HORIZON-MSCA-2021-SE-01-01

SENS4CORN

Novel optical nanocomposite sensors for analysis of micro and macro elements in corn plants

Panel: CHE

Project timeline: 2023-2027

Contract N: 101086364

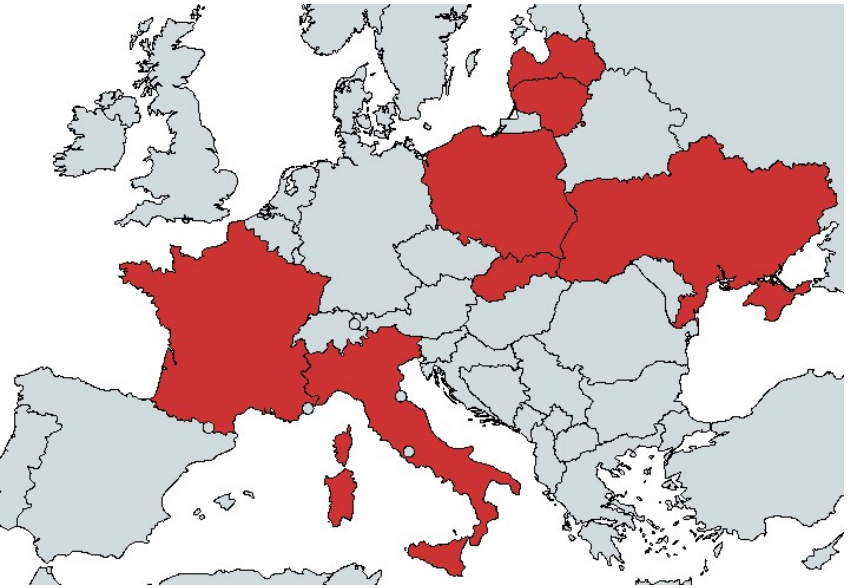
https://www.sens4corn.eu/

Coordinator: Dr. Roman Viter, University of Latvia
roman.viter@lu.lv

11 April 2025

MSCA Staff Exchanges Info Day

Project participants



Project coordinator: University of Latvia (UL), Latvia
Project partners:
Nicolaus Copernicus University in Toruń (NCU), Poland
National Research Council (CNR), Italy
Slovak University of Technology in Bratislava (STU), Slovakia
Ukravit Science Park (USP), Ukraine
MB SensoGrafa (SeGa), Lithuania
NanoWave (NAW), Poland
EDEN TECH (EDEN), France
University of Federico II, Italy
Kaunas Technical University, Lithuania
Paris Cité University, France
Institute of Agricultural Resources and Economics (AREI), Latvia
Associated partners:
MB Zinotech, Lithuania
Augmented Reality for Commercial and DIdactical Applications (ARCADIA), Italy

UNIVERSITY OF LATVIA
INSTITUTE OF ATOMIC PHYSICS AND SPECTROSCOPY

Project Objectives

-to develop nanocomposites ZnO-Metal Organic Framework (MOF) and ZnO-Schiff base (SB) nanocomposites with tunable structure, optical and electronic properties

-to investigate sensitive properties of photoluminescence ZnO-MOF and ZnO-SB nanocomposites to metal ions and anions (PO^{4-}, NO^{3-}, Zn^{2+}, K^{+}, Na^{+})

-to propose mechanisms of sensitivity towards target ions

-to integrate the sensor elements with microfluidic and portable optical systems.

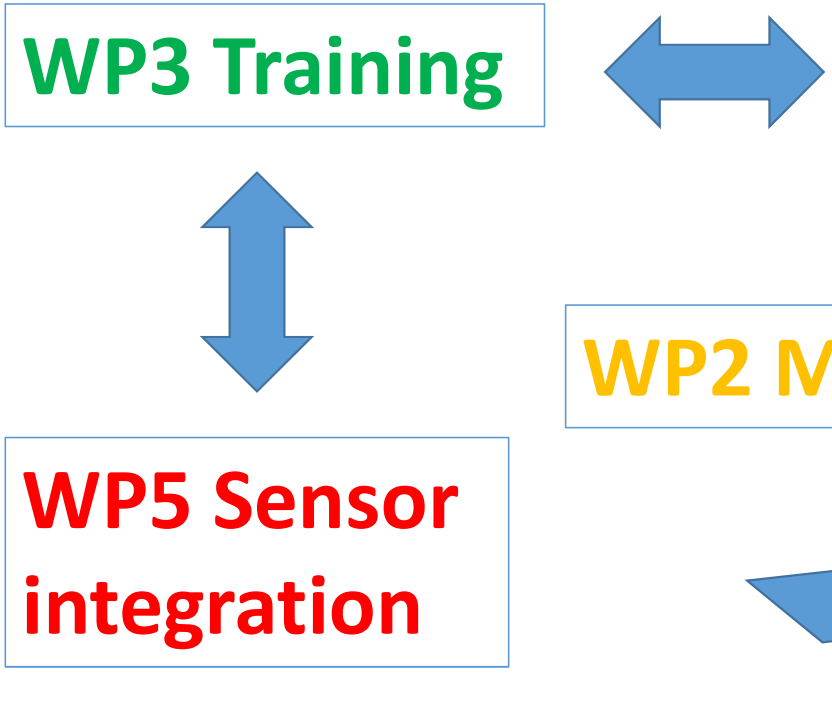
-to develop protocol of real maize samples probe preparation and perform in field testing of micro- and macro- elements for corn samples

1	Dissemination and outreach activities	Dissemination
2	Project Management	Management
3	Training of early stage, experienced researchers, technicians and management staff	Training
4	Fabrication ZnO-SB and ZnO-MOF with tuneable structure, electronic, optical and sensitive properties	Research
5	Development of integrated sensor system	Research
6	Ethics	Communication

European Commission

SENS4CORN

UNIVERSITY OF LATVIA
INSTITUTE OF ATOMIC PHYSICS AND SPECTROSCOPY

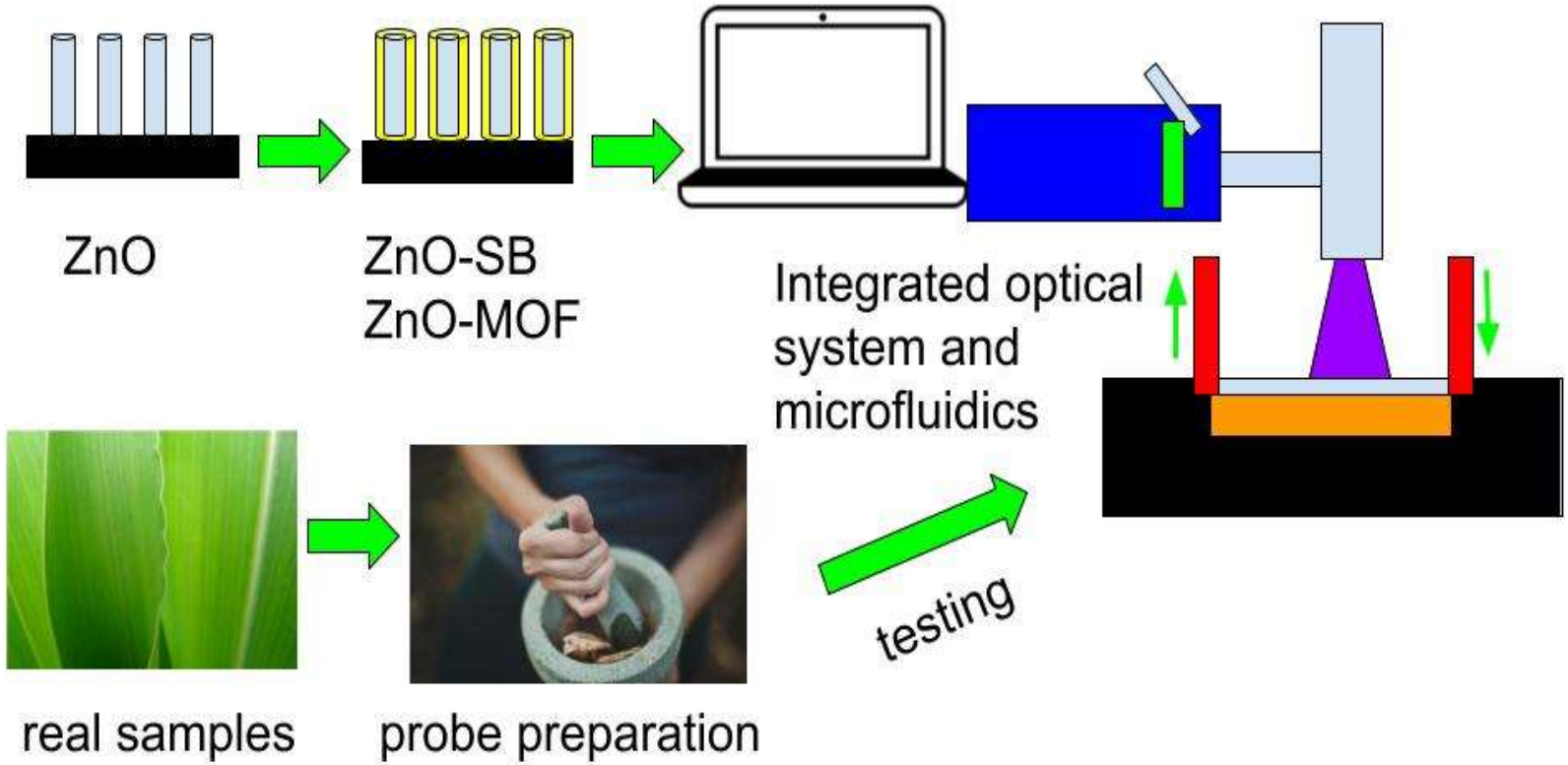


European Commission

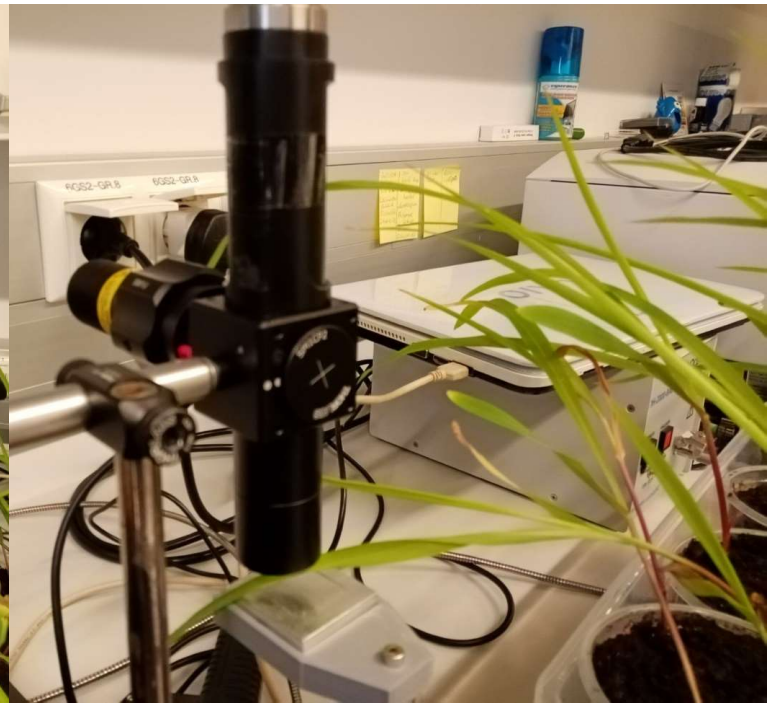
SENS4CORN

UNIVERSITY OF LATVIA
INSTITUTE OF ATOMIC PHYSICS AND SPECTROSCOPY

Project concept

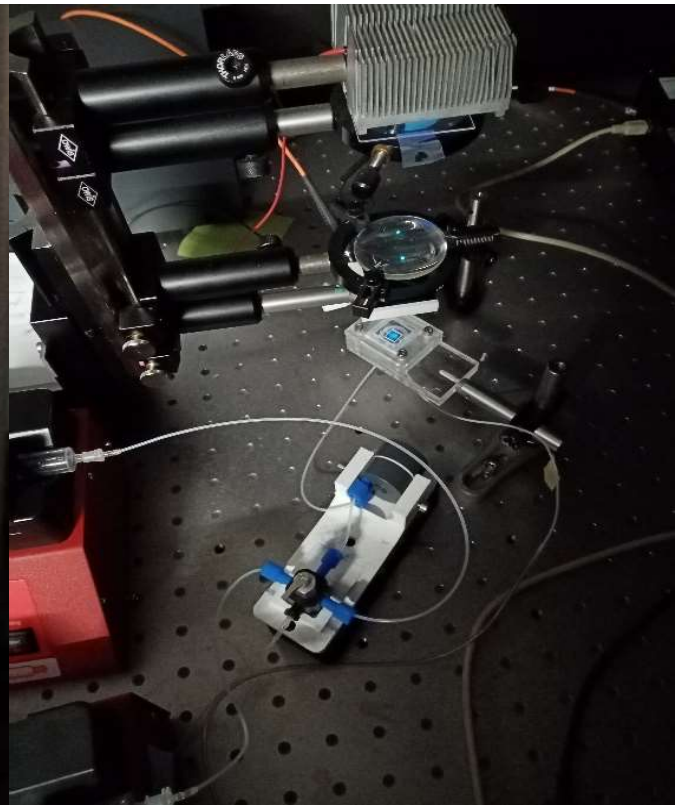


Smart testing



- Detection if plant is sick
- Analysis of chlorophyll fluorescence peaks
- Correlation with healthy samples
- Sample selection
- Preparation of probe (H2O/ethanol)

Smart testing



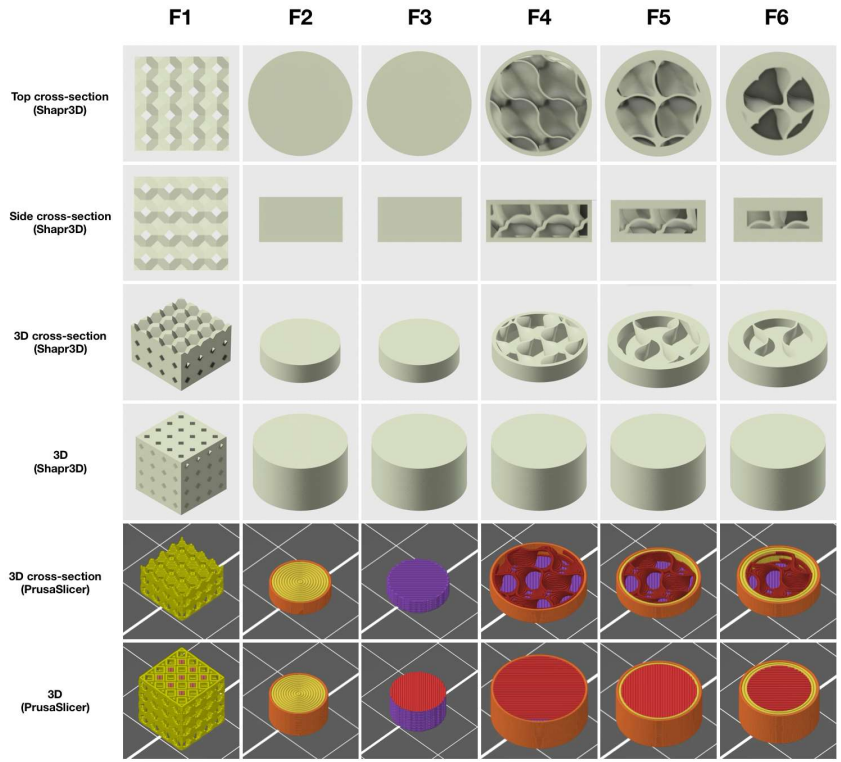
- Testing of probe by optical sensor
- Cuvette or fluidic system
- UV compatible materials
- Multi ion test

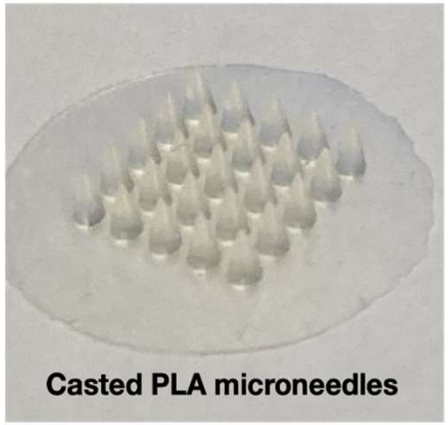
European Commission

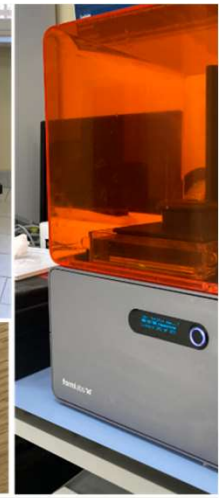
SENS4CORN

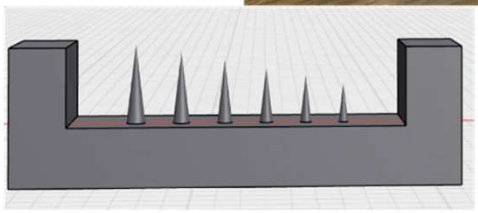
UNIVERSITY OF LATVIA
INSTITUTE OF ATOMIC PHYSICS AND SPECTROSCOPY

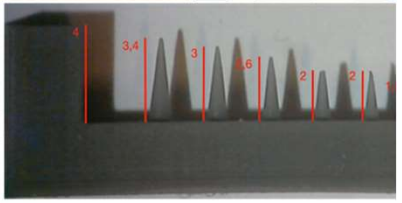
From 3D printed drugs to smart sensors











UNIVERSITY OF LATVIA
INSTITUTE OF
ATOMIC PHYSICS
AND SPECTROSCOPY

Motivation: why to apply for RISE projects

Validation of new ideas
Validation of new partners
Training of staff in research, management, team building
Connection with industry
Generation of new ideas
Growth of young researchers
Increase of your visibility and promotion of your university
New publications, new conferences, new projects

Consortium: how to make a right choice

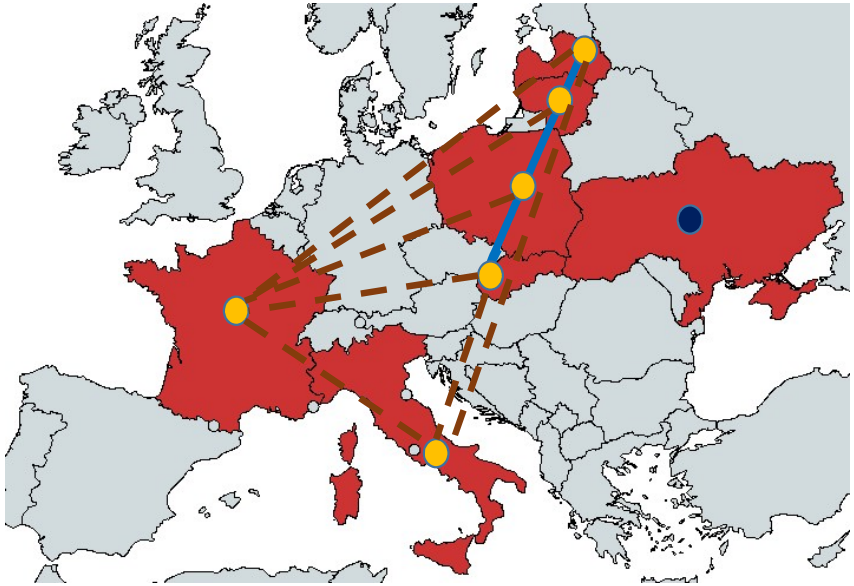
Geographic coverage of south and north

Transport connection and mobility

Expertise synergy

Industry / Academia balance

Market



UNIVERSITY OF LATVIA
INSTITUTE OF
ATOMIC PHYSICS
AND SPECTROSCOPY

Partner search: main challenges

Academic partners – My friend, Friend of my friend, ……

Academic partners – conferences, networking events

Academic partners – seminars, webinars

<u>Restrictions of academic partners:</u>

-small groups and limited human capacities

-national projects with restricted mobility (Germany, Austria, Switzerland)

-national laws (Italy, UK)

Main problem: how to find industrial partners

Partner search: main challenges

Industrial partners: university startups and spinoffs, SMEs

Industrial partners: personal contacts who moved to industry

Industrial partners: specialized fairs

Industrial partners – seminars, webinars

Industrial partners – LinkedIn, B2match platform, InfoDay, pitch presentation

Restrictions of industrial partners:

-profit orientation

-limited human capacities

-no need to travel and host

Motivation for industrial partners:

-technology transfer and IPR

-new skills and access to unique equipment

-participation in new non-RISE projects

-new products and new ideas

-TRL growth

UNIVERSITY OF LATVIA
INSTITUTE OF
ATOMIC PHYSICS
AND SPECTROSCOPY

Distribution of secondments

33% of academia-academia visits – wanted

Outgoing secondments: 80% from academia and 20% from industry

Hint: industrial associated partners

Optimized consortium:

8 academic, 6 industrial partners and 2 associated industrial partners (end users)

Average per academic partner: 30 secondments

Average per industrial partner: 4 secondments

Total: 250-260 secondments/project

Project writing and coordination: challenges

-Different expertise – different styles
-Industrial partners – limitations
-Delay between request and reply
-Incomplete information
-Limitation with time
-Incorrect planning and errors with eligibility

-Coordinator – main responsibility

Project writing and coordination: challenges

-up bottom (coordinator prepares a draft)

Faster

Corrections by partners

Individual vision and incomplete description

Stress to coordinator

- bottom up (partners prepare a draft)

Long time organization process

Long time writing

Team work and more details

High quality and less stress

Project management and implementation: processes

-Communication with project officer

-Consortium Agreement

-Kick off meeting and start of secondments

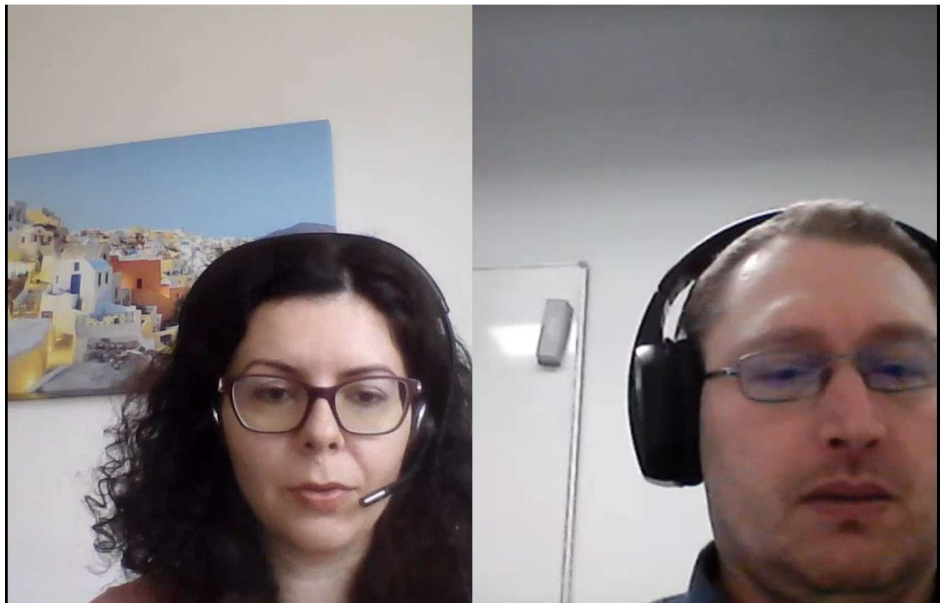
-Registration of visits and secondment reports

-Networking activities

-Reports

-Publishing of results

PO **DR. Cristina Nemes**



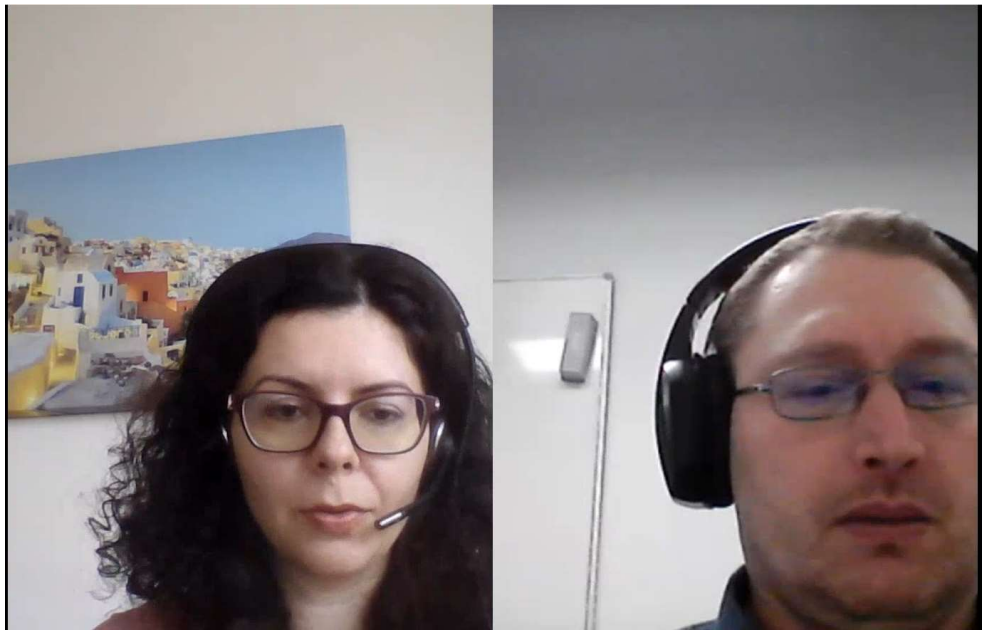
Project management and implementation: challenges

-Eligibility of secondments

-Internal changes at partner organization

-Force major (COVID-19, etc.)

-Contact officer



Project management and implementation: amendment

-No tragedy – it is life

-Time is crucial

-Contact officer

-Identify the reasons of amendment

-Propose the mitigation measures

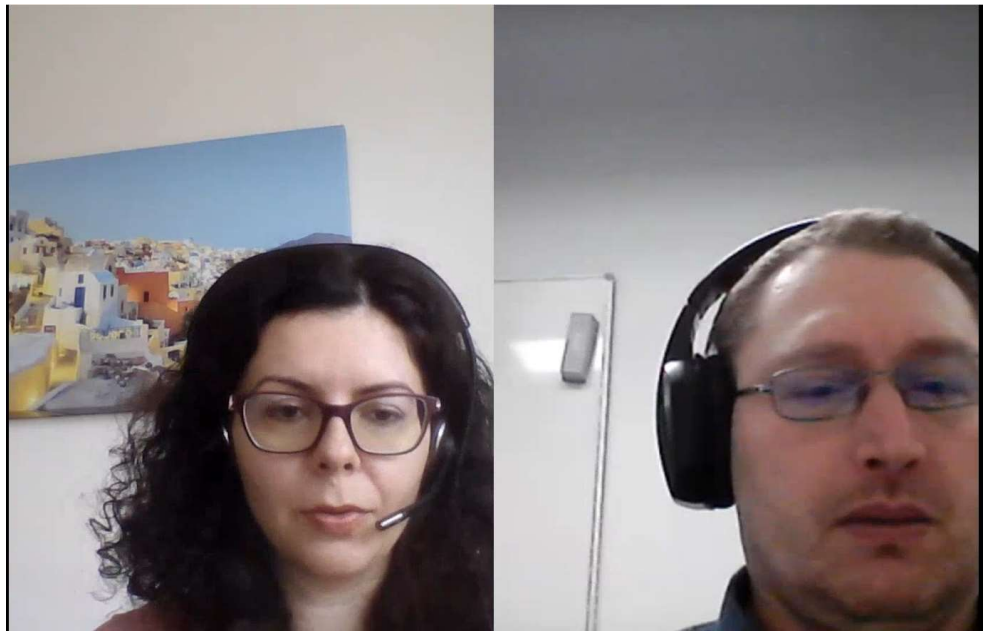
----New partners

-----Their roles

------Secondments redistribution

-Start amendment

-All automatic via system



UNIVERSITY OF LATVIA
INSTITUTE OF
ATOMIC PHYSICS
AND SPECTROSCOPY

Project management and implementation: impression

-Unit cost model – simple

-Automatic calculations of budget

-Easy registration of secondment

-Simple report process

UNIVERSITY OF LATVIA
INSTITUTE OF
ATOMIC PHYSICS
AND SPECTROSCOPY

Project management and implementation: impression

Submit RISE

Coordinate RISE

Be a participant of RISE

#Rise your RISE

UNIVERSITY OF LATVIA
INSTITUTE OF
ATOMIC PHYSICS
AND SPECTROSCOPY

Thank you for attention

Dr. Roman Viter, University of Latvia
roman.viter@lu.lv