Project offers / Expressions of Interest from Jülich

Joint Research and Education Programme "Palestinian-German Science Bridge PGSB"
Forschungszentrum Jülich GmbH & Palestine Academy for Science and Technology

Contact Details of responsible host at Forschungszentrum Jülich

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Function*	Institute and homepage of institute*
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University affiliation*

RWTH Aachen, Mechanical Engineering

Initial contacts at Palestinian university/universities (if available)

Thesis candidate(s) (if available)

Project description*

The Central Institute of Engineering, Electronics and Analytics – Engineering and Technology (ZEA-1) is a scientific technical institute of the Forschungszentrum Jülich GmbH. Mission of ZEA-1 is the design, the development, and the fabrication of scientific and technical equipment, instruments, and processes that are essential for cutting edge science but are not commercially available.
The core competencies of ZEA-1 are technology development and mechanical engineering of equipment, spectrometers and other components for research using neutron, photon, and hadron beams, for energy and environment research, for soil and plant investigations and for the neuroscience. ZEA-1 has broad and longtime experiences in innovative manufacturing techniques, joining technologies, measurement technologies, automation, and calculation and numerical simulation methods.

In the framework of the "Palestinian-German Science Bridge" education program we offer a fellowship for a bachelor or master thesis:

Measurement of carbon fiber polymer Structures (CRP) with Digital Image Correlation (DIC)

Modern support structures of particle detectors fulfill a variety of tasks. Crucial for detector systems is the stability and the dimensional accuracy of the support structure. From the physical point of view, the mass of the structure should be as low as possible, to prevent shielding of particles. In order to meet these two requirements computer simulations are carried out during the design process to minimize the weight of the support structure. In particular modern support structures for particle detectors are composed of carbon foams, high fiber content CFC materials and PMI based foams. Especially this mixture of materials - which are glued together - complicates the simulation models very strongly.
During the internship FEM calculations for CRP compound materials should be validated. The challenge is to assemble a digital image correlation system (DIC) to measure the deformations of

CRP- structures under mechanical stress. Furthermore, the obtained measurement data must be evaluated and converted, in order to compare them with the results of the simulations.

Date*	Signature*
05.03.2019	

* required field