Topics For 2020 Include

- **Simulation At A Detailed Level** – Creating A Roadmap Of Joining Technology To Improve Capabilities And Applications
- **Improved Processes To Enhance The Manufacturability Of Advanced High-Strength Steels**, Stamping And Hot Forming
- **Optimal Joining Of Aluminum And Steel** To Overcome Process Defects
- **Structural Adhesive Bonding** For Optimized Lightweighting With Minimal Fastening, Riveting

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Bringing Together OEM Leaders And Senior Engineers To Deliver Detailed Presentations, Case Studies And Panel Discussions

• High quality, energy efficient approaches in forming, joining and welding
• Application of innovation initiatives from the aerospace and defence industries
• Solving real world challenges in joining and welding dissimilar materials including composites, hybrid, laminated materials, and polycarbonates
• Structural adhesive bonding for optimized lightweighting
• Enhancing manufacturability of high strength metals, stamping and hot forming

• Scaling up additive manufacturing applications for vehicle mass production
• Advances in multi scale simulation for effective modelling of joining processes and lower manufacturing cost
• Reducing costs in ICEV, BEV and PHEV manufacturing with Industry 4.0, AI and digital twin with flexible lines and cells for variable production volumes and vehicle type
• Vehicle development and manufacture for zero-emission lifecycle, environmental sustainability and increased adoption of recyclable materials and alternatives to plastics

Unrivaled Sponsorship And Exhibition Showcase Opportunities
Make sure you have a presence on-site to connect and network with ICEV, BEV and PHEV senior engineers and technology decision makers from OEMs from North America and overseas.

For full details, contact the GALM team at sponsorship@lbcg.com or call (1) 800 721 3915
07:30 Coffee And Registration
09:00 Chair’s Welcome And Introduction
Elie Tohme, Director, Body Engineering, Research & Development, Strategic Planning, Karma Automotive

OPENING PANEL: MULTI-MATERIAL MANUFACTURING & PROCESSES - WHAT CAN WE LEARN FROM OTHER INDUSTRIES?
09:10 Emerging Transformative Technologies In Joining, Forming And Bonding Processes For Multi-Material Manufacturing From Different Industries Including Military And Aerospace
Automotive manufacturing innovation and sustainability requires not only OEM competitor benchmarking but also an understanding of the latest thinking in related industries. This opening panel includes case studies on key applications and how people are doing things differently in other industries that could benefit automotive industry processes and manufacturing.

- What do BEV platforms mean for materials and processes, including mainstream high volume, premium and ultra-premium vehicles?
- Manufacturing and processing developments for lightweighting including steel laminated sheet; hot stamped aluminum; GigaPascale steels; advanced composites
- Manufacturing technology advances to achieve safer, higher density in battery packaging and integration into the structure
- What are the lessons for innovation from experiences in aerospace, motorport and other industries?

Elie Tohme, Director, Body Engineering, Research & Development, Strategic Planning, Karma Automotive

Advances In Joining, Forming And Bonding For Optimized Lightweighting

11:30 Novel Lightweight Highway Vehicle Development Via ‘Closed Loop’ CAE Simulations And Physical Testing
- Trends in lightweight highway transportation vehicles
- Using raw material characteristics in CAE simulation for optimal design performance
- Application of closed-loop analysis and testing design process
- Development of large vehicle assemblies for efficient manufacture
Dr. Andrzej Wylezinski PE, Structural Engineering Manager, Wabash National Corp.

11:55 Questions & Discussion

MULTI-SCALE MODELING
12:00 Multi-Scale Modeling And Simulation Of Vehicle Parts Development And Manufacturing Involving Composite Materials
- Overcoming the challenges in more intricate modeling of structural parts with discontinuous, non-homogeneous composite materials including carbon or other bases
- Case examples of modeling plasticity, damage, and failure aspects of metal alloys for use in automotive component development
- Simulating the whole process including structural behaviour under both joining and crash
Dr. Venkat Altharaju, Staff Researcher, Polymer Composites, R&D Technical Center and Principal Investigator, Department of Energy Project, General Motors

12:25 Questions & Discussion

FLOW FASTER ASSEMBLY
12:30 Innovations In Joining Using Flow Fastening Technology For Greater Flexibility And Efficiency
Boris Baemler, Senior Applications Engineer, DEPRAG

12:55 Questions & Discussion

BATTERY ENCLOSURE LIGHTWEIGHT DESIGN
14:00 Implementation Of High Energy Scan In Advanced R&D And Optimization In The Design Of A Lightweight Sheet Aluminum Battery Enclosure
- The latest Digital Twin technology and its implementation in automotive
- How did this technology accelerate automotive design?
- Advanced benchmarking, design and analysis
- Experience in efficiently developing an optimized-design lightweight aluminum battery enclosure
Samy Paneerselvam, Technical Director, Head of CAE Performance and Testing, Caresoft Global

14:25 Questions & Discussion

ADITITIVE MANUFACTURING WITH METALS AND COMPOSITES
14:30 Manufacturing Process Enhancement Through Additive Applications For Prototyping And Low To High Volume Production
- Experiences with the adoption of additive manufacturing with metals and composites
- Where can additive manufacturing be integrated into serial manufacturing for high volume production now? In future?
- Developments in additive with metals including selective laser melting, laser metal deposition and binder jetting
- Potential for the manufacture of integrated complex structures with additive
Shea Nyquist, Senior Mechanical Engineer, Drako Motors

14:55 Question and Answer Session

SOLVING REAL WORLD CHALLENGES IN JOINING AND WELDING DISSIMILAR MATERIALS

MULTI MATERIAL WELDING
15:00 MultiMaterial-Welding - Next Generation Joining Technology For Lightweight And Multi-Material Designs
- Can an innovation from the medical industry revolutionize the automotive world?
- Adopting MultiMaterial-Welding technology to enable joining of different materials by creating a mechanical form-lock
- Addressing the challenges of vehicle manufacture from lightweight design to cost reduction in manufacturing processes
- MultiMaterial-Welding as a joining technology platform - multiple technologies, tools and software solutions for real-time, non-destructive quality control based on machine learning
Gregor Eckhard, CEO, MultiMaterial-Welding

15:25 Question and Answer Session

15:30 Networking Lunch In Exhibition Area - Sponsored by MultiMaterial-Welding And Bossard

FLOW DRILLING
16:00 Fastening And Joining Advances With Flow Drilling And Thread Rolling Screws
- Flow Drilling innovation advances: FastFlow® FDS, FlowStud™ FDS® and OptiCalc™ FDS® predictive software tool
- Thread rolling technology for high strength steel materials and new technology advances
Dr. Brandt Ruszkiewicz, Lead Development Engineer, Semibloc Corp.

16:25 Questions & Discussion

HYBRID MIG AND FSW
16:35 What Can We Learn From Experiences With Joining Best Practices In Aerospace And Other Industries For Automotive Applications?
Focus On Advances In Hybrid Metal Inert Gas (MIG) Welding And Friction Stir Welding (FSW) Processes
- Solving real world challenges in joining and welding dissimilar materials
- Exploring how other industries do their manufacturing
- Key thinking on their processes and learnings for automotive
Dr. Jerry Jones, Professor and Inventor, Process Research and Development, EnergYnTech, Oklahoma Wind Technology Facility and Colorado School Of Mines

17:00 Questions & Discussion

ULTRASONIC WELDING
17:10 Taking Ultrasonic Welding To The Next Level For Composite Structures And Battery Pack Manufacture
- Exploring opportunities to replace copper with aluminum for conductive applications in EVs
- Robust high quality solutions for joining copper and aluminum in battery pack connectors and other electrical system applications
- Overcoming the manufacturing and joining process quality challenges with ultrasonic welding

17:35 Questions & Discussion

17:45 Chair’s Day One Closing Remarks - Followed By Networking Drinks Reception For All Attendees
DAY 2
THURSDAY, MARCH 26, 2020
Optimizing Lower Volume Production With Industry 4.0, Flexible Cells And Lines, AI And Vision Sensing For Quality Control, Improving Metals Manufacturability And Sustainable Alternatives To Plastics

08:00 Coffee and Registration
09:00 Chair’s Welcome and Introduction

REDDUCING COSTS AND INCREASING EFFICIENCY OF MANUFACTURING WITH INDUSTRY 4.0 FROM MASS MARKET TO LOWER CUSTOMIZED PRODUCTION VOLUMES

OPENING DAY TWO PANEL - OPTIMIZING BEV AND PHEV PRODUCTION
09:10 Effective Solutions For Production Of Customized, Affordable EV And Autonomous Vehicles With Increased Production Efficiency
• Exploiting the use of common vehicle platforms / single underbodies in manufacturing to increase viability
• Adopting lightweighting technology and manufacturing innovation for EV chassis and vehicle platforms beyond the skateboard
• Reducing part count for manufacture through functional integration of cooling and other systems into the structure
• The future for pre-designed modules with proven techniques including chassis, suspension and powertrain systems
Dr. Youssef Zlada, Technical Specialist, Digital Manufacturing, Ford Motor Company
Antonio Mercado, Advanced Manufacturing Engineering Manager, Karma Automotive
Dr. Ing. Fouad el Khalidi, Strategy and Innovation General Manager, ESI Group
09:40 Questions and Discussion

ARTIFICIAL INTELLIGENCE AND VISION SENSING
09:50 How Artificial Intelligence (AI) Can Be Used In The Manufacturing And Assembly Processes To Ensure Effective Quality Control
• The role for integrated vision systems and lasers to optimize component positioning and joining
• Learning processes on automated fit and assembly improving quality and reducing variability through automated inspection and self-learning with AI-enabled camera vision systems
• Use of algorithms for control and monitoring during manufacturing processes
• Cost effective solutions in the automation of non-destructive testing (NDT) in the assembly plant
10:20 Questions and Discussion

FLEXIBLE PRODUCTION LINES AND CELLS
10:30 Implications Of Platform And Architecture, Including Skateboard, Uniframe And Unibody, For Vehicle Assembly And Manufacturing On The Same Line
• The trend to more flexible production line technology with increasing customization and use of new flexible cells
• Importance of the speed of switchover between vehicles on the same production line
• Adopting artificial intelligence (AI) and iglesias for faster time to market and customization, enabling manufacture of different vehicle types from SUVs to trucks on the same assembly line
• Maximizing manufacturing efficiency and flexibility with cobots and autonomous material handling robots
• Realizing the potential of Industrial Internet of Things (IIoT) to simplify integration and reduce process complexity
Edwin Pope, Global Lightweighting Principal Analyst, IH5 Market
11:00 Questions and Discussion
11:10 Networking Coffee Break In Exhibition Area

12:20 Questions and Discussion

CARBON FIBER AND COMPOSITE STRUCTURES IN HIGH VOLUME MANUFACTURING

PANEL - STRUCTURAL COMPOSITES
12:25 Adopting Structural Composites In The Manufacture Of Advanced Components With Low Cycle Times
• Developments in compression molding
• Advances in thermoset and thermoplastic resins with improved performance
• High pressure resin transfer molding (RTM) for thermostets and thermoplastics
• Fiber Tailored Placement (FTP) as an alternative to traditional metal stamping
• Potential for optimizing body structures through integration of stress sensing fiber optics for strain monitoring and measurement
• Looking to aerospace standardization to increase composite use
Dr. Venkat Aitharaku, Staff Researcher, Polymer Composites, R&D Technical Center and Principal Investigator, Department of Energy Project, General Motors
09:20 Questions and Discussion

13:00 Networking Lunch In Exhibition Area

PROCESSING, FORMING AND JOINING OF HIGH STRENGTH STEELS AND ALUMINUM

PANEL - ADVANCED HIGH STRENGTH STEELS
14:00 Improving The Manufacturability Of Advanced High Strength Steels (AHSS), Including Stamping And Hot Forming, For A New Generation Of EVs
• Emerging transformative technologies in forming and joining
• Achieving dimensional control with vehicle bodies and closures involving metal structures
• Transforming 1020 steel into ultra-high strength steel that rolls and bends like 1020 using flash heat treating technology
• Looking ahead: The potential for more agile manufacturing and lower cost processing
Moderator:
John Catterall, Vice President, Automotive Program, Auto / Steel Partnership (ASP)
Panelists:
Michael Ravenport PE, Executive Director, Auto / Steel Partnership (ASP)
Adam Ballard, Innovation Lead Engineer, Body Structures and Integrated Systems, Body SMT Innovations Team, General Motors
Dr. Hesham Ezatz, Senior Technical Consultant, Automotive Program (formerly Engineering Group Manager, General Motors), AISI
16:00 Steel-Aluminum Joining
14:45 Innovative Approaches For Optimal Joining Of Steel And Aluminum To Overcome Process Defects
• Adopting enhanced joining and manufacturing processes for integrating aluminum into mixed-material vehicle structures
• Enhanced solutions to joining new high strength steels and aluminum to overcome liquid metal embrittlement (LME)
• Optimizing the choice of new steels and aluminum alloys for high volume, lower cost vehicle production
Adam Ballard, Innovation Lead Engineer, Body Structures and Integrated Systems, Body SMT Innovations Team, General Motors
15:15 Questions and Discussion

15:25 Networking Coffee Break In Exhibition Area

PANEL - HYBRID, LAMINATED SANDWICH MATERIALS, ALUMINUM MATRIX COMPOSITES
15:45 Adopting A New Generation Of Hybrid, Laminated Materials And Aluminium Matrix Composites For Automotive Manufacturing Applications To Optimize Mass, Strength And Stiffness As Well As Reduce Material Costs
• How hybridizing can reduce material costs significantly
• Potential for honeycomb sandwich materials
• Overcoming the challenges with exotic / hybrid materials in terms of incompatible chemistries, thermal loads, water absorption and corrosion
• Composite sandwich construction without fasteners for low cost, thermally efficient lightweight body structures in commercial vehicles and class B trucks
• Transforming the forming process using sandwich vacuum infusion and deep draw design to manufacture composite body structures
Dr. Andrzej Wylezinski PE, Structural Engineering Manager, Wabash National Corp.
Dr. Raymond Boeman, Director, Vehicles Technology Area, Institute For Advanced Composites Manufacturing Innovation (IACMI)
16:20 Manufacturing With Engineering Polycarbonates And Plastics For Higher Performance And Lower Costs
• Adopting polycarbonates for exteriors as a low cost alternative to carbon fiber and aluminum for environmentally sustainable manufacturing
• Benefits and challenges of using polycarbonates compared to steel, aluminum and composites
• Surface coatings and treatments for polycarbonate durability in automotive applications
• Use of graphene nano-polymer materials that can deliver high production volumes at lower cost
16:45 Questions and Discussion

17:05 Networking Coffee Break In Exhibition Area

PANEL - VEHICLE LIFECYCLE AND SUSTAINABILITY
16:50 Moving To Adoption Of A Zero Emission Overall Lifecycle In Vehicle Development, Manufacturing And End-Of-Life Recycling
• Implications of zero-emission lifecycle vehicle development and manufacturing
• Energy demand issues with materials production and joining
• What is the future for polycarbonates and plastics?
• Potential for natural fibers as a low cost carbon fiber replacement
• What is the potential of recycling for reducing composite materials costs?
Lauren Wilk, Vice President, Policy & International Trade, The Aluminum Association
John Catterall, Vice President, Automotive Program, American Iron and Steel Institute (AISI)
Edwin Pope, Global Lightweighting Principal Analyst, IHS Markit
17:25 Chair’s Closing Remarks - Followed by Apple TV and Champagne Draw
17:30 End Of Conference

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<td>Friday, February 28</td>
<td>Monday, March 26</td>
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