MEET-CINCH – A Modular European Education and Training Concept in Nuclear and Radio Chemistry

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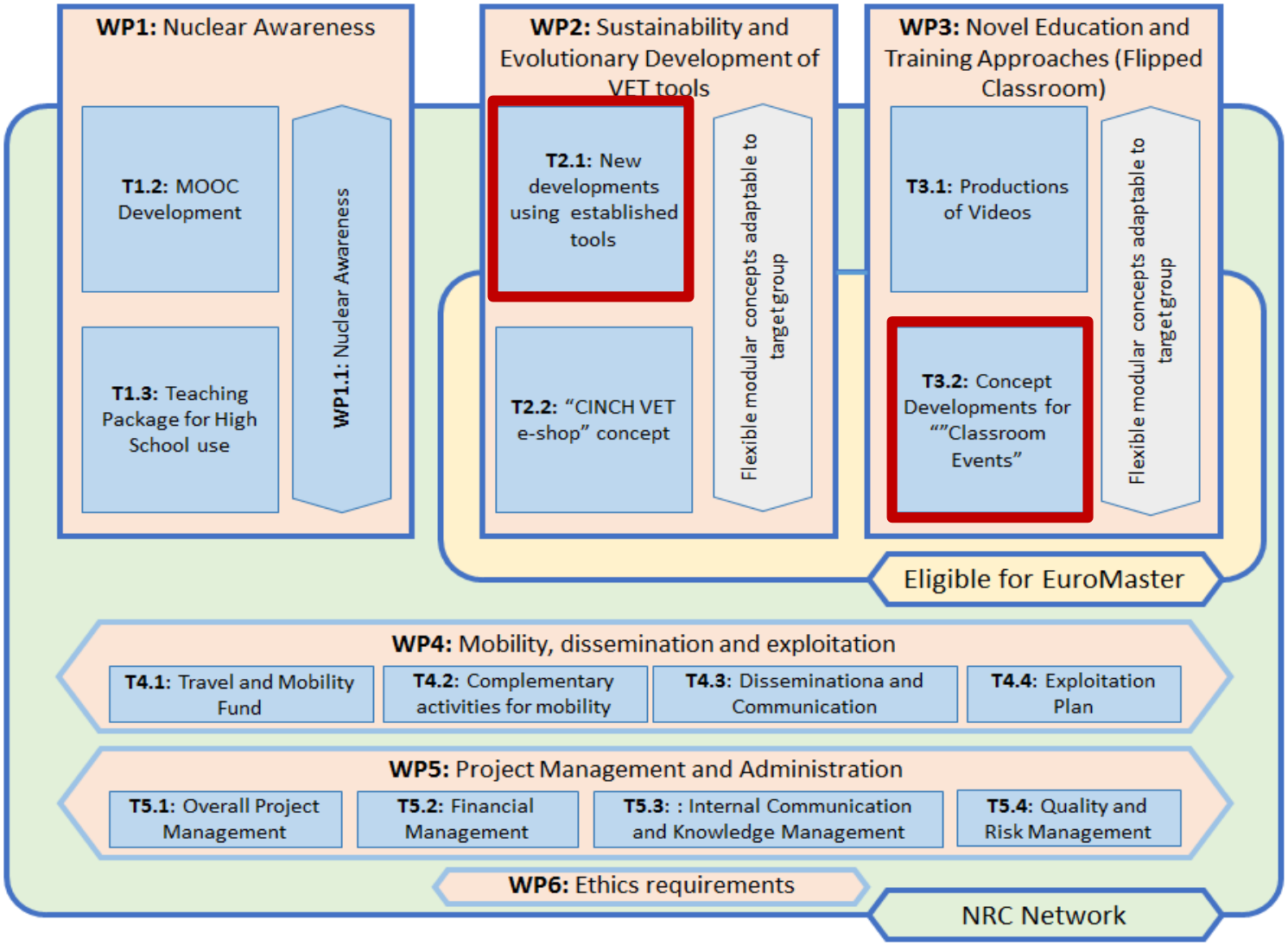
- In 2010–2016 a series of two “CINCH projects”
  - **CINCH-I**: Cooperation in Education in Nuclear Chemistry, and
  - **CINCH-II**: Cooperation and training in Education in Nuclear Chemistry

  were supported within Euratom FP7
- These projects aimed at mitigating the special skill-based deficits within nuclear chemistry at **master and doctorate levels** and the decline of number of staff qualified in this field.
- The **MEET-CINCH** project does not aim at sustainability of CINCH-I and CINCH-II only – its main aims are to
  - pro-actively bring the results achieved so far to their end-users (CINCH VET – **Vocational Education and Training** – e-shop),
  - significantly contribute to attracting new talents and increasing the nuclear (chemistry) awareness by developing a **MOOC** – Massive Open On-line Course, and
  - investigate the applicability of the modern **Flipped (Inverted) Classroom** concept in the nuclear chemistry teaching and training field.

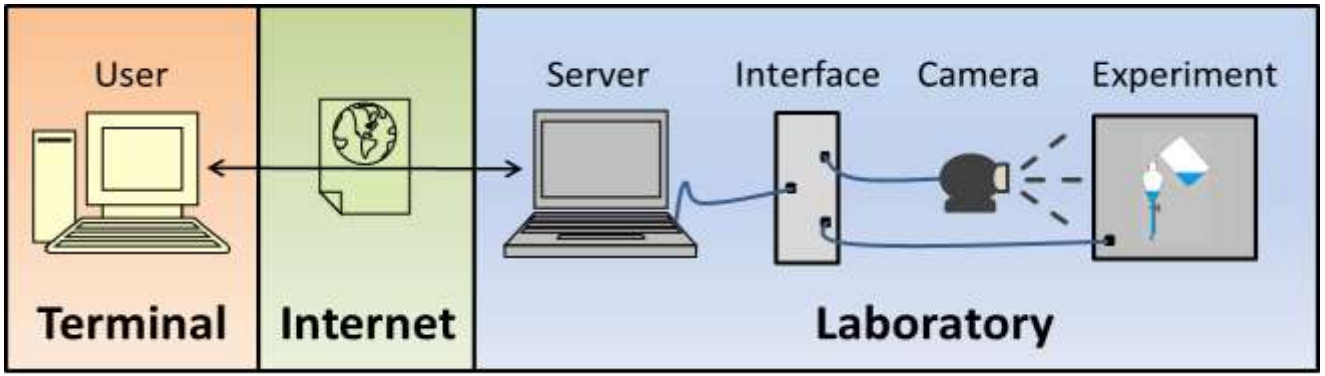
MEET-CINCH: A **M**odular **E**uropean **E**ducation and **T**raining **C**oncept **I**n **N**uclear and Radio**CH**emsitry, 01.06.2017 – 31.05.2020

Participant No *	Participant organisation name	Country
1 (Coordinator)	LEIBNIZ UNIVERSITÄT HANNOVER	Germany
2	CESKE VYSOKE UCENI TECHNICKE V PRAZE	Czech Republic
3	CHALMERS TEKNISKA HOEGSKOLA AB	Sweden
4	HELSINGIN YLIOPISTO	Finland
5	UNIVERSITY OF CYPRUS	Cyprus
6	JOZEF STEFAN INSTITUTE	Slovenia
7	UNIVERSITETY OF LEEDS	UK
8	NATIONAL NUCLEAR LABORATORY LIMITED	UK
9	POLITECNICO DI MILANO	Italy
10	EVALION SRO	Czech Republic
11	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	France
12	RESEAU EUROPEEN POUR L ENSEIGNEMENT DES SCIENCES NUCLEAIRES	France


WP1: Nuclear Awareness
T1.2: MOOC Development
T1.3: Teaching Package for High School use
WP1.1: Nuclear Awareness
WP2: Sustainability and Evolutionary Development of VET tools
T2.1: New developments using established tools
T2.2: "CINCH VET e-shop" concept
Flexible modular concepts adaptable to targetgroup
WP3: Novel Education and Training Approaches (Flipped Classroom)
T3.1: Productions of Videos
T3.2: Concept Developments for ""Classroom Events"
Flexible modular concepts adaptable to targetgroup
Eligible for EuroMaster
WP4: Mobility, dissemination and exploitation
T4.1: Travel and Mobility Fund
T4.2: Complementary activities for mobility
T4.3: Disseminationa and Communication
T4.4: Exploitation Plan
WP5: Project Management and Administration
T5.1: Overall Project Management
T5.2: Financial Management
T5.3: : Internal Communication and Knowledge Management
T5.4: Quality and Risk Management
WP6: Ethics requirements
NRC Network

WP 2: Sustainability and Evolutionary Development of VET tools

- 3 remote-controlled experiments (**RoboLabs)** have been developed in CINCH-II at LUH.
- 3 remote-controlled experiments were developed at Oslo University,
- 1 experiment will be developed in Milano
- They may be used either for preparation of real lab courses, operated by students as a substitute for hands on training, or included for demonstration into lecture courses.



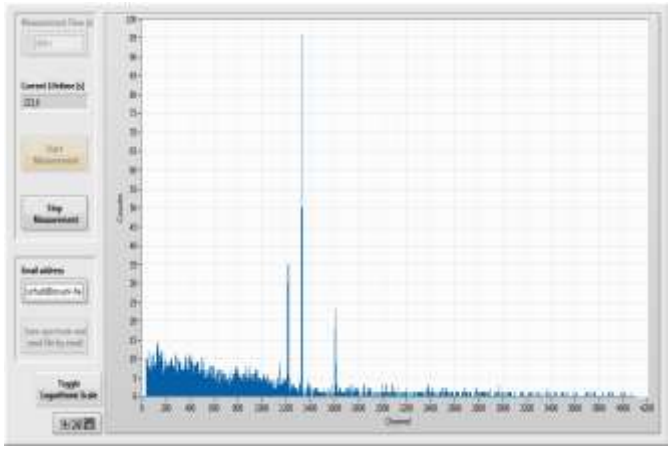
Oslo:
1) Neutron activation of silver
2) Absorption of gamma radiation
3) ^{234m}Pa radionuclide generator

Hannover:
4) Gamma Lab
5) Ion Lab
6) Autodeposition Lab

Milano
Dosimetry (under construction)

Robolabs developed at IRS: GammaLab

In GammaLab a user can select a sample and identify radionuclides via Gamma-spectrometry using an HP-Ge-detector. Samples range from ordinary drinking water to soil samples from nuclear hazard sites



- Practical experience in gamma-spectrometry
- Identification of different radionuclides
- Determination of their activity
- Meaning and importance of characteristic limits in the evaluation of environmental samples.

Gamma Lab as an Interactive Screen Experiment (ISE)

- combines real film and interactive simulations
- almost all possible real experimental situations are filmed and arranged in a multimedia system
- students run the experiment with a pointer device

Advantages:

- cheap maintenance costs (-> sustainability)
- benefit in lectures / homework (e.g. flipped classroom approach)
- allow multiple users to access the RoboLabs at the same time

see:

https://tetfolio.fu-berlin.de/tet/947091

WP3 Novel Education Tools

LUH has started the work on the training event for regulators and administrative bodies

- Inspired by a virtual experiment to determine the half-life of Ba-137m, LUH started to develop a three-dimensional environment corresponding to a radionuclide laboratory according to the German technical rule DIN 25425.
- In the simplest version of this course, members of regulators and administrative bodies could then move virtually in this room and check whether the requirements according to this technical rule are fulfilled or not.
  - Development of a virtual radionuclide laboratory for the training of members of regulators and administrative bodies
  - Therefore a 3D environment based on the model of a real radiation protection laboratory will be developed.
  - The movement in the virtual space will be realized for different end-device
  - The implementation of PDF-files in the virtual environment will be realized in order to adapt national regulations into this training course easily.

see: Virtueller Behördenkurs

Thank you for your attention!