



# XIII International Research - Technical Conference on the Problems of Designing, Construction and Use of Low Energy Housing ENERGODOM 2018

**CRACOW, SEPTEMBER 11 - 13, 2018**

## **FINAL PROGRAM**



More info:

 [www.energodom.eu](http://www.energodom.eu)  
 [energodom@energodom.eu](mailto:energodom@energodom.eu)

**CRACOW UNIVERSITY OF TECHNOLOGY**  
Faculty of Civil Engineering  
Institute of Building Materials and Structures  
**DIVISION OF BUILDING AND BUILDING PHYSICS**





**CONFERENCE ORGANIZER**  
**CRACOW UNIVERSITY OF TECHNOLOGY**  
FACULTY OF CIVIL ENGINEERING  
INSTITUTE OF BUILDING MATERIALS AND STRUCTURES  
**DIVISION OF CIVIL ENGINEERING AND BUILDING PHYSICS**



MARSHAL  
OF THE MAŁOPOLSKA REGION  
**Jacek Krupa**



MAYOR  
OF THE CITY OF KRAKOW  
**Jacek Majchrowski**

**UNDER THE AUSPICES OF**

RECTOR OF THE CRACOW UNIVERSITY OF TECHNOLOGY  
**Jan Kazior, Prof., PhD, DSc, Eng.**

DEAN OF THE FACULTY OF CIVIL ENGINEERING  
**Andrzej Szarata, Ph.D., D.Sc., Prof. of CUT**

BUILDING COMMISSION OF THE KRAKÓW BRANCH  
OF THE POLISH ACADEMY OF SCIENCES



SECTION OF BUILDING PHYSICS  
OF COMMITTEE ON CIVIL ENGINEERING AND HYDROENGINEERING  
OF POLISH ACADEMY OF SCIENCES

CHAMBER OF CIVIL ENGINEERS, DISTRICT MAŁOPOLSKA



INTERNATIONAL BUILDING PERFORMANCE SIMULATION ASSOCIATION



# ENERGODOM CONFERENCE SCIENTIFIC COMMITTEE

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**Boris Bielek**, Bratislava, Slovakia  
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CHAIR

## CONFERENCE ORGANIZER

**Division of Civil Engineering and Building Physics**

**Cracow University of Technology**



## THE SPONSORS



## MEDIA



ENERGODOM 2018		General outline	
11.09.2018 Tuesday	8:00 - 10:00	Registration	
	10:00 - 10:15	Conference opening ceremony	
	10:15 - 11:15	<b>Keynote Speaker: Umberto Berardi, Ryerson University of Toronto, CANADA</b> <b>From Nanotechnologies to Zero Energy Buildings: How innovative products may support the future of the construction sector</b> Room A	
	11:15 – 11.45	Coffee - Tea	
	11:45 - 13:00	<b>Session 1</b> <b>Low Energy Building Design</b> Room A	
	13:00 - 13:30	<b>Sponsor's presentation: ISOVER</b> <b>Nearly Zero Energy Multi-Comfort House in Warsaw – outcomes after 3 years of building use</b>	
	13:30 - 14:30	Lunch	
	14:30 - 15:45	<b>SESSION 2</b> <b>Building envelope systems and materials – Part 1</b> Room A	
	18:30	Meeting of the ENERGODOM 2018 Scientific Committee	
12.09.2018 Wednesday	9:00-10.00	<b>Keynote Speaker: Jan Radoń, University of Agriculture in Krakow, POLAND</b> <b>Energy and Historical Buildings</b> Room A	
	10:00 - 10:30	Coffee - Tea	
	10:30 - 11:45	<b>SESSION 3</b> <b>Internal and External Environment</b> Room A	
	11:45 - 12:15	<b>Sponsor's presentation: FAKRO</b> <b>Fakro company - products for passive construction</b>	
	12:15-13.15	Lunch	
	13.15-14.30	<b>SESSION 4</b> <b>Building envelope systems and materials - Part 2</b> Room A	<b>SESSION 5</b> <b>Laboratory and in-situ testing and data acquisition</b> Room B
	14:30-15.00	Coffee - tea	
	15:00 - 16:15	<b>SESSION 6</b> <b>Low energy building installations</b> Room A	<b>SESSION 7</b> <b>Lighting and acoustics</b> Room B
	19:00	<b>Reception</b> <b>Restaurant: Szara Gęś w Kuchni,</b> Rynek Główny 17, Kraków	
13.09.2018 Thursday	9:00 - 10:30	<b>SESSION 8</b> <b>Computer aided modeling and design</b> <b>(under the auspices of IBPSA)</b> Room A	
	10:30 - 11:00	Coffee - Tea	
	11:00 - 12:15	<b>SESSION 9</b> <b>Building, environment, sustainable development</b> Room A	
	12:15 - 12:45	<b>Conference Closure</b> Room A	
	12:45-13:45	Lunch + Coffee - tea	



XIII International Research-Technical  
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**ENERGODOM 2018**  
Krakow, 11-13 September, 2018.

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**11.09.2018 Tuesday**

**CONFERENCE VENUE:**

**Main Campus of Cracow University of Technology, ul. Warszawska 24, KRAKÓW  
Building: "Działownia"**

8 <sup>00</sup> – 10 <sup>00</sup>	<b>REGISTRATION</b>
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10 <sup>00</sup> – 10 <sup>15</sup>	<b>CONFERENCE OPENING, Room A</b>
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10 <sup>15</sup> – 11 <sup>15</sup>	Keynote Speaker: <b>Umberto Berardi</b> , Ryerson University of Toronto, Canada <b>From Nanotechnologies to Zero Energy Buildings: How innovative products may support the future of the construction sector, Room A</b>
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11<sup>15</sup> – 11<sup>45</sup> **C o f f e e - T e a**

11 <sup>45</sup> – 13 <sup>00</sup>	<b>SESSION 1</b> <b>Low Energy Building Design</b> Room A	<b>Chairman: Vasco Peixoto de Freitas</b>
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- 1/1 Firląg S., Chmielewski A., DEFINING THE POLISH NEARLY ZERO ENERGY BUILDING (NZEB) RENOVATION STANDARD
- 1/2 Kwiatkowski J., Sowa J., Trząski A., Wiszniewski A., DORMITORY THERMAL RETROFITTING TO NZEB STANDARD
- 1/3 D’Orazio M., Di Giuseppe E., Esposti R., Coderoni S., Baldoni E., A PROBABILISTIC TOOL FOR EVALUATING THE EFFECTIVENESS OF FINANCIAL MEASURES TO SUPPORT THE ENERGY IMPROVEMENTS OF EXISTING BUILDINGS – the authors not present
- 1/4 Wesołowska M., Szczepaniak P., Gajewski J., NZEBs BUILT OF ELEMENTS BASED ON STYROFOAM RE-GRANULATE
- 1/5 Basińska M., Koczyk H., THE CHOICE OF THE OPTIMAL LEVEL OF THE PRIMARY ENERGY INDEX FOR THE COLLECTIVE RESIDENTIAL BUILDINGS
- 1/6 Chwieduk D., SOLAR ENERGY IMPACT ON SPACE HEATING AND COOLING NEEDS IN MODERATE CLIMATE

13 <sup>00</sup> – 13 <sup>30</sup>	<b>Sponsor’s presentation: ISOVER</b> <b>Nearly Zero Energy Multi-Comfort House in Warsaw – outcomes after 3 years of building use</b>
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13<sup>30</sup> – 14<sup>30</sup> **L u n c h**

14 <sup>30</sup> – 15 <sup>45</sup>	<b>SESSION 2</b> <b>Building envelope systems and materials – Part 1</b> Room A	<b>Chairman: Shuici Hokoi</b>
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- 2/1 Kočí V., Maděra J., Černý R., RETROFITTING OF BUILDING ENVELOPES: EVALUATION OF EFFECTIVENESS USING WEATHER-AFFECTED MATERIAL PARAMETERS
- 2/2 Iringová A., DESIGN OF ENVELOPES FOR TIMBER BUILDINGS IN TERMS OF SUSTAINABLE DEVELOPMENT IN THE LOW-ENERGY CONSTRUCTION – the author not present

- 2/3 Turcsanyi P., Sedlakova A., EFFECT OF TWO DIFFERENT TYPES OF BUILDING ENVELOPE INSULATION ON FUTURE HEATING DEMAND OF A FAMILY HOUSE USING SIMULATION SOFTWARE
- 2/4 Konca P., STRENGTH AND HYGRIC PROPERTIES OF ETICS APPLIED AT VARIOUS TEMPERATURE, USING ADHESIVES WITH DIFFERENT CELLULOSE ETHERS – the author not present
- 2/5 Kaczorek D., HYGROTHERMAL ASSESSMENT OF INTERNALLY INSULATED BRICK WALL BASED ON NUMERICAL SIMULATION
- 2/6 Strzałkowski J., Garbalińska H., THERMAL SIMULATION OF BUILDING PERFORMANCE WITH DIFFERENT LOADBEARING MATERIALS

18<sup>30</sup> Meeting of the ENERGODOM 2018 Scientific Committee

## 12.09.2018 Wednesday

9 <sup>00</sup> – 10 <sup>00</sup>	Keynote Speaker: <b>Jan Radoń</b> , University of Agriculture in Krakow, Poland <b>Energy and Historical Buildings</b> , Room A
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10<sup>00</sup> – 10<sup>30</sup> C o f f e e - T e a

10 <sup>30</sup> – 11 <sup>45</sup>	<b>SESSION 3</b> <b>Internal and External Environment</b> Room A	<b>Chairman: Vojislav Novakovic</b>
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- 3/1 Magalhães S., De Freitas V., Alexandre J., ENERGY CERTIFICATION LABEL VS. PASSIVE DISCOMFORT INDEX FOR EXISTING DWELLINGS
- 3/2 Bochenek A., Klemm K., ASSESSMENT OF THE IMPACT OF SPATIAL DEVELOPMENT CHANGES ON THERMAL COMFORT EXPERIENCED BY MAN IN THE EXTERNAL ENVIRONMENT
- 3/3 Zygmunt M., Gawin D., ANALYSIS OF ENERGY EFFICIENCY AND THERMAL COMFORT FOR AN OFFICE BUILDING COMPLEX LOCATED IN POLAND-A CASE STUDY
- 3/4 Bugaj S., Kosiński P., THERMAL COMFORT OF THE SPORT FACILITIES ON THE EXAMPLE OF INDOOR TENNIS COURT
- 3/5 Sadłowska-Sałęga A., Radoń J., Sobczyk J., Wąs K., INFLUENCE OF MICROCLIMATE CONTROL SCENARIOS ON ENERGY CONSUMPTION IN THE GALLERY OF THE 19TH-CENTURY POLISH ART IN THE SUKIENNIC (THE FORMER CLOTH HALL) OF THE NATIONAL MUSEUM IN KRAKOW

11<sup>45</sup> – 12<sup>15</sup> **Sponsor's presentation: FAKRO**  
**Fakro company - products for passive construction**

12<sup>15</sup> – 13<sup>15</sup> L u n c h

13 <sup>15</sup> – 14 <sup>30</sup>	<b>SESSION 4</b> <b>Building envelope systems and materials - Part 2</b> Room A	<b>Chairman: Henryk Nowak</b>
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- 4/1 Fořt J., Pavlík Z., Jerman M., Černý R., EVALUATION OF THERMAL PERFORMANCE OF WINDOW LINTEL CONSTRUCTION DETAIL
- 4/2 Wieprzkowicz A., Heim D., THE CHARACTERISTICS OF TEMPERATURE FLUCTUATIONS IN THERMAL INSULATION COVERED WITH EXTERNAL LAYER OF PCM
- 4/3 Čekon M., Struhala K., POLYCARBONATE MULTI-WALL PANELS INTEGRATED IN MULTI-LAYER SOLAR FACADE CONCEPTS



- 4/4 Juras P., Durica P., Jurasova D., Ponechal R., Rybarik J., BUILDING OF RESEARCH CENTRE AS THE EXPERIMENTAL LABORATORY FOR CIVIL ENGINEERING
- 4/5 Juras P., COMPARISON OF TRIPLE GLAZED WINDOWS BASED ON LONG-TERM MEASUREMENT

13 <sup>15</sup> – 14 <sup>30</sup>	<b>SESSION 5</b> <b>Laboratory and in-situ testing and data acquisition</b> Room B	<b>Chairman: Dorota Chwieduk</b>
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- 5/1 Kapalo P., Spodyniuk N., EFFECT OF THE VARIABLE AIR VOLUME ON ENERGY CONSUMPTION - CASE STUDY
- 5/2 Nowak K., Nowak-Dzieszko K., Marcinowski A., ANALYSIS OF VENTILATION AIR EXCHANGE RATE AND INDOOR AIR QUALITY IN THE OFFICE ROOM USING METABOLICALLY GENERATED CO<sub>2</sub>
- 5/3 Kisilewicz T., Nowak-Dzieszko K., LOW AIRFLOW MEASUREMENTS BY MEANS OF GAS TRACING METHOD
- 5/4 Katunský D., Bagoňa M., Baláž R., Lopusniak M., Vertal M., Zozulák M., LONG TERM MONITORING OF THE THERMAL INSULATION PROPERTIES OF ENVELOPE BUILDING STRUCTURES IN REAL CLIMATIC CONDITIONS
- 5/5 Pietruszka B., Oberda K., Piasecki M., TESTS OF THE INNOVATIVE BUILDING MATERIALS USED FOR EXTERNAL WALLS IN A CASE-STUDY CONSTRUCTION OBJECTS

14<sup>30</sup> – 15<sup>00</sup> **C o f f e e - T e a**

15 <sup>00</sup> – 16 <sup>15</sup>	<b>SESSION 6</b> <b>Low energy building installations</b> Room A	<b>Chairman: Zuzanna Vranayova</b>
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- 6/1 Ferrantelli A., Vosa K., Kurnitski J., TOWARDS THE DEFINITION OF A REFERENCE IDEAL RADIATOR FOR THE ASSESSMENT OF HEAT EMISSION EFFICIENCY IN BUILDINGS
- 6/2 Kaposztasova D., Vranayova Z., HYGIENIC WATER AUDIT SCHEME AS A TOOL IN THE FIGHT AGAINST LEGIONELLA-PROBLEMS AND GOALS OF THE RESEARCH PROJECT
- 6/3 Juras P., Durica P., Jandacka J., IMPACT OF HEATING CONCEPT ON THE ENERGY DEMAND OF FAMILY HOUSE
- 6/4 Lis P., REDUCING ENERGY DEMAND IN EXISTING BUILDINGS AS A TOOL TO REDUCE AIR POLLUTION
- 6/5 Kovac M., Kovacova K., ICE RINK-DESIGN OF SIZE OF WATER STORAGE TANKS WITH SMALL HEAT SOURCE FOR ICE RESURFACING MACHINE

15 <sup>00</sup> – 16 <sup>15</sup>	<b>SESSION 7</b> <b>Lighting and acoustics</b> Room B	<b>Chairman: Umberto Berardi</b>
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- 7/1 Dolnikova E., Katunsky D., SIMULATION OF VISUAL COMFORT IN SELECTED INDUSTRIAL HALL
- 7/2 Knera D., Heim D., DETERMINATION OF DAYLIGHT CONDITIONS IN OFFICE ROOM USING DIGITAL IMAGES AS A LIGHT SOURCE
- 7/3 Heim D., Knera D., Krempski-Smejda M., Wieprzkowicz A., DETERMINATION OF TOTAL SOLAR AND VISUAL RADIATION TRANSMITTED THROUGH TRIPLE GLAZING COMPONENT WITH PCM LAYER
- 7/4 Nowak H., Kania T., NATIONAL AND EUROPEAN REQUIREMENTS CONCERNING ACOUSTIC INSULATION FROM AIR SOUNDS FOR INTERNAL WALLS
- 7/5 Kłosak A., Ziarko B., Nering K., ACOUSTICAL RENOVATION OF BEAM-AND-BLOCK ACKERMANN FLOOR IN CRACOW RESIDENTIAL BUILDING FROM 1940

19<sup>00</sup> **Reception:**  
**Restaurant "Szara Gęś w Kuchni", Rynek Główny 17, Kraków**

# 13.09.2018 Thursday

9 <sup>00</sup> – 10 <sup>30</sup>	<b>SESSION 8</b> <b>Computer aided modeling and design (under the auspices of IBPSA)</b> Room A	<b>Chairman: Dariusz Heim</b> 
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- 8/1 Dzedzic J., Novakovic V., OCCUPANT BEHAVIOR MODELING BASED ON MIGRATION REGISTRATION TECHNIQUE
- 8/2 Jędrzejuk H., THE INFLUENCE OF BUILDING ZONES WITH DIFFERENT DYNAMIC PROPERTIES ON THE BUILDING ENERGY PERFORMANCE
- 8/3 Stolarska A., Strzałkowski J., Garbalińska H., USING CFD SOFTWARE FOR THE EVALUATION OF HYGROTHERMAL CONDITIONS AT WALL - WINDOW PERIMETERS
- 8/4 Malinowski A., Muzychak A., MATHEMATICAL MODELING OF THE BUILDING THERMAL STATE TAKING INTO ACCOUNT THE HEAT AND ENERGY IMPACT OF THE ENVIRONMENT
- 8/5 Nowak Ł., Cebzat K., ENERGY PERFORMANCE CALCULATIONS FOR RANDOMLY GENERATED BUILDINGS-SELECTED RESULTS AND POSSIBLE APPLICATIONS OF THE DEVELOPED MODEL
- 8/6 Lechowska A., Szczepanik-Ścisło N., Schnotale J., Stelmach M., Pyszczyk T., CFD MODELLING OF TRANSIENT THERMAL PERFORMANCE OF SOLAR CHIMNEY USED FOR PASSIVE VENTILATION IN A BUILDING

10<sup>30</sup> – 11<sup>00</sup> **C o f f e e - T e a**

11 <sup>00</sup> – 12 <sup>15</sup>	<b>SESSION 9</b> <b>Building, environment, sustainable development</b> Room A	<b>Chairman: Tomasz Kisilewicz</b>
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- 9/1 Poorova Z., Vranayova Z., GIS MODELING OF GREEN ROOFS ALLOCATION POTENTIAL-CASE STUDY (KOSICE)
- 9/2 Čekon M., Struhala K., THERMAL, ENERGY AND LIFE-CYCLE ASPECTS OF A TRANSPARENT INSULATION FACADE: A CASE STUDY
- 9/3 Baba Y., Hokoi S., POTENTIAL INFLUENCE OF CARBON FIXATION BY WOOD CARBONIZATION ON ATMOSPHERIC CO<sub>2</sub> CONCENTRATION AND TEMPERATURE
- 9/4 Cascone S., Evola G., Leone C., Sciuto G., VERTICAL GREENERY SYSTEMS FOR THE ENERGY RETROFITTING OF BUILDINGS IN MEDITERRANEAN CLIMATE: A CASE STUDY IN CATANIA, ITALY – the authors not present
- 9/5 Berbesz A., Szefer I., INNOVATIONS IN SHAPING THE RESIDENTIAL AND RETAIL BUILDINGS. FUNCTIONAL AND PRO-ENVIRONMENTAL POTENTIAL OF SHIPPING CONTAINERS IN ARCHITECTURE

12<sup>15</sup> – 12<sup>45</sup> **Conference closure**

12<sup>45</sup> – 13<sup>45</sup> **L u n c h + C o f f e e - T e a**