

isocs Short Course Winter 2025

2 - 7 February 2025 – Bormio, Italy

CHEMICAL SENSING AND FOOD SCIENCE: FROM A PROOF OF CONCEPT TO INDUSTRIAL APPLICATIONS

Monday: State of the art and Industrial needs

8:30 – 8:45 Welcome

8:45 – 9:00 Introduction of participants

9:00 – 9:45 Food science: needs and challenges. Andrea Büttner, Fraunhofer Institute IVV

10:00 – 11:15 Analytical methods. Tilman Sauerwald & Gina Zeh, Fraunhofer Institute IVV

11:15 – 12:30 Gold Standards, Sensory Analysis: Objectives and Principles of Good Practice. Sylvie Issanchou, French National Institute for Agriculture, Food, and Environment

17:30 – 17:50: Industrial Partners I: Environmental sensors for consumer electronics.

Bosch Sensortec. Richard Fix

17:50 – 19:20: Practical session on Sensory analysis. Tilman Sauerwald & Gina Zeh, Fraunhofer Institute IVV

Tuesday: Chemical gas sensing

8:30 – 9:45 Reliability of measurements (E-noses, what are you really measuring?). Patrick Mielle, International Society for Olfaction and Chemical Sensing

10:00 – 10:45 Sensors and e-nose systems. Jesús Lozano, Universidad de Extremadura

10:45 – 11:30 Signal pre-processing for e-nose systems. Antonio Pardo, IBEC Barcelona

11:30 – 12:15 Gas Sensor Calibration Strategies. Christian Bur, Saarland University

17:30 – 17:50: Industrial Partners II: Nestlé. Ayed Charfedinne

17:50 – 19:20: Practical session on Sampling and e-nose data. Jesús Lozano & Felix Melendez Velasco, Universidad de Extremadura

Wednesday: E-tongues for food applications

8:30 – 10:00 Electronic tongues and sensors used in e-tongues. Manel del Valle, U. Autonoma de Barcelona

10:30 – 12:00 Applications of e-tongues in food analysis. Maria Luisa Braunger, Brazilian Nanotechnology National Laboratory

17:30 – 17:50: Industrial Partners III: JLM Innovation. Jan Mitrovics

17:50 – 19:20: Practical session on e-tongues. Manel del Valle & Xavier Cetó, U. Autonoma de Barcelona

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Thursday: Needs and applications

8:30 – 9:30 Perceptual interactions & cross-modalities: Flavor Construction and Modulation Strategies.

Thierry Thomas-Danguin, Research Centre for Taste, Smell, and Feeding behavior

9:30 – 10:45 From the Conquest of Space to the Conquest of Smells (How to become a billionaire?).

Patrick Mielle, International Society for Olfaction and Chemical Sensing

11:00 – 12:15 Technology Transfer: From Academia to the Industry. Andreas Güntner, ETH Zurich

17:30 – 18:30 From Proof of Concept to Industrial Reality: uses cases of Chemical Sensing from Food Industry Research. Ayed Charfedinne, Nestlé

18:30 – 19:30 Flash presentations from participants I

Friday: Research projects and Lessons learned

9:00 – 10:15 Research projects

9:00 AI-enabled reagentless analytical method for monitoring contaminants in edible oils and rapid quality assessment. Asia Kalinichenko, University of Tübingen

9:10 SERENADE Sensors and Eco-fRIENDly food-grade matERials for a sustaiNable and smArT food storagE and quality monitoring. Hamza Ali Imran, Saarland University

9:20 AMUSENS Multi-pixel gas sensor platform. Simone Saporito, JLM Innovation

9:30 VEGGIE NOSE Intelligent and modular sensory system for the detection of gases and volatile compounds in vegetable production. Jesús Lozano, Universidad de Extremadura

9:40 SENT-GC-MOS System Development Tool for portable GC-Systems. Oliver Brieger, Saarland University

9:50 PUMMEL Towards a handy, mobile gas chromatograph for application-specific gas measurements: a roadmap for GC-miniaturization. Tilman Sauerwald & Gina Zeh, Fraunhofer Institute IVV

10:00 BORDERSENS Border detection of illicit drugs and precursors by highly accurate electrosensors. Manel del Valle, UAB

10:15 – 10:45 Flash presentations from participants II

11:00 – 11:30 Round Table: Lessons learned

11:30 – 11:45 Closing school

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Flash presentations Session I (Thursday)

Electronic Noses: UEx prototypes and its uses, Felix Melendez Velasco
Tailored Paste Formulation for Industrial Production of MOX Gas Sensors, Luca Manini
Development of smart sensing systems for home appliances based on the electronic nose technology, L. Corra
Improvement of e-nose technologies for novel non-invasive diagnostic tools, Ana Maria Tischer
Detection and quantification of potential cancer biomarkers in urine samples using GC-IMS, Gema Guedes
Neurophysiological Sensor for Orthogonal Analysis of Neurochem. & Electrophysiological Activity, N. Shalabny
Development of data processing and machine learning methods applied to multi gas sensing systems, C. Ratti
Transfer Learning to Compensate Domain Shift with MOS Gas Sensors, Dennis Arendes
Breathlabs: Breath for Life, Lorena Díaz de León
Gas sensing for human breath analysis, Raffaella Germinario
Integrate approach to monitor emissions from industrial sites, Veronica Villa
Initial Exploration of Drone-Based Odour Monitoring using Transfer Learning, Zijian Wang

Flash presentations Session II (Friday)

From Sensing to Freshness: Potential of Electrical Impedance Spectroscopy with MOS Sensors, H Ali Imran
Detection and Estimation of VOC Emissions in Raspberries during the Spoiling Process, Luigi Masi
Application of Sensor Systems in Food Technology: Portable GC-MOS for Food Freshness, Motahareh Khalafi
GC-MOS systems for demand of on-site analysis and its potential, Oliver Brieger
From Lab to Field: MOX Gas Sensors for a Safer Agri-Food Chain, Dario Genzardi

