

## UFT Centre for Environmental Research and Sustainable Technology

Scientific progress evolves from knowledge, dedication and creativity. Excellent research that opens up innovative fields for application to be further developed in co-operation with industry and business.

It is the mission of the UFT to develop novel environmentally sound processes and products in scale-crossing approaches, and to assess and minimize their risks to the environment. Ecological friendly and environmentally compatible products and processes in a healthy environment describe the vision of the UFT.

At the UFT, a wide spectrum of environmental research is represented, from nano- to macroscale. The researchers investigate molecular processes, interactions within ecosystems, assess risks to the environment and develop environmentally friendly production processes.

Being a Central Research Unit of the University of Bremen, the interdisciplinary centre includes nine departments and one association from three faculties - from natural sciences, engineering and social sciences. The unit maintains numerous national and international cooperations with research institutions and industry and is interested in a goal-oriented expansion of these activities.

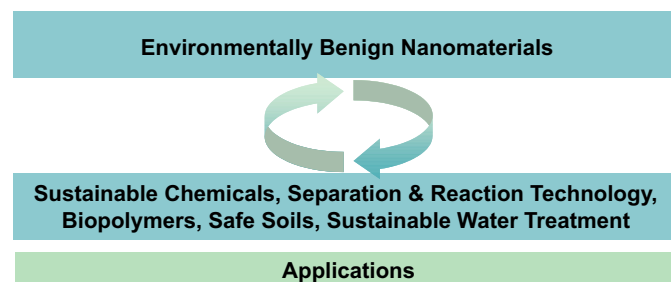
We welcome cooperations in research and development, e.g. in the fields of risk assessment of nanomaterials, environmental engineering, biological water treatment, sustainable chemistry, biological erosion control and combating desertification.

Faculties		
Chemistry & Biology	Production Engineering	Social Sciences
Departments		
<b>General and Theoretical Ecology</b> Prof. Juliane Filser <b>Applied Botany</b> Prof. Wolfgang Heyser <b>Molecular Genetics</b> Prof. Annette Becker <b>Bioorganic Chemistry</b> Prof. Detlef Gabel <b>Biochemistry</b> Prof. Ralf Dringen <b>Sustainable Chemistry</b> Dr. Stefan Stolte, Prof. Jorg Thöming	<b>Environmental Engineering</b> Prof. Norbert Rübiger <b>Chemical Engineering-Recovery and Recycling</b> Prof. Jorg Thöming	<b>Physiogeography</b> Prof. Jörg-Friedhelm Venzke <b>Research Center for Sustainability Studies (artec)</b> Cooperation

### The Research Focus

The research focus *Environmentally Benign Nanomaterials* addresses topics such as substitution and reduction of environmentally hazardous nanomaterials, reduction of their risks to the environment, energy and resource efficiency, and climate change. Innovative methods are available, from Nanosizer to a complex biotest-battery.

Within the graduate school „Toxic combination effects of synthesized nanoparticles: nanoToxCom“ funded by the Hans-Böckler-Foundation, the research focus is extended to advanced teaching and learning.



Closely interacting with the research focus are five research areas.

## The Research Areas (RA)

The RA **Sustainable Chemicals** focuses on the consideration of sustainability criteria as early as in the design phase of novel chemicals. Since 2002 the research group has been investigating Ionic Liquids, a class of substances with extraordinary properties and a wide range of technological applications. The UFT has an exceptionally wide array of Ionic Liquids available for research.

In the RA **Selective Separation & Reaction Technology** innovative technological solutions for the intensification of chemical reaction processes and their specific control are investigated, with an emphasis on microtechnology and membrane reactors. Tailored membranes for gas as well as liquid separation are developed and integrated into processes up to pilot scale.

The investigations of the RA **Biopolymers** aim at the use of naturally occurring substances. As an example Chitin/Chitosan has a wide range of applications, e.g., for biocide-free antimicrobial surfaces.

The RA **Safe Soils** is dedicated to the fundamental understanding of the soil ecosystem and its services, such as biogenic erosion control, soil fertility, or carbon sequestration. Risk assessment for these processes is developed and measures to combat soil degradation and desertification are designed. The award winning ReviTec<sup>®</sup>-approach has been applied in areas threatened by desertification.

Innovative technological as well as biological approaches are developed in the RA **Sustainable Water Treatment**. The results from the laboratory, e.g. Microparticle image velocimetry, can be scaled up in a technicum and in field stations for the demand of real world challenges.

## From Molecules to Ecosystems and Industrial Application

UFT's scale-crossing research covers molecules, genes, organisms, ecosystems and landscapes. Basic research is brought to application fulfilling sustainability criteria and addressing ecology, economy and social affairs in an integrated way.

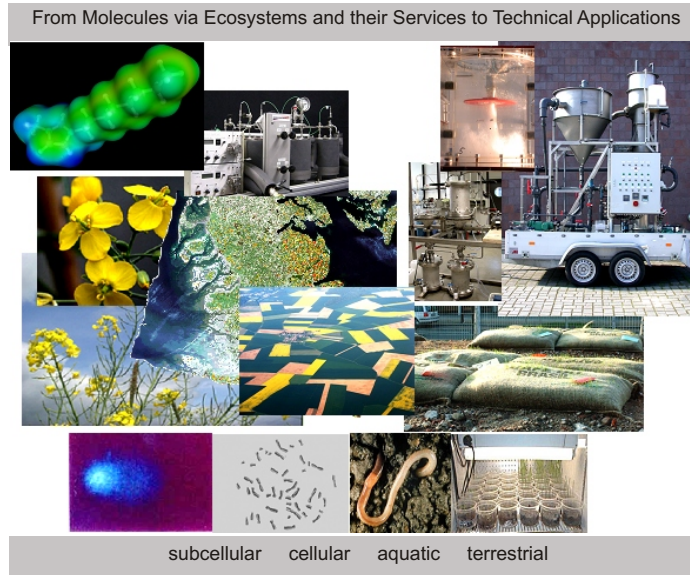
## Teaching and International Cooperation

The researchers of the UFT are involved in international master's courses of the University of Bremen, such as Ecology, Biochemistry and Molecular Biology, ISATEC (International Master in Aquatic Tropical Ecology).

The UFT maintains close international cooperations with institutions, e.g., in Cameroon, China, Denmark, Egypt, India, Poland, Romania, Thailand.

## Service

The UFT is open to all requests of companies, which would either like to develop their methods and products in an environmentally friendly way, or to refine them by applying new methods or innovative processes.



## Contact

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