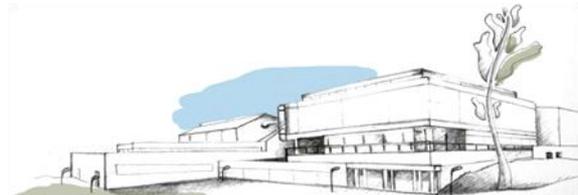




Nowelties

European Joint Doctorate



INTRODUCTORY TRAINING SCHOOL

Santiago de Compostela 7-11th October 2019

School of Engineering (ETSE)



CONTENTS

This course constitutes the first step of an extensive training programme oriented to PhD students to provide competences in cutting-edge technologies for wastewater treatment and resource recovery, aimed to improve and maximize efficiency of treatment configurations needed for the successful implementation of European directives. The course is structured into 3 different parts:

Part 1) **Sustainable water cycle**. Scientific and technological background to wastewater treatment, water reclamation and management; EU water directives and policy implementation; Best available technologies for wastewater treatment and water reclamation (from conventional to advanced); Organic micropollutants (OMPs) in wastewater treatment; Future challenges and opportunities for sustainable development of wastewater treatment sector (global change, climate change).

Part 2) **Innovation in water sector** (training provided by the company Aqualia). PhD students will have the opportunity of knowing actual case studies of water innovation projects, going from the project conception, technology watch and funding opportunities, to the project implementation and final market uptake of successful products.

Part 3) **Transferable skills and cross-training activities**. PhD students will be trained in complementary skills of good scientific practices including communication with the scientific community, general public and policy-makers: searching for information; web 2.0 tools to enhance learning and increase research competitiveness; communication and dissemination of scientific activity; scientific writing and publishing; good scientific practices.

This Introductory Training School is organized in the frame of the NOWELTIES EU project 812880 2019-2022: Joint PhD Laboratory for New Materials and Inventive Waste Treatment Technologies. Harnessing resources effectively through innovation in collaboration with the Spanish project COMETT: (CO)METabolic biotransformations in low environmental footprint wastewater Treatment reactors, targeting organic micropollutants (CTQ2016-80847-R), CRETUS Strategic Partnership (ED431E 2018/01) and the School of Doctorate of Sciences and Technology of the University of Santiago de Compostela.

PROGRAMME

Monday 7th October 2019

14:30 – 14:50	Registration
14:50 – 15:00	Course opening (<i>Auditorium</i>)
15:00 – 16:30 (<i>Auditorium</i>)	Current state of the art in water treatment technologies Juan M. Garrido & Francisco Omil (USC)
16:30 – 17:30 (<i>Auditorium</i>)	Water reclamation Jörg Drewes (TUM)
21:00	<i>Gala Dinner</i>

Tuesday 8th October 2019

9:00 – 10:00 (<i>Projects Classroom</i>)	Innovative processes for resources recovery from wastewaters (biorefinery, circular economy) Juan M. Lema (USC)
10:00 – 11:00 (<i>Projects Classroom</i>)	Occurrence and fate of micropollutants in water treatment plants Marta Carballa (USC)
11:00 – 11:30	<i>Coffee break</i>
11:30 – 12:30 (<i>Projects Classroom</i>)	Analytical issues of micropollutants (LC/MS, GC/MS) Mira Petrovic (ICRA)
12:30 – 13:30 (<i>Projects Classroom</i>)	Bioavailability and biodegradability Andreas Schäeffler & Kilian Smith (RWTH)
13:30 – 15:00	Lunch break
15:00 – 16:00 (<i>A7 Classroom</i>)	Post-treatment Jelena Radjenovic (ICRA)
16:00 – 17:00 (<i>A7 Classroom</i>)	Legislation relevant in wastewater treatment and resource recovery Alba Nogueira (USC)

Wednesday 9th October 2019

9:00 – 10:00 (<i>Projects Classroom</i>)	Economy in waste water treatment Yago Lorenzo (CETAQUA)
10:00 – 11:00 (<i>Projects Classroom</i>)	Workshop on scientific writing Gemma Eibes (USC)
11:00 – 11:30	<i>Coffee break</i>
11:30 – 12:30 (<i>Projects Classroom</i>)	Bibliometric training workshop Gracia Frutos (USC)
12:30 – 13:30 (<i>Projects Classroom</i>)	Sustainability of water treatment processes (LCA, SLCA, LCC) Maite Moreira (USC)
13:30 – 15:00	<i>Lunch break</i>
15:00 – 18:00 (<i>Industrial pilot plant</i>)	Practicum: Wastewater treatment technologies (<i>lab-scale demonstration of conventional and advanced wastewater treatment technologies</i>)

Thursday 10th October 2019

9:00 – 10:00 <i>(Projects Classroom)</i>	Ecotoxicological issues Paola Verlicchi (UNIFE)
10:00 – 11:00 <i>(Projects Classroom)</i>	Workshop on effective oral presentations Miguel Mauricio (USC)
11:00 – 11:30	<i>Coffee break</i>
11:30 – 12:30 <i>(Projects Classroom)</i>	Microbial characterisation: application of biomolecular tools Anuska Mosquera (USC)
12:30 – 13:30 <i>(Projects Classroom)</i>	Public acceptance, ethics and good scientific practices Cristina Gómez (USC)
13:30 – 14:30	<i>Lunch break</i>
14:30 – 15:30 <i>(Projects Classroom)</i>	Short Examination
15:30 – 18:30 <i>(Industrial pilot plant)</i>	Practicum: Wastewater treatment technologies (cont.) <i>(lab-scale demonstration of conventional and advanced wastewater treatment technologies)</i>
20:00	<i>Guided visit through the old town of Santiago de Compostela</i>

Friday 11th October 2019

9:00 – 9:30 <i>(Auditorium)</i>	Certificate award ceremony and Closure of the course Sonia Suárez & Francisco Omil (USC)
9:30 – 15:30	Aqualia training activity <i>Innovation in water sector workshop</i> <i>Visit to a full-scale urban WWTP with novel approaches in Vigo area</i> José R. Vázquez-Padín (Aqualia)
15:30 - 20:00	<i>Visit to the coast and beaches of Rías Baixas</i>

 Lectures	 Soft Skills	 Practicum	 Examination	 Social Programme	 Innovative projects workshop and technical visit
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LIST OF LECTURERS AND AFFILIATION

- Marta Carballa (USC)
- Cristina Gómez (USC)
- Anuska Mosquera (USC)
- Andreas Schaëffer (RWTH)
- Jörg Drewes (TUM)
- Juan M. Lema (USC)
- Alba Nogueira (USC)
- Kilian Smith (RWTH)
- Gemma Eibes (USC)
- Yago Lorenzo (CETAQUA)
- Francisco Omil (USC)
- José Ramón Vázquez-Padín (AQUALIA)
- Gracia Frutos (USC)
- Miguel Mauricio (USC)
- Mira Petrovic (ICRA)
- Paola Verlicchi (UNIFE)
- Juan M. Garrido (USC)
- Maite Moreira (USC)
- Jelena Radjenovic (ICRA)

USC: University of Santiago de Compostela (Spain); TUM: Technical University of Munich (Germany); RWTH: Technical University of Aachen (Germany); ICRA: Catalanian Institute for Water Research (Girona, Spain); UNIFE: University of Ferrara (Italy).

PRACTICUM

The objective of the practical activities carried out during the course is to better understand how the different innovative processes and tools described in the lectures can be applied at lab and pilot scale. The activities will be carried out in several laboratories at the school of engineering (ETSE) and the CRETUS institute, where lab- and pilot-scale reactors, analytical chemistry devices and microbiology tools are at students' disposal.

Each activity in the lab will be instructed by a researcher with practical expertise in the different topics. It will consist on a showcase for the practical implications of operating and following the main parameters in experimental processes, in an interactive environment between students and lecturers.

List of activities

- A1. Life cycle thinking for wastewater management. **Almudena Hospido**. USC (ETSE, Projects classroom)
- A2. Anammox and Granular bioreactors. **Alba Pedrouso**. USC (ETSE Floor +2, Lab. L2.7, L2.8)
- A3. Biopolymers. **Lucía Argiz**. USC (ETSE Floor -2, Lab. L2.7)
- A4. N-damo MBR reactors for the removal of OMPs. **Miguel Martínez**. USC (ETSE Floor -2)
- A5. Designing mixed-culture bioprocesses. **Riccardo Bevilacqua**. USC (ETSE Floor -2)
- A6. Enzymatic post-treatment of OMPs. **Jorge González**. USC (ETSE Floor +2)
- A7. Microbial ecology in bioreactors. **Guilherme Rodrigues**. USC (CRETUS)
- A8. Ecotoxicity in bioreactors. **Ovidio Álvarez**. USC (CRETUS)

SUMMARY

An integrated 28 h-course for PhD students covering 3 types of activities:

- Scientific and technological background of water treatment technologies and resource recovery
- Innovation in the water sector
- Transferable skills and cross-training activities

Didactical methods include:

- Lectures given by senior researchers (12.5 h)
- Practical operation of lab and pilot-scale treatment plants (6 h)
- Soft skills workshops (4 h)
- Innovative projects workshop and technical visit (4.5 h)
- Short examination (1 h)

Social programme:

- Gala Dinner (Monday)
- Guided tour through the old town of Santiago de Compostela (Thursday)
- Visit to the coast and beaches of Rías Baixas (Friday)

Number of participants: 24

- 14 ESRs of the NOWELTIES project
- 10 PhD students from groups of the NOWELTIES Consortium

Course language: English

Venue: School of Engineering (ETSE building). Rua Lope Gomez de Marzoa s/n. Santiago de Compostela (Spain)

ORGANISATION

COORDINATORS

Sonia Suárez and Francisco Omil (USC)

SECRETARIAT

Miyako Nitta (nowelties@icra.cat)