



**Marie Skłodowska-Curie  
Early Stage Researcher - PhD position**



at the Department of Engineering  
University of Perugia, Italy,

in the frame of the Marie Skłodowska-Curie European Training Network:

“NDTonAIR: Training Network in Non-Destructive Testing and Structural Health  
Monitoring of Aircraft structures”

EU call: H2020-MSCA-ITN-2016 - [www.ndtonair.eu](http://www.ndtonair.eu)

**Title of the ESR-PhD Research Project:** Eddy Current imaging for automatic defect identification and reconstruction in metallic structures.

**Abstract:** The project aims to develop an Automatic Defect Detection and Reconstruction procedure for metallic parts relying on processing and classification of Eddy Current Images obtained by using broadband coded excitation signals. Intermediate objectives are: (I) development of a semi-analytic model to represent defects patterns and to study lift-off invariance measurements; (II) definition of an optimal broadband coded-excitation; (III) definition of an ancillary-excitation allowing the lift-off variations to be measured; (IV) definition of image formation procedures for both time and frequency data; (V) numerical optimization and experimental realization of a sensor array for fast scanning of the samples; (VI) definition of an algorithm for reconstruction of defect's depth profile; (VII) development of a proper image fusion algorithm to merge defect's reconstructed profile starting from time- and frequency- features.

**Expected Results:** It is expected that the contextual processing of time and frequency data will make the procedure more robust against the noise assuring a high SNR level. The SNR level will be enhanced also by use of coded excitation.”

**Job description and eligibility Criteria:** The PhD position is in the PhD School of Industrial and Information Engineering. Since the research topic is situated in the field of electromagnetic nondestructive testing, an excellent background in electromagnetism, electrical and electronic engineering is requested.

Moreover, interest in signal and image processing as well as in sensors and data acquisition systems are desirable and appropriate skills in English speaking and writing are mandatory.

The research activity will be performed in the “Laboratory of NonDestructive Testing” of the Department Engineering at University of Perugia, but also periods of secondment at other partners of the consortium are planned (CEA-LIST - France, University of Cassino-Italy, University of Newcastle-United Kingdom, Brussels Airlines-Belgium).

The successful candidate will be therefore eager to move in other countries during the project.

**In addition, the successful candidate will satisfy at the time of the recruitment (1<sup>st</sup> February 2017) the following mandatory characteristics:**

- having not more than 4 years of equivalent research experience (i.e. working as researcher after obtaining your master's degree);
- having not been awarded a title of PhD;
- having not resided or carried out her/his main activity in Italy for more than 12 months in the last 3 years,

**Starting Date:** 1<sup>st</sup> February 2017

**Duration:** 36 months

**Expected start of the application:** 1<sup>st</sup> November 2016

**Deadline:** 31<sup>th</sup> December 2016

**Salary:**

1. Living allowance € 39.820,44/anno
2. Mobility allowance € 7.200,00/anno
3. Family allowance € 3.000,00/anno

For more info about salary calculation, the requisites for Family allowance and more details on the employment conditions, please see the founding body rules:

[http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016\\_2017/main/h2020-wp1617-msca\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-msca_en.pdf)

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“Laboratory of Nondestructive Testing” - Department of Engineering – University of Perugia