Polish Academy of Sciences
Institute of Fluid-Flow Machinery
Mechanics of Intelligent Structures Department

Notice of open competition #2:

student

in the frame of the Opus 29 project no 2025/57/B/ST8/00045, entitled: "Non-contact laser-based system for fatigue damage monitoring" funded by the National Science Centre, Poland

We are looking for a talented MSc student interested in continuing their scientific work and possibly pursuing a doctoral dissertation in the future

The main objective of the project is the design, development and analysis of a complete non-contact laser ultrasonic system for narrowband selective Lamb wave mode generation.

Such systems are advantageous for the non-destructive evaluation of structures in comparison to other contact methods, such as ultrasonic testing, which requires a coupling gel. It is also very flexible and allows the selective Lamb wave modes generation, which is not possible with a conventional setup of point-wise pulsed laser excitation and scanning laser Doppler vibrometer sensing. It opens up a new avenue in research for potential improvement in the damage identification of structures. In particular, wavefield imaging based on nonlinear guided waves combined with laser patterns for Lamb wave generation, such as the Archimedean spiral or concentric rings proposed in this project, has not been explored so far. The hypothesis is that such an approach will allow us to detect and identify damage earlier than by using point-wise laser excitation and wavefield imaging based on linear guided waves. It is also anticipated that by using full wavefield measurements and advanced modelling techniques, we will be able to better understand the damage-induced generation of nonlinear guided waves.

The role of the student in this project is modelling and simulation of the laser intensity distribution, point-wise pulse laser excitation analysis, and laser-pattern excitation analysis; analysis of thermo-elastic wave generation efficiency in metallic plates; assistance in experimental set preparation and measurements; and journal paper preparation.

A candidate will be a part of an energetic, curiosity-driven and culturally diverse team working at the Mechanics of Intelligent Structures Department, MISD (http://www.imp.gda.pl/en/o4/z1/). The MISD is a part of the Institute of Fluid-Flow Machinery, which belongs to the Polish Academy of Sciences.

Qualifications

- Proficiency in written and oral English
- Relevant study enrollment (mechanics, mathematics, physics, mechanical engineering, aerospace engineering or related field): student status
- Mobility and flexibility for conferences (up to twice a year).

We especially seek candidates who:

- possess knowledge about laser equipment,
- have programming skills,
- can write code in MATLAB language.

Additional assets are certificates related to the knowledge and experience in electromagnetic wave propagation, laser optics and finite element method.
In addition, the following will be assessed:

- the candidates' scientific track record,
- the prizes and distinctions of the candidate resulting from the research carried out.

For further information, please contact Pawel Kudela (pk@imp.gda.pl; phone: +48 58 6995 251).

General information

The period of employment for this position is in the form of contract for 24 months. Employment is possible immediately. The deadline for application submission is 30th November 2026, 11 am CET. Online interviews will be conducted upon prior notice and at an individually scheduled time.

Conditions of appointment

The salary is 2500 PLN gross for 12 months and 3250 PLN gross thereafter.

How to apply

The application must contain information about the educational background and work experience. The application, including a CV, grade transcripts (courses with grades) from the graduate studies, a copy of the certificate of completion of bachelor's degree studies, a list of publications (if any) and other attachments, should be submitted to Pawel Kudela (pk@imp.gda.pl) with the e-mail subject “Laser project candidate”.