



12th INTERNATIONAL TEXTILE, CLOTHING & DESIGN CONFERENCE

Magic World of Textiles

FINAL PROGRAMME

Organized by:

University of Zagreb
Faculty of Textile Technology
Zagreb, Croatia

Under the Auspices of:

MINISTRY OF SCIENCE, EDUCATION AND YOUTH, Zagreb, Croatia
UNIVERSITY OF ZAGREB, Zagreb, Croatia
CROATIAN ACADEMY OF ENGINEERING, Zagreb, Croatia
ASSOCIATION OF UNIVERSITIES FOR TEXTILES - AUTEX
THE TEXTILE INSTITUTE, Manchester, United Kingdom
INTERNATIONAL FEDERATION OF KNITTING TECHNOLOGISTS, Germany
European Technology Platform for the Future of Textiles and Clothing (Textile ETP), Brussels, Belgium
HDKO, Croatian Leather and Footwear Society, Zagreb, Croatia
HIST, Croatian Association of Textile Engineers, Zagreb, Croatia

Zadar, CROATIA
October 4th to October 7th, 2026

The Faculty of Textile Technology, University of Zagreb, has once more organised the 12th International Textile, Clothing and Design Conference in Zadar, making this conference traditional. The aim of the ITC&DC 2026 is to promote textile, clothing and footwear technology and design, through interdisciplinary approach. For over twentyfour years, the ITC&DC conference serves as a platform to exchange knowledge, experiences and research results on all aspects across the fashion, textile, and apparel industry. Our growing ITC&DC family will once more enjoy networking and exchange ideas.

Out of all the papers received, the International Review Committee has accepted 35 papers from 96 authors coming from 15 countries, and 30 of them are published in the Book of Proceedings of the 12th International Textile, Clothing & Design Conference 2026 – Magic World of Textiles.

These scientific papers are printed in their integral form in the Book of Proceedings of the 12th ITC&DC 2026, and will be presented in one of the following sections:

- A - Textile fibres and advanced materials
- B - Manufacture of yarns, fabrics and nonwovens
- C - Textile finishing, dyeing and care
- D - Clothing technologies and engineering
- E - Analysis, testing and quality control
- F - Design and marketing of textiles and clothing
- G - Environmental protection, ecology and energy management

We would like to express our sincerest thanks to all the participants for their valuable contribution and readiness to spend a part of their time in Zadar, making the picture of the Magic World of Textiles more valuable and more real. We express special thanks to the domestic and international scientific associations that have accepted to be the patrons of the 12th International Textile, Clothing and Design Conference (ITC&DC 2026). Our sincerest gratitude also goes to all the individuals and institutions that have helped us organise the 12th ITC&DC 2026.

ITC&DC Team will try to do everything necessary to realise the aims of the Conference and to make all the participant feel welcome guests in Croatia.

Welcome to Zadar!

ITC&DC Team

International Scientific/Programme Committee of the 12th ITC&DC 2026**President:**

Zvonko DRAGČEVIĆ, University of Zagreb, Zagreb, Croatia

Vice-President:

Anica HURSA ŠAJATOVIĆ, University of Zagreb, Zagreb, Croatia

Members:

Dominique C. ADOLPHE, The French University in Egypt, Cairo, Egypt
Mirela BLAGA, University of Iassy, Iassy, Romania
Edit CSANAK, Obuda University, Budapest, Hungary
Andrej DEMŠAR, University of Ljubljana, Ljubljana, Slovenia
Zbigniew DRACZYNSKI, Lodz University of Technology, Lodz, Poland
Jaime C. GRUNLAN, Texas A&M University, Texas, United States of America
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Rimvydas MILAŠIUS, Kaunas University of Technology, Kaunas, Lithuania
Klaus OPWIS, German Textile Research Centre North-West, Krefeld, Germany
Elizabeth RAMOS KALMAR, Edesign, Colombia
Daniela ZAVEC, ITP GmbH, Jenna, Germany

International Review Committee of the 12th ITC&DC 2026

Sandra BISCHOF (HR); Ružica BRUNŠEK (HR); Holger CEBULLA (DE); Edit CSANÁK (HU); Sanja ERCEGOVIĆ RAŽIĆ (HR); Sandra FLINČEC GRGAC (HR); Petra FORTE TAVČER (SI); Chuansi GAO (SE); Igor JORDANOV (MK); Ilda KAZANI (AL); Thomas LUXBACHER (AT); Sonja KOŠČAK KOLIN (HR); Thomas LUXBACHER (AT); Klaus OPWIS (DE); Elizabeth RAMOS KALMAR (CO); Tomislav ROLICH (HR); Andreja RUDOLF (SI); Katarina Nina SIMONČIČ (HR); Ana SUTLOVIĆ (HR); Brigita TOMŠIČ (SI); Torsten TEXTOR (DE); Edita VUJASINOVIĆ (HR); Daniela ZAVEC (DE); Petja ZOREC (SI)

Organizing Committee of the 12th ITC&DC 2026 (ITC&DC Team)

Lea BOTTERI, Selma IMAMAGIĆ, Maja MATUŠIN, Tanja PUŠIĆ, Bosiljka ŠARAVANJA, Ivana ŠPELIĆ

Coordinators of the 12th ITC&DC 2026:

Section A - Textile fibres and advanced materials: Andrej DEMŠAR
Section B - Manufacture of yarns, fabrics and nonwovens: -
Section C - Textile finishing, dyeing and care: Jaime C. GRUNLAN
Section D - Clothing technologies and engineering: Anica HURSA ŠAJATOVIĆ
Section E - Analysis, testing and quality control: Jun LI
Section F - Design and marketing of textile and clothing: Edit CSANAK
Section G - Environmental protection, ecology and energy management: Rimvydas MILAŠIUS

Registration desk: Selma IMAMAGIĆ & Maja MATUŠIN

Technical assistance: Maja MATUŠIN

GENERAL INFORMATION

12th ITC&DC 2026 will start on Sunday, October 4th to Wednesday October 7th 2026 in the Resort Borik, city Zadar, Majstora Radovana 7 (see map).

Information desk is in operation in the hotel Donat during the Conference. All details and necessary information on the contents and schedule of the Conference, as well as other relevant matter, will be available there for the participants and guests.

All participants during the conference should bring accreditation and appropriate tickets for individual events.

FINAL PROGRAMME

Sunday, October 4th 2026, Arrival day

18:30 – 19:45	Registration of authors and other participants
19:30 – 19:45	Meeting of International Scientific Committee and Coordinators of Sections (Conference Hall 2)
20:00 – 23:00	Welcome party (Hotel Donat)

Monday, October 5th 2026

09:00 – 09:30	Registration of authors and other participants
09:30 – 09:45	Opening ceremony (Conference Hall 1)
09:45– 10:30	Plenary lecture (Conference Hall 1)
10:30 – 11:00	Coffee break
11:00 – 12:30	Expert focus lectures (Conference Hall 1)
12:30 – 14:00	Conference lunch (Restaurant hotel Donat)
14:00 – 16:00	Oral presentation – Section A & G
	G1 – G5 A1 – A6
15:45 – 16:15	Coffee break
18:00- 19:30	An evening walk through the city of Zadar

Tuesday, October 6th 2026

09:00 – 11:00	Oral presentation – Section B & C; D, E & F
	C1 – C6; B1 D1 – D2; E1 – E2 & F1 – F3
11:00 – 11:30	Coffee break
11:30 – 12:30	Poster presentation (All sections)
12:30 – 14:30	Conference lunch (Restaurant hotel Donat)
14:30 – 15:00	Closing ceremony (Conference Hall 1)
20:30	Conference dinner (Restaurant hotel Funimation)

Wednesday, October 7th 2026

10:00	Official ITC&DC excursion for authors and other participants
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	Conference Hall 1
	Conference Hall 2

Monday, October 5th 2026

09:30 – 10:30 Plenary lecture (Conference Hall 1)

Rimvydas MILAŠIUS

Textile and Sustainability: What can we do?

Chair persons: Sandra BISCHOF & Klaus OPWIS

11:00 – 12:30 Expert focus lectures (Conference Hall 1)

Edit CSANÁK; Dóra PAPP-VID; Virág NÉMETHY; Orsolya NAGY SZABÓ;

Péterné KORONA & Rebeka PÁLFI

Reframing Cultural Heritage in Design Education: Student Projects on Sustainable Fashion, Adaptive Reuse, and Emerging Technologies

Chair persons: Anica HURSA ŠAJATOVIĆ & Daiva MILAŠIENE

Edita VUJASINOVIĆ

The Mystical World of Maritime Textiles - From the „Fiber of the Gods“ to the Science of Sailing

Chair persons: Daiva MIKUČIONIENE & Jaime C. GRUNLAN

14:00 – 16:00 Section G: Environmental protection, ecology and energy management (Conference Hall 1)

Chair person: Rimvydas MILAŠIUS

G1	Daiva MIKUČIONIENE <i>Textile Industry Challenges and Solutions to Reduce the Release of Synthetic Fibers</i>
G2	Markus MUSCHKIET & Janika SCHÜßLER <i>Assessing the EU Separate Collection Directive for Textiles in Germany and Its Transferability Across Europe</i>
G3	Nora NICKLAUS; Tihana DEKANIĆ & Holger CEBULLA <i>Physicochemical Characterization of Wastewater from Raw Merino Wool Scouring with Conventional and Bio-Based Agents</i>
G4	Klaus OPWIS; Lina VAN LIPZIG & Jochen Stefan GUTMANN <i>Detox NH₃ 2.0 - Decontamination of Production-Related Ammonia in Farming and Industry with the Aid of Functional Adsorber Textiles</i>
G5	Alessia PATRUCCO <i>Textile Waste Recycling: Finishing Removal</i>

14:00 – 16:00 Section A: Textile Fibres and Advanced Materials (Conference Hall 2)

Chair person: Edita VUJASINOVIĆ

A1	Taosif AHMED & Bingang XU <i>Fabric Architecture–Driven Triboelectric Textiles for Wearable Applications</i>
A2	Marcin BARBURSKI; Hasan Riaz TAHIR; Tomasz RYBICKI; Wiktor SMIECHOWSKI; Alan MICHALCZYK; Tsegaye LEMMI & Iwona KARBOWNIK <i>Design of Hybrid Textile-Polymer Frequency Selective Surfaces using Screen-Printing Techniques</i>
A3	Gaye DUMAN; Mert BAKIRLI & Güngör DURUR <i>Influence of Warp and Weft Integration of Pineapple Leaf Fiber (PALF) Blends on Woven Fabric Performance</i>
A4	Kristina PERANIDZE; Nataraja S. YADAVALLI; Mohammad AGHAJOHARI; Sergei MAKAEV; Mikhail PARKER; Sergiy MINKO & Vladimir REUKOV <i>Engineering Fiber-Based Biointerfaces for Cell Biology and Regenerative Medicine</i>
A5	Siddhi Vardhan Singh RAO; Apurba DAS; Bipin KUMAR & Nandan KUMAR <i>Acoustic Behavior of Nonwoven-Microperforated Foil Hybrid Panels and Its Prediction Model using Bioinspired Algorithms</i>
A6	Kuldip SINGH & Vijay BAHETI <i>Electromagnetic Interference Shielding and Ohmic Heating Properties of Nonwoven and Woven Activated Carbon Fabrics</i>

Tuesday, October 6th 2026

09:00 – 11:00 Section C: Textile Finishing, Dyeing and Care (Conference Hall 1)

Chair persons: Marcin BARBORSKI & Lea BOTTERI

C1	Sandra BISCHOF; Ines DOMINIĆ; Agata VINČIĆ & Zorana KOVAČEVIĆ Green Microwave Technology in Hemp Fibre Processing
C2	Hanna HOUSSEL-GARCIA; Fabien SALAÜN; Rodolphe SONNIER; Belkacem OTAZAGHINE; Christine LONGUET & Claire CAMPAGNE Fluorine-Free Functionalization for Water and Oil Repellent Textiles
C3	Joyjit GHOSH; David JUHAS; Quoc-Nghia N. DUONG; Seyedali MIRMOHAMMADSADDEGHI; Dwight Austin Van HORN & Vladimir REUKOV Durable Bio-Based Multifunctional Coatings for Antimicrobial and Flame-Resistant Medical Textiles
C4	Jaime C. GRUNLAN Wash-Durable Flame Retardant Polyelectrolyte-Based Finishing of Cotton and Polyester
C5	Brigita TOMŠIĆ; Maja BLAGOJEVIĆ, Nika PIRŠ; Ivan JERMAN; Rok FINK; Jaime C. GRUNLAN; Nataša ČELAN KOROŠIN & Barbara SIMONČIĆ Green Chemistry–Driven Design of Multifunctional Protective Silk Textiles for Advanced Applications
C6	Anita TARBUK; Tihana DEKANIĆ; Stefana BEGOVIĆ & Ana Marija GRANCARIĆ Electrokinetic Monitoring of Chitosan Functionalization and Washing Stability of Enzyme-Bioactivated Cotton/Polyester Blended Fabrics

Section B: Manufacture of yarns, fabrics and nonwovens (Conference Hall 1)

B1	Zayedul HASAN; Rochak RATHOUR; Apurba DAS; Ramasamy ALAGIRUSAMY & Nandan KUMAR Thermal Comfort Behavior Of Cut Resistant Fabric Consisting Of Stainless Steel Coresheath Yarn
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09:00 – 11:00 Section D: Clothing technologies and engineering (Conference Hall 2)

Chair persons: Edit CSANAK & Sanja ERCEGOVIĆ RAŽIĆ

D1	Özgür CEYLAN; Emel AYDIN; Nesligül KILIÇ & Irmak TAŞ; Elif Gökçe YEŞİLBAŞ; Ali Emre ARPACI; Nail ÇIRAK & Sinan KILINÇ Anthropometry, Ergonomics, and Brand Identity: A Segment-Oriented Design Model for Gender-Specific Garment Development
D2	Yongyi ZHANG & Jun LI Ergonomic Performance Optimization of Phase Change Cooling Garment Based on Multi-Index Comprehensive Evaluation

Section E: Analysis, testing and quality control (Conference Hall 2)

E1	Yifan CHEN; Zhaoli WANG; Jiayi ZENG; Yue HE; Yunyi WANG & Jun LI Prediction Method for Localized Thermal Insulation Requirements of Cold-Protective Workwear Based on the IREQ Model
E2	Luka SAVIĆ; Suzana KUTNJAK-MRAVLINČIĆ & Sanja ERCEGOVIĆ RAŽIĆ Adhesive Strength and Failure Mechanisms of FDM-Printed PETG Loops on PU-Coated and Uncoated Textiles

Section F: Design and Marketing of Textile and Clothing (Conference Hall 2)

F1	Özgür CEYLAN; Nesligül KILIÇ; Irmak TAŞ; Emel AYDIN; Irmak TAŞ; Özgen ÖZTURAN, Melek KESER & Özge POLAT <i>From Trend to Practice: Analog Nostalgia as a Framework for Heritage Textile Integration in Commercial Apparel Design</i>
F2	Lee MATTOCKS <i>What Makes Clothes Last? Emotional Durability and Garment Retention in Wardrobe Studies</i>
F3	Sabrina MAUTER; Dominique ADOLPHE & Markus MUSCHKIET <i>Labelling Structure for Textile Products Considering Differentiated Eco-Design Aspects</i>

11:30 – 12:30 Poster presentation (official time for discussion)

Section A: Textile Fibres and Advanced Materials

AP1	Emília CSISZÁR & Erika FEKETE <i>Raw and Bleached Linen as Cellulose Source for Nanocellulose Production</i>
AP2	Md. Zahid HASAN, K.Z.M Abdul MOTALEB & Rimvydas MILAŠIUS <i>Functionalization of Natural Waste-Based Bio-Epoxy Composites</i>
AP3	Alenka OJSTRŠEK; Ana BRATUŠA ŠTERN & Laura JUG <i>Tailoring of Electroconductive Electrospun Fibrous Net for Wearable Electronics</i>
AP4	Yitong WANG & Bingang XU <i>Kirigami-Structured Textile Nanogenerator for Self-Powered Wearable Sensing</i>
AP5	Juyang WEI & Bingang XU <i>Design of High-Performance Open-Porous Triboelectric Nanogenerator for Wearable Energy Harvesting</i>

Section C: Textile finishing, dyeing and care

CP1	Lea BOTTERI; Lea HARAMINA; Ana SUTLOVIĆ & Anita TARBUK <i>Sustainable Functionalization of Cotton using Banana Pseudostem Sap: Natural Dyeing and Flame Retardancy</i>
CP2	Zarnab GUL & Daiva MILASIENE <i>Sustainable Bio-Based Phase Change Nanocapsules for Thermoregulating Cotton Textile Applications</i>
CP3	Jovana PETKOVSKA & Igor JORDANOV <i>Layer-By-Layer Coated Cotton Fabric with Anthocyanin Grape Dye as a PH-Indicating Textile</i>

Section D: Clothing technologies and engineering

DP1	Selma IMAMAGIĆ; Bosiljka ŠARAVANJA; Anica HURSA ŠAJATOVIĆ & Paula MARKOVIĆ <i>Technological Analysis of Sewing Women's Sheath Skirt</i>
DP2	Jelena KOSANOVIĆ; Helena BILJANIĆ; Lea BOTTERI; Marijan MARCIUŠ; Katarina MARUŠIĆ & Nives MATIJAKOVIĆ MLINARIĆ <i>Naturally Derived Functional Coatings for Textiles</i>

Section E: Analysis, testing and quality control

EP1	Laura BERGLEZ; Lidija ŠKODIČ; Darko ŠTANC; Julija VOLMAJER VALH; Alen ERJAVEC & Manja KUREČIĆ <i>TGA-Based Analysis of Microfibres in Laundry Wastewater: A Cotton–Polyester Model Study</i>
EP2	Anica HURSA ŠAJATOVIĆ; Jun LI; Sandra FLINČEC GRGAC; Miao TIAN; Tihana DEKANIĆ; Yunyi WANG; Selma IMAMAGIĆ & Yun SU <i>Evaluating the Flammability and Thermal Protective Performance of Firefighter Clothing</i>
EP3	Bosiljka ŠARAVANJA; Anica HURSA ŠAJATOVIĆ; Ksenija SMOLJAK KALAMIR; Mateja RALJEVIĆ; Tanja PUŠIĆ & Krešimir MALARIĆ <i>Durability of the Electromagnetic Shielding Effectiveness of Electrically Conductive Fabrics for Clothing during Professional Care</i>

Section F: Design and marketing of textile and clothing

FP1	Tanja Nuša KOČEVAR <i>Enhancing Design Competencies in Fashion and Textile Education through Digital and Traditional Methods</i>
FP2	Marijana PAVUNC SAMARŽIJA; Edita VUJASINOVIĆ & Ružica BRUNŠEK <i>Assessing the Quality of Reclaimed Fibers Fillings in a Circular Economy Context</i>

Section G: Environmental protection, ecology and energy management

GP1	Kayee CHAN; Hanchao ZHANG & Jintu FAN <i>Selective Recycling of Textile Wastes via Photothermal Degradation</i>
GP2	Marijana PAVUNC SAMARŽIJA; Edita VUJASINOVIĆ & Zvonko DRAGČEVIĆ <i>Public Mindset on Textiles Recycling in Croatia - Survey-Based Insight</i>
GP3	Ivana ŠPELIĆ; Alka MIHELIĆ-BOGDANIĆ & Kristina ŠPELIĆ <i>Energy Optimization through AI Solutions in European Polymer-Processing Industries</i>
GP4	Živa ZUPIN; Ana Marija ŠTURM & Andrej DEMŠAR <i>Replacement of Fibre Blended Yarns with Single Component Yarns in Knitted Fabrics to Facilitate Recycling</i>

The posters should be on boards during the conference (from 5th to 6th October 2026)

MANNER OF PRESENTATION

For the papers to be **orally presented**, presentation is limited to 15 min and 5 min for discussion after all presentation.

An PC and LCD projector will be available for the participants wishing to accompany oral presentation of their papers with a Microsoft PowerPoint presentation. **These participants are requested to submit an USB stick for each paper at the registration.**

The USB sticks will be returned to the authors.

For the papers to be **poster presented**, the posters should be prepared in 1189 mm high and 841 mm wide (A0 format). Letters should be of such a size that can be read from 1 m distance.

The title is an integral part of the poster and should include:

Paper title
Name of author(s)
Institution
Address of author(s)

The posters should be on boards during the conference (from 5th to 6th October 2026)

After poster presentation in sections, the authors are required to remove their poster materials.

CONFERENCE FEE

Conference fee for authors and participants (in EUR):

Regular participants	650
Young scientists	450
Accompanying person	400

Participants that have not paid their conference fee via bank transfer should settle their dues (in EUR).

Registration fee for the individual authors (both regular participants and young scientists) include access to all the sessions, conference proceedings and materials, welcome cocktail, conference lunches (2), refreshments at conference coffee breaks, official ITC&DC excursion, a ticket for the evening entertainment and a ticket for the conference dinner.

Registration fees for the accompanying persons include admission to all sections, welcome cocktail, conference lunches (2), refreshments at conference coffee breaks, official ITC&DC excursion, a ticket for the evening entertainment and a ticket for the conference dinner.

The participants are cordially invited to join an evening walk through the city of Zadar with a tour guide, beginning at 18:00 on 5th October 2026. The meeting point is in front of Zadar Tourist Board, Jurja Barakovića 5, Zadar.

A conference dinner with music will be organised on 6th October 2026 at 20:30 in the Faunimation Hotel restaurant and **is included in the registration fee.**

The ITC&DC excursion for authors and accompanying persons will be organised on 7th October 2026, departing from the Hotel Funimation car park at 10:00 to the late evening hours.

TRAVEL INFORMATION

Zadar has its own airport: <https://zadar-airport.hr/en/homepage/>, which is only 11 kilometres away from the town.

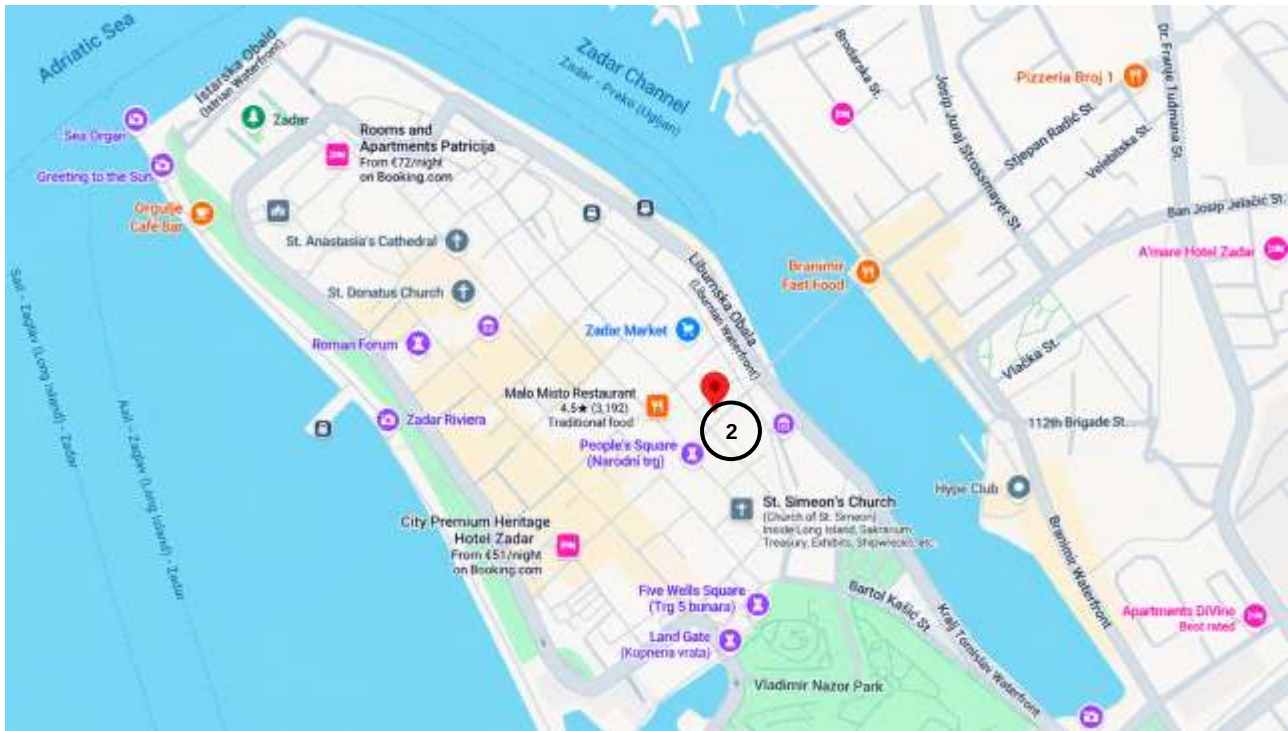
Buses from the airport to the main bus terminal in Zadar roughly run in conjunction with flight arrivals (see the How to get here page on the Zadar airport website for bus times - [airport bus info](#)).

A bus waits outside the terminal (on the right-hand side). A one-way ticket costs 5 EUR, which can be bought directly from the driver when boarding. This bus makes two stops - firstly at the main bus station in Zadar (driving takes only 15 minutes), and then just outside the Old Town (further 5 minutes). The ticket price is the same regardless of which stop you get off at.

All the other relevant information on your accommodation and stay in Zadar you can find in your Zadar Guide, which is a part of the conference material and will be distributed to each participant.

Monday, October 5 th 2026			
1	12:30 – 14:00	CONFERENCE LUNCH (Restaurant hotel Donat)	
2	18:00	EVENING WALK THROUGH THE CITY OF ZADAR (Zadar Tourist Board, Jurja Barakovića 5, Zadar)	
Tuesday, October 6 th 2026			
1	12:30 – 14:00	CONFERENCE LUNCH (Restaurant hotel Donat)	
3	20:30	CONFERENCE DINNER (Restaurant hotel Funimation)	
Wednesday, October 7 th 2026			
4	10:00 – 20:00	OFFICIAL ITC&DC EXCURSION	





We are here to welcome you!

LIST OF SPONSORS / DONATORS

Ministry of Science, Education and Youth, Republic of Croatia, Zagreb, Croatia

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