



NARODOWA AGENCJA  
WYMIANY AKADEMICKIEJ

Krakow 23.05.2019

## **Research Assistant in Cultural Heritage Research Group of the Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences**

### 1. The institution

The Institute (<http://www.ik-pan.krakow.pl>) is the only scientific institution in Poland and one of very few in the world devoted entirely to research in catalysis and chemistry of interfaces. It pursues interdisciplinary studies of phenomena occurring at phase interfaces, combining significant aspects of chemistry, physics, material engineering, and more recently biology, medicine and heritage science.

The institute is dedicated to advancing the field of heritage science, in which science and the humanities overlap. The Institute is home to Cultural Heritage Research Group (CHR), advancing understanding of the structure and properties of historic materials, mechanisms of their deterioration, and measures to conserve and protect them. Special emphasis is laid on phenomena occurring at the surfaces, such as interaction with moisture contained in the air and the resulting mechanical and structural response of works of art.

The CHR has vast experience in the international research cooperation in this area illustrated among others by several European projects in which it participated. The basic research is linked to extensive practical work also with international partners which included in recent years the Victoria and Albert Museum in London, the National Trust UK and the Getty Conservation Institute in Los Angeles.

Recently, after several years of research work in the Institute for the Preservation of Cultural Heritage at Yale University, Dr. Łukasz Bratasz won the 'Polish Returns' project financed by the Polish National Agency for Academic Exchange (NAWA). The aim of the NAWA project is strengthening potential of the CHR to develop physical model (numerical model based on properties of historic materials determined experimentally) of pictorial layers of paintings, to elucidate mechanism of crack formation in the layers, and thus enhance preventive conservation practice in museums.

**A full-time, 40-months position of a Research Assistant is open in the Cultural Heritage Research Group of the Institute.**



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## 2. The research in which candidate will participate

The Research Assistant reporting to the head of the CHR group will work on development of a comprehensive mechanical and numerical model of historical, aged paint layers - innovative at the global scale. The paint layer is a complex assembly of strata of humidity-sensitive materials which have - over centuries - aged, cracked and delaminated. Cracks join up into the network – the craquelure pattern (CP) - which is a distinctive characteristic of materials and physical structure of the artwork, an outcome of the construction and painting techniques employed by the workshop and the artist, but there is no knowledge on how those CPs developed and what is the impact of CPs on painting vulnerability to relative humidity variations..

The Research Assistant will be responsible for:

- building a database of material properties, including fracture toughness, for historical materials used in paint layers;
- developing a comprehensive 3D mechanical model of historical paint layers, especially understanding mechanisms and processes involved in CP formation based on finite element modelling using COMSOL Multiphysics software for analysis of strain/stress fields;
- determining vulnerability of historical paint layers with developed CPs to relative humidity variations, also after conservation treatments;
- application for new projects.

## 3. Eligibility

Candidates must have **MSc in material science, mechanical engineering, physics or related field**. PhD in the above disciplines is very welcomed.

Experience in stress/strain finite element modelling, fracture mechanics, material analysis and characterization, mechanical testing. Excellent written and verbal skills, fluency in English language as well as an interest in collaborative and multi-disciplinary research are essential.

## 4. Remuneration

The level of remuneration is **5500-6200 PLN/month** depending on candidate experience including health benefits.

5. Review of applications will begin immediately, and applications will be accepted until **12 p.m., June 23, 2019**. Decision will be taken until June 30, 2019.

6. Application should include:



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- a. cover letter,
  - b. consent to the processing of personal data for the needs necessary to carry out the recruitment process in accordance with the Act of 29 August 1997 on the protection of personal data (t.j. Dz. U. z 2016 r. poz. 922, z 2018 r. poz. 138, 723.) and fill in the form „Obowiązek informacyjny dla osób mających podjąć pracę/współpracę” confirming acquainting with its content. The form is available on the institute website [[FORMULARZ](#)],
  - c. a copy of the diploma of granting the professional degree, MSc or Ph.D.,
  - d. CV (including information about including parental leave, voluntary work, etc.),
  - e. at least one opinion about the Candidate from the previous supervisor, preferentially issued by an independent researcher,
  - f. list of scientific achievements.
7. The application should be sent in electronic form to: [ncikifp@cyf-kr.edu.pl](mailto:ncikifp@cyf-kr.edu.pl), with the note "Heritage Science - assistant".