

FINAL REPORT 2022

20th International Zeolite Conference

Valencia, Spain
3-8 July 2022



www.izc2022.com



Conference summary

With the theme 'Porous materials, a tool for a Sustainable Development', the 20th International Zeolite Conference was held in Valencia Conference Centre, from 3rd to 8th July, 2022. The conference, organized by the Spanish Catalysis Society, was preceded by a Pre-Conference School, held at ADEIT University-Enterprise Foundation of the University of Valencia, from 1st to 2nd July.

The five-day scientific program consisted of 7 plenary lectures, 12 keynote lectures, 168 oral presentations and 297 poster presentations, distributed in 4 parallel oral sessions and 3 poster sessions.

The figures

Total number of delegates: 569

Grants: 18

Abstracts submitted: 584

Oral presentations: 168

Poster presentations: 297

Pre-Conference School attendees: 64

Total budget: 306,572 €

Sponsorship income: 88,300 €

Exhibition income: 19,500 €



Key dates

1st announcement and call for abstracts, **17 January**

Abstract submission and registration open

Abstract submission deadline, **20 March**

Successive extensions of the deadline until **14 April**

Abstract author notification scheduled for **3 May**

Ultimately postponed until **16 May**

Early registration deadline, **31 May**

Recent Research Reports submission open, **20 May**

Deadline for RRR to be included in the Book of Abstracts, **15 June**

Entry card and general information, **30 June**

Pre-Conference School, **1-2 July**

Conference, **3-8 July**

Satisfaction survey and certificates, **12 July**



Important remarks

The first announcement was delayed until January 2022 due to the uncertainty caused by the **COVID-19 pandemic**. Throughout 2021, the organizing committee and the IZA board discussed the possibility of holding the congress online and chose to postpone the decision on the format of the congress as much as possible. In December 2021, taking into account the projections regarding the evolution of the pandemic, the Organizing Committee, with the approval of the IZA board, made the decision to hold the congress exclusively on site. Registrations and submission of abstracts were delayed because the improvement in the pandemic situation during the first half of 2022 was slow. For this reason, the initially planned deadline for abstract submission was extended by more than one month. Unfortunately, although the evolution of the pandemic allowed, as expected, for the elimination or at least the easing of transport restrictions on a practically global scale, China still maintained a travel ban to other countries in the days leading up to the congress, making it ultimately impossible for researchers from Chinese institutions and universities to attend. On the other hand, the **war in Ukraine** that started in February 2022, also resulted in the complete absence of researchers from Russia. Both unfortunate events undoubtedly contributed to a significant reduction in the number of attendees at the congress, as well as the number of communications presented.

Organising Committee

Chair – Avelino Corma

Co-Chairs - Joaquín Pérez Pariente, David Serrano

Secretary - Fernando Rey, Carlos Márquez

Treasury - Teresa Blasco, José Manuel López-Nieto

Paper Selection Chair - Enrique Sastre, Eduardo Palomares, Manuel Moliner, Juan Antonio Melero

Publication Chair - German Sastre, Susana Valencia

Pre-Conference School - Cristina Martínez, Joaquín Coronas

Local Organizing Board - Mercedes Boronat, Pablo Botella, Antonio Chica, Sofía Calero, Guillermo Calleja, María J. Climent, Patricia Concepción, Óscar de la Iglesia, Urbano Díaz, Isabel Díaz, M. José Díaz Cabañas, Marcelo E. Domine, José María Escola, Eva Díaz Fernández, Juana Frontela, Jose María Gómez Martin, Luis Gómez-Hortigüela, Sara Iborra, José Luis Jorda, Jesús Lázar, Francesc X. Llabrés i Xamena, Francisco Maldonado-Hódar, Alberto Marinas, Rosa María Martín-Aranda, Agustín Martínez, Joaquín Martínez-Triguero, Pascual Oña, Salvador Ordóñez García, Patricia Pizarro de Oro, Michael Renz, Enrique Rodríguez-Castellón, Araceli Rodríguez Rodríguez, M^a José Sabater, Manuel Sánchez-Sánchez, Carlos Téllez

Scientific Committee

Robert Bell, *University College London, UK*

Silvia Bordiga, *Università di Torino, Italy*

Mercedes Boronat, *ITQ-UPV/CSIC, Spain*

Domenico Caputo, *Università Federico II, Italy*

Jiří Čejka, *Academy of Sciences of the Czech Republic, Czech Republic*

Joaquín Coronas, *Universidad de Zaragoza, Spain*

Mark Davis, *CALTech, USA*

Dirk De Vos, *KU Leuven, Belgium*

Francesco Di Renzo, *Institut Charles Gerhardt Montpellier, France*

Isabel Díaz, *ICP-CSIC, Spain*

Marcelo E. Domine, *ITQ-UPV/CSIC, Spain*

Jack CQ Fletcher, *University of Cape Town, South Africa*
Javier García, *Universidad de Alicante, Spain*
Jorge Gascón, *KAUST, Saudi Arabia*
Enrica Gianotti, *Università del Piemonte Orientale, Italy*
Girolamo Giordano, *University of Calabria, Italy*
Roger Gläser, *University of Leipzig, Germany*
Luis Gómez-Hortigüela, *ICP-CSIC, Spain*
Juan Ramón González Velasco, *UPV/EHU, Spain*
Martin Hartmann, *FAU Erlangen-Nürnberg, Germany*
Suk Bong Hong, *Pohang University of Science and Technology, South Korea*
Irina Ivanova, *Moscow State University of Civil Engineering, Russia*
Freek Kapteijn, *TU Delft, The Netherlands*
Stefan Kaskel, *TU Dresden, Germany*
Naonobu Katada, *Tottori University, Japan*
Christine Kirschhock, *KU Leuven, Belgium*
Yoshihiro Kubota, *Yokohama National University, Japan*
Johannes Lercher, *Technische Universität München, Germany*
Zhongmin Liu, *Dalian Institute of Chemical Physics, China*
Rafael Luque, *Universidad de Córdoba, Spain*
Alberto Marinas, *Universidad de Córdoba, Spain*
Agustín Martínez Feliu, *ITQ-UPV/CSIC, Spain*
Joaquín Martínez Triguero, *ITQ-UPV/CSIC, Spain*
Masahiko Matsukata, *Waseda University, Japan*
Lynne B. McCusker, *ETH Zürich, Switzerland*
Juan Antonio Melero, *Universidad Rey Juan Carlos, Spain*
Roberto Millini, *Eni S.p.A., Italy*
Svetlana Mintova, *CNRS - Université de Caen, France*
Manuel Moliner, *ITQ-UPV/CSIC, Spain*
Russell Morris, *University of St. Andrews, UK*
Masaru Ogura, *University of Tokyo, Japan*
Tatsuya Okubo, *The University of Tokyo, Japan*
Miguel Palomino Roca, *ITQ-UPV/CSIC, Spain*
Heloise O. Pastore, *University of Campinas, Brazil*
Joaquín Pérez Pariente, *ICP-CSIC, Spain*
Sibele B.C. Pergher, *Universidade Federal do Rio Grande do Norte, Brazil*

Gerhard Pirngruber, *IFP Energies Nouvelles, France*
Patricia Pizarro, *Universidad Rey Juan Carlos, Spain*
Jefferey D. Rimer, *University of Houston, USA*
Manuel Sánchez Sánchez, *ICP-CSIC, Spain*
Enrique Sastre, *ICP-CSIC, Spain*
German Sastre, *ITQ-UPV/CSIC, Spain*
Wilhelm Schwieger, *FAU Erlangen-Nürnberg, Germany*
Bert Sels, *KU Leuven, Belgium*
Christian Serre, *Université de Versailles St. Quentin, France*
Joaquín Silvestre, *Universidad de Alicante, Spain*
Ben Slater, *University College London, UK*
Michael Stockenhuber, *The University of Newcastle, Australia*
Matthias Thommes, *FAU Erlangen-Nürnberg, Germany*
Michael Tsapatsis, *Johns Hopkins University, USA*
Susana Valencia, *ITQ-UPV/CSIC, Spain*
Jeroen van Bokhoven, *ETH Zürich, Switzerland*
Jihong Yu, *Jilin University, China*
Stacey Zones, *Chevron Energy Technology Company, USA*
Xiaodong Zou, *Stokholm University, Sweden*

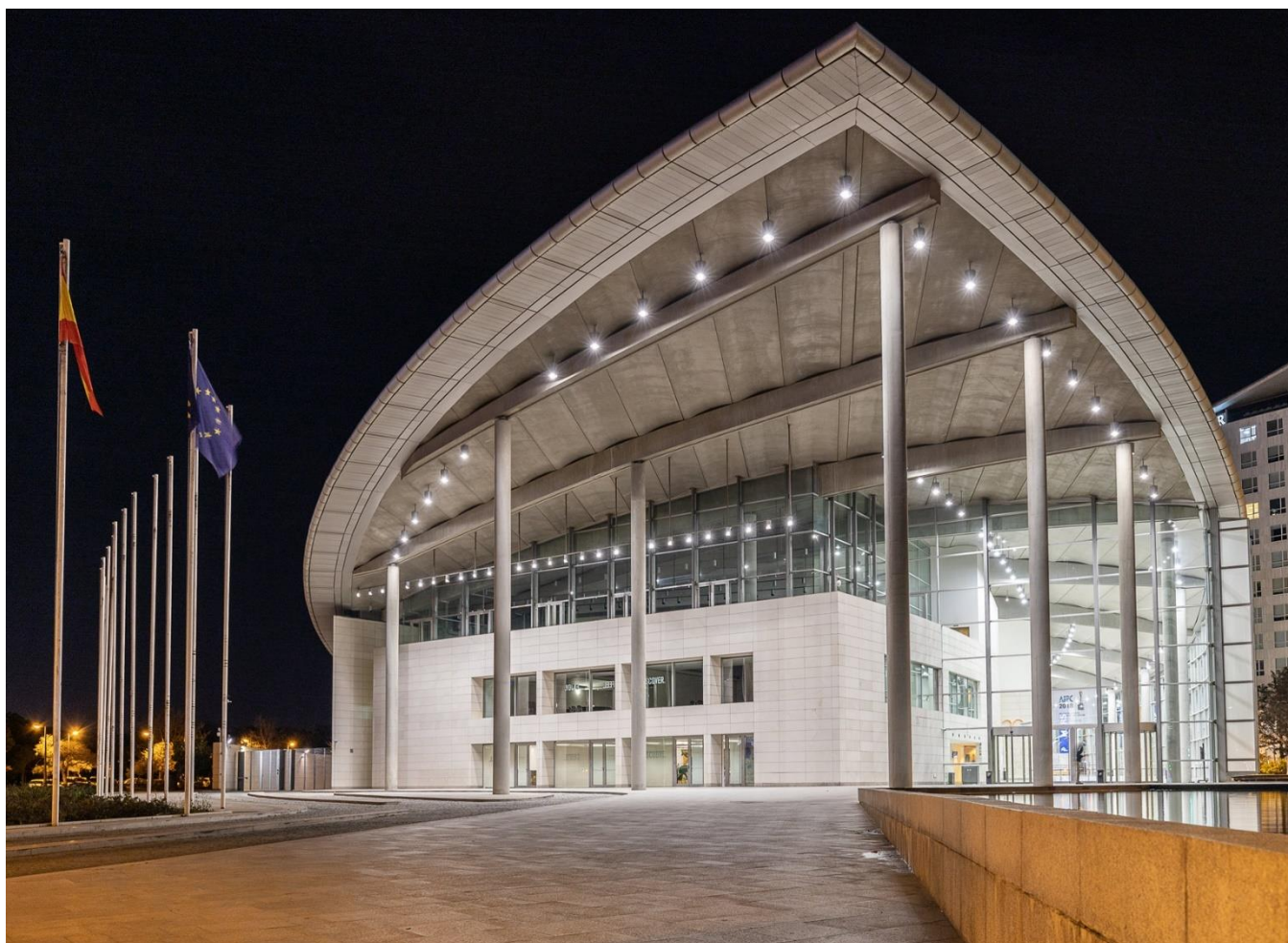
Technical Secretariat



izc2022@pacifico-meetings.com

Conference Venue

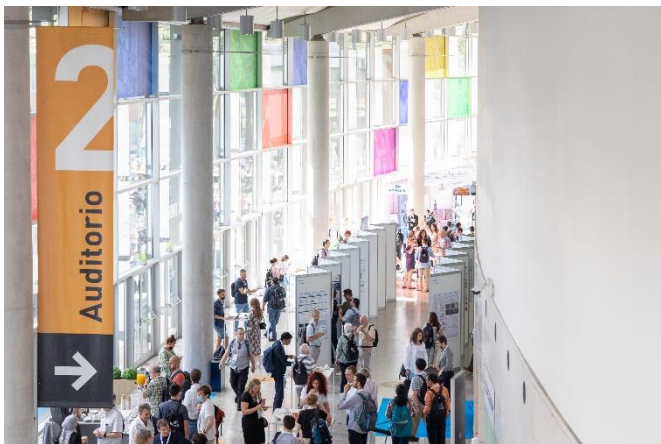
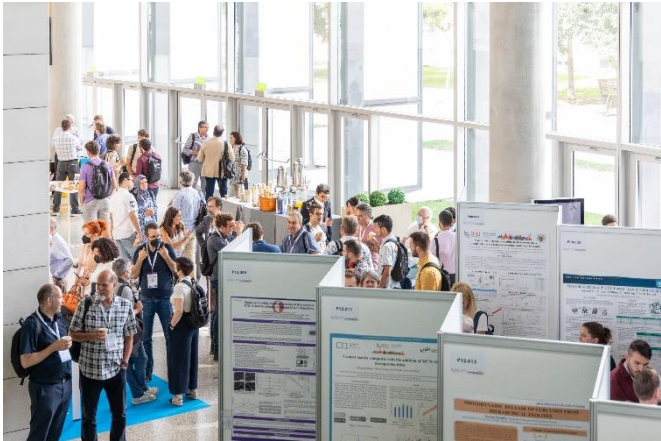
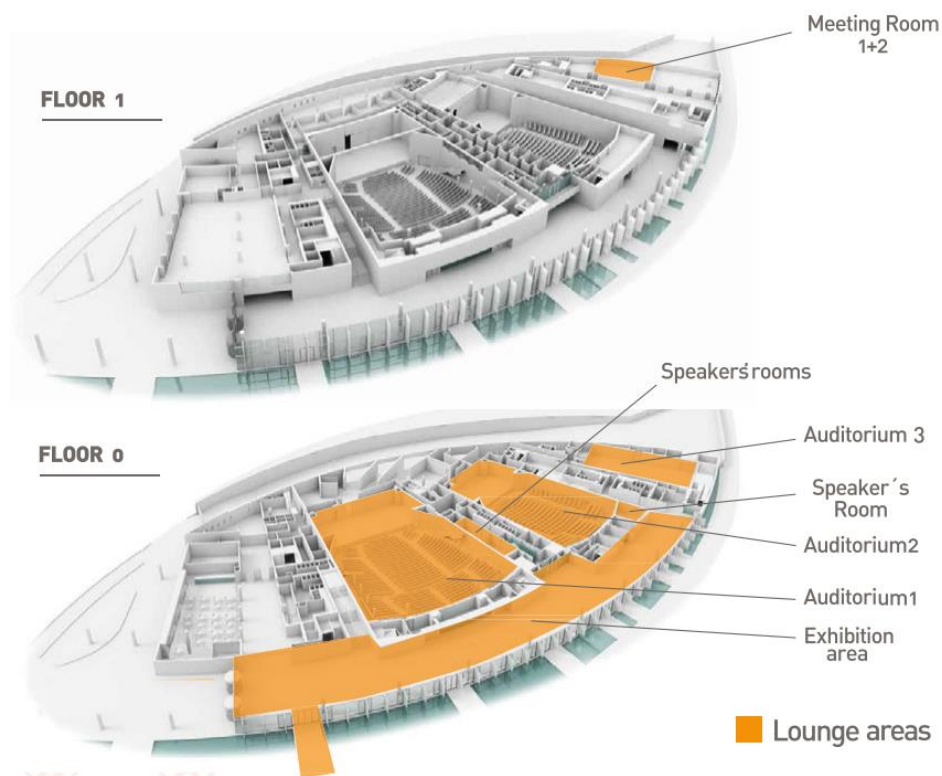
The 20th IZC was hosted at Valencia Conference Centre. This venue, created in 1998, is an emblematic piece of architecture, designed by the renowned architect Norman Foster. The building is located in Corts Velencianes Avenue, one of the main roads into the city and the main northwest approach road. It is well connected to the city centre by bus, metro and tram, and is easily accessed by bicycle. There is a large number of restaurants and several hotels within a short walking distance.



<https://palcongres-vlc.com/en>

Four halls were available for oral presentations, Auditorium 1, Auditorium 2, Auditorium 3, and the combined Meeting Room 1+2, along with an exhibition and poster area, registration desk and several small meeting rooms.

Venue floorplan



Registration Desk

The Registration Desk was located at the groundfloor.

Opening Hours:

Sunday 3 July: 16h-21h

Monday 4 July – Wednesday 6 July: 8h-19h

Thursday 7 July: 8h-15h

Friday 8 July: 8h-16h



Speakers preview room

The speakers preview room was located in Auditorium 2.

Speakers were requested to deliver their slides at least two hours prior to the presentation.

Pre-Conference School

A School, preceding the 20th IZC, was held in Valencia on Friday July 1st and Saturday July 2nd. The School aimed at spreading the knowledge and promoting discussion among young researchers, PhD and Post-doc students on the **fundamentals and applications of zeolites and other porous materials**. Researchers with expertise in different topics in the field contributed to the School with their lectures, and the attendees were invited to present posters that were exposed during the coffee and lunch breaks.

Speakers



Toru Wakihara
The University of Tokyo,
Japan



Rafael Gómez-Bombarelli
MIT, Cambridge, USA



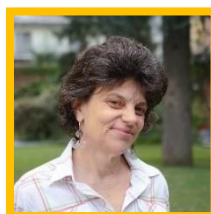
Tom Wilhammar
Stockholm University,
Sweden



Felipe Gándara
Materials Science Institute
of Madrid (ICMM-CSIC),
Spain



Sofía Calero
Eindhoven University of
Technology,
The Netherlands



Silvia Bordiga
University of Turin, Italy



Girolamo Giordano
University of Calabria, Italy



Anne Julbe
University of Montpellier,
France



Juan S. Martínez-Espín
Topsoe, Denmark



Filipa Ribeiro
Instituto Superior Técnico,
Portugal

School program

FRIDAY 1st JULY 2022

14:00-14:45	Registration
14:45-15:00	Opening
15:00-16:00	<i>Understanding and controlling zeolite synthesis</i> , by Toru Wakihara , Institute of Engineering Innovation, The University of Tokyo, Tokyo, Japan
16:00-17:00	<i>Predicting zeolite polymorphism from experimental and computational data</i> , by Rafael Gómez-Bombarelli , Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, USA
17:00-17:30	Coffee Break
17:30-18:30	<i>Structure determination of microporous materials at the atomic scale using electron microscopy</i> , by Tom Willhammar , Department of Materials and Environmental Chemistry, Stockholm University, Stockholm, Sweden
18:30-19:30	<i>From molecules to frameworks: The reticular approach in the design and discovery of new materials</i> , by Felipe Gándara , Materials Science Institute of Madrid (ICMM-CSIC), Madrid, Spain

SATURDAY 2nd JULY 2022

9:00-10:00	<i>Molecular simulation applied to porous materials</i> , by Sofia Calero , Department of Applied Physics, Eindhoven University of Technology (TU/e), The Netherlands
10:00-11:00	<i>Good practices in spectroscopic studies of Zeolites as catalysts</i> , by Silvia Bordiga , Department of Chemistry, NIS Centre of Excellence, University of Torino, Italy
11:00-11:30	Coffee Break / Poster session
11:30-12:30	<i>Zeolites and zeo-type materials for storage and conversion of CO₂ to valuable products</i> , by Girolamo Giordano , Department of Environmental and Chemical Engineering, University of Calabria, Italy
12:30-13:30	<i>Zeolite Membranes, from Synthesis to Application- Basics and Emerging Trends</i> , by Anne Julbe , Institut Européen des Membranes (IEM, UMR 5635 CNRS, ENCM, UM), Université de Montpellier, France
13:30-15:30	Lunch / Poster session
15:30-16:30	<i>An industrial view on the role of zeolitic materials towards #decarbonizing the production of chemicals and fuels</i> , by Juan S. Martínez-Espín , Biobased Chemicals R&D, Topsoe, Kongens Lyngby, Denmark
16:30-17:30	<i>Insights into zeolite confinement effect on bifunctional catalysis</i> by Filipa Ribeiro , CQE, Instituto Superior Técnico, Lisboa
17:30-18:00	Concluding remarks

School Venue

The School was held at ADEIT University-Enterprise Foundation of the University of Valencia, located in Virgen de la Paz Square, in the city centre.

<https://espacios.adeituv.es/en/>



Registration

Fees: 175 € (early bird – until May 31st), 225 € (standard)

Registration fees included coffee on both days and lunch on Saturday.

A total of **64** students attended the school.

Registered participants by country of affiliation

Spain	24	France	8	Japan	5	Italy	4
Brazil	4	USA	3	Germany	3	Slovenia	3
Portugal	2	Sweden	2	China	1	Finland	1
Czech Rep.	1	Netherlands	1	Poland	1	Switzerland	1
UK	1						

Grants

The **Italian Zeolite Association (AIZ)** offered two solidarity grants for Ukrainian PhD students and young researchers to attend the Pre-Conference School. These grants would cover the early registration fee. No applications were filed.

Conference Program

3 JULY		4 JULY				5 JULY			
		AUDITORIUM 1 (ROOM 1)	AUDITORIUM 2 (ROOM 2)	AUDITORIUM 3 (ROOM 3)	MEETING ROOM 1+2 (ROOM 4)	AUDITORIUM 1 (ROOM 1)	AUDITORIUM 2 (ROOM 2)	AUDITORIUM 3 (ROOM 3)	MEETING ROOM 1+2 (ROOM 4)
	9.00-9.20	Open Ceremony				AUDITORIUM 1 Plenary lecture 3: The impacts of new electron crystallographic techniques on developing nanoporous materials. Xiaodong Zou			
	9.20-9.40	AUDITORIUM 1 Plenary lecture 1: Zeolites and water. Impact on sorption and catalysis Johannes A. Lercher. Lecture “Fundación Ramón Areces”							
	9.40-10.00								
	10.00-10.20					O01.09	O04.09	O03.11	O02.09
	10.20-10.40	O01.01	O04.01	O03.01	O02.01	O01.10	O04.10	O03.12	O02.10
	10.40-11.00	O01.02	O04.02	O12.04	O02.02	O01.11	O04.11	O03.13	O02.11
	11.00-11.20	Coffee break				Coffee break			
	11.20-11.40	KN 1 Christian Serre	O04.03	O03.03	O02.03	O02.12	O04.12	KN 4 Ben Slater	O02.13
	11.40-12.00		O04.04	O03.04	O02.04	O01.12	O04.13		O02.14
	12.00-12.20	O01.03	O04.05	O03.05	O02.05	O01.13	O04.14	O03.14	O02.15
	12.20-12.40	O01.04	KN 2 Pablo Beato	O03.06	O02.06	O01.14	O04.15	O03.15	KN 5 Silvia Bordiga
	12.40-13.00	O01.05		O03.07	O02.07	O01.15	O04.16	O03.16	
	13.00-15.00	Free time for lunch							
	15.00-15.20	AUDITORIUM 1 Plenary lecture 2: Re-engineering of Zeolite Synthesis Tatsuya Okubo				AUDITORIUM 1 Plenary lecture 4: From fundamental understanding to NOx removal in automotive applications Peter N. R. Vennestrøm			
	15.20-15.40								
15.40-16.00									
Registration 16.00-19.00	16.00-16.20	O01.06	O04.06	O03.08	O02.08	O01.16	O03.17	O13.01	O02.16
	16.20-16.40	O01.07	O04.07	O03.09	KN 3 Russell E. Morris	O01.17	KN 6 Rafael Gómez-Bombarelli	O13.02	O02.17
	16.40-17.00	O01.08	O04.08	O03.10		O01.18		O13.03	O02.18
	17.00-17.30	Coffee break & poster session				INSIGHTS INTO SCIENTIFIC PUBLISHING Coffee break & poster session			
17.30-19.00									
Welcome Party 19.00-21.00									

	6 JULY				7 JULY				8 JULY			
	AUDITO- RIUM 1 (ROOM 1)	AUDITO- RIUM 2 (ROOM 2)	AUDITO- RIUM 3 (ROOM 3)	MEETING ROOM 1+2 (ROOM 4)	AUDITO- RIUM 1 (ROOM 1)	AUDITO- RIUM 2 (ROOM 2)	AUDITO- RIUM 3 (ROOM 3)	MEETING ROOM 1+2 (ROOM 4)	AUDITO- RIUM 1 (ROOM 1)	AUDITO- RIUM 2 (ROOM 2)	AUDITO- RIUM 3 (ROOM 3)	MEETING ROOM 1+2 (ROOM 4)
9.00-9.20	AUDITORIUM 1 Plenary lecture 5:				AUDITORIUM 1 Plenary lecture 6:				AUDITORIUM 1 Plenary lecture 7:			
9.20-9.40	Molecular diffusion as key for the understanding of gas separation through				Designing Zeolites with Reduced Diffusion Limitations through Knowledge and Manipulation of Diverse Crystallization Pathways				Will zeolite-based catalysis be as relevant			
9.40-10.00	MOF molecular sieve membranes Jurgen Caro and Jörg Kärger				Jeffrey D. Rimer				in future biorefineries as in crude oil refineries? 2.0 Bert F. Sels			
10.00-10.20	O01.19	O04.17	O10.01	O02.19	O01.25	O04.25	O08.01	O10.02	O06.01	O07.02	O08.09	O11.01
10.20-10.40	O01.20	O04.18	O09.01	O02.20	O01.26	O04.26	O08.02	O10.03	O06.02	O07.03	O08.10	O11.02
10.40-11.00	O01.21	O04.19	O09.02	O02.21	O01.27	O04.27	O08.03	O10.04	O06.03	O07.04	O08.11	O11.03
11.00-11.20	Coffee break				Coffee break				Coffee break			
11.20-11.40	KN 7 Heloise de Oliveira Pastore	O04.20	O09.03	O02.22	General Assembly				O05.01	O07.05	KN 11 Yu Wan	O12.01
11.40-12.00		O04.21	O09.04	O02.23					O05.02	O07.06		O12.02
12.00-12.20	O01.22	O04.22	O09.05	O02.24					O05.03	O07.07	O08.12	O12.03
12.20-12.40	O01.23	O04.23	KN 8 Philip Llewellyn	O02.25					O05.04	O07.08	O08.13	O01.32
12.40-13.00	O01.24	O04.24		O02.06					O07.09	O07.10	O08.14	O06.04
13.00-15.00	Free time for lunch											
15.00-15.20					O01.28	KN 9 Yoshihiro Kubota	O08.04	O10.05	KN 12 Michael Tsapatsis	O07.11	O06.05	O12.05
15.20-15.40					O01.29		O08.05	O10.06		O07.12	O06.06	O12.06
15.40-16.00					O01.30	O04.28	O08.06	O10.07	Concluding remarks			
16.00-16.20					O01.31	O04.29	O09.06	O10.08				
16.20-16.40	City tour 16:00 - 19:00h (Confirmation is required)				KN 10 Martin Schröder	O02.27	O08.07	O10.09				
16.40-17.00						O02.28	O08.08	O07.01				
17.00-17.30					Coffee break & poster session							
17.30-19.00												
20.00					Conference Banquet at Valencia Westin Hotel							
	Informal dinner at Masia Campo Anibal 20h Departure by coach from the venue to Campo Anibal for the Informal Dinner 20h30 Dinner at Campo Anibal 1h Departure by coach from Campo Anibal Included in the registration. Confirmation is required.				20h30 Departure by coach from the venue 21h Congress Dinner at The Westin Hotel Valencia Not included in the registration Confirmation is required. Its cost is 75€							

Registration

Full registration included morning & afternoon coffee breaks, Welcome Reception and Cultural Excursion, Delegate Bag and Program Guide. Conference dinner not included. Accompanying person registration included Welcome Reception and Cultural Excursion.

Registration fees

	Early Bird (closing 31 May)	Standard (from 1 June)	On-site (from 3 July)
Full registration	675 €	780 €	810 €
Student/concession full registration	335 €	370 €	400 €
Accompanying person		110 €	
Conference dinner		75 €	

Grants

The organizer of the 20th IZC offered a number of grants to help young researchers from less favored regions attending the meeting. The scholarships granted **full waiver of student registration fees** and **200 € travel allowance**. Applicants should present a communication at the conference. Up to **45 applications** were received and **15 scholarships** were granted. Awards were made by the Conference Secretary in consultation with the chair of the Scientific Committee.

Number of grants by nationality of awardee

Korea	3	China	2	Iran	2	Turkey	2
Brazil	1	Colombia	1	Guatemala	1	India	1
Poland	1	Slovakia	1				

Solidarity with Ukraine

Following the FEZA commitment to support scientific activities of Ukrainian researchers suffering from the war in Ukraine, the Organizing Committee launched the *IZC-2022 for Ukraine* initiative. Thus, **free registration** was offered to all attendees coming from Ukrainian Research Institutions and Universities.

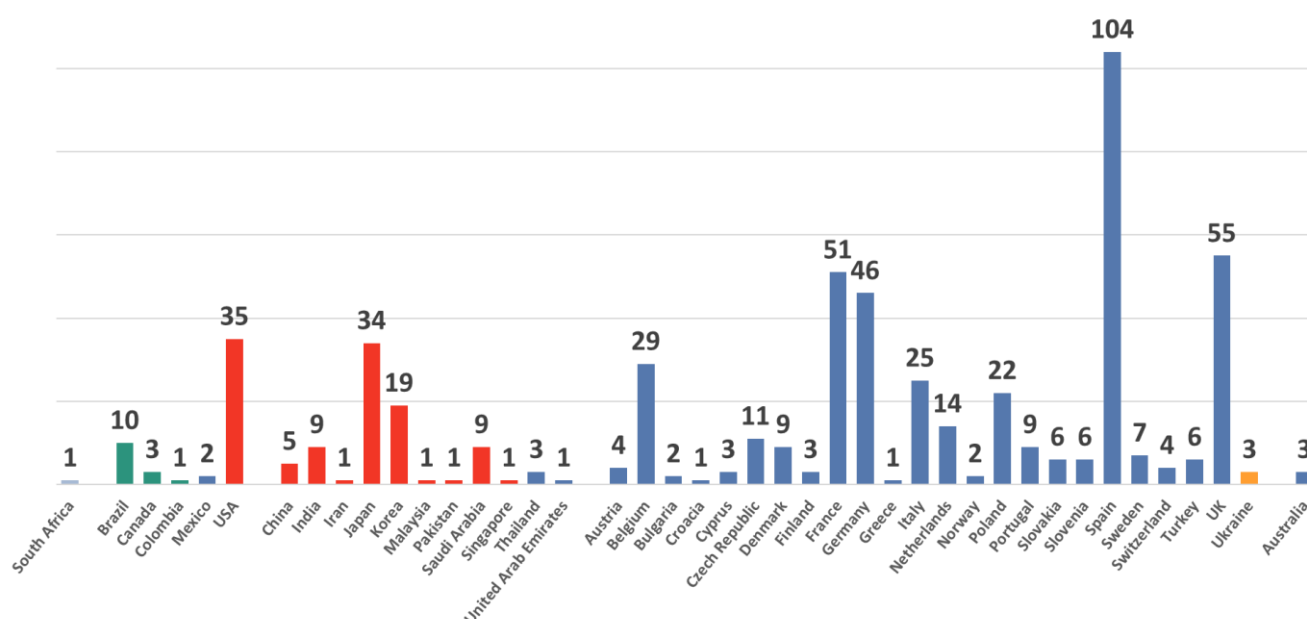
In response to this call, **3 Ukrainian researchers** filed an application and all were granted.

The **German Zeolite Association** also offered **two solidarity grants for Ukrainian PhD students and young researchers** to attend the Conference. Each grant was endowed with 500 € to cover the registration fee and a part of the costs for travel and/or accomodation. No applications were filed.

The figures

Student/concession full registrations	189
Student grants	15
Full registrations	287
<i>Solidarity with Ukraine</i> free registrations	3
IZA Honorary Member	3
Committee	15
Plenary Speaker	8
Keynote Speaker	12
Sponsor/exhibitor registrations	30
Accompanying person	7

Registrations by country of affiliation



Scientific Program

The theme of the 20th International Zeolite Conference was '**Porous materials, a tool for a Sustainable Development**'. The purpose of the Conference was to bring together academia and industry with the objective of exploring, reflecting and sharing ideas on the impact of research and technology on Porous Materials. The development of these materials and applications will require integrative research for a better understanding that will open their possibilities to contribute in the solution of present and future scientific and technological challenges.

Topics

The topics covered by the 20th IZC were:

- T1 Synthesis of porous solids: zeolites, mesoporous, MOFs and hybrid materials.
- T2 Advanced characterisation of porous solids.
- T3 Modelling and theoretical studies.
- T4 Reactivity studies in confined spaces. Catalytic applications.
- T5 Porous solids for sustainable energy production and storage.
- T6 Porous materials to avoid and remove by-products and pollutants.
- T7 Porous materials for biomass conversion.
- T8 Adsorption and separation.
- T9 Selective adsorption and separation of CO₂ and its transformation in valuable products. Decarbonization processes.
- T10 Multifunctional materials for catalysis.
- T11 Membranes.
- T12 Novel technological applications.
- T13 Natural zeolites.

Program overview

The Scientific Program extended from Monday morning to Friday evening, and included 7 Plenary Lectures, 12 Keynote Lectures, 168 Oral Presentations and 297 Poster Presentations. Each one of the 5 morning session and the afternoon sessions of Monday and Tuesday started with one of the Plenary Lectures. Keynote Lectures and Oral Presentations were distributed according to their respective topic in 4 parallel sessions each day. Posters were presented in 3 Sessions held in the evening of Monday, Tuesday and Thursday, after the Oral Sessions.

Plenary Lectures

- PL1 *Zeolites and water - Impact on sorption and catalysis.* **Prof. Johannes A. Lercher**, Technical University of Munich (Germany).
- PL2 *Re-engineering of Zeolite Synthesis.* **Prof. Tatsuya Okubo**, The University of Tokyo (Japan).
- PL3 *The impacts of new electron crystallographic techniques on developing nanoporous materials.* **Prof. Xiaodong Zou**, Stockholm University (Sweden).
- PL4 *From fundamental understanding to nox removal in automotive applications.* **Dr. Peter N. R. Vennestrøm**, Umicore Denmark ApS (Denmark).
- PL5 *Molecular diffusion as key for the understanding of gas separation through MOF molecular sieve membranes.* **Prof. Jurgen Caro**, Leibniz University (Germany) & **Prof. Jörg Kärger**, Leipzig University (Germany).
- PL6 *Designing zeolites with reduced diffusion limitations through knowledge and manipulation of diverse crystallization pathways.* **Prof. Jeffrey D. Rimer**, University of Houston (USA).
- PL7 *Will zeolite-based catalysis be as relevant in future biorefineries as in crude oil refineries? 2.0.* **Prof. Bert F. Sels**, Katholieke Universiteit Leuven (Belgium).

Plenary Speakers



Johannes Lercher

Johannes Lercher studied Chemistry at the Technische Universität Wien, graduating in 1978. He completed doctoral studies with Prof. Heinrich Noller in 1980. 1982, he spent at Yale University working with Prof. Gary Haller. After returning to the TU Wien he was Assistant and Associate Professor up to 1993. During the following five years (1993-1998) he was Professor of Chemical Technology at the University of Twente, Netherlands. In 1998

he was appointed as Professor of Chemistry at the Technische Universität München as. Since 2011 he is also the Director of the Institute of Integrated Catalysis and Battelle Fellow at the Pacific Northwest National Laboratory.

Prof. Lercher's research addresses fundamental aspects of catalysts and catalyzed reactions that enable catalysis to lower the carbon footprint via radically new approaches to synthesize energy carriers and chemical intermediates. Aiming to catalyze chemical conversions at significantly lower reaction temperatures and with higher selectivity than currently possible, the steric and chemical environment of sites and as a consequence the excess chemical potentials along a reaction path are used as guiding principle to synthesize novel catalysts



Tatsuya Okubo

Tatsuya Okubo is Executive Vice President and Professor of Chemical System Engineering at The University of Tokyo (UTokyo). He received his BS, MS and PhD degrees from UTokyo in 1983, 1985 and 1988, respectively. He started his academic career as Research Associate at Kyushu University in 1988, and then moved to UTokyo in 1991. He was promoted to Assistant Professor, Associate Professor and Full Professor in 1994, 1997 and 2006, respectively. He spent one year at California Institute of Technology as Visiting Associate of Prof. Mark E. Davis Group in 1993 – 1994, where he started the work on zeolite. He has been Professor of Presidential Endowed Chair for “Platinum Society” since 2012. Prof. Okubo served as Dean of Engineering at UTokyo in 2017 – 2020, and was appointed as Executive Vice President in April 2020. His research has been focused on science and engineering of nanoporous materials, particularly in the area of synthesis and application of zeolites. Prof. Okubo is an internationally well-renowned academician for his scholarly achievements, and has been recognized by awards such as the SCEJ Award from the Society of Chemical Engineers, Japan (SCEJ). He has achieved many domestic and international collaborations with both academic and industrial partners. He was a former council member of International Zeolite Association (2010 – 2016) and former President of Japan Zeolite Association (2018 – 2020). He is Fellow of SCEJ and a member of Engineering Academy of Japan. In addition, he has been a science advisor of Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan since 2018. Prof. Okubo has published more than 350 research publications in international journals, and is an inventor on more than 110 patents.



Xiaodong Zou

Professor Xiaodong Zou

Xiaodong Zou is a full professor and deputy head of the Department of Materials and Environmental Chemistry, Stockholm University. She received her B.Sc. in Physics at Peking University in 1984, and Ph.D. in structural chemistry at Stockholm University in 1995. After a one-year postdoc at Lund University in Sweden, she joined the faculty at Stockholm University in 1996 as an assistant professor, and became professor in structural chemistry 2005. Xiaodong Zou has made important contributions in the development of electron crystallographic methods. Her group has developed several image and diffraction-based methods and software for accurate atomic structure determination of unknown crystals, and solved many complex structures, especially porous materials such as zeolites and metal-organic frameworks. She is the founder of the Berzelii Center EXSELENT on Porous Materials. She is a council member of the International Zeolite Association and a member of the Structure Commission of International Zeolite Association. She has co-authored over 350 peer-reviewed publications, and given more than 200 invited talks. She received several prestigious awards given by the Royal Swedish Academy of Sciences, and is an elected member of the Royal Swedish Academy of Sciences (KVA), the Royal Swedish Academy of Engineering Sciences (IVA), a fellow of the Royal Chemistry Society (FRCS), UK.



Peter N. R. Vennestrøm

Peter N. R. Vennestrøm is a R&D Senior Manager at Umicore working in Automotive Catalysis and New Business Incubation. He received his B.Sc. and M.Sc. from the Technical University of Denmark in Chemistry specializing in Catalysis and Nanotechnology. He later carried out Industrial PhD work at the Politechnic University of Valencia together with the company Haldor Topsøe A/S under the supervision of Prof. Avelino Corma. Afterwards Peter undertook several positions at the

R&D facilities of Haldor Topsøe A/S in Denmark within environmental, refinery and renewable catalysis areas. Since the end of 2017 Peter has served as Principal Scientist and Senior Manager at Umicore working on fundamental and applied research for use in emission control catalysis and new business incubation projects. The research has always been focused on zeolites and catalyst formulation in close collaboration with strategic university partners.

Together with research partners Peter has published more than 40 scientific articles in international peer-reviewed journals including perspective article in Science and several articles in Angewandte Chemie, ACS Catalysis etc. He is also the inventor of 16 (currently published) patents or patent application families. His research interest lies in the collaborative efforts to design, understand and use of materials, and in particular zeolites, for sustainable and environmental solutions.



Jörg Kärger

Jörg Kärger graduated in Physics at Leipzig University (Diploma 1967, PhD 1970, Habilitation 1978) where, in 1994, he became full chair of Experimental Physics/Interface Physics. His research activities have been dedicated to the study of diffusion phenomena in general and the development of new experimental techniques for studying diffusion in nanoporous materials and continued unabatedly after his retirement in 2009. He has published several books, including

Diffusion in Condensed Matter (Springer 2005, with Paul Heitjans), *Leipzig, Einstein, Diffusion* (Leipziger Universitätsverlag 2007) and *Diffusion in Nanoporous Materials* (Wiley-VCH 2012, with Douglas Ruthven and Doros Theodorou), which became standard in the field.

His most recent book on *Diffusive Spreading in Nature, Technology and Society* (Springer 2018, with Armin Bunde, Jürgen Caro and Gero Vogl) introduces into diffusion processes as a ubiquitous phenomenon of truly interdisciplinary relevance and won the Literature Prize of the Fund of Chemical Industry 2019. His work has been recognized by numerous awards, including the Donald W. Breck Award for zeolite research, the Max Planck Research Prize, election to the Saxon Academy of Sciences and most recently, jointly with Jürgen Caro, the Eni Award for “Advanced Environmental Solutions”. Exotics among his more than 600 publications are entries in the Guinness book of records with the largest orchestra of bicycle bells and a computer game, attained during the Physics Sunday Lectures at Leipzig University.



Jürgen Caro

EDUCATION

1970 - 1974 Studying Chemistry at Leipzig University 1974 - 1977 Dr. rer. nat., Leipzig University (mentor: J. Kärger, summa cum laude) 1989 Dr. sc. nat. Academy of Sciences of German Democratic Republic (East Germany, DDR) 1992 Dr. rer. nat. habil., Leipzig University

WORK EXPERIENCE

1977-1991 Central Institute of Physical Chemistry of Academy of Sciences of German Democratic Republic (East Germany, DDR) in Berlin-Adlershof in different positions, working fields Adsorption, Catalysis, Membranes 1992-2001 Department Leader at the newly founded Institute of Applied Chemistry in Berlin-Adlershof in the fields of inorganic and polymer materials, functional materials, reaction engineering 2001 – 2021 Full professor (W3) for Physical Chemistry in the Institute of Physical Chemistry and Electrochemistry at the Leibniz University Hannover. Research on nanoporous materials such as zeolites, MOFs, COFs and their evaluation as membranes, catalysts and adsorbents.

AWARDS AND HONORS

2013 Breck Award of the International Zeolite Association
2013 Ostwald Medal of the Saxon Academy of Sciences
2016 Appointment as Corresponding Member of the Saxon Academy of Sciences
2019 Literature Price for the best book in chemistry: A. Bunde, J. Caro, J. Kärger, G. Vogl "Diffusive Spreading in Nature, Technology and Society"
2020 ENI Award for "Advanced Environmental Solutions" together with J. Kärger (Univ. Leipzig)
2021 One of the thousand most cited scientists over all disciplines worldwide for the last 10 years

TITLES

Dipl.-Chem., Dr. rer. nat., Dr. sc. nat, Dr. rer. nat habil.

POSITIONS

2001–2012 Director of the Institute of Physical Chemistry and Electrochemistry of Leibniz University Hannover
2013-2016 Guest Professor at the Chinese Academy of Sciences, Ningbo Institute
2013-2017 Part-time Professor of the University Panjin, China
2013-2017 Visiting Professor at Dalian University of Technology, China
2016-2020 Chairman of the Society of German Chemists, Hannover region
Since 2018 Distinguished Professor at South China University of Technology



Jeff Rimer

Professor Jeff Rimer is the Abraham E. Dukler Endowed Chair of Chemical Engineering at the University of Houston. He received B.S. degrees in Chemical Engineering and Chemistry from Washington University in St. Louis and Allegheny College, respectively. He was awarded a Ph.D. in Chemical Engineering from the University of Delaware and spent two years as a postdoctoral fellow at New York University prior to joining Houston in 2009 where he is now a Full Professor. His research focuses on elucidating fundamental mechanisms of

zeolite crystallization and applying these understandings to the design and synthesis of nanosized and hierarchical materials with tailored physicochemical properties. Prof. Rimer's research group examines crystal growth using unique tools such as high temperature in situ atomic force microscopy. His work is largely directed to the preparation of zeolite catalysts for various hydrocarbon upgrading reactions with an emphasis on controlled acid siting and novel approaches to reduce diffusion limitations.

Prof. Rimer serves as Treasurer in the International Zeolite Association council and also Co-Chairperson of the Synthesis Commission. He is a Senior Member of the National Academy of Inventors (NAI), an executive committee member of the Association for Crystallization Technology, former chair of the Southwest Catalysis Society, and chair of two Gordon Research Conferences on Crystal Growth & Assembly and Nanoporous Materials & Their Applications. He has received numerous awards that include the National Science Foundation CAREER Award, the 2016 Owens Corning Early Career Award and 2017 FRI/John G. Kunes Award from American Institute of Chemical Engineers (AIChE), and the inaugural 2016 Mellichamp Emerging Leader Lecturer at the University of California at Santa Barbara. In 2018 he received the Norman Hackerman Award in Chemical Research from The Welch Foundation, and in 2020 the Edith and Peter O'Donnell Award in Engineering from The Academy of Medicine, Engineering & Science of Texas (TAMEST). Prof. Rimer is an Associate Editor of *Crystal Growth & Design* (American Chemical Society) and also serves on the advisory boards for the *AIChE Journal*, *Molecular Systems Design & Engineering*, and *Reaction Chemistry & Engineering*.



Bert F. Sels

Bert F. Sels (1972), full professor at KU Leuven, obtained his Ph.D. in 2000 in the field of heterogeneous oxidation catalysis under the guidance of professor Pierre Jacobs. He was awarded the DSM Chemistry Award in 2000, the Incentive Award by the Belgian Chemical Society in 2005, and the Green Chemistry Award in La Rochelle in 2015. He is currently director of the Centre for Sustainable Catalysis and Engineering (CSCE) at the Faculty Bioscience Engineering at KU Leuven, Belgium.

His research activities encompass future challenges along the sustainable transition of the industrial organic chemistry with focus on utilization of renewable carbon. He has more than 380 peer reviewed papers, an h index of 92 and more than 30000 citations (google scholar), and he wrote more than 30 patents. He is listed as 'highly cited researcher' on the global Clarivate list (2021).

His research expertise includes catalysis in biorefinery and biofactory processes, the design of hierarchically porous materials, spectroscopy and kinetics for mechanism clarification and active site identification.

He was appointed member of the Research Council of the University. He is co-chair of the Catalysis Commission of the International Zeolite Association (IZA) and co-founder of the European Research Institute of Catalysis (ERIC). He is elected member of the European Academy of Sciences and of the Arts and Academia Europaea, visiting professor in the Chinese Academy of Sciences, international board member of ChemSusChem (Wiley), ChemCatChem (until 2021, Wiley), and currently associate editor of ACS Sustainable Chemistry & Engineering (ACS).

You can discover more details of his research at <http://www.sels-group.eu/>

Keynote Lectures

- KN1 *Robust metal organic frameworks: from synthesis, scale-up, shaping to industrial applications.* **Christian Serre**, Institut des Matériaux Poreux de Paris (France).
- KN2 *Advances in structure–catalytic performance relationships of zeolites.* **Pablo Beato**, Topsoe (Denmark).
- KN3 *The surprising room temperature lability of zeolites in contact with liquid water: what does it mean for how we view zeolites?* **Russell E. Morris**, University of St Andrews (UK).
- KN4 *Data learning approaches to identifying outstanding porous materials for chemical transformations and separations.* **Ben Slater**, University College London (UK).
- KN5 *Copper speciation in Cu-zeolites through the eye of a spectroscopist.* **Silvia Bordiga**, University of Turin (Italy).
- KN6 *Controlling zeolite polymorphism with simulations, big data and machine learning.* **Rafael Gomez-Bombarelli**, Massachusetts Institute of Technology (USA).
- KN7 *Organofunctionalization of SAPO-5 in dry and wet environments: does it make a difference in its catalytic behavior?* **Heloise de Oliveira Pastore**, University of Campinas (Brazil).
- KN8 *Selective adsorption and separation of CO₂ and its transformation into valuable products.* **Philip Llewellyn**, TotalEnergies (France).
- KN9 *Approach for the site-selective introduction of Ti atoms into MSE and YFI zeolite frameworks and the framework stabilization.* **Yoshihiro Kubota**, Yokohama National University (Japan).
- KN10 *Metal-organic framework materials for capture and catalysis of toxic and fuel gases.* **Martin Schröder**, University of Manchester (UK).
- KN11 *Exploiting rapid cycle kinetic separations with flexible zeolite ITQ-55.* **Yu Wang**, ExxonMobil Technology and Engineering (USA).
- KN12 *New MFI morphologies for membranes and catalysis.* **Michael Tsapatsis**, Johns Hopkins University (USA).

Abstracts

The figures

Abstracts submissions	584
Abstracts submitted for oral presentation	391
Oral presentations accepted	168
Poster presentations accepted	296

Remarks

43 abstracts withdrawn due to COVID-19 travel restrictions from China

77 abstracts withdrawn for failure to register

Abstract Process

Abstract submission opened on January 17th 2022. Initially planned to close on March 20th, there was an extension until April 14th.

Notification to authors were sent on May 16th.

Recent Research Reports submission opened on May 20th to be presented as Poster.

RRR abstracts submitted until June 15th were included in the Book of Abstracts.

Final abstract acceptance and publication in the Book of Abstracts required the presenting author to be registered.

Review

Peer review of all abstract was undertaken by the 20th IZC International Scientific Committee. Abstracts were allocated taking into account their scientific quality and the balance of the program.

Presentation

Authors were notified by e-mail of their abstract acceptance, the presentation format, either oral or poster, presentation code number, ID of presentation session, room, date and time of presentation. Oral presentations were set for 15 min, plus 5 min discussion time. Posters should be static A0 size (841 mm width x 1189 mm height).

Book of abstracts

Abstracts of Plenary Lectures, Keynotes, Oral Presentations and Poster Presentations were collected in the Book of Abstracts and published on-line in the Conference web site. The Book of Abstract was assigned International Standard Book Number (ISBN) 978-84-09-42100-8.

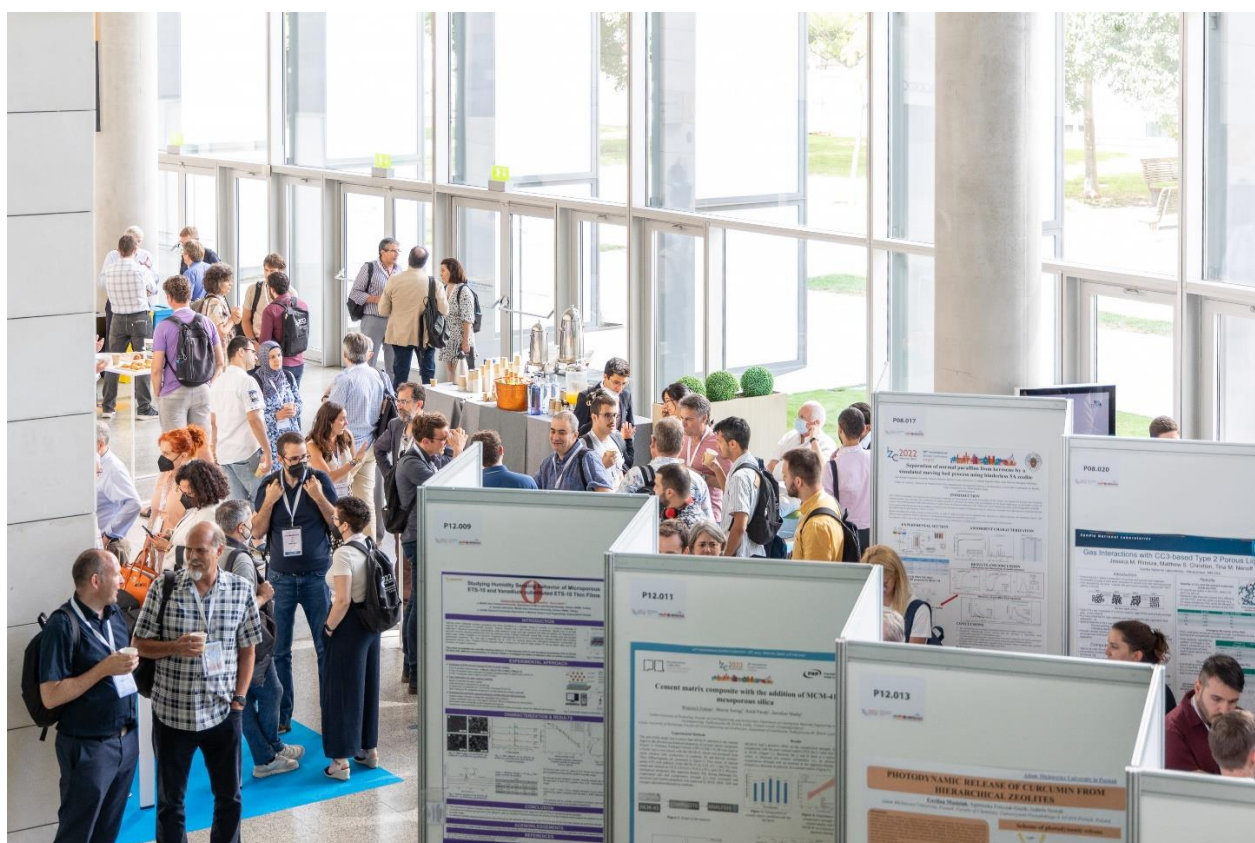


Poster sessions

Posters were displayed in the exhibition hall alongside the exhibition booths and coffee breaks area. Posters were displayed during the day of the corresponding Poster Session. Authors were asked to stand by their posters during the corresponding session to allow for delegates to engage in discussion.

Poster sessions schedule

- Poster Session 1: Monday 4th, 17:00 to 19:00
Hang poster: Monday 4th at 11:00
Remove poster: before Tuesday 5th at 11:00
- Poster Session 2: Tuesday 5th, 17:00 to 19:00
Hang poster: Tuesday 5th at 11:00
Remove poster: before Wednesday 6th at 11:00
- Poster Session 3: Thursday 7th, 17:00 to 19:00
Hang poster: Thursday 7th at 11:00
Remove poster: before Friday 8th at 11:00



Exhibition

Trade exhibition from Monday 4th to Thursday 7th 8:00-19:00, Friday 8th 8:00-15:00.

Exhibition Floorplan



Exhibitor	Stand
Pfeiffer Vacuum	1
Surface Measurement Systems	2
Tatva Chintan Europe	3
Anton Paar	4
Hidden Analytical	5
Hidden Isochema	6
VSK PRO – ZEO	7
Iberfluid	8
Microtrac Retsch	9
Malvern Panalytical	10



Accommodation

Valencia is a city that offers a wide range of accommodation options, with a huge diversity of rates and prices. Rooms were block-booked in a range of hotels close to the Congress venue for the dates from July 2nd to 8th.

HOTEL	DISTANCE	DSU	DOUBLE
Sercotel Sorolla Palace (4*)	180m	154€	165€
Meliá Valencia (4*)	300m	140€	155€
Ilunion Valencia (4*)	800m	116€	127€

**Breakfast and VAT included*

Other recommended options were:

HOTEL	*	Distance to the venue
Hotel Eurostars Gran Valencia	****	900 m
Hotel NH Center	****	2,7 km
Hotel One Shot Palacio Reina Victoria	****	4,8 km
Hotel Barceló Valencia	****	7,1 km

HOTEL	*	Distance to the venue
Ilunion Valencia 3	***	1,0 km
Hotel AD HOC Monumental	***	5,3 km
Expo Hotel Valencia	***	2,1 km

HOSTELS	Distance to the venue
Russafa Youth Hostel	5,4 km
Urban Youth Hostel	8,3 km
The River Hostel	5,1 km

Social Program

Welcome Reception

At the Conference Venue
Sunday 3 July, 19:00 to 21:00
Included in registration

City Tour

Wednesday 6 July, 16:00 to 19:00
Included in registration

Conference Banquet

At Valencia Westin Hotel
Thursday 7 July, 21:00
Not included in registration
Tickets could be purchased for 75 €

Informal Dinner

At Masia Campo Anibal
Wednesday 6 July, 20:30
Included in registration

The figures

Welcome Reception	300
City Tour	350
Informal Dinner	440
Conference Banquet	263



Sponsors

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Conference App

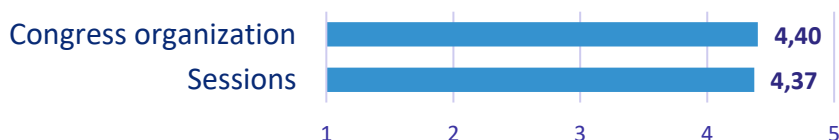
Dowloading of the 20th IZC smartphone app was recommended to all attendees. It provided most updated information on conference and social program.



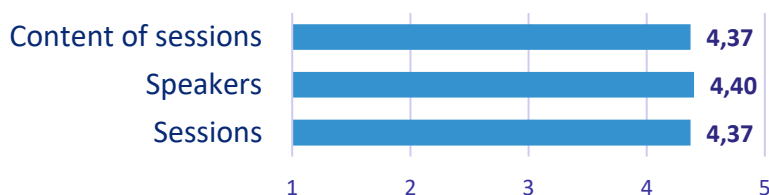
Satisfaction Survey

After the conference, attendees were requested to complete a satisfaction survey that was available from July 12th to September 17th, which resulted in a 39% response rate.

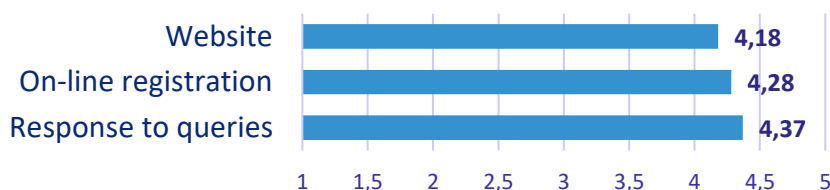
General feedback (rate 1-5)



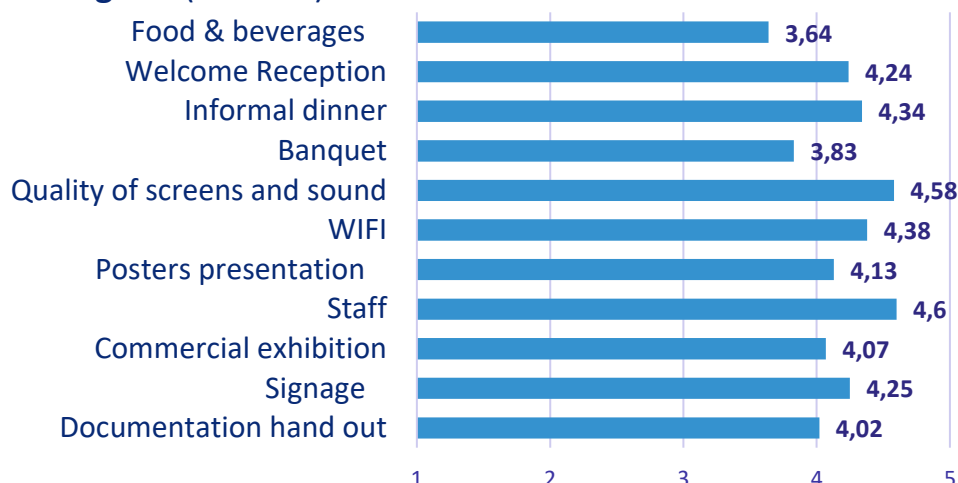
Scientific Programme (rate 1-5)



Pre-congress (rate 1-5)

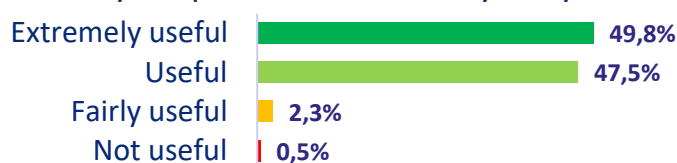


During the congress (rate 1-5)

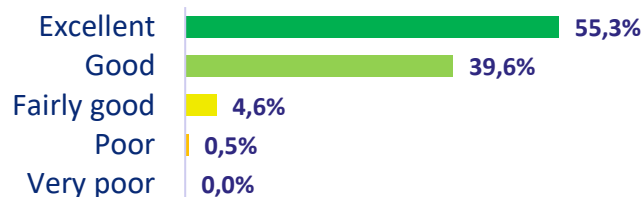


Quality of the event

- How useful for your professional activity did you find this event?

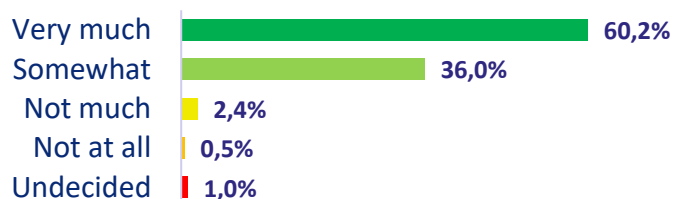


- What was your overall impression of this event?

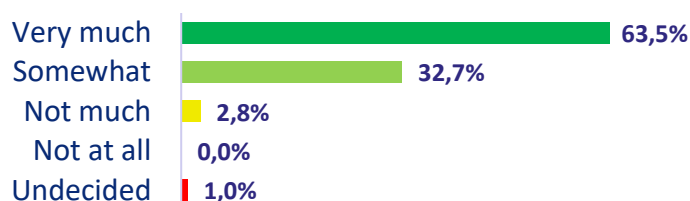


Relevance of the event

- Did the event fulfil your educational goals and expected learning outcomes?

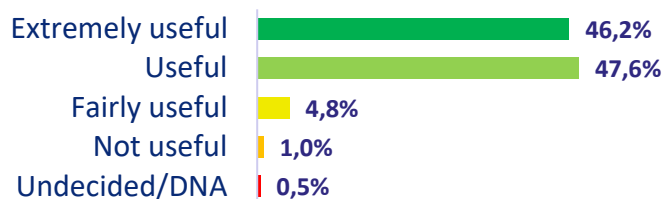


- Was the presented information well balanced and consistently supported by a valid scientific evidence base?

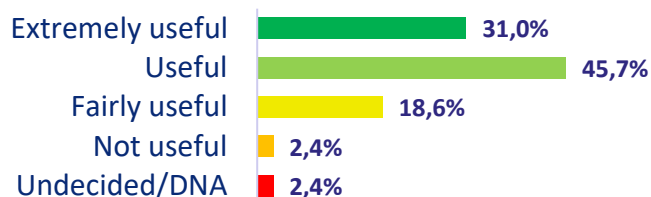


Relevance of the sessions

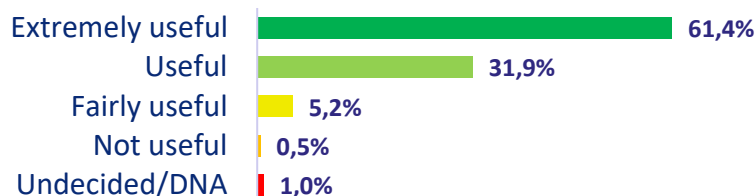
- How useful to you personally was each oral session?



- How useful to you personally was each poster session?

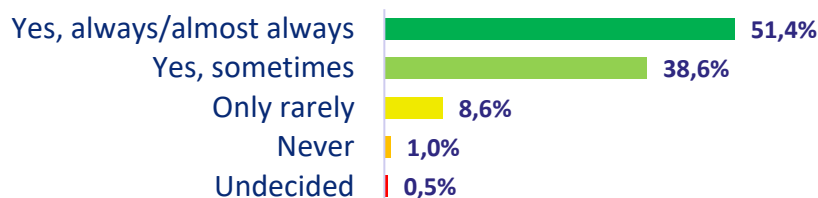


- How useful to you personally were the plenary lectures?



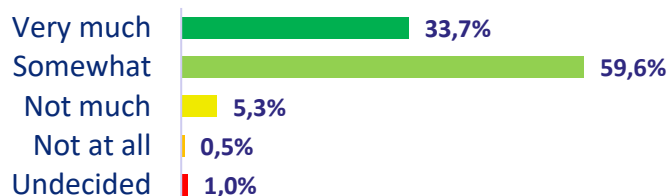
Suitability of formats used during the event

- Was there adequate time available for discussions, questions & answers and learner engagement?



Ways the event affects your daily practice

- Will the information you learnt be implemented in your practice?



Certificates

Attendance certificates were sent in electronic format by e-mail after the satisfaction survey was filled in.

Certificates of presentation were also sent by e-mail to the corresponding author, after the Conference.

IZA General Assembly

The IZA General Assembly was held on Thursday 7 July from 11:20 to 13:00 at Auditorium 1. The scientific program was adjusted to avoid any sessions to take place during this time.

Seven new members were elected to the IZA Council being:

Rob Ameloot (Belgium), Roger Glaeser (Germany), Tina Nenoff (USA), Sibeles Pergher (Brazil), Domenico Caputo (Italy), Manuel Molinar (Spain), Natasa Z. Logar (Slovenia)

The officers are:

President: Svetlana Mintova, Vice President: Michael Stockenhuber, Treasurer: Jeffrey Rimer, Secretary: Natasa Z. Logar.

The venue for the 22nd IZC in 2028 was confirmed: Philadelphia (USA).

Awards:

The Breck Awardee was **Prof. Suk Bong Hong (POSTECH, Korea)** for developing innovative synthetic methodologies including the synergistic use of organic and inorganic structure-directing agents that resulted in new zeolite framework types.

The IZA Award was given to **Prof. Valentin Valtchev (CNRS, France)**, for his contributions to the fundamental understanding of zeolite synthesis and post-synthesis modification of industrially-important zeolites. Prof. Valtchev will act as the IZA Ambassador from now until the next IZC in 2025.

The 2022 Young Researcher Award (YRA) was given to **Michiel Dusselier (KU Leuven, Belgium)** for his achievements in the knowledge-based development of catalyst for innovative catalytic conversion processes.

Finally, the new IZA Honorary Memberships were:

- **Jean-Pierre Gilson (LCS, ENSICAEN, France)**, for his outstanding contribution to zeolite science and technology and for the great service in the organization IZA-related events.
- **Avelino Corma (ITQ-Valencia, Spain)**, for his outstanding contributions to zeolite science and technology and his great service as chairman of IZC2022.