

Invitation

Embarking on a Journey of Smart Analytical Science with V4SSSAS


Currently, technology and science intertwine to pave the way for innovation, the **V4 Summer School on Smart Analytical Science (V4SSSAS)** serves as knowledge and skill enhancement in chemical analysis. Following the principles of SMART Analytical Science - Specific, Measurable, Achievable, Realistic, and Time-related chemical analysis, the project aims at innovations in lab-built analytical systems, green approaches, and expert systems for precise, quantifiable, and timely chemical analysis. Amidst the challenges posed by the pandemic inflation, research and development cuts, and an energy crisis, limiting researchers' mobility and hands-on training opportunities, V4SSSAS focuses on enhancing both hard and soft skills through formal and non-formal educational methods by **raising competencies in the design, construction, and application of smart analytical devices.**

V4SSSAS conducts a **Summer School for PhD candidates and researchers** at various stages of their careers, providing a multi-topic platform introducing participants to smart analytical science and networking among young researchers from V4 countries and institutions. The Summer School, preceded by a series of online lectures and completed by the eLearning platform, supplementing online and stationary events and maintained post-project, will **support the development of smart analytical devices and their introduction into research.** The innovative holistic approach to teaching and learning analytical chemistry stimulates discussion, mentoring, and experience transfer between early-stage of career researchers and experienced researchers. The friendly atmosphere at the conference center will provide possibilities for collaboration in research mobility, projects, and education.


With a regional relevance that spans V4 countries, including Partners' cities such as **Brno, Hradec Kralove, Krakow, Gdansk, Warsaw, Bratislava, and Veszprém**, V4SSSAS is dedicated to fostering the development of innovative solutions in analytical chemistry and contributing to the development and competitiveness of the V4 microregion countries.

*Let's forge ahead, exploring,
learning, and innovating in the
enthraling world of
Smart Analytical Science!*

First Online Seminar

 **Date:** 30th October 2023

 **Time:** 14:00 CET, Duration 2.5 h

 **Where:** Kraków: Online - registration at:
<https://v4sssas.project.uj.edu.pl/on-line-seminars>

We are thrilled to invite you to the inaugural Seminar of our project on Smart Analytical Science, scheduled for the **30th October at 14:00 CET**, conducted virtually to connect minds across borders. We are honoured to host two eminent speakers from Charles University (<https://www.faf.cuni.cz/>) and Jagiellonian University (<https://chemia.uj.edu.pl/>), who will delve into riveting lectures, sharing their profound knowledge and insights in the realm of analytical science. Your participation will not only enhance our collective knowledge but also pave the way for collaborative opportunities and innovative breakthroughs.

Chairs: Petr Chocholouš, Faculty of Pharmacy in Hradec Králové, Charles University (Czech Republic), Michał Woźniakiewicz, Faculty of Chemistry, Jagiellonian University (Poland)

Principles of Flow Techniques

Hana Sklenářová

The lecture will start with brief description of ways of automation applied on different levels and with different types of analysers. Then, basic principles of flow techniques, namely continuous/segmented flow analysis as equilibrium-based techniques and flow/sequential injection analysis as nonequilibrium-based techniques will be described in detail, and compared with respect to flow system set-up, sample manipulation, sample throughput, repeatability, advantages/disadvantages in terms of green chemistry approaches, etc. Miniaturization of flow injection and sequential injection systems will be stressed out. Experiments carried out in case of determination using spectrophotometry, fluorometry, or colour reaction will be demonstrated in short videos. Possibilities of automation using low-pressure flow techniques, application in different areas including sample preparation before separation of analytes in different systems, typically liquid chromatography (LC), and monitoring of long-term processes will be presented as well.



Hana Sklenářová

Charles University
Faculty of Pharmacy in Hradec
Králové
Department of Analytical
Chemistry
Hradec Králové, Czech Republic

Hana Sklenářová obtained her PhD in Pharmaceutical Analysis in 2002 and her habilitation in Analytical Chemistry in 2012 at the Faculty of Pharmacy of Charles University. Since the beginning of her research, she worked with low-pressure flow techniques, namely sequential injection analysis, applied for automation of colour reactions, sample preparation, and monitoring of dissolution and toxicological tests using different types of detections. She gained experience also in laboratories abroad, e.g., University of Graz (Austria), University of Porto (Portugal), University of Balearic Islands (Spain). Her current research is focused on monitoring of release of active substances from nanofibers or fluorescent/chemiluminescent markers of analytes

interaction with cell cultures. She is deputy head of the Department of Analytical Chemistry and head of the PhD committee in Pharmaceutical Analysis. She has co-authored 86 articles, 3 patents, 2 certified methodologies, and one utility model. Her publications have been cited more than 1200 times with H-index of 23.

Strategy in Analytical Calibration

Marcin Wieczorek

During the lecture, three basic and most popular calibration methods will be presented and their limitations related to systematic errors caused by the interference effect will be discussed in detail. In addition, several selected, innovative and less frequently used calibration approaches will be presented, which enable the diagnosis of matrix effects and/or enable the elimination of their influence on the analytical result. The advantages and disadvantages of each presented calibration method will be discussed.



Marcin Wieczorek

Jagiellonian University
Faculty of Chemistry
Department of Analytical
Chemistry
Kraków, Poland

Marcin Wieczorek received M.Sc. and Ph.D. degrees in analytical chemistry at the Faculty of Chemistry Jagiellonian University in Kraków in 2002 and 2007, respectively. In 2008, he was honoured with the award of the Committee of Analytical Chemistry of the Polish Academy of Sciences for his PhD thesis. Since 2007, he has been working in the Department of Analytical Chemistry at the Faculty of Chemistry at Jagiellonian University. He has been a habilitated doctor in chemical sciences since 2020. His main scientific interests focus on the development of new analytical calibration strategies and on new methods in chemical analysis realized with the use of flow techniques. He is a member of the Environmental and Industrial Analysis Team of the Committee of Analytical Chemistry Polish Academy of Sciences. He published more than 70 scientific articles, reviews and book chapters.

Future Events

Embark on a journey through the V4 Summer School on Smart Analytical Science (V4SSSAS) with our calendar of events, offering a vibrant array of workshops, seminars, and interactive sessions designed to enlighten and inspire researchers and science enthusiasts alike. Mark your calendars and join us in exploring the fascinating realms of smart analytical science, where knowledge, innovation, and collaborative opportunities converge into a unique scientific adventure!

2nd Online Seminar

 **Date:** 9th January 2024 (Online)

3rd Online Seminar

 **Date:** 19th March 2024 (Online)

4th Online Seminar

 **Date:** 4th June 2024 (Online)

Summer School

 **Date:** 23-28th September 2024 (Stationary)

5th Online Seminar

 **Date:** 15th October 2024 (Online)

Project Partners

- Faculty of Chemistry, Jagiellonian University, Poland
- Faculty of Pharmacy in Hradec Králové, Charles University, Czech Republic
- Faculty of Chemistry, University of Warsaw, Poland
- Institute of Analytical Chemistry of the CAS, v. v. i. (IAC), Czech Republic
- Faculty of Chemistry, Gdańsk University of Technology, Poland
- Faculty of Natural Sciences, Comenius University in Bratislava, Slovakia
- Research Institute of Biomolecular and Chemical Engineering, University of Pannonia, Hungary

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