*Centrul CERNESIM a fost dezvoltat în cadrul PROGRAMULUI OPERAȚIONAL SECTORIAL „CREȘTEREA COMPETITIVITĂȚII ECONOMICE”, AXA PRIORITARĂ 2, CD&I: Operațiunea 2.2.1 și PROGRAMUL NAȚIONAL „CAPACITĂȚI”, MODULUL I: Proiecte mari de investiții, Fonduri totale ale proiectului: 7.106.199,28 EURO, Perioada de implementare a proiectului perioada: 42 luni (28-10-2010 / 27-03-2014)

CERNESIM*

CENTRU INTEGRAT DE STUDII ÎN ŞTIINŢA MEDIULUI PENTRU REGIUNEA DE DEZVOLTARE NORD-EST

ALEXANDRU IOAN CUZA UNIVERSITY of IASI INSTITUTE OF INTERDISCIPLINARY RESEARCH

L1-Laborator de analize fizico-chimice

L2-Laborator de bio-monitorizare şi bioremediere a calităţii mediului

L3-Laborator pentru investigarea proceselor fizico-chimice din atmosferă şi pentru testarea noilor tehnologii ecologice pentru distrugerea poluantilor gazosi

L4-Laborator de environmetrie

L5-Laborator de studii şi analize economice de mediu

Contact: Professor PhD. habil. Romeo-Iulian OLARIU, oromeo@uaic.ro
Professor PhD. habil. Cecilia ARSENE, carsene@uaic.ro

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https://cernesim.uaic.ro

L1-Laborator de analize fizico-chimice

- ✓ Domenii de cercetare:
  - ✓ Chimie analitică şi analiză instrumentală aplicată in sănătate şi mediu;
  - ✓ Chimia compuşilor heterociclici cu aplicaţii în nano-ştiinţe, sănătate şi mediu;

- ✓ Infrastructura de cercetare:
  - ✓ Single crystal X-ray diffractometer with dual source type SuperNova, Agilent Technologies, UK
  - ✓ Nuclear magnetic resonance spectrometer (NMR) type Ascend 500MHz, Bruker, Germany
  - ✓ Liquid chromatograph coupled with inductively coupled plasma mass spectrometer type 7700X, Agilent Technologies, USA
  - ✓ Scanning electron microscope (SEM) type Quanta 250, FEI Company, UK
  - ✓ FTIR spectrophotometer type Vertex 70, Bruker Optik, Germany
  - ✓ Spectrofluorimeter type FLS-920s, Edinburgh Instruments, UK
  - ✓ Liquid chromatograph coupled ToF mass spectrometer with type, Agilent Technologies, USA
  - ✓ Liquid chromatograph with diode array and fluorescence detectors , Agilent Technologies, USA
  - ✓ High-resolution continuous source Atomic Absorption Spectrophotometer with flame, graphite furnace, hydride system, Analytik Jena ContrAA 700, Germany
  - ✓ VCDs-FTIR spctrometer, CHIRALIR2XTM, BioTools, UK-USA
  - ✓ Analyzer Multi N / C 3100, Analytic Jena, Germany

L2-Laborator de bio-monitorizare și bioremediere a calității mediului

- ✓ Domenii de cercetare:
  - ✓ Evaluarea biodiversitatii in arii protejate
  - ✓ Stabilirea potentialului de reintroducere/repopulare a unor arii naturale cu specii periclitate
  - ✓ Determinarea toxicitatii unor poluanti si nanomateriale asupra unor organisme vegetale acvatice si terestre
  - ✓ Stimularea metabolismului secundar la organisme vegetale in vederea obtinerii de culturi cu continut ridicat de substante bioactive
  - ✓ Identificarea efectulului fertilizantilor organici pentru optimizarea agriculturii ecologice
  - ✓ Determinarea efectului stimulatorilor asupra plantelor medicinale in culturi in vitro

- ✓ Infrastructura de cercetare:
  - ✓ Transmission electron microscope (TEM) Tecnai type G2 Spirit, FEI Company, UK
  - ✓ Thermal imaging equipment Lemnatec Scanalyzer PL
  - ✓ Kjeldahl Velp system for determining total nitrogen and protein
  - ✓ Semiautomatic microtome Leica RM2245
  - ✓ Leica microscope DM750
  - ✓ Leica M205 stereo camera DFC500
  - ✓ Stereromicroscop Leica S6 with incident light source fiber optic Leica L2

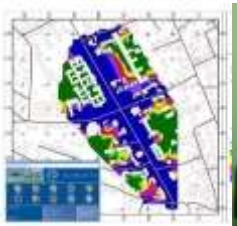
L3-Laborator pentru investigarea proceselor fizico-chimice din atmosferă şi pentru testarea noilor tehnologii ecologice pentru distrugerea poluantilor gazosi

- ✓ Domenii de cercetare:
  - ✓ Impactul compuşilor organici volatili asupra chimismului atmosferic, poluării aerului, chimiei aerosolilor şi evaluarea impactului acestora asupra speciilor oxidante din atmosfera şi asupra climei;
  - ✓ Producţia şi caracterizarea plasmelor la presiune atmosferică şi joasă şi identificarea de noi tehnologii pentru distrugerea poluanţilor gazoşi;;
  - ✓ Testarea de noi senzori pentru monitorizarea gazelor poluante, cu aplicaţie tehnologică
- ✓ Infrastructura de cercetare:
  - ✓ Environmental simulation chamber- ESC-Q-UAIC
  - ✓ Gas chromatograph with flame ionization and mass spectrometer detectors and thermal desorption Gerstel (Turbo) -TDSG-TDSA, Agilent Technologies, USA; Comprehensive gas chromatograph with flame ionisation and mass spectrometer detectors , Agilent Technologies, USA
  - ✓ Ion Chromatograph, Dionex ICS 5000 Thermo, USA
  - ✓ Analyzers (monitors) and generators series Ecotech, Australia
  - ✓ Scanning mobility particle size, TSI, USA
  - ✓ SUNSET Laboratory Inc. OC / EC, USA
  - ✓ Mass spectrometer with proton transfer, Korea Technology, UK
  - ✓ Aerosol mass spectrometer, Aerodyne Research, USA
  - ✓ Mass Spectrometer HPR60, Hiden Analytical, UK,
  - ✓ LIF system (pulsed dye laser), Quantel SA, France

L4-Laborator de environmetrie

- ✓ Domenii de cercetare:
  - ✓ Evaluarea şi estimarea impactului poluantilor asupra geosistemului;
  - ✓ Estimarea conţinutul de metale grele în roci, sol, apă, plante, probe arheologice;
  - ✓ Studii de reziliență, cartografiere şi analiză a distribuţiei spaţiale a diferiţilor poluanţi;
  - ✓ Studii de impact asupra mediului ca urmare a activităţilor economice;

- ✓ Infrastructura de cercetare:
  - ✓ Clean room with controlled atmosphere ISO 7
  - ✓ ICP-MS Systems 7700s , Agilent Technologies
  - ✓ LSX-266 Nd:YAG Laser Ablation System - Cetac Technologies, USA
  - ✓ RA-915 M Portable Zeeman Mercury Analyzer + RP 91/91C module Lumex Ltd
  - ✓ Analyzer multi N/C ® 2100 series with HTC module for solids
  - ✓ MARS 6 Acid Digestion System
  - ✓ Graphic station HP Z 800, HP high –end Z 800



L5-Laborator de studii şi analize economice de mediu

- ✓ Domenii de cercetare:
  - ✓ Evaluarea afacerilor în condiţiile internalizării efectelor activităţii asupra mediului;
  - ✓ Analiza şi evaluarea economică a resurselor de mediu;
  - ✓ Analiza şi evaluarea economică a efectelor poluării;
  - ✓ Studiul oportunităţii introducerii tehnologiilor nepoluante în activităţile economice;
  - ✓ Evaluarea impactului degradării mediului asupra populaţiei, prin anchete statistice, dar şi a modului în care bunăstarea socială şi economică influenţează calitatea mediului;
  - ✓ Studiul şi previziunea efectelor urbanizării asupra mediului.

- ✓ Infrastructura de cercetare:
  - ✓ Computer network
  - ✓ Business Planner software
  - ✓ IBM SPSS Statistics 21 software
  - ✓ SQL Software Analyst Xecutive

Cercetătorii noştrii

CERNESIM L1- CHIMIE Coordonator Prof. univ. dr. habil. Cecilia ARSENE

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- CS III dr. Cătălina CIOBANU
- ACS dr. Giorgiana – Alina NEGRU
- ACS dr. Tiberiu ROMAN
- ACS dr. Dumitrela DIACONU
- Laborant drd. Cornelia AMARANDEI

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- ACS dr. Gabriela MIHALACHE
- ACS dr. Maria-Magdalena FUSU

CERNESIM L3 – CHIMIE – Coordnator Prof. univ. dr. habil. Romeo-Iulian OLARIU

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- ACS drd. Claudiu ROMAN
- Laborant drd. Laurentiu ŞOROAGĂ
- Administrator ing. Vasile VATRĂ

Cercetătorii noştrii

CERNESIM

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- CS III dr. habil. Corneliu DOROFTEI
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- ACS dr. Aurelian CÂRLESCU

CERNESIM

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- CS dr. Elena-Diana BOBRIC
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- Laborant drd. Alexandra Petronela STOLERIU

CERNESIM

L5 – FEAA – Coordnator Prof. univ. dr. Costică MIHAI

- CS III dr. Simona-Roxana ULMAN
- CS dr. Cristina CĂUTIȘANU

Rezultate – L1-Chimie

ALEXANDRU IOAN CUZA UNIVERSITY of IASI INSTITUTE OF INTERDISCIPLINARY RESEARCH

Geochemistry 51 (2021) 125761

Contents lists available at ScienceDirect

Geochemistry

journal homepage: www.elsevier.com/locate/chemwe

Trace elements distribution in stream sediments of an abandoned U mining site in the Eastern Carpathians, Romania, with particular focus on REEs

Marius C. Sandu, Laurentiu V. Soroaga, Sorin I. Balaban, Ciprian Chelariu, Ovidiu Chiscan, Gabriel O. Iancu, Cecilia Arsene, Romeo I. Olariu

JOURNAL OF ENZYME INHIBITION AND MEDICINAL CHEMISTRY
2019, VOL. 34, NO. 1, 230–243
https://doi.org/10.1080/14756366.2018.1550085

Taylor & Francis

RESEARCH PAPER

OPEN ACCESS

Synthesis, molecular modelling and anticancer evaluation of new pyrrolo[1,2-*b*]pyridazine and pyrrolo[2,1-*a*]phthalazine derivatives

Lacramioara Popovici, Roxana-Maria Amarandi, Ionel I. Mangalagiu, Violeta Mangalagiu and Ramona Danac

Faculty of Chemistry, Alexandru Ioan Cuza University of Iasi, Iasi, Romania; CERNESIM Research Centre, Alexandru Ioan Cuza University of Iasi, Iasi, Romania

ABSTRACT

Two new series of heterocyclic derivatives with potential anticancer activity, in which a pyrrolo[1,2-*b*]pyridazine or a pyrrolo[2,1-*a*]phthalazine moiety was introduced in place of the 3′-hydroxy-4′-methoxyphenyl ring of phenstatin have been synthesised and their structure-activity relationship (SAR) was studied. Fourteen of the new compounds were evaluated for their *in vitro* cytotoxic activity by National Cancer Institute (NCI) against 60 human tumour cell lines panel. The best five compounds in terms of *in vitro* growth inhibition were screened in the second stage five dose-response studies, three of them showing a very good antiproliferative activity with GI_{50}<100 nM on several cell lines including colon, ovarian, renal, prostate, brain and breast cancer, melanoma and leukemia. Docking experiments on the biologically active compounds showed a good compatibility with the colchicine binding site of tubulin.

ARTICLE HISTORY
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Accepted 14 November 2018

KEYWORDS
Anticancer; phenstatin; pyrrolo[1,2-*b*]pyridazine; pyrrolo[2,1-*a*]phthalazine; 3 + 2 dipolar cycloaddition; docking; N-heterocycles

Rezultate – L2-Biologie

ALEXANDRU IOAN CUZA UNIVERSITY of IASI

INSTITUTE OF INTERDISCIPLINARY RESEARCH

molecules

MDPI

Article

Gelatin Reinforced with CNCs as Nanocomposite Matrix for *Trichoderma harzianum* KUEN 1585 Spores in Seed Coatings

Bianca-Ioana Dogaru [1], Vasile Stoleru [2], Gabriela Mihalache [2,3], Sems Yonsel [4] and Maria-Cristina Popescu [1,*]

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Abstract: Increasing interest on sustainable agriculture has led to the development of new materials which can be used as seed coating agents. In this study, a new material was developed based on gelatin film reinforced with cellulose nanocrystals (CNC) which was further used as nanocomposite matrix for *Trichoderma harzianum* KUEN 1585 spores. The nanocomposite films were characterized by Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) and scanning electron microscopy (SEM), showing the formation of new hydrogen bonds between the components with a good compatibility between them. Measurements of water contact angles and tests of water vapor sorption and swelling degree revealed an improvement in the water vapor absorption properties of the films as a result of their reinforcement with CNC. Furthermore, by adding the *Trichoderma harzianum* KUEN 1585 spp. in the seed coating material, the germination percentage, speed of germination and roots length of the corn seeds improved. The polymeric coating did not inhibit the growth of *T. harzianum* KUEN 1585, with this material being a good candidate in modern agriculture.

Keywords: gelatin; cellulose nanocrystals; bionanocomposite; seed coating; biofertilizer; germination; plant growth

check for updates

Citation: Dogaru, B.-I.; Stoleru, V.; Mihalache, G.; Yonsel, S.; Popescu, M.-C. Gelatin Reinforced with CNCs as Nanocomposite Matrix for Trichoderma harzianum KUEN 1585 Spores in Seed Coatings. *Molecules* 2021, 26, 5955. https://doi.org/10.3390/molecules26195955

Journal of Plant Diseases and Protection
https://doi.org/10.1007/s41348-021-00519-x

DPG

SHORT COMMUNICATION

First report of *Erysiphe salmonii* causing powdery mildew on *Fraxinus excelsior* in Romania

Vasilică-Claudiu Chinan[1], Maria-Magdalena Dascălu[2]

Received: 12 June 2021 / Accepted: 12 August 2021
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Abstract
In October 2020, *Fraxinus excelsior* saplings showing powdery mildew symptoms on both sides of the leaves were found in Southern Romanian Carpathians. Morphological examination revealed that the pathogen agent is *Erysiphe salmonii*, an Asian fungus that recently arrived in Europe. Species identity was confirmed by the phylogenetic analysis of two internal transcribed spacer (ITS) sequences from Romanian samples and a few other *E. salmonii* sequences available from GenBank. On the phylogenetic tree, they are all recovered as a highly supported clade of very similar sequences. A description and illustrations of the specimens collected in Romania are provided. To our knowledge, this is the first report of *E. salmonii* in Romania and the third in Europe, after Ukraine and Switzerland. Due to the invasive potential of the powdery mildew fungi, this record is important in the context of the range extension of *E. salmonii* in Europe.

Keywords Erysiphales · Common ash · Disease · Romanian Carpathians

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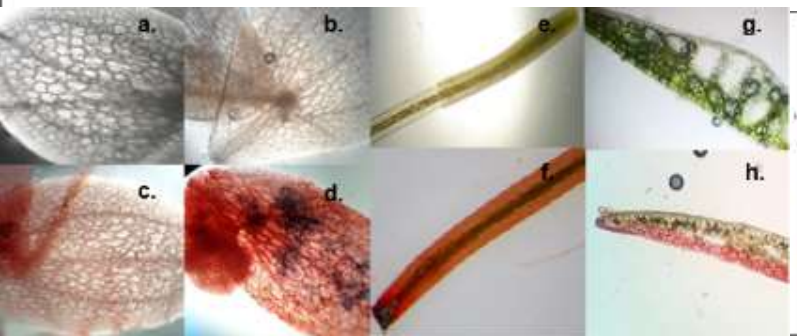
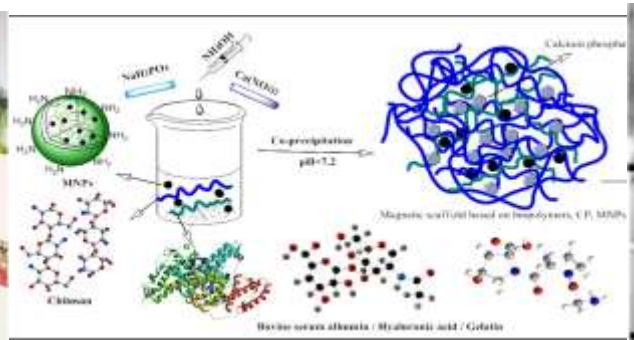
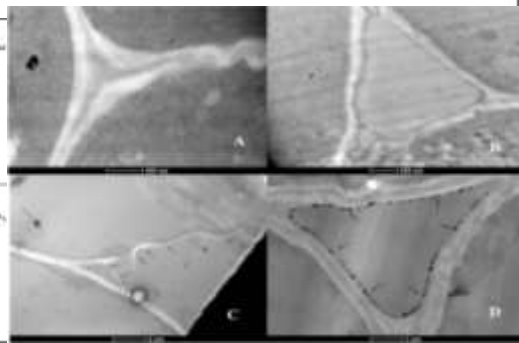
CERNESIM (Integrated Center of Environmental Science Studies in the North East Region), Institute of Interdisciplinary Research, Alexandru Ioan Cuza University of Iaşi, Iaşi, Romania







Rezultate – L3-Chimie

ALEXANDRU IOAN CUZA UNIVERSITY of IASI

INSTITUTE OF INTERDISCIPLINARY RESEARCH

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 265 (2022) 120379

Contents lists available at ScienceDirect

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy

journal homepage: www.elsevier.com/locate/saa

Gas-phase IR cross-sections and single crystal structures data for atmospheric relevant nitrocatechols

Claudiu Roman [a,b], Tiberiu Roman [b], Cecilia Arsene [a,b], Iustinian-Gabriel Bejan [a,b], Romeo-Iulian Olariu [a,b,*]

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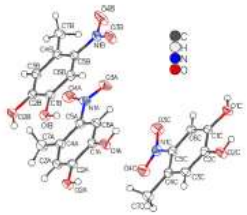
[b] Alexandru Ioan Cuza" University of Iasi, Integrated Center of Environmental Science Studies in the North Eastern Region - CERNESIM, 11 Carol I, Iasi 700506, Romania

HIGHLIGHTS

- Gas-phase IR absolute and integral absorption cross-sections of four nitrocatechols.
- Intercomparison of two methods for the estimation of gas-phase concentrations.
- Elementary cell structures of the single crystal of four nitrocatechols

GRAPHICAL ABSTRACT



Science of the Total Environment 695 (2019) 133838

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

Size-resolved measurements of $PM_{2.5}$ water-soluble elements in Iasi, north-eastern Romania: Seasonality, source apportionment and potential implications for human health

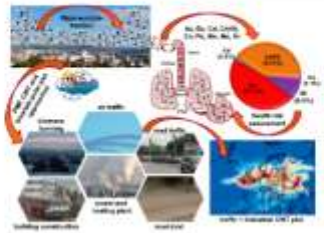
Alina Ciorniana Galon-Negru, Romeo Iulian Olariu, Cecilia Arsene *

"Alexandru Ioan Cuza" University of Iasi, Faculty of Chemistry, Department of Chemistry, 11 Carol I, Iasi, Romania
"Alexandru Ioan Cuza" University of Iasi, Integrated Centre of Environmental Science Studies in the North Eastern Region, 11 Carol I, 700506, Iasi, Romania

HIGHLIGHTS

- Several $PM_{2.5}$ water-soluble heavy metals have higher concentrations in cold season.
- High concentration levels of water-soluble elements from soil-dust resuspension or brake lining and tires
- Clear fine mode distribution (maxima at ~ 381 nm) for anthropogenic elements
- Five sources with seasonal dependent pattern identified by PMF analysis
- As and Cr(VI) with the largest cancer risks, exceed the critical value (1×10^{-6}).

GRAPHICAL ABSTRACT



Rezultate – L3-Fizica plasmei

ALEXANDRU IOAN CUZA UNIVERSITY of IASI

INSTITUTE OF INTERDISCIPLINARY RESEARCH

applied sciences

MDPI

Article

Time Behaviour of Helium Atmospheric Pressure Plasma Jet Electrical and Optical Parameters

Ioana Cristina Gerber [1], Ilarion Mihaila [2,*], Dennis Hein [1], Andrei Vasile Nastuta [1,†], Roxana Jijie [1], Valentin Pohoata [1] and Ionut Topala [1,*]

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Academic Editor: M.C.M. van de Sanden
Received: 7 July 2017; Accepted: 4 August 2017; Published: 9 August 2017

Abstract: Low temperature plasma jets gained increased interest in the last years as a potential device in many life science applications, including here human or veterinary medicine. Standardisation of plasma sources and biological protocols are necessary for quality assurance reasons, due to the fact that this type of atmospheric pressure plasma source is available in multiple configurations and their operational parameters span also on a broad range of items, such as all characteristics of high voltage pulses used for gas breakdown, geometrical characteristics, gas feed composition and conductive or biological target characteristics. In this paper we present results related to electrical, optical and molecular beam mass spectrometry diagnosis of a helium plasma jet, emphasising the influence of various operational parameters of the high voltage pulses on plasma jet properties. Discussion on physical parameters that influence the biological response is included, together with important results on plasma sources statistical behaviour until reaching a quasi-stationary working regime. The warm-up period of the plasma jet, specific to many other plasma sources, must be precisely known and specified whenever the plasma jets are used as a tool for life science applications.

Keywords: plasma medicine; plasma diagnosis; atmospheric pressure plasma jet

Surface & Coatings Technology 359 (2019) 97–107

Contents lists available at ScienceDirect

Surface & Coatings Technology

journal homepage: www.elsevier.com/locate/surfcoat

ELSEVIER

Energy-enhanced deposition of copper thin films by bipolar high power impulse magnetron sputtering

Ioana-Laura Velicu[a], Gabriela-Theodora Ianoş[a], Corneliu Porosnicu[b], Ilarion Mihăilă[c], Ion Burducea[d], Alin Velea[e], Daniel Cristea[f], Daniel Munteanu[f], Vasile Tiron[a,g]

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ARTICLE INFO

Keywords:
Bipolar Pulse High Power Impulse Magnetron Sputtering (BP-HiPIMS)
Fast ICCD imaging
Ion energy distributions (IED)
Tribology

ABSTRACT

Bipolar Pulse High Power Impulse Magnetron Sputtering (BP-HiPIMS) was investigated and used in this work to control the ion bombardment process of growing thin films and to improve their structure and properties. Energy-resolving mass spectroscopy was used to investigate the effect of reverse target voltage on the ion energies and fluxes during BP-HiPIMS of a high-purity copper target, in argon gas. It was found that the reverse target voltage provides a wide range of ion energies and fluxes incident to the growing film, which, in turn, produce a wide variety of effects during the deposition process, improving the adhesion strength and influencing both surface and bulk properties. Fast ICCD imaging was used to investigate both HiPIMS and BP-HiPIMS plasma dynamics. The temporal and spatial distributions of plasma potential measurements were performed in order to explain the mechanisms for accelerating the ions. The topological, structural and mechanical properties of the deposited coatings were investigated using atomic force microscopy (AFM), X-ray diffraction (XRD), Rutherford backscattering spectrometry (RBS), thermal desorption spectroscopy (TDS), scanning electron microscopy (SEM), nanoindentation and scratch tests. The obtained results indicate an energy-enhanced deposition process during BP-HiPIMS, the deposited films being characterized by smooth surfaces, dense microstructure, small inert gas inclusions, high elastic strain to failure, scratch resistance and good adhesion to the substrate. These improvements in the films' structure and properties may be attributed to the intense and energetic ion bombardment taking place during the deposition process. During BP-HiPIMS operation, there is no net increase in the deposition rate as compared to the monopolar regime due to the re-sputtering process.

Rezultate – L3-Fizica corpului solid

Journal of Sol-Gel Science and Technology
September 2019, Volume 91, Issue 3, pp 654–663 | Cite as

The influence of Sc^{3+} ions on the microstructure, electrical, and gas-sensing properties of Ni–Co–Sc ferrite

Authors Authors and affiliations

C. Doroftei
L. Leontie

1. Integrated Center for Studies in Environmental Science for North-East Region, Alexandru Ioan Cuza University of Iasi, Iasi, Romania
2. Faculty of Physics, Alexandru Ioan Cuza University of Iasi, Iasi, Romania

Original Paper: Sol-gel and hybrid materials for catalytic, photoelectrochemical and sensor applications
First Online: 06 July 2019

50 Downloads

Abstract

The influence of Sc^{3+} ion content on the microstructure, electrical, and gas-sensing properties of $Ni_{0.5}Co_{0.5}Sc_xFe_{2-x}O_4$ (x = 0.0, 0.05, 0.1 and 0.2) ferrites synthesized by a novel self-combustion method using polyvinyl alcohol as the colloidal medium, was studied. X-ray diffraction, X-ray photon spectroscopy (XPS), Brunauer–Emmett–Teller (BET) surface area, scanning electron microscopy (SEM), and energy-dispersive X-ray analysis (EDX) were employed to characterize the structure and morphology properties of these ferrites. The gas-sensing properties of hydrogen, methane, ethanol, methylene chloride, and benzene were investigated. The samples show p-type semiconducting properties for the studied gases within the temperature range of 100–380 °C. The results revealed that the partial substitution of Fe^{3+} by Sc^{3+} ions on the octahedral sites of the spinel structure of $Ni_{0.5}Co_{0.5}Fe_2O_4$ ferrite has a

Ceramics International 45 (2019) 20165–20171

Contents lists available at ScienceDirect

Ceramics International

journal homepage: www.elsevier.com/locate/ceramint

Influence of rare earth addition in cobalt ferrite thin films obtained by pulsed laser deposition

G. Bulai[a,*], V. Trandafir[b], S.A. Irimiciuc[c], L. Ursu[d], C. Focsa[e], S. Gurlui[b]

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ARTICLE INFO

Keywords:
Cobalt ferrite
Rare earth
Thin films
Structural properties
Magnetic hysteresis
Optical bandgap

ABSTRACT

The influence of rare earth (RE = Dy, Gd, Yb) ion doping on the structural, magnetic and optical properties of cobalt ferrite thin films was studied. $CoFe_{2-x}RE_xO_4$ (x = 0.01; 0.03; 0.05; 0.1; 0.2; 0.3) films were obtained by pulsed laser deposition on silicon substrates. The X-ray diffraction and Raman spectroscopy results on the bulk materials, which were used as targets during deposition, revealed the formation of residual phases as the concentration of RE dopant was increased. However, the annealed thin films presented diffraction lines and vibrational modes corresponding only to cobalt ferrite. A lower crystallinity of the deposited samples was observed when higher RE concentrations were used. Due to the substitution of Fe by RE elements which possess large ionic radii, the lattice parameter of the thin films presented a monotonous increase. The magnetic response of the nanostructures was correlated to the magnetic moment of the RE dopant and to the structural properties of the films. The optical bandgaps derived from the reflectance spectra presented an increasing trend as the Yb and Dy concentrations were augmented.

Rezultate – L4 –Geografie si Geologie

ALEXANDRU IOAN CUZA UNIVERSITY of IASI

INSTITUTE OF INTERDISCIPLINARY RESEARCH

Environmental Research 169 (2019) 86–101

Contents lists available at ScienceDirect

Environmental Research

journal homepage: www.elsevier.com/locate/envres

Wind erosion on arable lands, associated with extreme blizzard conditions within the hilly area of Eastern Romania

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ARTICLE INFO

Keywords:
Blizzard conditions
Wind erosion
Sediment deposition
Arable lands

ABSTRACT

The removal of wind-blown soils from cultivated fields is often expensive. It physically removes the most fertile portion of the soil that can lead to yield reduction in areas where wind erosion is a recurring problem. Soil nutrients and surface-applied chemicals can also be carried along with soil particles, contributing to off-site impacts.

An extreme blizzard event has been investigated as case study within the Moldavian Plateau of eastern Romania. The results obtained, based on 45 snow core samples, show that the deposited sediment widely varied depending on land-use. The highest mean value of 5967 g m^{-2} occurred on fallow land and it sharply decreased under winter wheat (445 g m^{-2}) and pasture (345 g m^{-2}).

Regarding the major subunits of the Moldavian Plateau, the Jijia Rolling Plain (JRP) was the most affected, with mean value of 7547 g m^{-2}. The Barlad Plateau (BP) and the Fakiu Rolling Plain (FRP) are depicted by smaller values, namely: 395 g m^{-2} and 386 g m^{-2}. By using remote sensing it was estimated that 208,990 ha under fallow from JRP (34% of the total) were heavily subjected to wind erosion with a mean soil loss of 2.04 t ha^{-1}, while the depositional area comprised 175,440 ha (29% of the total).

The deposited soil is loamy compared with the general clayey-loamy texture of local soils. The main source of the wind-blown material is represented by the close proximity fields under fallow of the depositional areas.

Journal of Environmental Protection and Ecology 19, No 3, 1091–1101 (2018)

Risk assessment

REMOTE SENSING, GIS AND HEC-RAS TECHNIQUES, APPLIED FOR FLOOD EXTENT VALIDATION, BASED ON LANDSAT IMAGERY, LIDAR AND HYDROLOGICAL DATA. CASE STUDY: BASEU RIVER, ROMANIA

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Abstract. Floods have always posed great threat to human settlements, and their monitoring has always been a very important step in the understanding, managing and predicting similar, future events, in order to mitigate flood risk and the concrete impact it has on communities and the environment. Modern techniques of analysing flood extent include remote sensing, by extracting flood limits from satellite imagery, and Geographical Information Systems (GIS), which are used in tandem, to generate cartographic material, depicting areas suffering from flood damage. Unfortunately, the results are not always precise, and can induce significant errors, due to which, the results are questionable and cannot be efficiently included in management plans, by authorities. The current study addresses the validation process of digitally generated GIS layers, based on statistical data derived from hydrological field recordings, with satellite images that reveal the proper flood extents, from the same time period, as the case study flash flood. The emphasis was put on comparing absolute and relative accuracy values, in order to validate several results, such as digital, HEC-RAS generated water levels (based on statistical analysis) with recorded water levels; 5% recurrence interval flood extents of HEC-RAS model, correlated withreal-world flood extent, and through satellite imagery.

Keywords: flood, GIS, HEC-RAS, remote sensing, validation.

Rezultate – L5 –FEAA

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sustainability

MDPI

Article

Peculiarities of the Relation between Human and Environmental Wellbeing in Different Stages of National Development

Simona-Roxana Ulman [1], Costica Mihai [2] and Cristina Cautisanu [1,*]

1 CERNESIM Environmental Research Center, Alexandru Ioan Cuza University of Iasi, 700505 Iasi, Romania; simona.ulman@uaic.ro

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check for updates

Abstract: The literature formed around the concept of sustainable development emphasizes that its achievement depends on how its dimensions evolve. Considering that the economic dimension is not an end in itself, but a means for achieving the other two dimensions, we concentrated on the relation between environment and society. Using the framework of Sustainable Society Index, we applied path analysis for identifying the effects of human wellbeing components on environmental wellbeing for 71 countries around the world in 2016. The countries were grouped into two groups—factor-driven and innovation-driven economies—according to Global Competitiveness Report. The main results revealed that once the society develops, the pressure upon the environment tends to move from the necessity of offering the basic human needs to the one regarding superior societal needs. While the least developed nations have to pay attention especially to population growth, safe sanitation and health as primary channels of better protecting the environment, in the case of the most developed countries, the main directions of environmental improvement may be education and good governance. Thus, a high environmental concern has to be cultivated in the development process, whichever its stage, but with distinct directions of action, as shown by this study.

Keywords: environmental wellbeing; human wellbeing; stages of development; path analysis

International Journal of Environmental Research and Public Health

MDPI

Article

The Impact of COVID-19 Pandemic on Stock Market: Evidence from Romania

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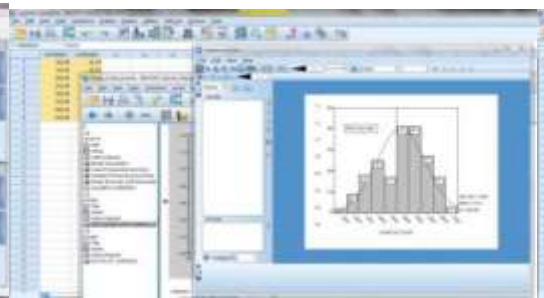
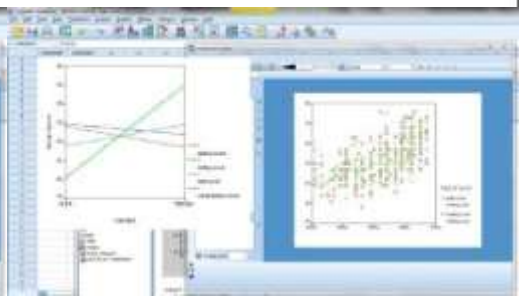
check for updates

Citation: Hatmanu, M.; Cautisanu, C. The Impact of COVID-19 Pandemic on Stock Market: Evidence from Romania. *Int. J. Environ. Res. Public Health* 2021, *18*, 9315. https://doi.org/10.3390/ijerph18179315

Abstract: The current health crisis has several socioeconomic influences that could be compared to those experienced during the 2008 economic and financial crisis. Governments around the world are making great efforts to sustain markets as there are signs showing that the health crisis will be followed by an economic crisis. In this study, we aim to investigate the impact of COVID-19 on the Romanian stock market. For this purpose, we considered the influence on the Bucharest Exchange Trading (BET) index of such variables as the number of new cases and the number of new deaths caused by COVID-19, measures taken by authorities, and the international economic context. The collected data covered the period between 11 March 2020 and 30 April 2021. The Autoregressive Distributed Lag (ARDL) Bound cointegration test was used to measure the impact of COVID-19 on the stock market. The results showed a significant long-term negative impact of the pandemic on the BET index for Romania, while the European economic context had a positive influence. Therefore, these results could be used by authorities as a good guideline for the efficient management of measures that aim to reduce the negative effects of the healthcare crisis.

Keywords: COVID-19 pandemic; BET index; economic activity; the ARDL Bound cointegration test; Error Correction Model (ECM); Romania



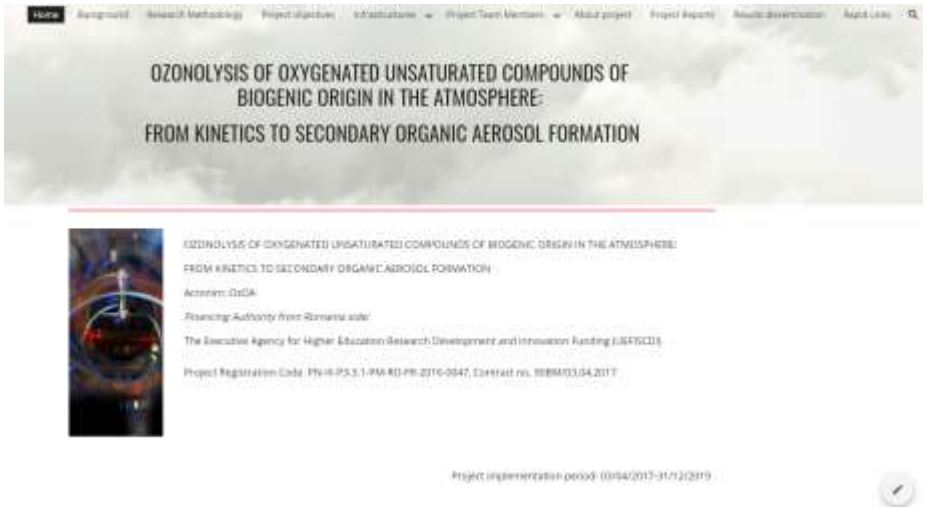


Environmental Simulation Chamber - ESC-Q-UAIC

https://www.erris.gov.ro/cernesim.uaic.ro

- CERENESIM este in Roadmap-ul național al infrastructurilor de cercetare din România 2017-2027, aprobat prin Ordinul ministrului cercetării și inovării nr. 624/03.10.2017

- Proiecte:



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- Proiect DEV-TREC

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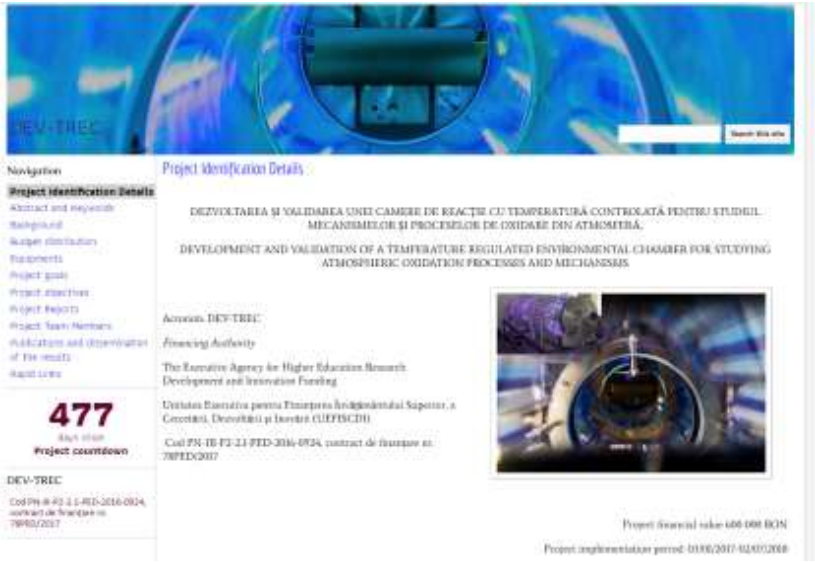

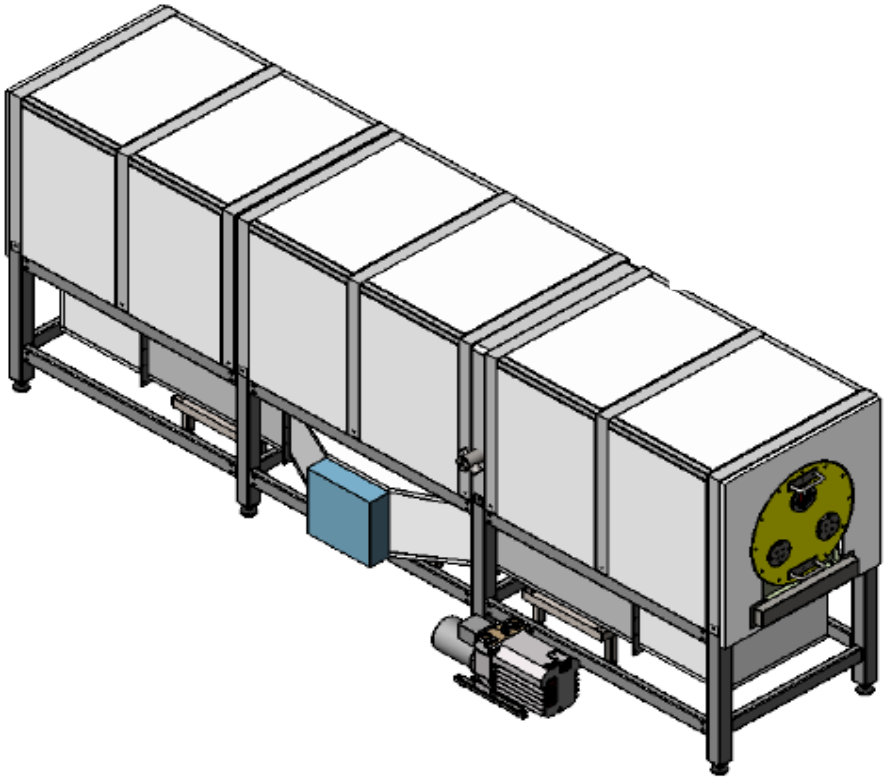

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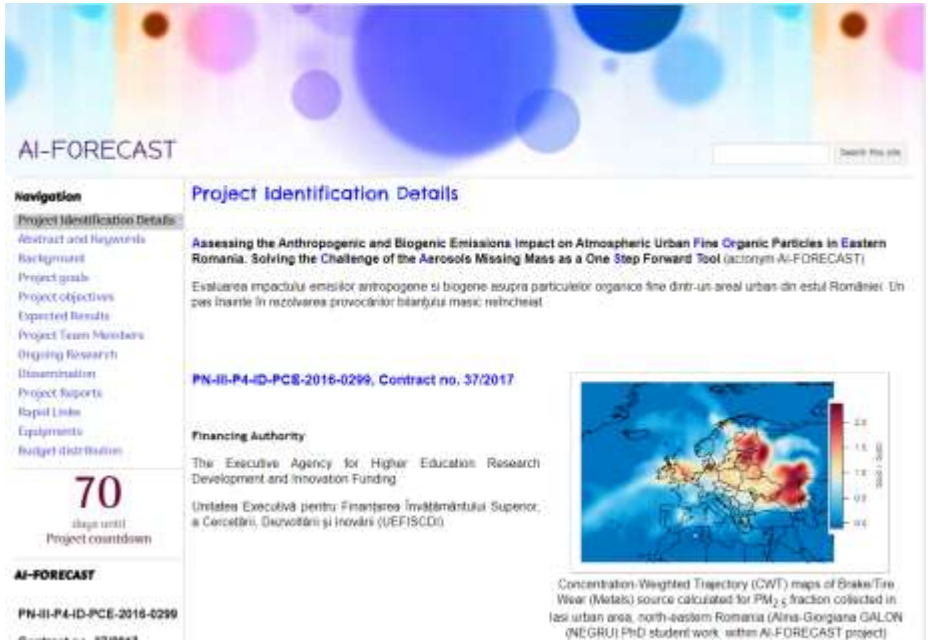
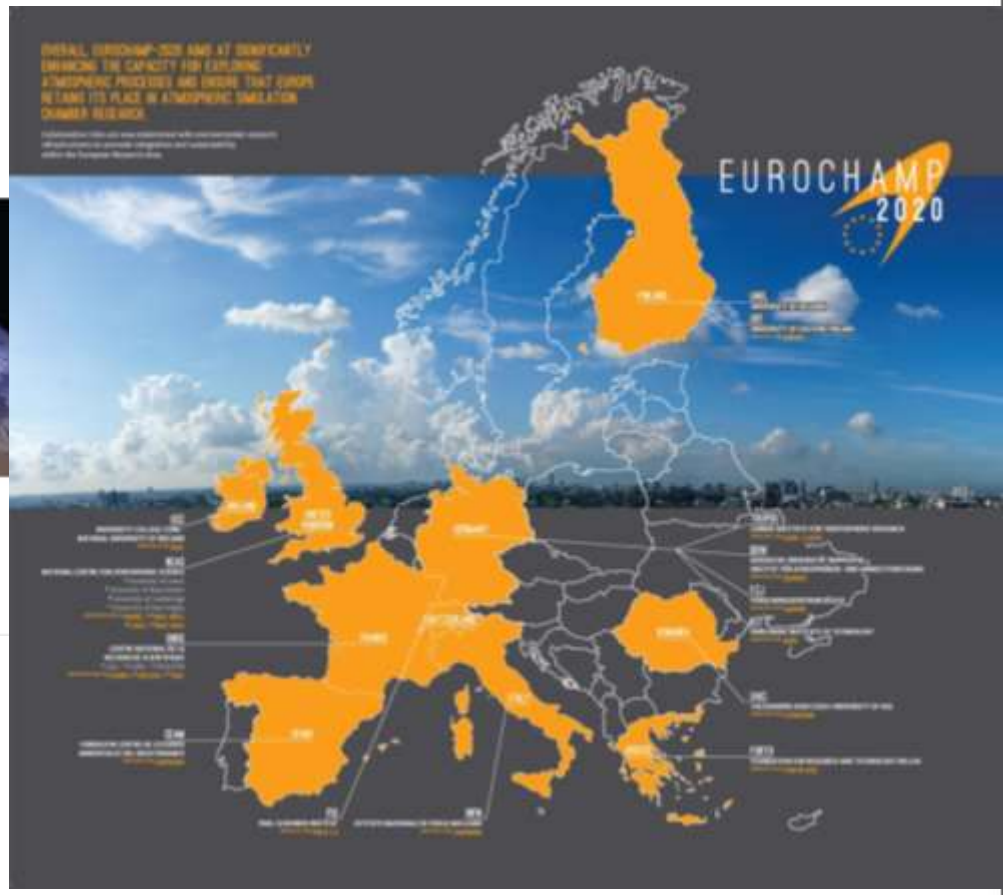


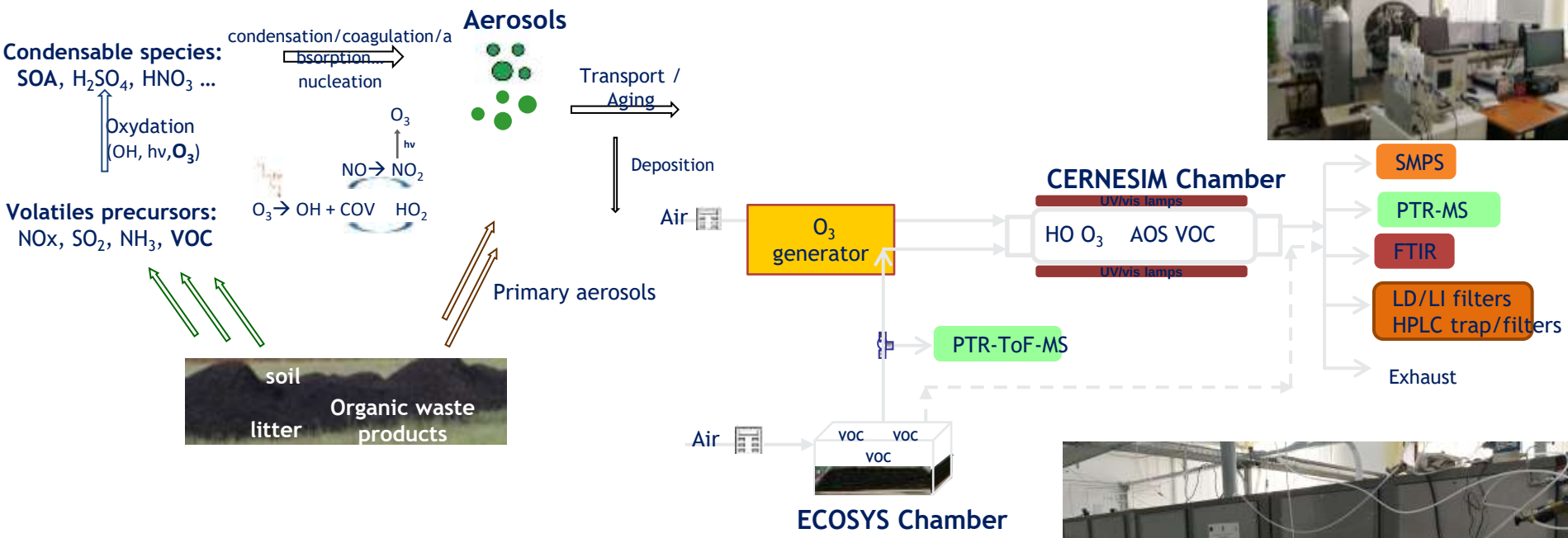
proiecte

- din 01-12-2016, camera ESC-Q-UAIC este cooptata in grupul EUROCHAMP – grupul care alcatuieste consortiul celor mai avansate Camere de simulare la nivel EUROPEAN



TNA 1 - UAIC-CERNESIM -Iasi (30-08/12-09 2019)

Context - Aerosoli organici secundari agricoli



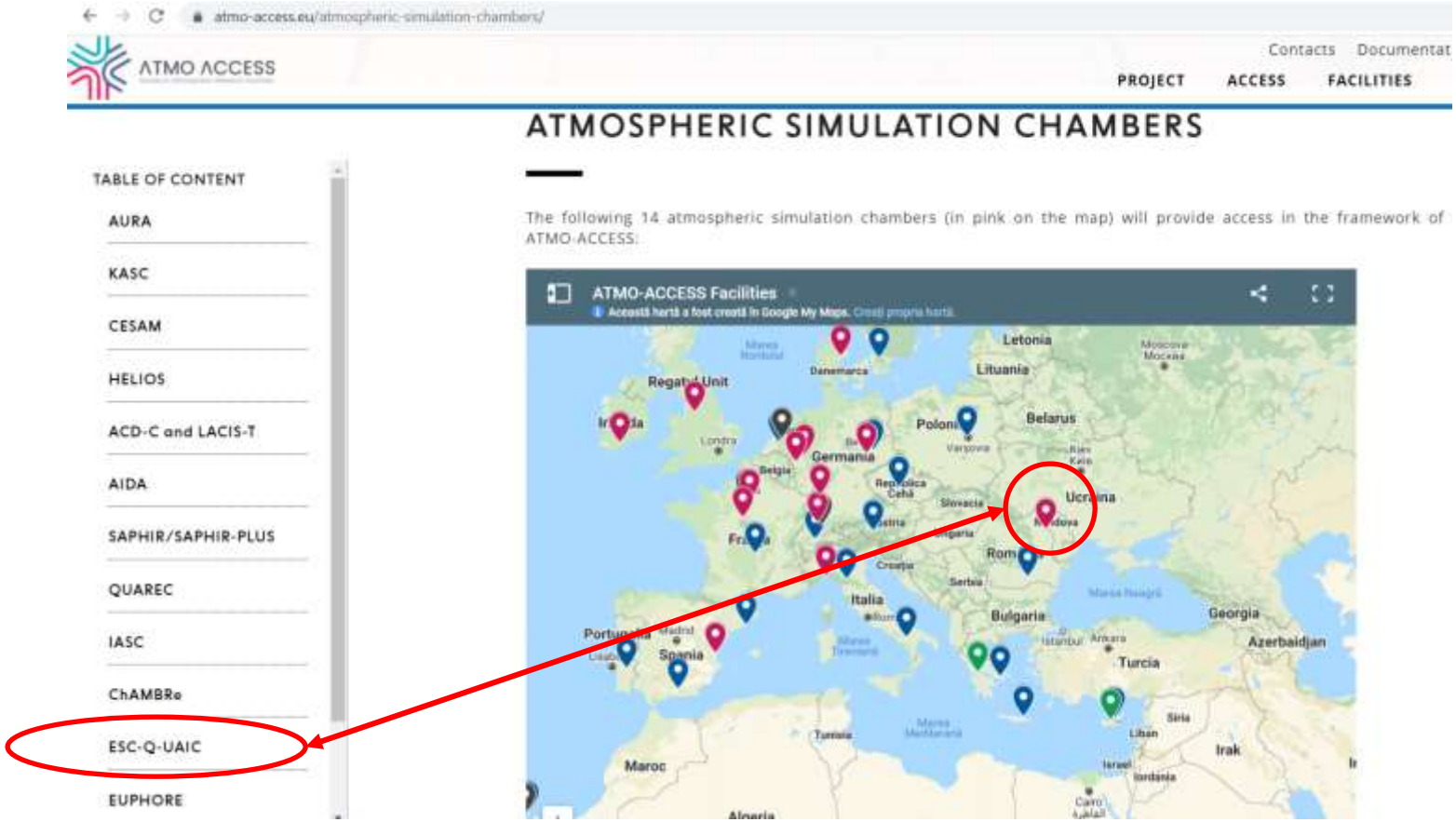
Consecințe:

Clima: împrăștierea și absorbția luminii, efect asupra norilor
Sănătate: astm, mortalitate, cancer pulmonar ...
Chimie: surse și consum, transport local sau lung

Rezultate activități Centru CERNESIM (2016-2021)

Nr. cercetatori si personal tehnic	Articole ISI			Brevete	Citari (Scopus)	Proiecte		Teze lic. /ma.	Teze doctorat (finalizate)
	Q1	Q2	Q3			CO	P		
22	30	30	50	7	Peste 500	10	10	70	15
Cadre didactice asociate - 30									

- din 01-04-2021, camera ESC-Q-UAIC (FN-National Facility) din cadrul Centrului CERNESIM este participanta in noul proiectul European ATMO-ACCESS – care permite accesul cercetatorilor din lume la infrastructura UAIC pentru studii de chimia atmosferei.



CERNESIM – participant la un nou proiect de infrastructură

- **CENTRU DE CERCETARE CU TEHNICI INTEGRATE PENTRU INVESTIGAREA AEROSOLILOR ATMOSFERICI ÎN ROMÂNIA (RECENT AIR)**

- **FINANTARE:** Programului Operațional Competitivitate POC 2014-2020/448/1/1/Mari infrastructuri de CD/1/Mari infrastructuri de CD/ Axa Prioritară 1/ Prioritatea de investiții 1a/

- **Cod MySMIS:** 127324

- **Contract nr.** 322/04.09.2020

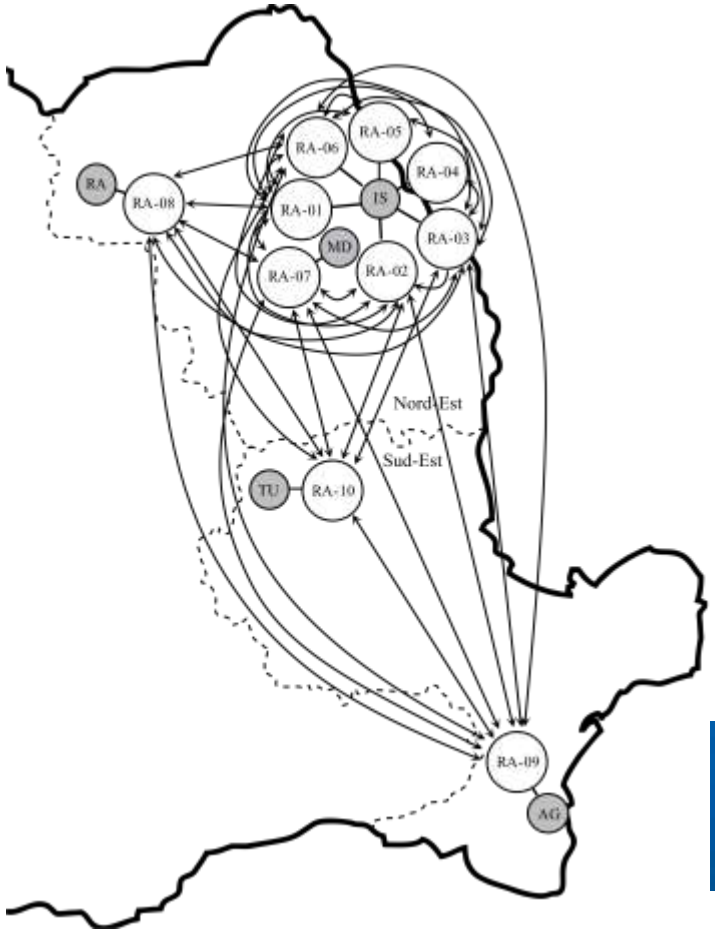
- **VALOAREA TOTALĂ A CONTRACTULUI:** 89.490.216,60 de lei

- **DURATA DE IMPLEMENTARE:** 36 luni
- **DIRECTOR PROIECT:**
  Prof. univ. dr. habil. Cecilia ARSENE

CERNESIM – participant la un nou proiect de infrastructură

- RECENT AIR va crea 10 laboratoare distincte de cercetare/dezvoltare care vor avea ca obiect de activitate studiul aerosolilor atmosferici, a factorilor care contribuie la formarea şi abundenţa acestora în atmosferă (aerosolii marini, praful generat din eroziunea solului sub acţiunea vântului etc):

UNIUNEA EUROPEANĂ



RA-01: Laborator de chimie aplicată în ştiinţa aerosolilor atmosferici (IS)
RA-02: Laborator de testarea şi monitorizarea calităţii aerului urban (Air Quality Monitoring Station) (IS)
RA-03: Laborator de investigare a proceselor fizico-chimice din fază gazoasă cu implicaţii în formarea aerosolilor organici secundari (IS)
RA-04: Laborator de sinteză organică aplicată în ştiinţele vieţii şi pământului (IS)
RA-05: Laborator de meteorologie aplicată şi climatologie (IS)
RA-06: Laborator de astronomie şi astrofizică (IS, Mădârjac)
RA-07: Laborator interdisciplinar de cercetare în geo-chimia arealelor rurale (IS)
RA-08: Laborator interdisciplinar de cercetare a mediului montan (SV, Rarău)
RA-09: Laborator interdisciplinar de cercetare a mediului marin şi a atmosferei terestre marine (CT, Agigea)
RA-10: Laborator de geografia şi fizica pământului (VN, Tulnici)

Instrumente Structurale 2014-2020

Centru de cercetare cu tehnici integrate pentru investigarea aerosolilor atmosferici în România

RECENT AIR

CERNESIM – participant la un nou proiect de infrastructură

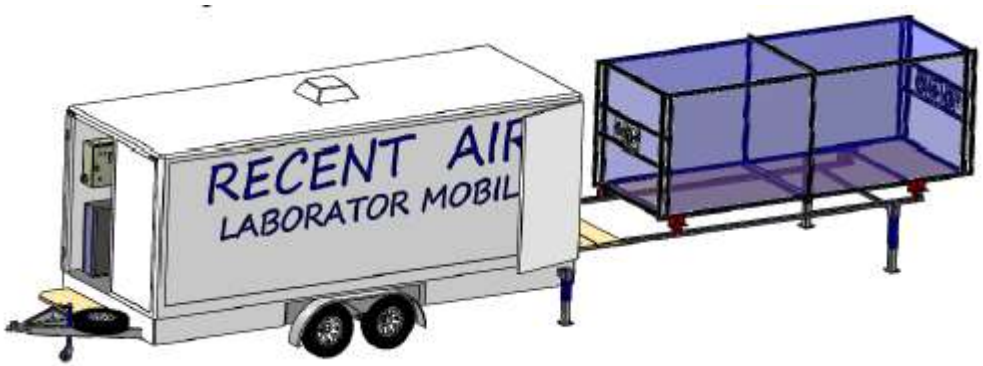
- CENTRU DE CERCETARE CU TEHNICI INTEGRATE PENTRU INVESTIGAREA AEROSOLILOR ATMOSFERICI ÎN ROMÂNIA (RECENT AIR)

- Cele cinci locații geografice distincte vizate de RECENT AIR au fost selectate în mod strategic pentru potențialul lor de a facilita generarea de informații științifice relevante pe termen mediu și lung (prin măsurători în regim intensiv, dar și prin monitorizare continuă), pentru aerosoli atmosferici cu „amprentă” specifică arealelor geografice selectate.

CERNESIM – participant la un nou proiect de infrastructură

- CENTRU DE CERCETARE CU TEHNICI INTEGRATE PENTRU INVESTIGAREA AEROSOLILOR ATMOSFERICI ÎN ROMÂNIA (RECENT AIR)

- RECENT AIR va amenaja și două laboratoare mobile: un laborator mobil pentru cercetare directă în timp real a atmosferei și un laborator mobil dotat cu aparatură, instrumente și echipamente pentru testarea calității aerului în diverse areale.



Parteneriat
SC CONITECH SRL
BARLAD - 731175, ROMANIA
E-mail: conitechbd@gmail.com

Vă mulțumim pentru atenție!

..şi suntem deschişi pentru colaborări!