



SOSPROCAN UNIT

ACTIVITY SUMMARY 2023



UC | Universidad
de **Cantabria**

Department of Chemical & Biomolecular Engineering

Sustainable Production in Cantabria (SOSPROCAN)

ETSIIyT – Universidad de Cantabria
Avenida de Los Castros 46, 39005 Santander
Cantabria – Spain

Tel.: +34 942 201590 / Fax: +34 942 201591

- <https://web.unican.es/Departamentos/ingquimica>
- <https://www.facebook.com/IngenieriaQuimicayBiomolecular/>
- <https://web.unican.es/portal-investigador/departamentos/detalle-departamento?d=023>



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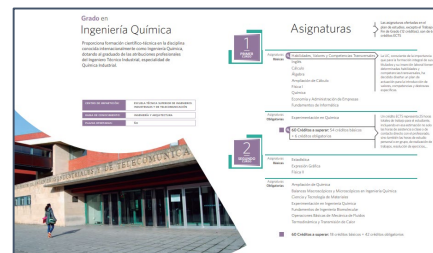


Equipment
Working Team
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ACADEMIC ACTIVITIES

☐ CHEMICAL ENGINEERING DEGREE

New Students Academic Year 2023/2024	Total Students Academic Year 2023/2024	TFGs defended in Academic Year 2022/2023
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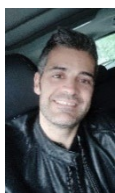
<https://web.unican.es/centros/etsiit/grados/giq>



Prof. Raquel Ibáñez
Vice-Dean of the ETSIIT
Head of the Chemical Engineering Studies
ibanezr@unican.es

☐ INTERNATIONAL ACADEMIC EXCHANGE PROGRAMMES

<https://web.unican.es/unidades/oficina-relaciones-internacionales/estudiantes>



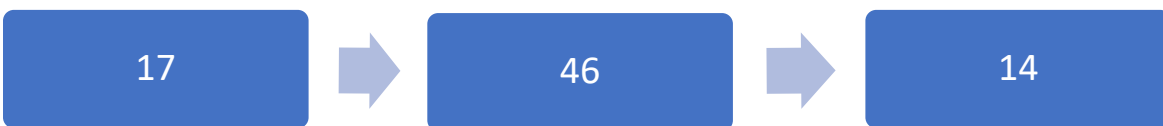
Eugenio Bringas
Academic Director for International Relations and Global Engagement in Vice-Rectorate of Internationalization
bringase@unican.es



Nazely Dibán
Coordinator of Academic Mobility in the area of Chemical Engineering
dibann@unican.es

☐ MASTER IN CHEMICAL ENGINEERING

New Students Academic Year 2023/2024	Total Students Academic Year 2023/2024	TFMs defended in Academic Year 2022/2023
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<http://web.unican.es/centros/etsiit/Paginas/Master-Universitario-en-Ingenieria-Quimica.aspx>



Maria José Rivero
Academic coordinator of the Master in Chemical Engineering
riveromj@unican.es



Clara Casado
Coordinator of the Curricular Internships
casadoc@unican.es

ACADEMIC ACTIVITIES

❑ DOCTORAL STUDIES IN CHEMICAL ENGINEERING, ENERGY AND PROCESSES

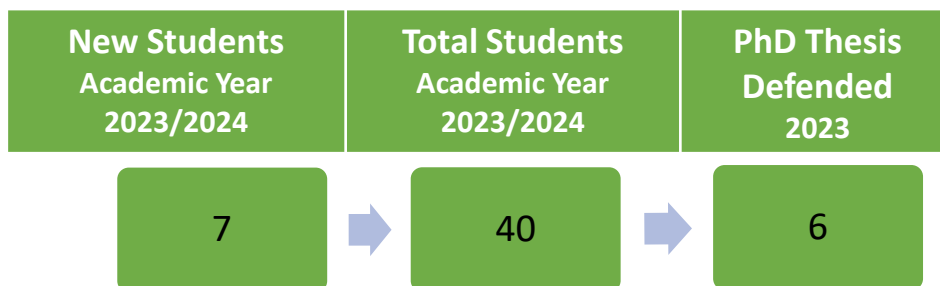
<https://web.unican.es/estudios/detalle-doctorado?p=183&a=2017>



Manuel Álvarez

Coordinator of the Doctorate Program in Chemical Engineering, Energy and Processes and UC Doctorate School: Member of the Steering Committee and of the Quality Commission

alvarezgm@unican.es



PHD. THESIS DEFENDED IN 2023



Andrea Arguillarena Maza

"Circular Economy in the Hot-Dip Galvanising Sector. Pilot Plant Demonstration and Environmental Sustainability Assessment"

Supervised by: Prof. Ane Urtiaga and Dr. María Margallo

January 13th, 2023

ACADEMIC ACTIVITIES PHD. THESIS DEFENDED IN 2023

Sophie M. Schröder Barraza

“Dioxins and Furans (PCDD/Fs) in the Electro-Oxidation of Drugs Used in the COVID-19 Pandemic. Experimental and Theoretical Analysis”

Supervised by: Prof. Inmaculada Ortiz and Dr. M^a Fresnedo San Román

January 20th, 2023



Salvador Asensio Delgado

“An Integrated Thermodynamic Framework for the Absorption of Fluorinated Refrigerants in Ionic Liquids”

Supervised by: Prof. Ane Urriaga and Dr. Gabriel Zarca

April 21th, 2023

Laura Rancaño Vázquez

“Avances en la Degradación Fotocatalítica de los Contaminantes Emergentes Halogenados: s-Metolacoloro y Ácido Perfluorooctanoico”

Supervised by: Prof. Inmaculada Ortiz and Dr. M^a José Rivero

June 30th, 2023



Carolina Tristán Teja

“Advancing Sustainability in the Water-Energy Nexus. Optimization of Reverse Electrodialysis Energy Recovery from Salinity Gradients”

Supervised by: Prof. Raquel Ibañez and Dr. Marcos Fallanza

July 12th, 2023

Víctor Manuel Maestre Muñoz

“Hybrid PV-Hydrogen Power System for Stationary Applications”

Supervised by: Prof. Inmaculada Ortiz and Prof. Alfredo Ortiz

July 14th, 2023



RESEARCH ACTIVITIES: Research Groups

The **SOSPROCAN team** hosts more than 70 researchers of the **University of Cantabria** with background in the analysis, design and optimization of environmental and production processes.

The mission of this team is to develop **cutting-edge research** to advance the sustainability and innovation of environmental and production processes, through:

- **Teaching**
- **Research & Development**
- **Services**

The members of SOSPROCAN team belong to four research groups:

DEPRO

[Development of Environmental and Production Processes](https://grupos.unican.es/depro/)



<https://grupos.unican.es/depro/>

Head of the Group: A. Irabien
irabienj@unican.es

PAS

[Advanced Separation Processes](https://grupos.unican.es/pasep/)



<https://grupos.unican.es/pasep/>

Head of the Group: I. Ortiz
ortizi@unican.es

TAB

[Environmental Technologies and Bioprocesses](https://grupos.unican.es/tab/)

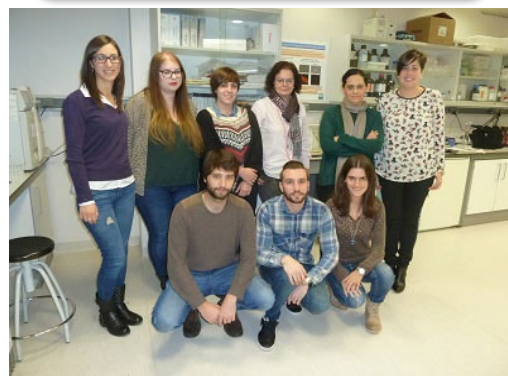


<https://grupos.unican.es/tab/>

Head of the Group: A. Urtiaga
urtiaga@unican.es

IPS

[Sustainable Processes Engineering](https://grupos.unican.es/ips/)



<https://grupos.unican.es/ips/>

Head of the Group: R. Ibáñez
ibanezr@unican.es

RESEARCH ACTIVITIES: Research Topics

DEPRO

Development of Environmental and Production Processes

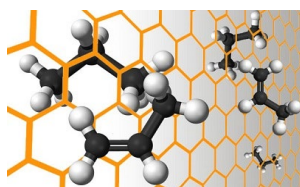
- ✓ **CO2 Capture and Utilisation, Waste Minimisation and Sustainability**
- ✓ **R&D of Membrane Separation Processes**
- ✓ **Sources and Characterization of Particulate Matter and its Components**
- ✓ **Life Cycle Assessment Tools for Decision Support in Processes and Products**



PAS

Advanced Separation Processes

- ✓ **Filtration membrane technology: Ultra and nanofiltration, reverse osmosis and direct osmosis, electrodialysis.**
- ✓ **Membrane technology for gas and gas-liquid separation: Gas permeation, pervaporation, membrane distillation.**
- ✓ **Energy Sustainability: Blue energy, Hydrogen, Fuel cell.**
- ✓ **High performance materials. Functionalized Magnetic Nanomaterials. Synthesis, characterisation and applications.**



TAB

Environmental Technologies and Bioprocesses

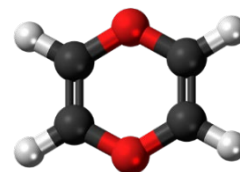
- ✓ **Environmental Technologies. Development of persistent pollutant remediation with integrated electrochemical and membrane technologies.**
- ✓ **Preparation and characterization of biocompatible functionalized materials for biomedical applications and tissue engineering.**
- ✓ **Membrane technologies for climate change mitigation: recovery of refrigerant gases, hydrogen, synthesis gas.**



IPS

Sustainable Processes Engineering

- ✓ **Development of advanced technologies for selective metal separation**
- ✓ **Applications of Advanced Oxidation Processes (POAS). Study of the Formation / Destruction of Persistent Organic Compounds.**
- ✓ **Development of Membrane Technologies for the Agri-Food Sector and in the Reuse of Purified Water**
- ✓ **Modelling, Simulation and Optimisation of Separation Processes with Liquid Membranes**

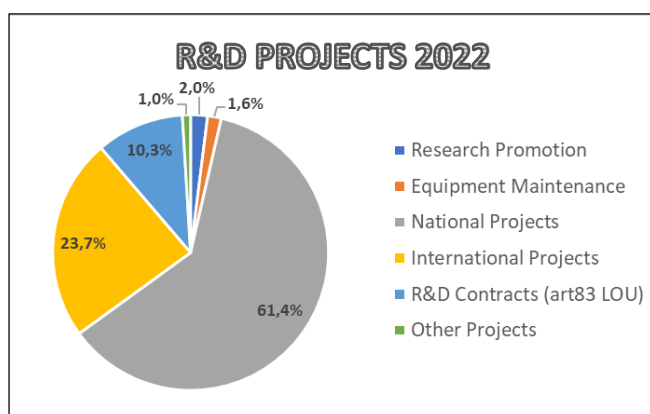


RESEARCH ACTIVITIES: Projects

SOSPROCAN team integrates 4 active and competitive R&D Groups. Below there is a summary of the competitive grants funded by several agencies and private companies that were being carried out in 2023:

European & International Projects	National Projects	Private & Regional Projects	R&D Contracts & UC Projects	Infrastructures & Analytical Equipment
8	27	8	5	2

The complete list of 2023 active projects is available on: <https://web.unican.es/departamentos/ingquimica/Paginas/Anuarios.aspx>



Research Budget: (expenditure in 2022)

Total = 1.177.572 €

Total UFG UC = 6.4 %

Ranking UFG UC = 2nd

Annual Increase = 6.6 %

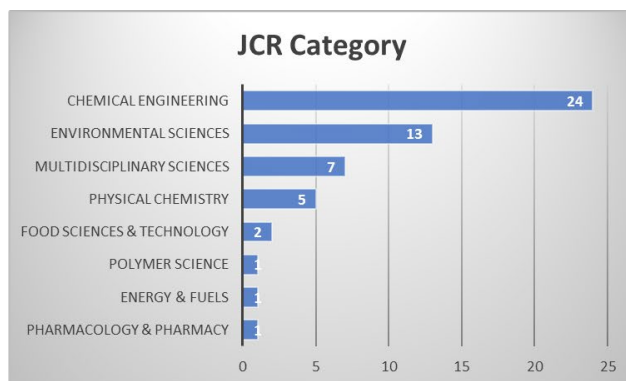
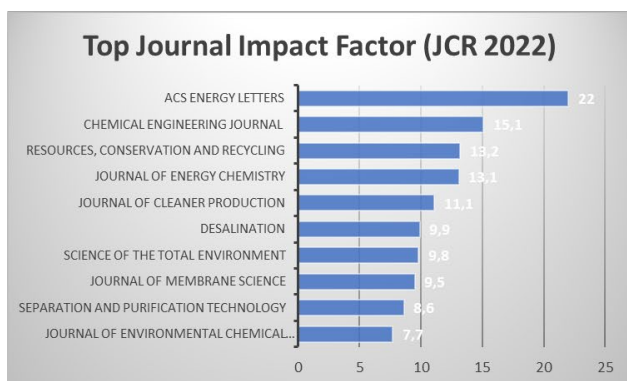
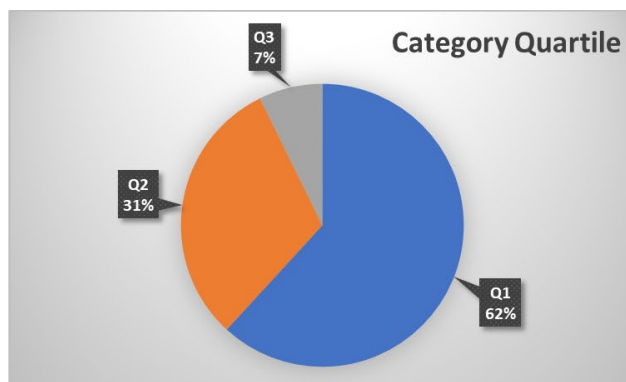
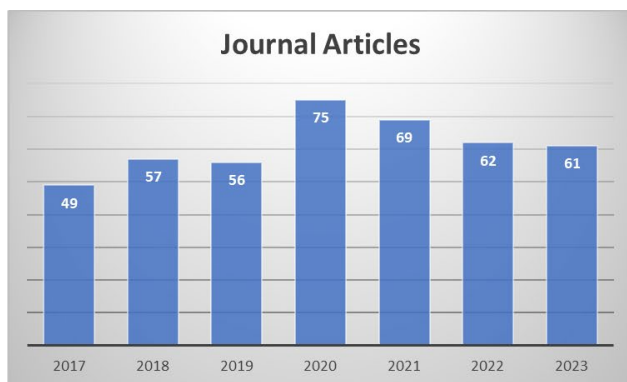
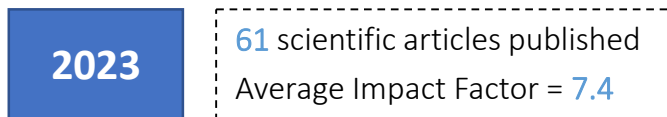
<https://web.unican.es/consejo-direccion/gerencia/Documents/Cuentas-anauales-2022-completas.pdf>

The research groups of SOSPROCAN team have actively participated in european and international projects in collaboration with partners and institutions. The researchers attended projects meetings where their main results were shared during 2023.



RESEARCH ACTIVITIES: Publications

The results of the research activity are published in international journals after peer-reviewed evaluation by specialized referees who support the quality of our research. In 2023, more than 60 articles were published.



The complete list of the articles published in 2023 is available on: <https://web.unican.es/departamentos/inguinica/Paginas/Anuarios.aspx>

RESEARCH ACTIVITIES: Congresses

The progress of our research activity was presented in international scientific congresses. During 2023, we attended more than 25 international conferences, with oral and poster contributions.



The complete list of the congress contributions in 2023 is available on: <https://web.unican.es/departamentos/ingquimica/Paginas/Anuarios.aspx> and <https://web.unican.es/portal-investigador/departamentos/detalle-departamento?d=023>

RESEARCH ACTIVITIES: Seminars & Conferences

The Chemical & Biomolecular Engineering Department of the University of Cantabria has organized the 2023 cycle of seminars and conferences given within the framework of the Doctorate program in Chemical Engineering, Energy and Processes:

January 17th, 2023

Dr. Pedro Beltrán-Alvarez, Centre for Biomedicine, Hull York Medical School, University of Hull (United Kingdom), delivered the conference “A new microfluidics model to investigate novel treatments against brain tumours maintained on-chip”.



January 26th, 2023

Fernando Polanco, former UC chemical engineering student and sustainability scientist in Cytiva Co. (Sweden), a global provider of technologies and services, delivered the conference “Sustainability Metrics as Business Driver: Challenges in Standardization & Data Sharing”.

March 15th, 2023

Dr. Mehdi Rahimi-Nasrabadi, TU Bergakademie Freiberg (Germany), delivered the conference “Graphitic carbon nitride nanostructures as photocatalysts for CO₂ reduction”.



March 21th, 2023

Prof. Karoliina Honkala, Nanoscience Center, University of Jyväskylä (Finland), delivered the conference “Heterogenous (electro)catalysis from first principles”. The event took place virtually on March 21th, 2023.

June 19th, 2023

Prof. Bohodir Boborajabov, Tashkent Chemical-Technology Institute (Uzbekistan), delivered the conference “Content and creation of technology for modifying bitumen and obtaining compositions on their basis for road surfaces”.

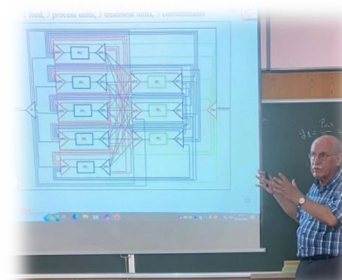


Prof. Ignacio E. Grossmann, R.R. Dean University Professor of the Chemical Engineering Department of Carnegie Mellon University (USA), delivered three conferences during his Fullbright stay in our department:

September 7th, 2023 - “Optimal Synthesis and Planning of Sustainable Chemical process and Energy Systems”

September 21th, 2023 - “Review of Center of Advanced Process Decision-making and Research Projects from Ignacio Grossmann’s Group”

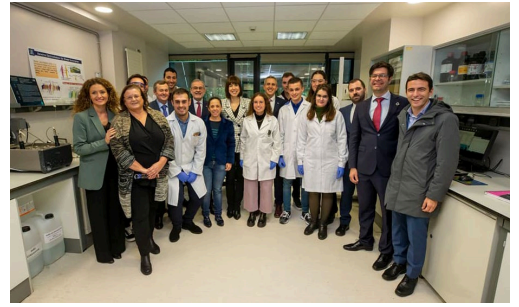
December 11th, 2023 - “Technical Writing”



RESEARCH ACTIVITIES: Seminars & Conferences

January 26th, 2023

The Spanish Minister of Science and Innovation, Diana Morant, visited the Department of Chemical & Biomolecular Engineering. During the visit to the research laboratories dedicated to the Complementary Energy and Renewable Hydrogen Plan and their application in Cantabrian industries, she was accompanied by the Vice President of Cantabria, Pablo Zuloaga, and the Rector of University of Cantabria, Angel Pazos.



April 20th, 2023

The Chemical and Biomolecular Engineering Department organized the International Researchers Day, an event dedicated to welcome the international researchers who were visiting our Department for research stays and internships. At the meeting, every international researcher delivered a brief presentation of her/his backgrounds and research interests. Next, we had the opportunity to socialize with refreshments.



May 4th, 2023

The workshop "Hydrogen Roadmaps in the Atlantic Area" took place on 4th May, 2023, in Santander (Spain). In the event, the Hydrogen Roadmaps were presented and discussed by the leading representatives of the National Hydrogen Associations of the 5 Atlantic Arc countries: Spain, Portugal, France, UK and Ireland. The event was open to the general public and it was organized within the framework of the European project "HYLANTIC"



May 15th, 2023

The workshop "NEPTUNUS project" took place on 15th May, 2023, at the Maritime Museum in Santander (Spain). The main results obtained in the NEPTUNUS research project were presented and discussed by the project partners. The conference was open to the general public. NEPTUNUS project aims to promote the sustainable development of the seafood sector in the Atlantic area.



RESEARCH ACTIVITIES: Seminars & Conferences

June 21th-22th, 2023



The Doctorate Program in Chemical Engineering, Energy and Processes organized the annual Doctoral Seminars, aimed at promoting the training of PhD students and disseminate their research activities. The seminars, open to general public, took place virtually. The first session, on June 21th, 3rd&4th year students presented the progress of their doctoral thesis, while the second session, on June 22th, was dedicated to 1st&2nd year students. 29 PhD students participated in the seminar.

July 10th, 2023

The progress and results obtained in the project "Re-Fish To Food: Recirculation of resources of the processing industry of marine products as a new source of proteins" were presented in a workshop, which took place at ETSIIT of the UC. RE-FISH TO FOOD aims to obtain new sources of proteins by applying the circular economy to by-products and effluents of the canning industry.



Curso "MODELADO Y OPTIMIZACIÓN DE SISTEMAS DE PROCESOS SUSTENTABLES"
Impartido por el Prof. Ignacio Grossmann, Universidad Carnegie Mellon (USA)

Departamento de Ingenierías Química y Biomolecular

OBJETIVOS DEL CURSO

1. Modelado de procesos de ingeniería.
2. Optimización de procesos de ingeniería.
3. Aplicación de técnicas de optimización a problemas de ingeniería.
4. Análisis de sensibilidad de los problemas de optimización.
5. Aplicación de técnicas de optimización a problemas de ingeniería.

TEMAS DEL CURSO

1. Introducción a la optimización de procesos de ingeniería.
2. Modelado de procesos de ingeniería.
3. Optimización de procesos de ingeniería.
4. Aplicación de técnicas de optimización a problemas de ingeniería.
5. Análisis de sensibilidad de los problemas de optimización.

PROGRAMA DEL CURSO

1. Introducción a la optimización de procesos de ingeniería.
2. Modelado de procesos de ingeniería.
3. Optimización de procesos de ingeniería.
4. Aplicación de técnicas de optimización a problemas de ingeniería.
5. Análisis de sensibilidad de los problemas de optimización.

September 4th-27th, 2023

Prof. Ignacio Grossmann, Doctor Honoris Causa by the University of Cantabria in 2016, delivered the course "MODELING AND OPTIMIZATION OF SUSTAINABLE PROCESS SYSTEMS (MOPS_2023)", from September 4th to 27th, 2023. The course was part of the Fulbright U.S. Scholar program in collaboration with the Department of Chemical and Biomolecular Engineering of the UC.



September 28th-29th, 2023

The "Workshop on Simulation and Optimization for Sustainable Engineering WSOSE", was organized on the occasion of the visit of Prof. I. E. Grossmann (Carnegie Mellon University, USA) to the Department of Chemical and Biomolecular Engineering in the framework of the "Fulbright U. S. Specialist Program". This conference was attended by more than 30 researchers from several Spanish universities with interest in the topic of Process Systems Engineering.



RESEARCH ACTIVITIES: Awards & Distinctions



Ranking of the World's Top 2% Scientists

Ángel Irabien, Inmaculada Ortiz, Ane Urtiaga, and Jonathan Albo are included the "World's Top 2% Scientists". This ranking, which is authored by researchers of Stanford University, is based on standardized bibliometric information.

June 6th, 2023

The Ibero-American Chemical Engineering Congresses (CIBIQ) presented its awards during the Gala Dinner of the 11th World Congress of Chemical Engineering (WCCE11), in Buenos Aires (Argentina). Prof. Ángel Irabien was awarded with the Gold Medal 2023, in recognition of his outstanding professional live and dedication to the promotion of the general interests of Chemical Engineering.



July 14th, 2023

Prof. Ane Urtiaga received the recognition for her outstanding research career, awarded by the Chemical Engineering Group of the Spanish Royal Society of Chemistry (RSEQ). Dr. Guillermo Díaz received the prize to the best doctoral thesis. The 2022 Research Awards event was held during the XXXIX Biennial Meeting of Chemistry, in Zaragoza.

October 20th, 2023

Miguel Viar received the second prize of the XX ARQUIMEDES University contest for Introduction to Scientific Research. The diplomas ceremony was presided by the Spanish Minister of Universities. The award-winning work "Recovery of fluorinated gases from refrigerant mixtures through extractive distillation: selection of the solvent and process design", was the result of his Master's Thesis supervised by Prof. Ane Urtiaga and Dr. Gabriel Zarca and Dr. Fernando Pardo in the TAB research group.



November 22th, 2023

The II MARE awards on Circular Economy were presented during the "I Encuentro I+D+i sobre Economía Circular en la UC". José Antonio Abarca, María Isabel Díaz, Kevin Fernández, Sergio Valentín Gutiérrez, Gonzalo Moral, Fabián Musy, Andrea Torre and Miguel Viar received their awards to the best Final Degree Project (TFG) or Best Master Thesis (TFM). In addition, the Knowledge transfer prize was awarded to the "Energy Push" project of the Advanced Separation Processes Group.



RESEARCH ACTIVITIES: Awards & Distinctions



December 13th, 2023

PhD students José Antonio Abarca and Kevin Fernández have been awarded ex aequo the prize for the “Best Master Thesis in CO₂ capture, transport, storage and utilization” by the Spanish CO₂ Technological Platform (PTECO₂), for their works developed in the DEPRO research group. The awards were presented during the 2023 Assembly of the PTECO₂ in Madrid.

Spanish Researchers Ranking Google Scholar Citations

Five members of the Department of Chemical and Biomolecular Engineering of the UC are included in the Ranking of researchers in Spain and Spaniards abroad (I). The list consists of the Top 10.000 profiles ranked first by h-index and the total number of citations. Ángel Irabien, Inmaculada Ortiz, Ane Urtiaga, Jonathan Albo, and Daniel Gorri are ranked among the 10.000 Spanish researchers.



Head of the Chemical and Biomolecular Engineering Department

Prof. Ane Urtiaga was elected as Head of the Chemical and Biomolecular Engineering Department. The official nomination, chaired by the Rector of the University of Cantabria, Prof. Ángel Pazos, took place on December 4th, 2023.

SOCIAL ACTIVITIES



Christmas Party
December 22th, 2022



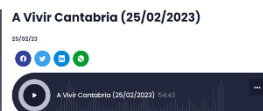
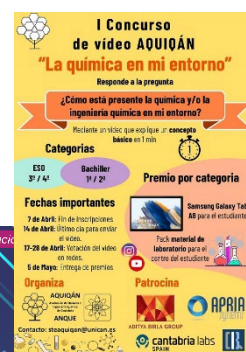
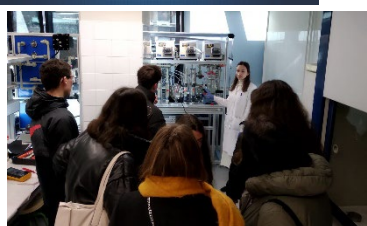
Summer Excursion
July 13th, 2023

DISSEMINATION ACTIVITIES

The Chemical & Biomolecular Engineering Department of the University of Cantabria has been involved in several dissemination activities organized by University of Cantabria and others during 2023:

- ✓ Local Chemistry Olympiad
- ✓ 11F International Day of Women and Girls in Science
- ✓ Open Doors Day UC

- ✓ European Researchers Night
- ✓ Science Week UC
- ✓ Circular Science Programme
- ✓ Media Interviews



HIGH SCHOOLS VISITING OUR DEPARTMENT IN 2023

- IES Santa Clara (Santander)
- IES José del Campo (Ampuero)
- IES Marqués de Manzanedo (Santoña)
- IES Alberto Pico (Santander)
- IES Ría San Martín (Suances)

MANAGEMENT ACTIVITIES: Department

Head of the Chemical & Biomolecular Engineering Department



Prof. Ane Urtiaga
Director

urtiaga@unican.es



Prof. Alfredo Ortiz
Deputy Director
(until 11/2023)

ortizal@unican.es



Prof. Antonio Dominguez
Deputy Director
(from 12/2023)

domingueza@unican.es

Administration of the Chemical & Biomolecular Engineering Department:

secretaria.quimica@unican.es Tel.: +34 972 20 15 90 / Fax: +34 972 20 15 91



Rosa Álvarez
alvarezr@unican.es

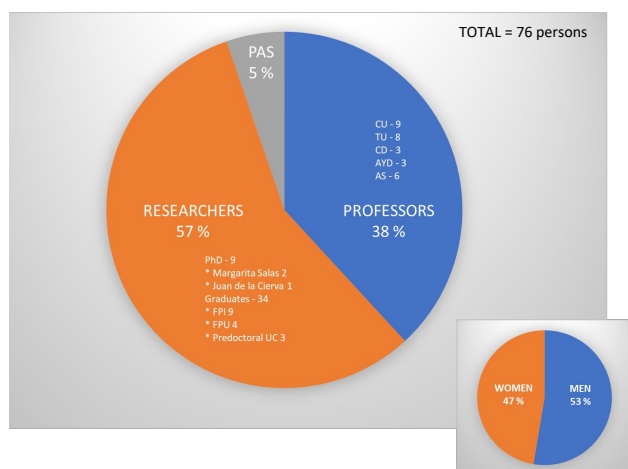


Domingo Álvarez
(from 10/2023)
alvaferd@unican.es



Sonia Valdivielso
(until 09/2023)
valdivielsos@unican.es

Members of the Chemical & Biomolecular Engineering Department



DEPARTMENT COUNCIL

- Academic and Research staff: 39 members
- Researchers (doctorate students, others): 10 members
- Master Students: 1 member
- Undergraduate Students: 2 members
- Administration: 3 members

PERMANENT COMMISSION

- Director of the Department
- Deputy Director of the Department
- Department Council Secretary
- 5 representatives of the PDEI – PhD
- 2 representatives of the PI – No PhD
- 1 representative of master and undergraduate students
- 1 representative of the Administration personnel

MANAGEMENT ACTIVITIES: University of Cantabria

UC Senate Members	
Members of the Department	Total Members
8	300

ETSIT Faculty Members	
Members of the Department	Total Members
6	100

Position	Number of Members from the Department
Academic Commission of the Chemical Engineering Degree	4
Academic Commission of the Industrial Engineering Degree	2
Quality Commission of the Chemical Engineering Degree	1
Academic Commission of the Master in Chemical Engineering	1
Quality Commission of the Master in Chemical Engineering	3
Quality Commission of the Master in Industrial Engineering	1
Academic Commission of the Doctoral Studies in Chemical Engineering, Energy and Processes	9
Quality Commission of the ETSIT	3
Posgraduate Commission of the ETSIT	2
Quality Commission of the UC	1
Research Commission of the UC	1
Doctorate Commission of the UC	2
Steering Committee of the Doctorate School (EDUC)	3
Quality Commission of EDUC	2
PhD. students representatives of the EDUC	2
University Ombudsman of the UC	1
Scientific director of the chromatography service (SerCrom) of the Scientific and Technical Research Services of the UC	1

MANAGEMENT ACTIVITIES: External

- **Academic member of the Royal Academy of Sciences of Spain, Prof. Inmaculada Ortiz Uribe.**
- **Government of Cantabria, General Director of Universities, Research and Transfer, Antonio Domínguez Ramos (until 08/2023).**
- **UNIBASQ: Prof. Ángel Irabien Gulias, Member of PDI Accreditation Panel; Prof. Inmaculada Ortiz, President of the Engineering and Architecture panel for accreditation of University degrees; Prof. Ane Urtiaga Mendia, Member of the committee of evaluation of remuneration supplements.**
- **Comisión Nacional Evaluadora de la Actividad Investigadora (CNEAI), Presidenta del Comité Asesor de Química: Prof. Inmaculada Ortiz**
- **Agencia de Calidad del Sistema Universitaria de Galicia: Evaluation Panel of PDI teaching activity, member Prof. Ane Urtiaga**
- **Governing Board of Asociación Nacional de Químicos e Ingenieros Químicos de España (ANQUE): Gabriel Zarca and Manuel Álvarez**
- **Editorial Boards of relevant Scientific Journals**
 - o Journal of Chemical Technology and Biotechnology (Wiley), Inmaculada Ortiz
 - o Science of the Total Environment (Elsevier), Ruben Aldaco
 - o Scientific Reports (Nature Publishing portfolio), Ane Urtiaga, Ruben Aldaco
 - o Journal of CO2 Utilization (Elsevier), Clara Casado
 - o Chemical Engineering Journal Advances (Elsevier), Maria José Rivero
- **Asociación de Química e Ingeniería Química de Cantabria (AQUIQÁN- ANQUE)**
- **Real Sociedad Española de Química (RSEQ). Secretary of Grupo Especializado de Ingeniería Química: Clara Casado. Secretary of Grupo Especializado Energía y Sostenibilidad: M^a José Rivero.**

SOSPROCAN TRANSFER UNIT: Equipment

The Transfer Unit SOSPROCAN has a **scientific and technological infrastructure** and a set of last generation analytical techniques, that enable to carry out a **complete physico-chemical characterization of a wide variety of samples**. The available equipment allows comprehensive control of a high number of environmental parameters as well as monitoring compliance. The main aim of the **Transfer Unit** is to **collaborate** and make available the extensive analytical capabilities of the equipment to the **productive sector and the Administration**, offering a high quality service.

ENVIRONMENTAL PARAMETERS AND WATER CHARACTERIZATION

- ✓ Fourier Transform Infrared Spectroscopy – FTIR
- ✓ Ion Chromatography: Determination of anions and cations
- ✓ Total Organic Carbon Analyzer – TOC
- ✓ Biological secure cabinet, sterilization autoclave, incubator, sealer Quanti-Tray and analysis cabinet for fluorescence
- ✓ General lab material for the determination of COD, BOD₅, NH₄⁺, ...



CHROMATOGRAPHY TECHNIQUES

- ✓ Sample preparation: Microwave Digestion, Soxhlet Extraction, Solid Phase Extraction, Clean-Up extract Power-Prep, Rotavap, Centrifugator, Liofilizator,
- ✓ Gas Chromatography with different detectors and injection systems: GC-MS + HS + SPME; GC-FID; GC-TCD
- ✓ Liquid Chromatography: UPLC/MS-MS; HPLC/PDA



PLASMA – MASS SPECTROMETRY

- ✓ Inductively Coupled Plasma Mass Spectrometry – ICP-MS
- ✓ Microwave plasma-atomic emission spectrometer (MP-AES)


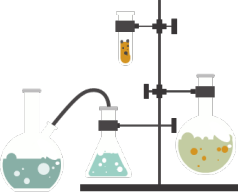





SOLID CHARACTERIZATION

- ✓ Thermobalance
- ✓ Osmometer
- ✓ Z-sizer and zeta-potential analyser
- ✓ Optical Stereo-microscope



SOSPROCAN TRANSFER UNIT: Working Team

QUALITY STAFF	Prof. Raquel Ibáñez Director	TECHNICAL STAFF
 Dr. Sonia Gómez		 Dr. Oscar Primo
 Dr. Gema Pérez (until 11/2023)		 Eng. Beatriz Arce

SOSPROCAN TRANSFER UNIT: Quality Certification

ISO 9001:2015 CERTIFICATION FOR:

- Determination of Organic Compounds by GC-MS (Gas Chromatography coupled to Mass Spectrometry)
- Elemental Analysis by ICP-MS (Inductively Coupled Plasma Mass Spectrometry).



SOSPROCAN TRANSFER UNIT: Customers

		Cátedra de Física Médica Departamento de Ciencias Médicas y Quirúrgicas	 Grupo Dynasol
			
			

SOSPROCAN TRANSFER UNIT: Contact & more information

 Analytical Services of SOSPROCAN Transfer Unit website:
<https://web.unican.es/departamentos/ingquimica/servicios>

 Contact e-mail: sersosprocan@unican.es





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Department of Chemical & Biomolecular Engineering

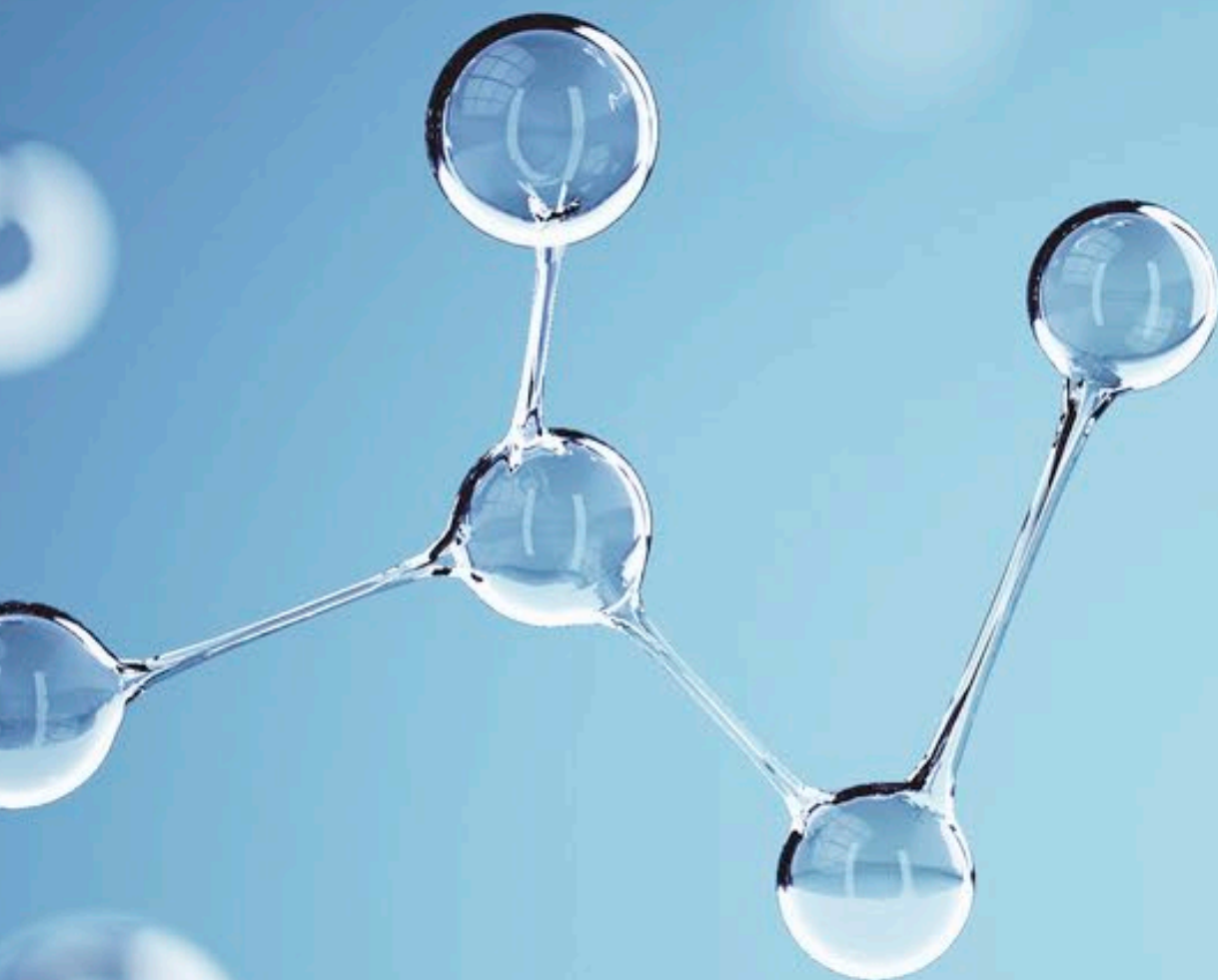
Sustainable Production in Cantabria (SOSPROCAN)

ETSIIyT – Universidad de Cantabria
Avenida de Los Castros 46, 39005 Santander
Cantabria – Spain

Tel.: +34 942 201590 / Fax: +34 942 201591

- <https://web.unican.es/Departamentos/ingquimica>
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This is a summary of the activities developed by the Chemical & Biomolecular Engineering Department of the UC in 2023. The on-line version is available at: <https://web.unican.es/departamentos/ingquimica/informacion-general/anuarios>