

Thesis Project Offer

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

Thesis type*

<input type="checkbox"/> BSc	<input checked="" type="checkbox"/> MSc	<input checked="" type="checkbox"/> PhD	Intended starting date (approx.): As soon as possible
------------------------------	---	---	---

Contact details of supervisor/responsible host at Forschungszentrum Jülich

Title*	Degree	First name*	Surname*
Mr.	Dr.	Emmanuel	Kentzinger

Phone*	E-mail*
+49 2461 61 3139	e.kentzinger@fz-juelich.de

Function*	Institute and homepage of institute*
Staff Scientist	JCNS-2 https://www.fz-juelich.de/jcns/jcns-2/EN/

University affiliation in Germany*

RWTH Aachen (via Prof. Dr. Thomas Brücke)

Co-Supervisor at Palestinian university (if applicable)

Title	Degree	First name	Surname
Title	Degree		

Phone	E-mail

University/institution	Department/faculty/institute

Project description*

Investigation of superconductor/ferromagnet thin film heterostructures with in-plane texture

The antagonist electron spin orders in ferromagnetism and in spin-singlet Cooper pairs mediated superconductivity hamper the application of superconductor/ferromagnet (S/F) thin film heterostructures in low power dissipation spintronics. However, at carefully engineered S/F interfaces, equal-spin-triplet Cooper pairs can be generated. This can be the case when the ferromagnet shows an in-plane magnetic texture like domains.

The proposed study aims at investigating, as a function of temperature and applied magnetic field, the depth and in-plane profiles of superconducting and ferromagnetic orders in an epitaxial thin film heterostructure of a high-T_c superconductor and a ferromagnet with in-plane texture.

The chosen system will be produced by a combination of high oxygen pressure sputtering and ultra-high vacuum molecular beam epitaxy. The samples will be investigated at the laboratory (X-ray diffraction, resistivity, magnetometry, magnetic force microscopy) and using advanced neutron scattering methods at worldwide unique instruments of the Heinz Maier-Leibnitz Zentrum (MLZ) in Garching close to Munich.

Date* Signature*

23.03.2020	
------------	--

* required field