



Hungary-Romania
Cross-Border Co-operation
Programme 2007-2013

Two countries, one goal, joint success!

European Union
European Regional Development Fund



Opening Conference

SMARTMAT project

University of Debrecen & Univerity of Oreda

***Hungarian-Romanian Research Platform
for Smart Materials Research Projects Support***

HURO/1101/191/2.2.1

Debrecen 15. 02. 2013

www.hungary-romania-cbc.eu
www.huro-cbc.eu



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The project aims

- To develop a joint Hungarian – Romanian research platform in the field of smart and other new materials which will support the development of fundamental research projects.
- The platform will integrate 3 laboratories, 2 at the University of Debrecen with the purpose of investigating smart and composite materials at **macro-**, and **micro**-scales and 1 laboratory at the University of Oradea where **nano**-scale properties can be analyzed.



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The project

- 18 month (Starting from 02. January 2013)
- Lead Partner Is University of Debrecen
Faculty of Engineering
- Project Partner is University of Oradea
Faculty of Engineering and Management
- 25 researcher
- Romanian side 19, Hungarian side 7 researcher
- Total budget is 1.195.121 Euro.
- (598.271 Euro – HU; 596.850 Euro - RO)



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The project management

Hungarian side as Lead Partner

Dr. István BUDAI project manager of LP.

Arnold PINTÉR financial manager of LP.

Imre CSÁKY project assistant of LP.

Romanian side as Project Partner

Dr. Tibor Vesselényi project manager of PP.

Țarcă Radu Cătălin financial manager of PP.

Prada Marcela project assistant of PP.



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Timeframe of project

Activity Package	YEAR 0 (01/2012 - 12/2012)			YEAR 1 (01/2013 - 12/2013)			YEAR 2 (01/2014 - 12/2014)		
	I	II	III	I	II	III	I	II	III
AP 0 - Preparation activities	31/01/12								
AP 1 - Project management				01/01/13				30/06/14	
AP 2 - Communication activities				01/01/13				30/06/14	
AP 3 - Upgrade of laboratory infrastructure				01/01/13		30/12/13			
AP 4 - Acquisition and integration of equipment...					01/05/13			30/06/14	
AP 5 - Integration of laboratories into the ...						01/11/13		30/06/14	

5

SMARTMAT project
University of Debrecen & University of Oradea

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APO. Preparation activities

Results and outputs :

- Meeting record (minute) about staff meeting
- Study regarding the state of the art of composite and nano materials and the relating equipments
- Fesability study
- Signed Documents (Application Form + Annexes)



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AP1. Project management activities

Results and outputs :

- ERDF Subsidy Contract
- Financial reports
- Supervising documents of the activities
- Progress reports
- Verification of the fulfillment of the assumed duties



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AP2. Communication activities

I. MARKETING

1. Webpage: It is important to have an own webpage of the project, where all the important information can be found. We are planning to refresh the webpage continuously with news and research results regarding to the project.
2. Brochure. It is necessary to publish brochures, because these tools have an important role in communication.

II. PR TOOLS

1. Organizing opening and closing events. The aim is to increase the background knowledge of the researcher, students and media, and to generate public appearance.
2. Organizing workshop – appearance on professional events. An important factor of the efficient communication is that the professional interested parties meet with the dissemination of project activities and research results.
3. Communication materials- tables, plaques.



AP3. Upgrade of laboratory infrastructure

Results and outputs

- Preparing technical specification of laboratories
- Preparation of public procurement documents and procedures
- Realization of laboratory works and clean room and verification of work conformity with technical plans.



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AP4. Acquisition and integration of equipments

Results and outputs

- Monitoring the availability of required equipments. Studies regarding equipment availability on the market
- Public acquisition, preparing of documents and procedures. Generating equipment specification and compliance with procedures
- Commissioning, testing, verification, validation of equipments



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AP5. Integration of laboratories into the SMARTMAT research platform

SMARTMAT scientific website and database –

electronic communication interface between laboratories, platform management, external partners and wide public;

SMARTMAT project website –

will be still functional after project termination, disseminating information about research project results, open to the wide public;

Smart Materials Research Laboratories – operation, equipments, staff;

Internal research and education partners – how they can access platform resources;

External research and education partners – how they can access platform resources;

Joint research project partners – public institutions, research centers, universities



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Outputs, results

- high level technical equipment and software and a knowledge base accumulated by the platform researchers, and students (BSc., MSc., PhD.)
- determine a higher level of knowledge in the area of material science and smart materials, generating long term results for the benefit of the cross-border area and not only there.
- new materials provide great opportunities for the creation of new knowledge-based enterprises and have a 'revolutionary' potential that can open up new production routes. It is also important that the research platform will support innovation, in particular, for start-ups, spin-offs and small and medium-sized innovative enterprises.



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Outputs, results

- Smart Materials Research Laboratories: SMRL1- macroscale analysis; SMRL2 - microscale analysis; SMRL3 - nanoscale analysis;
- Research platform website, ensuring project and platform visibility, disseminating project results;
- Research platform operational and communication database – as a knowledge base and a communication tool between partner researchers;
- Material science laboratories and experts database in Hajdu-Bihar - Bihor cross-border region, as an information center for research communities, individuals and large public;



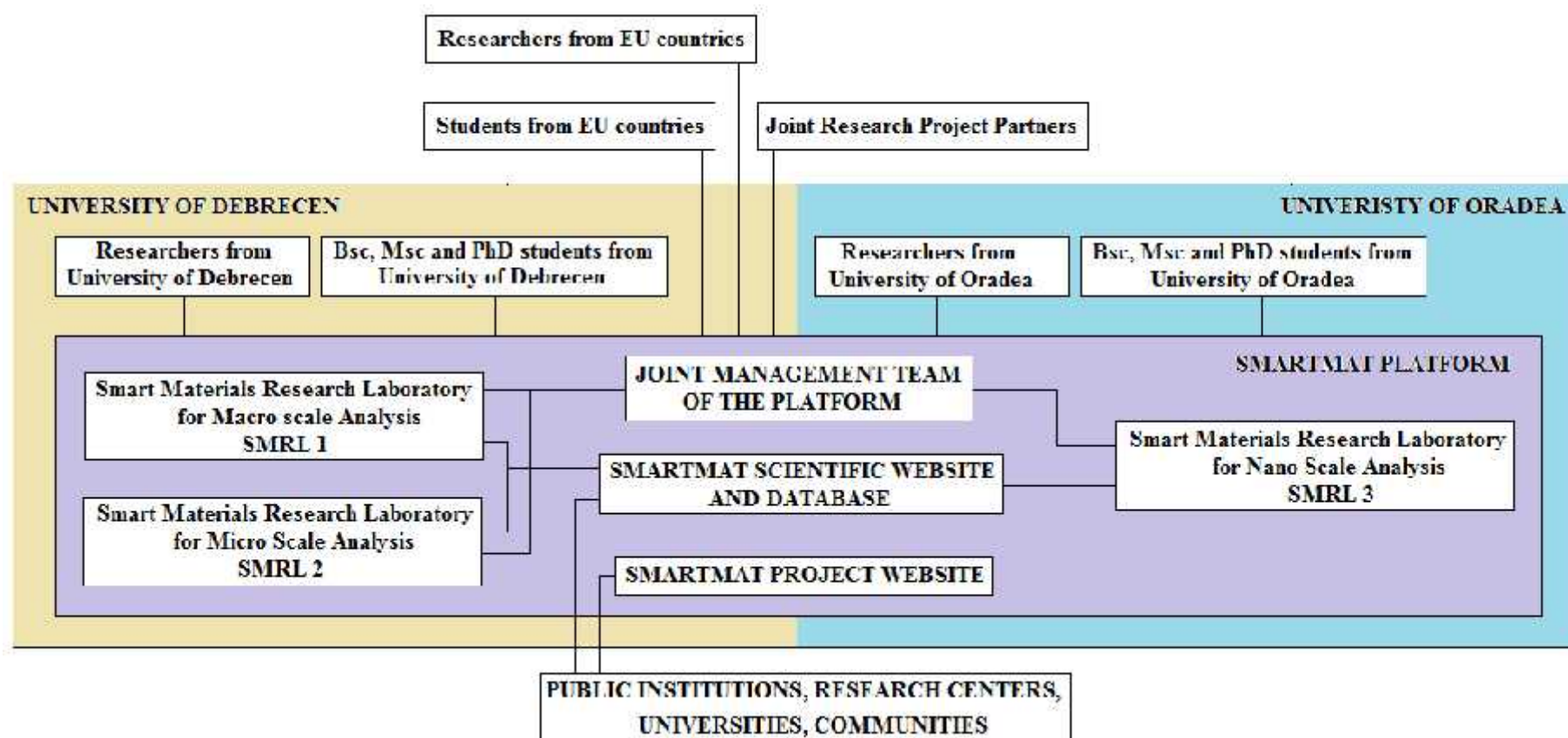
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SMARTMAT research platform





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SMARTMAT LABS

Smart Materials Research Lab for Macro scale SMRL1-HUN

500 kN ELECTROMECHANICAL TESTER
30 TN HYDRAULIC FLEXURAL TESTING FRAME
RapidAir 457 system for image analysis
ZK 75 HE Zyklos Concrete mixer

Smart Materials Research Lab for Micro scale SMRL2-HUN

TableTOP Electron microscope + EDX detector
Sample preparation for SEM
High temperature rheology measurement system for
viscosity measuring of liquid metals and vacuum system
Qform software for deformation modeling and simulation

Smart Materials Research Lab for Nano scale SMRL3-ROM (in a new clean room)

Atomic Force Microscope and accessories
Atomic Absorption Spectroscope



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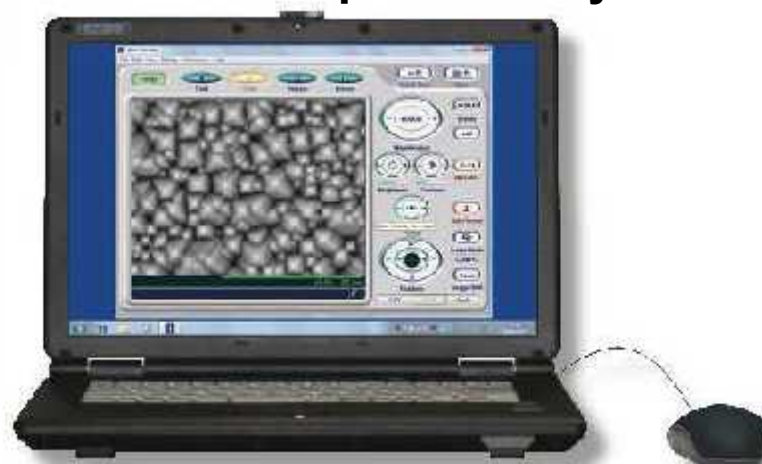
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SmartMat Research Lab for Micro scale - SMRL2

TableTOP SEM + EDX

It's simplicity enables all users, even those Scanning Electron Microscopy (SEM), to image their samples and to obtain high quality, high resolution images within minutes. No special sample preparation such as coating with metal films is required for hydrated





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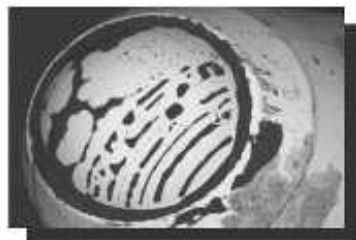
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SmartMat Research Lab for Micro scale - SMRL2

Materials



Entomology



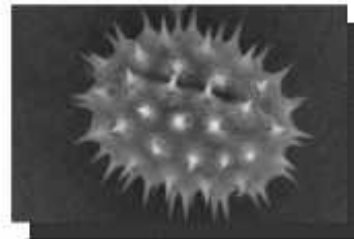
Medical



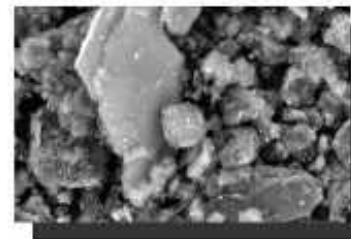
Food



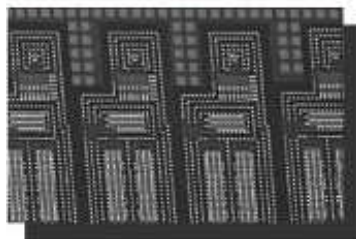
Botany



Cosmetics



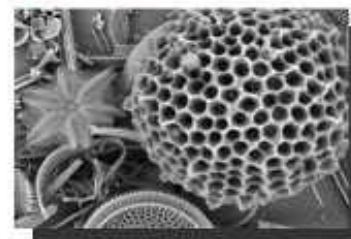
Semiconductor



Textiles



Environmental





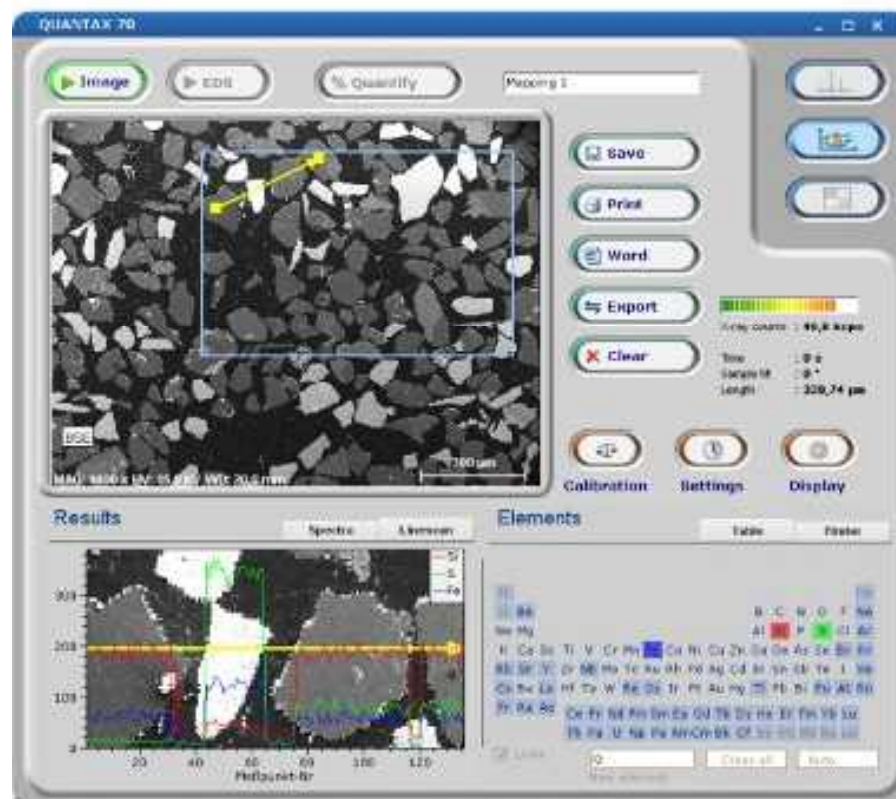
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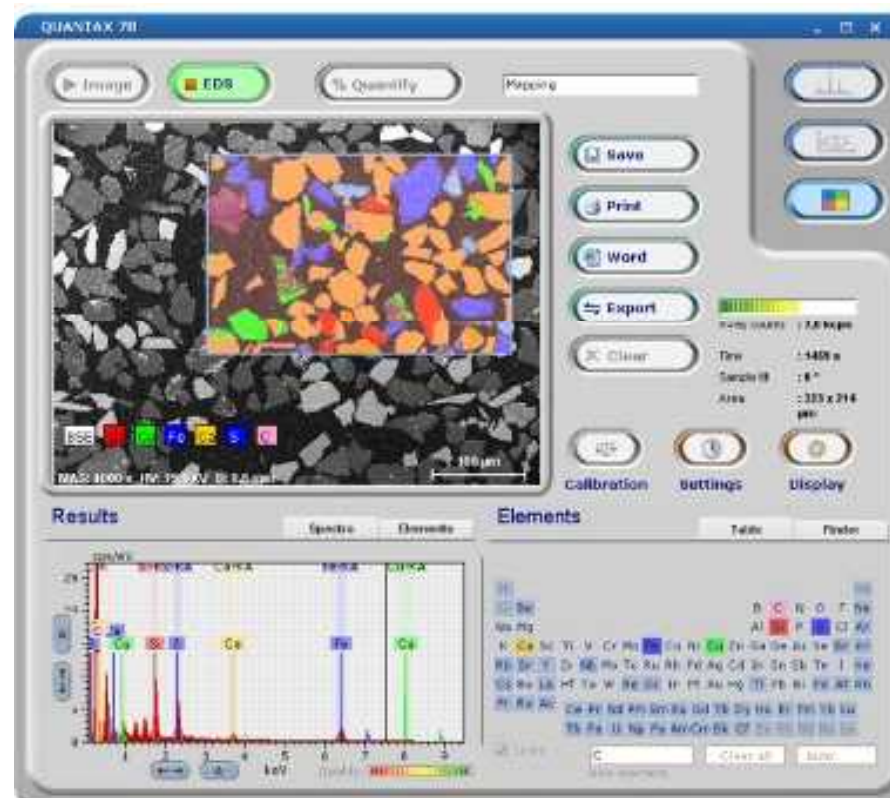
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SmartMat Research Lab for Micro scale - SMRL2



Line Profile Analysis (LPA)



Digital X-ray Mapping



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SmartMat Research Lab for Micro scale - SMRL2



Automatic and manual cut-off machine

- Very high cutting capacity
- Constant feed speed principle ensures minimum deformation
- Automatic feed speed reduction for fast cutting of hard materials
- Quick positioning and freely selectable stop position functions
- Effective cooling system reduces the risk of burns



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SmartMat Research Lab for Micro scale - SMRL2



The LaboForce specimen movers

- Semi-automatic fine grinding and polishing of single specimens
- Quick and easy operation
- High quality finished specimens
- Automatic dosing unit
- Adjustable drip lubricator



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RheolabQC Rotational Rheometer

Specifications Speed: 0.01 to 1200
1/min

Torque: 0.25 to 75 mNm

Shear stress*): 0.5 to 30000 Pa

Shear rate*): 10⁻² to 4000 1/s

Viscosity measuring range*): 1 to
109 mPas

Internal angle resolution: 2 μ rad

LAN-Ethernet interface: PC

Serial interface RS232: PC, print



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High Temperature Laboratory Furnaces

Gas supply for additional gases –
manually or automatically operated
versions

- Gas supply for reactive gases
with automatic control only
- Single-stage rotary vane pump up to 1
mbar
- Dual-stage rotary vane pump up to
 5×10^{-2} mbar
- Turbo pump in addition to rotary pump
 5×10^{-4} mbar
- Post-combustion of process-related flue
gases via heated gas outlet and burner
flame





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Thank You for your attention!



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GO SMARTMAT