

MEET-CINCH

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PROJECT PRESENTATION

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CO	Confidential, only for Beneficiaries of the MEET-CINCH project	

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1.1	14/06/2017	Fournier	Added RoboLab pictures
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Project information

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EXECUTIVE SUMMARY

This report summarizes the main information about the MEET-CINCH project to be used for publication and basic information about the project.

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1 INTRODUCTION

Nuclear- and radiochemistry (NRC) contains key knowledge and techniques needed by a modern society and is certainly needed in addressing many of the **societal challenges** defined in the HORIZON 2020 EU Framework Programme, namely, (a) **health**; (b) secure, clean and efficient **energy** and (c) **food security**. Within nuclear medicine diagnostic tools such as PET and SPECT imaging heavily rely on radiochemistry for preparing radionuclide loaded highly specific biomarkers. Radiotherapy profits strongly from development of cancer-seeking molecules armed with alpha- or beta-emitting radioisotopes which is only possible with NRC. Nuclear energy will play a role as a low carbon emission technique in many European countries for decades to come, relying on NRC in all stages of present and future fuel cycles. When using (geo)hydrothermal energy radionuclides accumulate in scales in pipes and filters, requiring NRC methods for radiation protection to reduce risks to workers. Further areas where nuclear and radiochemistry are of key importance include nuclear forensics, counteraction of proliferation issues and preparation for handling release of radionuclides (caused by e.g. accidents or terror attacks). Food safety includes radioecological assessment of risks from man-made and also natural radionuclides entering the food chain, e.g. using phosphate fertilizer, which often contain considerable amounts of uranium and radium or production of drinking water from deep wells with high uranium and radium contents. Further fields making use of NRC include dating applications in geology and archeology, ecology, and basic research such as investigation of super heavy elements.

To address challenges of maintaining competence in NRC and to counteract the negative perception of the nuclear field, the MEET-CINCH project proposed aims to enhance people's general awareness of the required and beneficial use of nuclear and radiochemistry techniques and methods. In particular, it is important to persuade a larger fraction of students to select an education within nuclear and radiochemistry, as there is a clear deficiency of candidates with such knowledge. With this background it's of utmost importance to develop and perform high quality NRC teaching and training according to the needs of research institutions, industry, hospitals, and other end-users. The requirements and demands from end-users have already been surveyed in our previous projects CINCH and CINCH-II. However, MEET-CINCH will seek direct contact with and input from the above mentioned groups in order to take into account their special needs in the material produced in MEET-CINCH.

2 NATURE AND SCOPE OF THE PROJECT

In 2010–2016 a series of two “CINCH projects” – CINCH-I: Cooperation in Education in Nuclear Chemistry, and CINCH-II: Cooperation and training in Education in Nuclear Chemistry – was supported within Euratom FP7 (<http://www.cinch-project.eu>). The projects aimed at mitigating the special skill-based deficits within nuclear chemistry at masters and doctorate levels and the decline of number of staff qualified in this field. The projects were built around the well-proven five-phase (Analysis, Design, Development, Implementation, Evaluation) Systematic Approach for Training (SAT) developed by IAEA; while CINCH-I dealt with the first three phases of the process, CINCH-II concentrated on the Implementation. Additionally, evaluation mechanisms were proposed and tested on the pilot courses developed during the projects.

Even though a major step towards the sustainability of the results achieved was done before the end of CINCH-II project – establishment of the NRC Network – some support is still needed during the period of transition to real sustainability. However, MEET-CINCH does not aim at sustainability only – its main aims are:

- **to pro-actively bring the results achieved so far to their end-users (CINCH VET e-shop),**
- **to significantly contribute to attracting new talents and increasing the nuclear (chemistry) awareness by developing a MOOC – Massive Open On-line Course and**
- **to investigate the applicability of the modern Flipped (Inverted) Classroom concept in the nuclear chemistry teaching and training field.**

3 ACTIVITIES

The organisation of this project is built around three pillars:

- **Nuclear Awareness** that aims particularly on general public and secondary school students
- **Sustainability and Evolutionary Developments** that aims particularly at vocational education and training (VET) of NRC professionals
- **Novel Education and Training Approaches** that aims both at university students and VET,

supported by two cross-cutting activities:

- **Mobility**
- **Management.**

To meet the above defined objectives, the proposed activities have been organised into three technical and two managerial work-packages that closely copy the project pillars listed above. This basic structure is completed by work package dealing with ethics issues (WP6). Each of the work-packages (apart from WP6) is further subdivided into several Tasks. The WPs are:

- WP1: Nuclear Awareness and Dissemination
- WP2: Sustainability and Evolutionary Development of VET tools
- WP3: Novel Education and Training Approaches (Flipped Classroom)
- WP4: Mobility, dissemination and exploitation
- WP5: Project Management and Administration
- WP6: Ethics requirements

4 EXPECTED RESULTS

The **expected results fulfilling the stated objectives** of MEET-CINCH are as follows:

- The **CINCH-II VET Syllabus update** to cover all the courses developed and demonstrated under CINCH, CINCH-II and MEET-CINCH projects.
- Based on an update of the earlier survey of end-users need and making use of the courses developed up to the “course material delivery” in the earlier projects, **several new courses** will be completed and brought up to the pilot level. These courses will make use of combination of all the existing tools – e.g. RoboLab exercises, Computers in Science exercises, CINCH Moodle course management system – and will both use and expand the teaching material available from NucWik.
- A new platform – **CINCH VET-e-shop** – will be launched that will provide easy access to and details of, including periodicity and pricing, all courses brought at least to a pilot level. This platform is expected to be a major contribution to the sustainability of the results achieved in all the mentioned projects.
- **The MOOC on NRC's importance.** In addition to increasing the awareness, this is expected to increase the number of students that select a career path which includes a NRC component.
- A **teaching package aimed for use in high-schools** for 16-18-year-old pupils. The package will demonstrate the importance of NRC for society and future work opportunities. A pilot will be run in the UK for their "A-level" pupils at the targeted age group. Similarly to MOOC, this activity is expected to increase the number of students that select an education that includes a NRC component, small or large
- **Mobility Fund** that will facilitate participation of students and young researchers from other “chemistry” Euratom joint projects, such as e.g. GENIORS, in lab courses and summer schools provided by MEET-CINCH or other activities.
- The modern **Flipped Classroom** (or so called Inverted Classroom) concept complementing the available tools for teaching and training in the nuclear and radiochemistry field. In conjunction with the **NucWik database of teaching materials**, a set of the **RoboLab remote operated laboratory experiments** and the **CINCH Moodle distant learning management platform** MEET-CINCH will provide a comprehensive toolkit, available in the VET-e shop mentioned above. The end user will be able to compile courses tailored to individual needs from this flexible modular base of teaching material.

5 SOCIETAL IMPACTS

MEET-CINCH will have the two following main societal impacts: (a) **young persons shall be attracted** to the field of nuclear and radiochemistry to counteract the loss of competence in the nuclear field and (b) **continuous training of personal working in the nuclear business** as well as for lateral entrants shall be eased by providing trainers with innovative teaching material and methods. MEET-CINCH mainly aims at European Qualifications Framework (EQF) level 7, i.e. academics and students at BSc / MSc level and beyond.

(a) NRC is a discipline of great relevance for all parts of the nuclear fuel cycle from fuel fabrication and reactor operation to geological disposal. Furthermore, radiation protection heavily relies on radiochemical pre-treatment for detection of non-gamma emitting radionuclides and for dose assessments via excretion analysis. It is the intention of MEET-CINCH to demonstrate the relevance of the topic to young persons. By producing a MOOC and developing and running a dedicated Teaching Package for High School use on NRC, the fascination of this field and its relevance for many different research directions shall be pointed out. Pupils shall be motivated to enter chemistry / radiochemistry university education and those already at BSc level education shall be encouraged to enter the field of NRC for their thesis and / or MSc programme. Mobility programme organized and at least partly financed by dedicated MEET-CINCH funds in close cooperation with the NRC Network and other European platforms in the field of nuclear education further add to attractiveness and quality of education in NRC. At the same time MEET-CINCH activities will point at job opportunities which are quite good due to upcoming retirement of a large fraction of recent personnel within the next decade. A career in NRC started today is very likely to persist for a whole professional life. This is true even for countries without nuclear energy production or for those phasing out nuclear power but confronted with challenges of decommissioning, nuclear legacies and waste disposal. The MOOC will also serve the aim to counteract the negative perception of everything nuclear which persists in many countries.

(b) Training of personnel either for maintaining competence in periodic courses which are mandatory for radiation protection officers or for lateral entrants such as for instance physical chemists who need additional NRC skills for new job assignments, should be conducted as effective as possible. To these ends MEET-CINCH will develop remote teaching concepts based on the flipped classroom concept and combining new to develop material with elements already available from CINCH and CINCH-II projects. A survey conducted as part of the CINCH-II project including industry, regulators, as well as education and research institutions demonstrated the need for NRC training concepts. Use of the remote teaching components developed for the flipped classroom concept to be used in the MEET-CINCH project answers the strict requirement of industrial players to minimize absence of their personnel from the work place. The combination of video teaching and only short one or two day classroom events is expected to be especially attractive for these end-users. Hence, a good acceptance of and request for the courses provided through the MEET-CINCH e-shop is to be expected.

On the other hand, making available customized teaching material in a modular way is very attractive also for teachers, so that both end-users and course providers will benefit from the outcome of the MEET-CINCH actions.

6 INFORMATION ABOUT IMPORTANT PUBLIC EVENTS

The interaction with different target groups is planned in all work packages according to specific types of results to be generated. In fact, communication of the project as well as of its deliverables is crucial to achieve the main objectives of MEET-CINCH. As obvious from the work plan, it is of great importance to develop and perform the planned NRC education and training methods, tools and materials in a way that reflects the needs of the target groups. This can be only assured by intensive, continuous and direct two-way communication with all types of end-users during the project.

The communication plan considerably benefits from the platforms and tools established in the predecessors of the project, which are further developed and extended in MEET-CINCH. The European NRC Network plays an important role in the planned communication (as well as dissemination) activities. The network was launched in 2016 and it sets promotion and representation of NRC education and training towards other organizations and society as an important part of its mission. The network currently has 23 active members and it will be expanded within MEET-CINCH, enabling thus even higher impact of this communication channel. It is the aim of MEET-CINCH to reach 40 members at the end of the project.

Students and pupils will be approached through the targeted courses, Moodle courses and RoboLabs as well as by the MOOC, which is also aimed at attracting younger generation (students between 16-20 years of age) to the nuclear chemistry apart from its general nuclear awareness raising goal that also targets wide society.

Video lectures and courses generated will be provided online for any type of end-users. Additionally, they will be advertised through all communication channels used in the project in order to reach the widest possible audience.

Two Public Reports for further spreading the information about the project will be released targeting wide society.

7 PROJECT INFORMATION

Website address: www.cinch-project.eu

Project type (funding instrument): Coordination Action

Project start date: 01/06/2017

Duration: 36 months

Total budget: 2 201 034,13 €

Maximum grant amount: 2 110 051,25 €

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List of Beneficiaries:

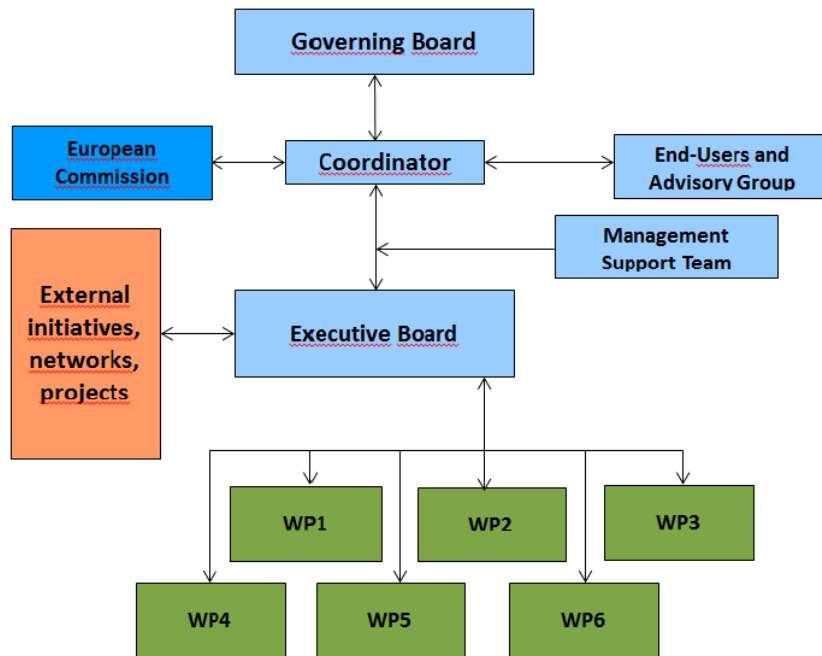
Partner number	Partner full name	Short name	Country code
1	Gottfried Wilhelm Leibniz University Hannover	LUH	DE
2	Czech Technical University in Prague	CTU	CZ
3	Chalmers University of Technology	CHALMERS	SE
4	University of Helsinki	UH	FI
5	University of Cyprus	UCY	CY
6	Jozef Stefan Institute	JSI	SI
7	University of Leeds	UNIVLEEDS	UK
8	National Nuclear Laboratory Ltd.	NNL	UK
9	Politecnico di Milano	POLIMI	IT
10	Evalion Ltd.	EVALION	CZ
11	Commissariat à l'énergie atomique et aux énergies alternatives	CEA	FR
12	Reseau Europeen pour l'enseignement des Sciences Nucleaires	ENEN	FR

8 ANNEXES

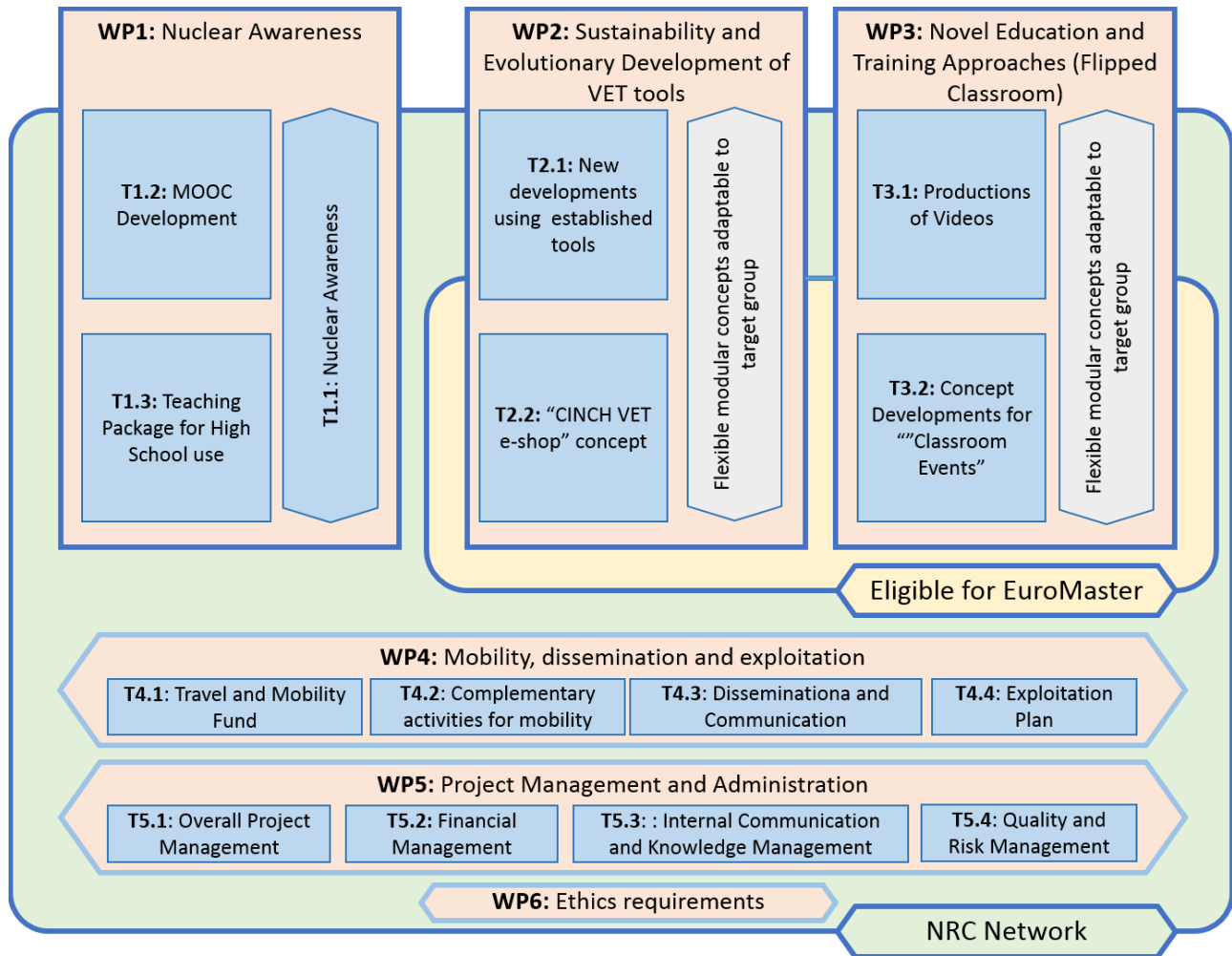
8.1 Project logo



8.2 Project organisation



8.3 Project Pert diagram



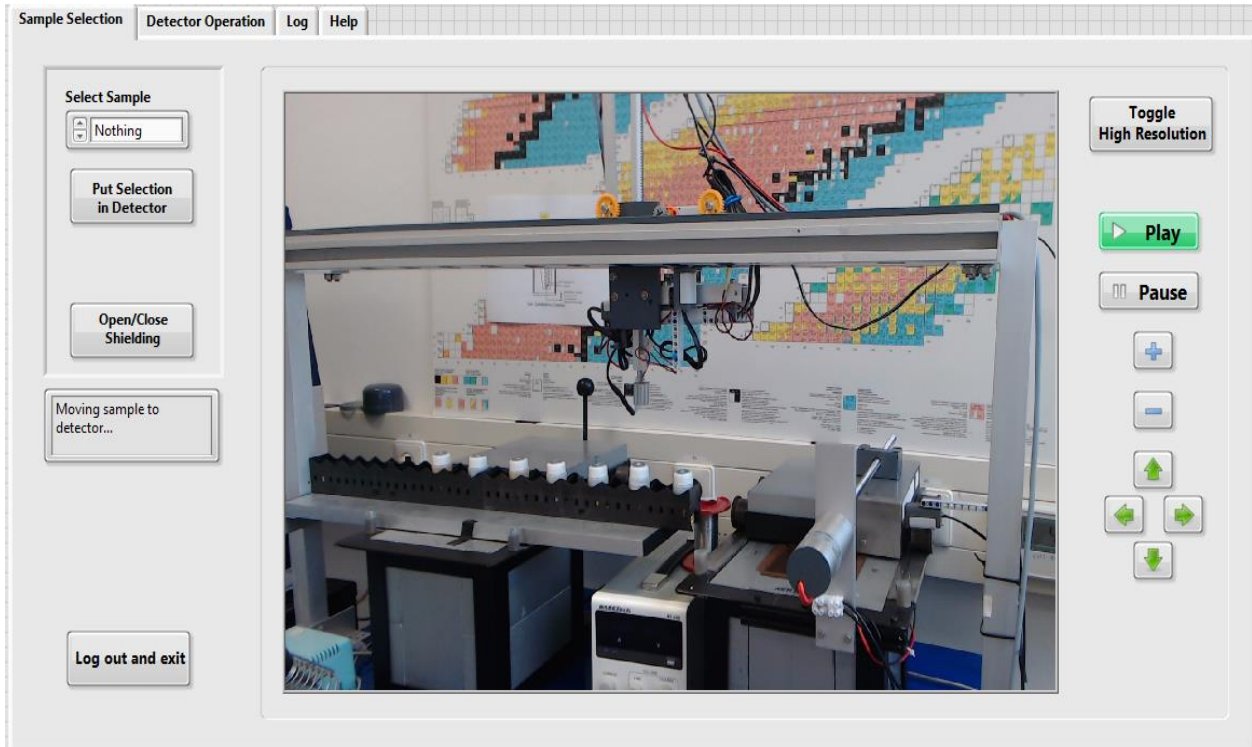
8.4 Photos

Current MEET-CINCH working group, Kick-off Meeting, Hannover, 2017.

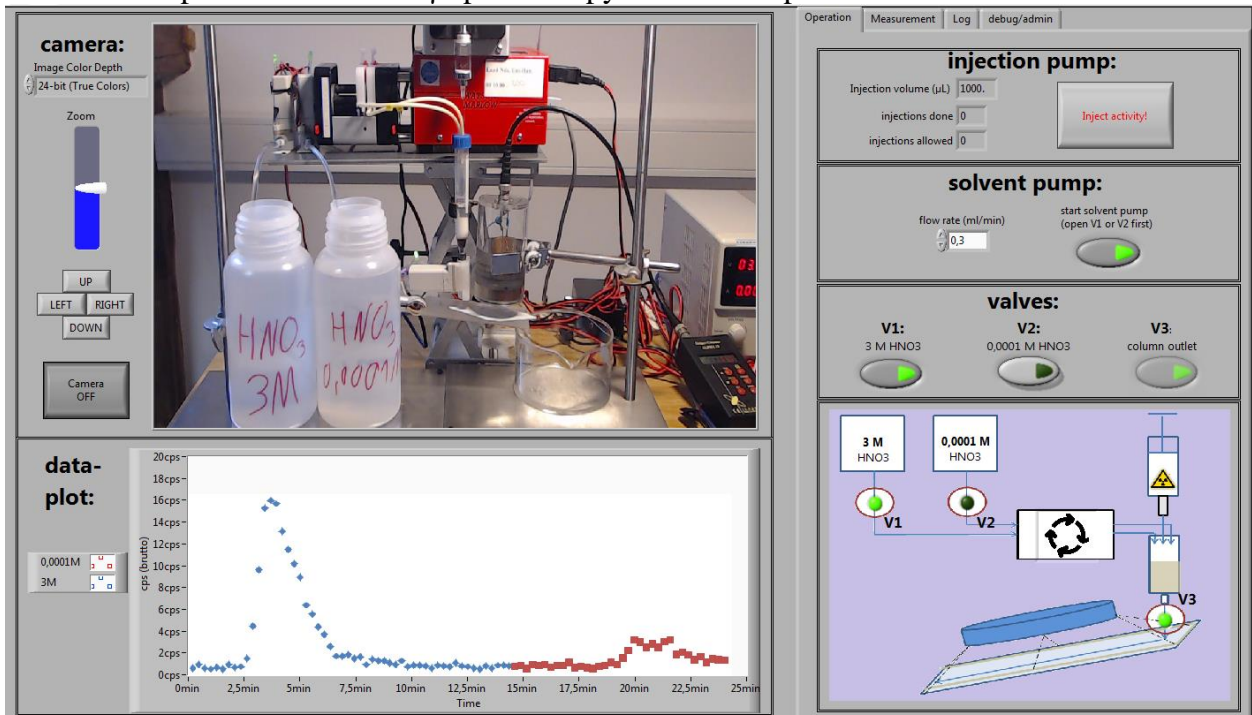


Tools to be used and developed (sample)

RoboLAB



Front panel of the HPGe γ -spectroscopy RoboLab experiment situated in Hanover



Front panel of the Ion Exchange RoboLab experiment situated in Hanover
Moodle Platform



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