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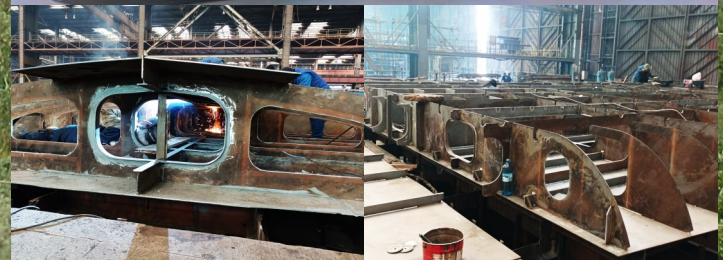
An Integrated System for the Complex Environmental Research and Monitoring in the Danube River Area, REXDAN



RESEARCH INFRASTRUCTURE



REXDAN RESEARCH CENTER



REXDAN RESEARCH VESSEL



An Integrated System for the Complex Environmental Research and Monitoring in the Danube River Area, REXDAN

Contract no. 309/ 10.07.2020, SMIS Code 2014+: 127065

Project co-financed by the European Regional Development Fund through the Competitiveness Operational Programme 2014-2020 (COP)

Priority axis: 1. Research, technological development and innovation (RTDI) to support economic competitiveness and business development;

Investment priority: IP 1a: Strengthening research and innovation (R&I) and infrastructure and building capabilities in order to develop R&I excellence, as well as promoting centers of expertise, especially those of European interest;

Specific objective: SO1.1. Increasing scientific capacity in the fields of smart specialization and health;

Action: 1.1.1 Large R&I infrastructures;

Area of intervention - 058 : Research and innovation infrastructures (public)

Project implementation period: 10. 07. 2020 - 31. 12. 2023



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REXDAN RESEARCH INFRASTRUCTURE

REXDAN RESEARCH INFRASTRUCTURE (RI), a constitutive part of the project *An Integrated System for the Complex Environmental Research and Monitoring in the Danube River Area*, REXDAN, SMIS code 127065, has three components (**REXDAN Research Center**, **REXDAN Research Vessel** and **REXDAN Autolaboratory**) designed so as to ensure the carrying out of complex, interdisciplinary research activities in the smart specialization field: *Energy, environment and climate change*.

The scientific novelty of **REXDAN RI** consists in:

- ◇ the possibility of carrying out research activities of excellence with the methodological integration of the characterization of the quality of extended aquatic ecosystems, practiced at international level only for limited areas;
- ◇ the possibility of achieving complex approaches to chemical, physical, biological and biodiversity factors in interdisciplinary algorithms, statistically calibrated, which will allow the introduction and validation of the Global Water Quality Index (GWQI) as a major parameter at EU level for the classification of surface waters corresponding to the Water Framework Directive;
- ◇ the possibility of assessing the impact of hydrotechnical works so to maintain channel navigability in parallel with determining the impact on biodiversity (migratory species of ichthyofauna and birds);
- ◇ the possibility of monitoring, by means of fixed and mobile systems, climatic parameters (continuously) and atmospheric composition (periodically), in areas where such measurements are sporadic or non-existent;
- ◇ the possibility of simultaneously carrying out international research projects of excellence on the board of an autonomous vessel, provided with high-technology equipment.

REXDAN Research Center includes 8 laboratories (laboratory for sample conservation and preparation, chromatography laboratory, instrumental analyses laboratory, spectrometry laboratory, ecology laboratory, genetics laboratory, bathymetry, hydrology and topometry laboratory, data storage/processing laboratory) and a climate change observation platform, 6 of these laboratories being fully equipped and integrated in the specific research activities.



REXDAN Research Vessel, which is under construction at ATG Shipyard, Giurgiu, will include 9 components (systems for sample collection and preservation, laboratory for sample preparation, radiometry laboratory, laboratory for physical-chemical analyses, aquatic ecology laboratory, air/atmosphere laboratory, biodiversity monitoring systems, bathymetry systems, IT laboratory), the acquisition procedures for the equipment to be included in these laboratories being in full development at present.

LABORATORY FOR SAMPLE CONSERVATION AND PREPARATION

SPECIFIC ACTIVITIES

- preliminary analysis of quality indicators for the conservation of environmental samples to be subjected to qualitative and quantitative chemical analyses, followed by the conservation of environmental samples;
- sample preparation for the determination of environmental pollutants by mineralization in order to determine the concentrations of heavy metals by spectral methods;
- extraction of toxic or potentially toxic organic compounds from samples for further analysis by chromatographic methods;
- determination of quality indicators regarding hardness, alkalinity, CB05, etc. of water samples;
- obtaining the pure and ultrapure water necessary for the preparation of the chemical reagents used in the laboratory analyses and not only.

EQUIPMENTS

EQUIPMENT

TECHNICAL SPECIFICATIONS

Magnetic stirrer with multi-station heating, RT 10, IKA

- ◇ 10 stirring / heating stations with a 0.4 L stirring capacity per position;
- ◇ adjustable temperature with a heating rate of 30 K/ min;
- ◇ speed control in 10 RPM steps.

Ultra-pure water device with UV filter, final filter, Simplicity UV System, Merck Milipore

- ◇ compact, portable system based on ion exchange resins for obtaining ultra-pure water;
- ◇ resistivity: 18.2 M Ω cm at 25 °C;
- ◇ instantaneous water flow produced by the final filter 0.5 L/ min;

Distillation and deionization equipment, CYCLON, FISTREEM

- ◇ production capacity 4 L/h of double-distilled water and 8 L/h of distilled water;
- ◇ glass double distiller;
- ◇ water conductivity resulting from double distillation: <1 μ S / cm;
- ◇ 30 L water storage tank with level sensor and automatic power off in case of tank filling.

Ultrasonic bath, Elmasonic S 60 H, Elma

- ◇ 37kHz ultrasound frequency;
- ◇ selectable temperature in 5 °C steps;
- ◇ possibility to select the duration of the ultrasound;
- ◇ possibility of automatic shutdown after 12 hours of continuous operation;
- ◇ functions: sweep, self-degassing/ degassing, auto-start, pause, start/stop.

Water bath, AD07R-20-A12E, PolyScience

- ◇ recirculation performed with compact circulator;
- ◇ pump immersion with adjustable capacity;
- ◇ temperature range -20°C ÷ 200°C;
- ◇ temperature stability: \pm 0.1 K;
- ◇ bath volume: 7 L.

Technical scales, EX 1103M, OHAUS

- ◇ weighing capacity 1100 g;
- ◇ reading accuracy: 1 mg;
- ◇ 2 touchless sensors.

Laboratory oven, FD115 Binder, Binder GmbH

- ◇ forced air circulation;
- ◇ temperature range + 100C above the ambient up to 300 °C.

EQUIPMENT

TECHNICAL SPECIFICATIONS

Analytical scales, EX 225D/AD, OHAUS

- ◇ capacity (g): 220 g;
- ◇ weighing accuracy to 5 decimal places;
- ◇ internal calibration with 2 calibration weights;
- ◇ 4 touchless sensors.

Laboratory centrifuge with cooling, FC5916R, OHAUS

- ◇ stainless steel centrifuge chamber;
- ◇ rotational speed of 16000 RPM;
- ◇ spin speed of 26331 RCF;
- ◇ max volume capacity centrifuge: 4X750 mL;
- ◇ cooling function for temperature range -20 °C ÷ +40°C.

Laboratory glassware washing machine, GW4090, SMEG

- ◇ fully automated, microprocessor controlled system;
- ◇ 40 pre-installed programs;
- ◇ the possibility of defining 30 more user programs;
- ◇ main operations in a complete cycle, without user intervention: pre-washing, washing, rinsing, final rinsing, drying and cooling;
- ◇ two-level washroom and two wash arms (up and down);
- ◇ HEPA filtered air drying system, at high temperatures, outside and inside by a turbo-blower injector;
- ◇ separate compartment for storing detergent and neutralizing agent;
- ◇ basic level rack;
- ◇ multifunctional rack with at least 48 injectors;
- ◇ rack for simultaneous washing of at least 100 pipettes.

Laboratory vibrating mill, 8000D, SPEX Europe

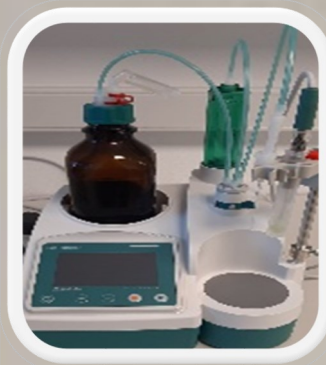
- ◇ two workstations;
- ◇ crushing samples at analytical dimensions of the order of μm ;
- ◇ sample sizes between 0.2-10 grams per vial for grinding and up to 60 mL for homogenizing powders or mixing emulsions;
- ◇ electronic stopwatch with pause and stop functions which displays the programmed running time and the time remaining while the mill is running;
- ◇ both steel and tungsten carbide bottles and balls.

Laboratory press for preparing the samples analyzed with FT-IR, MP250M, Maassen GmbH

- ◇ automatic hydraulic press;
- ◇ max. pressure 25 T;
- ◇ the diameter of the samples produced: 10 mm, 20 mm and 50 mm.

Digital MicroPipette Set, Electronic Pipettes, BOECO

- ◇ pipetting, reverse pipetting, mixing and dosing programs;
- ◇ battery-based operated with fast charging via USB cable charger;
- ◇ includes 3 micropipettes with adjustable pipetting volumes: 0.5 - 10 μl / 5 - 100 μl / 50 - 1000 μl .



LABORATORY FOR SAMPLE CONSERVATION AND PREPARATION

EQUIPMENTS

EQUIPMENT

CBO5 analysis system for 20-24 samples, FOC 200E + BOD Sensor System 6, VELP Scientifica

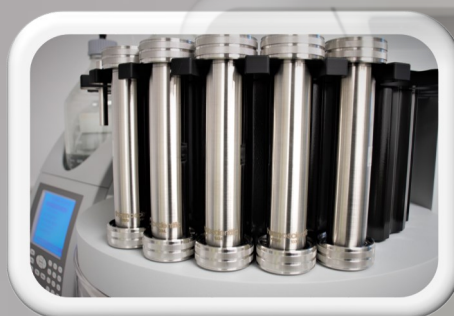
Microwave digestion system, ETHOS EASY, Milestone

System for sample extraction/purification by extraction, SOXTERM 414 Macro , GERHARDT

Automatic Titrator, Eco Titrator , Metrohm

TECHNICAL SPECIFICATIONS

- ◇ biochemical oxygen consumption analysis system consisting of 4 units of CBO5 measurement for 24 samples, simultaneously;
 - ◇ cooling thermostat with measuring units to be set;
 - ◇ wireless setting and remote control.
- ◇ stainless steel, multi-layer Teflon (PTFE) lined microwave cavity;
 - ◇ volume of the microwave cavity - 70 L;
 - ◇ built-in exhaust system;
 - ◇ dual magnetron and rotary speaker for even field distribution with a total microwave power of 1900 W.
- ◇ unit for the control and monitoring of 4 extraction systems, each using a different program;
 - ◇ controller for storing/recalling various extraction programs with multifunctional display;
 - ◇ compressor;
 - ◇ extraction system consisting of a 4-seater base unit which allows 4 extractions to be performed simultaneously.
- ◇ integrated stirrer and sample dispenser;
 - ◇ 20 mL and 50 mL burettes;
 - ◇ combined pH electrode;
 - ◇ temperature probe;
 - ◇ selective copper electrode and corresponding standard solution of Cu;
 - ◇ Calcium selective ion electrode and corresponding standard Ca solution;
 - ◇ REDOX electrode and corresponding standard chloride solution.



THE CROMATOGRAPHY LABORATORY

SPECIFIC ACTIVITIES

- analysis of pharmaceutical compounds from water, sediment and aquatic biota samples;
- analysis of halogenated disinfection by-products and chlorinated solvents in water;
- determination of polycyclic aromatic hydrocarbons from water and sediment;
- determination of organophosphorus pesticides from solid and liquid environmental samples;
- monitoring of ozone precursors, polar and non-polar volatile organic compounds, halogenated compounds and oxygenated volatile organic compounds (aldehydes and ketones) in ambient air;
- determination of pesticides and insecticides levels in water, sediment and biota;
- analysis of toxic ions in water samples;
- determination of organic pollutants in wastewater.
- determination of the bioaccumulation factor of organic pollutants in aquatic biota.

EQUIPMENTS

EQUIPMENT

**High-resolution LC-MS / MS,
Vanquish Flex UHPLC Systems
coupled to Orbitrap Exploris 120
Mass Spectrometer -Thermo
Fisher Scientific**

**GC MS laboratory GC Trace 1310
coupled to TSQ 9000 VPI Mass
Spectrometer - Thermo Fisher
Scientific and Thermal
Desorption System - Unity-xr**

**Ion chromatograph IC Dionex ICS-
6000 Thermo Fisher Scientific**

TECHNICAL SPECIFICATIONS

- ◇ resolution up to 120,000 (FWHM);
- ◇ mass range m/z 40–3000;
- ◇ scan rate up to 22 Hz;
- ◇ high accuracy and sensitivity.
- ◇ triple quadrupole gc-ms / ms;
- ◇ automatic headspace sampling system;
- ◇ table range: 1.2 - 1100;
- ◇ high sensitivity;
- ◇ femtogram detection limit.
- ◇ double channel - simultaneous anions and cations analysis;
- ◇ high pressure for fast analysis;
- ◇ high resolution;
- ◇ excellent sensitivity, stability and ease of use.



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THE SPECTROMETRY LABORATORY

SPECIFIC ACTIVITIES

- analysis of nutrients in water samples;
- analysis of heavy metal concentrations in water, sediments, aquatic vegetation, benthic invertebrates and fish by using various analytical methods;
- identification, characterization and quantification of microplastics in water, sediment, aquatic biota, biological systems, including food;
- studying the distribution of emerging micro-pollutants in the biotic and abiotic components of aquatic ecosystems;
- determination of heavy metal concentrations in wastewater and treated water;
- determination of physical-chemical properties of soils;
- monitoring of soil quality;
- quality assessment and management of sewage sludge;
- ecological reconstruction.



EQUIPMENTS

EQUIPMENT

TECHNICAL SPECIFICATIONS

Spectrum 3 Laboratory FT-IR Spectrometer with Spotlight 400 Microscope, PerkinElmer

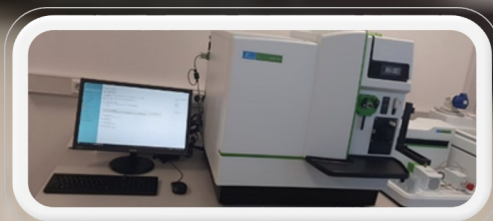
- ◇ spectral range: 7800-600 cm^{-1} (microscope module) and 14700 - 350 cm^{-1} (FT-IR module);
- ◇ spectrum acquisition rate - 170 full spectra/ second;
- ◇ signal-to-noise ratio (25 μ pixel size, 16 cm^{-1} spectral resolution, 4 scans) > 800: 1;
- ◇ ATR image pixel size: 6.25 μ , 1.56 μ .

UV-Vis-NIR laboratory spectrophotometer, Model Cary 5000, Agilent

- ◇ spectral range: 175 - 3300 nm
- ◇ measurement over 8.0 absorbance units with reference beam attenuation;
- ◇ spectral bandwidth: UV-Vis 0.01 - 5.00 nm, NIR 0.04 - 20 nm;
- ◇ light source: visible tungsten halogen and UV deuterium arc;
- ◇ integrating sphere with a spectral range between 200 and 2500 nm;
- ◇ diffuse reflectance accessory (DRA);
- ◇ variable slit widths (up to 0.01 nm) for optimal control over data resolution;
- ◇ the accuracy of the spectrophotometry method is less than 0.4%.

ICP-MS with speciation Nexion 2000C, PerkinElmer

- ◇ detection limit ppq (10-15);
- ◇ metal speciation (isotope analysis);
- ◇ extended dynamic range (EDR);
- ◇ All Matrix Solution (AMS);
- ◇ Dynamic Bandpass Tuning in reaction model;
- ◇ data acquisition system: Simultaneous Dual Mode Detector (100,000 data points/ sec);
- ◇ table range: 1-285 amu.



THE ECOLOGY LABORATORY

SPECIFIC ACTIVITIES

- monitoring water quality in surface ecosystems by using bioindicators;
- study and biological and ecological analysis of invasive species;
- assessment and monitoring of the quality of aquatic ecosystems related to the Danube (in-situ and ex-situ);
- environment and biodiversity management;
- modelling of ecological processes and ecological statistics;
- water resources management;
- plant and animal taxonomy.

EQUIPMENTS

EQUIPMENT

TECHNICAL SPECIFICATIONS

Stereomicroscope Zeiss SteREO Discovery V12

- ◇ principle of operation with continuous zoom;
- ◇ transmitted LED lighting for examination by transmission of samples;
- ◇ LED lighting with adjustable circular incidence and intensity;
- ◇ motorized;
- ◇ 2 cold light LED sources with luminous flux and a lifespan of 50,000 hours;
- ◇ touch screen panel;
- ◇ attachable optical systems (lenses, eyepieces and camera adapters, video camera - video documentation);
- ◇ accessories: colour digital camera, graphics station (computer), biological data analysis software.

Transmitted light microscope ZEISS Axio Imager 2

- ◇ accessories: colour digital camera, graphics station (computer);
- ◇ LED lighting, colour temperature 5700K, minimum operating time 60,000 hours;
- ◇ 120W fluorescence;
- ◇ binocular photo tube, ergonomically inclined to a maximum of 15°, with the image 100% in the eyepiece or 100% in the photo port and 25 mm field;
- ◇ 10X, 20X, 40X, 63X fluid lens;
- ◇ 100X apochromatic lens with numerical aperture of at least 1.4 for examination in transmitted light field, phase contrast and fluorescence, working distance minimum 0.17mm;
- ◇ digital video camera control and analysis software.

Invertoscope with camera and software ZEISS Axio Vert.A1

- ◇ LED lighting with ECO Power function;
- ◇ light field examination, phase contrast and DIC;
- ◇ inverted microscope stand, equipped with a revolver head for 5 objectives;
- ◇ photo binocular tube inclined at 45 degrees;
- ◇ support for moving the preparation in the range of 130 x 85 mm with right or left actuation;
- ◇ petri dish holder and microscope slides;
- ◇ fluid lens, magnification 20x, 40x, 63x;
- ◇ digital camera and graphics station;
- ◇ ZEN software;
- ◇ cell cultures kept in their protected environment.

THE ECOLOGY LABORATORY

EQUIPMENTS

EQUIPMENT

TECHNICAL SPECIFICATIONS

Vacuum pump, Merck Millipore, EZ-Stream® Vacuum Filtration Pump

- ◇ connection to the collector or to the filter device;
- ◇ the maximum vacuum delivered is 700bar;
- ◇ low noise up to 60dB;
- ◇ flow rate from 3.8 to 4 L/ min;
- ◇ compact design;
- ◇ gas seal with coated diaphragm;
- ◇ compatible with slightly aggressive gases and vapours;
- ◇ no lubrication required.

6-station filtration system with hoses and membranes, EZ-Fit™ Manifold

- ◇ material - steel;
- ◇ stations with individual shut-off / opening valve, which can be used independently;
- ◇ stations with concave sintered metal sieve used as filter holder (for buckling sterilization);
- ◇ autoclavable silicone with a 5-meter tube and a 9.5 mm-inner diameter;
- ◇ membrane dispenser (curve);
- ◇ set of membranes and funnels;
- ◇ filtration and vacuum pump systems simultaneously operable;
- ◇ filtration system connected to the vacuum pump.

Sedimentation chamber Utermöhl Pack

- ◇ combined plate chamber consisting of 3 cylinders of 10 ml, 50 ml and 100 ml;
- ◇ plate dimensions: 43x120mm;
- ◇ plate diameter: 39mm and 42mm;
- ◇ inner diameter of the sedimentation cylinder: 26 mm;
- ◇ Utermöhl aluminum support which allows the Utermöhl motherboard to be adapted to any inverted microscope.

Universal Laboratory Centrifuge 320R

- ◇ digital display for parameter values during spin;
- ◇ temperature range: -20 °C and +40 °C with pre-cooling function;
- ◇ max. capacity 4 x 200 ml/ 6 x 94 ml;
- ◇ RPM max. 16,000 min⁻¹;
- ◇ operating time 1 sec – 99 min: 59 sec, continuous operation, short cycle mode (pulse button);
- ◇ rapid centrifugation of samples;
- ◇ smooth and high-performance engine operation.



BATHYMETRY, HYDROLOGY AND TOPOMETRY LABORATORY

SPECIFIC ACTIVITIES

- terrestrial monitoring;
- analysis of hydro-morphometric changes;
- determination of land settlement;
- hydrological analysis of river flows;
- determination of alluvial deposits;
- monitoring quality hydromorphological elements for classifying the ecological status of canals and lakes;
- analysis of climatic factors influence on ADCP measurements;
- GIS use for urban development;
- creating geospatial databases regarding terrestrial and bathymetric measurements;
- sediment transport;
- modelling of pollutants transport in rivers and lakes;
- water flow modelling in canals and rivers;
- determination of flood risks and hazards;
- GIS use for geographical hazards;
- special applications of photogrammetric exploitation;
- spatial monitoring through UAV technologies;
- multispectral spatial analysis;
- techniques for making MDTs by using UAVs.

EQUIPMENTS

EQUIPMENT

Octocopter drone Predator 1115 Octa with LIDAR system

- ◇ battery-free flight time: approx. 60 minutes;
- ◇ maximum flight time with built-in lidar equipment: 40 minutes;
- ◇ telemetry 20km;
- ◇ accessories: thermal camera, topography camera, LiDAR sensor;
- ◇ multispectral camera, air quality sensor.

Electronic topographic level TOPCON DL-501

- ◇ accuracy H using invariant sight: 0.2 mm, 0.3 mm (standard deviation, 1 km double run);
- ◇ H accuracy using standard sight: 1.0 mm (standard deviation, 1 km double run);
- ◇ accuracy D: 15 mm to 30 m (standard deviation, 500 ppm for distances up to 50 m, 1,000 ppm for distances longer than 50 m).

Total 3D scanning station Focus Plus S-350 headlight

- ◇ measured distance range: 0.6 - 350m;
- ◇ maximum no. of point/sec: 2 million points / sec;
- ◇ noise range: ± 1 mm;
- ◇ fast scan time: <3min.

Base + Rover terrain GPS set, with rugged tablet terrain TOPCON HIPER HR

- ◇ the most advanced GNSS board with 452 universal channels, and reception of all available GNSS systems;
- ◇ GSM super sensitive modem, efficient UHF modem, Bluetooth, LongLink, Wi-Fi, static measurements, RTK, network or rover-base operation, efficient replaceable batteries.

TECHNICAL SPECIFICATIONS

BATHYMETRY, HYDROLOGY AND TOPOMETRY LABORATORY

EQUIPMENTS

EQUIPMENT

**Road profile system
TOPCON RD-M1 Scanner**

- ◇ mobile scanning of longitudinal roads/ protective dams profiles with a speed of up to 60 km / h.
- ◇ millimeter accuracy of point determination;
- ◇ intuitive and low-cost installation providing precise conditions for measuring the scanned area;
- ◇ fast long-distance scanning without a costly closing of lanes.

**Mobile scanner with camera and capture distance up to 100m
TOPCON IP-S3**

- ◇ IP65 / IP67 resistance;
- ◇ scan with over 700,000 pct / sec .;
- ◇ GNSS positioning system with a 3600 mm accuracy range;
- ◇ horizontal range up to 100 m;
- ◇ continuous scanning up to 8 hours.



THE CLIMATE CHANGE OBSERVATION PLATFORM

SPECIFIC ACTIVITIES

- air quality determinations;
- determinations of weather parameters;
- aerosol determinations;
- cloud determinations;
- mixture layer determinations.

EQUIPMENTS

EQUIPMENT

TECHNICAL SPECIFICATIONS

Ceilmeter CHM 15k „NIMBUS“ – Lufft

- ◇ laser-optical parameters;
- ◇ light source Nd:YAG solid state laser;
- ◇ wavelength 1064 nm;
- ◇ pulse energy 7 µJ;
- ◇ pulse repetition frequency 5 - 7 kHz;
- ◇ filter bandwidth 1 nm;
- ◇ field of view receiver 0.45 mrad.

Cloud radar RPG-FMCW- 94-DP

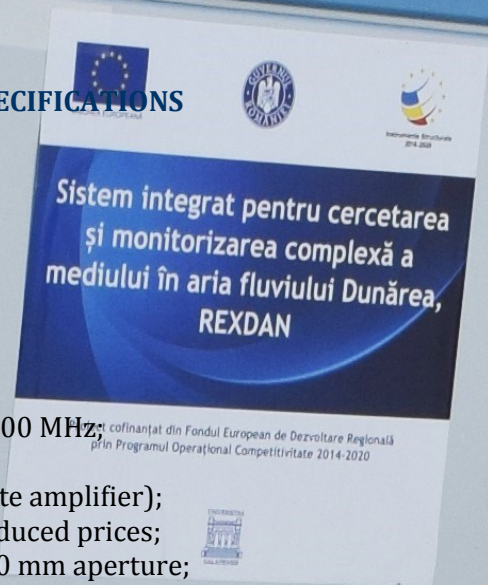
- ◇ centre frequency 94 GHz ($\lambda=3.19$ mm) \pm 100 MHz;
- ◇ typical IF range 0.35 to 4.5 MHz;
- ◇ transmitter power 1.5 W typical (solid state amplifier);
- ◇ lower transmitter powers available for reduced prices;
- ◇ antenna type Bi-static Cassegrain with 500 mm aperture;
- ◇ antenna gain 51.5 dB;
- ◇ beam width 0.48° FWHM;
- ◇ polarisation V (optional V & H);
- ◇ Rx system noise figure 4 dB (400 K system noise temperature);
- ◇ typical dynamic range (sensitivity) with 1.5 W transmitter @ 3 s sampling time
 - 60 dBz to +20 dBz (at 500 m height/5 m resolution)
 - 50 dBz to +20 dBz (at 2 km height/10 m resolution)
 - 47 dBz to +20 dBz (at 4 km height/30 m resolution)
 - 36 dBz to +20 dBz (at 10 km height/30 m resolution)
- ◇ ranging 50 m to 12 km typical, 16 km maximum;
- ◇ maximum vertical resolution -1 m.

Radiometer RPG-HATPRO-G5

- ◇ IR radiometer option 9.6-11.5 µm band, accuracy 1 K, noise: 0.2 K RMS;
- ◇ LWP Accuracy: \pm 20 g/m², Noise: 2 g/m² RMS;
- ◇ IWV Accuracy: \pm 0.2 kg/m² RMS, Noise: 0.05 kg/m² RMS;
- ◇ full sky IWV and LWP maps (only with azimuth positioner)
- ◇ optical resolution HPBW (frequency dependent): 3.0° - 4.2° for water vapour, 1.8° - 2.2° for temperature profiler;
- ◇ side-lobe level <-30dBc;
- ◇ pointing range/ resolution elevation: 0° to 180° (0.15° steps), full s/w control;
- ◇ azimuth (optional): 0° to 360° (0.1° steps), full s/w control
- ◇ system noise temperatures <400 K typical for 22.2 – 31.4 GHz profiler;
- ◇ <600 K typical for 51.4 – 58.0 GHz profiler

Rapid-E-Real-Time Bioaerosol Detector

- ◇ particle size range, micrometers (µm) 0.3 – 100;
- ◇ UV laser wavelength, nanometers (nm) 337;
- ◇ scattering laser wavelength, nm 445;
- ◇ imaging laser wavelength, nm 635;
- ◇ number of pixels to measure light scattering 14 + 14;
- ◇ fluorescence spectral range, nm 380-580;
- ◇ fluorescence spectral ranges of lifetime module, nm 373 – 387, 420 – 520;
- ◇ fluorescence decay resolution, nanoseconds (ns): 1.



THE DATA STORAGE/PROCESSING LABORATORY

SPECIFIC ACTIVITIES

- receiving, collecting and storing data from the research vessel;
- raw and advanced data processing by using softwares dedicated to research equipment and basic softwares for data processing (Matlab, Excel, and others);
- running numerical and graphic simulation models;
- obtaining finite results (graphs, statistical calculation) for participation in conferences, symposia, workshops, etc.;
- making reports, maps;
- making consumables, accessories for research equipment by using 3D printers;
- printing flyers, posters, posters, reports, etc. (from A0 to A4 format).

EQUIPMENTS

EQUIPMENT
3 D Printer

- TECHNICAL SPECIFICATIONS**
- ◇ FDM print resolution 50 μm ;
 - ◇ SLA print resolution 25 μm ;
 - ◇ Software for 3D models processing;
 - ◇ WI-FI connexion;
 - ◇ accessories: printing head with multimaterial, mobile printing bed.



LABORATORIES IN THE PROCESS OF BEING EQUIPED

THE INSTRUMENTAL ANALYSIS LABORATORY will support the carrying out of various specific activities among which :

- complex analyses of air, water and soil samples;
- direct determination of compounds in the samples to be analyzed;
- determination of inorganic and organic pollutants in water (heavy metals, pesticides, nutrients
- online and real-time monitoring of Danube water quality);
- in-situ and ex-situ monitoring of aquatic ecosystem quality;
- elaboration of statistical models and algorithms for estimating and monitoring the global water quality index (WQI);
- algorithmization of physical, chemical and biological parameters for determining quality classes for surface aquatic ecosystems;
- development of electrochemical biosensors detecting pesticides;
- development of electrochemical biosensors for detecting hormones, antibiotics, toxic cations and toxic anions.

THE GENETICS LABORATORY will support the carrying out of various specific activities among which:

- studying the profile of the species which develop in the researched area;
- documenting the adaptation of species to changes in environmental conditions;
- documenting the effects of environmental pollution on species;
- monitoring water and soil quality, sewage sludge, water, soil and air pollution.

REXDAN RI PROMOTED AT EUROPEAN LEVEL

REXDAN Research Infrastructure (RI), unique in Europe for its components and capabilities, was presented during a series of events held in Brussels between 27 and 28 April 2022.

On April 27, 2022 **REXDAN RI** was presented to the European Parliament during a summit. Chaired by the MEP Dan Nica, the Director General of DG for Research and Innovation, Jean-Eric Paquet, the Ambassador of the Permanent Representation of Romania to the EU, Iulia Matei and the Rector of “Dunărea de Jos” University of Galați, prof. dr. eng. Puiu-Lucian Georgescu, the meeting brought together the members of “Dunărea de Jos” University of Galați delegation with outstanding personalities in fields related to **REXDAN** project: Aida Liha Matejcek, head of the Administrative Capacity Building and Program Implementation II, Romania, DG REGIO, Apostolate Karamali, responsible for R&I Actors and Research Careers, Michael Vorländer, responsible for Education and Research, the Permanent Representation of the Federal Republic of Germany, Andreea Păstîrnac, Ambassador Extraordinary and Plenipotentiary of Romania to the Kingdom of Belgium, Louis Bellemin, Honorary Director of the European Commission, Mihaela Sticea, Secretary of the Mission of the Republic of Moldova to the EU, Sandra Milicevic Sperlic, First Counselor of the Mission of the Republic of Serbia to the EU, Cristina Anania and Iulia Mihail representatives of the Ministry of Research, Innovation and Digitalization, Corina Cretu, MEP.



On April 28, 2022, two other events relevant for the promotion of **REXDAN RI** were organized: a working meeting within the Romanian Office for Science and Technology (ROST) and another one at the residence of the Romanian Ambassador to the Kingdom of Belgium.



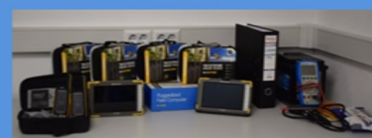
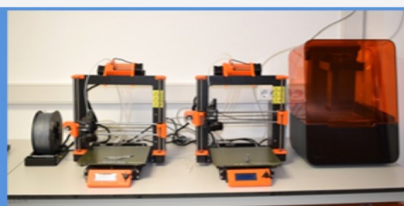
These meetings represent the first important step taken in promoting **REXDAN RI** at European level and in establishing international partnerships meant to support the multidisciplinary research activities to be carried out within this infrastructure.



An Integrated System for the Complex Environmental Research and Monitoring in the Danube River Area, REXDAN

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