

**Seventh International Conference**  
**ECOLOGICAL ENGINEERING AND ENVIRONMENT PROTECTION**  
**(EEEP'2021)**  
**with Youth Scientific Session and MELiSSA Summer University**  
**30 September - 3 October 2021, Varna, Bulgaria**

**P R O G R A M**

**30.09.2021 - Thursday**

**13<sup>00</sup> – 17<sup>00</sup> – REGISTRATION**

**17<sup>00</sup> – 17<sup>30</sup> – OPENING AND WELCOME ADDRESSES**

**Hristo Najdenski**, *President of the Organizing Committee*

**Christophe Lasseur**, *Member of the European Space Agency (ESA)*

*Others*

**PLENARY SESSION**

**Chairs: Alexandrov A., I. Simeonov**

**17<sup>30</sup> – 18<sup>00</sup> – Hristo Najdenski (Bulgaria)**, Microbial cellulose degradation – current state and perspectives

**18<sup>00</sup> – 18<sup>30</sup> – Christophe Lasseur, C. Paille, S. Ortega, A. Makaya, S. Bonnieux, C. Audas, (ESA, The Netherlands)**, ECLSS system for a Mars transit mission (*online*)

**18<sup>30</sup> – 19<sup>00</sup> – Viacheslav Ilyin, D. Korshunov, M. Skedina (Russia)**, Prospect for the use of microbial fuel cells in biological life support systems of hermetic objects

**20<sup>30</sup> – WELCOME PARTY**

**01.10.2021 – Friday**

**1<sup>st</sup> session: MAN AND BIOSPHERE, BIODIVERSITY AND ECOSYSTEMS**

**Chairs: Borisova D., G. Sotirov**

**9<sup>00</sup> – 9<sup>30</sup> – Plenary lecture: Harmand J. (France)**, Contribution of control and modeling for an integrated approach of water reuse to favour circular economy of nutrients (*online*)

**9<sup>30</sup> – 10<sup>00</sup> – Plenary lecture: Kathijotes N. (Cyprus)**, Investigating water management in archaeological sites in supporting sustainable tourism (*online*)

**10<sup>00</sup> – 10<sup>20</sup> – Kervedchiev M., K. Angelov, A. Dolashki, L. Velkova, P. Dolashka**, Treatment of wounds with natural substances

**10<sup>20</sup> – 10<sup>40</sup> – Daskalova A., A. Dolashki, L. Velkova, V. Petrova, A. Kujumdzieva, A. Tomova, P. Dolashka**, The unique tertiary structure in hemocyanins from molluscs proved by yeast enzymatic cleavage

**10<sup>40</sup> – 11<sup>00</sup> – COFFEE BREAK**

## **2<sup>nd</sup> session: SPACE TECHNOLOGY, ENVIRONMENTAL ASSESSMENT AND ECOLOGICAL MONITORING**

**Chairs: Ilyin V., P. Angelov**

**11<sup>00</sup> – 11<sup>30</sup> – Plenary lecture:** *Jelev G., G. Sotirov, D. Borisova*, Achievements in space explorations of Space Research and Technology Institute at the Bulgarian Academy of Sciences

**11<sup>30</sup> – 12<sup>00</sup> – Plenary lecture:** *Borisova D., V. Hristova*, Remote sensing data in environment state assessment

**12<sup>00</sup> – 12<sup>20</sup> –** *Chanev M.*, Problems and prospects in organic growing of cereals

**12<sup>20</sup> – 12<sup>40</sup> –** *Demerdjiev A., D. Tonev, N. Goutev*, Radiation shielding and dose assessment of the cyclotron facility at INRNE-BAS

**12<sup>40</sup> – 13<sup>00</sup> –** *Angelov P., P. Hristov*, Equipment for simulating microgravity conditions as onboard the International Space Station

**13<sup>00</sup> – 14<sup>30</sup> – LUNCH**

## **3<sup>rd</sup> session: ECOLOGICAL ENGINEERING, MICROORGANISMS AND ENVIRONMENT (I)**

**Chairs: Tashyrev O., L. Kabaivanova**

**14<sup>30</sup> – 15<sup>00</sup> – Plenary lecture:** *Tashyrev O., V. Hovorukha, O. Havryliuk, G. Gladka*, Spatial succession of microorganisms for treatment of organic waste and metal containing sewage with energy obtaining

**15<sup>00</sup> – 15<sup>20</sup> –** *Hovorukha V., O. Havryliuk, I. Bida, Y. Danko, O. Shabliy, O. Tashyrev*, Degradation of solid organic waste and purification of liquid filtrate with obtaining of hydrogen and methane

**15<sup>20</sup> – 15<sup>40</sup> –** *Kabaivanova L., J. Ivanova, V. Hubenov, E. Chorukova, I. Simeonov*, Anaerobic biodegradation of native wheat straw in thermophilic conditions with microalgae cultivation in the digestate

**15<sup>40</sup> – 16<sup>10</sup> – COFFEE BREAK**

## **4<sup>th</sup> session: ECOLOGICAL ENGINEERING, MICROORGANISMS AND ENVIRONMENT (II)**

**Chairs: Tonev D., V. Ilyin**

**16<sup>10</sup> – 16<sup>30</sup> –** *Daccò C., G. Carpani, M. E. E. Temporiti, L. Nicola, S. Tosi*, Development of a microbial consortium for the bioremediation of complex hydrocarbon mixtures: studying its potential and demonstrating its effectiveness through an ecotoxicological test

**16<sup>30</sup> – 16<sup>50</sup> –** *Ivanov S.*, Study of the pathosystem *Xanthomonas euvesicatoria* - pepper plants and the possibilities for biological control of bacteriosis by bacteriophages

**16<sup>50</sup> – 17<sup>10</sup> –** *Parvanova-Mancheva T., E. Vasileva, V. Beschkov*, Water purification by immobilized microorganisms

**17<sup>10</sup> – 17<sup>30</sup> –** *Vasileva E., T. Parvanova-Mancheva, V. Beschkov*, Effects of climate and environmental change, conserving water resources

**17<sup>30</sup> – 18<sup>50</sup> – Poster session I**

**19<sup>30</sup> – 22<sup>00</sup> – OFFICIAL DINNER**

**02.10.2021 – Saturday**

**5<sup>th</sup> session: ECOLOGIZATION OF AGRICULTURE AND FORESTRY**

**Chairs: Marinova S., H. Tsakov**

**9<sup>00</sup> – 9<sup>30</sup> – Plenary lecture:** *Alexandrov A., I. Iliev*, The European Green Deal and the Forests

**9<sup>30</sup> – 10<sup>00</sup> – Plenary lecture:** *Heyndrickx M., J. Huygens, T. Van den Meersche, E. Daeseleire, I. Becue, G. Rasschaert (Belgium)*, One health in an agricultural context: antibiotic residues and resistance in manure and soil (*online*)

**10<sup>00</sup> – 10<sup>20</sup> –** *Marinova S., E. Zlatareva*, Estimation of industrial material flow produced by „Devnya cement“AD for remediation of acid spills

**10<sup>20</sup> – 10<sup>40</sup> –** *Tsakov H., A. Alexandrov, D. Zoteva, O. Roeva*, Forest fires in 2020 - economic and social consequences

**10<sup>40</sup> – 11<sup>10</sup> – COFFEE BREAK**

**6<sup>th</sup> session: RENEWABLE ENERGY SOURCES AND BIOFUELS, MICROBIAL FUEL CELLS (I)**

**Chairs: Nenov V., D. Korshunov**

**11<sup>10</sup> – 11<sup>40</sup> – Plenary lecture:** *Korshunov D. (Russia)*, Studies of fermentation of vegetable waste and biological nitrogen removal processes using microbial fuel cells

**11<sup>40</sup> – 12<sup>10</sup> – Plenary lecture:** *Wang H. (China)*, Data-driven based intelligent model free control and its application to renewable energy systems (wind turbine and biomass) (*online*)

**12<sup>10</sup> – 12<sup>30</sup> –** *Blagoev A., S. Zapryanov, V. Gol'tsev, O. Gemishev*, Application of the plasma focus discharge in the radiobiology studies

**12<sup>30</sup> – 14<sup>00</sup> – LUNCH**

**7<sup>th</sup> session: RENEWABLE ENERGY SOURCES AND BIOFUELS, MICROBIAL FUEL CELLS (II)**

**Chairs: Hovorukha V., H. Yemendzhiev**

**14<sup>00</sup> – 14<sup>20</sup> –** *Peeva G., H. Yemendzhiev, R. Koleva, V.Nenov*, Nutrient recovery from waste sludge and wastewater

**14<sup>20</sup> – 14<sup>40</sup> –** *Mersinkova Y., Z. Ahmed, H. Yemendzhiev*, Comparative analysis of conventional anaerobic digestion and bio-electrochemical systems in waste organics utilization

**14<sup>40</sup> – 15<sup>00</sup> –** *Boukoureshlieva R., T. Stankulov, A. Momchilov*, Carbon-based cathode catalyst used in MFCS for wastewater treatment and energy recovery

**15<sup>00</sup> – 15<sup>30</sup> – COFFEE BREAK**

**8<sup>th</sup> session: YOUTH SCIENTIFIC SESSION: ECOLOGICAL ENGINEERING, MICROORGANISMS AND ENVIRONMENT**

**Chairs: Tsyntsarski B., P. Dolashka**

**15<sup>30</sup> – 15<sup>50</sup> –** *Korosteleva A., D. Korshunov*, Fermentation of organic waste in microbial fuel cell: optimization of technical parameters and microflora dynamics

**15<sup>50</sup> – 16<sup>05</sup> –** *Daneva Y.*, Ecosystems and biodiversity

**16<sup>05</sup> – 16<sup>20</sup> –** *Zahariev I.*, Space technology and environment state assessment

**16<sup>20</sup> – 16<sup>35</sup> –** *Pavlov R.*, Renewable energy and biofuels

## **9<sup>th</sup> session: ECOSYSTEMS AND ENVIRONMENTAL BIOTECHNOLOGIES**

**Chairs: Daccò C., L. Dimitrov**

**16<sup>40</sup> – 17<sup>10</sup> – Plenary lecture:** *Dimitrov L.*, Seabed mapping of the Bulgarian Black Sea Shelf for habitat characterization

**17<sup>10</sup> – 17<sup>30</sup> –** *Simeonov I., L. Kabaivanova, E. Chorukova*, Two-stage anaerobic digestion of organic wastes: a review

**17<sup>30</sup> – 17<sup>50</sup> –** *Chaabna A., S. Semcheddine*, Improvement of biogas production by SMC. Application on AM2

**17<sup>50</sup> – 18<sup>10</sup> –** *Christov N. (France), H. Wang (China), I. Simeonov*, Extremum seeking control of two-stage anaerobic digestion system: a mini review

**18<sup>10</sup> – 19<sup>30</sup> – Poster session II**

**03.10.2021 – Sunday**

## **10<sup>th</sup> session: YOUTH SCIENTIFIC SESSION MELiSSA (online)**

**Chairs: Najdenski H., P. Angelov**

**9<sup>00</sup> – 9<sup>30</sup> – Plenary lecture:** *Arnau C., D. García, L. Alemany, E. Peiro, C.-G. Dussap, L. Poughon, O. Gerbi, B. Lamaze, C. Lasseur, F. Godia*, MELiSSA Pilot Plant: testing the integration of compartments in a regenerative life support system

**9<sup>30</sup> – 9<sup>45</sup> –** *Ciurans C., N. Bazmohammadi, C.-G. Dussap, J. Vazquez, J. M. Guerrero, F. Gòdia*, The design of a hierarchical control structure to assess the integration of a higher plants compartment into the MELiSSA Pilot Plant

**9<sup>45</sup> – 10<sup>00</sup> –** *Md Muntasir A.*, Microbial monitoring of the spacebakery wheat growth chamber reveals a dynamic shift in the microbial composition correlated with plant growth phases

**10<sup>00</sup> – 10<sup>30</sup> – COFFEE BREAK**

**10<sup>30</sup> – 10<sup>45</sup> –** *Timmer M.J., J. De Paepe, T. Van Winckel, M. Spiller, P. Markus, R. Ganigué, C. Lasseur, K.M. Udert, S.E. Vlaeminck*, Nitrogenisor: nitrogen gas production from urine with partial nitritation/anammox in a membrane-aerated biofilm reactor

**10<sup>45</sup> – 11<sup>00</sup> –** *Markus P., K.M. Udert*, Successful application of nitritation/anammox to undiluted source-separated urine

**11<sup>00</sup> – 11<sup>15</sup> –** *Harrison E., A. Smith, N. Leys, F. Mastroleo, M. Davey, P. Mehrshahi*, The use of synthetic ecology for the sustainable production of vitamin B12 enriched algal biomass on long space missions

**11<sup>15</sup> – 11<sup>40</sup> – YOUTH SCIENTIFIC DEVELOPMENTS - ANNOUNCEMENT OF THE RESULTS FOR THE BEST BULGARIAN SCIENTIFIC WORKS – P. Angelov**

**11<sup>40</sup> – 12<sup>20</sup> – GENERAL DISCUSSION AND CLOSING OF THE CONFERENCE – H. Najdenski**

**12<sup>20</sup> – 14<sup>00</sup> – LUNCH**

**14<sup>00</sup> – 19<sup>00</sup> – EXCURSION**

## Poster session I

01.10.2021, Friday, 17<sup>30</sup> – 18<sup>50</sup>

**P.1.** *Georgiev G., I. Stoycheva, K. Miteva, N. Petrov, B. Petrova, U. Szeluga, S. Pusz, B. Tsyntsarski, V. Hubenov*, SYNTHESIS AND CHARACTERIZATION OF ADVANCED CARBON MATERIALS FOR ANTISEPTIC APPLICATION

**P.2.** *Miteva K., G. Georgiev, I. Stoycheva, N. Petrov, B. Petrova, A. Sarbu, B. Tsyntsarski*, BIOCARBON FROM DIFFERENT BIOMASS PRECURSORS

**P.3.** *Stoycheva I., G. Georgiev, B. Tsyntsarski, A. Kosateva, B. Petrova, R. Zaharieva*, REMOVAL OF CADMIUM IONS FROM CONTAMINATED WATER BY CARBON MATERIAL FROM RDF

**P.4.** *Eneva R., J. Miteva-Staleva, M. Kaleva, L. Dimitrova, N. Boteva, V. Hubenov*, TWO-PHASE ANAEROBIC DIGESTION OF WHEAT STRAW USING IMMOBILIZED MICROBIAL CONSORTIA

**P.5.** *Chorukova E., G. Valevski, G. Stoyancheva, I. Simeonov*, LABVIEW COMPUTER CONTROL SYSTEM FOR HYDROGEN BIOREACTOR IN ANAEROBIC DIGESTION PROCESS

**P.6.** *Hubenov V., S. Mihaylova, I. Nikolova, L. Kabaivanova, E. Chorukova*, INFLUENCE OF pH AND ORGANIC LOAD ON THE STARTUP OF BIOHYDROGEN PRODUCTION FROM CORN STEEP LIQUOR

**P.7.** *Chorukova E., I. Simeonov, O. Roeva*, MATHEMATICAL MODELING OF A TWO-STAGE ANAEROBIC DIGESTION SYSTEM WITH HYDROGEN AND METHANE PRODUCTION USING CORN STEEP LIQUOR AS A SUBSTRATE

**P.8.** *Peeva G., R. Koleva, H. Yemendzhiev, V. Nenov*, OPTIMIZATION OF STRUVITE CRYSTALLIZATION PROCESS

**P.9.** *Koleva R., G. Peeva, H. Yemendzhiev, V. Nenov*, CHEESY WHEY AS A SUBSTRATE FOR HYDROGEN PRODUCING BIO-ELECTROCHEMICAL SYSTEM

**P.10.** *Brankova L., L. Dimitrova, E. Shopova, Z. Katerova, I. Sergiev, D. Todorova*, INVOLVEMENT OF SOME PLANT MICROSOMAL P450-RELATED ELECTRON TRANSFER COMPONENTS, GLUTATHIONE POOL AND GLUTATHIONE-S-TRANSFERASE IN PHYSIOLOGICAL RESPONSES OF HERBICIDE-TREATED WHEAT PLANTS TO DROUGHT AND FLOODING

**P.11.** *Aleksandrov V., I. Sergiev, D. Todorova*, CHLOROPHYLL FLUORESCENCE AND LEAF PIGMENTS CONTENT IN HERBICIDE-TREATED WHEAT PLANTS SUBJECTED TO SOIL DROUGHT OR FLOODING

**P.12.** *Zaharieva M., M. Angelovska, L. Dimitrova, M. Kaleva, T. Kim, Y. Ilieva, E. van Collie, M. Heyndricks, H. Najdenski*, NEW APPROACHES FOR FAST DETECTION OF *YERSINIA ENTEROCOLITICA* AND *YERSINIA PSEUDOTUBERCULOSIS* IN RAW MEAT AND MILK SAMPLES

## Poster session II

02.10.2021, Saturday, 18<sup>10</sup> – 19<sup>30</sup>

**P.13.** *Daskalova A., L. Velkova, V. Petrova, A. Kujumdzieva, A. Tomova, A. Dolashki, P. Dolashka,* EVALUATION OF ENZYMES EXPRESSED IN HAPLOID AND DIPLOID *SACCHAROMYCES CEREVISIAE* CELLS

**P.14.** *Kurutos A., A. Dolashki, L. Velkova, P. Dolashka,* FLUORESCENT LABELING OF ANTIMICROBIAL GLYCOPEPTIDES FROM MUCOS OF GARDEN SNAIL *HELIX ASPERSA*

**P.15.** *Chaney M., L. Filchev,* APPLICATION OF REMOTE SENSING METHODS IN VITICULTURE – A REVIEW

**P.16.** *Dancheva A.,* METHODS FOR IDENTIFICATION AND VISUALIZATION OF MUNICIPAL WASTE DISPOSAL SITES USING AEROSPACE DATA

**P.17.** *Dimitrova L., M. Kaleva, M. Zaharieva, C. Stoykova, I. Tsvetkova, M. Angelovska, Y. Ilieva, V. Kussovski, S. Naydenska, H. Najdenski,* ANTIBIOTIC RESISTANCE AND BIOFILM FORMATION IN *ESCHERICHIA COLI* STRAINS ISOLATED FROM SWINE FAECES AND LAGOONS

**P.18.** *Zlatkova A., V. Lyubenova,* MONITORING OF THE PHYSIOLOGICAL STATES OF FED-BATCH FERMENTATIONS WITH *E. COLI*

**P.19.** *Popova K., M. Mincheva, A. Demerdjiev, N. Goutev, D. Tonev,* PERSPECTIVES FOR THE DESIGN OF ANTISENSE OLIGONUCLEOTIDES, LABELED WITH RADIONUCLIDES AT THE CYCLOTRON FACILITY OF INRNE-BAS

**P.20.** *Dzhembekova N., S. Moncheva, N. Slabakova, I. Zlateva, S. Nagai,* MONITORING OF POTENTIALLY TOXIC PHYTOPLANKTON IN THE BULGARIAN BLACK SEA AREA ON THE BASE OF ENVIRONMENTAL DNA METABARCODING

**P.21.** *Yoncheva K., N. Benbassat, M. Zaharieva, L. Dimitrova, A. Kroumov, M. Kaleva, V. Kussovski, H. Najdenski,* OREGANO OIL ENCAPSULATED IN CHITOSAN-ALGINATE NANOPARTICLES – IMPROVED ANTIMICROBIAL EFFECT AND SYNERGISM WITH ANTIBIOTICS

**P.22.** *Stankulov T., R. Koleva, R. Bukureshtlieva, H. Yemendzhiev, V. Nenov, A. Momchilov,* PERFORMANCE OPTIMIZATION OF MFC FOR WASTEWATER TREATMENT – THE ELECTRODE MATERIAL IMPACT

**P.23.** *Geleva E., D. Tonev, N. Goutev, V. Bashev, A. Demerdjiev,* ASSESSMENT OF NATURAL RADIOACTIVITY LEVELS OF MINERAL WATER IN BULGARIA

**P.24.** *V. Hubenov, S. Mihaylova, D. Neeva, I. Nikolova, E. Chorukova, L. Kabaivanova,* DARK FERMENTATION FOR BIOHYDROGEN PRODUCTION FROM WHEAT STRAW - ALKALI PRETREATMENT TYPE, ORGANIC LOAD AND pH IMPACT ON STARTUP OF THE PROCESS