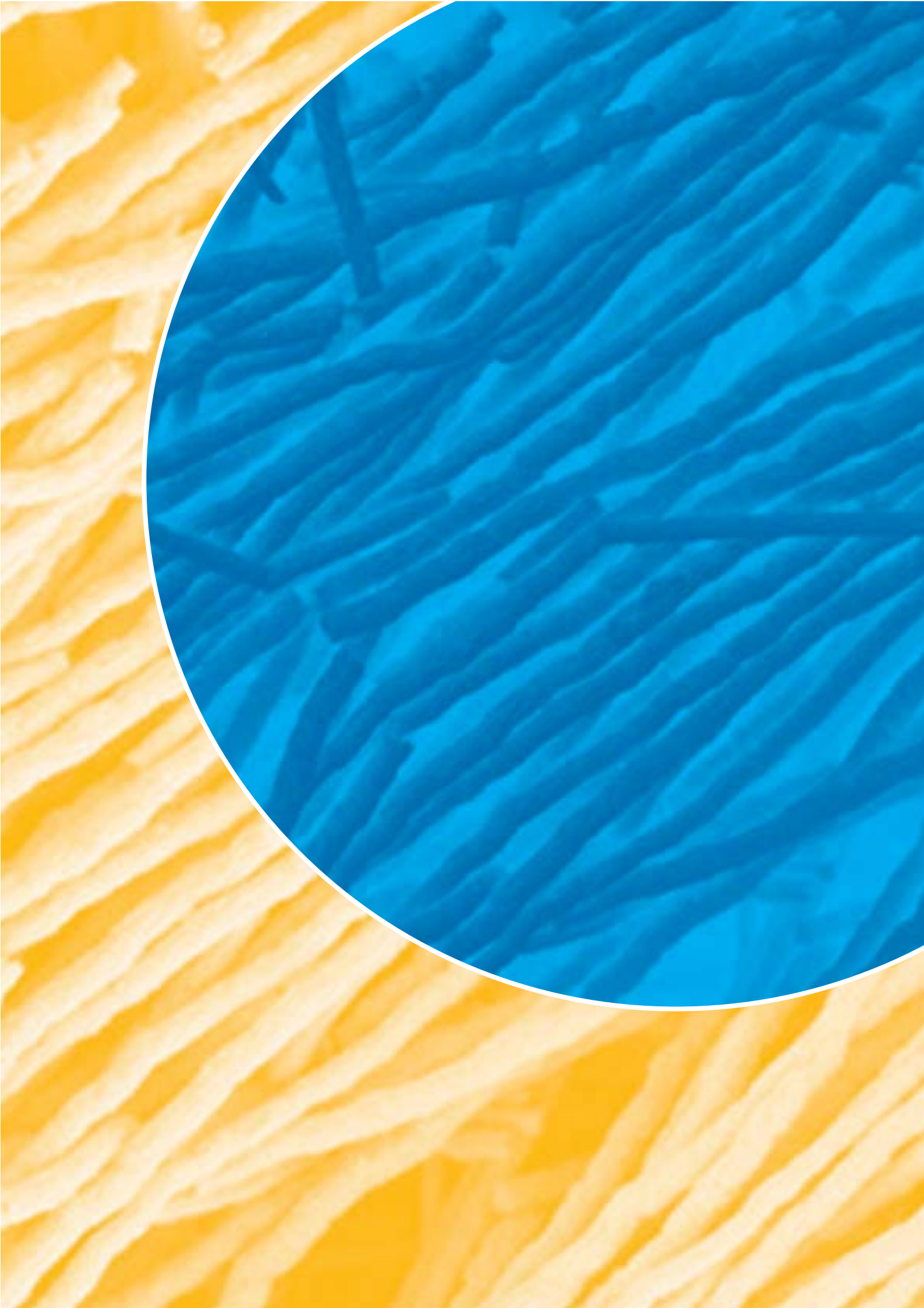




**APPENDIX**

APPENDIX APPENDIX APPENDIX APPENDIX



# Organigramm

## Organization Chart

### Biomaterials Director: Prof. Peter Fratzl · Secretary: Kerstin Gabbe

- Biological Materials**
  - Mineralized Tissues/Dr. Himadri S. Gupta
  - Bone Research/Prof. Peter Fratzl
  - Mechanobiology/Dr. Richard Weinkamer
  - Plant Biomechanics/Dr. Ingo Burgert
- Biomimetic Materials**
  - Biotemplating/Dr. Oskar Paris
  - Biomimetic Materials/Prof. Peter Fratzl
- Synchrotron Research**
  - Scanning Diffraction Beamline/Dr. Oskar Paris

### Colloid Chemistry Director: Prof. Markus Antonietti · Secretary: Annette Pape

- Heterophase Polymerization**
  - Heterophase Polymerizations – Polymer Dispersions/Dr. Klaus Tauer
- Mesostructured Organic-Inorganic Hybrid Materials**
  - Biomimetic Mineralization/Dr. Helmut Cölfen
  - Functional Mesostructured Inorganic-Organic Materials – Advanced X-ray Scattering Methods/Dr. Bernd Smarsly
- Polyelectrolytes and their Complexes**
  - Nanostructured Materials by Ionic Self-Assembly: Function and Switchability/Dr. Charl F. J. Faul\*
  - \*Since January 2005 permanent employee of the University of Bristol
- Amphiphilic Polymers**
  - Bioorganic -Synthetic Hybrid Polymers as Molecular LEGO<sup>®</sup>-Bricks/Dr. Hans G. Börner
  - Amphiphilic Block Copolymers/Dr. Helmut Schlaad
- Mesoporous Materials by Nanocasting and Nanocoating**
  - Porous Materials via Nanocasting Procedures: Innovative Materials and learning about Softmatter Organization/Prof. Markus Antonietti
- Synthesis and Assembly of Nanoparticles**
  - Synthesis, Functionalization, Assembly and Application of Metal Oxide Nanoparticles/Dr. Markus Niederberger
- Modern Techniques of Colloid Analysis**
  - Fractionating Colloid Analysis/Dr. Helmut Cölfen
  - Electron Microscopic Studies of Colloidal Systems and Biomaterials/Dr. Jürgen Hartmann
  - Multi Angle Laser Light Scattering in Dependence on Time/Dr. Gudrun Rother
  - Modern Methods of Light Scattering/Dr. Reinhard Sigel

### Interfaces Director: Prof. Helmuth Möhwald · Secretary: Karin Kreßler

- (Quasi) Planar Interfaces-Fluid Interfaces**
  - Interactions in Complex Monolayers/Dr. Gerald Brezesinski
  - Thermodynamics, Kinetics and Dilational Rheology of Interfacial Layers/Dr. Reinhard Müller
  - Molecular Organization in Soluble Monolayers and Functional Films/Dr. Hubert Motschmann
  - Thin Liquid Films/Dr. Regine v. Klitzing Since November 2004 Associate Professor (C3) in Physical Chemistry at University Kiel
  - Thermodynamics of Thin Layers/Dr. Hans-Joachim Müller, Dr. Rumen Krastev
  - Rheological Properties of Fluid Interfaces/Dr. Klaus-Dieter Wantke
- Solid Interfaces**
  - Nucleation, Interfacial Molecular Mobility and Ordering of Alkanes at Solid/Vapor Interfaces/Dr. Hans Riegler
- Non-Planar Interfaces**
  - Nanoscale Membranes: Adhesion and Mechanics/Dr. Andreas Fery
  - Ordering of Functional Nanoparticles/Dr. Dayang Wang
  - Modular Materials: From Dynamic to Nanotechnological Devices/Dr. Dirk G. Kurth
  - Bioinspired Control of Electrical and Optical Properties of Interfaces/Prof. Helmuth Möhwald
  - Multifunctional Polyelectrolyte-based Micro- and Nanocapsules/Dr. Gleb Sukhorukhov\*
  - \*Since March 2005 Chair in Biopolymers at the Queen Mary University of London
- Joint Laboratories**
  - Molecular Assembly of Biomimetic Systems/Prof. Junbai Li
  - Research Group Nanotechnology for Life Science/Dr. Jean-Francois Lutz

**Managing Director (2003-2004)**  
Prof. Dr. Helmuth Möhwald

**Theory** Director: Prof. Reinhard Lipowsky · Secretary: Gudrun Conrad

- Interfaces and Wetting** · Wetting Morphologies at Structured Surfaces/Prof. Reinhard Lipowsky
- Membranes and Vesicles** · Mesoscopic Simulations of Complex Nanostructures and Processes/Dr. Julian C. Shillcock  
· Properties of Thermally Fluctuating Vesicles/Dr. Thomas Gruhn  
· Thermal Fluctuations and Elasticity of Lipid Membranes/Dr. Wilhelm Fenzl  
· Effect of Electric Fields on Model Membranes; "Squaring" the Vesicle/Dr. Rumiana Dimova  
· Membrane Adhesion/Dr. Thomas Weikl  
· Mastering Membrane Fusion/Dr. Rumiana Dimova
- Polymers and Filaments** · Free and Tethered Polyelectrolytes/Dr. Christian Seidel  
· Structure Formation in Systems of Mesoscopic Rods/Dr. Thomas Gruhn  
· The Elasticity of Silk/Dr. Haijun Zhou  
· Semiflexible Polymers and Filaments/Dr. Jan Kierfeld
- Molecular Motors** · Traffic of Molecular Motors/Dr. Stefan Klumpp
- Biological Systems** · Protein Folding/Dr. Thomas Weikl  
· Emmy Noether Junior Research Group Cellular Adhesion Clusters under Force/Dr. Ulrich Schwarz\*  
\*Since February 2005 Leader of a Junior Research Group in the Centre for Modelling and Simulations in the Biosciences (BIOMS, Heidelberg University)  
· Evolution in Stochastic Environments/Dr. Angelo Valleriani
- Interdepartmental Activities** · Ions Interacting with Membranes and Polymers and in-between Comes Water/Dr. Rumiana Dimova  
· Advanced Confocal Microscopy/Dr. Rumiana Dimova

**Administration/Other Services**

Head: Andreas Stockhaus  
Secretary: Rita Heine

**Budgeting/Accountancy**

Head: Karin Schönfeld,  
Thea Dumke, Anke Klein

**Personnel**

Head: Gudrun Patz, Gisela Gutjahr

**Procurement/Purchase**

Head: Marianne Schulz, Sylvia Ost

**Other Services**

Head: Andreas Stockhaus  
Olaf Gaida, Bodo Ryschka

**Location Manager**

Reina Schlender

**Caretaker**

Peter Westermeier

**Campus Technique**

Head: Heiko Jung, Hagen Hannemann,  
Dirk Nast, Heinz Schmidt, Thomas Vogt

**Drawing and Photography**

Christine Steinger

**Electronic Workshop**

Henryk Pitas, Monika Scholz,  
Wolfgang Stein

**Glass Blowing Workshop**

Cliff Janiszewski

**IT-Service Group**

Head: Dr. Ingolf Müller,  
Thomas Baumann, Michael Born,  
Ingo Fiedler, Hans-Jürgen  
Schanze

**Library**

Head: Dorothea Stscherbina,  
Silke Niehaus-Weingärtner

**Mechanic Workshop**

Heads: Günter Haseloff,  
Wolfgang Katz,  
Andreas Kretschmar,  
Wolfgang Nierenz

**Public Relations**

Katja Schulze

**The Equal Opportunities Commissioners**

Radostina Georgieva, Antje Reinecke

**The Foreign People Commissioner**

Georg Garnweitner

**The Ph.D. Students Representatives**

Ilka Bischofs, Christian Holtze,  
Michelle Prevot, Wolfgang Wagermaier

**Works Council**

Head: Henryk Pitas, Thomas Baumann,  
Günter Haseloff, Andreas Kretschmar,  
Dr. Ingolf Müller, Olaf Niemeyer, Sylvia Ost,  
Gudrun Rother, Dorothea Stscherbina

# Fachbeirat

## Scientific Advisory Board

Name	Institution
Prof. Ruth Duncan	Centre for Polymer Therapeutics, Welsh School of Pharmacy (Cardiff University)
Prof. Gerhard D. Findenegg	Institute of Chemistry (Technical University Berlin)
Prof. Michael Grunze	Chair for Applied Physical Chemistry (University of Heidelberg)
Dr. Rüdiger Iden	Department of Polymer Physics (BASF AG)
Prof. George Jeronimidis	Centre for Biomimetics (The University of Reading)
Prof. Michael Klein	Department of Chemistry (University of Pennsylvania/Philadelphia)
Prof. Toyoki Kunitake	RIKEN Institute (The University of Kitakyushu)
Prof. Dominique Langevin	Laboratoire de Physique des Solides UMR C8502 Université Paris Sud
Dr. Wolfgang v. Rybinski	Henkel KGaA
Prof. Erich Sackmann	Department of Physics E 22 (Technical University Munich)
Prof. Michael Schick	Department of Physics (University of Washington, Seattle)
Prof. Steven Weiner	Department of Structural Biology (The Weizmann Institute of Science, Rehovot)

# Drittmittelprojekte

## Third Party Funds

### Öffentliche Zuwendungsgeber

Zuwendungs- geber	Thema	Projektleiter	Bewilligungszeitraum	Zusammenarbeit mit
BMBF	BioFuture: Nanofabrikation neuartiger biofunktioneller Materialien und Bioverkapselung	Dr. Caruso GF	01.11.1999-30.06.2004	
BMBF	Selbststrukturierende organisch-anorganische Hybridnanopartikel auf der Basis von amphiphilen Blockcopolymeren und Charakterisierung des Bildungsmechanismus ihrer Überstrukturen	Dr. Cölfen KC	01.06.2001-30.04.2004	Forschungszentrum Jülich GmbH
BMBF	Weiterentwicklung und Betrieb der Messstrecken A2 und BW4 für Kleinwinkelstreuung am HASYLAB (DESY)	Dr. Fenzl GF/TH	01.04.2001-31.03.2004	
BMBF	Nanobiotechnologie-Verbundprojekt: Multifunktionale künstliche Zellen als Transporter, Sensoren und Nanoreaktoren	Dr. Sukhorukov GF	01.05.2002-30.04.2005	Universität Leipzig Capsulation Nanoscience AG
BMBF	Polymere Haftvermittler zur Verbesserung der Eigenschaften funktionaler Papiere	Dr. Riegler GF	01.04.2002-31.03.2005	SCA Hygiene Products GmbH, Fraunhofer-Institut für Angewandte Polymerforschung, Capsulation Nanoscience AG
BMW i	Innovationskompetenz mittelständischer Unternehmen: Ausarbeitung der konzeptionellen Idee und Testung der Entwicklungsstufen zur Entwicklung eines allgemein anwendbaren Gerätes zur Bestimmung der physiko-chemischen Stabilitätsparameter von Schaum	Dr. Lunkenheimer UG	06.03.2002-28.02.2004	GIT Gesellschaft für innovative Technologie mbH
BAM(BMW i)	Nationale Tensid-Referenznormale	Dr. Lunkenheimer UG	01.11.2002-31.12.2004	
DLR	Finanzierung der Reise- und Aufenthaltsausgaben für die Durchführung des "Microgravity" Experiments - Reflight of FAST - im Rahmen der Shuttle Mission STS 107	Dr. Miller GF	01.09.2000-30.06.2003	
FWF Wien	Charakterisierung unbehandelter und modifizierter Holzfasern	Dr. Burgert BM	01.11.2003-31.10.2006	
HMI Berlin	Wissenschaftliche und technische Zusammenarbeit auf dem Gebiet der Untersuchung von Oberflächen und dünnen Schichten mit Neutronenstreuung	Prof. Möhwald GF	01.01.1999-31.12.2004	

BM – Abteilung Biomaterialien/Department of Biomaterials  
 GF – Abteilung Grenzflächen/Department of Interfaces  
 KC – Abteilung Kolloidchemie/Department of Colloid Chemistry  
 TH – Abteilung Theorie/Department of Theory  
 UG – Unabhängige Gruppe/Independent Research Group

## Öffentliche Zuwendungsgeber

Zuwendungs- geber	Thema	Projektleiter	Bewilligungszeitraum	Zusammenarbeit mit
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Biomimetische Mineralisation mit amphiphilen Blockcopolymeren	Dr. Cölfen KC	01.01.1998-31.12.2003	
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Synthese und Untersuchung des Assoziationsverhaltens von neuen linearen und verzweigten amphiphilen Blockcopolymeren	Dr. Schlaad KC	01.01.1998-31.12.2003	
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Phasenverhalten reiner Stoffe und binärer Mischungen in geordneten mesoporösen Materialien	Prof. Antonietti KC	01.01.1998-31.12.2003	
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Wechselwirkung von Nanopartikeln und Membranen	Prof. Lipowsky Dr. Döbereiner TH	01.01.1998-31.12.2003	
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Elektronentransferreaktionen in Materialien mit Polaritätsgradienten	Prof. Möhwald GF	01.01.1998-31.12.2003	Universität Potsdam
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Hierarchische Architekturen aus Modulen mit metallosupramolekularen Koordinations-Polyelektrolyten	Prof. Möhwald Dr. Kurth GF	01.01.2001-	
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Strukturbildung und Dynamik in selbstorganisierenden Blockcopolymer-Tensid-Mischsystemen	Dr. Schlaad KC	01.01.2004-	TU Berlin
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Ordnungsstrukturen in Systemen aus stäbchenförmigen Molekülen	Prof. Lipowsky Dr. Gruhn TH	01.01.2004-	
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Synthese molekularer Objekte mit neuer Architektur und deren hierarchische Strukturbildung	Prof. Antonietti KC	01.01.2004-	FU Berlin
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Strukturbildung von Polyelektrolyten und Kolloiden an flüssigen Grenzflächen und in dünnen Filmen	Prof. v. Klitzing GF	01.01.2004-	
DFG/TU Berlin	SFB 448: Mesoskopisch strukturierte Verbundsysteme; Molekulare Prozesse in mesoskopisch strukturierten Polyelektrolytsystemen	Prof. Möhwald GF	01.01.2004-	TU Berlin



## Öffentliche Zuwendungsgeber

Zuwendungs- geber	Thema	Projektleiter	Bewilligungszeitraum	Zusammenarbeit mit
DFG	Magnetische Eigenschaften, Strukturbildung und Synthese von Submikrometer großen magnetischen Hohlkugeln	Dr. Caruso GF	01.12.2001-31.05.2003	
DFG	Photonic Crystals from Coated Colloids	Dr. Caruso GF	01.08.2001-31.07.2003	
DFG	Kombination von Reflektions-Interferenz-Kontrast-Mikroskopie mit kraftmikroskopischen Methoden zur Untersuchung von Adhäsion und mechanischen Eigenschaften von Polyelektrolyt- Hohlkörpern	Dr. Fery GF	01.05.2003-30.04.2005	
DFG	Enzymatisch gesteuerte Benetzungsübergänge in zweidimensionalen dipolaren Langmuir-Filmen	Dr. Fischer GF	01.09.2002-31.10.2004	
DFG	Untersuchung und Charakterisierung supramolekularer Aggregate	Dr. Kurth GF	01.12.2002-30.06.2004	
DFG	Molekulare Orientierung und Aggregation von Tensiden an Grenzflächen zwischen zwei Flüssigkeiten	Dr. Müller GF	01.10.2002-30.09.2004	
DFG	Der Zusammenhang zwischen der Stabilität von Schäumen und Emulsionen und der Änderung der freien Energie bei der Bildung dünner Flüssigkeitsfilme	Dr. Müller GF	01.11.2000-31.05.2003	
DFG	Bildung zwei-dimensionaler hoch organisierter Strukturen auf Basis komplementärer Wasserstoffbrückenbindungen durch molekular-spezifische Erkennung	Prof. Vollhardt GF	26.11.2001-31.12.2003	
DFG	Auto-Oszillationen der Oberflächenspannung: Mechanismus und Wirkungsprinzipien eines neuartigen selbstorganisierenden dissipativen Systems	Prof. Vollhardt GF	15.05.2001-14.05.2003	
DFG	Controlled Radical Polymerization	Dr. Tauer KC	01.11.2002-14.12.2004	
DFG	Kolloidale magnetische Flüssigkeiten: Grundlagen, Entwicklung und Anwendung neuartiger Ferrofluide	Dr. Landfester KC	15.07.2001-26.04.2003	
DFG	Biokompatible magnetische Partikel: Herstellung und Charakterisierung polymerverkapselter, super-paramagnetischer Nanopartikel	Dr. Landfester KC	01.08.2002-30.09.2003	
DFG	Fluktuierende Riesenvesikel als morphologische Sonden zur Untersuchung der Materialeigenschaften amphiphiler Membranen und ihrer Wechselwirkung mit biologischen Makromolekülen	Dr. Döbereiner TH	01.05.2001-30.04.2003	

## Öffentliche Zuwendungsgeber

Zuwendungs- geber	Thema	Projektleiter	Bewilligungszeitraum	Zusammenarbeit mit
DFG	Adhäsion von Vesikeln an lateral strukturierten Grenzflächen	Prof. Lipowsky TH	01.05.2002-30.04.2004	
DFG	Simulation von an einer Fest-Flüssig-Grenzfläche verankerten Polyelektrolytketten bei expliziter Behandlung von Gegen- und Salzkationen	Dr. Seidel TH	01.08.2001-31.07.2003	
DFG	Untersuchung der spezifischen Wechselwirkung maßgeschneiderter Blockcopolymere und Polypeptide mit Mineraloberflächen in AFM-Desorptionmessungen	Dr. Cölfen KC	01.11.2003-	
DFG	Kristallisation von Calciumcarbonat und -phosphat über mesoskopische Transformation von Precursorpartikeln in natürlichen organischen Matrizen als Template und Modellsysteme für Biomaterialien	Dr. Cölfen KC	15.10.2003-14.10.2005	
DFG	Entwicklung von katalytisch aktiven Dendrizymen mit enzymanalogem Struktur-Wirkungsprofil	Dr. Kurth GF	15.07.2004-14.07.2005	
DFG	Structure Elucidation of Shear Oriented Ionic Self-Assembled Materials (SISAM)	Prof. Antonietti KC	09.09.2003-	
DFG	Higher Levels of Self-Assembly of Ionic Amphiphilic Copolymers: Strategies Based on Multiple Molecular Interactions (SONS-AMPHI)	Dr. Schlaad KC	01.10.2003-30.09.2005	
DFG	Auto-Oszillationen der Oberflächenspannung: Mechanismus und Wirkungsprinzipien eines neuartigen selbstorganisierenden dissipativen Systems	Prof. Vollhardt GF	15.05.2003-31.07.2004	
DFG	Counterion distribution in aligned lamellar phases and on monolayers at the air/water interface	Prof. Möhwald GF	01.11.2004-	
DFG	Adhesion and Fusion of Model Lipid Membranes	Dr. Dimova TH	01.01.2004-	
DFG	Controlled Precipitation of Biominerals using Catanionic Surfactant Self- Assembly Structures	Dr. Cölfen KC	15.08.2004-	

## Öffentliche Zuwendungsgeber

Zuwendungs- geber	Thema	Projektleiter	Bewilligungszeitraum	Zusammenarbeit mit
DFG	Koordinationsfonds des deutsch-französischen Kooperationspakets: Complex fluids: From 3 to 2 Dimensions	Prof. Möhwald GF	01.01.2004-31.12.2005	
DFG	Adsorptionsdynamik von Tensiden an Grenzflächen zwischen zwei Flüssigkeiten in Anwesenheit von Lösungsmittelgradienten.	Dr. Miller GF	01.10.2004-30.09.2006	
DFG	Nanodrähte und Nanoröhren: von kontrollierter Synthese zur Funktion	Dr. Niederberger KC	15.07.2004-14.07.2006	
DFG	Controlled Radical Polymerization (CRP) in aqueous heterophase systems	Dr. Tauer KC	01.11.2004-	
DFG	Funktionalisierte Monoschichten auf der Basis oberflächenaktiver Stoffe und polymerer Verbindungen	Dr. Miller GF	22.03.2002-	
DFG	Amyloid-Lipid-Wechselwirkung an Grenzflächen	Dr. Brezesinski GF	01.03.2003-28.02.2005	
DFG	Struktur metallocupramolekularer, hierarchisch strukturierter Materialien mit periodisch geordneten Metall-Ligand-Komplexen	Dr. Kurth GF	01.06.2003-31.05.2005	
DFG	Emmy-Noether-Programm: Modelling forces and signalling in cell adhesion – Nachwuchsgruppe	Dr. Schwarz TH	01.11.2001-31.10.2003	
DFG	Emmy-Noether-Programm: Bioorganische und biomimetische Polymere: Synthese, Charakterisierung und Anwendung der Polymerhybridsysteme – Nachwuchsgruppe	Dr. Börner KC	01.02.2003-	
DFG	Emmy-Noether-Programm: Modelling forces and signalling in cell adhesion – Nachwuchsgruppe	Dr. Schwarz TH	01.01.2004-31.01.2005	
DAAD	Projektbezogener Personenaustausch mit Frankreich	Dr. Brezesinski GF	01.01.2003-31.12.2004	

## EU

Zuwendungs- geber	Thema	Projektleiter	Bewilligungszeitraum	Zusammenarbeit mit
ESA/ESTEC	Topical Team: Foam and Emulsion Technologies- Concerted Action Team	Dr. Miller GF	01.10.2003-31.12.2004	Universität Aix-Marseille Universität Compiègne I.C.F.A.M. Genua
ESA/ESTEC	FASES - Fundamental and applied studies of emulsion stability	Dr. Miller GF	01.10.2003-30.09.2006	Universität Florenz
ESA	Bone Structure, changes in Microgravity	Dr. Saporin BM	01.10.2004-30.09.2005	Charité – Universitätsmedizin Berlin Universität Potsdam ZIB Berlin University of Aarhus Scanco Medical AG Siemens AG Indeed – Visual Concepts GmbH
EU	Nanocapsules with functionalized surfaces and walls	Prof. Möhwald GF	01.09.2000-31.08.2004	CNRS Toulouse EPFL-Dept. Chimie LCPPM, Lausanne I.C.F.A.M. Genua Advanced Drug Delivery Technologies AG Muttenz Nimbus Biotechnologie GmbH Leipzig, Faculdade Engenharia da Universidade do Porto, Porto, Universität für Bodenkultur, Wien
EU	Marie-Curie Programm “Early Stage Training on Biomimetic Systems”	Prof. Lipowsky Dr. Valleriani TH	01.09.2004-31.08.2005	University of Copenhagen Politecnico di Milano Université Paul Sabatier Toulouse University of Edinburgh University of Leoben
EU	Marie Curie Research Training Networks (RTN): Self-organized nanostructures of amphiphilic copolymers	Prof. Antonietti Dr. Schlaad KC	01.01.2004-31.12.2007	Universität Bayreuth, TU Berlin Wageningen Universiteit Commissariat a L'Energie Atomique, Paris Centre National de la Recherche Scientifique, Paris Univerzita Karlova v Praze BASF Aktiengesellschaft Rhodia Recherches S.A., Aubervilliers Universität Basel Moscow State University
EU	Nanocapsules for Targeted Controlled Delivery of Chemicals	Dr. Sukhorukov GF	01.03.2004-28.02.2007	SINTEF, Norwegen UFC, Frankreich ICSC, Poland PlasmaChem, Mainz Coventya, Frankreich Coatex, Frankreich ICB, Polen

## Stiftungen

Zuwendungs- geber	Thema	Projektleiter	Bewilligungszeitraum	Zusammenarbeit mit
AvH-Stiftung	Sofja Kovalevskaja-Preis: Design of multifunctional micro- and nano-sized polymer capsules	Dr. Sukhorukov GF	01.12.2001-31.12.2005	
VW-Stiftung	Tunable Selfassembled 2D and 3D photonic band-gap structures for applications in the visible optic, infrared and mm-wave ranges	Prof. Möhwald Dr. Caruso GF	01.03.2000-28.02.2003	Hebrew University of Jerusalem
VW-Stiftung	Polyoxometalate clusters in self-assembling hierarchical architectures: from discrete nanoscopic structures to extended liquid crystalline mesophases	Dr. Kurth GF	01.09.2002-31.08.2005	Universität Bielefeld Humboldt-Universität zu Berlin
VW-Stiftung	Biocomposite capsules as artificial viruses	Dr. Brezesinski GF	01.01.2003-31.12.2005	Universität Leipzig Universität Bochum
VW-Stiftung	Nanoengineered polymer capsules: tools for detection, controlled delivery and site specific manipulation	Dr. Sukhorukov GF	01.07.2004-30.06.2007	Universität München Internationale Universität Bremen
VW-Stiftung	Blockcopolymer vesicles with controlled uptake/release functions for drugs and Genes	Prof. Antonietti KC	15.07.2004-14.07.2007	Universität Hamburg Universität Duisburg Universität Freiburg
ZEIT-Stiftung	Nanochemie für eine zukünftige Automobiltechnik	Prof. Antonietti KC	01.01.2001-31.12.2003	MPI für Chemische Physik fester Stoffe Fritz-Haber-Institut der Max-Planck-Gesellschaft MPI für Kohleforschung

## Industrie

Zuwendungs- geber	Thema	Projektleiter	Bewilligungszeitraum	Zusammenarbeit mit
Bayer AG	Untersuchung des Adsorptionsverhaltens von Dispergierhilfsmitteln auf Oberflächen von organischen Feststoffteilchen	Dr. Miller Dr. Lunkenheimer GF/UG	01.07.2000-30.06.2003	
BASF AG	Polyurethandispersionen via Mini-Emulsionspolymerisation	Dr. Landfester KC	01.12.2000-30.11.2003	
BASF AG	Entwicklung neuer Detektionstechniken für die Analytische Ultrazentrifugation	Dr. Cölfen KC	01.12.2001-30.11.2004	
8sens.Bio- gnostic AG	Nanoverkapselte Enzymkristalle für Affinitätstests	Dr. Caruso GF	01.11.2001-31.10.2003	
Mitsubishi	Surface control by functional polymers	Prof. Antonietti Dr. Landfester KC	01.03.2002-28.02.2003	
L'Oréal	Nanocapsules and the encapsulation of lipophilic and hydrophilic molecules in particles composed of polyester type polymers by using the technology.	Prof. Antonietti KC	01.08.2002-31.07.2003	
AT&S	Kontrollierte Herstellung von Dispersionen leitfähiger Materialien	Prof. Antonietti KC	01.06.2002-31.05.2003	
Clariant AG	Entwicklung neuer Herstellungsverfahren zur Synthese und Verkapselung organischer Pigmente	Prof. Antonietti Dr. Landfester KC	01.06.2003-31.05.2004	
Clariant AG	Beeinflussung von Kristallisationsprozessen	Prof. Antonietti KC	01.10.2004-30.09.2005	
Schering AG	Kolloidale Diagnostika für die MRI	Prof. Antonietti KC	01.04.2004-30.03.2005	

# Ausgewählte Veranstaltungen

## Selected Events

- **09 April 2003 Poster Session**  
Price: Ilka Bischof and Ulrich Schwarz: "Cell Organization in Soft Media due to Active Mechanosensing"
- **06 May 2003 Campus Info Day**  
Surveys of Scientific Activities of the Golm Institutes and talks about more specific research topics
- **08 May 2003 Girl's Day**
- **12-13 May 2003 Soft Matters 2003**  
A Bilateral Symposium sponsored by the Laboratory for Research on the Structure of Matter (Philadelphia) and the Max Planck Institute of Colloids and Interfaces (Potsdam)
- **20 June 2003 Alumni Meeting and Poster Session**  
Trends in Colloids and Interface Science
- **05-10 October 2003 LB 10 on Organized Molecular Films in Beijing (China)**
- **12-13 November 2003 Meeting of the Scientific Committee/Fachbeirat and Poster Session**
- **26 November 2003 11th Anniversary of the Max Planck Institute of Colloids and Interfaces**
- **21 December 2003 Sonntagsvorlesung im Alten Rathaus Potsdam**  
"Auf die Verpackung kommt es an – Wirkstoffe in der Nano- und Biotechnologie" Prof. Helmut Möhwald
- **22 April 2004 Girl's Day**
- **23 April 2004 International Max Planck Research School on "Biomimetic Systems" (IMPRS) – Symposium**
- **12 May 2004 Leibniz-Kolleg Potsdam: "Evolution in der Chemie"**  
Experimental demonstrations for teachers and pupils
- **13 May 2004 Leibniz-Kolleg Potsdam: "Evolution in der Chemie"**  
Vortrag: Evolution in der gezielten Molekülsynthese, Nobelpreisträger Prof. Jean-Marie Lehn  
Direktor ISIS, Universität Louis Pasteur, Straßburg
- **11 June 2004 Alumni Meeting and Poster Session**  
Trends in Colloids and Interface Science, Price: Markus A. Hartmann et al.: Trabecular Bone Remodelling
- **09-12 September 2004 6th Elba Max Planck Forum on Nanoscale Science and Technology**  
Synchrotron Radiation and Nanobiosciences, Porto Conte - Sardinia (Alghero), Italy
- **26-30 September 2004 International Engineering Conference on Micromechanical Properties of Biomaterials**  
Tomar, Portugal
- **07-08 October 2004 Kick-off Meeting of the Marie Curie – Early Stage Training on "Biomimetic Systems"**  
Max Planck Campus Potsdam
- **05 November 2004 Symposium zur Systembiologie**  
Max-Planck-Institut für Kolloid- und Grenzflächenforschung, Max-Planck-Institut für Molekulare Pflanzenphysiologie  
Max-Planck-Campus Potsdam
- **17 November 2004 „Nanochemische Konzepte einer nachhaltigen Energieversorgung (ENERCHEM)“**  
Eröffnungskolloquium, München
- **22-23 November 2004 14th Ostwald-Kolloquium**  
"Fluids at Interfaces and in Pores: Phase Transitions and Related Phenomena" Tagungsstätte Harnack Haus, Berlin
- **17 December 2004 "Bionano – Zukunft der Nanotechnologie"**  
Berlin-Brandenburgische Akademie der Wissenschaften

# Wissenschaftliche Abschlüsse

## Scientific Degrees

### Diploma Theses

#### *Department of Interfaces:*

Bodenthin, Y.: Struktur dünner Filme aus metallo-supramolekularen Modulen. Universität Potsdam 2003.

Dönch, I.: Rasterkraftmikroskopie und Polyelektrolyt-Multilag. FU Berlin 2004.

### Master Theses

#### *Department of Biomaterials*

Stachewicz, U.: Mechanical Mapping of Compact Bone with Lamellar Resolution. University of Applied Sciences Münster and AGH University of Science and Technology in Krakow 2004.

#### *Department of Colloid Chemistry*

Franke, D.: Towards insulated molecular wires: Polymerization of surface active monomers onto 1-D and 2-D supramolecular supports. Universität Potsdam 2003.

Ba, J.: The synthesis of macroporous polymer gels and their use as scaffolds for fuel cell membranes and catalysts. Universität Potsdam 2004.

Fischer, A.: Synthesis and Characterization of mesoporous crystalline tin oxide. Universität Paris 2004.

Sel, Ö.: Towards Functional Hierarchical Polymer Colloids. Universität Potsdam 2004.

### PhD Theses

#### *Department of Biomaterials*

Wöß, A.: Rapid Prototyping zellulärer Materialien. University of Leoben 2004.

#### *Department of Colloid Chemistry*

Krasia, T.: Synthesis and colloidal properties of a novel type of block copolymers bearing  $\beta$ -dicarbonyl residues. Universität Potsdam 2003.

Montenegro, R.: Crystallization, Biomimetics and Semiconducting Polymers in Confined Systems. Universität Potsdam 2003.

Thomas, A.: Poröse Silikate durch Nanocasting: Von chiralen Templaten zu neuer Chemie in Poren. Universität Potsdam 2003.

Deshpande, A. S.: Synthesis of Porous Oxide for catalytic applications using templating techniques. Universität Potsdam 2004.

Erbe, A.: Ellipsometrische Lichtstreuung als neue Methode zur Charakterisierung der Grenzfläche von Kolloiden. Universität Potsdam 2004.

Losik, M.: Phasenverhalten von Polypeptid-Blockcopolymeren. Universität Potsdam 2004.

Lucas, G.: Gradientenzentrifugation: Neue Anwendungen eines klassischen Verfahrens. Universität Potsdam 2004.

Ramirez Rios, L. P.: Superpara- and paramagnetic polymer colloids by miniemulsion processes. Universität Potsdam 2004.

Sinn, C.: Ion binding to polymers and lipid membranes in aqueous solutions. Universität Potsdam 2004.

Taden, A. J.: Kristallisationsphänomene in Miniemulsionen: Geordnete Strukturen und Anwendungen für die Enzymatische Polymerisation. Universität Potsdam 2004.

Wohlrab, S.: Polymerinduzierte Morphogenese bei der Kristallisation von Aminosäuren. Universität Potsdam 2004.



**Department of Interfaces:**

- Antipov, A. A.: Polyelectrolyte multilayer capsules as controlled permeability vehicles and catalyst carriers. Universität Potsdam 2003.
- Bosio, V.: Interaction of multilayer coated surfaces studied by colloidal probe atomic force microscopy. Universität Potsdam 2003.
- Heinig, P.: The Geometry of Interacting Liquid Domains in Langmuir Monolayers. Universität Potsdam 2003.
- Ibarz-Ric, G.: Controlling internal structure and permeability of polyelectrolyte multilayer microcapsules. Universität Potsdam 2003.
- Kraß, H.: Neuartige supramolekulare Polyoxometallat- und Polyelektrolyt-Amphiphil Komplexe. Universität Potsdam 2003.
- Radtchenko, I. L.: Nanoengineered polymeric capsules as physico-chemical microreactors. Universität Potsdam 2003.
- Schneider, M.: Untersuchung von Wechselwirkungskräften und dem Adsorptionsverhalten von Polyelektrolytmolekülen auf Nanometer-Skala. Universität Potsdam 2003.
- Schöler, B.: Einfluss der Ladungsdichte auf den Aufbau von Polyelektrolyt Multischichten mit der Layer-by-Layer Technik. Universität Potsdam 2003.
- Schollmeyer, H.: Zweidimensionale molekulare Ordnung und Strukturbildung: Triakontan an planaren SiO<sub>2</sub>/Luft-Grenzflächen. Universität Potsdam 2003.
- Schütz, P.: Dünne Kompositfilme aus Nanopartikeln und Polyelektrolyten. Universität Potsdam 2003.
- Schwarz, B.: NMR Spektroskopie an Polyelektrolyt Mono- und Multischicht-Systemen. Universität Potsdam 2003.
- Wang, L.: Lipid monolayers coupled to polyelectrolyte multilayers: Stability, dynamics and interactions. Universität Potsdam 2003.
- Dong, W.-F.: Polyelectrolyte Multilayer Capsules: Structure, Encapsulation, and Optical Properties. Universität Potsdam 2004.
- Li, L.: Polyelectrolyte Hollow Capsules Functionalized for Vectorial Electron Transfer. Universität Potsdam 2004.
- Muruganathan, R.: Permeability and Interaction in Freestanding Foam Films. Universität Potsdam 2004.
- Rusu, M.: Phase transitions of thermoreversible polymers in polyelectrolyte multilayers. Universität Potsdam 2004.
- Sobal, N. S.: Kolloide Nanosysteme aus magnetischen und metallischen Materialien: Synthese und Charakterisierung. Universität Potsdam 2004.
- Teixeiro Cordeiro, A. L.: Viscoelastic Nanocapsules under Flow in Microdevices. Universidade do Porto 2004.
- Yue, X.: Monolayer Phase Behavior of Bipolar Amphiphiles and their coupling with DNA. Universität Potsdam 2004.

**Theory Department:**

- Brinkmann, M.: Benetzung lateral strukturierter Oberflächen. Universität Potsdam 2003.
- Franke, T.: Haftübergang von Lipid-Vesikeln: Effekt von  $\text{CrCl}_3$  auf PC-Membranen. Universität Potsdam 2003.
- Imparato, A.: Dynamic and Elastic properties of Fluid Bilayer Membranes. Universität Potsdam 2003.
- Klumpp, S.: Movement of Molecular Motors: Diffusion and Directed Walks. Universität Potsdam 2003.
- Valencia, A.: Condensation and Crystallization on Patterned Surfaces. Universität Potsdam 2003.
- Bischofs, I.: Elastic Interactions of Cellular Force Patterns. Universität Potsdam 2004.
- Illya, G.: Bilayer Material Properties and Domain Formation from Dissipative Particle Dynamics. Universität Potsdam 2004.
- Nikolov, V.: Model membranes grafted with long polymers. Universität Potsdam 2004.
- Uyaver, S.: Simulations of Annealed Polyelectrolytes in Poor Solvents. Universität Potsdam 2004.
- Haluska, C. K.: Interactions of functionalized vesicles in the presence of europium (III) chloride. Universität Potsdam 2005.

**Habilitations**

**Department of Colloid Chemistry:**

- Schlaad, H.: Polymer Self-Assembly: Adding Complexity to Mesostructures of Diblock Copolymers by Specific Interactions. Universität Potsdam 2004.

**Department of Interfaces:**

- Kurth, D. G.: Self-Assembly of Hierarchically Structured Architectures of Metallo-supramolecular Modules. Universität Potsdam 2003.

**Theory Department:**

- Schwarz, U. S.: Forces and Elasticity in Cell Adhesion. Universität Potsdam 2004.

# Personalien

## Appointments and Honors

**2003**

### Ruf an eine Universität

#### Appointments

- PD Dr. habil. Thomas Fischer  
PD Dr. habil. Thomas Fischer, Group Leader in the Department of Interfaces, accepted a position as Associate Professor at the Florida State University in Tallahassee.
- Dr. habil. Katharina Landfester  
Group Leader in the Department of Colloid Chemistry, accepted a position as Full Professor (C4) in Organic Chemistry (Macromolecular Chemistry and Organic Materials) at the University Ulm.
- Prof. Reinhard Lipowsky  
Director of the Theory Department, refused a chair appointment at the LMU Munich.
- Dr. Monika Schönhoff  
Group Leader in the Department of Interfaces, accepted a position as Associate Professor (C3) in Physical Chemistry at the University Munster.

### Ehrungen/Mitgliedschaften/Honorarprofessuren

#### Honors/Memberships/Honorary Professorships

- Prof. Markus Antonietti  
Director of the Department of Colloid Chemistry, obtained the Goldschmidt-Elhuyar-Award of the La real Sociedad Espanola de Quimica 2003.
- Dr. Gerald Brezesinski  
Group Leader at the Department of Interfaces, was appointed as Guest Professor at the Utsunomiya University in Japan.
- Prof. Helmut Möhwald  
Director of the Department of Interfaces, became new President of the German Colloid Society.

**2004**

### Ruf an eine Universität

#### Appointments

- Dr. Charl Faul  
Group Leader in the Department of Colloid Chemistry, accepted a Lectureship in Materials Chemistry at the School of Chemistry, University of Bristol
- Dr. Ulrich Schwarz  
Emmy Noether junior research group leader in the theory division, accepted an appointment as member of the Interdisciplinary Center for Scientific Computing (IWR) and junior research group leader at the newly established Center for Modelling and Simulation in the Biosciences (BIOMS) at Heidelberg University.
- Dr. Gleb Sukhorukov  
Group Leader in the Department of Interfaces, accepted a position of Chair in Biomaterials at the Queen Mary University of London.
- Dr. Regine v. Klitzing  
Group Leader in the Department of Interfaces, accepted a position as Associate Professor (C3) in Physical Chemistry at the University Kiel.

### Ehrungen/Mitgliedschaften/Honorarprofessuren

#### Honors/Memberships/Honorary Professorships

- Prof. Peter Fratzl  
Director of the Department of Biomaterials, was appointed as Honorary Professor at the Humboldt University Berlin.
- Dr. Dirk G. Kurth  
Group Leader in the Department of Interfaces, was appointed as Co-Director of a Joint Laboratory at the National Institute of Materials Science in Tsukuba, Japan.
- Prof. Helmut Möhwald  
Director of the Department of Interfaces, was elected as Corresponding Member of the Austrian Academy of Sciences.
- Prof. Helmut Möhwald  
Director of the Department of Interfaces, was appointed as Guest Professor at the Fudan University in Shanghai.
- Dr. Richard Weinkamer  
Group Leader in the Department of Biomaterials, obtained the Publication Award 2005 of the German Academy of the Osteological and Rheumatological Sciences for: Weinkamer, R., Hartmann, M.A., Brechet, Y. and Fratzl, P.: A stochastic lattice model for bone remodeling and aging, Phys. Rev. Lett. 93, 228102 (2004).

# Wissenschaftliche Veröffentlichungen und Patente

## Publications and Patents

### Biomaterials

Aichmayer, B., Fratzl, P., Saller, G., Puri, S.: Surface-directed spinodal decomposition on a macroscopic scale in a nitrogen and carbon alloyed steel. *Phys. Rev. Lett.* 91, 015701&/1-4 (2003).

Burgert, I., Frühmann, K., Keckes, J., Fratzl, P. and Stanzl-Tschegg, S. E.: Microtensile testing of wood fibers combined with video extensometry for efficient strain detection. *Holzforschung* 57, 661-664 (2003).

Burgert, I., Okuyama, T., Yamamoto, H.: On the generation of radial growth stresses in the big rays of Konara oak trees. *Wood Science* 49, 131-134 (2003).

Burgert, I.: Über die mechanische Bedeutung der Holzstrahlen. *Schweizerische Zeitschrift für Forstwesen* 154, 498-503 (2003).

Fischer, F.D., Svoboda, J., Fratzl, P.: A thermodynamical approach to grain growth and coarsening. *Phil. Mag.* 83, 1075-1093 (2003).

Fratzl, P.: Small-angle scattering in materials science – a short review of applications in alloys, ceramics and composite materials. *J. Appl. Cryst.* 36, 397-404 (2003).

Fratzl, P.: Cellulose and collagen: from fibres to tissues. *Curr. Opin. Coll. Interf. Sci.* 8, 32 - 39 (2003).

Frühmann, K., Burgert, I., Stanzl-Tschegg, S.E., Tschegg, E.K.: Mode I fracture behaviour on the growth ring scale and cellular level of spruce. (*Picea abies* [L.] Karst.) and beech (*Fagus sylvatica* L.) loaded in the TR crack propagation system. *Holzforschung* 57, 653-660 (2003).

Frühmann, K., Burgert, I., Tschegg, E.K. and Stanzl-Tschegg, S.E.: Detection of the fracture path under tensile loads through in situ tests in an ESEM chamber. *Holzforschung* 57, 326-332 (2003).

Gao, H., Ji, B., Jäger, I. L., Arzt, E., Fratzl, P.: Materials become insensitive to flaws at nanoscale: Lessons from nature. *Proc. Natl. Acad. Sci. USA* 100, Issue 10, 5597-5600 (2003).

Gupta H. S., Roschger P., Zizak I., Fratzl-Zelman N., Nader A., Klaushofer K., Fratzl P.: Mineralized microstructure of calcified avian tendons: A scanning small angle X-ray scattering study. *Calcif. Tissue Int.* 72, 567-576 (2003).

Jakob, H.F., Erlacher, K., Fratzl, P.: Nanostructure analysis of complex materials using two-dimensional small angle x-ray scattering. *Mater. Sci. Forum* 414-415, 411-418 (2003).

Jaschouz, D., Paris, O., Roschger, P., Hwang, H.-S., Fratzl, P.: Pole figure analysis of mineral nanoparticle orientation in individual trabecula of human vertebral bone. *J. Appl. Cryst.* 36, 494-498 (2003).

Keckes, J., Burgert, I., Frühmann, K., Müller, M., Kolln, K., Hamilton, M., Burghammer, M., Roth, S. V., Stanzl-Tschegg, S. and Fratzl, P.: Cell-wall recovery after irreversible deformation of wood. *Nat. Mater.* 2, 810-814 (2003).

Lichtenegger, H. C., Müller, M., Wimmer, R., Fratzl, P.: Microfibril angles inside and outside crossfields of Norway spruce tracheids. *Holzforschung* 57, 13-20 (2003).

Loidl, D., Peterlik, H., Müller, M., Riekkel, C. and Paris, O.: Elastic moduli of nanocrystallites within carbon fibers measured by in-situ x-ray microbeam diffraction. *Carbon* 41, 563-570 (2003).

Misof, B.M., Roschger, P., Cosman, F., Kurland, E.S., Tesch, W., Meßmer, P., Dempster, D.W., Nieves, J., Shane, E., Fratzl, P., Klaushofer, K., Bilezikian, J., Lindsay, R.: Effects of intermittent parathyroid hormone administration on bone mineralization density in iliac crest biopsies from patients with osteoporosis: a paired study before and after treatment. *J. Clin. Endocrin. Metab.* 88, 1150-1159 (2003).

Misof, B.M., Roschger, P., Tesch, W., Baldock, P.A., Keckes, J., Meßmer, P., Eisman, J.A., Boskey, A.L., Gardiner, E.M., Fratzl, P., Klaushofer, K.: Targeted overexpression of vitamin D receptor in osteoblasts increases calcium concentration without affecting structural properties of bone mineral crystals. *Calcif. Tissue Int.* 73, 251-257 (2003).

Paris, O. and Müller, M.: Scanning x-ray microdiffraction of complex materials: diffraction geometry considerations. *Nucl. Instr. Meth. in Phys. Res. B* 200, 390-396 (2003).

Roschger P., Gupta H. S., Berzanovich A., Ittner G., Dempster D. W., Fratzl P., Cosman F., Parisien M., Lindsay R., Nieves J. W., Klaushofer K.: Constant mineralization density distribution in cancellous human bone. *Bone* 32, 316-323 (2003).

Schöberl, T., Gupta, H. S., Fratzl, P.: Measurements of mechanical properties in Ni-base superalloys using nanoindentation and atomic force microscopy. *Mater. Sci. Engg. A.* 363, 211-220 (2003).

Stadler, L. M., Sepiol, B., Weinkamer, R., Hartmann, M., Fratzl, P., Kattelhardt, J. W., Zontone, F., Grubel, G. and Vogl, G.: Long-term correlations distinguish coarsening mechanisms in alloys. *Physical Review B* 68, art. no.-180101 (2003).

Tesch, W., VandenBos, T., Roschger, P., Fratzl-Zelman, N., Klaushofer, K., Beertsen, W., Fratzl, P.: Orientation of Mineral Crystallites and Mineral Density during Skeletal Development in Mice Deficient in Tissue Nonspecific Alkaline Phosphatase. *J. Bone Miner. Res.* 18, 117-125 (2003).

Weinkamer, R., Fratzl, P.: By which mechanism does coarsening in phase-separating alloys proceed? *Europhys. Lett.* 61, 261-267 (2003).

Zizak, I., Roschger, P., Paris, O., Misof, B.M., Berlanovich, A., Bernstorff, S., Amenitsch, H., Klaushofer, K., Fratzl, P.: Characteristics of mineral particles in the human bone-cartilage interface. *J. Struct. Biol.* 141, 208-217 (2003).

### 2004

Burgert, I., K. Frühmann, J. Keckes, P. Fratzl and S. Stanzl-Tschegg: Structure-function relationships of four compression wood types: micromechanical properties at the tissue and fibre level. *Trees-Structure and Function* 18, 480-485 (2004).

Burgert, I., Jungnikl, K.: Adaptive growth of gymnosperm branches – ultrastructural and micromechanical examinations. *J. Plant Growth Regulation* 23, 76-82 (2004).

Erlacher, K., Gorgl, R., Keckes, J., Jakob, H., Bruegemann, L., Doppler, P., Bergmann, A., Leitner, H., Marsoner, S., Fratzl, P.: Small angle X-ray scattering with cobalt radiation for nanostructure characterization of Fe-based specimen. *Mater. Sci. Forum* 443 - 444, 155-158 (2004).

Fratzl, P., I. Burgert and H. S. Gupta: On the role of interface polymers for the mechanics of natural polymeric composites. *Physical Chemistry Chemical Physics* 6, 5575-5579 (2004).

## Publications/Department of Biomaterials

- Fratzl, P., I. Burgert and J. Keckes: Mechanical model for the deformation of the wood cell wall. *Zeitschrift für Metallkunde* 95, 579-584 (2004).
- Fratzl, P., Gupta, H.S., Paschalis, E.P. and Roschger, P.: Structure and mechanical quality of the collagen-mineral nano-composite in bone. *Journal of Materials Chemistry* 14, 2115-2123 (2004).
- Fratzl-Zelman, N., Valenta, A., Roschger, P., Nader, A., Gelb, B.D., Fratzl, P. and Klaushofer, K.: Decreased bone turnover and deterioration of bone structure in two cases of pycnodysostosis. *J Clin. Endocrin. Metab.* 89, 1538 - 1547 (2004).
- Gajic, R., F. Kuchar, R. Meisels, J. Radovanovic, K. Hingerl, J. Zerbakhsh, J. Stampfl and A. Woesz: Physical and materials aspects of photonic crystals for microwaves and millimetre waves. *Zeitschrift für Metallkunde* 95, 618-623 (2004).
- Gierlinger, N., M. Schwanninger and R. Wimmer: Characteristics and classification of Fourier-transform near infrared spectra of the heartwood of different larch species (*Larix* sp.). *Journal of near Infrared Spectroscopy* 12, 113-119 (2004).
- Gindl, W., H.S. Gupta, T. Schoberl, H. C. Lichtenegger and P. Fratzl: Mechanical properties of spruce wood cell walls by nanoindentation. *Applied Physics A-Materials Science & Processing* 79, 2069-2073 (2004).
- Gindl, W., C. Hansmann, N. Gierlinger, M. Schwanninger, B. Hinterstoisser and G. Jeronimidis: Using a water-soluble melamine-formaldehyde resin to improve the hardness of Norway spruce wood. *Journal of Applied Polymer Science* 93, 1900-1907 (2004).
- Gupta, H.S., P. Messmer, P. Roschger, S. Bernstorff, K. Klaushofer and P. Fratzl: Synchrotron diffraction study of deformation mechanisms in mineralized tendon. *Physical Review Letters* 93, Art. No. 158101 (2004).
- Kozeschnik, E., Svoboda, J., Fratzl, P. and Fischer, F. D.: Modelling of kinetics in multi-component multi-phase systems with spherical precipitates II: Numerical solution and application. *Mater. Sci. Eng. A.*, 385, 157-165 (2004).
- Maier, G., Wallner, G., Fratzl, P.: 3D Small Angle X-Ray Scattering (SAXS) on deformed PVDF Foils. *Mat. Res. Soc. Symp. Proc.* 782, A5.17/1 - 7 (2004).
- Roschger, P., K. Matsuo, B. M. Misof, W. Tesch, W. Jochum, E.F. Wagner, P. Fratzl and K. Klaushofer: Normal mineralization and nanostructure of sclerotic bone in mice overexpressing Fra-1. *Bone* 34, 776-782 (2004).
- Sarén, M.-P., Serimaa, R., Andersson, S., Saranpää, P., Keckes, J., Fratzl, P.: Effect of growth rate on mean microfibril angle and cross-sectional shape of tracheids of normal spruce. *Trees* 18, 354-362 (2004).
- Stampfl, J., A. Woss, S. Seidler, H. Fouad, A. Pisaipan, F. Schwager and R. Liska: Water soluble, photocurable resins for Rapid Prototyping applications. *Macromolecular Symposia* 217, 99-107 (2004).
- Stampfl, J., Fouad, H., Seidler, S., Liska, R., Schwager, F., Woesz, A., Fratzl, P.: Fabrication and moulding of cellular materials by rapid prototyping. *Int. J. Materials and Product Technology*, 21, No. 4, 285-296 (2004).
- Stampfl, J., Seyr, M.M., Luxner, M.H., Pettermann, H.E., Woesz, A., Fratzl, P.: Regular, low density cellular structures - rapid prototyping, numerical simulation, mechanical testing. *Mat. Res. Soc. Symp. Proc.* Vol. 823, W8.8.1-W8.8.6 (2004).
- Svoboda, J., Gamsjäger, E., Fischer, F.D., Fratzl, P.: Application of the thermodynamic extremal principle to the diffusional phase transformations. *Acta Mater.* 52, 959-967 (2004).
- Svoboda, J., Fischer, F. D., Fratzl, P. and Kozeschnik, E.: Modelling of kinetics in multi-component multi-phase systems with spherical precipitates I: Theory. *Mater. Sci. Eng. A.* 385, 166-174 (2004).
- Tian, B. H., C. Lind, E. Schafner and O. Paris: Evolution of microstructures during dynamic recrystallization and dynamic recovery in hot deformed Nimonic 80a. *Materials Science and Engineering A-Structural Materials Properties Microstructure and Processing* 367, 198-204 (2004).
- Weinkamer, R., P. Fratzl, H. S. Gupta, O. Penrose and J. L. Lebowitz: Using kinetic Monte Carlo simulations to study phase separation in alloys. *Phase Transitions* 77, 433-456 (2004).
- Weinkamer, R., M. A. Hartmann, Y. Brechet and P. Fratzl: Stochastic lattice model for bone remodeling and aging. *Physical Review Letters* 93, Art. No. 228102 (2004).
- Woesz, A., J. Stampfl and P. Fratzl: Cellular solids beyond the apparent density – an experimental assessment of mechanical properties. *Advanced Engineering Materials* 6, 134-138 (2004).
- Since January 2005**
- Burgert, I., Frühmann, K., Keckes, J., Fratzl, Peter and Stanzl-Tschegg, S.: Properties of Chemically and Mechanically Isolated Fibres of Spruce (*Picea Abies* [L.] Karst.). Part 2: Twisting Phenomena. *Holzforschung* 59, 247-251 (2005).
- Burgert, I., Eder, M., Frühmann, K., Keckes, J., Fratzl, P. and Stanzl-Tschegg, S.: Properties of Chemically and Mechanically Isolated Fibres of Spruce (*Picea Abies* [L.] Karst.). Part 3: Mechanical Characterisation. *Holzforschung* 59, 354-357 (2005).
- Fratzl, P., Gupta, H. S., Paris, O., Valenta, A., Roschger, P., Klaushofer, K.: Diffracting “stacks of cards” – some thoughts about small angle scattering from bone. *Progr. Colloid Polym. Sci.* 130, 32-38 (2005).
- Gupta, H.S., Schratler, S., Tesch, W., Roschger, P., Berzlanovich, A., Schoeberl, T., Klaushofer, K. and Fratzl, P.: Two different correlations between nanoindentation modulus and mineral content in the bone – cartilage interface. *Journal of Structural Biology* Volume 149, 138-148 (2005).
- Hartmann, M., Weinkamer, R., Fratzl, P., Svoboda, J. and Fischer, F. D.: Onsager's Coefficients and Diffusion Laws – A Monte Carlo Study. *Philosophical Magazine* 85, No. 12, 1243-1260 (2005).
- Loidl, D., Peterlik, H., Paris, O. and Riekkel, C.: Local nanostructure of single carbon fibres during bending deformation. *ESRF Highlights* 2004, 49-50 (2005).
- Misof, B. M., Roschger, P., Baldini, T., Raggio, C. L., Zraick, V., Root, L., Boskey, A. L., Klaushofer, K., Fratzl, P., Camacho, N. P.: Differential Effects of Alendronate Treatment on Bone from Growing Osteogenesis Imperfecta and Wild-Type Mouse. *Bone* 36, 150-158 (2005).
- Paris, O., Zollfrank, C. and Zickler, G. A.: Decomposition and carbonization of wood biopolymers – A microstructural study of softwood pyrolysis. *Carbon* 43, 53-66 (2005).

## Publications/Department of Biomaterials

### **Book Chapters: 2003**

Ander, P., Burgert, I., Frühmann, K.: The possible relationship between dislocations and the strength of different spruce fibers: A single fibre study. Proceedings of the 2nd International Conference of the European Society for Wood Mechanics Stockholm, Sweden, May 25th -28th, pp. 63-66 (2003).

Burgert, I. and Frühmann, K.: Micromechanics of wood – structure-function relationships at the tissue and fiber level. Proceedings of the 2nd International Conference of the European Society for Wood Mechanics, (ed. L. Salmén) Stockholm, Sweden, May 25th-28th, pp. 153-162 (2003).

Fratzl, P.: Collagen: Hierarchical structure and viscoelastic properties of tendon. in *Elastomeric Proteins*, P.R. Shewry, A.S. Tatham, A.J. Bailey (Eds.) Cambridge University Press, pp. 175-188 (2003).

Frühmann, K., Burgert, I., Sinn, G., Stanzl-Tschegg, S. E.: Fracture mechanical parameters for the TR – crack propagation system in wood. Proceedings of the 2nd International Conference of the European Society for Wood Mechanics Stockholm, Sweden, May 25th-28th, pp. 213-219 (2003).

Stampfl, J., Cano Vives, R., Seidler, S., Liska, R., Schwager, F., Gruber, H., Wöß, A., Fratzl, P.: Rapid Prototyping – A route for the fabrication of biomimetic cellular materials. Proceedings of the 1st International Conference on Advanced Research in Virtual and Rapid Proto-typing, (Eds: P.J. Bartolo, G. Mitchell et al.), 1.-4. Oct., Leiria, Portugal, pp 659-666 (2003).

Wöß, A., Stampfl, J., Fratzl, P.: Rapid Prototyping biomimetisch gestalteter Materialien. "Verbundwerkstoffe und Werkstoffverbunde", Ed.: H.P. Degischer, Wiley-VCH Verlag GmbH & Co., Weinheim, 785-789 (2003).

Zollfrank, C. and Paris, O.: Thermal degradation of wood and microstructure of biocarbon. Proceedings of the 12th international Symposium on Wood and Pulping Chemistry, University of Wisconsin-Madison, Department of Forest Ecology and Management, Madison, Wisconsin, USA, Volume 1, 349-352 (2003).

### **2004**

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