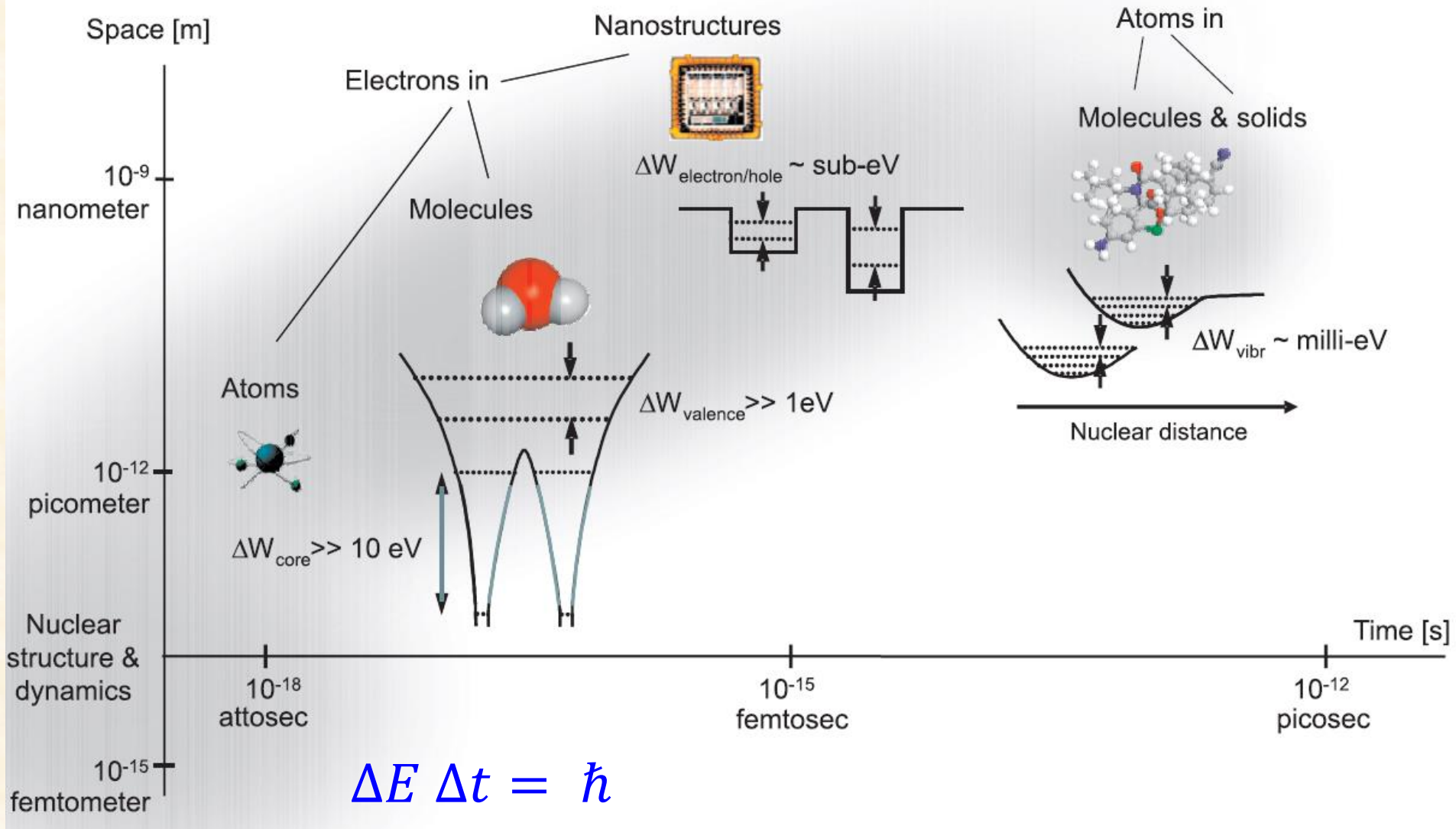


Towards **ATTOSECOND SINGLE-CYCLE** **UNDULATOR LIGHT: LUSIA**

Alan Mak, Georgii Shamuilov, Peter Salen, Janos Hebling, Yuichiro Kida, Brian McNeil, Takashi Tanaka, Neil Thompson, Zoltan Tibai, Stefano Bonetti, Mats Larsson, Sverker Werin, Francesca Curbis, Sara Thorin, Mikhail Krasilnikov, Frank Stephan, Vitaliy Goryashko

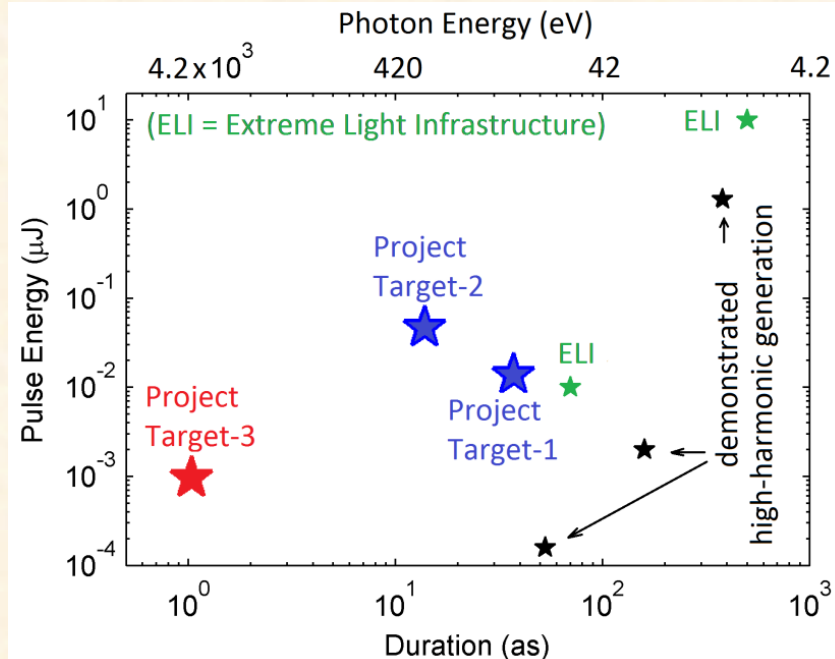
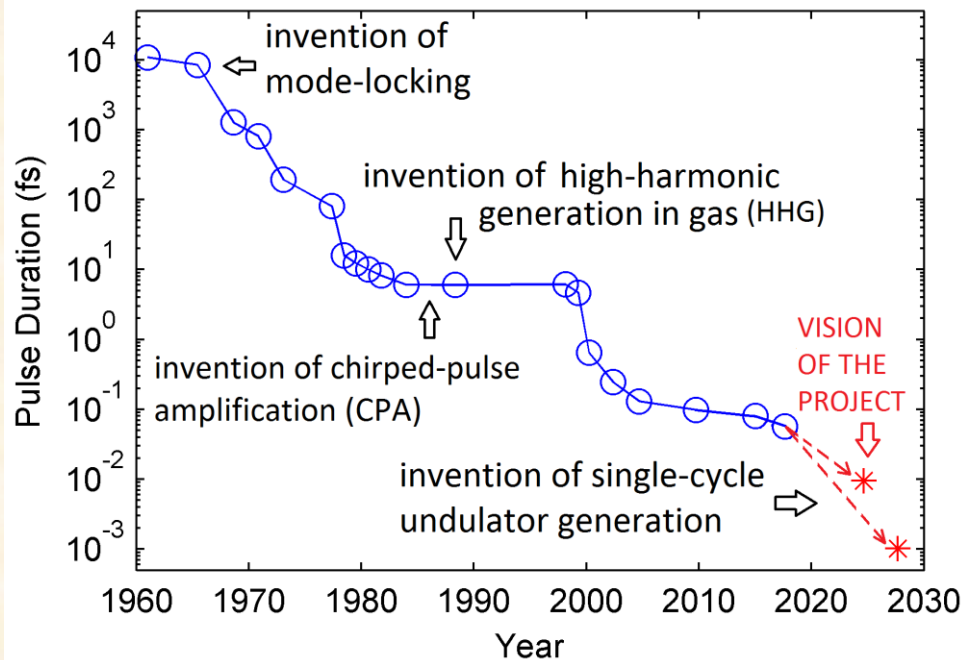
2017, Uppsala

Time and length scales of the nanoworld



$$1 \text{ as} \Rightarrow 4 \text{ keV}$$

State-of-the-art of pulse generation and the DREAM



X-ray tube



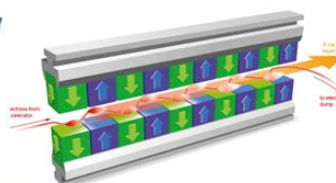
laser



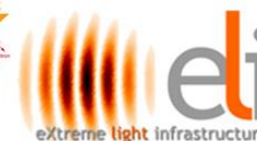
synchrotron



X-ray Free Electron Laser



Extreme Light Infrastructure



**coherent
attosecond
single-cycle
undulator
light**

1895

1960

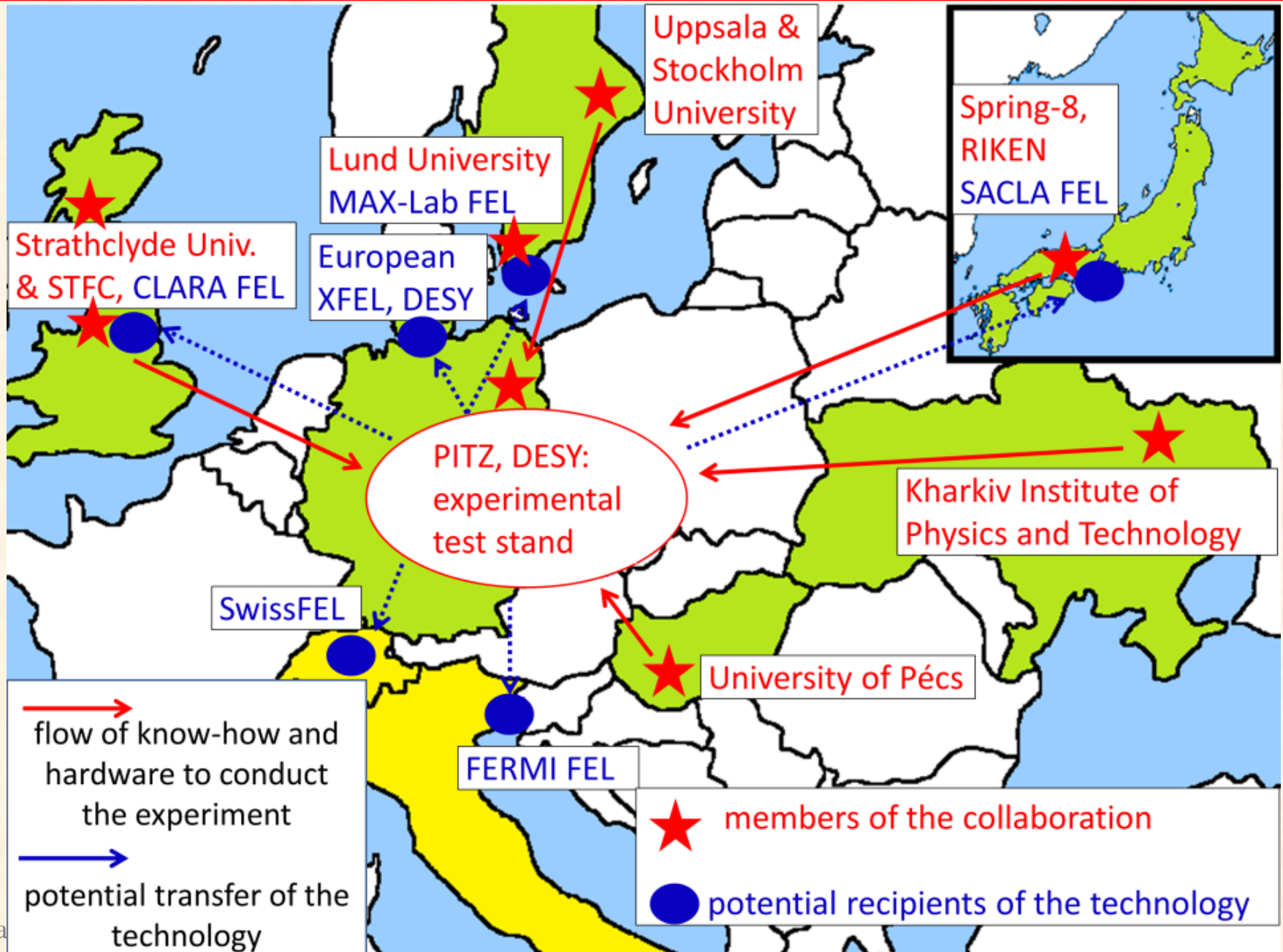
1970

2009

2018

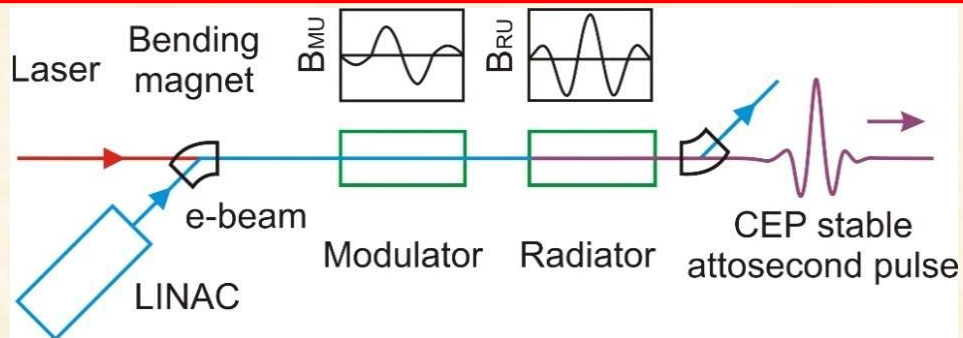
Horizon 2020

LUSIA collaboration

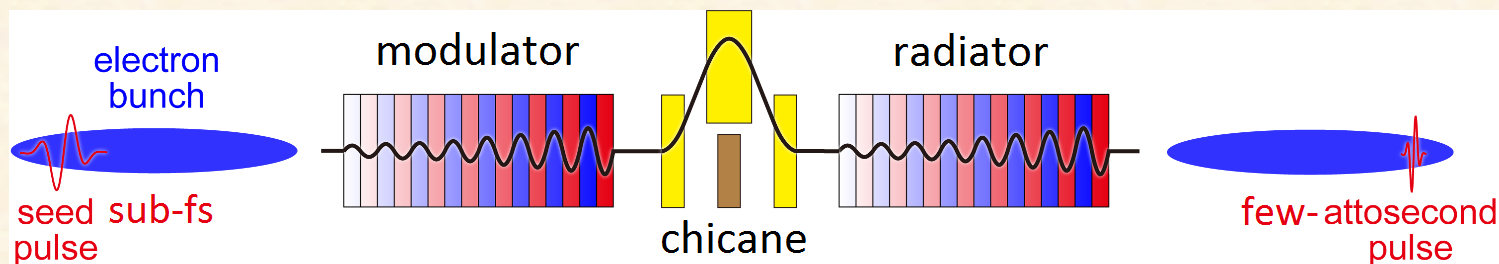


Ideas how to generation few-cycle pulses

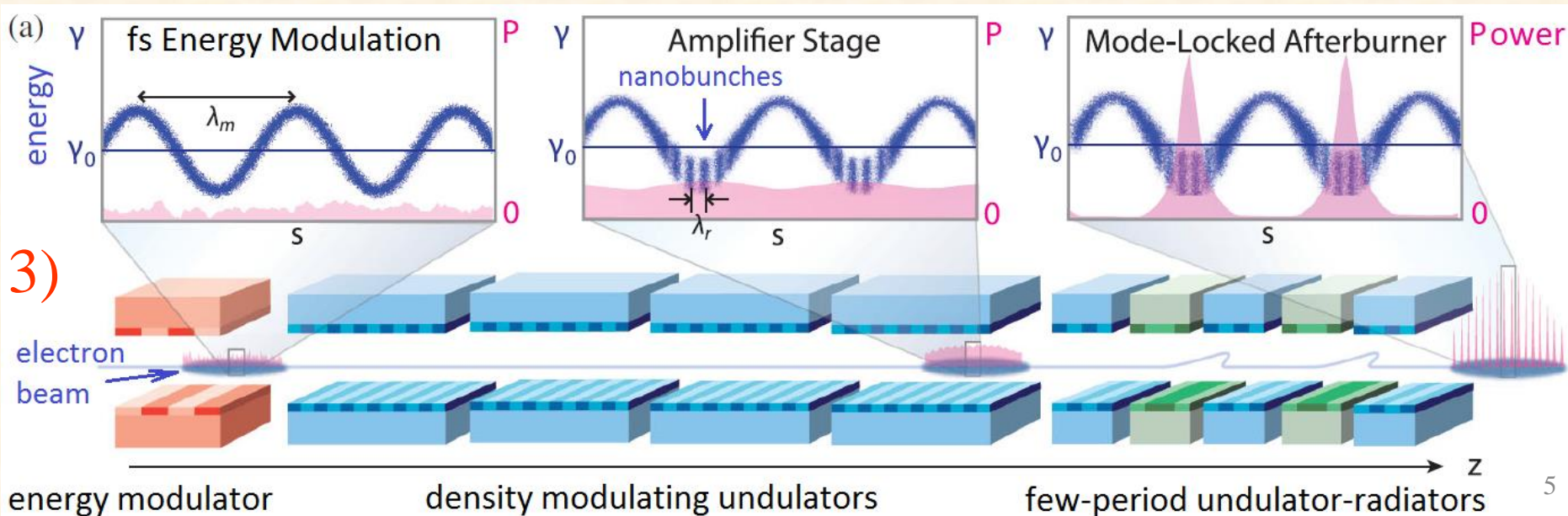
1)



2)



3)



Next steps

LUSIA collaboration meeting in Hungary, Pecs University, late November.

Everyone is welcome.