:</u> <i>Formnext</i> , Messezentrum Frankfurt
09/2019	<u>Attendance:</u> <i>Internationales Forum der Mechatronik</i> , HS Cham
09/2018	<u>Attendance:</u> <i>Metallographietagung der DGM</i> , Montanuniversität Leoben
09/2017	<u>Attendance:</u> <i>Metallographietagung der DGM</i> , HS Aalen
03/2017	<u>Attendance:</u> DGM advanced training „Systematische Analyse technischer Schadensfälle“, Ermatingen/CH
09/2016	<u>Attendance:</u> <i>Metallographietagung der DGM</i> , FU Berlin
07/2015	<u>Attendance:</u> <i>18. Festkörperanalytiktagung</i> , TU Wien, Wien
06/2015	<u>Attendance:</u> <i>Advanced training EBSD in OIM and TEAM</i> , Fa. EDAX, Tilburg/NL
09/2014	<u>Attendance:</u> <i>Metallographietagung der DGM</i> , Montanuniversität Leoben
03/2014	<u>Instructor:</u> Advanced training for teachers „LPM-Fortbildungsseminar: Analytische REM- und FIB/REM-Anlagen“ Universität des Saarlandes, Saarbrücken
10/2013	<u>Instructor:</u> Deutsches Kupferinstitut (DKI)-Fortbildungsseminar „Oberflächentechnik und Beschichtung“ im Fraunhofer-in Haus-Zentrum, Duisburg
09/2013	<u>Talk:</u> <i>EUROMAT 2013</i> Sevilla, Symposium C4.IV Laser Micro-Nanoengineering
05/2013	<u>Talk:</u> <i>11th European Congress of Stereology 2013</i> , Kaiserslautern, Minisymposium Multiscale Analysis
05/2013	<u>Talk:</u> <i>International Congress on Metallurgical Coatings and Thin Films ICMCTF 2013</i> , San Diego, Topical Symposium TS2 Advanced Characterization of Coatings and Thin Films
02/2013	Plenary talk: <i>7. VDI-Tagung Gießtechnik im Motorenbau</i> Magdeburg
09/2009	<u>Talk:</u> <i>Materials Science and Engineering MSE 2009</i> Glasgow, Symposium D21
03/2009	<u>Talk:</u> <i>DPG-Frühjahrstagung 2009</i> Dresden, Division Materialphysik, Symposium Mikro- und Nanomechanik
09/2008	<u>Talk:</u> <i>Materials Science and Engineering MSE 2008</i> Nürnberg, Symposium D11
05/2008	<u>Poster:</u> <i>E-MRS Spring Meeting</i> Strasbourg, Symposium B (Best-Poster-Award)
03-04/2008	<u>Research visit:</u> Argentina, Universidad Nacional de Rio Cuarto und Centro Atómico de Bariloche in a joint BMBF-funded research project
11/2007	<u>Talk:</u> <i>Südwestdeutsches Mechanikkolloquium 2007</i> Saarbrücken
10/2007	<u>Instructor:</u> NanoBioNet-Advanced training course „Gefüge und Bruch: 3D-Analyse von Werkstoffen auf der Mikro- und Nanoskala“ Universität des Saarlandes, Saarbrücken
03/2007	<u>Poster:</u> <i>DPG-Frühjahrstagung 2007</i> Regensburg, Division Materialphysik, Symposium Mikro- und Nanomechanik
03/2007	<u>Poster:</u> <i>8. Workshop Rasterkraftmikroskopie in der Werkstoffwissenschaft</i> , DGM-Arbeitskreis „Probe Techniques“, Chemnitz
02/2007	<u>Poster:</u> <i>8. Tagung Gefüge und Bruch</i> Bochum
02/2007	<u>Instructor:</u> NatWorking-Fortbildungsseminar „LPM-Fortbildungsseminar: Werkzeuge in der Nanowelt“ Universität des Saarlandes, Saarbrücken
09/2006	<u>Talk:</u> <i>4. Interreg-Workshop „Materials Science“</i> in Luxemburg
09/2006	<u>Instructor:</u> <i>Messe „Abi was dann?“</i> Congresshalle Saarbrücken
06/2006	<u>Talk:</u> <i>JuniorDGM-Tag 2006</i> Berlin, Wettbewerb „Beste Diplomarbeit 2006“ (nominated for award)
2006-2011	<u>Instructor:</u> DGM advanced training „Exakte Zielpräparation und 3D-Werkstoffanalyse für die Praxis“ Universität des Saarlandes, Saarbrücken

Supervision of undergraduate theses

- 2013 Master's thesis: T. Kreuter „Kristallographische Charakterisierung FIB-präparierter Atomsdendenspitzen mittels Transmissions-Kikuchi-Beugung“
- 2011 Diploma thesis: M. Wobrock „Laserinterferenz-Metallurgie von TiNi-Multilayern zur lokalen Induzierung des Formgedächtniseffektes“
- 2010 Master thesis: I.C. Schramm Benítez „Localized formation of intermetallic phases by LIMET in Ni/Al multilayer thin films“
- 2010 Bachelor's thesis: D. Henry „Prozessautomatisierung zur Messung und Auswertung von Oberflächentopographien anhand Methoden der Weißlichtinterferometrie“
- 2010 Student research project: M. Wobrock „Präparation von TiNi Dünnschichten mittels Ionenstrahl PVD für die Herstellung des thermischen Formgedächtniseffektes durch nachgeschaltete thermische Behandlungsverfahren“
- 2009 Diploma thesis: C. Frey „Ermittlung der optimalen Laser-Parameter zur lokalen Bildung intermetallischer Phasen in CuAl-PVD-Schichten mittels LIMET“
- 2008 Student research project: C. Frey „Systematische Neuerfassung der Sputterparameter metallischer und intermetallischer Element- und Verbindungstargets bei Verwendung einer filamentlosen HF-Ionenquelle“
- 2008 Diploma thesis: E. Detemple „Untersuchung der Steifigkeitsskalierung am Beispiel von LIMET-strukturierten TiAl-Multilayern mittels Bulge-Test“
- 2008 Student research project: E. Detemple „Aufbau eines KOH-Ätzstandes zur nasschemischen Probenpräparation für die Bulge-Test-Technik“
- 2008 Diploma thesis: A. Manzoni „Periodische LIMET-Strukturierung von metallischen Multilayer-Dünnschichten zur lokalen Erzeugung von intermetallischen Phasen“
- 2006 Student research project: M. Engstler „Untersuchungen zur Optimierung der Versuchsdurchführung am Röntgendiffraktometer Panalytical X'Pert MRD System“