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# Innovation Day Poster Session Guide

## September 21, 2026

## Poster Session, 10:00 AM – 11:15 AM

On Innovation Day emerging industry leaders celebrate today's innovations in the chemical industry and seek solutions for tomorrow's challenges. By taking early-career scientists out of the lab and giving them broader access to their colleagues and to the historical and social context of their research, Innovation Day supports a 21st-century chemical enterprise that addresses society's most pressing needs. Cohosted by the Society of Chemical Industry (SCI) and Science History Institute since 2004, Innovation Day 2026 is a hybrid event held in person and online on September 21. In its 23rd year of highlighting breakthroughs and achievement in innovation, our program continues to attract leading speakers and participation from across all sectors of the chemical enterprise.

Innovation Day 2026 features 17 posters. The themes of this year's event explore AI & Sustainability, AI & Digital Transformation, and AI & Training the Workforce of the Future.

This Poster Session Guide is organized alphabetically by poster presenter last name. The Guide includes poster presenter name(s), poster authors (when available), company affiliation, and poster title and abstract for each poster. Please use this as a guide to explore posters that will be on display at this year's Innovation Day program.

For full poster citations, please contact the poster presenters.

***Organized by Presenter Surname***

**Presenter Name:** Jonathan DeRocher, Senior TS&D Scientist, Dow Coating Materials
**Authors:** Jonathan DeRocher, Paul Doll, Ramesh Iyer, Dan Wu
**Company:** Dow
**Poster Title:** Efficient Data Collection and Processing to Enable Paint Product Carbon Footprint Calculations
**Abstract:** Paint manufacturers and retailers are pledging to reduce their Scope 3 emissions significantly by 2030 and beyond, meaning every supplier to the industry needs to report their product carbon footprints to help meet these ambitious goals. In Dow Coating Materials, we are committed to helping our customers and the coatings industry lead the way toward a lower carbon future by providing rigorous carbon footprint data based on the ISO-14067 standard to our customers. Traditionally these assessments would be carried out by a sustainability practitioner and take weeks to generate. Like a custom-tailored suit, the result was a great fit, but the process was slow and expensive. To make this process more efficient, our team set out to create a streamlined methodology which generalizes the calculation, without compromising accuracy. This methodology was certified by TÜV-Rheinland within certain compositional limits. Our team then built an easy-to-use web interface that allows our formulators to perform their own PCF calculations, enabling them to work with their customers to assess their formulations and help them make progress toward their sustainability commitments.

**Presenter Name:** Joseph Ferrar, Principal Chemical Engineer, Cellulose Esters Process Technology group
**Company:** Eastman
**Poster Title:** EsmeriTM Cellulose Ester Micropowder for Biodegradable Personal Care
**Abstract:** Esmeri™ is a family of ECHA microplastic-compliant cellulose ester micropowders developed by Eastman for personal care applications. Produced from sustainably sourced wood pulp, Esmeri™ combines renewable feedstocks with reduced environmental persistence, achieving externally certified biodegradation of 60% within 28 days (OECD 301B). These attributes address a key limitation of conventional personal care microparticles, including poly(methyl methacrylate) and nylon, which can persist in the environment long after product use. Compatible with a broad range of formulations, including foundations, lipsticks, pressed powders, sunscreens, and skin care products, Esmeri™ delivers enhanced product performance while supporting more sustainable formulation design. Through control of particle morphology and size, enhanced soft-focus performance is achieved alongside maintained or improved sensory feel, color payoff, and other critical formulation attributes. As personal care products remain a significant source of primary microplastic emissions, biodegradable, wood-derived alternatives offer a practical pathway to reducing environmental persistence without sacrificing functionality. The Esmeri™ platform illustrates how sustainable materials innovation can simultaneously advance environmental goals, regulatory compliance, and consumer performance expectations.

**Presenter Name:** Subhash Garhwal, Senior Research Chemist
**Authors:** Subhash Garhwal, Irene Cai, Timothy Boller, Matthew Holtcamp, Michael Leaf, Venkatesh Meenakshisundaram, Joe Moebus and Jarod Younker
**Company:** ExxonMobil
**Poster Title:** Accelerating Metallocene Catalyst Discovery Through Machine Learning and Graph Neural Networks
**Abstract:** Accurate prediction of supported metallocene catalyst performance remains challenging due to uncertainties surrounding the nature of the active catalytic site and the inability of conventional particle-scale simulations to explicitly account for key components such as activators and silica supports. Although Density Functional Theory (DFT) has demonstrated success in predicting catalyst energetics,

these predictions often fail to correlate with experimentally observed supported catalyst performance. To address this gap, a machine learning (ML) framework was developed that leverages DFT-derived descriptors from proposed catalyst resting states, including electronic and structural features such as ligand charge distributions. Correlating these descriptors with experimental catalyst performance enabled the construction of a predictive model that reduced the candidate synthesis and testing space by approximately 50%, significantly improving screening efficiency. Building on this approach, a graph neural network (GNN) methodology was subsequently explored to directly learn structure-performance relationships. Preliminary results indicate that the GNN approach is highly promising and offers a pathway toward reducing reliance on computationally intensive DFT calculations while maintaining predictive capability. These results demonstrate the potential of combining computational chemistry and advanced machine learning techniques to accelerate metallocene catalyst discovery and optimization for polyolefin production.

**Presenter Name:** Stephen Jones, Senior Innovation Chemist
**Company:** Univar Solutions, Houston Solution Center, Houston, TX
**Poster Title:** Teaching the Machine, Training the Chemist: How Prompt Engineering Enables AI-Assisted Sustainable Formulation Development
**Abstract:** Artificial intelligence (AI) has the potential to accelerate formulation expertise by enhancing, rather than replacing, the work of formulation scientists. This study explores prompt engineering as a framework for training both AI systems and chemists through iterative, knowledge-driven interactions. By asking progressively targeted technical questions, formulators can guide AI from broad recommendations toward practical formulation strategies while deepening their understanding of formulation science. A case study involving the development of a sustainable, lightly abrasive, non-scratching bathroom cleaner was used to evaluate this approach. Rather than requesting a complete formulation, a structured sequence of prompts explored cleaning mechanisms, abrasive selection, rheology, sustainability objectives, and ingredient functionality. AI-generated recommendations were then compared with a formulation independently developed through conventional laboratory research, ingredient screening, and performance testing. Results demonstrated that prompt quality significantly influences formulation outcomes and that iterative questioning can guide AI toward solutions that closely reflect the reasoning of experienced formulators. The findings suggest that AI can serve as an effective collaborative learning partner by generating hypotheses, identifying formulation tradeoffs, and supporting more sustainable R&D through reduced experimental trials—because laboratory validation remains essential! This prompt-to-prototype approach promotes critical thinking, accelerates knowledge acquisition, and positions prompt engineering as a valuable competency for future formulation scientists.

**Presenter Name:** Brian Koo, Research Scientist
**Company:** Arkema
**Poster Title:** The Future of Thermal Analysis: Towards Autonomous Workflows
**Abstract:** Differential Scanning Calorimetry (DSC) is an important tool for thermal characterization, yet data analysis and report generation remain a largely manual effort despite advances in instrumentation that have enabled high-throughput data collection. This project aims to eliminate that bottleneck through a fully automated workflow that converts raw DSC data into complete analytical reports while delivering results consistent with expert-level interpretation.
This proof-of-concept workflow was developed with a human-in-the-loop quality review. In a validation study of approximately 200 samples, 98% were processed correctly without any user intervention. Following this successful demonstration, the workflow has been deployed and is now live for the laboratory's most common material class.

By streamlining data analysis and reporting, the workflow reduces analyst effort by approximately 95% and allows scientists to focus on higher-value activities. This capability represents an important step toward the autonomous laboratory, with future efforts focused on expanding automation to additional material classes and other characterization workflows, including rheology, X-ray, and chromatography.

**Presenter Name:** Kai Kwan, Application Development Engineer
**Affiliation:** Trinseo
**Poster Title:** AI in Action: Accelerating Innovation in Trinseo R&D
**Abstract:** AI is transforming how R&D organizations access knowledge, generate insights, and accelerate innovation. At Trinseo, AI-powered solutions are helping researchers navigate vast collections of internal reports, patents, scientific literature, and experimental data, turning information into actionable intelligence. Platforms such as Catalyst, Patsnap, and Uncountable enable rapid search and analysis of knowledge while maintaining secure access to confidential information. These tools support critical activities including scientific data analysis, experimental design optimization, technology landscaping, competitor monitoring, and automated documentation. By uncovering hidden trends, reducing trial-and-error experimentation, and streamlining knowledge discovery, AI empowers scientists to make faster and more informed decisions. The result leads to improved productivity, stronger intellectual property, and an accelerated path from concept to commercialization. Looking ahead, Trinseo aims to expand knowledge integration, measure AI's impact on innovation outcomes, and foster broader adoption of AI-driven best practices across functions in the organization.

**Presenter Names:** Joel Lischefski, Analytical Lab Manager, Corporate Planning, Technology & Sustainability (CPT&S)
Sikander Hakim, Planning Manager, Corporate Planning, Technology & Sustainability (CPT&S)
Jeff S. Fodor, Research Engineering Fellow, Corporate Planning, Technology & Sustainability (CPT&S)
**Company:** Chevron Phillips Chemical (CPChem)
**Poster Title:** Building the Data Foundation for AI-Enabled Research and Innovation
**Abstract:** Industrial research organizations generate large volumes of experimental data, but the value of that data is often limited by fragmented workflows, inconsistent context, and disconnected storage. This poster presents a practical approach for modernizing the research and technology data environment to accelerate innovation and establish a foundation for artificial intelligence. The approach begins with understanding researcher workflows and defining a common framework for samples, experiments, methods, equipment, and results. Laboratory systems and instruments are then connected to a governed data environment where information can be structured, linked, traced, and reused across the research lifecycle. This foundation supports more efficient data discovery, reduces manual data preparation, improves knowledge transfer, and enables advanced analytics and predictive modeling. The poster also describes the characteristics required for research data to become AI-ready, including accessibility, quality, context, lineage, security, and governance. Illustrative use cases demonstrate how connected data can support faster analysis and more informed experimental decisions. Finally, the poster outlines a future in which natural-language interfaces, continuously improving models, and AI-assisted experimental design augment scientists and engineers. The central message is that successful AI transformation begins not with an algorithm, but with trusted, contextualized, and reusable scientific data.

**Presenter Name:** Michael Lucas, Principal Engineer
**Company:** ExxonMobil
**Poster Title:** The Starmind Experience – Tacit Knowledge Capture at ExxonMobil

**Abstract:** Knowledge management experts estimate that 80% of a corporation's tacit technical knowledge – the experience, judgment, and context of how to run a world-class organization – is not captured in formal documentation. This gap is increasingly critical as global companies address workforce retirements, rapid expansion to remote technology centers, and broader workforce transformation in the growth of AI capability. From January through July of 2026, ExxonMobil evaluated Starmind as a tacit knowledge capture program. The goal of this pilot was to evaluate its capability to facilitate a step change in enterprise capability for discovering expertise, routing technical questions, capturing expert responses. The pilot began with a group of 300 employees in a single technology area and expanded through word-of-mouth demand to 1,200 participants and growing by the end of the pilot. By June 30, users had asked and answered thousands of questions with tens of thousands of views for the newly captured information. Collected data from the pilot indicated time saved from this tacit knowledge capture to 2.5 full-time employees per 1,000 users. The pilot results demonstrated an increase in knowledge flow across disciplines and locations. Additionally, Starmind promoted reconnection of employees who had moved beyond a technology back to their former colleagues as well as preservation of knowledge from employees approaching retirement. Work with Starmind continues, working to build this into the knowledge management ecosystem at ExxonMobil.

**Presenter Name:** Vishnu Nair, Polymer and Novel Materials Scientist
**Company:** ExxonMobil
**Poster Title:** Integrated Refining-to-Advanced Graphite Technology for Li-ion Batteries
**Abstract:** Building on its long history of innovation, ExxonMobil has developed advanced technologies that convert heavy refinery byproducts into high-performance battery anode graphite. This graphite technology enables up to 30% faster charging, 4x longer battery life, and up to 30% higher usable capacity through a continuous graphitization process. ExxonMobil's integrated refining-to-graphite approach combines advanced product development with scalable, manufacturable processes, creating a competitive advantage in the battery materials market. This technology supports the development of a more resilient and reliable graphite supply chain while enabling large-scale production to meet growing demand for lithium-ion batteries.

**Presenter Name:** Aanish Paruchuri, Data Scientist
**Company:** Arkema, Inc.
**Poster Title:** Automated Melt Fracture Quantification with Computer Vision
**Abstract:** Melt fracture remains a significant surface instability that undermines the consistency and performance of polymer films produced under high shear and elongational stresses. As the industry advances toward next-generation polymer processing aids and faster formulation development cycles, the need for objective, automated, and high-throughput methods to quantify melt fracture in real time has become increasingly critical. Traditional characterization methods have remained limited to manual visual inspection or prohibitively costly measurement systems. Relying on subjective visual grading introduces inconsistency, prolongs development cycles, and limits the ability to accurately link processing parameters to the onset of surface instabilities. This work presents a low-cost optical measurement strategy combined with a real-time computer-vision pipeline for quantifying melt fracture in clear polymer films. By pairing a structured backlit pattern with a computationally efficient algorithm, the system delivers continuous, quantitative measurements suited for both laboratory studies and pilot-scale extrusion. Designed to remain robust under the challenging conditions encountered during pilot testing, the system offers an accessible and scalable tool for accelerating formulation screening, supporting process optimization, and enabling future integration with automated or closed-loop extrusion control.

**Presenter Name:** Vidhya Raj, Composites Customer and Application Development Supervisor
**Company:** ExxonMobil Technology and Engineering Company
**Poster Title:** Proxxima™ Polyolefin Thermoset System: A New Frontier in High-Performance Materials for Industrial Applications
**Abstract:** Polyolefin thermoset resin systems are a new generation of high-performance, polyolefin-based materials engineered for advanced composites, coatings, and molded polymers. These systems consist of a low-viscosity cyclic olefinic monomers like dicyclopentadiene (DCPD) and a Ru-based Grubbs catalyst, offering exceptional processability and tunable cure kinetics. This enables rapid fiber wet-out and compatibility with a wide range of manufacturing techniques including resin transfer molding (RTM), pultrusion, and filament winding. Designed for lightweight, durability, and cost-effectiveness, these resins deliver a 5–10% density advantage over conventional thermosets while maintaining an excellent balance of mechanical properties. Their inherent hydrophobicity and chemical resistance support long-term performance in aggressive environments, making them ideal for infrastructure and mobility sectors. Polydicyclopentadiene (pDCPD) based resin systems enable faster cycle times and improved lifecycle economics for manufacturers seeking high-performance solutions. Early adoption in civil infrastructure, such as corrosion-resistant rebars has demonstrated their value, with growing interest in automotive applications including battery housings and structural components. This poster will showcase performance data and case studies illustrating how pDCPD based resins enhance design flexibility, reduce processing complexity, and improve manufacturing efficiency across multiple industry segments.

**Presenter Name:** Ben Reiner, Associate Research Scientist, Enterprise Innovation & Growth
**Company:** Dow
**Poster Title:** Little Green Leaves: Modeling Sustainability of Functional Polysaccharides
**Abstract:** On the back of your shampoo bottles are sometimes little green leaves. These small bits of foliage represent years of product development endeavoring to balance polymer performance and sustainability. In the home and personal care market, polysaccharide polymers, play a variety of roles including rheology modifier, deposition aid, dispersant, and soil release agent. Post use in consumer products such as shampoos and conditioners, these polymers are washed down the drain into municipal greywater. Ideal polymers biodegrade in these wastewater streams to minimize environmental persistence. Unfortunately, biodegradation testing is expensive in both time and money. The average biodegradation test is at least 30 days. This is a wholesale mismatch between the speed of material synthesis/formulation and sustainability testing. Therefore, attempts to rationally engineer functional polysaccharides simultaneously for high performance and biodegradation is deviously challenging. This poster will detail approaches to model wastewater biodegradability from point of synthesis dramatically accelerating synthesis-material feedback loops and enabling proliferation of more sustainable functional polymer technology.

**Presenter Name:** Danielle Singleton, Fluids Customer Application Development Advisor
**Authors:** Andres Villalpando, Danielle Singleton, Jeffrey Camacho-Bunquin, Katelyn Coleman, Caterina Tran, Brianna Dufek, Suhas Ketkar, Austin Schultz, Quinn Carlson, Ryan Logan
**Company:** ExxonMobil
**Poster Title:** Criticality of modern analytical techniques in semiconductor-grade IPA analysis: Impacts of construction material and supply chain conditions on product integrity
**Abstract:** The rapid expansion of artificial intelligence (AI) technologies has accelerated global demand for semiconductor manufacturing and driven unprecedented industry growth. As leading chip manufacturers expand operations in North America and work to meet the ultra-high purity requirements associated with increasingly advanced and shrinking node technologies, greater attention is being placed on the effects of materials of construction and supply chain conditions on trace

contaminant levels in critical process chemicals. This study investigates the presence of ppb- and ppt-level leachates from various liner materials into semiconductor-grade isopropyl alcohol (IPA), a widely used solvent in semiconductor fabrication. In addition, the effects of thermal exposure and oxidative degradation on the long-term chemical stability of IPA are evaluated to better understand potential contamination risks during storage and distribution. The poster also highlights the critical role of modern analytical instrumentation and trace-level detection techniques in identifying, quantifying, and mitigating contaminants that may impact semiconductor manufacturing performance and yield.

**Presenter Name(s):** Shankar Kollengodu Subramanian, Sr. Polymer Engineer
**Company:** Trinseo LLC/Altuglas LLC
**Poster Title:** Trinseo Advanced Materials for Consumer Electronics: Trends, Innovations, and Sustainability
**Abstract:** The consumer electronics market requires materials that balance performance, aesthetics, processability, and sustainability. Trinseo's polycarbonate (PC) and PC/ABS compounds are designed to meet these needs across applications such as laptops, tablets, monitors, smart home devices, networking equipment, gaming systems, and wearables. PC provides excellent impact resistance, dimensional stability, and thermal performance, enabling durable and lightweight product designs. PC/ABS combines the toughness and heat resistance of PC with the processing benefits and surface quality of ABS, supporting attractive, high-quality finishes. These materials offer excellent colorability, premium aesthetics, and compatibility with evolving technologies. To address regulatory requirements and sustainability goals, Trinseo offers flame-retardant, low-emission, and sustainable solutions that enhance product safety while reducing environmental impact. The portfolio also includes grades with improved flow, scratch resistance, and durability. This presentation highlights Trinseo's latest PC and PC/ABS innovations, emphasizing material advancements, sustainability initiatives, and emerging trends shaping the consumer electronics industry.

**Presenter Name:** Roger Turner, Curator of Instruments and Artifacts
**Authors:** Roger Turner, Curator of Instruments and Artifacts; Molly Jacobs, Director of Applied Research; Joel Tickner, Director of the Chemicals Policy and Science Program
**Company:** Science History Institute and Lowell Center for Sustainable Production, University of Massachusetts Lowell
**Poster Title:** Understanding History to Accelerate the Chemical Industry's Transformation to Sustainability
**Abstract:** History offers inspirations, lessons, and warnings to the chemical industry today. Through the T.T. Chao Symposia in 2025 and 2026, the Science History Institute and the University of Massachusetts Lowell Center for Sustainable Production have connected industry leaders with historians, scientists, and analysts. These discussions are producing a "useable history" aimed to help accelerate the chemical industry's transformation towards sustainability. This poster describes some of the insights derived from the Chao Symposia. First, we note how government engagement has been essential to the chemical industry's innovation and growth. Second, we describe how financialization beginning in the 1970s undercut innovation in bulk chemical manufacturing. Third, we note how history reveals alternative ways of organizing systems for chemical production. Finally, by viewing the chemical industry as a global technological system, the Chao Symposium has helped participants understand the broader logics that have made the chemical industry arguably more difficult to change compared to other sectors. We invite industry leaders to learn more by joining the next Chao Symposium, taking place at the Science History Institute the day after Innovation Day on September 28, 2027.

**Presenter Name:** Liwei Ye, Hydrocarbon Scientist
**Company:** ExxonMobil Technology & Engineering

**Poster Title:** Catalyst design for rapid, selective, and solventless closed-loop recycing of nylon-6
**Abstract:** The growing accumulation of end-of-life Nylon-6 plastics presents a significant environmental challenge and highlights the need for efficient chemical recycling technologies. We report a rationally designed catalytic system that enables highly selective depolymerization of Nylon-6 back to its monomer, ε-caprolactam, under exceptionally mild and solvent-free conditions. By tailoring both the metal center and ligand environment, the catalyst achieves near-quantitative monomer recovery (>99% yield) at low catalyst loadings and reduced temperatures compared with previously reported methods. Mechanistic studies reveal that catalyst structure plays a critical role in promoting efficient polymer-chain deconstruction while minimizing catalyst deactivation. The process is broadly applicable to post-consumer Nylon-6 products, including fishing nets, carpets, textiles, and mixed plastic waste streams, delivering high monomer recovery across diverse feedstocks. Importantly, the recovered ε-caprolactam can be repolymerized to produce high-quality Nylon-6 with properties comparable to or exceeding those of the original material. This work demonstrates how rational catalyst design can advance closed-loop recycling of Nylon-6 and provides a scalable pathway toward reducing plastic waste and supporting a circular polymer economy.

**Presenter Name:** Yan Zhou, Research Scientist
**Company:** Quaker Houghton
**Poster Title:** Building the Foundation for AI in Industrial R&D: Lessons from Quaker Houghton's Digital Transformation
**Abstract**: Artificial intelligence (AI) offers significant opportunities to accelerate innovation in the chemical industry, but success requires more than adopting new tools. At Quaker Houghton, we are taking a practical approach to AI by applying it to improve knowledge retrieval, enhance collaboration, and support technical problem solving in R&D while learning what is needed to scale these capabilities effectively.
This presentation will share lessons from our digital transformation journey, including the importance of data readiness, knowledge management, user adoption, and governance. We will discuss how AI can help scientists and engineers access expertise more efficiently and make better-informed decisions, while also highlighting the challenges of integrating AI into established industrial workflows. Real-world examples will demonstrate why combining AI capabilities with domain expertise is essential for delivering reliable and actionable outcomes.
Attendees will gain a practical perspective on both the opportunities and challenges of implementing AI in an industrial R&D environment and learn key considerations for organizations seeking to accelerate innovation through AI-enabled knowledge and decision support.