Opening for PhD student position
– Physics-Guided Damage Identification in Composite Structures Using Vibration and Wave Propagation Methods

Institute of Fluid-Flow Machinery, Polish Academy of Sciences, Gdańsk, Poland

Potential PhD Supervisor:
Dr hab. inż. Maciej Radzieński

About the PhD project

We are seeking a motivated and talented candidate holding an MSc degree who is interested in continuing their scientific research and pursuing a doctoral dissertation. The PhD will be conducted at the Institute of Fluid-Flow Machinery, Polish Academy of Sciences, Gdańsk.
This project's topic focuses on physics-guided damage identification in composite structures using vibration analysis and elastic wave propagation methods. The research will investigate modal characteristics, including natural frequencies, mode shapes, and local changes in dynamic response, as well as guided waves, Lamb waves, dispersion phenomena, and mode conversion. Physics-guided machine learning will be used to integrate numerical models, physical equations, and wave propagation to improve damage detection, localization, and quantitative assessment.

Research Tasks

The successful candidate will:

1. Investigate vibration-based methods, including modal characteristics, mode shapes, natural frequencies, and local changes in dynamic response
2. Study elastic wave (guided waves, Lamb waves) propagation, including dispersion phenomena, mode conversion, and damage-induced changes in the wavefield
3. Develop physics-guided machine learning approaches integrating numerical models, physical equations, and wave propagation knowledge to improve damage detection, localization, and quantitative assessment
4. Conduct experimental investigations using elastic waves techniques.
5. Develop computational codes in MATLAB.
6. Perform signal processing and analyse experimental and numerical results.
7. Prepare technical reports documenting research methods, analyses, and findings.
8. Prepare manuscripts for publication in peer-reviewed journals and presentations for scientific conferences.
9. Present research results at national and international scientific conferences.

The offer

We offer a PhD position:

- in the Department of Mechanics of Intelligent Structures, Institute of Fluid-Flow Machinery, Polish Academy of Sciences Gdańsk, Poland (http://www.imp.gda.pl/en/o4/z1/).
- with enrolment in the Tricity Doctoral School Polish Academy of Sciences
- with a PhD scholarship offered for 46 months (planned to begin on **December 1, 2026**)
- with the following monthly PhD scholarship of
    - 3,571 PLN/month gross before mid-term evaluation (years I-II)
    - 5,501 PLN/month gross after mid-term evaluation (years III-IV)

Eligibility criteria/ skills/qualifications

1. Masters in mechanical engineering, material science, physics or related fields.
2. High average grade obtained during studies.
3. Good knowledge of written and spoken English.
4. High motivation for scientific work and a strong commitment to research work.

Specific Requirements

We especially seek candidates who:

- have knowledge of guided waves and vibration-based methods
- have experience with MATLAB environment, ability to develop computational codes in MATLAB
- possess knowledge of data analysis, and signal processing

In addition, the following will be assessed:

- the candidates' scientific track record (publications, conferences, participation in projects, scholarships, etc.),
- awards, honours, or distinctions of the candidate resulting from the research carried out.

Selection procedure

Selection process is in accordance to Rules of the Recruitment to the Tricity Doctoral School, Polish Academy of Sciences for the academic year 2026/2027 (https://www.imp.gda.pl/bip/dokumenty-tsd-pan/).

1. Submission of applications is possible until **November 13, 2026, 12:00 AM**
2. Form of applications: Applications in English can be sent by e-mail to **tsdpan@imp.gda.pl** with a subject "PhD student application - Physics-Guided Damage Identification in Composite Structures".
3. Candidates interested in applying for the position should submit the following documents:
    - cover letter
    - CV / scientific resume
    - copy of the certificate of Master degree
    - the list of scientific achievements (publications, participation in research projects, participation in conferences, awards, scientific stays, etc.)

- optional: letter(s) of recommendation obtained from people (e.g. supervisors, former managers) directly cooperating with the candidate.

4. The application must contain information about the educational background and work experience.
5. Please, attach the requested documents in the PDF format.
6. The result of the recruitment procedure will be sent to the candidates via email.
7. Please include in the application the following statement:

   "I hereby authorize to process my personal data included in my application for the needs of the recruitment process (in accordance with the Act of 08.20.1997 r. on personal data protection - Dz. U. No 133, item 883) ".

Selected candidates will be invited for an interview (in person or via online videoconference).

Additional questions could be sent by email to Tricity Doctoral School Polish Academy of Sciences: mmieloszyk@imp.gda.pl