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June
2022

Re-UNITA RESEARCH Newsletter

Editorial

This is the fourth Re-Unita newsletter. The newsletter represents a valuable tool to enhance the networking inside UNITA and to promote mutual projects. The newsletter complements other strategic measures such the mapping of research activities within the three core thematic areas, the Unita weekly talks, and the presentation of the research infrastructure available for sharing.
This fourth issue highlights aspects of the circular economy through the exploitation of biomass from agri-food production and methods of urban regeneration by capitalizing on peri-urban landscapes (natural configuration, agricultural landscape) with the value of eco-cultural heritage (PER-START project). Also, you will be able to find interesting information about the projects and careers of young researchers in the fields of sustainable development by developing some materials able to use better our resources and decreases atmospheric pollution, as well as the decarbonization of the economy and its consequences.

Enjoy reading this newsletter. Nonetheless, be active and find other creative ways to increase the cooperation among UNITA researchers!

Florin Alin SAVA
Vice-Rector for Research
West University of Timisoara

Cultural Heritage

Peri-Urban Strategic Areas in Transformation. Eco-cultural challenges in urban regeneration processes in Spanish Cities" (PER-START)

The PER-START project focuses on peri-urban landscapes with eco-cultural heritage value—arising from their natural configuration, agricultural landscape, and other human activities—that could serve as catalysts in current urban regeneration processes. The PER-START project faces the challenge to broaden the concept of "cultural heritage" by raising awareness of the "power of the place" and the eco-cultural value of these often ignored and neglected peri-urban strategic areas. In our opinion, the features, problems and opportunities of these peri-urban landscapes can only be properly understood through innovative, interdisciplinary, inter-institutional and collaborative research that is mindful of the importance of an international perspective. The PER-START project takes on this challenge. It commits to producing efficient landscape urbanism and environmental strategies to halt the degradation processes taking place in many of the peri-urban natural and agricultural landscapes of Spanish cities by exploring the potentialities of these peri-urban areas in transformation. The objective is to activate urban regeneration processes based on eco-cultural dynamics by expanding the network of public spaces and diluting boundaries between the urban and the rural space/nature.

https://iphunizar.com/proyectos-de-sus-integrantes/peri-urban-strategic-areas-in-transformation-per-start-eco-cultural-challenges-in-urban-regeneration-processes-in-spanish-cities/

Circular Economy

The exploitation of biomass from agri-food production chain following the principle of circular economy found new synergies within UNITA

The exploitation of biomass from agri-food production chain following the principle of circular economy found new synergies within UNITA. On the base of previous projects, i.e. "US4GreenChem" (BBI H2020 - https://www.dstf.unito.it/do/progetti.pl/Show?_id=ilzg) and Por Fesr "Promesso" we showed how green extraction technologies could recovery high-added value natural products, followed by the conversion of lignocellulosic residue to platform chemicals and new biopolymers. The main sources used were wheat straw, grape pomace, chestnuts, and apples peels.

Renewable Energies

The Physics of Materials and Renewable Energy (MATREG) Research Center

Starting from the idea that the efficiency of an energy system depends on the physical behavior of a whole chain of components (from energy production to the final consumer), a research center has been built in West University of Timisoara - "Physics of Materials and Renewable Energy (MATREG)"- that aims to address several physical aspects of energy production and consumption to increase efficiency throughout the whole energy chain. Thus, the center aims to address the following research directions: (i) optimizing the growth processes of materials with energy relevance, such as multicrystalline silicon for photovoltaic applications, fluorides doped with rare earths for use as laser materials; (ii) obtaining new materials with energy relevance (with laser and LED applications); (iii) numerical modeling of crystal growth processes; (iv) development of melt flow control techniques with the help of electric and magnetic fields; (v) modeling solar radiation at the earth surface; (vi) modeling the solar cells operation; (vii) forecasting the energy production of PV systems.

Crystal growth research at the Department of Physics, West University of Timisoara (UVT), began 40 years ago. The main goal was the design of installations and the development of technologies for obtaining and characterizing crystals. Over time, attention has been focused on several objectives: obtaining different types of crystals, characterizing their physical properties, and using numerical simulation methods to optimize the quality of crystals and installation details. The research was focused on obtaining new materials that can influence technical progress in various fields (electronics, photovoltaics, optics, lasers, medicine,

etc.). Two methods of crystal growth have been developed in particular: the vertical Bridgman method and the Edge-defined Film-fed growth (EFG) method for obtaining profiled crystals. Soon, a new Czochralski equipment will be installed.

The research on photovoltaics at the Physics Department of the West University of Timisoara has begun 20 years ago and experienced an impressive development after the commissioning of the Solar Platform in 2008 (http://solar.physics.uvt.ro/). The Solar Platform includes four experimental facilities: Solar Radiation Monitoring Station (SRMS) which is the sole Romanian radiometric station outfitted for monitoring solar radiation on tilted surfaces; PV Laboratory; A micro-PV plant designed for testing the forecasting models; An all-sky-imager for monitoring the state-of-the-sky. A new facility of the Solar Platform is currently developed within the ICAM project (https://icam.uvt.ro/). This new facility is being equipped with the following state-of-the-art instruments such as: (i) A spectrophotometer EKO WISER II, which measures UV-VIS-IR spectral solar irradiances in all weather conditions. To our best knowledge this is the only automatic solar spectrophotometer installed in Romania and one of the few instruments operating in Europe; (ii) a Ciemel photometer integrated in the AERONET network.

PhD student of the month

UNIZAR PhD student, Javier Felipe Andreu is an Industrial Engineer, with experience in the automotive, household appliance and railway industries. After completing a master's degree in renewable energies and energy efficiency, he decided to launch himself into research.

He is currently researching, in CIRCE Institute, the resources necessary to decarbonize the economy in a bioregion, and the consequences that this decarbonization can have, both in the ecological footprint, the footprint of critical materials and the interregional relationship that will occur between energy production and consumption.

Javier Felipe is part of a network of students that organizes sustainability talks related to the Sustainable Development Goals. He also participates in Talent for Sustainability, where a large network of young people is seeking to become agents of social change. In this network they have prepared a report that will be presented to the congress and a dialogue has also been organized in which he participated with Teresa Ribera, third Vice President of the Government and Minister for the Ecological Transition and the Demographic Challenge.

1) Future of Energy and Climate. Intergenerational conversation with Teresa Ribera (19/05/2022)
https://icirce.unizar.es/noticias/19052022-javier-felipe-participa-en-dialogo-con-teresa-rivera-vicepresidenta-tercera-del
https://www.youtube.com/watch?v=Pk7NC8NOcOA

2) COL·LOQUI AMB JAVIER FELIPE - En temps incerts, debats per la revolta (12/05/2022)- Minute 13´22´´
https://www.youtube.com/watch?v=ExN0WUM4VKU

Woman researcher of the month

Silvia Bordiga, Full Professor at the Department of Chemistry, University of Turin.

After her PhD in Chemical Science in 1993, she continued her research on nanostructured high surface area materials. Broad aim of her work is to describe both structure and number of the active sites, as well as reaction mechanisms and origin of catalysts deactivation. The common denominator of her interests is the wide concept of sustainability, strongly interconnected with both energy efficiency and integration of resources (possibly renewable) to allow a sustainable growth of our society.

Read the interview »

Highlights

The 21st of June, we received in Zaragoza, within the framework of the Re-UNITA Project, the presence of two representatives from the Université de Pau et des Pays de l'Adour: Isabelle Le Hécho and Hervé Garraud.
We arrange for them, in the WP4 framework, a visit to the different facilities and some equipment that help researchers to develop their studies. Many thanks to the people who joined us from the General Research Support Service, the Institute of Nanoscience and Materials of Aragon, the University Institute of Research in Engineering of Aragon and the @University Institute of Biocomputing and Physics of Complex Systems Research.

Would you like to share this SUMMER a new experience in a different environment?
"UNITA - Rural Mobility" is a university internship programme for UNITA students in entities and companies in rural municipalities.
The University of Zaragoza has launched a new call for rural mobility.
APPLY NOW! JOIN US!!
https://internacional.unizar.es/unita--mobility

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