



Sargent Centre Newsletter

A bimonthly newsletter

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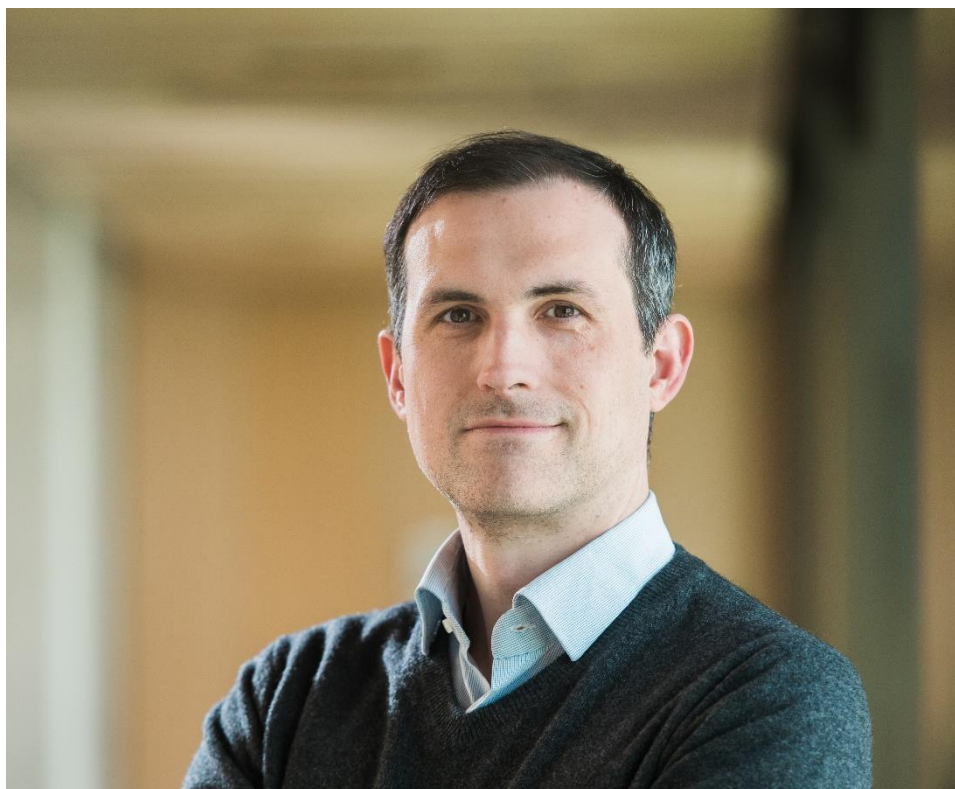
A message from the editorial team

We would like to welcome all Sargent Centre students, academics, and industrial partners to the first newsletter of the 2023-2024 academic year! In this issue we hear from new industrial consortium member Carbonaires, the latest academic member of the Sargent Centre Marcello Segal, and learn about some exciting upcoming events. Enjoy!

The Editorial Team

Tom Savage, Luxi Yu, Ahmed Alyazidi, Waqar Ashraf, and Marcello Segal

Academic Feature: Marcello Sega



Dr. Marcello Sega, Associate Professor in Molecular Thermodynamics at UCL, has recently joined the Sargent Centre. Ahmed Alyazidi spoke to Marcello about his research:

AA: *What drove your decision to join the Sargent Centre?*

MS: [I want to] bridge the gap between academic exploration and practical industrial applications [...] I'm excited about introducing industrial partners to the latest in computational strategies and learning from them about pressing issues."

AA: *What are you researching at the moment?*

MS: A CFD simulation suite which uses the lattice Boltzmann method to effectively deal with compliant and/or reactive boundaries, droplets, capsules, particles, and even electrolytes through coupling with electrokinetic equations. [...] These mesoscale simulations can improve our understanding of the wetting dynamics of complex fluids and offer insights into problems as diverse as fluidised bed reactors to the nuances of nanocapsule movements within capillary blood flow.

AA: *What do you get up to in your spare time?*

MS: [I enjoy] cooking dishes from the different regional cuisines of Italy [...as well as] experimenting with fusion recipes which draw inspiration from global cuisines. This love for gastronomy fits nicely into my fascination with exploring London's endless wonders; I moved here about a year ago, and the city has not stopped surprising me since!

Since the time of this interview, Dr. Segal has joined the editorial team of the newsletter. We are excited to have him on our team!

Announcements

Event of the Year!

In the last issue we welcomed **Carbonaires** into the Sargent Centre industrial consortium. Now we have had a chance to let them tell us a bit [more about their vision](#).

We asked Carbonaires about their motivation and goals within the consortium. Here is what they said:

“As a startup and SME our motivations are learning based for the most part. We also want to share our vision for decarbonisation and green capitalism. Our business model fuses science, ethics, tech and finance and we hope to learn about each area and how they interact from the consortium members, faculty, and staff. We also plan to continue our intern program with Imperial via the Sargent Centre and the consortium.”

We look forward to their ongoing contribution!

Deputy Director of the Sargent Centre **David Bogle** has been awarded the [Jacques Villermaux Medal](#) by the European Federation of Chemical Engineering (EFCE). Awarded every four years, the medal recognises achievements by a scientist within the context of the Federation's science policy, working parties, conference programme or other related activities.

The **Prosperity Partnership** and the **UKRI Interdisciplinary Centre for Circular Chemical Economy** were awarded the [IChemE Global Awards](#) in the Pharmaceuticals and Sustainability categories, respectively. The IChemE Global Awards were established in 1994 and are widely recognised as the world's most prestigious chemical engineering awards and they aim to celebrate excellence covering the breadth of the chemical and process industries.

The **Sargent Centre and its Industrial Consortium** have been selected as finalist of the [Bhattacharyya Award](#), an annual award to celebrate collaboration between academia and industry.

The panel has recognised that bringing fundamental research advances to practice is deeply embedded in the Sargent Centre's approach. For over 30 years, Sargent Centre researchers and process industry partners have collaborated to address challenges in manufacturing, decarbonisation, energy efficiency, optimisation, data science, multi-scale modelling, risk and uncertainty. This has resulted in successful spin-out creation and software licensing, with tools used across the pharmaceutical, agrochemical, consumer goods, food and energy sectors. Building on its strong partnerships, the Sargent Centre trains technical leaders and innovators who can harness new research to accelerate the design of new processes and increase their productivity and sustainability.

The **UCL Department of Chemical Engineering** is celebrating its **100th anniversary** since its establishment in 1923. Take a journey through our illustrious history, the department's current status, and our forward-looking perspective for the next century.

The Centenary video is now [online](#). Moreover, there is a dedicated [website](#) for the Centenary celebrations including the (growing) list of upcoming events, such as the the Centenary seminar. Upcoming talks in this series feature distinguished speakers presenting on a variety of topics, from the role of flow chemistry in sustainability to the use of microgravity experiments in understanding and modelling boiling phenomena. Click [here](#) for more information on how to register.

Three new MSc [programmes](#) in [Nature-Inspired Solutions](#), [Digital Manufacturing of Advanced Materials](#) and [Advanced Propulsion](#) received their first cohorts last September in the new UCL East campus. This campus is the biggest development in UCL's nearly 200-year history and is equipped with state-of-the-art research and teaching facilities for cross-disciplinary research and open innovation. This exciting development opens a new chapter also for UCL Chemical Engineering, broadening our academic horizons and reinforcing our commitment to innovation and excellence in research and teaching.

After hosting a successful iteration of the **Process Analytics Course** last summer, we are happy to announce that the Sargent Centre will be hosting the 2024 iteration on the 20th of May 2024. Course participants will be introduced to modern day multivariate data analytics methods through lectures and hands-on workshops. The syllabus is geared towards general concepts on latent variable modelling (LVM) theory and advanced topics on the analysis of specific data scenarios (e.g. batch data, image analysis, and chemometrics). More information will be sent out by e-mail soon!

Conferences and Workshops

Industrial Data Science Workshop:

The Industrial Data Science Workshop that unfolded on **19th September** introduced participants to process data challenges and how to solve them with data science, including general Machine Learning concepts for regression models (supervised learning) and anomaly detection (unsupervised learning). The instructor includes:

Dr. Francisco Navarro (Sr. Data Science Training Lead at IFF and Visiting Researcher at Imperial College London), **Dr. Mattia Vallerio** (Manufacturing Excellence Site Manager at Solvay and Advanced Process Control Specialist) and **Dr. Carlos Perez** (Industrial Data Scientist at Solvay and Optimization Specialist).

The workshop spanned three days, covering topics including Industrial Data Science, Monitoring Assets and Troubleshooting Processes. Attendees engaged in hands-on sessions, connecting theoretical knowledge to practical applications, ensuring a comprehensive understanding of industrial data science concepts.

Pharmaceutical Manufacturing Forum:

The recent pharmaceutical manufacturing forum proved to be a dynamic and insightful event, attracting industry leaders and experts. Attendees commenced the day with registration and a warm welcome, setting the stage for a series of engaging presentations.

Morning Highlights:

- AstraZeneca's **Paul Heath** discussed Innovative Medicines Manufacturing Technologies.
- **Salvador García-Muñoz** of Eli Lilly & Company and **Claire Adjiman** from Imperial College London explored the Industry-Academia Prosperity Partnership.
- **Eva Sorensen** from UCL provided insights into Pharmaceutical Manufacturing Research at UCL.
- **Richard Bourne** of the University of Leeds discussed Industry 4.0 Optimization.

Afternoon Highlights:

- **Sarantos Kyriakopoulos** of Takeda explored CMC Pain Points and Future Challenges.
- GSK's **Gary Finka** discussed Driving Digital Innovation in Biopharma CMC.
- **Dana Barasso** from Siemens shared Practical Examples of Digitalization in Pharma.

- **Patrick M. Piccione & Agostino Dall'Ara** of Roche discussed Culture Change & Business Cases.

Panel Discussion: Moderated by **Amparo Galindo** of Imperial College London, the panel discussion featured insights from **Katie Murray** from AstraZeneca, **Aline Miller** from the University of Manchester, **Andrew Livingston** from QMUL & Exactmer Ltd, and **Paul Matejtschuk** from MHRA & NIBSC.

Featured Posters and Recent Publications

- [Extending the SAFT- \$\gamma\$ Mie approach to model cyclic ketones in non-ideal mixtures.](#)
- [Application of a novel cloud-based platform for kinetic model identification in pharmaceutical processes.](#)
- [Reinforcement Learning-Based Control of Fed-Batch Production Reactor.](#)
- [Reaction Automation at the Centre for the Rapid Online Analysis of Reactions \(ROAR\).](#)

[Here](#) is a list of recent publications by Sargent Centre members.

