SISC Newsletter

Supramolecular, Interfacial and Synthetic Chemistry
School of Natural Sciences
University of Kent

Issue 1, November 2025

SISC
Supramolecular, Interfacial and Synthetic Chemistry

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Supramolecular, Interfacial & Synthetic Chemistry (SISC)
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Interested in joining SISC or collaborating with us? Please contact us at the email above — we welcome new members and partners.

Contents

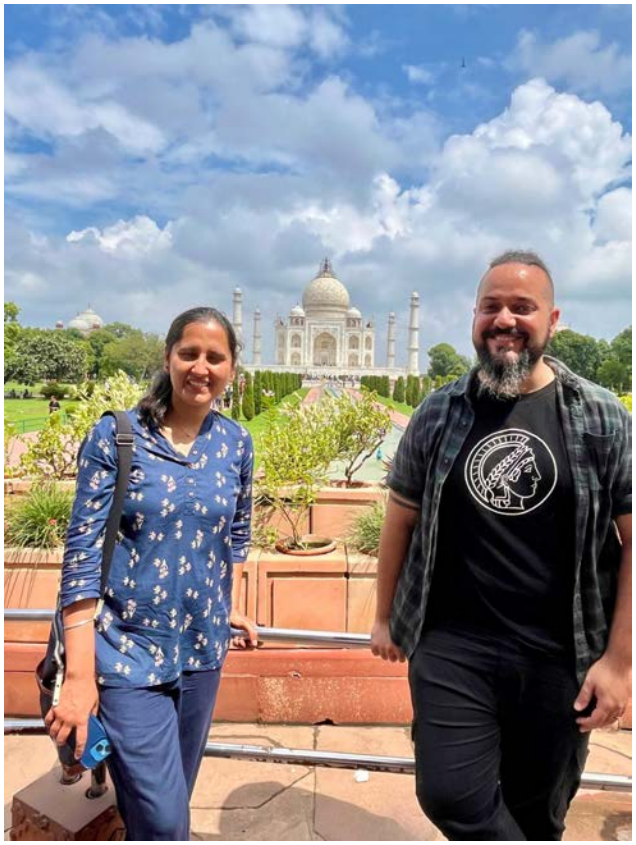
1. News

1.1 From the Editors

We are delighted to introduce the *SISC Newsletter*, a new monthly publication designed to share the outstanding work taking place across our research, teaching, and engagement activities within the Supramolecular, Interfacial and Synthetic Chemistry (SISC) group.

Each issue will highlight major academic developments, recent publications, conferences, student projects, visiting researchers, and wider collaborations that reflect our dynamic and growing community. The newsletter will also be circulated to the School of Natural Sciences, allowing the School to feature selected items across its channels and showcase the depth and diversity of work emerging from SISC.

Our aim is to celebrate and amplify the fantastic things we do — from high-impact research to innovative teaching and outreach — while strengthening internal communication and ensuring that our contributions are visible across Kent and beyond. We hope this initiative helps connect colleagues, inspire new collaborations, and reinforce the collective identity of SISC within the School's broader strategic direction.



Dr Felipe Fantuzzi & Dr Mandeep K. Chahal
Editors, SISC Newsletter

1.2 Mechanochemistry research showcased at INCOME 2025 in Berlin

Dr Helena Shepherd and Dr Yolanda Sabater-Algarra represented the University of Kent at the 11th International Conference on Mechanochemistry (INCOME 2025), held in Berlin-Adlershof. This major international event gathered leading scientists, engineers, and early-career researchers to share the latest advances in the fast-growing field of mechanochemistry.

INCOME is widely recognised as the premier international forum for mechanochemistry and mechanical alloying, offering a unique platform for the exchange of groundbreaking research, innovative methodologies, and emerging technological developments. The 2025 edition featured a high-calibre scientific programme of oral and poster presentations delivered by established experts and rising talents from across the globe.

Dr Shepherd and Dr Sabater-Algarra join the international community at the premier mechanochemistry conference.

Across five days, the conference covered the full spectrum of mechanochemistry — from fundamental reaction mechanisms to novel synthetic methods, sustainable chemistry, and industrial applications. Sessions highlighted advances in experimental approaches, mechanistic studies, and new techniques that are reshaping how chemical transformations are achieved under solvent-free or solvent-minimised conditions.

By taking part in INCOME 2025, Dr Shepherd and Dr Sabater-Algarra engaged with an active international community at the forefront of sustainable synthesis and materials chemistry. Their participation reflects SISC's growing contribution to mechanochemical research and its commitment to advancing innovative approaches to chemical synthesis and characterisation.

Learn more about INCOME 2025.

1.3 Shepherd Group explores high-pressure chemistry at Diamond Light Source

Lewis Jackson, Dr Yolanda Sabater-Algerra and Dr Helena Shepherd conducted high-pressure single-crystal diffraction experiments at the Diamond Light Source, following the successful acceptance of their beamtime proposal.

Across two intensive days on the I19 beamline (Small Molecule Single Crystal Diffraction), Dr Helena Shepherd and her research team used diamond anvil cells to compress crystalline samples and collect high-resolution diffraction data under well-defined pressure conditions. This approach allows researchers to probe structural changes, phase transitions, and intermolecular contacts that are not accessible at ambient pressure.

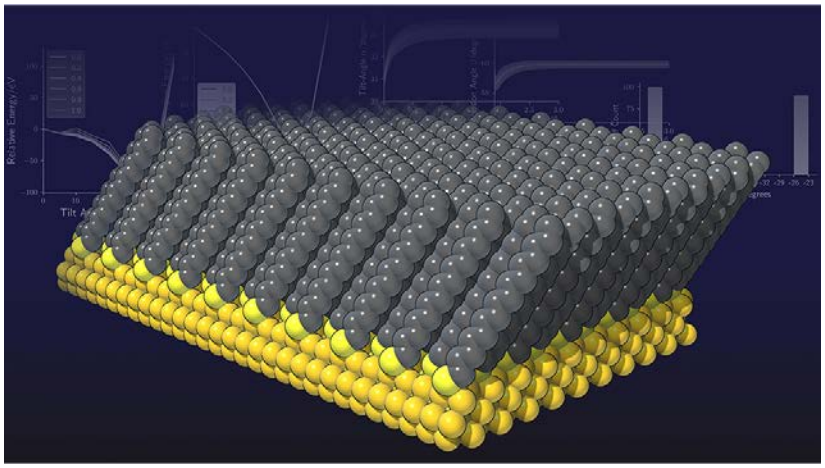
Access to I19 enabled precise measurements across multiple pressure points, generating a robust dataset for subsequent crystallographic refinement and comparison with room-pressure structures. The work forms part of the group's broader programme in crystal engineering and solid-state chemistry, aimed at establishing reliable structure–pressure relationships in functional molecular materials.

This successful visit underlines SISC's engagement with national large-scale research facilities and the group's continued use of advanced crystallographic methods to address challenging chemical questions.

Learn more about the I19 beamline at Diamond Light Source.

1.4 SISC research featured in Scilight

The work of Cauê P. Souza and Dr Felipe Fantuzzi on the atomistic modelling of self-assembled monolayers (SAMs) was recently featured in *Scilight*, AIP Publishing's platform that highlights significant advances across the physical sciences. The interview accompanies their paper, "A refined atomistic model of functionalised self-assembled monolayers on gold: Assessment of force field parameters", published in the *Journal of Chemical Physics*.



Cauê Souza and Dr Felipe Fantuzzi discuss their refined atomistic model of functionalised self-assembled monolayers on gold in an interview with Scilight.

Because of their ability to organise spontaneously into ultrathin, ordered layers on metal surfaces, SAMs play a central role in the design of materials for electronics, sensors, and catalysis. Yet despite nearly eight decades of research, their microscopic structure and stability have remained difficult to predict with precision. The study by Souza and Fantuzzi, in collaboration with Alexey V. Verkhovtsev, Nigel J. Mason, and Andrey V. Solov'yov, introduces a computational framework capable of accurately reproducing these nanoscale arrangements and explaining how force-field parameters influence molecular packing on gold surfaces.

"Self-assembled monolayers organise themselves into incredibly precise patterns—almost like molecular mosaics—just by dipping a surface into a solution," said Fantuzzi. "They're easy to make, but their properties are surprisingly complex and still not fully understood after nearly 80 years of study."

Souza added that the model not only reproduces experimental observations but also helps reveal the interplay of molecular and surface interactions that govern SAM formation. "This means we're not just creating a simulation tool—we're advancing the fundamental understanding of how SAMs behave," he said.

The authors were initially motivated by the challenge of simulating light-assisted nanofabrication processes involving SAMs—particularly photo-assisted chemical vapour deposition, which enables metal deposition at room temperature. However, the implications of their model extend far beyond that context, providing a foundation for studying more complex systems and supporting the design of advanced technologies such as chemical detectors, flexible electronics, and medical devices.

The *Scilight* article, written by Ben Ikenson, can be accessed here, while the original research paper is available in the *Journal of Chemical Physics* via https://doi.org/10.1063/5.0274290.

1.5 SISC delegation strengthens research and academic partnerships across India

A Kent delegation comprising Professor Bob Green, Dr Mandeep Chahal and Dr Felipe Fantuzzi delivered lectures, workshops and meetings across India, strengthening collaborations and opening new pathways for joint research and two-way student/staff mobility.

A delegation from the University of Kent, comprising Professor Bob Green, Dr Mandeep Chahal, and Dr Felipe Fantuzzi, embarked on a productive visit to leading universities and research institutes across India. Their itinerary focused on delivering lectures and workshops, engaging with students and faculty, and exploring avenues for collaborative research and bidirectional mobility. Emphasising practical academic partnerships in fields such as forensic science, chemistry, materials science, sports science, and space-related disciplines, the programme was supported and coordinated by Kent's International Office in partnership with key institutions like the National Forensic Sciences University (NFSU) in Ghandinagar and Galgotias University in Greater Noida.

In Lucknow, at the Uttar Pradesh State Institute of Forensic Sciences, Professor Green conducted multi-day sessions for law and emerging forensic science students. Moving to Faridabad, the team facilitated workshops at Manav Rachna University to bolster their nascent forensic science programme, while discussions with sports science faculty outlined potential research-driven teaching collaborations with Kent. In the Delhi-NCR region, engagements included specialised sessions for the dental faculty at SGT University and an exploratory visit to Jamia Hamdard. Further campus interactions at Geeta University and Sharda University revealed robust student enthusiasm and opportunities for research-informed education and mobility programs.

At Galgotias University in Greater Noida, the delegation presented invited talks at the International Conference on Recent Trends in Biosciences and Technology, followed by in-depth meetings with the international office and academic leaders. Conversations centred on fostering meaningful exchange mechanisms, including short research visits, summer schools, and co-supervised projects, tailored to Galgotias' expanding student population. The team also connected with representatives from Nanyang Technological University (Singapore) on active-learning initiatives for staff development, positioning Galgotias as a prime partner for research collaboration and mobility in biosciences and related fields.

Venturing eastward to Dhanbad, the group visited the Indian Institute of Technology (Indian School

of Mines), one of India's oldest technical institutions, where Dr Fantuzzi delivered seminars to the physics and chemistry departments. Talks emphasised prospective research partnerships and post-graduate mobility in forensic and molecular sciences, leveraging IIT (ISM) Dhanbad's robust scientific foundation to align with Kent's Schools of Natural Sciences and Engineering, Mathematics, and Physics.

In Kolkata, a lively seminar at the Ramakrishna Mission Vivekananda Centenary College drew a large audience of undergraduate and master's students, sparking keen interest in Kent's postgraduate opportunities and highlighting ongoing research in chemistry and astrochemistry.

The visit extended to Ahmedabad-Gandhinagar, where interactions with students and staff at various institutions built foundations for structured exchange programs and research seminars. At Kadi Sarva Vishwavidyalaya, the delegation led large-group sessions on forensic science and brainstormed curriculum enhancements. Discussions at Pandit Deendayal Energy University explored synergies in materials, energy, and analytical sciences, complementing Kent's expertise in molecular modelling, spectroscopy, and interfacial chemistry. A seminar at the Physical Research Laboratory deepened ties in space-astrochemistry, including analytical support for shock-tube synthesis studies and student collaborations involving NFSU, PRL, and Kent. Additionally, a tour of Gujarat International Finance Tec-City (GIFT City) revealed its vibrant innovation ecosystem, offering prospects for industry-linked student placements, professional training, and joint events in applied analytics, standards, and advanced instrumentation.

Dr Fantuzzi at Pandit Deendayal Energy University.

The trip culminated in a comprehensive multi-day programme at NFSU in Gandhinagar, featuring workshops, student interactions, and curriculum-alignment discussions. As Kent's strongest institutional partner in India, NFSU reinforced mutual commitments to joint teaching, research, and training in forensic science and allied areas. Leadership meetings advanced co-supervised projects streamlined progression pathways to Kent's postgraduate offerings, and established frameworks for staff and student exchanges. High levels of student participation underscored the benefits of international forensic education, with media coverage in the Times of India amplifying the collaboration's national importance and Kent's global outreach through its International Office.

Throughout the itinerary, the delegation emphasised high-impact activities—such as invited conference presentations, interactive workshops, and focused seminars—that lay the groundwork for co-supervised initiatives and short-term exchanges. These efforts uncovered tangible opportunities for joint research, practical mobility for students and staff (including research internships and visiting lectureships), and structured progression routes, bolstering Kent's international footprint and the pivotal role of SISC in fostering global, interdisciplinary scientific connections.

1.6 GlobalCert delegation visits Kent to strengthen international links

The visit strengthened Kent's growing collaboration with GlobalCert—an international education and training network based in Singapore with active operations across India and the UAE—highlighting new opportunities for student mobility and research-led learning within the School of Natural Sciences.

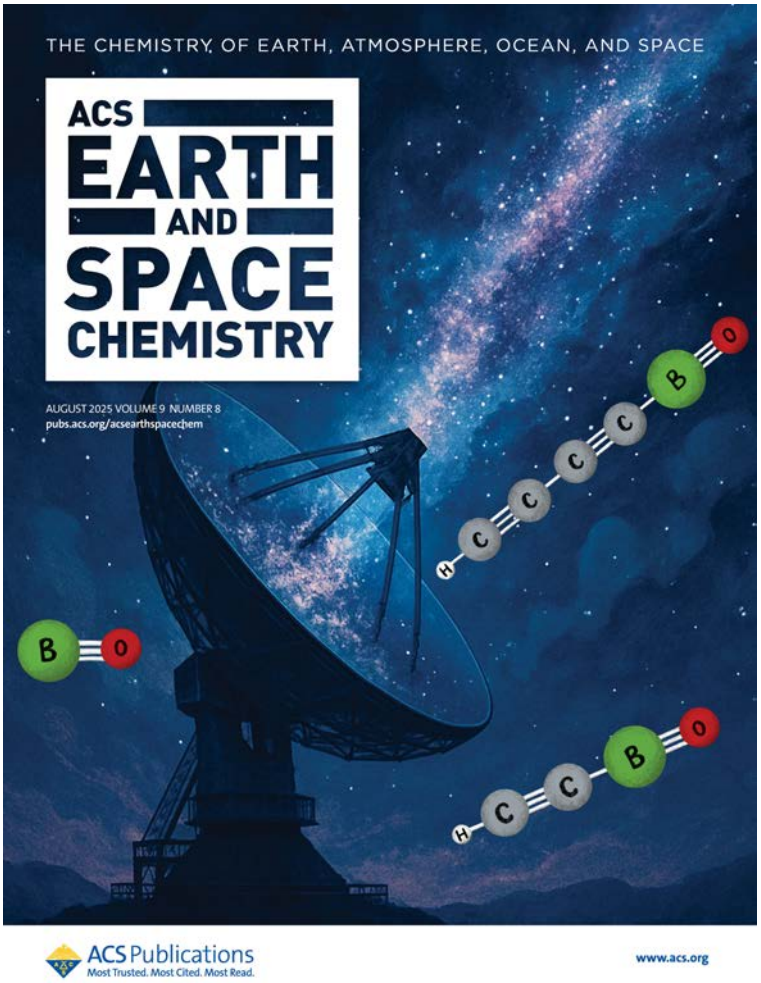
The University of Kent, in collaboration with its School of Natural Sciences, recently welcomed a delegation from GlobalCert, a Singapore-based international education and training organisation with operations spanning India and the UAE. The group comprised approximately 20 Indian students, GlobalCert representatives Aditya Ranjan and Shubhangi Dashore, and Dr Jinal Joshi from Kadi Sarva Vishwavidyalaya (KSV) University. Over the course of a productive week-long programme, participants were immersed in Kent's offerings in chemistry, forensic science, and related fields, gaining direct exposure to research-led teaching at the Canterbury campus.

Throughout the visit, students engaged with academic staff, toured state-of-the-art teaching laboratories and research facilities, and participated in hands-on taster sessions alongside interactive Q&A panels covering study skills, project development, and career pathways. Dedicated meetings with Kent's International Office and Admissions team delved into practical options for short-term study, visiting-student programmes, and seamless progression into undergraduate, taught, and research degrees. Discussions also highlighted opportunities for co-branded summer schools, internships, and scholarship guidance.

Engagements with GlobalCert centred on developing scalable mobility initiatives, such as connecting school outreach events in India with enriching on-campus experiences at Kent. Meanwhile, conversations with Dr Joshi explored curriculum synergies and potential staff-student exchanges between Kent and KSV. This visit strengthens ties forged during the University's recent itinerary in India, paving the way for targeted collaborative recruitment efforts, enhanced research-informed learning opportunities, and ongoing support for prospective students within the SISC community.

1.7 SISC research featured on the cover of ACS Earth and Space Chemistry

A recent article co-authored by Dr Felipe Fantuzzi and collaborators from Mexico and Germany was featured on the cover of ACS Earth and Space Chemistry. The paper, titled "Can Boronyl-Bearing Carbon Chains Serve as Gas-Phase Molecular Carriers of Interstellar Boron?", explores the possibility that boron-containing carbon chains could act as molecular carriers of boron in the interstellar medium.



The study reveals that boronyl-bearing carbon chains could serve as potential interstellar boron carriers, combining high intrinsic stability with key challenges for detection under cosmic conditions.

Using high-level quantum chemical calculations, the authors examined the stability and spectroscopic properties of a series of HC_nBO chains (n = 1–12), drawing parallels to the well-known cyano-bearing carbon chains observed in space. The study revealed that boronyl-bearing species exhibit high dipole moments and low enthalpies of formation, suggesting their potential detectability via radioastronomical methods. However, the analysis also highlighted key challenges to their astrophysical detection, including the low cosmic abundance of boron and the tendency of these molecules to decompose through reactions with CN radicals and H^- anions.

The cover image illustrates the dual nature of these systems: their strong intrinsic stability paired with the fragility imposed by interstellar conditions. The findings shed new light on how boron chemistry could influence molecular evolution in space, connecting astrochemical theory with broader questions about the chemical origins of life.

Download the cover here. Link to the paper: 10.1021/acsearthspacechem.5c00089

1.8 Tenetehara Periodic Table project receives RSC Inclusion and Diversity Fund award

The Royal Society of Chemistry (RSC) has awarded funding through its Inclusion and Diversity Fund to support the Tenetehara Periodic Table project, led by Dr Felipe Fantuzzi in partnership with Dr Stefano C. G. Biagini at the University of Kent, and developed in collaboration with the GEDAI Amazônia group at the Federal University of Pará (UFPA). The initiative aims to create an interactive, multilingual periodic table that integrates scientific, linguistic and cultural perspectives by presenting the names and meanings of chemical elements in the Tenetehara language, spoken by Indigenous communities in the Brazilian Amazon.

The initiative will develop an interactive multilingual periodic table incorporating the names and meanings of elements in the Tenetehara Indigenous language, promoting diversity and cultural inclusion in chemistry education. Image credit: Photograph by Rodrigo Abd/AP, via The Guardian.

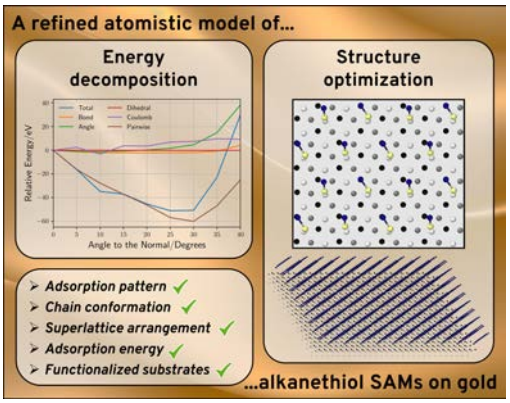
Developed in collaboration with educators and Indigenous representatives, the project promotes inclusivity in science communication by celebrating the coexistence of scientific and ancestral knowledge systems. Beyond documenting native terminology, the interactive resource will also include phonetic recordings, cultural interpretations and pedagogical materials co-created with local teachers and students.

The Tenetehara Periodic Table represents a step toward broadening access to chemistry education and fostering intercultural dialogue between Western science and Indigenous heritage. The RSC's support recognises the project's contribution to embedding diversity, equity and cultural awareness within chemical education and outreach—linking science with linguistic preservation, community engagement and global citizenship.

2. Publications

2.1 A refined atomistic model of functionalized self-assembled monolayers on gold: Assessment of force field parameters

Cauê P. Souza, Alexey V. Verkhovtsev, Nigel J. Mason, Andrey V. Solov'yov, Felipe Fantuzzi

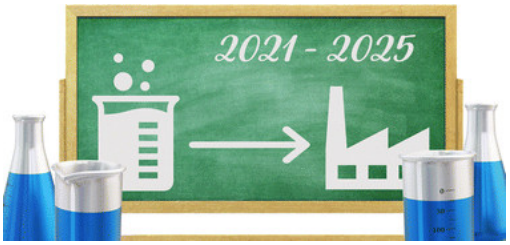


Self-assembled monolayers (SAMs) of alkanethiols on gold surfaces are important for various technological applications, such as electroanalytical sensors, organic electronic devices, and catalysts. However, providing a consistent computational description of the unique structural features of these SAMs, such as adsorption patterns, chain conformations, and superlattice arrangements, is challenging, particularly within a versatile computational framework that can simulate both the structural features of these systems and their irradiation-driven chemical transformations. This study systematically analyzes molecular mechanics force field parameters for bonded and nonbonded (van der Waals and electrostatic) interactions in alkanethiol SAMs with different terminal groups. Using structure optimization and energy decomposition analysis, we assess the impact of force field parameters on key properties, such as the equilibrium tilt angle, ligand packing density, and nanoscale structural organization. Based on this detailed benchmarking, an optimal set of force field parameters has been identified that reproduces the experimentally determined structural and energetic properties of SAMs and ensures their dynamic stability at room temperature. This provides a validated framework for simulating pristine and functionalized alkanethiol-coated substrates under thermal conditions relevant to experimental applications.

The Journal of Chemical Physics **2025**, *163*, 094704.
DOI: 10.1063/5.0274290

2.2 Advances in applied supramolecular technologies 2021–2025

Dominick E. Balderston, Elba Feo, Anamaria Leonescu, Mackenzie Stevens, Alexander M. Wilmshurst, Philip A. Gale, Cally J. E. Haynes, George T. Williams, Jennifer R. Hiscock

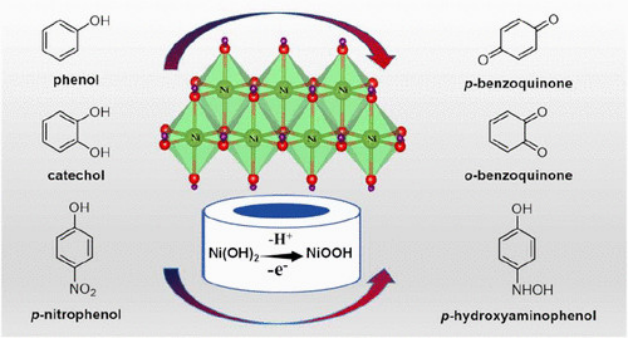


Supramolecular chemistry is a rapidly evolving field that has focused on building a foundation of fundamental understanding in controlling molecular self-assembly, through the use of non-covalent interactions. A common criticism of the field is that whilst the systems produced are very elegant, they do not have real-world use. Therefore, focus is now moving to applying the fundamental understanding of supramolecular chemistry to the production of commercially viable products. Building on our previous review in this area, which described the translational potential of innovations within the field of supramolecular chemistry up to the year 2020, we now review the progress of this field over the years 2021–2025 with the aim to inspire researchers to apply supramolecular chemistry to solve real world problems, moving innovation out of the laboratory and into the commercial marketplace.

Chemical Society Reviews **2025**, *54*, 8888–8924.
DOI: 10.1039/D4CS01037J

2.3 Pristine Nanostructured α-Ni(OH)$_2$ as a Nonenzymatic Electrochemical Strip Sensor for Trace Detection of Phenolic Compounds

Suman Mondal, Aritra Roy, Rene Pfeifer, Felipe Fantuzzi, Amitava Choudhury, Kalisadhan Mukherjee



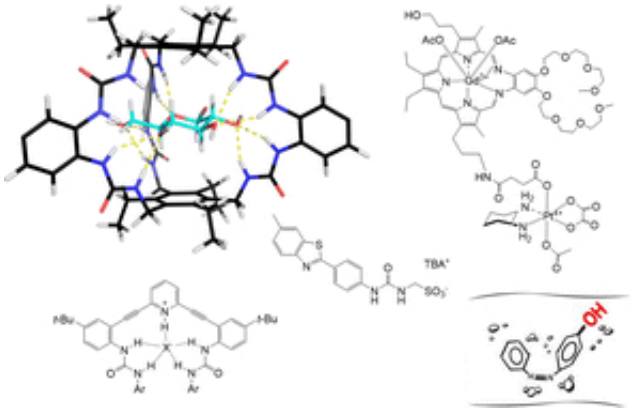
Developing electrochemical sensors capable of detecting multiple analytes at distinct potentials is vital for applications in environmental, biomedical, and quality monitoring. Here, we explore nanostructured, nonenzymatic α-Ni(OH)$_2$ as a versatile sensing material for the selective detection of phenol, catechol, and p-nitrophenol using two platforms: a standard three-electrode system and a portable strip sensor. α-Ni(OH)$_2$ was synthesized via a wet-chemical method and coated onto glassy carbon and screen-printed carbon electrodes for the respective configurations. Electron microscopy confirmed semicrystalline nanoscale morphology (nanoparticulate films), and cyclic voltammetry revealed clear redox signatures for each analyte, enabling selective detection with distinct peak positions across both systems. The three-electrode setup reached limits of detection of 0.003 μM (phenol), 0.1 μM (catechol), and 1 μM (p-nitrophenol), whereas the portable sensor achieved 0.3, 1, and 2 μM, respectively. Amperometric measurements confirmed sensor performance at target potentials. Additionally, machine learning algorithms were applied to model signal behavior and support analyte classification. This combined approach demonstrates a robust strategy for sensitive, selective, and portable detection of multiple phenolic compounds.

ACS Applied Nano Materials **2025**, *8*, 20463–20476.
DOI: 10.1021/acsanm.5c03716

2.4 Making molecules work – stories of supramolecular translation

Anthony P. Davis, Arri Priimagi, Matti Virkki, Jennifer R. Hiscock, Calden N. Carroll, Michael M. Haley, Darren W. Johnson, Jonathan F. Arambula, Kristle Karoscik, Jonathan L. Sessler

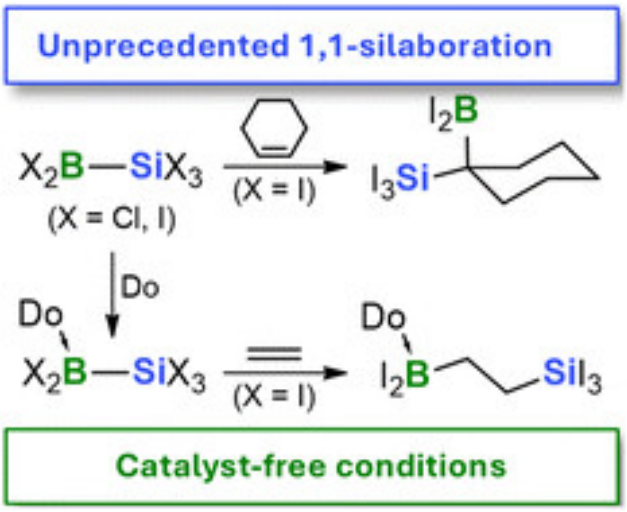
Commercialising supramolecular chemistry has proved challenging, but encouraging stories are beginning to emerge. In this editorial we present accounts of programs aimed at diabetes management, humidity sensing, antimicrobials, shock absorbing materials, nitrate sensing and anticancer agents. The experiences of the authors are intended to help others following similar paths, assisting efforts to develop real-world applications of functional molecules.



Chemical Science **2025**, *Advance Article*.
DOI: 10.1039/D5SC90071A

2.5 Synthesis of perhalogenated silylboranes (X = Cl, I) and their application in regiodivergent alkene silaboration

Jan Heller, Christoph D. Buch, Alexander V. Virovets, Eugenia Peresypkina, Hans-Wolfram Lerner, Felipe Fantuzzi, Matthias Wagner



Silaboration of olefins is a synthetically valuable and atom-economic mode of functionalization; however, it typically requires transition-metal catalysis. We have overcome this requirement by using highly reactive perhalogenated silylboranes, $X_2B–SiX_3$ (X = Cl, I), for which we herein report a straightforward synthesis, a full characterization, and their key properties. Access to this compound class was enabled by substantial improvement in the synthesis protocol for our previously published compound $[Et_4N][I_3B–SiI_3]$, now available on a 40 g scale via only two steps. Cation exchange with $Li[Al(OC(CF_3)_3)_4]$ affords the mixture $Li[I_3B–SiI_3]/I_2B–SiI_3/LiI$, serving as a synthetic equivalent of the elusive pure $I_2B–SiI_3$. Its chlorine analogue $Cl_2B–SiCl_3$ is accessible as a distillable liquid via treatment of $[Et_4N][I_3B–SiI_3]$ with $GaCl_3$. For both perhalogenated silylboranes, various Lewis base adducts $Do·X_2B–SiX_3$ were obtained in excellent yields and structurally characterized by X-ray diffraction (Do = SMe_2, Py, PPh_3, IDipp; IDipp = 1,3-bis(2,6-diisopropylphenyl)-1,3-dihydro-2H-imidazol-2-ylidene). We demonstrated that $Me_2S·I_2B–SiI_3$ undergoes efficient 1,2-silaboration of the challenging, non-activated substrate ethylene at rt with 0.1 eq. BI_3 as promoter. In contrast, $Li[I_3B–SiI_3]/I_2B–SiI_3/LiI$ effects a quantitative, unprecedented 1,1-silaboration of cyclohexene at rt. This remarkable reactivity switch was elucidated by experimental and quantum-chemical studies of the underlying steric and electronic factors.

Chemical Science **2025**, *Advance Article*.
DOI: 10.1039/D5SC06234A

2.6 Bridging lab and industry: The impact of a bio-conversion unit on black soldier fly larvae production and microbiome dynamics

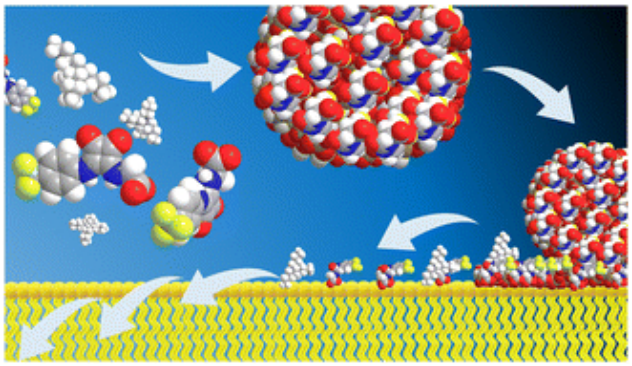
William J. S. Edwards, Chloe Skingle, Richard Small, Robert Barker, Anastasios D. Tsaousis

This study evaluates the viability of a novel bio-conversion unit (BCU) for extensive black soldier fly larvae (BSFL) production as a sustainable feed additive for livestock. The BCU's effectiveness in converting organic byproducts into valuable biomass via the production of BSFL was assessed to reduce reliance on environmentally taxing feed sources like soy and fishmeal. Additionally, the BCU was tested for its ability to replicate small-scale BSFL experiments in a realistic industrial environment while facilitating simultaneous testing of multiple feeding substrates for BSFL. BSFLs were reared in the BCU on various low-bioburden commercial byproducts, and their yield, macronutrient and micronutrient profiles were compared to those of larvae raised on a nutritionally balanced diet. High-throughput amplicon sequencing was used to investigate the impact of different diets on the BSFL gut microbiome, replicating laboratory findings on an industrial scale. Larvae reared on low-bioburden substrate in the BCU demonstrated comparable or improved protein and fat content compared to those reared on animal feed, with consistently high yields across all byproduct substrates. Micronutrient analysis revealed elevated calcium levels (compared to the literature), among other essential elements, in the byproduct-fed larvae, further supporting their potential as a nutritious livestock feed additive. Microbiome analysis confirmed a stable core microbiome across all conditions, with some genera emerging as dominant at the industrial scale, highlighting the importance of larger-scale replication for accurate microbiome research. In this pilot study, the BCU proves to be a reliable and efficient system for broad BSFL production, converting organic byproducts into high-quality biomass suitable for animal feed. Its controlled environment and scalability make it a valuable tool for conducting industrial-scale scientific research on BSFL, bridging the gap between laboratory studies and real-world applications.

JSFA Reports **2025**, *5*, 304–3014.
DOI: 10.1002/jsf2.70010

2.7 Towards the development of supramolecular self-associating amphiphiles as antibiofilm agents against Pseudomonas aeruginosa and Candida albicans biofilms

Kira L. F. Hilton, Hendrik J. F. Steyn, Kusasalethu S. Luthuli, Matthew Rice, Bree R. Streather, Esther Sweeney, Lisa J. White, Findley R. Morgan, Jennifer Rankin, Jennifer Baker, Charlotte Bennett, Hollie B. Wilson, Perry A. Hailey, Michelle D. Garrett, Jose L. Ortega-Roldan, J. Mark Sutton, Charlotte K. Hind, Carolina H. Pohl, Jennifer R. Hiscock

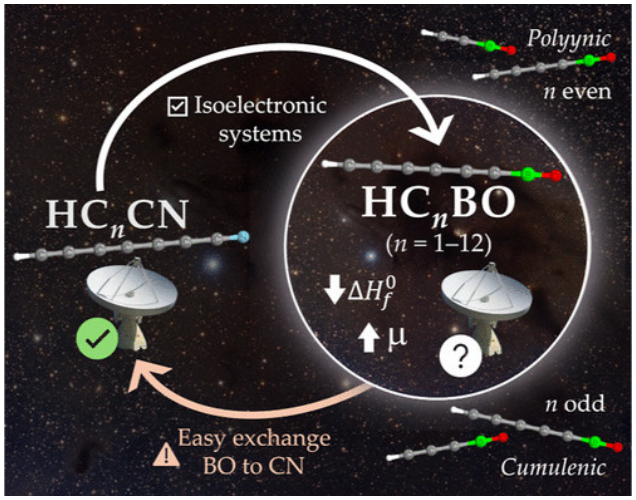


The rise of antimicrobial resistant (AMR) infection represents a growing threat to the global population and to economic health. The majority of antimicrobial innovations are developed against planktonic microorganisms, however those same microorganisms contained within a biofilm can become over 1000 times more resistant to antimicrobial (including antibiotic) agents. Supramolecular self-associating amphiphiles (SSAs) are a class of amphiphilic salts and related compounds that have shown the potential for development into antibiofilm agents. Within the scope of this work we present five structurally diverse SSAs. We characterise the self-associative properties of these SSAs in the solid state and in solution, before analysing the interactions of these agents with model synthetic membranes and determining their antibiofilm activity against WHO high/critical priority pathogens, Pseudomonas aeruginosa and Candida albicans. We also combine SSAs as 1:1 co-formulations and confirm the combination of SSA to inform both SSA phospholipid membrane interaction events and biological activity. Finally, we undertake a series of in vitro and in vivo DMPK experiments to verify the drug-like properties for these structurally diverse SSAs.

Journal of Materials Chemistry B **2025**, *13*, 8239–8251.
DOI: 10.1039/D5TB00653H

2.8 Can Boronyl-Bearing Carbon Chains Serve as Gas-Phase Molecular Carriers of Interstellar Boron?

Cinthya K. Prieto-García, Heidy M. Quitián-Lara, Josep M. Masqué, Felipe Fantuzzi, J. Oscar C. Jiménez-Halla



Boron is an exotic element in space. However, although no boron-bearing molecules have yet been identified in the interstellar medium (ISM), its unique chemical properties suggest that it could play a pivotal role in astrobiology and the origins of life. Given the isoelectronic relationship between the cyano (CN) and boronyl (BO) groups and the widespread detection of HC$_n$CN carbon chains in the ISM, we herein computationally investigate the potential of analogous BO-bearing chains (HC$_n$BO, n = 1–12) as viable gas-phase carriers of interstellar boron. Our calculations indicate that HC$_n$BO species exhibit lower enthalpies of formation and higher dipole moments than their CN-bearing counterparts, suggesting enhanced intrinsic stability and potential for detection via rotational spectroscopy. However, analysis of their formation and destruction pathways reveals that BO-bearing chains are susceptible to exergonic decomposition through reactions with CN radicals and H– anions, which may significantly affect their abundances in the ISM. These findings underscore that, while HC$_n$BO systems emerge as theoretically attractive interstellar boron carriers, competitive decomposition and the element's low cosmic abundance pose substantial challenges to their astrophysical detection.

ACS Earth and Space Chemistry **2025**, *9*, 2045–2055.
DOI: 10.1039/D5TB00653H

3. Meetings

3.1 CEQPAS

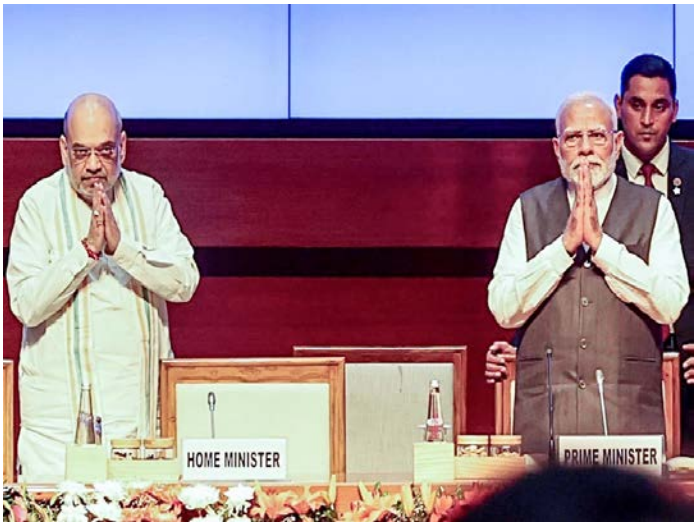
CEQPAS – *Centennial of Quantum Theory: Progress in Atomic and Molecular Structure* will be held in **Belgrade, Serbia from 3–5 November 2025**. Organised by the Institute of Physics Belgrade and the Institute of Chemistry, Technology and Metallurgy (both University of Belgrade), together with the University of Kent through the MOLecular Excited State spectroscopy (MOLESs) consortium, this three-day symposium will be part of the International Year of Quantum regional activities. It will welcome up to 40 participants, with priority for researchers from Central and Eastern Europe and a special focus on early-career scientists. It will feature oral presentations by all delegates.

The programme will be structured into five interlinked sessions: 1) atomic and molecular spectroscopy and its applications to atmospheric sciences and astronomy; 2) collisions and their applications in plasma physics; 3) studies in chemical physics and physical chemistry; 4) the use of artificial intelligence and machine learning for atomic and molecular data analysis and generation; and 5) the application of quantum science to our wider understanding of phenomena, including radiation sciences.

There is no registration fee; participants are responsible for their travel and accommodation. Further details will be available on the CEQPAS website.

3.2 DGP-IGP

DGP-IGP – *All India Conference of Directors General and Inspectors General of Police* will be held in **Raipur, Chhattisgarh, India from 28–30 November 2025**. Marking the 60th annual meeting, the programme will bring together senior police and security leadership from across India to review internal security priorities — including counter-terrorism, cyber security, drug control, border management, and efforts to combat Naxalism — with particular attention to progress and joint strategies in Chhattisgarh's Bastar region, where coordinated operations have shown tangible results. The conference will open with Union Home Minister Amit Shah, with Prime Minister Narendra Modi expected to deliver the valedictory address; notably, this will be the Prime Minister's second visit to the region in two months, underscoring its strategic importance. Hosted at the new Marine Drive complex in New Raipur, the event will convene top officials nationwide to assess ongoing efforts and shape future strategy, providing a platform for cross-agency collaboration, policy development and knowledge exchange that supports India's evolving response to internal and transnational security challenges.



Prime Minister Narendra Modi and Home Minister Amit Shah at the 59th All India Conference of Directors General and Inspectors General of Police, held in 2024 (Image credit: ANI).

4. Announcements

4.1 Vacancy: Lecturer in Forensic Science at the University of Kent

The School of Natural Sciences at the University of Kent is inviting applications for a permanent position as *Lecturer in Forensic Science* (Grade 7, Education and Research contract). This role offers an exciting opportunity to join a dynamic academic environment that integrates Chemistry and Forensic Science to deliver innovative teaching and internationally recognised research.

The successful candidate will contribute to the design and delivery of high-quality, student-centred teaching, and develop an independent research programme aligned with the School's strategic priorities. Areas of expertise across forensic science are welcome, with particular interest in candidates with experience related to ballistics. The post also includes opportunities to supervise students, collaborate across disciplines, and participate in outreach and engagement activities that strengthen Kent's forensic science profile nationally and internationally.

Applicants should hold a PhD in Forensic Science or a closely related discipline, have experience in higher education teaching and assessment, and demonstrate an emerging record of internationally excellent research.

Applications close on 10 November 2025. For full details and to apply, please click here (job reference: **SNS-048-25**).

4.2 Fully Funded Master's by Research: Porous Organic Materials for Catalysis

Applications are now open for a fully funded Master's by Research studentship within the School of Natural Sciences, focusing on the development of porous organic molecular materials for catalytic applications. The project, supervised by Dr Mandeep Chahal, aims to design and synthesise solution-processable porous materials derived from pyrrolic macrocycles, exploring how structural modifications influence their physicochemical and catalytic properties.

This internally funded studentship will cover tuition and bench fees for one home student, with an expected start date in January 2026. The project provides an excellent opportunity to gain hands-on experience in organic synthesis, materials characterisation, and catalysis, contributing to a growing area of molecular materials research at Kent.

Interested candidates are encouraged to contact Dr Mandeep Chahal (m.k.chahal@kent.ac.uk) for further details and application guidance before **Friday, 21 November 2025**.