

Prof. Dr. Patrizio Neff

Curriculum Vitae

Personal data

Born 17th September, 1968 in Mosbach/Baden, Germany
Current position Full Professor (W3)
Contact University of Duisburg-Essen
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Education

1975–1979 **Basic primary school**, *Pestalozzi-Schule*, Groß-Umstadt.
1979–1981 **Primary school**, *Geiersbergschule*, Groß-Umstadt.
1981–1985 **Secondary modern school**, *Ernst-Reuter-Schule*, Groß-Umstadt, *O-level*.
1985–1988 **Grammar school**, *Alfred-Delp-Schule*, Dieburg, *university entrance diploma*.
1988–1989 **Military Service**, *Panzergranadierbataillon 53*, Fritzlar, Hessen.
1989–1992 **Undergraduate studies**, *TH Darmstadt*, Darmstadt.
Intermediate Diploma Mathematics and Examination in History (for teaching)
1992–1995 **Graduate studies**, *TH Darmstadt*, Darmstadt.
1992–1993 **Study abroad**, *University of Sussex*, Brighton GB.
Erasmus Stipendium, Lectures with Prof. Edmunds, Prof. Elliott
since 1994 **Collaborater in the working group 6**, **Prof. H.-D. Alber**, *TH Darmstadt*,
Darmstadt.
"Partial Differential Equations and Applications"
Nov. 1995 **Diploma in Mathematics**, *TH Darmstadt*, Darmstadt, "*Summa cum laude*".
Subjects I + II: Functional Analysis + Philosophy
1996–1997 **Ph.D. studies**, *TU Darmstadt*, Darmstadt.
Hessian State grant
Feb. 2000 **Ph.D.**, *TU Darmstadt*, Darmstadt, "*Summa cum laude*".
8th July, 2004 **Habilitation**, *TU Darmstadt*, Darmstadt.

Theses

- Nov. 1995 Diploma thesis
Title *"A stationary vortex ring as weak solution of the Euler equations"*
Supervisor Prof. H.-D. Alber
- Feb. 2000 Ph.D. thesis
Title *"Mathematical Analysis of Multiplicative Viscoplasticity"*
Referees Prof. H.-D. Alber, Prof. E. Meister
- Jul. 2004 Habilitation thesis
Title *"Geometrically exact Cosserat theory for bulk behaviour and thin structures. Modelling and mathematical analysis"*
Referees Profs. H.-D. Alber, M. Hieber, K. Hutter, S. Müller, P. Steinmann

Professional experience

- 1997–1998 **Collaborator in interdisciplinary Collaborative Research Center SFB 298, TU Darmstadt, Darmstadt.**
"Deformation and Failure" under direction of Prof. Kollmann.
- 1998–2000 **Lecturer Department of Mathematics, TU Darmstadt, Darmstadt.**
- 2000–2001 **Senior Lecturer Department of Mathematics, TU Darmstadt.**
- 2001–2002 **Visiting Associate Professor, California Institute of Technology, Pasadena, USA, Aeronautics, Prof. Ortiz.**
- 2002–2004 **Senior Lecturer Department of Mathematics, TU Darmstadt.**
- since July 2004 **Assistant Professor Department of Mathematics, TU Darmstadt.**
- Oct. 2005 **Substitute of Full Professor W3 of Nonlinear Analysis, University of Duisburg-Essen.**
- 2006–2009 **Senior Lecturer Department of Mathematics, TU Darmstadt.**
- since 2009 **Full Professor W3 and Chair of Nonlinear Analysis, University of Duisburg-Essen, Essen.**
- 2010–2012 **Dean of Studies, Faculty of Mathematics, University of Duisburg-Essen.**
- 2011–2015 **Initiator and speaker of the Mathematics Preliminary Course Program, University of Duisburg-Essen, supported by the Bund-Länder-Programm.**
- since 2012 **Member of faculty board, Faculty of Mathematics, University of Duisburg-Essen.**
- 2014–2015 **Collaborator on the creation of the OMB+ E-Learning Platform, Cooperation of 11 German universities.**
- spring 2016 **Visiting Professor, INSA, Lyon.**
- spring 2017 **Visiting Professor, INSA, Lyon.**

Teaching experience

- 2003 Introduction to Variational Methods (english).
- 2005 Elementare Partielle Differentialgleichungen.
- 2005–2006 Mathematische Modellierung und Differentialgleichungen.
- 2006–2007 Mathematik I für Biologen und Chemiker.
- 2007 Mathematik II für Chemiker und Biologen.
- 2007 Elementare Partielle Differentialgleichungen, *Darmstadt*.
- 2007–2008 Mathematik I für Biologen und Chemiker.
- 2008 Mathematik II für Chemiker und Biologen.
- 2008–2009 Analysis I für Mathematiker (english).
- 2009 Funktionalanalysis 1.
- 2009–2010 Analysis 1 für Mathematiker.
- 2010 Analysis 2 für Mathematiker.
- 2010–2011 Analysis 3 für Mathematiker.
- 2011 Funktionalanalysis 1.
- 2011–2012 Analysis 1 für Mathematiker.
- 2012 Analysis 2 für Mathematiker.
- 2012–2013 Analysis 3 für Mathematiker.
- 2013 Variationsrechnung und Sobolevräume.
- 2013–2014 Analysis 1 für Mathematiker.
- 2014 Analysis 2 für Mathematiker.
- 2014–2015 Analysis 3 für Mathematiker.
- 2015 Variationsrechnung und Sobolevräume.
- 2015–2016 Nichtlineare Elastizitätstheorie.
- 2016 Gewöhnliche Differentialgleichungen.
- 2016–2017 Charakteristikentheorie und PDE.
- 2018 Variationsrechnung und Sobolevräume.
- 2018–2019 Nichtlineare Elastizitätstheorie.
- 2019 Gewöhnliche Differentialgleichungen.
- 2019–2021 Analysis 1 für Mathematiker.
- 2021 Analysis 2 für Mathematiker.

Conferences and workshops

More than 150 talks and presentations, including the following:

- October 2001 **Seminar**, *Joint Mathematics and Mechanics Colloquium*, California Institute of Technology, Pasadena.
- May 2002 **Plenary lecture**, *Joint Mathematics and Mechanics Colloquium*, University of California, Berkeley.
- April 2004 **Seminar**, *Oberseminar Analysis*, Max-Planck Institut für Mathematik in den Wissenschaften.

- January 2005 **Plenary lecture**, *GAMM Seminar on Microstructures*, TU Darmstadt.
- November 2005 **Miniworkshop**, *Analysis and Computation of Microstructure in Finite Plasticity*, MFO, Oberwolfach.
- October 2006 **Seminar**, *COMMAS Summer School on "Computational Mechanics of Materials and Structures"*, Universität Stuttgart.
- December 2006 **Plenary lecture**, *Institute of Fundamental Technological Research*, Polish Academy of Sciences, Warsaw.
- April 2007 **Seminar**, *Instituts-Kolloquium*, Max-Planck Institut für Eisenforschung.
- September 2007 **Plenary lecture**, *Langenbach-Seminar*, Weierstraß Institut für Angewandte Analysis und Stochastik, Berlin.
- September 2007 **Plenary lecture**, *Advanced school on "Poly, quasi and rank one convexity in applied mechanics"*, Centre International des Sciences Mecanique (CISM), Udine.
- November 2007 **Seminar**, *Colloquium on Applied Analysis*, Universite Pierre et Marie Curie, Paris.
- January 2008 **Plenary lecture**, *IUTAM Symposium on Theoretical, Modelling and Computational Aspects of Inelastic Media*, Capetown.
- February 2008 **Seminar**, *Applied Mathematics Seminar*, Mathematical Institute, University of Oxford.
- May 2008 **Seminar**, *SISSA: International School for Advanced Science*, Trieste, Italy.
- May 2009 **Plenary lecture**, *Euromech-Conference 510: Mechanics of generalized continua*, Sorbonne, U-Paris 6, Paris.
- October 2009 **Plenary lecture**, 9th conference *"Shell-Structures: Theory and Applications"*, Gdansk-Jurata.
- November 2012 **Plenary lecture**, *Kolloquium des Fachbereiches Mathematik*, TU Darmstadt.
- July 2013 **Plenary lecture**, *Canadian Conference of Nonlinear Solid Mechanics*, McGill-University, Montreal.
- July 2013 **Invited**, *ASME-Annual Summer Meeting: SES Medal Symposium in honor of D.J. Steigmann*, Brown University, Providence.
- March 2014 **Plenary lecture**, *Euromech on Generalized Continua*, Cisterna di Latina.
- February 2015 **Plenary lecture**, *International Symposium on Modern Mathematics and Mechanics*, Olomouc.
- July 2015 **Invited**, *European Solid Mechanics Congress*, Madrid.
- October 2015 **Keynote**, *International Conference on Extended Continuum Models*, Antalya.
- November 2015 **Miniworkshop**, *Plasticity on Different Scales*, MFO, Oberwolfach.
- June 2016 **Plenary lecture**, *ETAMM Conference - Emerging Trends in Applied Mathematics and Mechanics*, Perpignan.
- July 2016 **Plenary lecture**, *Conference in Honour of G. Grioli*, Accademia Nazionale del Lincei, Rome.
- March 2017 **Invited**, *Minisymposium on dislocation-based plasticity*, GAMM annual meeting, Weimar.
- June 2017 **Keynote**, *International Symposium on Defects and Material Mechanics*, Lyon.
- February 2018 **Workshop**, *Variational Methods for the Modeling of Inelastic Solids*, MFO, Oberwolfach.
- April 2018 **Workshop**, *Nonlinear Data: Theory and Algorithms*, MFO, Oberwolfach.

- June 2018 **Plenary lecture**, *ETAMM Conference - Emerging Trends in Applied Mathematics and Mechanics*, Krakow.
- September 2018 **Keynote**, *Mathematics of Thin Structures*, Dresden.
- October 2018 **Workshop**, *Computational Engineering*, MFO, Oberwolfach.

Supervised Ph.D. theses

- 2006 **Daniel Balzani**, *Polyconvex anisotropic energies and modelling of damage applied to arterial walls*.
W3-Professor for Computational Engineering, Ruhr Universität Bochum
- 2007 **Ingo Münch**, *Ein geometrisch und materiell nichtlineares Cosserat-Modell. Theorie, Numerik und Anwendungsmöglichkeiten*.
W3 Professor Statistics and Dynamics, TU Dortmund
- 2008 **Joelle Beyrouthy**, *Reduction dimensionnelle d'un modele viscoelastique en grandes deformations*.
- 2009 **Wolfgang Müller**, *Newton-type algorithms on $SO(3)$ and elasto-plastic Cosserat models*.
- 2010 **Stefanie Vanis**, *Numerical simulation of finite micromorphic elasticity using FETI-DP domain decomposition methods*.
W2-Professor at the Faculty of Automotive Engineering, Ostfalia University of Applied Science Wolfsburg
- 2010 **Vera Vetrov née Ebbing**, *Design of polyconvex energy functions for all anisotropy classes*.
Full Professor, Institute of Engineering and Natural Science, Westfälische Hochschule, Gelsenkirchen
- 2016 **Robert Martin**, *Logarithmic strain and its role in nonlinear elasticity*.
Assistant Professor at the Faculty of Engineering, University of Duisburg-Essen
- 2016 **Christian Thiel**, *Neue Matrix-Ungleichungen und Anwendungen auf konstitutive Beziehungen in der nichtlinearen Elastizitätstheorie*.
- 2019 **Robert Martin**, *Generalized convexity of functions and relaxation in nonlinear elasticity theory*, Habilitation Thesis.
- 2021 **Jendrik Voss**, *Constitutive inequalities in nonlinear elasticity and quasiconvexity*.

Current Ph.D. students

- 2017- **Hassam Khan**, *Analytical solutions in the relaxed micromorphic model (DAAD grant)*.
- 2018- **Maryam Mohammadi Saem**, *Higher-order Γ -convergence for Cosserat shells*.

Publications

More than 142 refereed articles with > 1190 citations by > 550 authors in [MathSciNet](#), h-index (excluding self-citations): 29, see also

- o [zbMath](#)
- o [Web of Science](#)

- [arXiv](#)
- [google scholar](#) (> 6400 citations)
- [Research Gate](#) (> 6200 citations)

Grants and Funding

“Konstruktion und Analyse anisotroper polykonvexer Energiefunktionen”

DFG Research Project **NE 902/2-1** and **SCHR 570/6-1**, with J. Schröder

First funding period: 2006–2008, Second funding period: 2009–2011

Funding received: ~ 315.000 €

MINT-Vorkurs

Part of the *Bund-Länder-Programm*

One professorship (W2) and two assistant positions (TVL-E13)

Funding received: ~ 900.000 €

“Modelling and mathematical analysis of geometrically nonlinear elasto-plastic Cosserat shells with higher order effects”

DFG research project **NE 902/8-1** and **BI 1965/2-1**, with M. Birsan

Funding period: 2019–2022

Funding: ~ 175.000 €

Approved

“A variational scale-dependent transition scheme - from Cauchy elasticity to the relaxed micromorphic continuum”

DFG research project **NE 902/10-1** and with L. Scheunemann and J. Schröder.

Funding period: 2021–2024

Funding: ~ 11.000 €

Approved

Member of Editorial Board

- Zeitschrift für Angewandte Mathematik und Physik, Springer
- Mathematics and Mechanics of Solids, Sage
- Mathematics and Mechanics of Complex Systems, msp
- Journal of Elasticity, Springer
- Continuum Mechanics and Thermodynamics, Springer
- GAMM-Mitteilungen, Wiley
- Archive of Applied Mechanics, Springer

Main research interests

Nonlinear partial differential equations, generalized Korn’s inequalities, nonlinear elasticity theory, theory of shells, plates and membranes, elastoplasticity theory, extended continuum mechanics (Cosserat, micropolar, micromorph), homogenisation and Γ -convergence, matrix analysis