



IV INTERNATIONAL SCIENTIFIC CONFERENCE - WINTER SESSION

# INDUSTRY 4.0

11 -14.12.2019, BOROVELTS, HOTEL ELA

[www.industry-4.eu](http://www.industry-4.eu)

## ORGANIZER

**SCIENTIFIC-TECHNICAL UNION OF MECHANICAL ENGINEERING BULGARIA  
“INDUSTRY 4.0”**

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 Bulgarian Academy of Sciences  
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 University of National and World Economy, Sofia  
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 Association of Mechanical Engineers, Czech Republic  
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 Higher Education Academy of Sciences, Ukraine  
 Union of Mechanical Engineers, Ukraine  
 Scientific-Technical Association, China  
 Ufa State Aviation Technical University, Russia  
 Association for promotion of innovative technologies - InnovativeFET, Croatia  
 Industrial Institute of Agricultural Engineering-Poznan, Poland

## INTERNATIONAL PROGRAMMING COMMITTEE

<b>Co-Chairs:</b>		
Prof. D.Sc. Georgi Popov, DHC, Technical University of Sofia, BG	Prof. Dr. Dr. Jivka Ovtcharova, DHC, Karlsruhe Institute of Technology, DE	
<b>Members:</b>		
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## NATIONAL ORGANIZING COMMITTEE

<b>Chairman:</b> Prof. Dr. Ivan Kralov	<b>Vice chair:</b> Dr. Rajcho Georgiev
<b>Members:</b>	
Prof. Dimitar Damjanov	Prof. Emil Trifonov
Prof. Dimitar Karaivanov	Prof. Georgi Pandev
Prof. Ljubomir Dimitrov	Prof. Hristo Karamishev
Prof. Nikolay Tonchev	Prof. Pepo Yordanov
Prof. Marija Evtimova	Prof. Tzanka Dikova
L.Col. Prof. Georgi Georgiev	Prof. Iliya Zhelezarov

## INVITATION

*Dear colleagues,*

*Humanity is facing before the biggest challenge you of its existence. It proposed a strategy "INDUSTRY 4.0", in which the physical world merges with the virtual. Information technology, telecommunications and manufacturing are united when the means of production are becoming more independent. It is still impossible to say how it will look smart factories in the future. The scientists from around the world, from all scientific fields are called to seek an answer to the many challenges of "INDUSTRY 4.0".*

*We invite the scientists and the researchers to present the results of their research works before the academic society and the industry representatives and to publish them in the international scientific magazines, issued by the Scientific-Technical Union of Mechanical Engineering.*

*We invite the companies to introduce their high-tech products and services, offered on the market, by presentations at the conference sessions and advertisements in the conference documents.*

*We do believe, that the International Scientific Conference "INDUSTRY 4.0" will become a place for meetings and discussions of scientists of all scientific fields, who are overcome by the challenge of transforming the innovation ideas into products and services, which create development and jobs, and establish a fair, ecological and high-tech society.*

*The conference program will give you the chance to find new friends and ideas, to relax, to amuse, and to feel the charm of the splendid winter in the mountains.*

*Prof. D.Sc. Georgi Popov, DHC  
President of Bulgarian Scientific-Technical Union of Mechanical Engineering,  
Co-Chairman of the International Program Committee*

## **THEMATIC FIELDS**

### **TECHNOLOGICAL BASIS OF “INDUSTRY 4.0”**

- Cyber physical systems (CPS); Warning system; Industry process control; Automation; Smart power grid
- Informatisation of production and logistics; Machine-to-machine communication (M2M);
- Design principles in “Industry 4.0”; Interoperability; Virtualisation; Decentralisation; Real-time acquisition and analysis of data; User-oriented services; Modularity; Parametric design; Customised products;
- Computer-integrated systems (CIS); Computer-integrated production; Application systems: CAD, CAE, CAM, CAPP and other; Industry digitalisation; Communicating robots;
- Strategies for integrated systems construction; Integration criteria, conceptual models;

### **DOMINANT TECHNOLOGIES IN “INDUSTRY 4.0”**

- Smart production technologies and systems; Advanced mechanical engineering technologies – laser, plasma, ultrasound, radiation, optical, and other technologies; Additive technologies and additive production; Digital production of optimum items made of metal, polymers, composite and ceramic materials;
- Virtual engineering technologies and simulations; Information and computer technologies; Robotic engineering; Artificial intellect; Radio electronics; Instrument-making; Communication and navigation engineering and technologies; Mathematical modelling and supercomputer engineering;
- Materials, structures, systems - SMART technologies; Powder and plasma metallurgy; material science, solid state physics, mechanics and chemistry; Composite materials and coatings; Microtechnologies microelectromechanical systems; Strengthening technologies; Nanotechnologies, nanoelectronics, nanometrology, nanoequipment and nanoindustry;
- Environment-friendly technologies; wastes treatment; Energy engineering and technologies; Solar and hydrogen energy production; Energy recuperation;

### **BUSINESS & “INDUSTRY 4.0”**

- Change of business models; Cloud services, data analysis and evaluation; 3D production simulation; Sharp reduction of time from the idea to the market; Flexibility and customisation of mass production; Remote management and maintenance of plants.
- Creation of Smart Factory; Smart factories; Industrial infrastructure; Integrated production; Industrial restructuring; Industrial internet infrastructure ;
- Principles of new type companies creation in the digital production industry; Technology suppliers – key production technologies (communicative robots, telemaintenance systems, 3D printing); Infrastructure and services suppliers (telecom, clouds, datasets analysis); industrial users (traditional manufacturers) ;
- Effects of «Industry 4.0»: Cooperation between different business functions, different product lines, technologies and stakeholders; Organisation forms
- Virtual marketing; users’ integration through internet space ;
- Management of „Industry 4.0”; Market implementation of innovation products; Intellectual property;
- Education: Business games and simulation models for qualification updating; Role of human factor in the innovation activities;

- Nonlinear processes, system analysis and applicable synergetics; Synergetic, geopolitical and geoeconomic analysis of issues for results-oriented development of competitiveness and finances ;

### **SOCIETY & „INDUSTRY 4.0”**

- Economic freedom; Civil society and democracy: Information society: Information philosophy ;
- Infrastructure of knowledge-base economy; efficient public institutions, high-quality education; efficient fundamental science, high-quality human capital; production of knowledge and high tech;
- Financial, political, legislative, social and international aspects of development of “Industry 4.0”, of fundamental and applied research, high tech and high-tech industry;
- The innovation and credit and taxation policy of the state as a determining factor for “Industry 4.0” development; Role of legislative, executive power and court authorities, state and private sectors of industry, business, banks and stock exchanges in the development and protection of the outcome from the fundamental and applied research, high tech and high-tech industry ;
- Education, fundamental and applied research, high tech and high-tech industry as factors for the national security, the citizens quality of life and the protection of their rights; Social, corporate and individual security; safety systems; Cybersecurity; Risks of viruses intrusion and data stealing, economic spying and sabotage;
- Social issues of „Industry 4.0”; Human labour concept, Employment, skills and human force strategy; Future of professions: Possible concerns for unemployment; Digital competency; Combination of engineering and digital competencies; E-training;
- Influence of „Industry 4.0” on the financial sector and economic development; Global, regional and investment consequences; Investments in the high-tech fields

**The official language of the International Scientific Conference “INDUSTRY 4.0” is English.**

### **CALL FOR PAPERS**

Scientists from all over the world are kindly invited to present the results of their researches in the Plenary, Conference and Poster Sessions.

Companies, offering machines, materials, technologies and services on the market, are also invited to present practical results in accordance with the Conference topics in the form of company presentations and advertisement at the Conference halls and in the Conference printed issues.

**Paper’s abstract** up to 200-350 words in .doc or .docx format, with up to 10 keywords, authors’ names and titles, occupation and e-mail address, together with the Author’s Response ([Form A](#)) or the [online registration](#) has to be sent to the Organizing Committee not later than **30.09.2019**.

The Author’s response Form A will be registered in the section [“Received Abstracts and Papers”](#) of the Conference web-site and a registration number will be given the paper. The Organizing Committee recommended the authors use this registration number in the further correspondence and if the files sent also begin with this number and the phrase “IND-4”.

For example: **131\_Spenser\_IND- 4.doc**.

Authors of the approved papers will be informed about the Program Committee’s decision not later than **05.10.2019**.

Only papers formatted in accordance with the [graphical](#) and [text](#) instructions, accepted peer-reviewed and presented at the oral and poster Conference sections will be published.

**The full text papers** up to 4 pages, written in English, must be sent not later than **15.11.2019** by email, together with the Application form for participation ([Form B](#)) or [online registration](#). The name of the paper’s file has to consist of the registration number, author’s name and the phrase “IND-4”. For example: **“131\_Spenser\_IND-4.doc”**

**If the authors cannot participate personally in the Conference, they can participate in the poster session.** In that case the author should pay only the publication fee and the paper will be published in the

International scientific journal “**INDUSTRY 4.0**” ISSN (print) 2534-8582 и ISSN (on-line) 2534-8582. The poster papers have to be formatted according to the poster [graphical](#) and [text](#) instructions. They should be sent by e-mail until **01.12.2019** so the papers could be presented at the Conference. The Organizing Committee takes the obligation to print the poster and to include it in the poster session.

All instructions can be found on the Conference website: <http://www.industry-4.eu>. On example of the title page can be downloaded there, so the authors could write easy the whole paper according to the requirements.

## PUBLICATIONS

All papers included in the Conference scientific program will be published in International Scientific Journal “**Industry 4.0**” ISSN (print) 2534-8582 и ISSN (on-line) 2534-997X - [www.stumejournals.com](http://www.stumejournals.com). The Editorial board of the journal is formed by Members of the International Programme Committee. Issues of the journal will be deposited in the National Library "St. Cyril and St. Methodius" and the Central Scientific and Technical Library.

## FEES AND PAYMENTS

TYPE OF FEE	Euro	
	Up to 15.11.2019	After 15.11.2019
<b>1. Conference fees:</b>		
<b>1.1. Participation Fee</b> for participation in The International Scientific Conference “ <b>INDUSTRY 4.0</b> ” <b>Includes:</b> Published in the issue of International Scientific Journal " <b>Industry 4.0</b> ", ISSN (print) 2534-8582 и ISSN (on-line) 2534-997X , Welcome cocktail, Conference materials, coffee breaks, CD with all conference contributions.	<b>200 / 150*</b>	<b>250 / 200*</b>
<b>1.2. Fee for second and third paper</b> - only publication fee	<b>90</b>	<b>130</b>
<b>2. Accompanying person (including co-authors)</b> <b>Includes:</b> Welcome cocktail , Conference materials, coffee breaks	<b>110</b>	<b>150</b>
<b>3. Publication fee</b> (For authors who cannot participate personally in the Conference ) <b>Includes:</b> Published in the issue of International Scientific Journal " <b>Industry 4.0</b> ", ISSN (print) 2534-8582 и ISSN (on-line) 2534-997X , CD with all papers and printing of the poster paper in A1 format.	<b>90</b>	<b>130</b>
<b>4. Additional payments:</b>		
<b>4.1.</b> For receiving the printed issue of the journal at the Conference (volume with the papers).	<b>20</b>	<b>20</b>
<b>4.2.</b> For receiving the printed issue of the journal by post (volume with the papers).	<b>30</b>	<b>30</b>

\* **Reduced fee for Young scientists in 35 years.**

## OVERNIGHT STAYS

### Hotel “ELA”\*\*\* - BOROVELS

Price per night: single room 35 Euro, double room - 40 Euro

### Hotel “RILA”\*\*\*- SOFIA

Price per night: single room 40 Euro, double room - 50 Euro

## PAYMENTS

**Bank transfer** to the account of the Scientific and Technical Union of Mechanical Engineering at ProCredit Bank:

**IBAN: BG53 PRCB 9230 1449 8985 01, BIC: PRCBBGSF**

**Beneficiary: NTS Mashinostroene-Industry 4.0.**

Please write in the payment document “**IND-4W**” and your registration number which you may find here: <http://www.industry-4.eu> in the section “**Received abstracts and papers**”.

**In cash** at the office of the Scientific and Technical Union of Mechanical Engineering: 1000 Sofia, 108 "G. S. Rakovski" Str. Office №411.

**All bank charges related to the transfer are borne by the participant.**

## GENERAL INFORMATION

### THE VENUE

#### Hotel Ela

Registration, opening, plenary and sectional sessions: **Hotel Ela (Fir-tree)\*\*\***.

Address: Samokov, Borovets resort, Hotel Ela.

### ACCOMMODATION

#### **Hotel Ela (Fir-tree)\*\*\* at the Borovets winter resort.**

The Borovets winter resort is located at 1350 m above the sea level on the northern slopes of the Rila mountain, 70 km southeasterly from Sofia and 10 km from the town of Samokov. The climate of the resort is temperate; the winter is mild with loads of snow. The average temperature in January – the coldest month is minus 4,8 C°. Usually the ski season starts in the beginning of December and closes in April.

Hotel Ela is located in the ideal centre of the Borovets winter resort. The hotel is situated close to the gondola lift station for Yastrebits and the Musala peak (2925 m) and 300 m from the drag lifts.

Visual information about the resort "Borovets" can be found at:

<https://www.youtube.com/watch?v=WUMNYPQ5W1Y>

<https://www.youtube.com/watch?v=GjRGtnSNEA0>

#### **Address: Samokov, Borovets resort, Hotel Ela**

In case you travel by car, you can use the GPS coordinates of Hotel Ela:

GPS - 42.26757, 23.60381

### CITY TRANSPORT TO HOTEL ELA

From Sofia Airport by underground to Joliot-Curie station. The South coach station is located 50 m in the south of the underground station, under the bridge of Dragan Tsankov boulevard. The buses for Samokov depart every 30 minutes.

The travel duration is 1 hour approximately. Ticket price - 5:00 leva (~ 2.5 €).

Minibuses depart every 30 minutes to the Borovets resort at the Samokov coach station, sector No 2. The travel duration is 10-12 minutes approximately. Ticket price - 1,30 leva (~ 0.65 €). First bus departs for Borovets resort at 7:00 and the last one at 19:00. Taxi fare from Samokov coach station to Hotel Ela: 10-12 leva (~ 5-6 €).

Hotel Ela is located 20 m from the last station, in reverse direction of arrival.

#### **Hotel Rila – City of Sofia**

The lodging for the night in Hotel Rila, Sofia is reserved for conference participants, who would like to sightsee Sofia, or the transport connections do not allow an immediate departure to the Borovets resort. The Hotel Rila is located at the exact centre of Sofia, very close to the Serdika underground station.

From Sofia Airport by underground to Serdika station. At 150 meters southeast is located Hotel Rila.

**Address: Sofia 6, Tsar Kaloyan St., Hotel Rila.**

### TIME TABLE

**11.12.2019** (Wednesday) Registration of the participants.

**12.12.2019** (Thursday) Opening ceremony 10:00. Plenary session. Conference sessions. Poster session. Welcome party.

**13.12.2019** (Friday) 09:00 Conference sessions. Closing of the Conference.

**14.12.2019** (Saturday) Departure of the participants.

### REGISTRATION

In the lobby of the Hotel ELA - Borovets

**11.12.2019** from **16:00** to **20:00** and

**12.12.2019** from **08:00** to **10:00**.

### **ENTRY TO BULGARIA**

Visitors from the European Union coming to Bulgaria need an identity document.

Visitors from other countries require an entry visa.

Visitors are recommended to contact the Bulgarian Embassy (you can find them on: <http://www.mfa.bg/>) or Consulate in their own country for information on visa requirements. If an official letter of invitation is requested, please contact the conference Secretariat in due time (before the registration deadline).

### **TIME**

Bulgaria is in the Eastern European Time Zone (GMT+2)

### **WEATHER**

Average air temperature in Borovets in the period 12-15 December 2018– minus 2,5 °C.

Snow cover out on the slopes in Borovets during the period 12-15 December, 2018 – 160 cm.

Check the weather in real time here: <http://weather.bg/indexen.php>.

### **CURRENCY**

The official currency is the lev (plural: leva).

1 euro = 1.95583 lev

All major credit cards (e.g. VISA, MasterCard, Eurocard) are usually accepted in Bulgaria

### **EMERGENCY SERVICES**

Uniform European telephone number for emergency situations: **112**

## **DEADLINES**

The Abstract of the paper and Author's Response <a href="#">Form "A"</a> or <a href="#">online registration</a> should be sent up to	<b>30.09.2019</b>
Confirmation of the abstract approval	<b>05.10.2019</b>
The Full text of the paper(s) and Participation <a href="#">Form "B"</a> or <a href="#">online registration</a> should be sent up to	<b>15.11.2019</b>
Payment of the Conference fees	<b>15.11.2019</b>
Announcement of the Conference program on the web page: <a href="http://www.industry-4.eu">http://www.industry-4.eu</a>	<b>01.12.2019</b>
The Organizing Committee will receive posters up to	<b>01.12.2019</b>
Registration of the participants: from 16:00 to 20:00	<b>11.12.2019</b>
from 08:00 to 10:00	<b>12.12.2019</b>
Opening of the Conference - 10:00	<b>12.12.2019</b>
Departure of the participants	<b>14.12.2019</b>

### **CONFERENCE SECRETARIATE**

Scientific-Technical Union of Mechanical Engineering

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