



# 10<sup>th</sup> World Congress of Chemical Engineering

10<sup>th</sup> World Congress  
**OF CHEMICAL  
ENGINEERING**

11<sup>th</sup> European Congress  
**OF CHEMICAL  
ENGINEERING**

4<sup>th</sup> European Congress  
**OF APPLIED  
BIOTECHNOLOGY**

Chemical  
and Biochemical  
Engineering in a  
Global World:  
**Solutions  
4 Global  
Challenges**

A place  
for all the  
Chemical and  
Biochemical  
engineering  
community

**STUDENT  
CONFERENCE  
PROGRAM**

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# 10<sup>th</sup> World Congress of Chemical Engineering

## ► Promoters



WORLD CHEMICAL ENGINEERING COUNCIL  
(WCEC) - WCCE

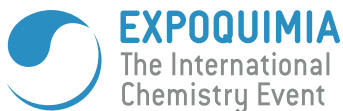


EUROPEAN SOCIETY OF BIOCHEMICAL  
ENGINEERING SCIENCES (ESBES) - ECAB



EUROPEAN FEDERATION OF CHEMICAL  
ENGINEERING (EFCE) - ECCE

## ► Congress Partner



EXPOQUIMIA.  
THE INTERNATIONAL CHEMISTRY EVENT

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# Welcome

On behalf of the organizing and students' committees is a great pleasure to welcome you to Spain and the Student Conference of the WCCE10. Barcelona is a city with a very rich cultural heritage, great diversity and unwavering joie de vivre. It is a fitting venue for this conference with a full week with Science, Industry and Society inspiring the Future.

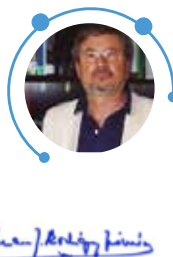
This conference represents a unique opportunity to join scholars from Chemical Engineering and other related areas coming from different countries. The Program includes a wide diversity of activities of academic, scientific and professional interest as well as the necessary space for entertainment. We will enjoy a number of lectures and workshops dealing with selected topics relative to current scientific and professional challenges. The world Chem-E-Car® competition organized by AIChE, one of the stars of this conference, combines science, engineering and entertainment for the sake of demonstrating the value of collective projects joining enthusiastic young people. Two other competitions are scheduled, consisting on a presentation of posters with research results and a Chemical Engineering Quiz. These three competitions have fairly attractive awards. Tours to industrial plants in the areas of Barcelona and Tarragona as well as to selected stands of Expoquímia have been also organized as part of the Program.

Barcelona is a beautiful city plenty of history, art and curiosities. Therefore we have included touristic visits to enjoy its most attractive places, be sure to take your time to find out what makes Barcelona so special. And, of course, the agenda includes a party where all of you will have the opportunity to enjoy and do networking, one of the important objectives of the conference.

We hope you will enjoy the conference and Barcelona. The members of the committee will be ready to provide you any help you may need. And, we thank every one of you for joining us.



Prof. Carlos Negro  
Chairman of WCCE10



Prof. Juan J. Rodriguez  
Chairman of the Students Program

# Committee

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Spain, ES

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# Sponsors

## ► Main Congress Partners



## ► Gold Sponsors



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► Global Grand Challenge Sponsor: Energy



► Chem-E-Car Competition Sponsor



► Others

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► Supporters



# Speakers ▶ Keynotes



**Water and energy.**  
**Saturday, September 30<sup>th</sup>**  
**Room C1 - 10:10h**  
**Victor Monsalvo**  
 Head of Eco-Efficiency at FCC Aqualia

## ▶ CV

Victor Monsalvo is Head of the Eco-efficiency Area at the Innovation and Technology Department of FCC Aqualia. Before, he had been Head of the Technological Area of Water in Abengoa Research. He got his PhD on Chemical Engineering from the Universidad Autonoma de Madrid, where he became Assistant Professor. His research activity deals with water and wastewater treatment and reuse, membrane-based technologies and value products recovery.

## ▶ Abstract

There is a growing understanding of the tight relationships between water/wastewater management and energy balance. Where are the opportunities to address the water-energy nexus? Cities and industries are starting initiatives for a better use of available water through investing in efficiency, reuse and value products recovery. An appraisal and current novel perspective towards market replication of breakthrough technologies will be presented. and recent promising solutions will be discussed to face current challenges.



**Soil remediation.**  
**Sunday, October 1<sup>st</sup>**  
**Room C1 - 11:45h**  
**Peter Jaffe**

Princeton University

## ▶ CV

Peter R. Jaffe is Professor of Civil and Environmental Engineering and Associate Director for Research at the Andlinger Center for Energy and the Environment, both at Princeton University. He was appointed as Board Certified Member of the American Academy of Environmental Engineers by Eminence. His research interests relate to the processes governing the transport and transformation of pollutants in the environment and their application towards the remediation of contaminated systems.

## ▶ Abstract

This lecture will focus on methodologies for immobilizing and/or mobilizing trace metals/radionuclides in soils/groundwater via chemical and/or biological methods. Organic contaminants in soils/ground waters are usually either flushed or degraded. Degradation requires the manipulation of proper redox conditions to allow autochthonous microorganisms to degrade the compound. In selected cases the subsurface can be bioaugmented with organisms capable of degrading a specific contaminant. Examples of these degradation strategies will be reviewed.



## ► Workshops



**Build Your Leadership Skills with  
AIChE Student Membership.**  
**Saturday, September 30<sup>th</sup>**  
**Room C1- 11:30h**  
**Sarah Ewing**  
AIChE Student Chapter

### ► CV

Sarah is a Senior Member Associate for AIChE and she is responsible for managing student membership benefits, community, conferences, and competitions.

### ► Abstract

The American Institute of Chemical Engineers is the global home of chemical engineering professionals, with more than 50,000 members from 100 countries around the world. This workshop will be given by Sarah Ewing, who coordinates all of the AIChE undergraduate student membership benefits. Sarah will review the benefits of AIChE student membership and how membership opens the door to valuable volunteer leadership opportunities that will look great of your résumé and carry over throughout your career. Sarah will also give examples of ways that students can volunteer within AIChE, and how to effectively use volunteer leadership experience to set yourself apart in job interviews.



**Beer homebrewing**  
**AIChE Chapter Barcelona**  
**Saturday, September 30<sup>th</sup>**  
**Room C1 - 12:15**  
**Alex Parraga, Carla Ramos, Ferran Valls, Victor Capdevila**  
Chemical Engineering students, Spain.

### ► CV's

**Alex Parraga** is a 4th year student of Chemical Engineering at Universitat Politècnica de Catalunya. He has been working for over a year on a pilot plant project for beer production. He is interested on the field of industrial control and automation.

**Carla Ramos** is 4th year student of Chemical Engineering at Universitat Politècnica de Catalunya. She has been working on the beer project for more than a year, seeking to develop a pilot plant with the help of her colleagues. She is also interested in the fields of process simulation.

**Ferran Valls** loves the chemistry of things. He is a 4th year student of Chemical Engineering at Universitat Politècnica de Catalunya. He is characterized by his desire to learn and his perseverance to solve the problems. He is interested in the food sector and the production processes in the related industries.

**Victor Capdevila** is taking the 4th year of Chemical Engineering at Universitat Politècnica de Catalunya. He is enthusiastic about craft beer, beer varieties and beer tasting. He enjoys making his own beer with his colleagues and improving recipes.

### ► Abstract

Homebrewing is fun and it has recently become fashionable. However, brewing is a complex biotechnological engineering process, a challenge for Chemical Engineers! This workshop will briefly introduce the main aspects of the brewing process and the experience of producing your own beer at the campus.



#### ► CV

Laura Escabias is Graduate in Psychology and Master in Human Resources by the Universidad Pontificia de Comillas. She worked formerly for Integra Foundation, dedicated to the integration of collectives at risk of social exclusion and people with disabilities. Then, she joined AstraZeneca Pharmaceutical Spain, managing the recruitment processes for trainee positions and supporting the Talent and Development area.

#### How to write a successful CV.

**Saturday, September 30<sup>th</sup>**

**ROOM C1 - 15:00h**

**Laura Escabias**

RRHH en AstraZeneca Spain

#### ► Abstract

The main purposes of this workshop are learning how to elaborate a successful resume and how to face a job interview taking into account this 2.0 reality that we live in. As we dig deeper into our self-knowledge through some tools, we will be able to design our professional profile based on our competencies. In this way, we will describe the talent profile of the current job market so we can adjust our competencies and improve our employability. Some tips, some do's and don'ts to enhance ourselves on our leap into the professional world.



#### From leadership to undertaking.

**Sunday, October 1<sup>st</sup>**

**ROOM C1 - 11:00h**

**Jesús Arauzo**

Universidad de Zaragoza

#### ► CV

Jesus Arauzo is Professor of Chemical Engineering at the University of Zaragoza (Spain), where he is Director of the International Transfer Technology Office and co-founder of the Aragón Institute for Engineering Research (I3A). He was the Manager of the Energy Program of the Spanish National R&D Plan and has been Director of the Chemical Engineering Tech. (Water & Hydrogen) of ABENGOA Research S.A. His research activity is related to the thermochemical conversion of biomass and industrial residues.

#### ► Abstract

Recent reports remark that 85% of the future careers are yet to be developed. To face this huge challenge it becomes a need, from a point of view of self-leadership and thus, professionally, to encourage undertaking. The research task is an ideal platform where these merge, as it is necessary to lead innovative changes and build-up new projects looking towards the future to generate value for the welfare of society. During the workshop there will be a realistic analysis on the challenges of the process "From leadership to undertaking" and how to face the obstacles in the way.

# Speakers



**Chemical Engineering and Sustainability.**

**Sunday, October 1<sup>st</sup>**

**ROOM 1 - 11:45h**

**Richard Darton**

University of Oxford, UK

## ► CV

Richard Darton is Emeritus Professor of Engineering Science at the University of Oxford and co-director of the Oxford Geoengineering Programme. He has been President of IChemE (Institution of Chemical Engineers) and chaired the EFCE Working Party on Fluid Separations. He is a Fellow of the Royal Academy of Engineering. In 2011 he received the Order of the British Empire (OBE). His research areas include dynamic surface effects at gas/liquid interfaces.

## ► Abstract

Moving towards greater sustainability is proving to be one of the major challenges of the 21st Century. In this workshop we will discuss the issues involved, including climate change, the food-energy-water nexus and the transition to a reduced-carbon economy. How should chemical engineers respond?



# General Information



## Conference Venue and Date

### Fira de Barcelona

From September 30<sup>th</sup> to October 3<sup>rd</sup>, 2017  
Fira Gran Via – North Access. Hall 8  
Carrer Foc 37 - 08038 Barcelona



## Technical Secretariat

**GRUPO PACIFICO**  
The power of meeting

**Maria Cubi, 4 - Pral. | 08006 Barcelona (SPAIN)**

Tel. +34 932.388.777 - Fax. +34 932.387.488  
students@wcce10.org



## Registration Desk Opening Times

Registration desk opening times and technical secretariat schedule are outlined below:

- **Saturday, September 30<sup>th</sup>:** from 08:30 to 17:00
- **Sunday, October 1<sup>st</sup>:** from 08:30 to 19:00
- **Monday, October 2<sup>nd</sup>:** from 08:30 to 10:30
- **Tuesday, October 3<sup>rd</sup>:** from 08:30 to 10:30

Please go to the registration desk upon arrival to the venue to collect your congress documents.



## Medical Assistance & Insurance

**Emergency phone: 112**

Participants are advised to make their own arrangements regarding travel insurance and medical assistance during the Congress. Neither the Organization nor the Secretariat are able to accept any responsibility whatsoever for damage or injury to persons or their belongings during the Congress.



## Badges & Security

It is essential that you wear your personal badge at all times while in the Congress venue and during the Social Events, as it is the official entrance pass to scientific sessions. For the Social Events, it will also be necessary to present the corresponding ticket.

This badge will grant you access to all the different exhibition areas at EXPOQUIMIA (opening, October 2nd, 2017.)



## Attendance Certificate

Attendance Certificates will be issued by the General Secretariat and it will be sent by e-mail after the congress.



## Speakers' Preview room:

Opening times:

- **Saturday, September 30th:** from 08:30 to 17:00
- **Sunday, October 1st:** from 08:30 to 12:00

- All session rooms are connected to the Preview Room, and all presentations must be uploaded via the Speaker Services Center in advance please. Presentations may not be uploaded directly onto the computers in the session rooms. Use of your own computer is not possible.
- Please check in with the Preview Room at least 4 hours in advance of your scheduled session. The Speaker Services Center will ensure that presentations are problem-free onsite and your participation is critical to our success.

# General Information



## Expoquimia

Student Conference attendants will have the opportunity to visit the exhibition in small groups, accompanied by a member of the Student Committee as a guide. During the tour, it will be possible to visit the stands of chemical industry's leading companies and organizations. Do not miss this opportunity to create businesses contacts for your future professional development. The guides will answer any doubts that may and serve as link with the delegates of the companies.



## Lunch

There will be a pack-lunch available on Saturday and Sunday. You will have a ticket with your badge that must be exchanged in the lunch area



## APP

Search for the App WCCE10 both in Apple store and Google Play, and download it... stay tuned!



DECHEMA  
CongressEngine /  
WCCE10  
DECHEMA e.V.



## Wi-Fi

The wifi acces is free for all attendants to the congress. This network will be broadcasted to all congress venue areas, (Hall 8). Access to this WiFi network is through the following password:

- **Network:** [WCCE10](#)
- **Password:** [wccce2017](#)



## Public Transport

WCCE10 recommends using public transport wherever possible.

**SUBWAY:** Line 9 Sud from the airport to Fira Gran Via, and into Barcelona city centre. Metro stop:

► Europa Fira (15 minute)

**BY BUS:** Bus line 79, stop, Av Joan Carles I-Botànica is the nearest stop to Fira Gran Via.

**BY TAXI TO/FROM THE VENUE:** Ask the driver to drop you off at Fira Gran Via NORTH entrance

### Barcelona Metro Timetables, General schedules

- Monday to Thursday: from 5AM to 12PM
- Friday: from 5AM to 2AM
- Weekend from 5AM on Saturday until 12PM on Sunday uninterrupted

### Metro lines connections to and from



# CHEM-E-CAR<sup>®</sup> Competition

In this context organized by AIChE, students from different education levels will compete with prototype cars powered by chemical reactions.

## ACTIVITIES:

- ▶ Chem-E-Car Safety Inspection
- ▶ Chem-E-Car Poster Competition
- ▶ Chem-E-Car Competition



### **AIChE Chem-E-Car Competition<sup>®</sup> at WCCE10 Safety Inspection (Saturday 30th, 15:00 h):**

This is a mandatory session for those participating in the Chem-E-Car Competition. Student teams should bring their car, poster and full printed Engineering Design Package for the Safety Inspectors to review. Teams must pass the safety inspection without safety violations before they can compete in the main competition on Sunday. Please note that this session is limited to Chem-E-Car Competition participants.





**AIChE Chem-E-Car Poster Competition at WCCE10 (Sunday 1st, 9:00 h):**

This is a mandatory session for those participating in the 2017 Chem-E-Car Competition. Student teams should bring their car, poster and full printed Engineering Design Package for the Poster Competition judges to review. Chem-E-Car Competition Teams will present their design to a panel of judges and answer questions on unique features, safety considerations and reaction calibration methods. All are invited to the poster competition. Be sure to stop by and check out all of the Chem-E-Car designs and choose which car you think will win the competition!

**AIChE Chem-E-Car Competition® at WCCE10 (Sunday 1st, 13:00 h):**

This competition will feature over 20 undergraduate student Chem-E-Car teams from around the world. Each car will be given two opportunities to traverse a specified distance carrying a certain additional load. The required load and distance will be given to each team one hour prior to the start of the performance competition so that teams can calibrate their reactions. Come and cheer for your favorite team as they compete for the international title! Please note that the first run of the competition will begin at 13:00 h.



# CHEM-E-CAR® Competition

## ► List of CHEM-E-CAR teams

|   |   |
|---|---|
|  <b>AMIRKABIR</b><br>University of Technology          |    |
| Amirkabir University of Technology, Iran  | Beijing University of Chemical Technology, China  |
|    |    |
| China University of Petroleum, China  | Georgia Tech University, USA  |
| <br>PERSONA CIENCIA EMPRESA<br>UNIVERSITAT RAMON LLULL | <br>天津大学<br>Tianjin University             |
| IQS School of Engineering, Universitat Ramon Llull, Spain   | Tianjin University, China   |
| <br>دانشگاه کاشان<br>University of Kashan             | <br>Politechnika Łódźka                   |
| Kashan University, Iran   | Lodz University of Technology, Poland   |
| <br><b>McGill</b>                                    | <br>南京工业大学<br>NANJING TECH<br>UNIVERSITY |
| McGill University, Canada   | Nanjing Tech University, China  |
|    | <br>PERSIAN GULF<br>UNIVERSITY           |
| National University Pedro Ruiz Gallo, Peru  | Persian Gulf University, Iran   |

|   |   |
|---|---|
|    |    |
| Universidad de Cantabria, Spain   | Polytechnique de Montreal, Canada   |
|    |    |
| University Complutense of Madrid, Spain   | Queens University of Belfast, UK  |
|    |    |
| Texas A&M Qatar, Qatar  | The University of Queensland, Australia   |
|   |   |
| Universidad Rovira i Virgili, Spain   | Universitat Politècnica de Catalunya, Spain   |
|  |  |
| Université Laval, Canada  | University of British Columbia, Canada  |
|  |   |
| University of Puerto Rico, USA  |   |

# CHEM-E-QUIZ

**Saturday, September 30th**  
**ROOM C1 - 15:45h**

Test your Chemical Engineering knowledge in our greatest challenge, the Chem-E-Quiz!! Form your teams (4 students per team) and face our three round contest. Winners will obtain a 750€ prize and 500€ and 250€ will be awarded to the second and third team, respectively.

One mobile phone or laptop per team will be needed to access the Kahoot platform. You have to be accurate and fast! Unit operations, chemical reaction engineering, separation processes, industrial chemistry and much more...

**Are you ready?**



500€



750€



250€



# Students poster competition

**POSTER AREA - 13:00H**

## Do you have communication skills?

Then, the Student Poster Competition is the right event for you. Five minutes to present your work to the judges, to charm them, to convince them that you deserve one out of the seven 500€ awards that await for the top posters. If you did not bring any contribution, you can always learn from other students the latest innovations in chemical reaction engineering, environmental engineering and sustainability, materials engineering and sciences, processes, biotechnology, etc.

### ► Guidelines for Posters' Authors

Each poster will be judged by a panel of 3 or 4 professional members from academia and industry. You must be present at your poster from 13:00h until 15:00h on Saturday, September 30th to talk to judges in order to qualify for the Poster Competition.

- You are responsible for printing the poster and bringing it to the conference.
- Your poster must be a DIN A0: 841 mm wide by 1189 mm high.
- Posters presenting authors are responsible for setting-up and taking down their poster.
- Self-adhesive pads for posting will be offered by the organizer.
- SET-UP: Saturday, from 09:00h
- DISMANTELLING: Sunday from 11:00h to 13:00h
- Unclaimed posters at the end of the conference are not responsibility of the conference organizers and will be disposed.

### ► 7 Available Research Areas



#### TOPIC 1

Knowledge, Education and Training



#### TOPIC 2

Unit Operations and Separation Processes



#### TOPIC 3

Chemical Reaction Engineering



#### TOPIC 4

Process Systems Engineering



#### TOPIC 5

Product Engineering and Advanced Materials



#### TOPIC 6

Applied Biotechnology



#### TOPIC 7

Environmental and Sustainable Chemical Engineering

**Saturday  
September 30<sup>th</sup>  
at 13:00 in the  
POSTER AREA**

# Students poster competition

## POSTERS ACCEPTED

### TOPIC 2 – Unit Operations and Separation Processes

| Poster number | Author             | University                       | Country |
|---------------|--------------------|----------------------------------|---------|
| <b>UOSP-1</b> | Golodnova, Dasha   | State Institute of Technology    | Russia  |
| <b>UOSP-2</b> | Ortiz, Paloma      | Universidad de Cantabria         | Spain   |
| <b>UOSP-3</b> | González, Cristina | Universidad de Cantabria         | Spain   |
| <b>UOSP-4</b> | Rogenbuke, Sofia   | Yildiz Tecnical University       | Turkey  |
| <b>UOSP-5</b> | Romero, Marta      | Complutense University of Madrid | Spain   |
| <b>UOSP-6</b> | Morona, Lorena     | Complutense University of Madrid | Spain   |
| <b>UOSP-7</b> | Malik, Rugia       | Sultan Qaboos University         | Oman    |
| <b>UOSP-8</b> | Rong, Yi           | Mines Paristech                  | France  |



## Title

Increasing of straight-run naphtha octane number by n-paraffins adsorption and isomerization on zeolites

Influence of alcohols on the dehydration performance of hydrophilic ZSM-5 zeolite membranes

Development of microfluidic-magnetophoretic devices for gram-negative sepsis treatment

Integrated forward osmosis-membrane distillation process for whey concentration

Styrene monomer production. Design of the purification unit

Production of anhydrous ethanol by extractive distillation

Thermodynamic Modeling and Calculations of the Volume Change of Mixing for Binary Liquid Mixtures

Solvothermal recrystallization- kinetic experiments and modelling of the gypsum-plaster system

# Students poster competition

## POSTERS ACCEPTED

### TOPIC 3 – Chemical Reaction Engineering

| Poster number | Author                 | University                               | Country  |
|---------------|------------------------|--|----------|
| <b>CRE-1</b>  | Ding, Chuanqin         | China University of Petroleum Qingdao    | China    |
| <b>CRE-2</b>  | Wang, Jinyao           | China University of Petroleum Qingdao    | China    |
| <b>CRE-3</b>  | Juana, Aina            | Universitat de Girona                    | Spain    |
| <b>CRE-4</b>  | San Martín, Claudia    | Universitat de Girona                    | Spain    |
| <b>CRE-5</b>  | Herrera, Andrés        | Universidad Nacional de Colombia, Bogotá | Colombia |
| <b>CRE-6</b>  | Wang, Ziyang           | China University of Petroleum Qingdao    | China    |
| <b>CRE-7</b>  | Xuwen, Hu              | China University of Petroleum Qingdao    | China    |
| <b>CRE-8</b>  | Di Lorenzo, Gianfranco | University of Salerno                    | Italy    |
| <b>CRE-9</b>  | Giancarli, Davide      | Università Campus Bio-Medico di Roma     | Italy    |



## Title

Optimization design of aromatic alkyl transfer device of Kenli Petrochemical

A Study on surface modification of graphene quantum dots and their interaction with biological macromolecules

Mobile number technology applied to bioreactors: determination of batch-time (tb) in fermentation processes

Solving kinetic chain length equation by using mobile technology

Dynamic optimizaion of the industrial emulsion polymerization of vinyl acetate

Synthesis of propylene from bioethanol catalyzed by zirconium based metal oxides

Optimization Design of Dimethyl Carbonate

Experimental study on the segregation and fluidization behavior of poly-disperse binary mixtures of biomass and inert particles

Biodiesel production from microalgae: thermodynamics considerations

# Students poster competition

## POSTERS ACCEPTED

### TOPIC 4 – Process System Engineering

| Poster number | Author               | University                                    | Country  |
|---------------|----------------------|---|----------|
| <b>PSE-1</b>  | Anselmi, Helene      | Université de Lorraine                        | France   |
| <b>PSE-2</b>  | Oganesian, Anani     | St. Petersburg State Institute of Technology, | Russia   |
| <b>PSE-3</b>  | Fitschen, Jürgen     | Hamburg University of Technology              | Germany  |
| <b>PSE-4</b>  | Aguillarena, Andrea  | Universidad de Cantabria                      | Spain    |
| <b>PSE-5</b>  | Padberg, Pascal      | RWTHAachen University                         | Germany  |
| <b>PSE-6</b>  | Sierra, Diego        | Universidad de los Andes                      | Colombia |
| <b>PSE-7</b>  | Bering, Luise        | RWTH Aachen University                        | Germany  |
| <b>PSE-8</b>  | García Merino, Belén | Universidad de Cantabria                      | Spain    |
| <b>PSE-9</b>  | Lim, Siang           | University of British Columbia                | Canada   |

### Title

Simulation of a coal power plant and of the integration of a postcombustion CO<sub>2</sub> capture unit

Analysis and design of integrated isobutane to high-octane fuels processes

Visualization of mixing in an acrylic 12000L aerated stirred tank reactor

Environmental and economic optimization of electrical generation in cantabria using wind power

Process Design for Optimal Dynamic Operation of a Cryogenic Air Separation Unit

Bacterial Foraging Optimization Algorithm for non-hazardous plant layouts

Advanced Process Control for Optimal Operation of an Air Separation Unit under Fast-Changing Market Dynamics

Design of feedback controllers using simulation tools

Deep Reinforcement Learning for Model Predictive Control

# Students poster competition

## POSTERS ACCEPTED

### TOPIC 5 – Product Engineering and Advanced Materials

| Poster number | Author            | University                            | Country   |
|---------------|-------------------|---------------------------------------|-----------|
| <b>PEAM-1</b> | Enderle, Ana      | Ulm University                        | Germany   |
| <b>PEAM-2</b> | Wang, Huiqiu      | China University of Petroleum Qingdao | China     |
| <b>PEAM-3</b> | Fei, Jingyuan     | University of Sydney                  | Australia |
| <b>PEAM-4</b> | Orozco, Juan      | Universidad Industrial de Santander   | Colombia  |
| <b>PEAM-5</b> | Artem, Janaina    | University of Campinas                | Brasil    |
| <b>PEAM-6</b> | Fernandes, Nonato | Federal University of Ceará           | Brasil    |
| <b>PEAM-7</b> | Romay, Marta      | Universidad de Cantabria              | Spain     |

### Title

Novel hybrid organic-inorganic materials for purification technologies

High-Performance Room-Temperature NO<sub>2</sub> Sensors Based on Microstructures Self-Assembled from n-type Phthalocyanines

Characterisation of forward osmosis membrane fouling during wastewater reclamation

Study of corrosive behavior of ASTM A335 P92 steel exposed to simulated refinery environments.

Bacterial Nanocellulose and Bromelain: Evaluation of Antimicrobial Activity

Papain immobilization using calcium alginate membranes for wound dressing

Mixed-matrix membranes of poly( $\epsilon$ -caprolactone) and reduced graphene oxide to accelerate hydrolytic degradation for neural tissue engineering

# Students poster competition

## POSTERS ACCEPTED

### TOPIC 6– Applied Biotechnology

| Poster number | Author                | University                       | Country  |
|---------------|-----------------------|----------------------------------|----------|
| <b>AB-1</b>   | Micán, Karen          | University of laSabana           | Colombia |
| <b>AB-2</b>   | Jolicoeur, Thomas     | Polytechnique Montreal           | Canada   |
| <b>AB-3</b>   | Kritharis, Athanasios | University of British Columbia   | Canada   |
| <b>AB-4</b>   | Nausa, Astrid         | Universidad Nacional de Colombia | Colombia |
| <b>AB-5</b>   | Kamal, Syed Haider    | University of British Columbia   | Canada   |



| Title  |
|--|
| Antioxidant, antibacterial, antifungal, cytotoxic activity and total polyphenols in <i>Clusia multiflora</i> .                       |
| Kinetic of ex vivo red blood cells storage   |
| Building Brains Marrying Engineering Medicine in the Fight Against Alzheimer Disease   |
| Effect of operational parameters on the production of monoclonal antibodies employing chinese hamster ovary cells: clonal variation. |
| A stimulus-responsive, in situ forming, nanoparticle-laden hydrogel for ocular drug delivery   |

# Students poster competition

## POSTERS ACCEPTED

### TOPIC 7—Environmental and Sustainable Chemical Engineering

| Poster number | Author                         | University                               | Country                     |
|---------------|--------------------------------|--|-----------------------------|
| ESCE-1        | Baviskar, Rohit                | Ambedkar Technological University        | India                       |
| ESCE-2        | Díaz, Miguel A                 | Universidad de Carabobo                  | Venezuela                   |
| ESCE-3        | Wang, Bo                       | China University of Petroleum<br>Qingdao | China                       |
| ESCE-4        | Rancaño, Laura                 | Universidad de Cantabria                 | Spain                       |
| ESCE-5        | Marcos-Madrado, Aitor          | Universidad de Cantabria                 | Spain                       |
| ESCE-6        | Al Mazrouei, Sara              | HCT - Abu Dhabi - Ruwais                 | United Emirates o<br>Arabia |
| ESCE-7        | Montes, Paula                  | Universidad de Cantabria                 | Spain                       |
| ESCE-8        | Sánchez Salvador, José<br>Luis | Complutense University of Madrid         | Spain                       |

Continued on the next page



## Title

Fresnel levels in evaporation ponds for brine disposal

Estudio de reacciones de limoneno sobre zeolita beta

Seven Groups Composition Separation and Kinetic Study on Pyrolysis Behavior of Pine Sawdust

Combination of coagulation-flocculation and photocatalysis for the treatment of landfill leachate.

New Highly Ion-Exchange Membranes Based on Renewable Polymers for Electrochemical Applications

Investigating effect of novel thin film catalyst for environment applications

LIFE-2-ACID Towards a sustainable use of metal resources in the galvanic industry

A comprehensive study of optimal conditions to remove water-based inks from wastewaters using cellulose nanofibers

# Students poster competition

## POSTERS ACCEPTED

### TOPIC 7–Environmental and Sustainable Chemical Engineering

| Poster number | Author                          | University                              | Country  |
|---------------|---------------------------------|---|----------|
| ESCE-9        | Fornaro, Filippo<br>Alessandro  | Università Campus Bio-Medico di<br>Roma | Italy    |
| ESCE-10       | Bizzotto, Giovanni              | Università di Padova                    | Italy    |
| ESCE-11       | Benés González, Mario           | Universidad de Zaragoza                 | Spain    |
| ESCE-12       | Vadillo Abascal, José<br>Manuel | Universidad de Cantabria                | Spain    |
| ESCE-13       | San Martín Gómez,<br>Sergio     | Universidad de Cantabria                | Spain    |
| ESCE-14       | Montejano, Adrián               | Universidad Autonoma de Madrid          | Spain    |
| ESCE-15       | Landi, Eleonora                 | University of Pisa                      | Italy    |
| ESCE-16       | Cubides, Pablo                  | Universidad Nacional de Colombia        | Colombia |

## Title

Sewage sludge power plant design

Hydrofluoric acid free electropickling of stainless steel

Hydrodeoxygenation of lignocellulosic fast pyrolysis oil

The carbon footprint of the photovoltaic solar generation

POWER TO GAS: Integration of wind renewable energy for Hydrogen generation as a future energetic vector in the Atlantic area

Photocatalytic-mechanism of phenolic pollutants

Pesticides groundwater contamination removal using novel adsorbents from hydrochar

Use of neural networks to model water quality using satellite imagery

# Social program

## ► Saturday, September 30<sup>th</sup>

### WALKING TOURS. 18:00 h

Each participant can pick one of the two tours available. You will have a ticket with your badge that must be shown at the guide upon your arrival at the meeting point.

Reservation is needed



### Historical Barcelona. MEETING POINT: 17:45 h. Plaza Cataluña, in front of the "Hotel Olivia Plaza"



Tour in the "Barri Gothic" of Barcelona to admire the Roman walls and the mixture of Romanesque, Gothic, Baroque and modern styles in the same area. During this tour you will walk through the narrow streets of Medieval Barcelona and see corners such as Plaça Sant Felip Neri, Plaça Sant Jaume (political center of the city), Plaça del Rei and the cathedral.

### Modernism and Ramblas. MEETING POINT: 17:45 h. Passeig de Gràcia 107, in front of "Palau Robert"



During this tour, the group will see the magnificent modernist facades of the buildings that are on the Passeig de Gràcia and walk along the most famous street in Barcelona: Las Ramblas. The tour starts in front of Casa Milà, to follow down the avenue that is considered the most elegant in Barcelona, Passeig de Gràcia, until the "Manzana de la Discordia" where you can see 3 modernist houses from 3 different architects: Casa Batlló (Gaudí) The Casa Amatller (Puig i Cadafalch) and the Casa Lleó i Morera (Domènech i Muntaner). The tour will continue on the Passeig de Gràcia until Plaça Catalunya to continue along Las Ramblas. During the tour of Las Ramblas you can see the details of Barcelona's most famous street, including the Boqueria Market.



## ► Saturday, September 30<sup>th</sup>

### NETWORKING STUDENT PARTY. 21:00 h

You will have a ticket with your badge that must be shown upon your arrival at the pub in order to gain access to the "private" area and enjoy the Party!!!

Let's have fun together at The George Payne Irish bar  
(Plaça d'Urquinaona, 5, Barcelona)



## ► Sunday, October 1<sup>st</sup>

WCCE10 WELCOME RECEPTION, conference venue

# Industrial Tours



## ► Monday, October 2<sup>nd</sup>

### BASF SONATRACH PropanChem S.A

BASF SONATRACH PropanChem S.A., a joint venture between the German BASF and the Algerian SONATRACH for the production of propylene. The installation has a production capacity of 350,000 tons per year of propylene. Propane necessary for the production of propylene is imported from Algeria. The propylene production process includes the transportation of propane from the port of Tarragona, the dehydrogenation reaction and separation of propene and propane by distillation.

**MEETING POINT: 08:30h at CONFERENCE VENUE Fira Gran Via - North Access. Hall 8. Carrer Foc 37**

### Lyondell-Basell

Company that manufactures polypropylene and advanced polyolefins. It has a capacity of 225,000 tons per year. The process involves the polymerization of propylene with Ziegler catalysts, as well as the compounding of resins ready for transformation. Advanced polyolefin products are used in automotive components, electrical appliances and pipe and blade applications.

**MEETING POINT: 08:30h at CONFERENCE VENUE Fira Gran Via - North Access. Hall 8. Carrer Foc 37**

### Sant Adrià del Besòs total waste management plant

Installation combines the management of solid urban waste and incineration with energy recovery. It takes place the separation of the different components of the waste and the organic part are treated in digesters for biogas production. Treatment capacity: 192,000 tons/year of separation and digestion and 350,000 t/year of energy recovery.

**MEETING POINT: 09:00h at CONFERENCE VENUE Fira Gran Via - North Access. Hall 8. Carrer Foc 37**

4

#### Sant Feliu de Llobregat Wastewater treatment plant

The sewage treatment plant of Sant Feliu de Llobregat is a facility dedicated to the treatment of wastewater of part of the metropolitan area of Barcelona. It has ability to treat about 70 million liters of wastewater every day. It contains typical equipment and processes of a WWTP: pre-treatment, primary treatment, biological secondary treatment. It also has a line of treatment of sludge, which includes biogas obtaining and energy generation.

**MEETING POINT 09:10h at CONFERENCE VENUE Fira Gran Via - North Access. Hall 8. Carrer Foc 37**

5

#### Sant Joan Despí Treatment for drinking water station (ETAP)

The ETAP of Sant Joan Despí, operating since 1955, operates with captured surface waters of the Llobregat River and groundwater from the aquifer of the lower Valley of the river, to produce drinking water.

It is one of the most advanced European technologies, in addition to the pretreatment, clarification and final disinfection processes, it applies a treatment with ozone and activated carbon which ensures its better quality. In addition, this plant applies innovative processes, such as reverse osmosis and the reuse of waste.

**MEETING POINT 09:10h at CONFERENCE VENUE Fira Gran Via - North Access. Hall 8. Carrer Foc 37**

6

#### Damm Group : El Prat de Llobregat Beer production plant

Do you want to know the secrets of the Mediterranean beer? Come visit the Estrella Damm Brewery and discover the brewing process of our beer, made with 100% natural ingredients and still brewed to the original 1876 recipe by August K. Damm.

You will also be able to enjoy the taste of the Mediterranean with a beer tasting of Estrella and other beers of the family.

The brewing is a meticulous process in which the beer, little by little, is acquiring its definitive characteristics. This process, which lasts approximately four weeks, is basically structured in eight stages. All, except the first, are made in the production plant of Damm in Prat de Llobregat.

**MEETING POINT FIRA: 09:15h at CONFERENCE VENUE Fira Gran Via - North Access. Hall 8. Carrer Foc 37**



## SATURDAY, SEPTEMBER 30<sup>th</sup>

### Room C1

|       |   |
|-------|---|
| 09:00 | <b>Registration desk opening</b>  |
| 10:00 | <b>Student Welcome</b><br>J.J. Rodriguez  |
| 10:10 | <b>Keynote K1:</b> Water and Energy<br>V́ctor Monsalvo. FCC-Aqualia   |
| 11:00 | Coffee break  |
| 11:30 | <b>Workshop W1:</b> AIChE Student Chapter<br>Sarah Ewing. AIChE   |
| 12:15 | <b>Workshop W2:</b> Beer homebrewing. UPC AIChE Chapter<br>Alex Parraga, Carla Ramos, Ferran Valls, Victor Capdevila<br>Chemical Engineering students, Spain. |
| 13:00 | <b>Student Poster Competition + Lunch</b>   |
| 15:00 | <b>Chem-E-Car<sup>®</sup> Safety Inspection</b> (only teams)  |
| 15:00 | <b>Workshop W3:</b> How to write a successful CV<br>Laura Escabias. AstraZeneca   |
| 15:45 | <b>Chem. Eng. Quiz</b>  |
| 18:00 | Barcelona city tour   |
| 21:00 | Networking student party  |

## SUNDAY, OCTOBER 1<sup>st</sup>

### Room C1

|                |   |
|----------------|---|
| 09:00          | <b>Chem-E-Car<sup>®</sup> Poster Competition</b>  |
| 09:30          | <b>Keynote K2:</b> Soil remediation<br>Peter Jaffe. Princeton University                            |
| 10:30          | Coffee break  |
| 11:00          | <b>Workshop W4:</b> Leadership and enterprising<br>Jesus Arauzo. U. Zaragoza                        |
| 11:45          | <b>Workshop W5:</b> Chemical Engineering and Sustainability<br>Richard Darton. University of Oxford |
| 13:00          | <b>Chem-E-Car<sup>®</sup> Competition + Lunch</b>   |
| 16:30          | <b>Student Award Ceremony</b>   |
| 17:00h - 19:00 | <b>WCCE10 Welcome Reception</b> (Main Hall congress)  |



## MONDAY, OCTOBER 2<sup>nd</sup>

### Auditorium

08:30

**Industrial Tours**

09:00 - 10:00

**Opening & Awards Ceremony**

10:00 - 11:00

**Plenary Lecture**

[Ignacio E. Grossmann](#). Department of Chemical Engineering Center for Advanced Process Decision Making.

[Carnegie Mellon University](#). Pittsburgh, USA

"Evolution of Process Systems Engineering and Future Trends in Research"

## TUESDAY, OCTOBER 3<sup>rd</sup>

### Auditorium

10:00

**WCCE10 PLENARY Session**

[Miguel Paradinas](#). Deputy CEO, Técnicas Reunidas.

"Engineering Strategies for a Growing World: TR experience"

11:00 - 11:30

**Coffee break**

11:30

**EXPOQUIMIA GUIDED TOUR**

Meeting point: Technical Secretariat Desk (Entrance, Hall 8)

10<sup>th</sup> World Congress  
of Chemical Engineering

# About the Organisers

The three events programmed for 2017 are organized by EFCE's Spain Group, composed of the following organizations who represent all aspects of chemical engineering.

**We invite you to get to know them better.**



ANQUE

With over 66 years of history, ANQUE is today a prestigious professional association with over 8.500 members. It is one of the largest association of Spain, headquartered in Madrid and with local offices in all Spanish Autonomous Communities.

ANQUE offers a portfolio of unique services and benefits to its members and works to strengthen Chemistry & Chemical Technology and their professionals in Spain.

ANQUE's mission is to be the Spanish voice of Chemistry and Chemical Technology and defend the interests and image of the profession, raise the scientific and professional profile and achieve greater recognition through social awareness while representing the hub of its members' interdisciplinary network before public authorities

ANQUE aims to boost its network in all areas -scientific, technical, social, economic and cultural- both natio-nally and internationally. ANQUE was one of EFCE's founding societies in 1953.

[www.anque.es](http://www.anque.es)



The Association and the College of Industrial Engineers of Catalonia have always maintained a clear focus on service to industrial engineers and to society. It represents almost 9.000 engineers.

Its institutions have a specific klout that is based on the proven track record that the profession has contri-buted to the development of the country and its technological progress. On this basis the association was created in 1863 and subsequently the College in 1950, always with the aim of safeguarding the profession and defending its partners and members.

They have deployed a wide range of services that help professionals in all contexts in which they develop, including the workplace, the family and/ or society. Their strength lies in the individual presence of each of the partners/members. That is why they want to be a home to all engineers to face all the challenges pre-sented by the present and the future.

[www.eic.cat](http://www.eic.cat)



The Spanish Society of Industrial Chemistry and Chemical Engineering, SEQUI, was founded in 1960. Its main purpose is to contribute to the expansion and progress of the Spanish chemical industry by bringing together the professionals working in this sector. Other main objectives of the Society are to facilitate collaboration between the scientific and academic communities with the industry, as well as cooperate with political and social institutions. These objectives are achieved through different activities and events organized every year.

The most prominent example is the celebration of the Mediterranean Congress of Chemical Engineering that takes place every three years, which in 2014 celebrated its thirteenth edition. This event brought together researchers from the industry on new areas of chemical engineering such as biochemical engineering or food.

The Spanish Society of Industrial Chemistry and Chemical Engineering is a member of the European Federation of Chemical Engineering and Corrosion (EFCE). Because of this, SEQUI has an active representation on various working groups of the Federation and representatives of the Society have held positions office in the Council of the Scientific Advisory Board EFCE.

[www.sequi.es](http://www.sequi.es)



AIQS, the Association of Chemists and Engineers of the Institut Químic de Sarrià (IQS) was founded in 1921 in Barcelona, being the oldest Spanish society for chemical engineers. In 1972 AIQS joined EFCE. Currently, AIQS has near 2.000 members, all of them coming from IQS, mainly Chemical Engineers and Chemists.

Since its foundation, the main objective of AIQS is to foster chemical science and technology in the benefit of society. To do this, IQS and its alumni are promoting ongoing education among its members, and are offering a range of the most interesting activities and services to its members.

IQS is a Higher Education Centre founded by the Society of Jesus, with over one hundred years of experience and an extensive record of accomplishments and history in the academic and research field that enable the institution to offer a fully consolidated and proven teaching method.

Its vocation and social commitment involve educating people in an ethical and integral manner in all personal, academic and professional areas. Due to its scientific tradition, IQS is able to teach its students to love their work, and to exercise their professional activity seriously and rigorously and with initiative and creativity.

The professionals educated at IQS have a solid background for their professional careers in international environments, are stimulated by scientific knowledge and are well aware of the current social reality when it comes to making decisions. In short, professionals and executives who are able to respond to the new challenges posed by the current social, scientific, financial and industrial context.



# 10<sup>th</sup> World Congress of Chemical Engineering

**TECHNICAL SECRETARIAT**

**GRUPOPACIFICO**

*The power of meeting*

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