



**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:** Pulse-Compression Phased-array UT inspection with on-board real-time processing.

**Abstract:** Ultrasonic inspection is the most used Non-destructive testing technique for the evaluation of the integrity of both metallic and composites materials and structures, especially in the aircraft industry. The project aims to optimize the sensitivity of ultrasonic inspections by combining (1) phased-array sensors, i.e. beam shaping and orientation, (2) pulse compression with coded excitation for increase SNR and bandwidth/temporal resolution and (3) advanced imaging techniques such as SAFT, inversion methods and full-matrix capture

**Expected results:** The combination of the previous tools will make possible to: (1) inspect very attenuating structures such as sandwich or multilayer structures, tick Fiber Glass composites or special metallic alloys; (2) use higher frequency of inspection without lack of SNR allowing a higher spatial and temporal resolution and detection of smallest defects; (3) give very precise information about defects size and position to allow a better evaluation of the structure integrity.

**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 ultrasonic nondestructive testing, with emphasis on the optimization of the excitation signals both in terms of ultrasonic field generation and of SNR enhancement, an excellent background in acoustic, electrical and electronical engineering is requested. Moreover, skills in signal and image processing as well as on the respective hardware (e.g. transducers, ADC, data acquisition systems) and software (e.g. Octave/MATLAB, Labview, Python etc.) are desirable. Appropriate competencies 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, X-Phase srl-Italy, University of Warwick-United Kingdom, SIEMENS-Germany).

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