



Prof. Dr. Andreas Greiner
born 5.8.1959
Polymer Chemist

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My basic philosophy of science

I strongly believe that chemistry can give us the basic understanding of our daily life and will secure our sustainable doing for the benefit of future generations. Interdisciplinary work beyond only chemistry is essential for successful chemistry.

Polymers solve problems and do not create problems. Polymers have to be reused and polymer waste has to be handled properly.

New polymer properties can be generated by the combination of synthesis and chemical- as well as physical-processing. Biobased polymers are an important basis for sustainable materials. Never should biobased polymers compete with food resources.

Scientific results should be, wherever possible, translated to real world applications. All my understanding is reflected by my research and teaching.

Study in Chemistry and Ph. D. in Polymer Chemistry (1988) (University of Marburg), Postdoc in Santa Barbara; Professor in Mainz, Marburg, and Bayreuth; > 335 publications, 2 Books, > 20 patents, > 100 invited lectures, > 100 industry cooperations

Present major responsibilities

Chair of Macromolecular Chemistry II
at the University of Bayreuth (UBT)

<https://www.mcii.uni-bayreuth.de/en/index.html>

Business Unit Future Solution in
New Materials Bayreuth GmbH (NMB)

<https://www.nmbgmbh.de/>

Supreme review panel of Deutsche Forschungsgemeinschaft (DFG) for Polymer Materials

Coordinator for Master Polymer Science and
Ph. D. program Polymer Science at UBT

Major areas of research:

- Sustainable polymer materials
- Ultralight weight porous polymers
- Bionic design of polymer materials
- Electrospinning of polymer nonwovens,
- Speciality polymer coatings
- Conductive polymer composites
- Polymer-nanoparticle composites
- Microplastics pollution – mechanisms

10 most important publications

1. Liao, M. Dulle, J. Martins, R. B. Wehrspohn, S. Agarwal, S. Förster, H. Hou, P. Smith, A. Greiner: High strength in combination with high toughness in robust and sustainable polymeric materials **Science** **366**, 2019, 1376–1379 (2019)
2. M. Steinhart, J. H. Wendorff, A. Greiner, R. B. Wehrspohn, K. Nielsch, J. Schilling, J. Choi, U. Gösele: Polymer nanotubes by wetting of ordered porous templates **Science** **296**, 1997 (2002)
3. O. Hauenstein, S. Agarwal, A. Greiner: Bio-based polycarbonate as synthetic toolbox **Nat. Commun.** **7**, 11862 (2016)
4. A. F. R. M Ramsperger, Vinay K. B. Narayana, W. Gross, J. Mohanraj, M. Thelakkat, A. Greiner, H. Schmalz, H. Kress, C. Laforsch: Environmental exposure enhances the internalization of microplastic particles into cells **Sci. Adv.** **6** (2020)
DOI 10.1126/sciadv.abd1211
5. Z. Fan, M. Köhn Serrano, A. Schaper, S. Agarwal, A. Greiner: Polymer/nanoparticle hybrid materials of precise dimensions by size-exclusive fishing of metal nanoparticles **Adv. Mater.** **27**, 3888-3893 (2015)
6. F. Mitschang, H. Schmalz, S. Agarwal, A. Greiner: Tea-bag-like polymer nanoreactors filled with gold nanoparticles **Angew. Chem. Int. Ed.** **53**, 4972-4975 (2014)
7. S. Agarwal, A. Greiner, J. H. Wendorff: Functional materials by electrospinning of polymers **Prog. Poly. Sci.** **38**, 963-991 (2013)
8. S. Chen, H. Hou, F. Harnisch, S. A. Patil, A. A. Carmona-Martinez, S. Agarwal, Y. Zhang, S. Sinha-Rey, A. L. Yarin, A. Greiner, U. Schröder: Electrospun and solution blown three-dimensional carbon fiber nonwovens for application as electrodes in microbial fuel cells **Energy Environ. Sci.** **4**, 1417-1421 (2011)
9. A. Baudler, I. Schmidt, M. Langner, A. Greiner, U. Schröder: Does It Have to Be Carbon? Metal Anodes in Microbial Fuel Cells and Related Bioelectrochemical Systems, **Energy Environ. Sci.** **8**, 2048-2055 (2015)
10. A. Greiner, J. H. Wendorff: Electrospinning: A fascinating method for the preparation of ultrathin fibres **Angew. Chem. Int. Ed.** **46**, 5670-5703 (2007)