Fab Management Forum

Welcome Remarks

L. Altimime
President
SEMI Europe, Berlin, Germany

Abstract
Coming Soon

Biography
Laith Altimime, as President of SEMI Europe, leads SEMI's activities in Europe and the Middle East and Africa (EMEA). Altimime has P&L responsibility as well as ownership of all Europe region programs and events, including SEMICON Europa. He is responsible for establishing industry standards, advocacy, community development, expositions, and programs. He provides support and services to SEMI members worldwide that have supply chain interests in Europe. He manages and nurtures relationships with SEMI members in the region and globally as well as with local associations and constituents in industry, government, and academia. Altimime has more than 30 years of international experience in the semiconductor industry. Prior to joining SEMI in 2015, He held senior leadership positions at NEC, KLA-Tencor, Infineon, Qimonda, and imec. Altimime holds an MSc from Heriot-Watt University, Scotland.

References

Opening Remarks by Session Chair



M. Woittennek
Vice President Business Unit Wide-Bandgap
X-Fab, Dresden, Germany

Abstract
Coming Soon

Biography
Coming Soon

References

From silicon to sovereignty: Accelerating trusted chip making for Physical AI and AI infrastructure



M. Horstmann
General Manager & Senior VP
GlobalFoundries, Berlin, Germany

Abstract
Geopolitical shifts are redefining the semiconductor industry: resilience, trusted supply and technological sovereignty have become strategic priorities alongside economic efficiency. As smart manufacturing systems increasingly require autonomy, sensing, Physical AI and secure communications, the need for a trusted, European manufacturing backbone has become essential.
In parallel, AI keeps evolving rapidly from data center AI and generative AI to Physical AI. But the growth is facing challenges in the availability of data center capacity, high power consumption and costs.
Manfred Horstmann will explore how GlobalFoundries' European footprint supports secure access to the differentiated chips enabling automotive systems, connected devices, Physical AI and AI infrastructure made in Europe for the world.
While highlighting GF Dresden's capacity expansion and end-to-end European ecosystem, the presentation outlines how investment, collaboration and new technologies such as FDX Fusion can strengthen Europe's resilience, innovation and global competitiveness

Biography
Dr. Manfred Horstmann is General Manager and Senior Vice President at GlobalFoundries (GF) and has led the company's European manufacturing operations since October 2020, including the Dresden site, one of the world's most advanced and successful semiconductor manufacturing facilities.
With nearly 30 years of experience in research, technology development, and semiconductor manufacturing, Dr. Horstmann is a leading voice for industrial semiconductor applications, European chip sovereignty, and Physical AI. Under his leadership, GlobalFoundries is investing a double-digit billion-euro amount in the expansion of its Dresden Fab - The SPRINT project is considered a European benchmark project for scalable, subsidized semiconductor capacity. As a physicist, Dr. Horstmann combines deep technical expertise with a strategic vision for the future of the European technology industry. The Dresden site employs more than 3,200 people from 47 nations, reflecting GlobalFoundries' strong international presence and commitment to innovation.

References

From Installed Base to Strategic Advantage - How VAT helps fabs protect, recover and evolve productive fab capacity in Europe



M. Osswald
Business Unit Head Global Services
VAT Group, St.Gallen, Switzerland

Abstract
Europe’s semiconductor competitiveness depends not only on adding new capacity, but on keeping its installed base productive, adaptable and technologically relevant. VAT enables this evolution through advanced vacuum technology, lifecycle services, upgrades and retrofits that protect uptime, enhance performance and extend asset relevance. Turning the installed base into a strategic advantage strengthens both fab competitiveness and Europe’s long-term semiconductor resilience.

Biography
Dr. Marc Osswald is Senior Vice President and Head of Business Unit Global Service at VAT, leading the strategic direction and global development of the company’s service business. With a strong focus on both semiconductor fabs and equipment OEMs, he contributes to positioning VAT as a strategic partner for operational excellence and long-term technology advancement.
Prior to joining VAT, Marc held leadership positions in the **automotive industry, with a focus on new business development and aftermarket**. His professional background spans strategy, business development, product management and innovation across global industrial businesses. Marc holds a Ph.D in Business and Economics from Ulm University.

References

Winning in the EU: Margin & Complexity Over Volume



O. Tal
CEO
The MAX Group, Alpine, NJ, United States of America

Abstract
European fabs cannot outspend the industry's volume leaders on capital. Leading-edge manufacturers reinvest a large share of their revenue into capacity, a level of spending few companies can sustain, and fewer still can sustain year after year. For most of the industry, including most European fabs, trying to compete this way is not realistic.

This talk presents a different strategy. Fabs in the EU do not need to win on volume. They can win on margin instead, running high-mix, high-complexity work where customers pay for reliability and precision rather than the lowest cost per chip. European specialty manufacturers already follow this model, and it comes with a fraction of the capital intensity.

Choosing this strategy is the easy part. Running it well is not. High-mix, high-WIP environments are unforgiving of weak operational discipline, and the fabs that get it wrong lose the very margin advantage they set out to capture.

This talk draws on field results from directly supporting over 200 fabs globally to unpack what separates fabs that capture the margin advantage from those that lose it to their own complexity, and leaves attendees with a pointed question: is your fab built to compete this way, or just positioned to?

Biography
Oded Tal founded the MAX Group in 1999 and serves as CEO. Under his leadership, MAX has grown into the leading provider of management, operations, and engineering services to the semiconductor industry. He has also held executive roles for MAX clients navigating M&A, including CEO of TSI Semiconductors, where he led its transformation and sale.

Before founding MAX, Tal held various positions in the semiconductor and automotive industries in the United States and Israel. After serving in the Israeli Air Force, where he taught piston engine maintenance, he began his career at Computest Automotive Test Equipment in development and operations management. He has served on the CS Mantech technical committee and board of directors, along with other commercial and NGO entities, and currently sits on the board of directors of Enablence Technologies.

Tal holds a PhD in industrial engineering from Louisiana State University, where his research focused on hidden losses in automated semiconductor manufacturing. He also holds an MEM in engineering management from Ohio State University and a BS in industrial engineering, with a focus on manufacturing, from the University of New Haven.

References

Air Liquide Advanced Materials : European solutions for chip manufacturing technology innovation



L. Castrogiovanni
Vice President Electronics Europe
Air Liquide, Electronics Europe, Milan, Italy

Abstract
Air Liquide stands as the global and European leader in industrial and specialty gases, equipment, and advanced materials for the semiconductor industry. At the core of its regional strategy is the Advanced Materials Center of Chalon-sur-Saône, an innovation powerhouse that provides a highly resilient, European-based supply chain. This strategic proximity enables chip manufacturers to mitigate geopolitical tensions, international tariffs, and logistics disruptions while benefiting from flexible, high-precision local production.

This competency, knowledge, and assets allow rapid deployment of advanced molecule samples and the co-development of new molecules—benefiting from a 20-year-old R&D library of development. This aims for very rapid industrialisation to effectively supply resilient and innovative molecules for European chip makers with a strong appetite for innovation.

Over the past two decades, Air Liquide's material innovations have consistently enabled major technological breakthroughs in Atomic Layer Deposition, Chemical Vapor Deposition, and etch processes. The state-of-the-art Chalon facility continues this trajectory with dedicated cleanrooms, advanced analytical laboratories, and flexible, automated manufacturing units. Backed by rigorous ISO quality certifications and continuous capacity expansions, an expert team oversees a rapidly growing portfolio of dozens of high-purity precursor molecules engineered for next-generation semiconductor architectures.

Beyond precursor synthesis, the site delivers a holistic, end-to-end service model tailored to every stage of industrial maturity, spanning initial studies, pilot lines, and high-volume manufacturing. The operational scope integrates advanced low vapor pressure chemical distribution, specialized fleet canister maintenance, and ultra-high-purity analytical capabilities such as ICP-MS and air-sensitive quality testing. This comprehensive ecosystem ensures seamless operational reliability and stringent quality assurance across all customer facilities.

Looking to the future, Air Liquide is actively pioneering environmentally conscious chemical technology by developing low global warming potential etch gases that align with industry sustainability imperatives. Furthermore, the Chalon facility expands beyond traditional microelectronics to drive forward-looking innovation in quantum computing, isotope supply, and novel thin-film applications. By bridging advanced chemical engineering with emerging manufacturing needs, the center reinforces its position as an indispensable partner for the next generation of semiconductor innovation.

Biography
Lorenzo Castrogiovanni is a distinguished international business leader and industrial engineer who serves as Vice President Europe – Electronics at Air Liquide.

Over a career spanning more than two decades across Europe and international markets, he has established a strong record of strategic vision, multi-country organizational leadership, and executive governance. His expertise encompasses high-tech semiconductor sectors, heavy process industries, clean energy transition initiatives, and digital transformation, where he consistently builds high-performing, multi-cultural teams and drives sustainable corporate growth.

Throughout his tenure at Air Liquide, Lorenzo has held key executive positions across key European regions

and global account networks. In his current capacity, he leads broad industrial operations and top-level executive engagement with leading technology and semiconductor global accounts. Earlier roles include directing major regional business units in Russia and Italy, leading strategic corporate alignment under top group executives in Paris, and driving forward-thinking commercial initiatives in energy efficiency, industrial IoT, and hydrogen clean technologies.

His academic foundation combines rigorous technical education with executive management development. He holds a Master's Degree in Industrial Engineering & Management from Università di Roma, alongside post-graduate studies at École des Ponts ParisTech, an MBA from Collège des Ingénieurs, and executive leadership credentials from INSEAD. A multilingual professional fluent in Italian, English, and French, with proficiency in German, Russian, and Spanish, he brings an exceptionally global, adaptive, and culturally agile perspective to senior leadership.

Beyond his professional achievements, Lorenzo is recognized for his resilient, empathetic leadership style and dedication to continuous personal growth. His commitment to endurance and personal challenge is demonstrated by completing demanding athletic accomplishments, including the Marathon des Sables ultra-marathon and swimming across the Messina Strait. Guided by a strong customer-centric philosophy, he continues to lead transformational initiatives that blend industrial excellence with innovation and strategic foresight.

References

From AI Demand to Fab Reality: Investment, Capacity, and Manufacturing Outlook



C. Tseng
Sr. Director
SEMI, Milpitas, United States of America

Abstract
AI is reshaping the semiconductor growth cycle and pushing manufacturing investment to a significantly higher level. However, the impact extends well beyond leading-edge logic. Memory expansion, technology migration, advanced packaging, and continued investment in mature-node and specialty manufacturing are broadening the next fab investment cycle.

This presentation will examine SEMI's latest outlook for global fab investment, equipment spending, installed capacity, and technology migration, highlighting how AI-driven demand is translating into manufacturing requirements across logic, DRAM, NAND, and specialty technologies. It will also look at the continued importance of 200mm and smaller-wafer manufacturing, where power, analog, compound semiconductors, MEMS, and other specialty applications continue to support substantial investment.

The presentation will conclude with a regional perspective on Europe, examining how new fab investment, supply-chain resilience initiatives, and Europe's strengths in automotive, industrial, power, and specialty semiconductor manufacturing position the region within the next global investment cycle.

Biography
Clark Tseng is Senior Director of Market Intelligence at SEMI, where he leads the development and execution of global market intelligence strategies covering the semiconductor manufacturing supply chain. He oversees SEMI's market research portfolio and global research partnerships, providing analysis and forecasts on fab investment, capacity, equipment, materials, and semiconductor manufacturing trends.

Clark has extensive experience analyzing the semiconductor industry across foundry, IDM, memory, fabless, and OSAT markets, with a particular focus on manufacturing investment, technology transitions, and regional supply-chain dynamics.

Before joining SEMI, Clark held strategic and analytical roles at leading technology companies. At MediaTek, he served as Deputy Director of the Computing, Connectivity, and Metaverse Business Group, providing market intelligence and competitive analysis across computing, connectivity, automotive, and emerging technology markets. Previously, he was Division Manager for Strategy and Business Development at Qimonda, where he led market and competitive intelligence activities for the Asia-Pacific region. He began his career as an analyst at IDC, covering semiconductor, flat-panel display, and telecommunications markets.

Clark holds a Bachelor of Business Administration and a Bachelor of Arts in International Relations from National Chengchi University in Taiwan.

References



J. Recklies
Executive Vice President Frontend
Infineon, Munich, Germany

Biography
Coming Soon

References

Challenges of Digital Transformation in an Established Semiconductor Factory

J. Jentzsch
Infineon Technologies Dresden AG & Co. KG,
Dresden, Germany

Abstract
Through a digital transformation project at Infineon's Dresden site, our goal is to implement a coordinated, holistic digitalization strategy for the site. This involves fundamentally rethinking the organization, processes, and collaboration. The focus is not only on the technical implementation of individual projects, but rather on supporting employees through the transformation phase by further developing their work methods and adapting and introducing new business processes.

Biography
Julia Jentzsch has been with Infineon Dresden since 2011. After holding positions in industrial engineering, implementing automation projects, and maintenance manager, she has led the Digital Transformation Dresden department since 2025. Her focus is on the successful implementation of digital transformation project at Infineon Dresden.

References

Building the Workforce for the Future Fab: *Anticipating capability needs and developing people at scale*

A. Matteoda
VP - Business Human Resources Front-End Manufacturing
STMicroelectronics, Milan, Italy

Abstract

AI and automation are reshaping semiconductor manufacturing, changing the skills and expertise required in the future fab. Drawing on STMicroelectronics' perspective, this session explores the workforce challenges accompanying this transformation, with a focus on evolving roles, capability development, and the preservation of critical know-how. It considers workforce development as an integral part of fab transformation, alongside advances in technology and operations.

Biography

Alice Matteoda is Front-End Manufacturing Business Human Resources at STMicroelectronics. She leads the people strategy for ST's global front-end manufacturing organization, supporting workforce transformation, talent development, and organizational effectiveness across the company's front-end manufacturing network. With nearly 20 years of international HR leadership experience in semiconductors, aerospace, automotive, and industrial manufacturing, she has extensive expertise in leading large-scale business transformations, organizational development, and capability-building initiatives. Alice is also co-founder of STEM by Women, an association promoting women's careers in STEM fields

References

Behnke’s Rule of n: How Factory Scale Shapes Semiconductor Company Performance

J. Behnke
General Manager Smart Manufacturing
INFICON Inc., Syracuse, United States of America



Abstract
John will present his recently published “Behnke’s Rule of n,” a framework that explains the core industrial engineering drivers behind some of the biggest shifts in the semiconductor industry over the past 25+ years. The rule can be summarized simply: a semiconductor factory’s size and scale have a dramatic impact on its achievable KPIs. The underlying physics are straightforward. Understanding them unlocks powerful insights for industry and policy leaders. John will explore how the rule applies across an entire organization, from in-fab tool and product groups to multi-site manufacturing optimization. He will also share how companies that have mastered these principles have outpaced industry growth, and how smaller, niche players can use the rule to sharpen their performance and improve their odds of profitable growth.

Biography
Mr. Behnke has over 40 years of semiconductor industry experience. As the GM of INFICON’s FPS Product Line and Head of its IMS Marketing team, John leads a global team that develops and deploys Smart Manufacturing software and hardware solutions which improve factories performance. INFICON’s comprehensive Digital Twin of a factory enables advanced Factory Scheduling, optimized WIP movement and other advanced capabilities.

He is also a Co-Chair of the Semi North America Smart Manufacturing Chapter as well as a founding member of Semi’s Smart Global Executive Committee.

Prior to his current role at FPS John served as: the President of Novati Technologies, SVP and GM of the Semiconductor Group at Intermoleculor, CVP for Front End Manufacturing and Tech Transfers at Spansion and Director of Operations at AMD's Austin Fab 25

References

From Insights to Impact: Simulation-Enabled Determination of Actionable Fab Enhancement Measures



P. Lendermann
Chief Business Development Officer
D-SIMLAB Technologies Pte Ltd, Singapore, Singapore

K. Behrens
Robert Bosch Semiconductor Manufacturing Dresden GmbH, Dresden, Germany

Abstract
Bosch's 300 mm Dresden semiconductor fab is characterized by a highly diverse mix of ASICs, MOSFETs, and MEMS products in ramp up. This creates a production environment in which equipment and process releases as well as performance improvements constantly reshape factory capacity and performance. In such an environment, accurate prediction of wafer output and cycle time is challenging.
In this presentation, we will describe how fab simulation overcomes this challenge by providing a digital twin of the dynamic production environment that can not only predict future performance but also explain it. By revealing the process steps, equipment groups, and operational constraints that limit factory performance, it makes current and future bottlenecks transparent. This enables derivation of actionable insights. Identified bottlenecks directly translate into targeted improvement measures whose impact on wafer output and cycle time can be quantified before implementation. Measures with the highest operational benefit can be prioritised accordingly. As such, by connecting forecasts, bottleneck identification, and actionable measures, fab simulation becomes the key enabler of continuous operational improvement. In this way simulation evolves from a forecasting tool into a decision support system that systematically drives wafer output growth and cycle time reduction throughout the fab ramp up.
In the presentation, we will also describe how this has been realized jointly by Bosch and D-SIMLAB through the deployment of the *D-SIMCON Dynamic Capacity and Material Flow (DCMF) Planner*, the flagship module of the AI-enabled *D-SIMCON Digital Twin* suite for Semiconductor Manufacturing, and the kind of benefits that have been achieved so far.

Biography
Peter Lendermann is a Co-Founder and serves as the Chief Business Development Officer of D-SIMLAB Technologies, a Singapore-headquartered company providing AI-enabled, simulation-based decision support solutions for Capacity Planning and Production Flow Optimisation to Semiconductor Manufacturing companies. Prior to this he worked at the Singapore Institute of Manufacturing Technology where he led related R&D activities until spinning them off into D-SIMLAB. Peter has been engaged in the field of production logistics, supply chain management and related decision support technologies and solutions since the early 1990's. He holds a PhD in Physics from Humboldt University in Berlin (Germany) and an MBA in International Economics and Management from SDA Bocconi in Milan (Italy).

Korbinian Behrens specialises in capacity planning and fab optimization at the Bosch semiconductor fab in Dresden, Germany. Responsible for fab simulation in a 300 mm high-mix manufacturing environment, he develops simulation-based decision support capabilities for capacity planning, production flow optimisation and operational performance improvement. His focus is on applying simulation and data-driven methods to support manufacturing decisions and identify improvement opportunities across semiconductor production. He holds a German Diploma in Business Information Systems.

References

From Control Room to Autonomous Operations: the ROCC Journey



R. Roussel
Manufacturing Data & Modeling Manager &
Member of Technical Staff
STMicroelectronics, Berlin, Germany

Abstract
As semiconductor manufacturing continues to grow in scale and complexity, operational excellence requires new ways of monitoring, controlling, and optimizing fab activities. To support this transformation, STMicroelectronics established the Remote Operations Collaborative Center (ROCC), a centralized operational hub bringing together production and process teams in a 24/7 collaborative environment.
During its first phase, from 2024 to 2026, the ROCC focused on three strategic pillars: remote equipment control through the deployment of a standardized solution, automated anomaly detection using advanced supervision tools, and the implementation of a collaborative operating model enabling faster decision-making and problem resolution.
Building on these foundations, the ROCC is now entering a new phase centered on AI-driven operations. Key initiatives include AI agents for anomaly detection and resolution, robotic process automation for remote execution, and a Global Scheduler capable of optimizing fab activity and predicting bottlenecks several days in advance.
This presentation will share the ROCC journey toward more autonomous semiconductor manufacturing operations.

Biography
Renaud Roussel is an expert in full automation scheduling and dispatching at STMicroelectronics' wafer fab in Crolles, France.
He earned an engineering degree in materials science from the University of Grenoble in 1998. He began his career in production management at STMicroelectronics in Crolles, working in shift teams in different workshops, first in the 200 mm fab and then in the 300 mm fab. In 2007, he became production planning and logistics manager at Tronics Microsystems, a MEMS manufacturer now part of the TDK Group. He returned to STMicroelectronics in 2009 as lithography area coordinator and, in 2011, became senior project leader for full automation in the 300 mm fab. Since 2023, he has led the Manufacturing Data and Modeling team within the Crolles 300 mm Manufacturing Engineering Department. He is also a member of Technical Staff.

References

Autonomy Needs a Plan the Fab Can Trust: A Live Deployment of Dynamic Capacity Planning at Diodes

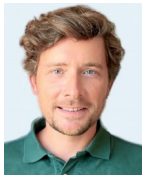
J. Potter
CEO & Cofounder
Flexciton Ltd, London, United Kingdom

Abstract
Most autonomous-fab roadmaps focus on data, connectivity, and automation. This talk focuses on decisions. Fab decisions sit in layers by time horizon: capacity planning (months), production planning (weeks), fab-wide scheduling (a day), and toolset scheduling (minutes).
Autonomy comes from adding intelligence: connecting the layers, letting optimisation make decisions, with AI removing manual work and people setting objectives. Capacity sits at the top: plan it on static averages and the decisions below inherit the error, however good their optimisation. In a live deployment at Diodes' Greenock fab, a dynamic capacity model replaced the spreadsheet within three months, delivering weekly bottleneck foresight and plans in under an hour, not days.

Biography
Jamie co-founded Flexciton in 2016 and serves as CEO, driving the company's vision to optimise complex manufacturing and enable an autonomous factory. He led the commercialisation of Flexciton's cutting-edge technology within the semiconductor industry and expanded its global customer base across the US, Europe, and Asia. Under his leadership, the solution offering evolved into a comprehensive suite of autonomous technologies for planning and scheduling across front-end and back-end semiconductor manufacturing. Jamie is a founding member of the SEMI Smart Manufacturing Committee for Europe and has represented the UK deep tech sector to the government. An Oxford graduate (top of his year, Mathematics & Statistics), he was named to the Forbes 30 Under 30 list in 2018.

References

From Fragmented Data to Resilient Fabs: AI-Augmented Engineering for Europe's Semiconductor Future



A. Varin
High-Tech Manufacturing Product Manager
Spotfire, Product Management, Göteborg, Sweden

A. Chimera
Industry Solution Lead
Spotfire, Göteborg, Sweden

Abstract
Europe's semiconductor industry is entering an era defined by geopolitical uncertainty, supply chain pressures, rising manufacturing complexity, and an urgent need to improve competitiveness. In this environment, fab performance is not only a matter of equipment, process technology, or capacity. It increasingly depends on how fast engineering teams can turn complex, fragmented manufacturing data into trusted decisions.

Today, yield, quality, process, equipment, test, wafer, and operational data often live across separate systems, tools, and teams. Engineers spend too much time moving between applications, reconciling data, rebuilding context, and repeating analysis before they can act. As fabs become more automated and data-rich, this fragmentation becomes a strategic risk: if something goes wrong, the same automation that increases productivity can also increase the volume of defective material produced before the issue is detected, understood, and contained.

This presentation will explore a future in which industrial AI & analytics becomes a connected decision environment for semiconductor manufacturers. Rather than replacing engineers with AI, companies need to focus on augmenting engineering expertise with contextual analytics, domain-specific intelligence, statistical guidance, wafer-centric representations, and AI-assisted investigation. This approach helps engineers ask better questions, move faster across data domains, identify patterns earlier, and make decisions with confidence.

Using Spotfire as an example of this vision, the session will discuss how visual analytics, advanced analytics, wafer-level analysis, scalable data access, and AI-assisted workflows can come together to support the next generation of fab management. The focus will not be on a product roadmap, but on broader perspectives: How software can help European fabs become more resilient, more adaptive, and more competitive while keeping human expertise at the center of manufacturing decisions.

Biography
Arnaud is the High-Tech Manufacturing Product Manager for Spotfire, with a focus on industrial investigations, data visualization, and semiconductor manufacturing use cases.
Since joining Spotfire in 2013, Arnaud has worked closely with customers, frontline engineers, and scientists to understand complex analytical workflows and translate them into product capabilities that help engineering and operations teams make better-informed decisions. He currently leads Spotfire's semiconductor manufacturing product investments, including wafer-centric analytics and yield and quality-improvement workflows. His work focuses on helping fabs connect fragmented data domains and tools, accelerate engineering investigations, and bring advanced analytics, visual exploration, and AI-assisted workflows into large-scale manufacturing environments.

References

Hidden Costs, Visible Gains: How Sub-Fab Thermal Intelligence Drives Uptime, Energy Savings, and Sustainable Operations

M. Joyner
Sales Executive Expert, Semiconductor
Watlow Electric Manufacturing Company, St. Louis, United States of America

Abstract

Driving Fab Uptime, Sustainability, and Operational Resilience Through AI-Enabled Thermal Analytics for Sub-Fab Systems

Event/Format: Fab Management Forum at Semicon Europa 2026

Company: Watlow Electric Manufacturing Co.

Presenter: Mark Joyner

E-mail: mark.joyner@watlow.com

Presentation: Oral Presentation

As semiconductor fabs continue to scale advanced manufacturing operations while facing increasing pressure to improve uptime, energy efficiency, sustainability, and operational resilience, greater visibility into sub-fab thermal systems has become critical. This presentation demonstrates how fab-level thermal analytics and connected monitoring technologies can help semiconductor manufacturers identify inefficiencies, predict failures earlier, optimize maintenance strategies, and improve overall fab performance.

Presentation Format: Fab Management Forum Technical Session

Motivation

Modern European semiconductor fabs rely heavily on Advanced Process Control (APC), Fault Detection and Classification (FDC), and fab-level analytics to improve yield and productivity. However, many thermal systems in the sub-fab and utility layers such as exhaust heating, abatement, forelines, gas delivery, and nitrogen heating are typically monitored only through local controller alarms and periodic maintenance. Despite operating outside the main process chambers, these systems have a direct impact on equipment uptime, process stability, energy consumption, safety, and environmental compliance, yet they often fall outside the scope of traditional fab-level monitoring.

As a result, issues such as temperature and power drift, clogging or deposition in exhaust systems, sensor degradation, leaks, and wiring faults are frequently detected only after they lead to process excursions, unplanned downtime, or environmental risk. At the same time, European fabs face increasing pressure to reduce energy use and CO2 emissions while maintaining high-volume production in alignment with EU semiconductor and sustainability objectives. This work was motivated by the combined challenges of uptime risk, latent thermal-driven variability, and limited visibility into the energy and health performance of sub-fab thermal assets.

This case study examines how systematic, sub-fab level thermal monitoring can complement existing APC and manufacturing analytics to support both competitiveness and sustainability in European semiconductor manufacturing.

Scope and Objectives

The work combines expertise in thermal systems engineering, semiconductor manufacturing, and data analytics to investigate how high-resolution thermal data from sub-fab systems can be transformed into actionable operational insights. Data was collected from industrial heaters, SCRs, and control panels using connected controllers and supplemental monitoring points. The dataset included temperatures, setpoints, power consumption, electrical resistance, and controller health indicators, streamed into a standardized analytics pipeline.

The analytics framework targets five key classes of failure and inefficiency modes that are relevant to production sub-fab environments and can be characterized using fab-level thermal monitoring:

Thermal drift identified through long-term deviations in power-to-temperature response.

Clogging and deposition effects in abatement and exhaust systems, detected via changes in temperature uniformity and power behavior; in one system, this enabled extending maintenance intervals from two weeks to twelve weeks.

Heating faults and post-maintenance anomalies, such as mis-wired or degraded zones, identified through correlated power and temperature trends.

Sensor and controller degradation, detected through abnormal thermal or power behavior prior to protective

shutdowns.
Energy inefficiencies, quantified through power trends linked to insulation loss, configuration errors, or drifted setpoints.
The case study presents production examples and use cases illustrating several classes of failure and inefficiency and demonstrates how the same physics-informed methods can generalize across additional modes. The objective is to convert raw thermal signals into actionable information for engineering teams without duplicating existing Manufacturing Execution System (MES) or Advanced Process Control (APC) dashboards, while providing Application Programming Interface (API) access that exposes system-level data through a unified interface.

Core Innovation

The core contribution of this work is a thermal analytics framework tailored specifically to semiconductor sub-fab systems. Rather than treating thermal data as generic IoT signals, the approach incorporates physics-informed features, including zone-to-zone balance, thermal response behavior, and electrical-to-thermal relationships.
Key characteristics include early detection of heater and Silicon Controlled Rectifier (SCR) degradation, engineering-oriented outputs such as health indicators and fault precursors, and a low-disruption deployment model leveraging existing controller infrastructure. Results are exposed through standard interfaces to enable integration with fab analytics platforms. The data pipeline is designed to be secure, scalable, and compatible with evolving cybersecurity requirements.

Collaboration & Ecosystem Fit

The proposed framework is designed to complement existing fab analytics, APC, and FDC infrastructures, enabling collaboration between fabs, equipment suppliers, and control system providers. Standardized data access and APIs support joint development with R&D partners and facilitate reuse across multiple European fabs operating similar sub-fab architectures. By improving visibility into energy and health performance of utility systems, the approach aligns with European semiconductor and sustainability initiatives aimed at reducing energy consumption, emissions, and operational risk across the manufacturing ecosystem.

Benefits and Outlook

The case study demonstrates measurable benefits, including reduced unplanned downtime, improved energy efficiency, and increased confidence in process stability. The framework is designed to scale across repeatable sub-fab system architectures using standardized industrial communication protocols, enabling deployment without hardware redesign while maintaining disciplined data models and integration practices.
Over the next 3 - 5 years, the approach can evolve toward tighter integration with control systems through edge-based analytics and selective closed-loop actions, such as guided setpoint adjustments or power balancing within validated safety limits.
Demonstrated using Watlow and Eurotherm industrial control platforms, the methodology is transferable to other controller ecosystems that support common industrial protocols, supporting the long-term goal of competitive, resilient, and environmentally sustainable semiconductor manufacturing in Europe.

Biography

Mark Joyner is a seasoned semiconductor industry professional with over three decades of experience spanning engineering and commercial roles. Originally from London, England, he began his career in the industry in 1989 and has since built deep expertise at the intersection of advanced thermal technologies and wafer fabrication.
In his current role at Watlow, Mark leads Sales and Account Management across Europe, working with wafer fabs to deploy high-performance thermal solutions that enhance process stability, operational reliability, energy efficiency, and equipment uptime across fab and sub-fab environments.
Mark holds an MSc in Molecular Electronics from Cranfield Institute of Technology. He lives in Edinburgh, Scotland, with his wife and son.

References

Beyond Adaptive Manufacturing: Unlocking the Full Potential of the Integrated Autonomous Manufacturing Site

L. Wall
Head of Vertical Sales Electronics &
Semiconductors Germany
Siemens AG, Munich, Germany

Abstract

As the semiconductor industry faces unprecedented cost pressures, labor shortages, and increasing process complexity, isolated fab automation is no longer sufficient. While conventional tools optimize individual processes, fabs continue to struggle with siloing between engineering, IT, OT, and facility operations.
This presentation outlines the strategic paradigm shift toward the integrated autonomous manufacturing site. Moving beyond adaptive manufacturing to stable, scaled operations requires a unified digital and physical ecosystem. We examine how breaking silos across domains and connecting facility management with production data enables true self-optimization, predictive infrastructure resilience, and maximum energy efficiency.
Attendees will gain actionable insights into how software-enabled integration - leveraging a robust data foundation and advanced automation architectures - accelerates ramp-up times, drives ROI, and transforms the fab into an agile, autonomous ecosystem for future-proof manufacturing.

Biography

Dr. Leona Wall is Head of Vertical Sales Electronics & Semiconductors Germany at Siemens AG. She leads Siemens' strategic engagement with semiconductor and electronics customers in Germany and has a proven track record of supporting industry leaders in scaling manufacturing capacity and navigating complex transformation initiatives across the semiconductor value chain. With a background in strategy consulting at Siemens Advanta and academic research at EPFL Lausanne, her expertise spans large-scale transformation, integrated industrial solutions, and innovation at the intersection of technology and business.

References

Accelerating Fab Performance with Physical AI Reinforcement Learning



T. Tieleman
Managing Director
Applied Materials, Digital Enablement Group,
Amsterdam, The Netherlands

Abstract
A deployed reinforcement learning (RL) physical AI solution dynamically optimizes work-in-process (WIP) movement across the fab. Unlike approaches that optimize individual decisions in isolation, RL enables rapid adaptation to changing fab conditions, fab-wide optimization that considers the downstream effects of WIP movement decisions across interconnected tool groups, and multi-objective optimization across competing KPI goals. Building on the deployed solution, the work examines the future potential of RL-based physical AI for increasingly adaptive fab-wide WIP control.

Biography
Tijmen Tieleman is an AI scientist with Applied Materials' AGS Digital Enablement Group, AI Center of Excellence. His expertise spans advanced AI algorithms and the application of AI to complex real-world challenges. He contributes to the development and application of AI technologies for fab optimization. He holds a PhD from Geoff Hinton's AI lab.

References

Toward Autonomous Manufacturing: The Path from AI-Assisted Analytics to "Human in the loop" Agentic AI

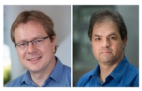
S. Tropsa
Head of Technical Solutions, Growth Markets
Seeq Corporation, Sandy, United States of America

Abstract
As AI begins to meaningfully integrate into manufacturing operations, many companies are looking to get beyond deploying a basic chat bot. LLM Models are also advancing far quicker than they can be vetted for security concerns. In this session, Seeq will show how the Seeq Analytics and AI platform enables manufacturers to roll out scalable, trustable agentic AI workflows that are user customizable but purpose built for manufacturing environments. In practice, Intel has scaled the Seeq Platform and Agentic AI integrations within their ecosystem across their fabs to implement AI workflows allowing for faster time to detection as well as resolution for a given anomaly detected in the software, saving an estimated 7.5 million dollars through the platform roll out.

Biography
Sean Tropsa began his career as an engineer in the semiconductor manufacturing industry, where he developed expertise in analyzing large data sets with an emphasis on root cause analysis and process optimization. In his current role as the Head of Technical Solutions, Growth Markets, Sean leverages this background to help subject matter experts in the Semiconductor Industry apply Seeq to derive actionable insights from their data to meet sustainability goals, while improving reliability, yield, and quality. Sean holds both BS and MS degrees in Chemical Engineering from Arizona State University.

References

Towards Global Fab Scheduling



S. Knopp
CTO
Planimize, Gardanne, France

S. Dauzère-Pérès
Planimize, Gardanne, France

Abstract
The **Planimize Schedule Optimizer** can now provide real-time schedules for any work center in a fab, offering a single optimization engine that is easier to maintain than dedicated dispatching or scheduling tools. Relying solely on Planimize software, with no third-party solver, it considers all complex operational constraints while simultaneously optimizing many conflicting objectives. The software has been in operation since 2023, generating schedules within minutes in fully automated 300mm front-end fabs in Europe. In this talk, we present some of our latest developments on cluster tool scheduling and preview a new tool, the Global Fab Scheduler, which builds on the genericity of the Planimize Schedule Optimizer to optimize the entire fab rather than individual work centers.

Biography
Sebastian Knopp co-founded the company Planimize in 2021 where he currently serves as CTO, focusing on the development of optimization software to enhance factory efficiency. He completed his PhD Thesis on scheduling in semiconductor manufacturing (St-Etienne, France, 2016) and has a degree in computer science (Karlsruhe, Germany, 2006). Before founding Planimize, he worked at different companies on optimization software in the domains of logistics and education.

Stéphane Dauzère-Pérès is Professor at Mines Saint-Etienne in its site of Gardanne, France. He received the Ph.D. degree from Paul Sabatier University in Toulouse, France, in 1992 and the H.D.R. from Pierre and Marie Curie University, Paris, France, in 1998. He was a Postdoctoral Fellow at M.I.T., U.S.A., in 1992 and 1993, and Research Scientist at Erasmus University Rotterdam, The Netherlands, in 1994. He has been Associate Professor and Professor from 1994 to 2004 at the Ecole des Mines de Nantes, France. His research interests broadly include modeling and optimization of operations at various decision levels (from real-time to strategic) in manufacturing and logistics, with a special emphasis on production planning (lot sizing) and scheduling, and on semiconductor manufacturing. He has published more than 120 papers in international journals and has contributed to more than 300 communications in national and international conferences. Stéphane Dauzère-Pérès has coordinated numerous academic and industrial research projects, including 4 European projects and 31 industrial (CIFRE) PhD theses. He was runner-up in 2006 of the Franz Edelman Award Competition, and won the Best Applied Paper of the Winter Simulation Conference in 2013, the EURO award for the best theory and methodology EJOR paper in 2021, and the EURO award for the best review EJOR paper in 2026.

References



M. Enzelberger-Heim
Fab Manager
Texas Instruments, Freising, Germany

Biography
Coming soon

References

SiC Update: Technology Changes, Market Outlook & Order Trends



B. Marchetti
Vice President Engineering Wide Band Gap Semiconductor
Bosch, Reutlingen, Germany

Abstract
Coming soon

Biography
Coming soon

References

Digital Photonics: The age of Smart Light



S. Ertl
Senior Vice President & General Manager
ams OSRAM, Bavaria, Germany

Abstract
Light is entering a new era. Digital Photonics combines highly pixelated emitters and sensors with integrated microelectronics, optics and digital interfaces, turning photonic components into intelligent, programmable systems.
This presentation explores how smart light enables innovation in adaptive automotive lighting, energy-efficient microLED solutions for AI-enabled smart glasses, and highly parallel optical interconnects for next-generation AI data centers.
Realizing this potential requires the integration of emitters, detectors, micro-optics, CMOS electronics and advanced packaging, together with the ability to scale from innovation to high-volume manufacturing. Digital Photonics establishes light as an intelligent platform that can sense, communicate and respond.

Biography
Sabine Ertl is Senior Vice President and General Manager at ams OSRAM. With extensive international experience and a track record of leading global, cross-functional teams, she combines technology, business and people leadership to drive innovation and growth. She is passionate about building diverse teams, fostering collaboration and creating environments where experts from different disciplines can solve complex challenges together. Convinced that the future of photonics will be shaped by interdisciplinary collaboration, she focuses on translating technological innovation into scalable products and sustainable business success.

References

Europe’s Independent Wide-Bandgap Foundry Service - From Customer Needs to Industrial Scale



A. Fischer
Director Sales EMEA
X-Fab, Erfurt, Germany

Abstract
The growing demand for advanced power electronics is reshaping industries ranging from AI infrastructure and data centers to renewable energy, industrial automation, and aerospace. As innovation accelerates, the ability to industrialize new technologies quickly and reliably becomes a key competitive advantage.
This presentation explores how independent foundries, strategic partnerships, and manufacturing excellence are helping bridge the gap between innovation and high-volume production. It highlights the role of collaboration, quality-driven processes, and scalable manufacturing ecosystems in supporting the next generation of power semiconductor technologies and strengthening Europe's position in the global semiconductor landscape.

Biography
Axel Fischer is Head of Sales EMEA at X-FAB, based at the company's manufacturing site in Erfurt, Germany.

He is responsible for driving sales across X-FAB’s complete technology and manufacturing portfolio, including CMOS, Power, MEMS, and Photonics solutions.

With more than 30 years of experience in the microelectronics industry, Axel has held leadership positions spanning Marketing, Sales, Product Management, Technical Support, and Operations. He has developed deep expertise in building and scaling high-tech businesses across international markets.

Axel began his career with Cypress Semiconductor in Munich and subsequently joined Texas Instruments in Nice, where he worked within the ASIC and Chipset organization.

He later spent 21 years with Samsung Semiconductor, holding several executive leadership roles, including Head of Business Units, and played a key role in establishing and growing Samsung’s Foundry business across the EMEA region.

Before joining X-FAB, Axel served as Chief Commercial Officer at ITEN, the Lyon-based pioneer in solid-state microbattery technology.

In addition to his executive responsibilities, Axel actively supports emerging technology companies as an advisor and supports the Board of Directors of ElectraMet (USA).

Axel holds a Master's degree in Automation Engineering and Electronics from the Technical University of Chemnitz, Germany.

References