

## GEMS – German Engineering Materials Science Centre

→ Beam time is allocated via a proposal procedure. The introduction to the instrument, the supervision during the experiment and help during the data analysis are provided by the instrument scientist.

Requests for beam time can be submitted at <http://gems.hzg.de>

→ Combined synchrotron and neutron proposals are possible  
→ Travel expenses are available to groups from universities and public research institutions

→ Commercial service for industry:  
→ Characterisation of structural and functional materials  
→ Quality assessment, damage analysis, product optimisation  
→ Test beamtime for industry supported by EU (projects SINE 2020 and Baltic TRAM)

## About Helmholtz-Zentrum Geesthacht

A total of about 850 employees are involved in coastal and materials research at the Helmholtz-Zentrum Geesthacht. In line with the slogan "Science creates benefits", the employees are studying future storm surges and the coastal environment. The new materials and welding methods that the researchers create are making cars and planes lighter, and that in turn helps to save fuel and conserve the environment.



## Contact

### Prof. Dr. Martin Müller

Head of the division  
"Materials Physics"  
Head of GEMS  
tel.: +49(0)4152 87-1268  
tel.(DESY):+49(0)40 8998-6902  
email: martin.mueller@hzg.de

### Dr. P. Klaus Pranzas

External and industrial use – GEMS  
tel.: +49(0)4152 87-1326  
tel.(DESY):+49(0)40 8998-6901  
email: klaus.pranzas@hzg.de

### Dr. Marc Thiry

Industrial Liaison Officer – GEMS  
tel.: +49(0)40 8998-6914  
email: marc.thiry@hzg.de

Helmholtz-Zentrum Geesthacht  
Zentrum für Material- und  
Küstenforschung GmbH  
(Centre for Materials  
and Coastal Research)  
Max-Planck-Straße 1, 21502 Geesthacht  
[www.hzg.de](http://www.hzg.de)

### Dr. Peter Staron

Head of the department "X-ray  
Diffraction with Synchrotron Radiation"  
tel.: +49(0)4152 87-1208  
tel.(DESY):+49(0)40 8998-6912  
email: peter.staron@hzg.de

### Dr. Christina Krywka

Head of the department "X-ray  
Imaging with Synchrotron Radiation"  
tel.: +49(0)40 8998-6903  
email: christina.krywka@hzg.de

### Dr. Jean-Francois Moulin

Group Leader "Neutron Scattering"  
tel.: +49(0)89 289-10762  
email: jean-francois.moulin@hzg.de

### Dr. Jochen Fenske

Group Leader "New Instrumentation  
for Neutron Scattering"  
tel.: +49(0)4152 87-1224  
email: jochen.fenske@hzg.de

HELMHOLTZ-ZENTRUM GEESTHACHT

GEMS – GERMAN ENGINEERING MATERIALS SCIENCE CENTRE

## Neutrons and Photons for Science and Technology



**GEMS**  
German Engineering Materials Science Centre

**Helmholtz-Zentrum  
Geesthacht**  
Centre for Materials and Coastal Research



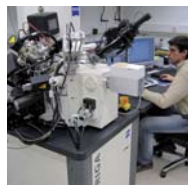
→ The Helmholtz Centre Geesthacht has bundled its activities in the field of synchrotron radiation and neutrons at the „German Engineering Materials Science Centre” GEMS.

GEMS is part of the Materials Physics Division of the Institute of Materials Research. It is the user platform which provides external users with unique research instruments for their materials research with a strong focus on challenging in-situ experiments.

The instruments at GEMS are available for the use of research scientists and engineers from universities, research institutes and industry.

The synchrotron radiation instruments are operated at the synchrotron ring PETRA III which is located at the HZG outstation at Deutsches Elektronen Synchrotron DESY in Hamburg.

The instruments using neutrons are located at the HZG outstation at the research reactor FRM II in Garching near Munich and are partially operated together with the Technical University Munich.



## Instrumentation at the X-ray source PETRA III:

### HEMS

The High Energy Materials Science Beamline HEMS uses its particularly high energy X-rays to penetrate deeply into materials. Due to the high photon flux in-situ experiments can be performed. Research scientists illuminate entire car engines with the HEMS instrument, for example. HEMS offers the possibility of tomography and diffraction (texture, strain).

#### Dr. Norbert Schell

tel.: +49 (0)40 8998-3637  
fax: +49 (0)40 8998-4203  
email: norbert.schell@hzg.de

### IBL

The Imaging Beamline IBL takes particularly high resolution images which are very rich in detail. The resolution of the images goes right down to the nanometer level. However, the samples cannot be penetrated quite as deeply as with the HEMS-Beamline. For example, micro and nanotomography images can show medical doctors in fine detail how implants have become connected to tissue.

#### Dr. Felix Beckmann

tel.: +49 (0)40 8998-5309  
fax: +49 (0)40 8998-5399  
email: felix.beckmann@hzg.de

### Nanofocus Endstation

The Nanofocus Endstation of the DESY beamline P03 (MINAXS) provides conditions for scanning X-ray nanodiffraction (SXND) for materials science, even in extended in situ sample environments, with a beam size of 250 nm and an energy in the range 8 - 23 keV. In addition control for pressure, E/B fields, temperature, fluid shear, tension or indentation force is available.

#### Dr. Christina Krywka

tel.: +49 (0)40 8998-6903  
fax: +49 (0)40 8994-5334  
email: christina.krywka@hzg.de

## Instrumentation at the neutron source MLZ/FRM II:

### REFSANS

The horizontal reflectometer REFSANS has been designed to enable specular reflectometry as well as grazing incidence neutron scattering studies of the interfaces of solids and liquids.

#### Dr. Jean-Francois Moulin

tel.: +49 (0)89 289-10762  
email: jean-francois.moulin@hzg.de

### SANS-1

SANS-1 is dedicated to the small-angle scattering technique. Measurements with very high neutron flux are possible at this instrument e.g. of large or thick samples on the nanometer scale.

#### Dr. André Heinemann

tel.: +49 (0)89 289-14534  
email: andre.heinemann@hzg.de

### STRESS-SPEC

The STRESS-SPEC diffractometer measures the mechanical tensions and texture properties of materials - in particular in large steel components which cannot be penetrated by X-rays.

#### Dr. Weimin Gan

tel.: +49 (0)89 289-10766  
email: weimin.gan@hzg.de