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Deliverable 7.2

Monitoring the progress of PhD projects

Work Package: 7



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Executive Summary

RadoNorm integrated E&T activities into the scientific and technical development work of the project by initiating a PhD and postdoctoral grant programme which was open to talented students and early career scientists from all European countries. For this, 29% of its budget was allocated towards education & training activities for PhD students and postdoctoral fellows as mentioned in its proposal, far exceeding the stipulated 5% in the NFRP 12 funding call of the EURATOM Horizon2020 Work Programme 2019-2020.

As part of this programme, the progress of work of PhD students and of early career postdocs in RadoNorm (collectively called early career researchers; ECRs) was monitored. To this end videoconferences were organised initially, that were replaced by setting up an ECR Council that organised several activities of the ECRs.

This report describes the initial monitoring of the ECR progress of work and the activity of the ECRC.

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1. Recruitment of PhD students and early career postdocs

Approximately 24% of the RadoNorm budget was dedicated to salaries of PhD students and early career postdocs (collectively referred to as ECRs – early career researchers). During the first 18 months of RadoNorm, 20 PhD students and 14 early career postdocs were recruited.

The WP7 consortium (composed of WP Leaders) decided that it will not participate in the local process of recruiting ECRs but will act as the final approving body. The recruiting process was carried out according to national/local regulations. Every recruiting organisation sent a short report of the recruiting process with information about the received applications and the listing of the candidates. WP7 members checked if the selection outcome conformed with the RadoNorm requirements (Table 1) and gave their approval within 5 days of receiving notification. It was generally practiced that the approval step by WP7 took place before the approval of the candidate by the local decision body. This was not seen as *not sine qua non* but helped avoiding the unlikely situation that WP7 rejects a candidate that has been approved by the local body. In reality, WP7 members never rejected a candidate.

Table 1. Selection criteria for PhD students and early career postdocs.

<i>Uniform selection criteria for acceptance of PhD students</i>	<i>Uniform selection criteria for acceptance of Early Career Postdocs</i>
<ul style="list-style-type: none"> • The applicant must have good command of English • The applicant must be ready to participate in RadoNorm meetings and report on his/her progress of work 	<ul style="list-style-type: none"> • The applicant must have good command of English • The applicant must be ready to participate in RadoNorm meetings and report on his/her progress of work • Applicants must be less or equal to 5 years after obtaining a PhD title. The time constraint is prolonged by a time equivalent to a taken maternity or paternity leave.

2. Initial monitoring of ECR progress of work

RadoNorm was a large and interdisciplinary project, with ECRs working in different fields of radiation research. In order to ensure that the ECRs get an overview of each other's activities, two virtual meeting were organised in 2021 (Figure 1 and Table 2) where each ECR presented his/her planned work. Each presentation was followed by a discussion.

Figure 1. Screenshot from the ECR work plan presentation meeting

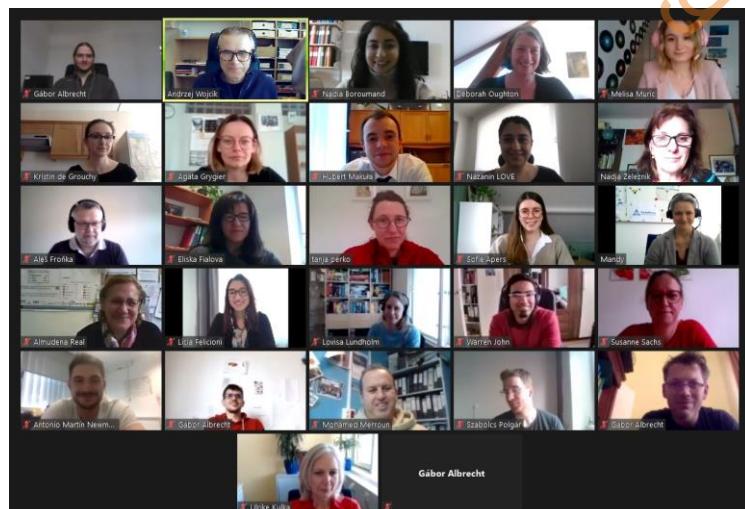


Table 2. Agendas for the two ECR work plan presentation meetings.

15 April 2021, 14:00-16		21 May 2021, 14:00 – 16:45	
 RadoNorm Managing risks from radon and NORM		 RadoNorm Managing risks from radon and NORM	
1 st PhD/ECR Day – 2021 04 15, 14:00-16:00	AGENDA	2 ND PhD/ECR Day 2021 05 21, 14:00-16:45	
14:00-14:05 Welcome <i>Ulrike Kulka (coordinator), Andrzej Wojcik, SU (WP7 Leader)</i>	WP2	14:00-14:05 Welcome <i>Ulrike Kulka (coordinator), Andrzej Wojcik, SU (WP7 Leader)</i>	WP2
14:05-14:15 Influence of uranium speciation on its transfer to plants <i>Warren John HZDR (WP2)</i>		14:05-14:15 Temporal validity of radionuclides (RNs) retention parameters in soils <i>Sarah Zamane; IRSN (WP2)</i>	
14:15-14:25 Investigation of the interactions of microorganisms with uranium in anthropogenic contaminated waters as basis for the development of a bioremediation technology <i>Antonio Martin Newman Portola (WP2)</i>		14:15-14:25 Development of an integrated system of interventions for effective protection from ionising radiation of workers in activities with NORM <i>Lauro Luzzi; SAPIENZA and INAIL (WP2)</i>	
14:25-14:35 Modelling absorbed dose from the decay of radon progenies in the nuclei of radiation sensitive cells of the airway epithelium <i>Peter Füri (WP3)</i>		14:25-14:35 Typical indoor aerosols influence on radon measurements & Identification of radon prone buildings through different methods <i>Joan Rey; HES-SO and EPFL (WP2)</i>	
14:35-14:45 New implementation of the stochastic lung model <i>Gábor Albrecht (WP3)</i>	WP3	14:35-14:45 Elucidating the mechanisms governing the interaction of naturally-occurring radionuclides in soils <i>Joan Serra; Ventura UB (WP2)</i>	
14:45-14:55 Effects and mechanisms of action of combined exposures to radon or NORM and other stressors relevant of true exposure situations of humans and biota <i>Nadia Bouyoumadi, SU (WP4)</i>		14:45-14:55 Key variables influencing radionuclide mobility and transfer in soil <i>Mila Pelkonen; NMBU (WP2)</i>	
14:55-15:05 Register-based studies on the association of radon and childhood leukemia and brain cancers in Finland <i>Jad Abuhamed, TUNI (WP4)</i>	WP4	14:55-15:05 Break	
15:05-15:15 Break		15:05-15:15 Separation and modelling the effects on lung epithelium of cigarette smoke particles and radon progeny <i>Emese Drozsdik; EK (WP3)</i>	WP3
15:15-15:25 Critical raw materials recovery from sediments created due to release of radium rich formation waters <i>Hubert Makula, GIG (WP5)</i>	WP5	15:15-15:25 Assessment of Uncertainties affecting dosimetric calculations for the intake of Radon and NORM <i>Thomas Makumbi; KIT (WP3)</i>	
15:25-15:35 Determination of activity size distribution of the radioactive aerosol particles in the atmosphere of selected NORM and radon workplaces in the Czech Republic <i>Eliska Fialova, SU/CHBO (WP5)</i>		15:25-15:35 Biologically Based Modeling of Lung Carcinogenesis <i>Cristoforo Simonetto; HMUG (WP4)</i>	WP4
15:35-15:45 Radon Health Communication <i>Sofie Apers, UAntwerp (WP6)</i>	WP6	15:35-15:45 Mathematical modelling of low dose hypersensitivity and induced radioresistance <i>Szabolcs Polgár; EK (WP4)</i>	
15:45-15:55 Innovative survey methodologies to study the effectiveness of health communication in radon prone areas and NORM exposure situations: deliberative opinion polls and geocoded survey data <i>Melisa Muric, UAntwerp (WP6)</i>		15:45-15:55 Break	
15:55-16:05 Discussion and end of meeting		15:55-16:05 Assessment of the impacts of various types of radon protective and remedial measures on the environment <i>Licia Felicioni; CVUT (WP5)</i>	WP5
		16:05-16:15 The application of thermoluminescent detectors for simultaneous measurements of radon and thoron decay products <i>Agata Grygor; GIG (WP5)</i>	
		16:15-16:25 Socio-psychological barriers and facilitators to radon risk mitigation behaviour <i>Kristin de Grouchy; TCD & SCK CEN (WP6)</i>	
		16:25-16:35 Marketing and Societal Challenges of NORM in Building Materials <i>Nazanin Love Uhasselt & SCK CEN (WP6)</i>	WP6
		16:35-16:45 General discussion and date of next meeting	

3 Setting up of the ECR council

During the first annual meeting many ECRs presented their results. It became clear that this will be the practice during the coming annual meetings, hence it was decided that further progress report meetings of the ECRs would mean an unnecessary burden. Also, a top-down approach in organising the progress report meetings would not necessarily promote the creation of independent and creative future radiation researchers. Instead, it was decided that during the second annual meeting, a RadoNorm Early Career Researcher's Council (ECRC) will be created. The ECRC will organise regular seminars, webinars and meetings and discussions in a way that fosters transdisciplinary collaboration and team building.

The seminars will be open to anybody and announced on the RadoNorm website. The first round of seminars will aim at giving an overview of problems and known unknowns in that field tackled by each WP of RadoNorm. Each given seminar should thus be a joint effort of a group of ECRs from a given WP. It should be prepared to allow non-specialists to understand the problems. It should avoid technical details as far as possible. It should stimulate discussion and – ideally – promote collaboration. Later seminars will focus more on results achieved by RadoNorm.

The ECRC was set up during the 2022 annual meeting in Munich. It was composed of the chairperson Ämilie Degenhardt (BfS) and representatives of RadoNorm work packages: Warren John (BfS) for WP1, Andrea Maiorana (ISS) for WP2, Alok Dhaundiyal (EK) for WP3, Wafa Alimam (TUNI) for WP4, Hubert Makula (GIG) for WP5 and Melisa Muric (U Antwerp/SCKCEN) for WP6.

The first ZOOM meeting was organised in November 2022 (Figure 2) and was followed by monthly meetings.

Figure 2. Screenshot of the first ECRC meeting in November 2022.



4. Monitoring the activity of the ECRC

The ECRC held monthly ZOOM meeting to which the WP7 leader was always invited. The Council also made use of the opportunity to organise their own training courses once each year around topics that were relevant to ECRs such as science communication, career perspectives and the use of artificial intelligence (AI), see Table 2 below. These courses additionally helped networking amongst ECRs and empowered them within the RadoNorm and radiation protection community to be independent. The first course was organised together with the WP7 leader at SU; later courses were organised more independently by the ECRC. Senior RadoNorm researchers were always invited as lecturers.

Table 3. Training courses organised by the ECRC

Call for courses	Course Name	Organising Institute(s)	Duration (weeks)	Number of participants
2023	Transdisciplinary communication in Radon and NORM	Stockholm University	1	9
2024	Career management and perspectives in radon and NORM	BfS	1	6
2025	AI in Science: Key knowledge, applications and challenges	GSI, University Granada	1	11

The ECRC reported about its activity at each annual meeting. During the final meeting in Budapest, a session was held entitled “Reflections on RadoNorm E&T activities and perspectives from ECRs”, where ECRC members stressed how the monthly meetings showcased the ECRs’ work across various work packages and fostered constructive discussions and out-of-the-box thinking. The meetings provided an environment where ECRs could explain their work in simple terms without fear of judgment, encouraging open questions and knowledge-sharing across disciplinary boundaries, an element often lacking in formal academic settings, where a high level of prior knowledge is assumed. This supportive atmosphere not only built confidence but also enabled team building among the ECRs, which had been lacking at the project’s start. Such camaraderie among the next generation can be seen as essential to ensuring an effective succession of researchers.

The RadoNorm travel grants were extensively used by ECRs to present their research at numerous conferences, thereby contributing significantly to the dissemination of the project's results and facilitating their integration into the radiation protection community. The RadoNorm research stay grants further supported longer exchange visits and research stays. Based on personal testimonies, notable outcomes of these networking opportunities include helping ECRs secure new career positions within European radiation protection institutions, broadening their research horizons, and establishing contacts with internationally recognized organizations such as the ICRP and WHO.

5. Number of ECRs supported by RadoNorm

Not all PhD students and early career postdocs were hired for the whole duration of RadoNorm. But the overall number of ECRs that were supported, at least partly, during the project is: 24 PhD students and 15 postdocs.

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