



Prof. Dr. Dr.h.c. Peter Fratzl

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Personal Data

Date of Birth: 13.09.1958
Place of Birth: Vienna, Austria
Nationality: Austrian

Curriculum Vitae

2009-

Honorary Professor (Physics of Biomaterials) at the University of Potsdam

2004-

Honorary Professor of Physics at Humboldt University Berlin

2003-

Director at the Max Planck Institute of Colloids and Interfaces, Department of Biomaterials, Potsdam-Golm, Germany

1998-2003

Chair of Metal Physics at the University of Leoben (Austria) and Director of the Erich Schmid Institute of Materials Science of the Austrian Academy of Sciences

1993

Scientific advisor to the director of the "Ludwig Boltzmann-Institute of Osteology", Vienna (Austria)

1993-1994

Visiting Research Fellow at the Heriot-Watt University in Edinburgh (UK)

1986-1998

Assistant and Associate Professor at the Institute for Materials Physics of the University of Vienna (Austria)

1981-1985

Researcher at the Austrian Academy of Sciences, Vienna and at "Laboratoire Leon Brillouin" in Saclay (France); Visiting Research Fellow at Hahn-Meitner-Institute in Berlin and at New York University

1983

Dr. rer. nat. Physics, University of Vienna (Austria)

1980

Ingénieur Diplômé de l'Ecole Polytechnique Paris (France)

Research Fields

- Biomimetic materials research. Structure function relation in biological materials
- Bone and mineral research with biomedical applications: Bone material quality in osteoporosis treatment, materials aspects in bone regeneration
- Mechanical properties and modeling of composite materials. Solid-state phase transformations
- More than 450 Publications in scientific journals and books; numerous invited lectures at conferences and institutions

Awards and Distinctions**2015**

Election as member of the Academy of Science and Literature / Mainz

2013

Election as member of the German Academy of Science and Engineering (ACATECH)

2013

Jerome B. Cohen Distinguished Lecture Series, Northwestern Univ., Evanston, USA

2012

Election as Fellow of the Materials Research Society (MRS), USA

2010

Doctor honoris causa, University of Montpellier, France

2010

Gottfried Wilhelm Leibniz-Preis

2008

Max Planck Research Prize for pioneering work on biological and bio-inspired materials (together with Prof. Robert Langer, MIT)

2008

Erwin Ühlinger Memorial Lecture, German Osteological Society

2007

Election as Corresponding Member of the Austrian Academy of Sciences

2007

Herbert Johnson Memorial Lectures, Cornell University, Ithaca, USA

2007

Seidman Family Memorial Lectures, Technion, Haifa, Israel

2000

Byk-Tosse Osteology Award

1998

Lilian B. Clark Lectureship, Univ. Texas at Dallas, USA

1997

Copp-Award of the German Osteological Society

1995

Austrian Government Award for Research in Rheumatology

1988

Erich Schmid Award of the Austrian Academy of Sciences

Selected Papers

1. **OSMOTIC PRESSURE INDUCED TENSILE FORCES IN TENDON COLLAGEN**
Admir Masic, Luca Bertinetti, Roman Schuetz, Shu-Wei Chang, Hartmut Metzger, Markus J. Buehler, Peter Fratzl
Nature Communications **6**, 5942 (2015)
2. **THE MECHANICAL ROLE OF METAL IONS IN BIOGENIC PROTEIN-BASED MATERIALS**
Elena Degtyar, Matthew J. Harrington, Yael Politi, Peter Fratzl
Angewandte Chemie Int. Ed. **53**, 12026 - 44 (2014)
3. **SELF-SIMILAR MESOSTRUCTURE EVOLUTION OF THE GROWING MOLLUSC SHELL REMINISCENT OF THERMODYNAMICALLY DRIVEN GRAIN GROWTH**
Bernd Bayerlein, Paul Zaslansky, Yannicke Dauphin, A. Rack, Peter Fratzl, Igor Zlotnikov
Nature Materials **13**, 1102 - 1107 (2014)
4. **NUCLEATION AND GROWTH OF MAGNETITE FROM SOLUTION**
Jens Baumgartner, Archan Dey, Paul H. H. Bomans, Cécile Le Coadou, Peter Fratzl, Nico A. J. M. Sommerdijk and Damien Faivre
Nature Materials **12**, 310 - 314 (2013)
5. **SELF- ASSEMBLY OF AMORPHOUS CALCIUM CARBONATE MICROLENS ARRAYS**
Kyubock Lee, Wolfgang Wagermaier, Admir Masic, Krishna P. Kommareddy, Mathieu Bennet, Inderchand Manjubala, Seung-Woo Lee, Seung B. Park, Helmut Cölfen and Peter Fratzl
Nature Communications **3**, 725 doi: 10.1038/ncomms1720 (2012)
6. **IRON-CLAD FIBERS: A METAL-BASED BIOLOGICAL STRATEGY FOR HARD FLEXIBLE COATINGS**
Matthew J. Harrington, Admir Masic, Niels Holten-Andersen, J. Herbert Waite, Peter Fratzl
Science **328**, 216 - 220 (2010)
7. **BIOMATERIAL SYSTEMS FOR MECHANOSENSING AND ACTUATION**
Peter Fratzl, Friedrich G. Barth
Nature **462**, 442 - 448 (2009)

8. **Collagen: Structure and Mechanics**
Peter Fratzl (editor)
506 pages, ISBN: 978-0-387-73905-2, Springer Science+Business Media, LLC
(2008)
(Including: P. Fratzl, Chapter 1, pp. 1 - 13)
9. **NATURE'S HIERARCHICAL MATERIALS**
Peter Fratzl and Richard Weinkamer
Progress in materials science 52, 1263 - 1334 (2007)
10. **THE ROLE OF WHEAT AWNS IN THE SEED DISPERSAL UNIT**
Rivka Elbaum, Liron Zaltzman, Ingo Burgert, Peter Fratzl
Science 316, 884 - 886 (2007)
11. **REVERSIBLE SWITCHING OF HYDROGEL-ACTUATED NANOSTRUCTURES INTO COMPLEX MICROPATTERNS**
A Sidorenko, T. Krupenkin, A. Taylor, P. Fratzl, J. Aizenberg
Science 315, 487 - 490 (2007)
12. **COOPERATIVE DEFORMATION OF MINERAL AND COLLAGEN IN BONE AT THE NANOSCALE**
Himadri S. Gupta, Jong Seto, Wolfgang Wagermaier, Paul Zaslansky, Peter Boesecke and Peter Fratzl
Proceedings of the National Academy of Sciences of the USA 103 (47), 17741 - 17746 (2006)
13. **FROM BRITTLE TO DUCTILE FRACTURE OF BONE**
Herwig Peterlik, Paul Roschger, Klaus Klaushofer and Peter Fratzl
Nature Materials 5, No. 1, 52 - 55 (2006)
14. **SKELETON OF EUPLECTELLA SP.: STRUCTURAL HIERARCHY FROM THE NANOSCALE TO THE MACROSCALE**
Joanna Aizenberg, James C. Weaver, Monica S. Thanawala, Vikram C. Sundar, Daniel E. Morse, Peter Fratzl
Science 309, 275 - 278 (2005)
15. **MATERIALS BECOME INSENSITIVE TO FLAWS AT NANOSCALE: LESSONS FROM NATURE**
Huajian Gao, Baohua Ji, Ingomar L. Jäger, Eduard Arzt, Peter Fratzl
PNAS **100**, Issue 10, 5597 - 5600 (2003)