

Dr. Anke Klingner

Medical Micro & Nano Robotics Laboratory mmnrobotics.com
Department of Physics physics.guc.edu.eg
Faculty of Engineering and Material Science ems.guc.edu.eg

anke.klingner@guc.edu.eg

Room C7-04

The German University in Cairo

13411 New Cairo City - Main Entrance Al Tagamoa Al Khames, Egypt

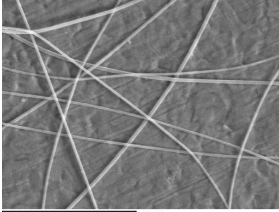
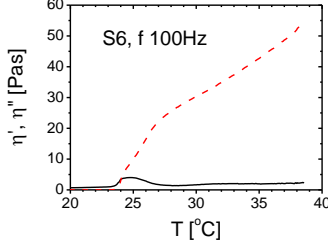


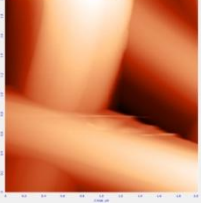

- PHD: "Variation of liquid morphology induced by electrical fields for application in microfluidic devices", Department of Applied Physics, Ulm university, Germany, 2004
- Diploma: "Residual stresses in W/C multilayers", Department of Crystallography and Solid State Physics, TU Dresden, Germany, 2000

Projects

- Development and Control of Sperm-Driven Magnetic Microrobots, DAAD-BMBF 2015/16
- Material Design, Bio-Compatibility, and Simulation of Materials and Products Used in Medical Applications of Bone Healing, DAAD-BMBF 2015/16
- Optimization of 3D printed metallic parts for laser welding, DAAD-BMBF 2015/16

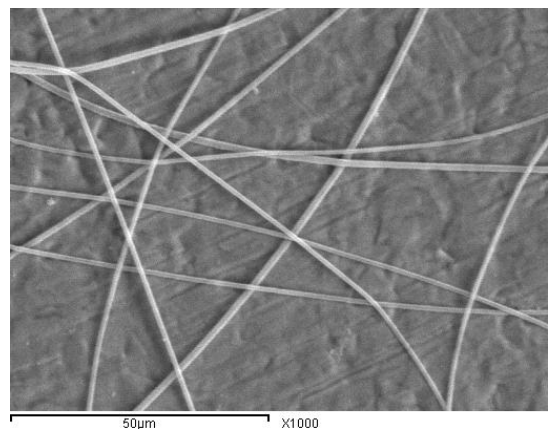
Analytical measurements offered for cooperation

<ul style="list-style-type: none">• Electrospinning/spraying of polymeric solutions into nanofibers, nanodroplets	 <p>nanofibers</p>
<ul style="list-style-type: none">• Viscoelastic characterization<ul style="list-style-type: none">▪ low viscosity materials, 1-10kHz, low evaporation, low sample volume (1 drop), 0-40°C - Piezoaxial vibrator▪ high viscosity materials, 1-100Hz - Gemini rheometer	 <p>Thermo-responsive gel</p>

<ul style="list-style-type: none"> Atomic Force Microscopy (AFM), Light Microscopy 	 <p>nanofibers</p>
<ul style="list-style-type: none"> dielectric spectroscopy (1-200kHz) 	
<ul style="list-style-type: none"> Dilatometer, DSC 	
<ul style="list-style-type: none"> Tensile measurements 	

Nanofibers by electrospinning

Nanofibers are fibers with a very thin diameter. Diameters as small as 10 nm can be produced with the method of electrospinning. At the department of macromolecular chemistry, University in Marburg, Germany, pesticide enriched nanofibers are applied to plants. The nanostructure has potential to reduce the amount of pesticides. One application of nanofiber mats is as filtration material e.g. in cigarettes. Many groups investigate nanofibers as tissue for bones etc. Because of the high surface area, cell are expected to grow faster on such tissue. Further applications could be in the field of sensors, photovoltaic devices or microelectronic devices.



How the fibers are produced? A polymer solution is filled in a syringe. Then, a high voltage of about 20 kV is applied between the syringe and the collector. The collector is at a distance of about 15 cm. The figure shows Polymethylmethacrylate (PMMA) fibers produced at GUC.

Several Bachelor and Master projects were conducted in this field in the Engineering Material Science Department and Pharmacy and Biotechnology.

Publications

- 1) **Accepted: “Model of influence of fiber/drop deposition on laser transmission intensity”** Anke Klingner, Gamal Abd El-Nasr, Ashraf Abd El- Haleem, International Journal of Nanostructures Polymers and Nanocomposites
-

- 2) **Submitted: “Non-Contact Micromanipulation of Microbeads via Pushing and Pulling using Clusters of Paramagnetic Microparticles”** Ahmed G. El-Gazzar, Louay E. ElKhouly, Mahmoud Awara, Anke Klingner, Sarthak Misra and Islam S. M. Khalil, Contributed paper at IEEE International Conference on Robotics and Automation, May 26-30, 2015
 - 3) **“Magnetic-Based Motion Control of a Helical Robot Using Two Synchronized Rotating Dipole Fields”** Mahmoud Alshafeei, Abdelrahman Hosney, Anke Klingner, Islam S.M. Khalil, Regular paper at 5th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, Anhembi Convention Center in São Paulo, Brazil August 12-15, 2014
 - 4) **“Developing the Potential Ophthalmic Applications of Pilocarpine Entrapped Into Polyvinylpyrrolidone–Poly(acrylic acid) Nanogel Dispersions Prepared By γ Radiation”** Hassan A. Abd El-Rehim, Ahmed E. Swilem, Anke Klingner, El-Sayed A. Hegazy, Ashraf A. Hamed, *BioMacromolecules* **14**, 688 (2013)
 - 5) **“IN-SITU INJECTABLE THERMOSENSITIVE GEL BASED ON POLOXAMER AS A NEW CARRIER FOR TAMOXIFEN CITRATE”** DALIA S SHAKER, MOHAMED K. GHORAB, ANKE KLINGNER, MOHAMED S. TEIAMA, *International Journal of Pharmacy and Pharmaceutical Sciences* **5**, 429 (2013)
 - 6) **“Corrosion behavior of 90-10 Copper-Nickel alloy in natural and artificial sea water”** A. M. El-Aziz, W. Sharaf, A. Klingner, *Corrosion protection (Ochrona przed korozja)* **56**, 11 (2013)
 - 7) **“A Phase II Study of Nd-YAG Laser Therapy in Patients with Non-Operable Malignant Obstructive Endobronchial Lesions after Prior Chemotherapy and/or Radiation Therapy”** Hanan Shawky, Ashraf Sayed Abd El- Haleem, Ibraheem Salah, Adel Alnozahy and Anke Klingner, *Journal of American Science* **9**, 334 (2013)
 - 8) **“The effect of additives on the surface morphology and dielectric properties of PVA based electrospun nanofibers”**, Anke Klingner, Safaa Abdoun Bashier, Amr A. S. A. M. Abdeen, Bernhard Stoll, *Journal of nanostructured polymers and nanocomposites* **6**, 48 (2010)
 - 9) **“Corrosion inhibition of iron by polystyrene polymeric nanofibers”**, Ahmed Abdel-Aziz, Ahmed Mohamed Saleh, Anke Klingner, *Ochrona przed Korozja*, Vol. 53, No. 12, 663-665 (2010)
 - 10) **“Electrospun nanofibers with rough surface”**, Mohamed Ali Abdelmegeid, Mikhael Youssef Soliman, Anke Klingner, *Genetic Engineering & Biotechnology Journal (GEBJ)* Vol. 8, No. 1 (2010)
 - 11) **"Electrowetting: A convenient way to switchable wettability patterns."**, F. Mugele, A. Klingner, J. Buehrle, D. Steinhauser, S. Herminghaus, *J. Phys. Cond. Matt.* **17**, 9, S559 (2004)
 - 12) **"Capillary bridges in electric fields."**, A. Klingner, J. Buehrle, and F. Mugele, *Langmuir* **20**, 6770 (2004)
-

- 13) **"Electrowetting-induced morphological transitions of fluid microstructures."**, A. Klingner and F. Mugele, J. Appl. Phys. **95**, 2918 (2004) also in: Virtual J. of Nanoscale Sci. & Techn. 9 8 (2004)
 - 14) **"Self-excited dynamics of capillary bridges in electric fields."**, A. Klingner, S. Herminghaus, and F. Mugele, Appl. Phys. Lett. **82**, 4187 (2003) also in: Virtual J. of Nanoscale Sci. & Techn. 7 24 (2003)
 - 15) **"Stressed States and Self-Organized Structuring of W/C Multilayers."**, D.C. Meyer, A. Klingner, T. Leisegang, Th. Holz, R. Dietsch, P. Paufler, Materials Research Society Symposium Proceedings **695** L12.2.1-L12.2.6 (2002)
 - 16) **"Two-dimensional observation of drainage and layering transitions in confined liquids."**, F. Mugele, T. Becker, A. Klingner, and M. Salmeron, Coll. Surf. A **206**, 1-3, 105 (2002)
 - 17) **"Self-organized structuring of W/C multilayers on Si substrate."**, D.C. Meyer, A. Klingner, Th. Holz, P. Paufler, Appl. Phys. A **69**, 657 - 659 (1999)
-