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**CALL FOR EXPRESSION OF INTEREST IN PHD STUDIES IN COLLABORATIVE DOCTORAL PARTNERSHIP BETWEEN KAUNAS UNIVERSITY OF TECHNOLOGY (KTU), LITHUANIAN ENERGY INSTITUTE (LEI) AND THE JOINT RESEARCH CENTRE (JRC)**

**Study Program:** Technological Sciences, Energetics and Power Engineering (T 006)

**Research topic:** Analysis of spent fuel ageing processes during interim and long storage period

**Problem description:** This PhD program is aimed to provide relevant separate effect studies of spent fuel ageing process for an interim and long storage period in wet and dry storage facilities using experimental results and include these results in the numerical simulation tools. All activities will consist in two big tasks: (a) experimental work and (b) simulation work.

In the experimental work part, the UO2 samples will be doped with the strong α-emitter 238Pu and some properties will be monitored periodically by means of XRD, SEM, TEM Vickers Hardness and acoustic microscopy (elastic properties) as a function of the increasing self-irradiation dose.

In the simulation work part, the MFPR-F simulation tool, which is developed in IRSN and deals with the release of a variety of fission products under various conditions, will be modified. The MFPR-F code will be extended to include the capability to simulate the effects of α-self-irradiation in UO2 at an atomic and mesoscopic scale. To validate the performed modifications, the simulations of above-mentioned experiments will be performed and comparison with available experimental data obtained at the JRC –Karlsruhe will be performed. Later, the modified MFPR-F code will be applied for the analysis of the self-irradiation effects on the mechanical and thermal properties. Finally, the MFPR-F code will be coupled with the TRANSURANUS code and tested during the simulation of a complete fuel rod.

**Expected outcomes:** In the frame of proposed PhD program:

* (a) the detailed thermal and mechanical characteristics of UO2 doped with the strong α-emitter 238Pu will be provided; (b) the TRANSURANUS code will be extended by coupling with the MFPR-F simulation tool of the IRSN, which deals with the release of a variety of fission products under SNF interim and long storage period.
* (a) at least two common (co-authors form KTU and LEI and JRC) publications in the Clarivate Analytics data base referred by Web of Science Core Collection should be prepared and published; (b) the PhD thesis should be prepared and defended.

**Mentor's contact**: dr. Tadas Kaliatka (Tadas.Kaliatka@lei.lt)

**Prerequisites:** MSc. in Nuclear Engineering is desirable, the program is targeted for Masters with backgrounds of Mechanical Engineering, Electrical and Computer Engineering, Physics, Chemistry, Material Science. The successful candidate must have strong analytical skills, be proactive and self-driven. The candidate must have interest in researching on the processes in nuclear fuel and professional command of English (both written and spoken).

**Collaborative Doctoral Partnership between KTU, LEI and the JRC**

PhD studies will be developed within the framework of the collaborative doctoral partnership between the Joint Research Center of the European Commission (JRC) and the Kaunas University of Technology (KTU), Lithuanian Energy Institute (LEI).

It is expected that the student will start and finish PhD studies at the Lithuanian Energy Institute and will spend a considerable part of the study (minimum 12 months and max up to 36 months) at the JRC premises in Karlsruhe (Germany).

During this period the student will be paid according to the corresponding **Grant Holder and GH 20 scheme** [1] [2]. Temporary employment contract covering the doctoral period of the candidate during the stay at JRC. This doctoral position covers a competitive salary for the research work carried out during this period.

The JRC will also nominate a topic advisor and will provide relevant data and access to the necessary research infrastructure – thus, the PhD student will be jointly supervised by LEI and JRC.

After successfully completing the PhD program conditions, the candidate will be awarded the doctoral degree by KTU.

[1] <https://ec.europa.eu/jrc/sites/jrcsh/files/jrc_grantholder_rules.pdf>

[2] <https://ec.europa.eu/jrc/sites/jrcsh/files/Grantholder%20Vademecum%20KRU.pdf>

**Student’s selection procedure**

This call is oriented for the students from Member State of the EU and Horizon Framework Program Associated Countries [3]

The selection is done in two phases.

* Selection procedure at the KTU - LEI:
  + The KTU - LEI performs preselection procedure according the Regulation of Research Doctoral Studies of the institutions of joint doctoral studies (approved by Senate of KTU) and Regulations for the admission to doctoral studies of KTU (with participation of JRC representatives as observers in the interview of applicants).
  + The KTU - LEI establishes a short-list of two to five candidates per PhD position.
  + The KTU - LEI informs the short-listed candidates about the results of the selection and that it will send their application (CV, motivation letter and any other relevant documents) to the JRC.
* Selection procedure at the JRC:
  + The decision on the recruitment of the candidate is taken by the JRC, following the below selection process and in accordance with the **GH Rules [1]**.
  + KTU - LEI sign PhD study contract with the selected candidate after information of the outcome of the selection process is received from the JRC.

[3] <https://ec.europa.eu/info/files/countries-associated-horizon-2020-framework-programme_en>

[**Application for the KTU - LEI**](https://www.tuzvo.sk/sites/default/files/files/Terms_and_conditions_TUZVO%20final(1).pdf) **preselection procedure**

Applicants for doctoral studies must submit the following documents:

* Application Form\*, indicating the field of science, research topic and form of funding;
* List (full bibliographic description) and Copies of scientific publications, and in the absence of such works – a Scientific Report\*\*, the topic of which is in accordance with the topic of the dissertation specified in the application (if a candidate applies for two topics, two separate scientific reports must be submitted);
* Official legalised Bachelor’s and Master’s diplomas or a higher education degree equivalents and academic transcripts. If said documents are issued in foreign institutions, they must be recognized in the Republic of Lithuania in accordance with the appropriate procedure (recognition of educational documents is carried out by the Centre for Quality Assessment in Higher Education https://www.skvc.lt/);
* Research proposal on the selected topic (if required for a certain programme)
* Curriculum Vitae;
* References by two academic referees or researchers from the relevant field of science;
* Copy of ID card or passport;
* Certificate of English proficiency: IELTS >=6.5, TOEFL>=90, ECFR>=C1, or equivalent
* Other relevant documents (copies of certificates of a course completion, certificate of passing doctoral level exam, etc.).

**Eligibility criteria - JRC**

Candidates should, prior to the start of the employment contract with the JRC:

* have the nationality of a Member State of the EU or a country associated to the Research Framework Programmes or being resident in an EU Member State since at least five years and
* be enrolled in a PhD programme with the KTU and LEI.

Candidates who are already enrolled in the doctoral study program with the KTU and LEI for fewer than 12 months can also be considered eligible.

The selected candidate will have not more than 6 months from the request for confirmation of interest in the position, to produce proof of enrolment in the doctoral study program.

**How to apply**

Fill in the application form, add all the required documents, and mail it to the LEI (see address below). The failure to provide on time all required documents will result in the exclusion from the competition.

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| **Address to deliver documents to:**  Lietuvos energetikos institutas  Breslaujos g. 3, room AK-233.  44403 Kaunas, Lithuania. | **Dates & Deadlines:**   |  |  | | --- | --- | | Submission of applications for KTU-LEI preselection procedure: | for Lithuanian students – June 22, 2021  for foreigner students – May 31, 2021 | | Motivational interviews in KTU-LEI: | June 28 – 30, 2021 | | Notification of applicants about the results of selection into KTU-LEI short-list candidates: | June 30, 2021 | | Notification of applicants about the JRC competition results: | September – October, 2021 | | KTU-LEI Study Agreement: | October 30, 2021 | |
| **Contact person:**  Jolanta Kazakevičienė  Studies Administrator  tel. +370 37 401 809  email [studijos@lei.lt](mailto:studijos@lei.lt) |