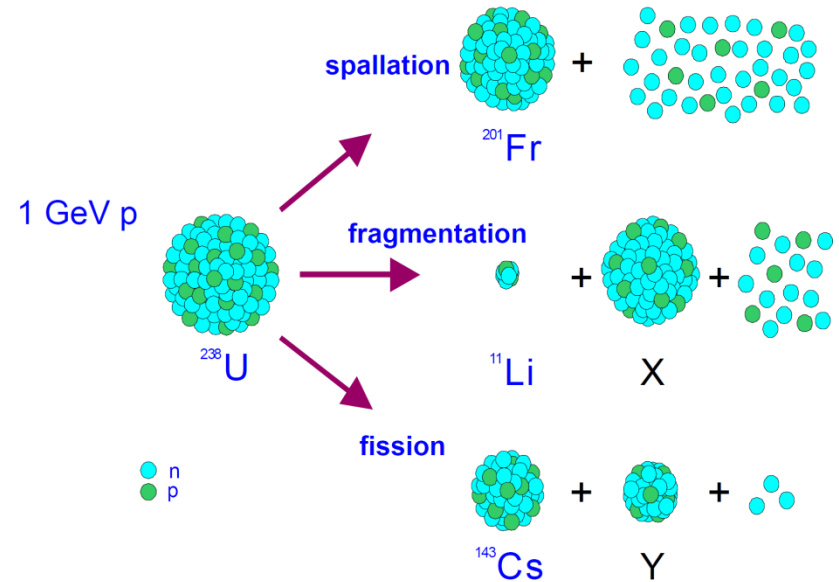
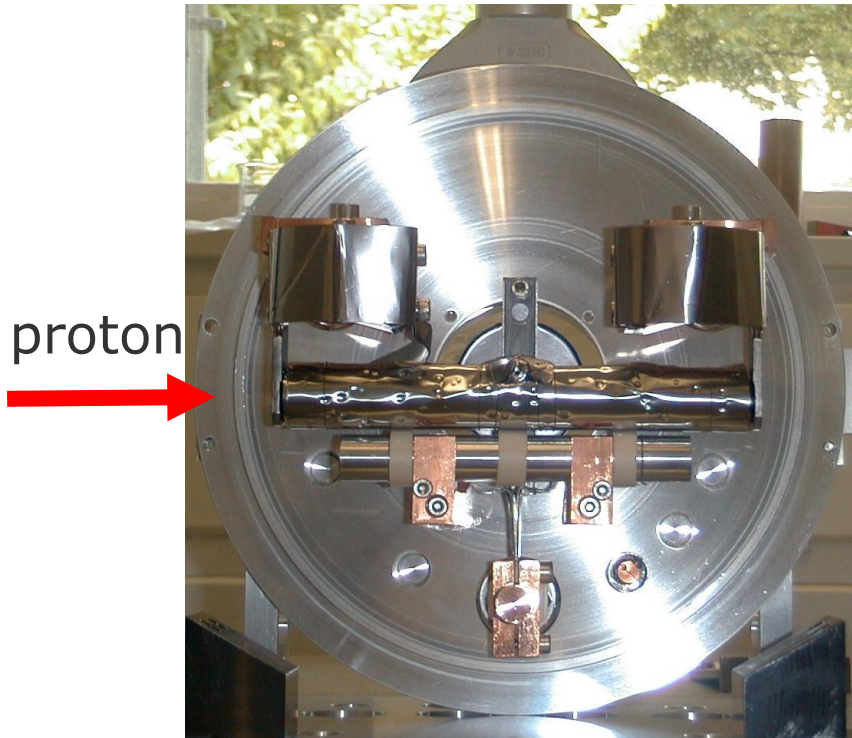


ActILab kick-off meeting CERN Contribution

Alexander Gottberg

Target Layout





Task 1: Synthesis of new actinide targets (CERN, INFN, IPNO)

Subtask 1: Sol-gel synthesis in complex fluids ("Chimie douce")

Subtask 2: Nanostructures

Task 2: Characterization of actinide targets (CERN, INFN)

Subtask 1: Microstructure, porosity, specific surface, crystalline phase

Subtask 2: Emissivity, thermal conductivity at high temperature

Task 3: Actinide targets properties after irradiation (CERN, PSI)

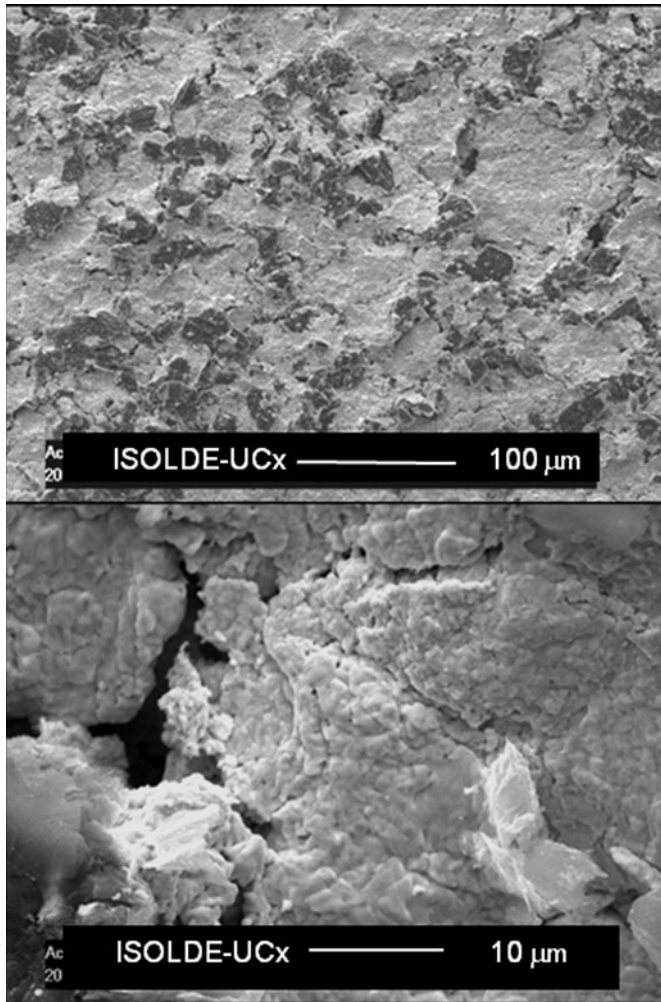
Subtask 1: Post-irradiation examination of target prototypes

Task 4: Online tests of actinide targets (CERN, GANIL, IPNO)

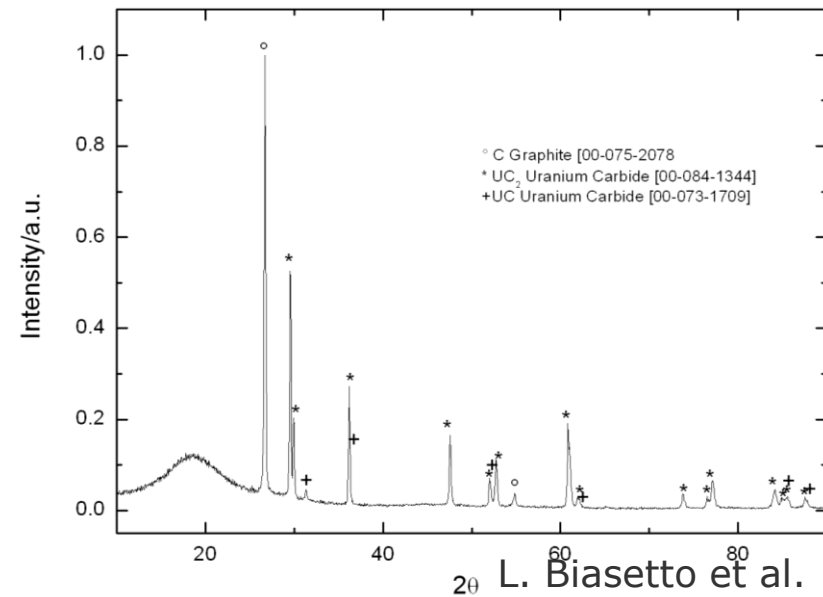
Subtask 1: Impact of pulse time structure on release and ageing properties

Subtask 2: Analysis of the results-effusion and diffusion phenomena

Cern provides infrastructure for pre-irradiation analysis of micro and nano structures, for thermal conductivity and emissivity measurements.



$$\square \text{ bulk} = 3.5 \text{ g/cm}^3$$



How to do release modeling from this material ?

Nominal Density UC Target at CERN



Importation from Russia of HD-UC pellets to CERN :



Set 1: 100 pills

UC (U5:0.38%), 13.2mm diam., 1mm thick, 12.3g/cm³, avg. grain 10 μ m ,
UC2<4%

Set 2: 300 pills

UC (U5:0.38%), 13.2mm diam., 1mm thick, 12.7g/cm³, avg. grain 6 μ m ,
UC2<4%

Task 1: Synthesis of new actinide targets (CERN, INFN, IPNO)

Subtask 1: Sol-gel synthesis in complex fluids ("Chimie douce")

Subtask 2: Nanostructures

Contribution in one of the subtasks

Cern provides class A laboratories

Aim: purposive synthesis of nanostructured UCx materials

Material exchange between institutes? (Task 1, 2, and 3)



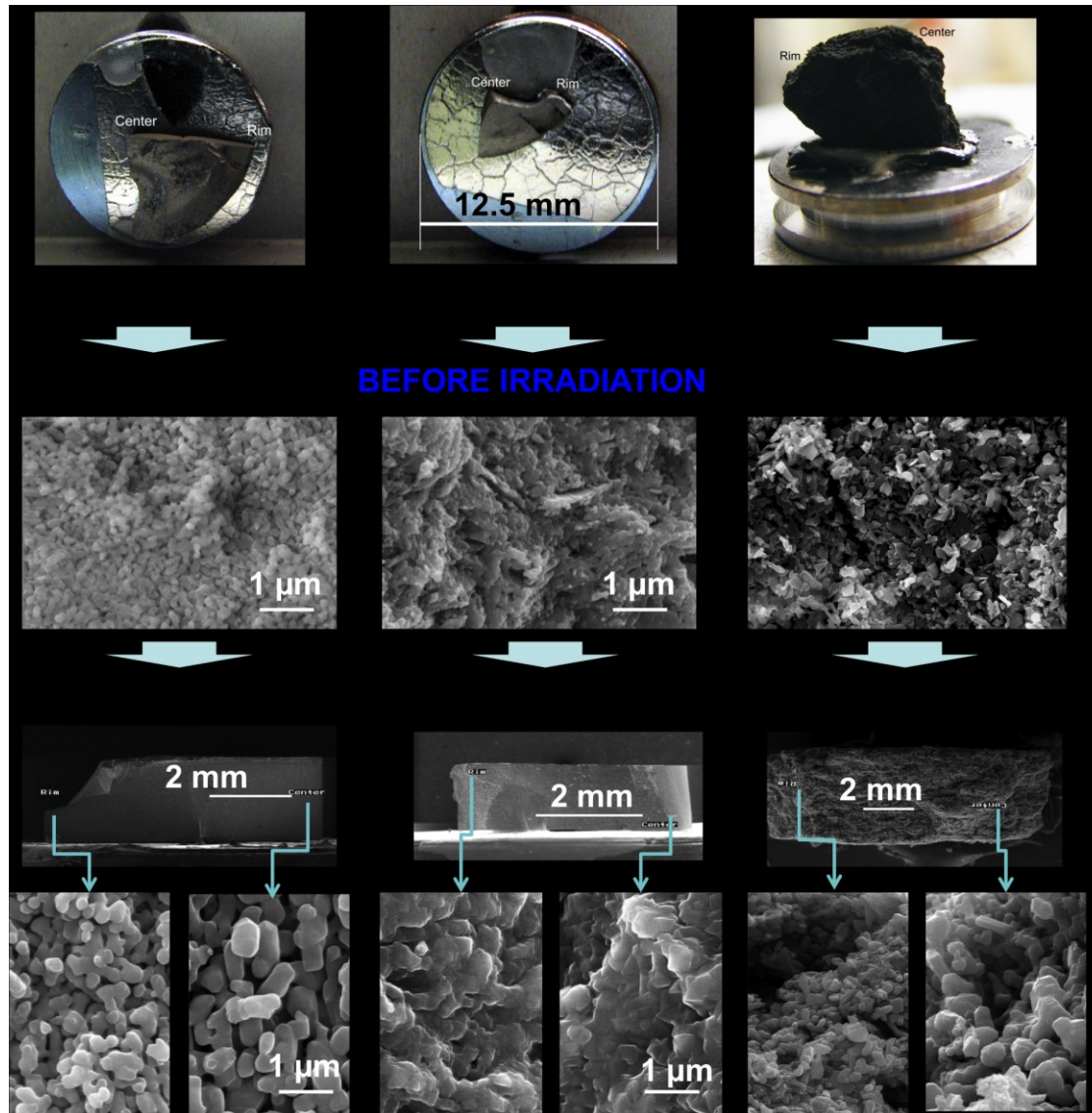


Task 3: Actinide targets properties after irradiation (CERN, PSI)
Subtask 1: Post-irradiation examination of target prototypes

Shipment of material to PSI (hot cell) after irradiation

In the framework of CERN target development:

Micro-EXAFS studies at SLS before and after irradiation
-> information about chemical structure in the μm regime



Sandrina Fernandez,
PhD thesis



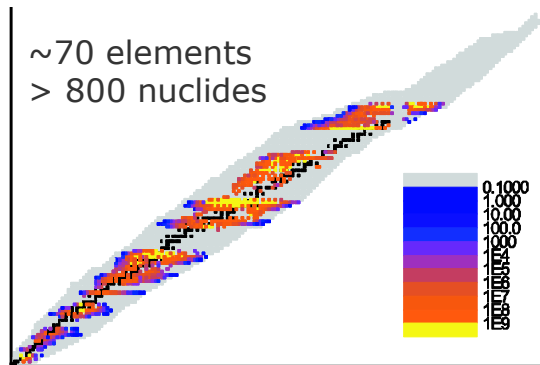
Task 4: Online tests of actinide targets (CERN, GANIL, IPNO)

Subtask 1: Impact of pulse time structure on release and ageing properties

Subtask 2: Analysis of the results-effusion and diffusion phenomena

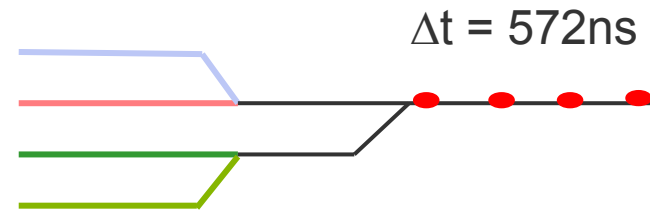
CERN provides:

large range of isotopes



M. Turrion

well defined and variable pulsed beam structure



- Series in one column of the periodic table
- Systematic investigation of release mechanisms

- Short release time characteristics (μs) for exotic nuclei
- Influence on ageing



Preparation of online tests:

Shutdown for one year at CERN in 2012 or 2013, announced in June 2011
-> online tests of new target materials have to be scheduled accordingly

Beamtime application to INTC