Bernd Michael Müller-Bierl

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Summary

Experienced and interdisciplinary researcher with a background in physics, neuroimaging, and the philosophy of language. Demonstrated expertise in high-field MRI, quantitative modeling, and image analysis. Transitioned from applied biomedical research to independent theoretical inquiry, with current focus on the intersections of phenomenology, cognition, and linguistic representation. Recognized for conceptual clarity, methodological precision, and reflective depth in both scientific and philosophical work.

Education

- **1993–1997** Postgraduate Research (Doctoral Thesis), *Institut National Polytechnique de Grenoble*, Grenoble, France
  Numerical analysis of passive circuits in microwave engineering; French Government Fellowship. Modeling in FORTRAN using the Transmission Line Matrix (TLM) method and Mathematica.

- **1992–1993** Graduate Studies in Astrophysics, *Observatoire de Meudon (Paris) / Christian Huygens Laboratory (Leiden)*, France / Netherlands
  Attended DEA-level graduate program in astrophysics and space techniques. Participated in advanced lectures and seminars, and taught a dedicated seminar on gravitational wave detection based on foundational texts in general relativity. Derived the gravitational field equations following Weinberg's formalism. Wrote and defended a Master's thesis on the numerical modeling of galaxy distributions at the Observatoire de Meudon. Formal degree not conferred due to personal circumstances.

- **1990–1991** Diploma Thesis Student, *Fraunhofer Institute for Solar Energy Systems*, Freiburg, Germany
  Developed a theoretical framework for the measurement and performance analysis of multi-junction solar cells. Designed and implemented a simulation platform to determine cell conversion efficiency, enabling precise evaluation of advanced photovoltaic devices. Additionally developed a statistical method for assessing the homogeneity of the light field in a solar simulator.

- **1989–1990** Parallel Studies in Philosophy, *University of Freiburg*, Germany
  Attended advanced lectures and seminars in practical philosophy, epistemology, and phenomenology alongside studies in physics. Focused on Husserlian intentionality, Wittgenstein's theory of meaning, and the conceptual foundations of perception and cognition. This background laid the foundation for later independent work on the interface of philosophy and neuroscience.

- **1986–1991** Physics and Mathematics, *University of Freiburg / Constance*, Germany
  Emphasis on classical and quantum physics, numerical analysis, and field theory. Completed advanced coursework in differential geometry, analysis, tensor analysis in curved spaces, algebra, algebraic topology, and measure-theoretic probability; well beyond standard curriculum for theoretical physics. Graduate seminar on the EPR paradox, including an original formal derivation of Bell inequality violation from quantum mechanical principles and an extended seminar presentation.

Professional Experience

- **2013–Present** Independent Researcher, Affiliated Guest Scholar, University of Leipzig (2018–2020), Germany
Engaged in independent theoretical research at the intersection of phenomenology, language, and cognition. Pursued original conceptual work and manuscript development outside institutional funding structures. Through a guest affiliation at the Department of Theology, University of Leipzig, participated in seminars and conducted extensive academic library research, collecting digital source material for subsequent projects. Focused on developing a unified account of intentionality, experience, and verbal behavior.

- **2010–2013** Research and Support Scientist, *UZ Brussel*, Belgium Contributed to the ERASMUS MRI education program for international board-certified medical specialists across Europe (2010–2012), delivering lectures and supervising practical sessions in Łódź, Cambridge, and Dundee. In 2013, assumed responsibility for the Brussels course as host institution lead, overseeing curriculum design, coordination of teaching staff, and course organization. Facilitated academic exchange across institutional and national boundaries while supporting clinical research in diffusion and perfusion MRI. Contributed to studies on cardiac stress testing and perfusion imaging using cardiac MRI protocols. Collaborated with clinical and academic teams to advance technical development and support routine imaging operations.

- **2007–2010** Postdoctoral Fellow, *Max Planck Institute for Biological Cybernetics*, Tübingen, Germany
Engaged in neuroimaging research at ultra-high field MRI systems with a focus on functional brain imaging. Modeled spin-echo and gradient-echo BOLD contrast mechanisms in high-field fMRI, developing custom analysis tools and studied Statistical Parametric Mapping techniques for the analysis of functional imaging data. Participated in interdisciplinary collaborations at the interface of systems neuroscience and imaging physics.

- **2002–2007** Postdoctoral Fellow, *University Clinics of Tübingen*, Germany Conducted research and taught courses in medical physics, including MRI physics, MR angiography, and image modeling. Developed advanced methods for artifact assessment, correction, and signal analysis in MR-guided interventions. Initiated studies on MRI–metal artifact formation. Performed fundamental numerical simulations of magnetic field distributions and their effects on MRI artifacts. Collaborated closely with medical staff, students, and interdisciplinary research teams. Awarded the Innovation Prize for Medical Technology by the State of Baden-Württemberg (EUR 300,000). Completed the state-certified University Teaching Qualification Program (Hochschuldidaktik-Zertifikat Baden-Württemberg).

Awards and Honors

- **2004** Innovation Prize for Medical Technology, State of Baden-Württemberg
(€300,000 project funding)

Research Projects

- **2019–2023** Independent philosophical research on the intersections between phenomenology, language, and cognition. Developed a framework of perception that bridges Husserlian intentionality and neurocognitive dimensions. Ongoing manuscripts integrate insights from phenomenology, embodied cognition and linguistic analysis.

- **2017–2019** Initiated and conceptually designed the interdisciplinary research proposal "Ways of World-perception (WWP)". Proposed a framework for integrating subjective perceptual experience into models

of linguistic world-reference, incorporating findings from neuroimaging and philosophy of mind. Work laid the conceptual foundation for subsequent manuscript development.

- **2013–2016** Exploratory work on the foundations of perceptual categorization, with emphasis on verbal behavior and phenomenological description. Engaged with primary texts in phenomenology, philosophy of language, and cognitive psychology to inform a unified theoretical perspective. Provided groundwork for later theoretical and applied projects.

Teaching Experience

- **2010–2013** – Led Erasmus MRI education program for international board-certified medical specialists across Europe. Head of organization for the Erasmus Course on Basic MRI Physics in Brussels (2013). Delivered lectures at Erasmus Courses in Łódź (2010), Cambridge (2011), Dundee (2012), and Brussels (2013). Designed curriculum, coordinated teaching staff, and supervised practical training sessions.

- **2007** – Completed the state-certified University Teaching Qualification Program (Hochschuldidaktik-Zertifikat Baden-Württemberg).

- **2002–2007** – Taught medical physics courses, including MRI physics, MR angiography, and image modeling (University Clinics of Tübingen).

Publications

Peer-Reviewed Articles in Physics and Medical Imaging

[1] B. Müller-Bierl et al. "Signal increase for dipiridamol induced stress on cardiac magnetic resonance perfusion in minipig". In: *Journal of Cardiovascular Magnetic Resonance* 16.suppl 1 (2014), P75.

[2] B. Müller-Bierl et al. "Cylinders or walls? A new computational model to estimate the MR transverse relaxation rate dependence on trabecular bone architecture". In: *MAGMA* 27.4 (Aug. 2014), pp. 349–361.

[3] B. M. Müller-Bierl et al. "Biopsy needle tips with markers – MR compatible needles for high-precision needle tip positioning". In: *Medical Physics* 35.6 (June 2008), pp. 2273–2278.

[4] B. M. Mueller-Bierl et al. "Magnetic field distribution and Signal Decay in functional MRI in very high fields (up to 9.4 T) using Monte Carlo Diffusion modeling". In: *International Journal of Biomedical Imaging* 2007 (2007), p. 70309.

[5] B. Müller-Bierl et al. "Numerical simulations of intra-voxel dephasing effects and signal voids in gradient echo MR imaging using different sub-grid sizes". In: *MAGMA* 19.2 (May 2006), pp. 88–95.

[6] B. Müller-Bierl et al. "Compensation of magnetic field distortions from paramagnetic instruments by added diamagnetic material: measurements and numerical simulations". In: *Medical Physics* 32.1 (Jan. 2005), pp. 76–84.

[7] B. Müller-Bierl et al. "Numerical modeling of needle tip artifacts in MR gradient echo imaging". In: *Medical Physics* 31.3 (Mar. 2004), pp. 579–587.

Theoretical and Philosophical Work

[1] B. Bierl. "Reduction, Reinforcement, and Related Design in the Analysis of Verbal Behavior". Submitted to Journal of Theoretical and Philosophical Psychology; major revision requested on 2025-08-15. Original US title: "Reduction and Reinforcement Revisited: Integrating Skinner's Verbal Operants with Husserl's Phenomenological Method". 2025.

[2] B. Bierl. "Experience and Constitution in Husserl's Phenomenology". Submitted to Husserl Studies (rejected) and to Studia Phaenomenologica; rejection decision on 2025-07-28. Manuscript under revision. 2025.

[3] B. Bierl. "Experience and the Life-World: Husserl, His Readers, Merleau-Ponty, and Wittgenstein". Submitted on 2025-10-02; in peer review. 2025.

[4] B. Bierl. "Intentionality, Intersubjectivity, Life-World: The Systematic Role of Style in Husserl's Vocabulary and Method". Submitted on 2025-10-01; rejected. 2025.

[5] B. Bierl. "Ethology and the 4E Framework: Historical Continuities in the Study of Animal Behavior". Submitted on 2025-10-13; in peer review. 2025.

[6] B. Bierl. "From Brentano to Cognitive Science: The Genealogy of Experience Between Phenomenology and Empiricism". Submitted on 2025-10-17; later rejected in Human Studies and redirected with a suggestion to Phenomenology and the Cognitive Sciences. 2025.

[7] B. Bierl. "Enactive Hermeneutics: Toward a Constructivist Ontology of Understanding". Submitted on 2025-10-23; in peer review. 2025.

[8] B. Bierl. "Toward a Bio-Ethological 4E Linguistics: Language as Life in Mind and Behavior". Submitted on 2025-10-30; accepted as a forum discussion paper (decision communicated by Kleanthes Grohmann on 2025-11-04). 2025.

[9] B. Bierl. "Embodiment, Normativity, and Language: Reconstructing the Architecture of Mind Beyond Computationalism and Enactivism". Submitted; in peer review. 2025.

[10] B. Bierl. "Language, Grammar, Responsiveness – A Phenomenological Critique of Behaviorist Reaction Models". Submitted to Linguistics and Philosophy; rejected on 2025-07-14. Suggested resubmission to Human Studies and later to Continental Philosophy Review. 2025.

[11] B. Bierl. "Intentional Language Use Between Behavior and Experience". Submitted on 2025-07-29; in peer review. Decision expected in early 2026. 2025.

[12] B. Bierl. "Intentionality, Embodiment, and Responsiveness: Toward an Enactive Hermeneutics". Submitted and rejected on 2025-08-08; redirected with a suggestion to Phenomenology and the Cognitive Sciences (PCS). 2025.

[13] B. Bierl. "Meaning Before Language: Phenomenology, Animal Communication, and the Limits of Representation". Manuscript in preparation; not yet submitted. 2025.

[14] B. Bierl. "Limits of Signal Modulation in Linear Neuronal Chains: An Analysis Using the TLM Model". Submitted to Biological Cybernetics on 2025-08-09; rejected, with recommendation to consider preprint servers such as arXiv or bioRxiv. 2025.

Collaborative Publications (Co-authored)

[1] C. Thomas et al. "In vitro assessment of artifacts from commercially available markers for image-guided preoperative marking of bone and soft tissue lesions". In: *Journal of Vascular and Interventional Radiology* 21.7 (July 2010), pp. 1100–1104.

[2] K. Uludağ, B. Müller-Bierl, and K. Uğurbil. "An integrative model for neuronal activity-induced signal changes for gradient and spin echo functional imaging". In: *Neuroimage* 48.1 (Oct. 2009), pp. 150–165.

[3] P. Mertens et al. "Magnetic field distribution in the presence of paramagnetic plates in magnetic resonance imaging: a combined numerical and experimental study". In: *Medical Physics* 35.5 (May 2008), pp. 1777–1784.

[4] J. Pintaske, B. Müller-Bierl, and F. Schick. "Field perturbations by magnetic dipoles as a model for magnetically labelled cells in MRI". In: *Z Med Phys* 16.4 (2006). German, pp. 252–260.

[5] C. Juchem et al. "Combined passive and active shimming for in vivo MR spectroscopy at high magnetic fields". In: *Journal of Magnetic Resonance* 183.2 (Dec. 2006), pp. 278–289.

[6] J. Pintaske, B. Müller-Bierl, and F. Schick. "Geometry and extension of signal voids in MR images induced by aggregations of magnetically labelled cells". In: *Phys Med Biol* 51.18 (Sept. 2006), pp. 4707–4718.

[7] J. Pintaske, B. Müller-Bierl, and F. Schick. "Effect of spatial distribution of magnetic dipoles on Lamor frequency distribution and MR Signal decay – a numerical approach under static dephasing conditions". In: *MAGMA* 19.1 (Feb. 2006), pp. 46–53.

[8] A. Boss et al. "Magnetic susceptibility effects on the accuracy of MR temperature monitoring by the proton resonance frequency method". In: *Journal of Magnetic Resonance Imaging* 22.6 (Dec. 2005), pp. 813–820.

[9] K. Heidler and B. Müller-Bierl. "Measurement of multi-junction solar cells". In: *Proceedings of the 10th EC Photovoltaic Solar Energy Conference*. Ed. by D. Ong. Springer, 1991, pp. 111–114.

Languages

- German — Native

- English — Fluent

- French — Fluent

- Dutch — Conversational

Technical Skills

- **Programming:** ASSEMBLER, BASIC, C++, FORTRAN, Matlab, Python, R, IDL, TEX/LATEX

- **Artificial Intelligence:** Built a Dockerized, web-based Retrieval-Augmented Generation (RAG) system using GPT-5.1 and local 3B/7B/14B LLMs, deployed on an AI workstation (ASUS ROG Strix G18).

- **Modeling:** FEM, MoM, TLM, FD-TD, SPICE, COMSOL, Mathematica, SPSS

- **MRI Systems:** Siemens, Philips, Bruker, 0.2–16.4T field strengths

- **Numerical Competence:** High precision in simulation design, stability testing, and sensitivity analysis

- **Theoretical Acumen:** Deep conceptual insight into model architecture, biophysical relevance, and methodological boundaries

- **Writing and Argumentation:** Clear scientific expression with strong logical structure and reflective depth

References

- Prof. Fritz Schick, University of Tübingen Email: fritz.schick@med.uni-tuebingen.de

- Prof. Jürgen Hennig, University Medical Center Freiburg Email: juergen.hennig@uniklinik-freiburg.de

- Prof. Fabien Ndagijimana, University of Grenoble Email: fabien.ndagijimana@univ-grenoble-alpes.fr

- Prof. Kâmil Uğurbil, University of Minnesota Email: ugurb001@umn.edu