

## **Horizon 2020**

### **Societal Challenge: Improving the air quality and reducing the carbon footprint of European cities**



ICARUS

**Project: 690105 – ICARUS**

Full project title:

**Integrated Climate forcing and Air pollution Reduction in Urban Systems**

**MS11: ICARUS School/ Students Exchange  
Programme**

**WP8: Dissemination, communication and involvement of  
stakeholders**

Lead beneficiary: MU



## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>3</b>
<b>2</b>	<b>PLANNING FOR STUDENTS EXCHANGE SUMMER SCHOOLS .....</b>	<b>3</b>
2.1	General planning .....	3
2.2	Plan for the 1 <sup>st</sup> Summer school in Brno (Czech Republic), end of summer 2018 .....	3
<b>3</b>	<b>SYLLABUS AND TRAINING MATERIAL .....</b>	<b>4</b>
<b>4</b>	<b>QUALITY ASSURANCE OF THE SUMMER SCHOOL .....</b>	<b>5</b>



## 1 Introduction

Attendance of a summer school provides several cultural and academic benefits, beyond some additional insights of technical knowledge. One of the most documented benefits of attending a summer school is the confidence it gives so to young researchers. Many of them have not been away from home for a prolonged period of time and attending a summer school allows them to do so in a supervised and supportive environment that has been specifically designed for them. This new-found confidence is not just social, it can also instil an academic confidence depending on the type of summer program chosen. The social skills developed at a residential summer school are far reaching. Students learn to interact and make friends from day one and for a large number of them, they do so in their second language. For many, this is the first time in a long time that they have had to make new friends or interact with people on a daily basis whom they do not know and which is great practice for entering an early research or academic career. Summer Schools that offer academic subjects like the ones proposed in ICARUS can provide a valuable learning environment for students. If the academics are taught to a high level by qualified professionals in an inclusive and safe setting, students can gain university level academic skills that will benefit them throughout their entire career. As summer schools often teach in a more experiential way than traditional every day schools, students and young researchers are involved in the learning process and this often results in a deeper form of learning and applicable skills. Summer School programs often cover public speaking and presentation skills as well as helping students to develop leaderships skills that help them both socially and in an academic setting. Attending a summer school allows students to meet others like them of a similar age and academic status, but from all over the world, giving them the opportunity to make friends from different cultures and backgrounds. This is a significant boost for developing the culture of international collaboration, which is of particular importance for the successful design and implementation of future research projects.

## 2 Planning for students exchange summer schools

### 2.1 General planning

During the course of the ICARUS project, 3 training schools will be organized. The recruitment of the summer school participants will be focused on the university students and junior scientists from participating cities. The aim of these summer schools will be:

- To provide insides on the methodologies related to air pollution, climate change and human health interactions
- To effectively support the dissemination of the project results and methodologies.

The time plan and the location are described below:

- 1<sup>st</sup> Summer school in Brno (Czech Republic), month 26 (end of Summer 2018)
- 2<sup>nd</sup> Summer school in Pavia (Italy), month 38 (end of Summer 2019)
- 3<sup>rd</sup> Summer school in Thessaloniki (Greece), month 48 (Summer 2020)

It has to be noted that this milestone is a living document which will be updated during the course of the project to include details on the 2nd and 3rd summer school once agreed with the project partners.

### 2.2 Plan for the 1<sup>st</sup> Summer school in Brno (Czech Republic), end of summer 2018

In 2018, the week-long ICARUS summer school will be organized in Masaryk University in Brno, Research Centre for Toxic Compounds in the Environment (RECETOX). The RECETOX summer school



of environmental chemistry and toxicology has been organized on the annual bases since 2005 addressing selected problems related to chemical compounds in the environment, their sources, behaviour, long-range transport, exposure pathways, effects, and related risks. It provided a practical training in environmental sciences to (so far) almost 500 participants from 86 countries. It is supported by UNEP (Secretariat of the Stockholm, Basel and Rotterdam Conventions) as it significantly contributes to building global capacities for environmental exposure and impact assessment and effectiveness evaluation of the international treaties on toxic chemicals.

The 2018 ICARUS summer school will offer a combination of the lectures and practical courses providing participants with a solid background in environmental chemistry, ecotoxicology, risk assessment and modelling as well as an insight into the global agenda to prevent and control releases of toxic contaminants into the environment. In a specific part of the summer school, the participants will be educated on the concepts and methodologies used in the ICARUS project. This will be complemented by the practical laboratory course and a field trip to the Central European background observatory in Kosetice (intercalibration site for the EMEP, GAPS and MONET networks) which also serves as a background to the city of Brno.

The lectures will be presented by the ICARUS scientists as well as external experts. A maximum capacity of the summer school will be 60 participants. 30 slots will be offered to the university students from the ICARUS participating cities which can enrol and gain the credits for the course. Remaining 30 slots will be reserved for the junior scientists working in the project but also the stakeholders (the city planners and managers, industrial partners or SMEs, and NGOs) on the international level. On the last day of the summer school, ICARUS student congress will be organized where the junior scientists of the ICARUS project will present the achievements of the project to the summer school participants. The workshop for the local stakeholders will be also prepared back-to-back to the ICARUS summer school. A variety of stakeholders will be invited for this workshop including representatives of the cities, industrial enterprises, local services providers, NGOs, citizens but also local university and high school students. This will bring the ICARUS students in contact with the local ICARUS team and city authorities and create an opportunity to share an experience from various cities.

### 3 Syllabus and training material

The summer schools will be organized in a way to provide a comprehensive understanding between the interplay of atmospheric physics and chemistry, air pollution, climate change, human exposure and health effects. The syllabus of the summer school courses is given below:

- Air pollution introduction (what is air pollution, scales, pollutants)
- Air pollution sources and emissions
- Atmospheric motion and pollutant transport
- Gas phase chemistry and photochemical smog
- Aerosols and particulate matter
- Monitoring air pollution
- Chemical analysis of particulates and source apportionment
- Air pollution modeling
- Data fusion for air pollution assessment
- Climate change (greenhouse gases, radiative forcing)
- Interplay between air pollution and climate change



- Exposure and health effects
- Regulatory framework and air pollution management
- Evaluation of policies and what-if scenarios
- Training in computational platforms

High quality training material will be provided to the students. This will include high resolution presentations, notes for every chapter of the course in electronic and hard-copy forms, demonstrations of monitoring instrumentation, chemical analysis and modelling software.

Moreover, the training courses will be recorded and they will be posted in a dedicated section of the ICARUS web portal; posting online the documentation and the courses will result in further dissemination and visibility of the ICARUS project.

Recommended literature should include:

- ✚ Atmospheric Pollution: History, Science, and Regulation, by Mark Z. Jacobson, Cambridge University Press, Cambridge, 2002.
- ✚ Air Quality, by Thad Godish, 4th Edition, Lewis Publishers, 2003. (Available through the USF main and HSC bookstores. Also on course reserve at the main USF library.) Fundamentals of Air Pollution. 4th Edition, by Daniel Vallero. Academic Press, Burlington, MA, 2008.
- ✚ Air Pollution and Health, S.H. Holgate, J.M. Samet, H.S. Koren, and R.L. Maynard, Eds., Academic Press, 1999.
- ✚ Atmospheric Chemistry and Physics, by John Seinfeld and Spyros Pandis, John Wiley & Sons, 1997.

## 4 Quality assurance of the summer school

It is the responsibility of the organisers/professors to ensure that:

- a satisfactory training plan is developed
- background knowledge of the students is properly taken into account
- training has been completed satisfactorily
- the training material is comprehensive and attractive

It is the responsibility of the students to ensure that:

- the training is undertaken
- new training needs are identified
- evidence of satisfactory achievement has been provided to the professors
- provide an essay of 20-30 pages based on a relevant topic the last day of the course

At the end of the course, anonymous questionnaires will be distributed to the students, for the evaluation of the training course. Recommendations by the attendants, will be used in the organisation of the next summer school.