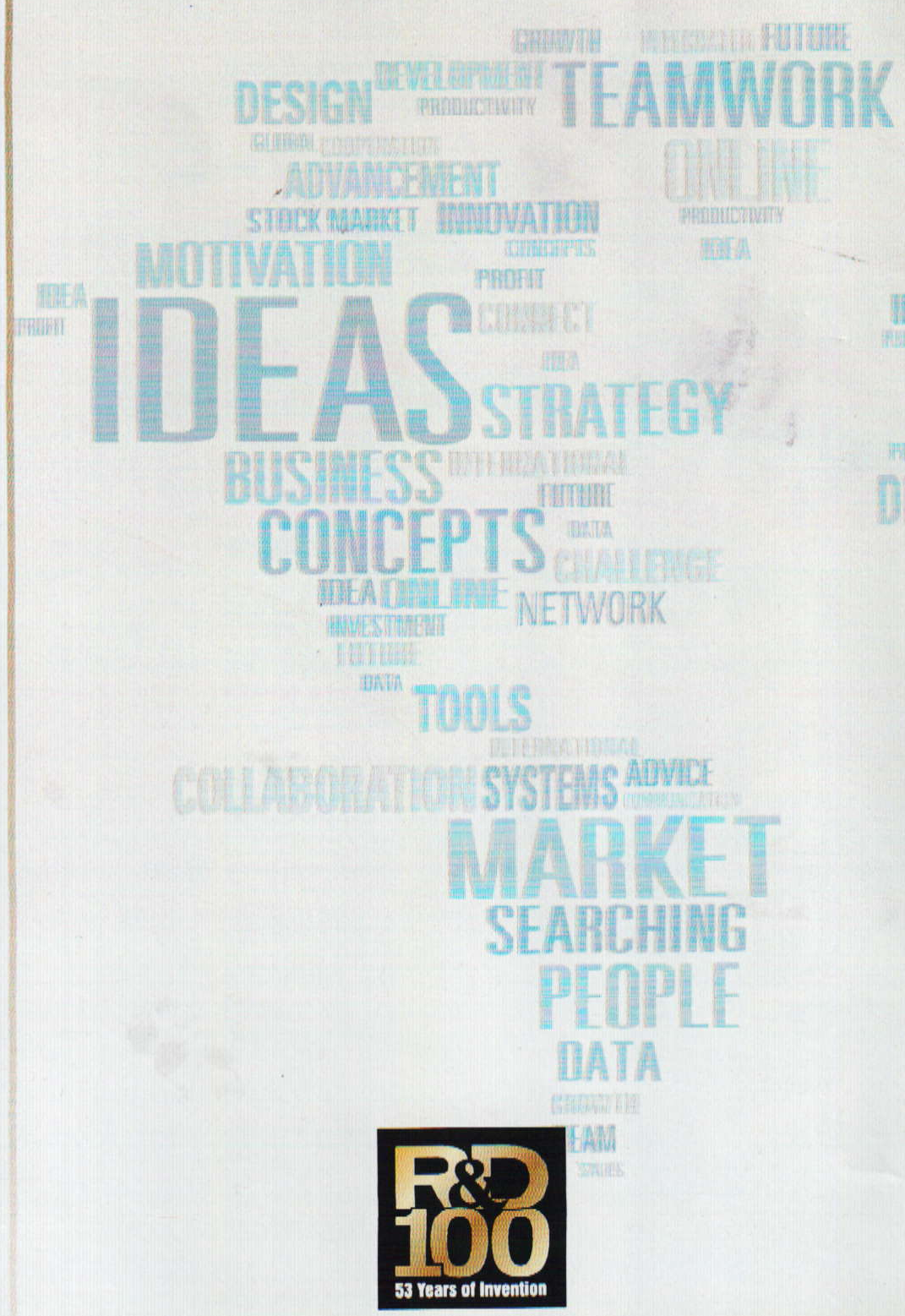
R&D 100 AWARDS & TECHNOLOGY CONFERENCE

CONFERENCE GUIDE

November 12–13, 2015

Caesars Palace, Las Vegas, Nevada



R&D 100 — 53 Years of Invention

Presented by: R&D

www.rd100awards.com

Recognizing Excellence, Inspiring Innovation

The Promise of Innovation

Dear Colleague:

Welcome to the **R&D 100 Awards & Technology Conference**, the first time we are presenting this educational conference in conjunction with the 53-year-old R&D 100 Awards program. These two events—over a two-day period at Caesars Palace in Las Vegas—highlight the great ideas and innovations in technology and science unveiled by research and development teams in the past 15 months. It's a celebration of great ideas and new promises—and a unique opportunity to network with the leaders of the industries who are making an impact in R&D today.

This conference encompasses four separate tracks, which focus on areas of R&D that reflect robust activity, creative innovation and practical solutions. Our faculty includes leaders in their fields who will share new developments, critical information and personal insights. The tracks include presentations on **R&D Strategies & Efficiencies, Emerging Technologies & Materials, Innovation in Robotics & Automation, and Instrumentation & Monitoring**.

Please join in on all of the many opportunities to network, *including meals hosted in Innovation Hall*, coffee breaks between sessions, as well as two featured Keynote Sessions. The first, on Thursday, is presented by Thom Mason, Director, Oak Ridge National Laboratory, in the Innovation Hall Theater and focuses on how scientists and engineers are working together today to improve the global energy landscape. The second Keynote Session on the future of innovation by Dean Kamen, inventor, entrepreneur and advocate for science and technology, kicks off the Friday programming in the Innovation Hall Theater.

We invite you to connect with all conference attendees at the far-reaching Friday panel discussion, **R&D Innovation and New Technologies: Eye on the Future**, moderated by Tim Studt, R&D 100 Awards & Conference Program Director. You will have the opportunity to ask questions and discuss the emerging trends in research and development with an expert panel. It promises to be an exciting end to this conference—and will offer much to ponder as we map out the R&D future for the varied industries that ultimately have the same goal of improving life through the power of science and technological advancements.

Bea Riemschneider
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Conference At-A-Glance

THURSDAY, NOVEMBER 12, 2015

8:00 a.m. – 4:00 p.m. ..... **Conference Registration**
Octavius Registration Desk

8:00 a.m. – 12:00 p.m. ..... **Exhibitor Check-in**

10:00 a.m. ..... **Breakout Sessions**
Rooms Vary (Octavius 1-8)

11:00 a.m. ..... **Break**

11:15 a.m. ..... **Breakout Sessions**
Rooms Vary (Octavius 1-8)

12:00 p.m. ..... **Lunch in Innovation Hall**
Octavius 24

1:00 p.m. ..... **Breakout Sessions**
Rooms Vary (Octavius 1-8)

2:00 p.m. ..... **Break**

2:15 p.m. ..... **Breakout Sessions**
Rooms Vary (Octavius 1-8)

3:15 p.m. ..... **Break in Innovation Hall**
Octavius 24

3:45 p.m. ..... **General Session**
Keynote – *Innovation for the Energy Challenge*
Octavius 24, Innovation Hall Theater

4:30 p.m. ..... **Global Funding Forecast**
Octavius 24, Innovation Hall Theater

4:40 p.m. ..... **Young Mind Awards**
Octavius 24, Innovation Hall Theater

4:50 p.m. ..... **Innovation Reception**
Octavius 24, Innovation Hall Theater

6:00 p.m. ..... **Event Adjourns for the Day**

Recognizing Excellence, Inspiring Innovation

FRIDAY, NOVEMBER 13, 2015

8:00 a.m. – 9:00 a.m. ..... **Breakfast in Innovation Hall**
Octavius 24

9:00 a.m. ..... **General Session**
Keynote – *Innovation: Past, Present and Future*
Octavius 24, Innovation Hall Theater

10:00 a.m. ..... **Break**

10:15 a.m. ..... **Breakout Sessions**
Rooms Vary (Octavius 1-8)

11:15 a.m. ..... **Break**

11:30 a.m. ..... **Breakout Sessions**
Rooms Vary (Octavius 1-8)

12:30 p.m. ..... **Lunch in Innovation Hall**
Octavius 24

1:30 p.m. ..... **Breakout Sessions**
Rooms Vary (Octavius 1-8)

2:30 p.m. ..... **Break in Innovation Hall**
Octavius 24

3:00 p.m. ..... **R&D Innovations and New Technologies: Eye on the Future**
Octavius 24, Innovation Hall Theater

4:00 p.m. ..... **Free Time**

5:00 p.m. ..... **Awards Banquet Registration Opens**
Octavius 25 Foyer

6:00 p.m. ..... **Networking Reception**
Octavius 24

6:45 p.m. ..... **Seating for Dinner**
Octavius 25

7:00 p.m. ..... **R&D 100 Awards Banquet**
Octavius 25

8:00 p.m. ..... **R&D 100 Awards Presentation**
Octavius 25

10:30 p.m. ..... **R&D 100 Awards & Technology Conference Adjourns**

R&D 100 Awards & Technology Conference By Track

R&D Strategies & Efficiencies

- **1A** Strategic Investment in Disruptive Technologies
- **1B** R&D Management Complexity in the Next Decade
- **1C** The APS Upgrade Project: Building the Ultimate 3D Microscope
- **1D** R&D Alliances: Relational, Portfolio and Network Factors Impacting Outcomes
- **1E** Building a Culture of Innovative Leadership
- **1F** Stranded Technology: Unleashing the Potential
- **1G** Advanced Technologies and Innovation in Action

Emerging Technologies & Materials

- **2A** Additive Manufacturing: One Small Step
- **2B** Custom Prototyping in the Lighting Industry: Advanced Technologies and Innovative Manufacturing Processes
- **2C** Driving Bioenergy with Single Cell Technologies
- **2D** The Power of Collaboration: Less Risk, Less Cost
- **2E** Emerging Battery Technologies
- **2F** Solar Cell Technology: Energizing the World
- **2G** Disruptive Innovation Through Engineering Simulation

Innovations in Robotics & Automation

- **3A** Human-on-a-Chip: Navigating Stormy Biological Seas
- **3B** The Laboratory of Things: When Technology Meets Lab
- **3C** Avoiding a Loss in the Lab: Business Continuity Planning for R&D Organizations
- **3D** Deductible R&D Costs: The New Regulations Landscape
- **3E** Artificial Intelligence in Automation
- **3F** Emerging Opportunities and Challenges in Interplanetary Exploration Using CubeSats
- **3G** Robots in Hazardous Environments: Reimagining Dull, Dirty and Dangerous

Instrumentation & Monitoring

- **4A** Neuroscience and Technology: Next Generation of Neural Interfaces
- **4B** The Microscopy Market
- **4C** A New Blueprint for Innovation
- **4D** Quality by Design for Drugs
- **4E** Facing the World's Water Crisis: The Future of Wastewater Treatment
- **4F** The Future of Best R&D Practices
- **4G** The Future of Cannabis Testing

Recognizing Excellence, Inspiring Innovation

R&D 100 Awards & Technology Conference Agenda

THURSDAY, NOVEMBER 12, 2015

8:00 a.m. – 4:00 p.m. .....REGISTRATION OPENS

10:00 a.m. – 11:00 a.m. .....BREAKOUT SESSIONS

1A: Strategic Investment in Disruptive Technologies

Vicki A. Barbur, PhD, Senior Vice President and Chief Technical Officer, Concurrent Technologies Corporation

Octavius 2/3

This presentation will discuss the approach to delivering "innovation" via a process that provides technology teams with "guard rails" and "landing zones" for targeted efforts, delivered through disruptive technology platforms with well-defined thrusts to manage company expectations alongside a pipeline of delivered value over time (short <3 years, mid 4 to 7 years and long term > 10 years).

Innovation is a word that is used often in business and technical environments to conjure up evidence of new or different approaches, novel and creative solutions or the introduction of new products, things or methods, as well as identification of potentially unique and unexpected concepts. It is a word that is overworked and overused currently, and results in some frustration on the part of the community due to it being considered ill-defined, open to ambiguity and being subject to variability in individual interpretation.

Concurrent Technologies Corporation (CTC) has developed an approach to new technology/product development which covers three areas of "innovation"—the sustaining, the developmental and the strategic phases—and sets clear comprehensive definitions for each alongside the balance of investment for the continuum to guarantee that solutions continue to be creative, novel and unique.

2A: Additive Manufacturing: One Small Step

Lonnie Love, PhD, Group Leader, Polymer Systems Additive Manufacturing, Oak Ridge National Laboratory, Dept. of Energy

Octavius 4

Manufacturing is going through a rapid transformation away from labor to sophisticated automated processes. Additive manufacturing is attaining high levels of attention in terms of how it can disrupt manufacturing. While there is great promise for this rapidly evolving industry, there are still numerous challenges.

The goal of this presentation is to describe some of the scientific tools and breakthroughs that enable advancements in emerging additive manufacturing processes, while also describing emerg-

ing challenges. Topics will include microstructure control, printed composites and recent advancements in high-speed, large-scale additive manufacturing. While additive manufacturing can enable a renewal of advanced manufacturing in the U.S., we likewise need to focus on developing the workforce that will use the technology. The presentation will conclude with the importance of STEM-related programs, such as the FIRST Robotics Program, that introduce students to the future on manufacturing.

3A: Human-on-a-Chip: Navigating Stormy Biological Seas

John A. McLean, PhD, Stevenson Professor of Chemistry, Vanderbilt Institute of Chemical Biology

Octavius 5

This presentation demonstrates the integration of omics measurements on a single platform to generate massive data sets for systems-wide analyses. These data sets are then rapidly interrogated using emerging big data mining strategies to understand the prevailing biological forces as illustrated in systems, synthetic and chemical biology.

One of the emerging strategies to understand complex biology is systems-wide analyses and rapid data mining strategies. Broad-scale characterization of the molecular inventory in cells, tissues and biological fluids is now facilitated by integrated omics measurements (i.e., integrated metabolomics, proteomics, lipidomics, glycomics, etc.) accompanied by fast minimal sample preparation, fast measurements, high concentration dynamic range, low limits of detection and high selectivity. This confluence of figures-of-merit place demanding challenges on analytical platforms. Ion mobility-mass spectrometry (IM-MS) provides rapid (ms) gas-phase electrophoretic separations on the basis of molecular structure and is well-suited for integration with rapid (µs) mass spectrometry detection techniques.

A critical feature in transitioning from untargeted data analyses to actionable information is the simultaneous utilization of big data mining strategies to cull through the data and understand quickly what is important in the biological noise. Towards this end, we integrate strategies developed in astronomy and Internet commerce to instruct us which of the signals are most relevant for answering the question at hand. This presentation will focus on the utilization of these new paradigms for wide-scale biological challenges in systems, synthetic and chemical biology, with a particular emphasis on their utility in the development of "human-on-a-chip" constructs.

4A: Neuroscience and Technology: Next Generation of Neural Interfaces

Santinderpall Pannu, PhD, Director, Center of Bioengineering, Lawrence Livermore National Laboratory, Dept. of Energy

Octavius 6/7/8

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Most neuromodulation systems use bulk metal conductors and electrodes on the order of millimeters, which limits the spatial resolution for both recording and stimulating neural tissue. Further, therapies such as deep brain stimulation for central tremor disorders use constant stimulation based on settings established in the clinic.

This presentation will focus on advances in neuromodulation systems that have recently reached the clinics with systems which provide therapeutic stimulation based on physiological biomarkers. Leveraging advanced neural interface and micropackaging technologies, the next generation of neuromodulation systems are being developed which have high-spatial-density neural interfaces with embedded electronics to support simultaneous recording and stimulation from multiple regions of the brain. A combination of different configurations (cortical and sub-cortical) neural interfaces are possible in these systems. Finally, these neuromodulation systems also have embedded processors that can implement algorithms for closed-loop therapeutic neuromodulation based on physiological biomarkers.

11:00 a.m. – 11:15 a.m. .....BREAK

11:15 a.m. – 12:00 p.m. .....BREAKOUT SESSIONS

1B: R&D Management Complexity in the Next Decade

Bradford Goldense, NPDP, CMfgE, CPIM, CCP, CEO, Goldense Group

Octavius 2/3

Management science changes at a slower pace than technical science. By 2010, being global was an everyday norm. The pervasiveness of Open Innovation (OI) and Intellectual Property (IP) practices have been gradually increasing since the 1980s. They are on the cusp of becoming pervasive across industries. OI will enable "buy versus make" for just about every aspect of innovation, doubling complexity. IP considerations will overlay both organic and OI in nearly every decision to be made. R&D is on track to quadruple in the daily management of complexity.

This presentation will provide attendees with the following: information on emergent industries that will facilitate OI exchanges between companies; chart the path between R&D and business development organizations to achieve OI capability; offer understanding of the considerations of make versus buy for the sourcing of R&D innovations; provide insight on the status and challenges of monitoring and calculating financial results from OI; discuss where the Venn diagrams of OI and IP overlap and where they need unique management; become aware of the public markets and entities that are making it easier to value and monetize IP; discuss operationalizing the impact that IP will have on all product and business plans produced today; and internalize the

effects of OI and IP on the culture and organizations responsible for innovating.

2B: Custom Prototyping in the Lighting Industry: Advanced Technologies and Innovative Manufacturing Processes

Tony Holtz, Technical Specialist, Proto Labs

Octavius 4

Custom prototyping and low-volume manufacturing is increasingly used by product designers and engineers within the lighting industries to quickly iterate and develop optical parts and lighting components. This presentation will focus on how to use rapid injection molding and 3D printing for housings, fixtures and optical parts.

Attendees will learn about how the industry is being pushed forward by advanced technologies in injection molding and additive manufacturing (3D printing), and the materials those processes use. The discussion will focus on how materials, such as thermally conductive plastic and liquid silicone rubber can improve product design while reducing manufacturing turn times and cost.

The presentation will cover the design considerations for injection molding like draft, gating and part thickness, and explain how additive manufacturing is taking part designs that were once impossible to manufacture, and producing them in a days. We'll discuss how you can effectively move from one process to another.

3B: The Laboratory of Things: When Technology Meets Lab

Gene Tetreault, Senior Director, Products and Marketing, Unified Laboratory Management Portfolio, BIOVIA

Octavius 5

The increasing number of sensors and devices that communicate and are controlled across the laboratory network infrastructure creates opportunities for increased integration between the physical lab and computer-based systems that results in improved accuracy, efficiency and performance in the laboratory. This presentation will explore what is available today and contemplate the adjacent possibilities as the emerging technologies are developed and become available mainstream.

4B: The Microscopy Market

Barbara Foster, President, The Microscopy & Imaging Place

Octavius 6/7/8

Microscopy is driving innovative analyses, giving new "eyes" not only to traditional arenas such as biology and materials sciences, but to pathology, pharma, nanotechnology, neuroscience, forensic sciences, the hunt for natural resources and manufacturing. As evidenced by the number of different microscopy technologies included in the list of R&D 100 Finalists, never was the old adage, "IDKYCDT!" (I didn't know you could do that) so true.

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This presentation discusses seven hot trends that have emerged in the last 3 to 5 years, tracking their meteoric rise from pure research to routine commercialization. Focal topics include correlative microscopy, imaging larger and deeper and multi-dimensionally, leaping the limits of resolution, the collision of microscopy and spectroscopy, imaging dynamic processes, new directions in portability and the impact of the iPad.

The explosion in new modalities presents both exciting opportunities and new challenges for end users and promises intriguing new markets for instrument developers.

12:00 p.m. – 1:00 p.m. .....LUNCH AND INNOVATION HALL EXHIBITS

1:00 p.m. – 3:45 p.m. .....BREAKOUT SESSIONS

1C: The APS Upgrade Project: Building the Ultimate 3D Microscope

Stuart Henderson, PhD, Project Director, Advanced Photon Source, Argonne National Laboratory, Dept. of Energy

Octavius 2/3

To assure continued U.S. global leadership in x-ray science, the U.S. Department of Energy is planning a major Advanced Photon Source Upgrade Project (APS) that will transform the Advanced Photon Source (APS) at Argonne National Laboratory into the ultimate 3D x-ray microscope. This project will make the APS the world's brightest storage-ring hard x-ray light source, offering world-class technologies that will fulfill the research needs of the U.S. scientific and industrial community for decades to come.

Today, the APS at Argonne National Laboratory in Chicago is a world-leading light source—a synchrotron large enough to encircle Wrigley Field. This incredibly complex machine will be transformed by the Upgrade Project, a major, multi-year project requiring manufacture and installation of more than 3,000 tons of state-of-the-art magnets and other components.

With the APS Upgrade Project, the high-energy x-rays of the APS will make it possible to measure chemical reactions deep inside samples and to observe nanoscale structures buried inside real materials and devices. It will open new research frontiers that will enable us to understand the causes of Alzheimer's and other debilitating diseases; observe the electrochemical reactions inside a working battery; develop high-performance 21st-century materials; create cleaner, greener chemical catalysts; and expand our understanding of the universe.

2C: Driving Bioenergy with Single Cell Technologies

Babetta Marrone, PhD, Senior Scientist, Los Alamos National Laboratory, Dept. of Energy

Octavius 4

From the groundbreaking invention of flow cytometry and cell sorting, to modern high-throughput screening technologies and microfluidics platforms for individual cell analysis, single-cell technologies enable the study of cell-to-cell variations in complex cell populations. In turn, the ability to study and isolate single cells from heterogeneous cell populations has enabled a wide range of discoveries in the biosciences. Most of these discoveries are applied in the biomedical field. Recently, however, single-cell technologies are playing a key role in building the biological foundation needed to advance the field of bioenergy, particularly the development of microalgae-based biofuels.

Single-cell technologies are being integrated with other innovative biotechnology and bioengineering approaches to increase the productivity of microalgae cultivation systems and lower the cost of producing fuels and manufacturing valuable bioproducts from algae. The development of sustainable and affordable algae-based biofuels is a multidisciplinary effort that requires active cross-fertilization of ideas to address the diversity of technical challenges.

3C: Avoiding a Loss in the Lab: Business Continuity Planning for R&D Organizations

Lester Keizer, CEO, Business Continuity Technologies

Octavius 5

Research and development organizations, appreciating the vast amount of capital resources at stake, are increasingly concerned about their level of preparedness. A business continuity plan (BCP) will help ensure recovery and minimal disruption in the event of a disruption or disaster.

Protecting intellectual property, critical equipment, vital records, facilities, cyber security, supply chain, regulatory requirements, along with a litany of related functions comprise an effective BCP. This presentation will address the unique considerations of a research and development enterprise.

4C: A New Blueprint for Innovation

David S. Bem, PhD, Vice President, Research & Development, Consumer Solutions and Infrastructure Solutions, The Dow Chemical Company

Octavius 6/7/8

Innovations have consequences, both intended and unintended; both need to be addressed to solve global challenges.

2:00 p.m. – 2:15 p.m. .....BREAK

2:15 p.m. – 3:15 p.m. .....BREAKOUT SESSIONS

1D: R&D Alliances: Relational, Portfolio and Network Factors Impacting Outcomes

Bruce Chehroudi, PhD, Vice President of R&D, Advanced Technology Consultants

Octavius 2/3

It is increasingly difficult for any single organization to develop internally all the capabilities needed to foster new innovations. Also, in early stages of knowledge development, knowledge tends to be tacit (i.e., in-depth and highly inter-connected) and dense (i.e., tightly packed and full of relationships). We observe that in industries with expanding complexities, the innovation trajectories are increasingly found in "networks of R&D alliances."

Under such an environment, a firm's success also depends on its abilities to develop and manage collaborations (specifically R&D alliances) to create and apply new knowledge, products and services. R&D alliances are viewed as channels for transfer of technological knowledge related to the development of technological innovations. Both technological knowledge flow and factors of firm innovation depend on a number of R&D alliance dimensions at the relational, portfolio and network levels of evaluation. Implications for R&D alliance managers in terms of alliance partner selection and alliance architecture are presented.

2D: The Power of Collaboration: Less Risk, Less Cost

Alex Peng, PhD, Vice President & General Director, Material and Chemical Research Laboratories, ITRI

Octavius 4

It is a long process for an innovative advanced material to cross the "Valley of Death" before it has a chance to arrive in the marketplace. It goes through many stages including feasibility, performance requirement, manufacturability and reliability. Unexpected conditions or requirements may surface anytime, which may stop the process.

In 1973, ITRI's Material and Chemical Research Laboratories (MCL) was established to develop advanced materials and bring them across the Valley of Death to become marketable products. In this presentation, examples will be shown to demonstrate MCL's success in commercializing advanced materials. These include the first carbon fiber bicycle frame for Giant Bicycles, TSMC's first IC foundry and the high-safety STOBA lithium-ion battery for electric vehicles.

The presentation will also discuss how to integrate materials, processes and equipment effectively to develop a successful product. Today's technologies change at a very fast pace. The uncertainty generates higher risk in materials and product development. ITRI established an Open Innovation Platform that involves integrating internal and external knowledge and expertise into the innovative process. The cross-discipline collaboration

with domestic and international partners speeds up the rate of innovation and commercialization, and lowers the risk of turning an innovative material into a successful product.

3D: Deductible R&D Costs: The New Regulations Landscape

Dan Mennel, CPA, Grant Thornton LLP
Liza Zbarskaya, Senior Manager, Grant Thornton LLP
Octavius 5

Many taxpayers incur significant costs to develop new or improved products or manufacturing processes when expanding their business.Often these development efforts require considerable material and supply expenditures to be incurred to evaluate and resolve uncertainties encountered during the design and development process. For example, the construction of full-scale physical models or trial production runs are needed, and depending on the facts, recently issued guidance supports treating these costs as deductible R&D expenditures, regardless of how the assets are ultimately used. Further, these costs may be eligible to be treated as Qualified Research Expenditures (QRE) for purposes of the research tax credit (this means a dollar for dollar offset to tax liability).

The new section 174 Regulations provide specific rules and definitions to assist taxpayers in determining the proper treatment of certain component material costs incurred as part of their R&D process. This presentation will address examples of how this new section works, including those involving an aircraft manufacturer and the automobile industry, and discusses challenges encountered during product and process development.

These new Section 174 Regulations have broad application to R&D activities incurred for both product and manufacturing process development and provide opportunities for taxpayers in most industries.

4D: Quality by Design for Drugs

Amy Lachapelle, Founder, QBD Strategies
Octavius 6/7/8

Drug development is a complex, high-risk business. Approximately one of the 5,000 and 10,000 drug candidates in the discovery phase will succeed and make it to market. The period between discovery and proof-of-concept (early-stage development) requires multidisciplinary efforts that will provide data on safety, efficacy, manufacturability and product characterization to ensure successful transition into pre-clinical and clinical development in a low-budget environment with critical timelines. This presentation will describe the complexity of integrating scientific strategies designed to provide the product knowledge required to transition a drug product successfully to the pre-clinical/clinical development phase.

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Currently, the cost of bringing a drug to market is approximately $1 billion—and much of the cost is associated with failures late in product development due to safety and efficacy issues. The FDA has acknowledged the growing gap between drug discovery and a marketable product, and has been striving to help industry reduce this gap. The FDA has begun a "Critical Path Initiative" and developed guidance advocating the use of strategic science, data analysis and good documentation practices. Used along with gap analyses, failure mode analyses and risk assessments, these tools provide a product knowledge portfolio for improved decision making and knowledge management.

Early-stage R&D efforts provide the foundational knowledge upon which further drug development will proceed, even though financial support for this stage is limited. It is critical for a successful product that the scientific strategies are designed to capture as much product knowledge as possible on a very limited budget. This presentation will describe the complexity of the multidisciplinary approaches required for a successful early-stage R&D effort and provide strategies to implement a science-based regulatory approach early in the development process.

3:15 p.m. – 3:45 p.m. .....BREAK AND INNOVATION HALL EXHIBITS OPEN

3:45 p.m. – 4:30 p.m. .....KEYNOTE SESSION: INNOVATION FOR THE ENERGY CHALLENGE

Thom Mason, PhD, Director, Oak Ridge National Laboratory, Dept. of Energy
Innovation Hall Theater

4:30 p.m. – 4:45 p.m. .....GLOBAL FUNDING FORECAST

Tim Studt, Global Funding Forecast, R&D 100 Awards and Technology Conference Program Director
Innovation Hall Theater

4:40 p.m. – 4:50 p.m. .....YOUNG MIND AWARDS

4:45 p.m. – 6:00 p.m. .....INNOVATION HALL RECEPTION

FRIDAY, NOVEMBER 13, 2015

8:00 a.m. – 3:00 p.m. .....REGISTRATION OPENS

8:00 a.m. – 9:00 a.m. .....BREAKFAST AND INNOVATION HALL EXHIBITS

9:00 a.m. – 10:00 a.m. .....KEYNOTE SESSION – INNOVATION: PAST, PRESENT AND FUTURE

Dean Kamen, DEKA Research & Development Corporation, FIRST®
Innovation Hall Theater

10:00 a.m. – 10:15 a.m. .....BREAK

10:15 a.m. – 11:15 a.m. .....BREAKOUT SESSIONS

1E: Building a Culture of Innovative Leadership

Tamara Carleton, PhD, CEO & Founder, Innovation Leadership Board

Octavius 2/3

Innovation is driven as much by the ideas as by the people. The elements necessary to develop a culture for innovative leadership, as well as what defines "star-shaped" leaders and teams needed in innovation, will be discussed. A new tool called "VOICE Stars" that can help with a company's internal planning and team development will be discussed.

Key points include the definition of an innovative culture; the values of star-shaped leaders and why they are important to innovation; how to assess your group's innovation culture; and best practices for building an innovative culture.

2E: Emerging Battery Technologies

Jeff Chamberlain, PhD, Deputy Director, Joint Center for Energy Storage Research, Argonne National Laboratory, Dept. of Energy

Octavius 4

Advanced energy storage research includes automotive, grid and advanced power train systems.

3E: Artificial Intelligence in Automation

Kyle Reissner, 1A Mobility Platform Leader, Rockwell Automation Inc.

Octavius 5

Pioneering disruptive software innovations in industrial mobility and information intelligence creates new mobility strategies and transforms the existing set of established industrial software products to be mobile first.

4E: Facing the World's Water Crisis: The Future of Wastewater Treatment

Rakesh Govind, PhD, President, PRD Tech, Inc.

Octavius 6/7/8

Wastewater treatment, which has mainly relied on centralized treatment plants, now has to move towards decentralized treatment to prevent water shortages. Decentralized treatment of wastewater is the future of wastewater treatment, since centralized treatment has effectively been converting fresh water to salt water and the natural reverse conversion of salt water in the form of rain is undergoing a major change due to climate change, resulting in either floods or drought.

Wastewater treatment is essential for mankind, but its reliance on centralized treatment has to shift to a decentralized structure in order to save fresh water on this planet. Developed countries

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have installed large, centralized treatment plants in every major city, but they are currently unable to maintain the vast infrastructure of sewer lines. Under-developed countries lack adequate centralized treatment capacity, but are unable to fund installation of new treatment plants.

It is imperative that if under-developed countries don't want to face water shortages in the future, they should proceed with decentralized wastewater treatment plants instead of trying to fund large, centralized treatment facilities. Developed countries should start relying on decentralized treatment systems for future growth of cities instead of extending their existing network of sewer lines. However, it is important that the growth of decentralized treatment be accompanied by centralized monitoring—and this is becoming possible with the emergence of new, low-cost sensors.

This presentation will discuss advanced treatment strategies for wastewater and methods to derive fertilizer-grade materials and other products from wastewater. New sensors and communication capabilities are emerging that are enabling real-time measurement of water quality, thereby allowing centralized monitoring capabilities.

1F: Stranded Technology: Unleashing the Potential

William B. White, CEO, Offenberger & White

Octavius 2/3

Innovative technologies with the potential for new products often die somewhere between R&D and sales simply because practical benefits are not properly explained. Because new technologies require an educated customer committed to evaluating benefits in context with alternatives, the R&D effort must include an investment in clarifying a value proposition that must propagate within the firm and throughout the market. Large companies no longer have legions of product managers to build the precepts for a consultative sale. Small and emerging growth companies never have these. Venture capital investors who fund promising ideas are often at a loss to market them to those who matter most—the customers—at a time when such efforts are needed most.

This presentation outlines the planning process to minimize uncertainty when bringing new technologies to the market. We will examine conventional and new media tools required to establish a dialogue with stakeholders, from sales and service to customer purchasing influences. Investors and R&D managers are not marketers. Even if a company has a better idea, the "so what" factor hangs it in the balance. With absent internal resources to "explain things," finding an effective and sustainable resource for marketing becomes a priority.

Regardless of a company's stage, marketers must ultimately provide an internal service to the enterprise, build the offer and supply the tools necessary to manage brands and educate the

distribution channel. Unless we understand the sacred ground between the point of sale and the customer, even the most expensive marketing investments will always underperform. Today, we must think our way into such success, and this requires an integrated marketing effort.

2F: Solar Cell Technology: Energizing the World

Bill Tumas, PhD, Associate Laboratory Director for Materials/ Chemical Science & Technology, National Renewable Energy Laboratory (NREL), Dept. of Energy

Octavius 4

Meeting our future global energy needs in a sustainable manner constitutes one of the greatest challenges facing the world in the 21st century and will require advances in energy conversion, delivery, storage and utilization. Remarkable progress has been made over the last two decades on the cost and performance of photovoltaic solar cell technology. We are witnessing phenomenal growth in the deployment of solar energy technologies worldwide.

This presentation will provide an overview of the current status of photovoltaic solar cell technology, along with remaining technical research and development challenges. Key advances and remaining barriers for materials, devices and systems that span commercial, emerging and new technology platforms will be presented. We will also provide an overview of NREL's extensive program in photovoltaic research, development and deployment that aims to address the U.S. Dept. of Energy SunShot Initiative goals, which seek to make solar energy cost competitive with other forms of electricity by the end of the decade. Collaborative international initiatives will also be discussed.

3F: Emerging Opportunities and Challenges in Interplanetary Exploration Using CubeSats

Jekan Thanga, PhD, Assistant Professor, School of Earth and Space Exploration, Arizona State Univ.

Octavius 5

The space industry is undergoing a revolution due to increased availability of low-cost miniaturized electronics and increased reliability of these devices thanks to the techniques of mass manufacturing pioneered from the smartphone industry. This has led to a new class of spacecraft called CubeSats that are highly modular and are limited in volume and mass. Popular CubeSats form-factors include the 3U, which is 30 x 10 x 10 cm (the size of a loaf of bread), and the 6U, which is 36 x 24 x 12 cm (size of a large shoebox).

CubeSats trace their origin to universities. Standards were co-developed by Dr. Jordi Puig-Suari and Dr. Robert Twiggs and were the products of student projects. Rapid advancement

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in technology has led to ambitious missions and concepts supported by several national space agencies to flyby Mars, explore the moon, asteroids, Europa and Venus. CubeSats, thanks to their low mass and volume, could offer a pathway to perform planetary science for a few million dollars, instead of hundreds of millions of dollars.

Arizona State Univ. through the Space and Terrestrial Robotic Exploration (SpaceTREx) Laboratory emerged with an ambitious goal of developing science-focused CubeSat missions. Our studies have identified that CubeSats can produce rich science data through focused, short duration missions and can access extreme environments that would be inaccessible or too risky for a large, high-profile spacecraft. One such mission is LunaH-Map, a 6U CubeSat that will obtain high-resolution maps of hydrogen in the permanently shadowed craters of the moon. Opportunities await in exploring caves and Mare pits on the moon, canyons and crater walls on Mars and even icy surfaces on far-off Europa.

The true advantage of these devices comes from having many of them operate as a swarm. Even if one or a few are damaged or destroyed, the mission continues. However, autonomy, propulsion, communication and power remain important challenges at the forefront of our research efforts. Progress has been made in the development of multi-spacecraft control, particularly using neuro-evolutionary (neural networks that are evolved using a Darwinian process) to find robust, creative solutions that enable autonomous control of multiple robots or spacecraft. At times these solutions exceed human capabilities and can produce creative solutions not envisioned by a supervisor. Through sustained research, increased popularity and wide use of CubeSats, a pathway is set towards realizing a new, low-cost platform for planetary exploration.

4F: The Future of Best R&D Practices

Daryl Belock, Vice President of Innovation & R&D Collaboration, Thermo Fisher Scientific

Octavius 6/7/8

Development of new analytical instrumentation contributes to the advancement of new products. This presentation will discuss best practices in the new product development process working with customers, key opinion leaders and third parties that help accelerate the development of new innovations in analytical instrumentation.

12:30 p.m. – 1:30 p.m. .....LUNCH AND INNOVATION HALL EXHIBITS

1:30 p.m. – 2:30 p.m. .....BREAKOUT SESSIONS

1G: Advanced Technologies and Innovation in Action

Ted Bostic, PE, Chief Technology Officer, Stanley Black & Decker

Octavius 2/3

This presentation will be structured around the Stanley Black and Decker (SBD) history of innovation. Key points include how SBD technologies affect the world; history of SBD innovation and technology development; highlights and examples of innovation and product development; state-of-the-art within industry and a discussion of critical upcoming technology milestones; advanced innovation ongoing at the university level that will affect industry and consumers; and innovation processes and accelerating the pace of innovation within large organizations.

The presentation will deep-dive into conceptual technical concepts and innovation process and focus on the application, solutions and results side of innovation and product development. It will also address innovation philosophies, methodologies, pitfalls and organization structures that allow companies to apply singular-focus, targeted investment and early-stage risk reduction.

2G: Disruptive Innovation Through Engineering Simulations

Larry Williams, PhD, Director of Product Management, ANSYS

Octavius 4

Great products are designed using advanced engineering simulation. Breakthrough thinking and innovation is achievable by both large corporations and small startups. It is possible to go beyond the traditional and try new ideas without ever building prototypes. Exciting applications, such as robotics, digital manufacturing/3D printing, autonomous cars, Internet of Things, and digital medicine, can be delivered by physics-based system simulation tools.

This presentation will show how great products are designed by engineers using advanced physics-based simulation, and how that technology has allowed individuals and companies to create disruptive products. The next great innovations come not only from highly financed corporations, but also from two energetic engineers in a garage. Industry examples will be highlighted that show how a custom app was developed to help eye surgeons plan the most effective procedure; how Hyperloop adopted simulation to prove their novel transportation system works before ever building a prototype; and how National Instruments combines product simulation with hardware emulation to build hybrid automobile drive systems before any electric motor has ever been built.

3G: Robots in Hazardous Environments: Reimagining Dull, Dirty and Dangerous

Brian E. O'Neil, PhD, Research and Development Engineer, Los Alamos National Laboratory, Dept. of Energy

Octavius 5

R&D 100 Recognizing Excellence, Inspiring Innovation

Conventional wisdom suggests that to be successful, a robotics project should hit one of the three D's: dull, dirty or dangerous. If a task is so mind-numbing that humans can't stand it, a robot that never gets bored will do it better, faster and cheaper. For decades, if your robotics project didn't hit one of these three D's, it was most likely a non-starter.

This didn't stop pop culture from thinking bigger. Long before the first Unimate robots started mindlessly putting cars together, people have imagined robots that sense, think, judge and act. Asimov's I, robot was published in 1950. GM didn't have a robot on its factory floor until 1961. We imagine robots not only as soldiers, but as ambassadors. We want robots that can care for the elderly, and do the dishes. Robots that can keep us company, and treat disease. The irony is that the same technologies that would enable robots to transcend the 3 D's would also make them dramatically more adept at performing tasks within them. This presentation explores how we currently use robots in hazardous environments, and how emerging technologies designed to enable robots to transcend their traditional roles will also transform how they do Dull, Dirty and Dangerous.

4G: The Future of Cannabis Testing

Scott A. Kuzdzal, PhD, Life Sciences Business Leader, Shimadzu Scientific Instruments

Octavius 6/7/8

Twenty-four U.S. states and the District of Columbia have legalized medical marijuana, and another four states have legalized recreational marijuana. Cannabis sold for both medicinal and recreational use requires accurate analytical testing to ensure accurate potency labeling and reduce the risk of contamination. This presentation gives an overview of this budding market and reviews the current status and future opportunities in cannabis analytical testing, including the development of cannabinomics and personalized "cannaceuticals."

Attendees will understand the importance of analytical testing in cannabis laboratories and get a closer look at cannabis compounds, including cannabinoids and terpenoids. Cannabis contains over 500 compounds that are unique to the cannabis plant, including over 80 cannabinoids. They will also learn more about each analytical test used in today's cannabis labs, including the current limitations and opportunities for testing. This presentation explores the wide variety of cannabis sample types, from marijuana dry product to concentrates. Concentrates, the "billion dollar industry" of cannabis, are used to create oils for the electronic vaping industry, as well as the growing edible industry. Most importantly, this presentation focuses on how some labs are moving beyond cannabis quality control testing to include components of biotechnology, research and development and education.

2:30 p.m. – 3:00 p.m. .....BREAK AND INNOVATION HALL EXHIBIT

3:00 p.m. – 4:00 p.m. .....EXPERT PANEL – R&D INNOVATIONS AND NEW TECHNOLOGIES: EYE ON THE FUTURE

Moderator: *Tim Studt, Program Director, R&D 100 Awards & Technology Conference*

Keynote Speaker: *Dean Kamen, Founder, FIRST®*
(For Inspiration and Recognition of Science and Technology)

Keynote Speaker: *Thom Mason, PhD, Director, Oak Ridge National Laboratory, Dept. of Energy*

Daryl Belock, Vice President of Innovation & R&D Collaboration Thermo Fisher Scientific

John McLean, PhD, Stevenson Professor of Chemistry Vanderbilt Institute of Chemical Biology

Alex Peng, PhD, Vice President & General Director Material and Chemical Research Laboratories, ITRI

Innovation Hall Theater

4:00 p.m. – 6:00 p.m. .....OPEN TIME

5:00 p.m. – 7:00 p.m. .....R&D 100 AWARDS BANQUET REGISTRATION OPENS
Octavious 25 Foyer

6:00 p.m. – 6:45 p.m. .....R&D 100 AWARDS NETWORKING RECEPTION
Octavious 24

6:45 p.m. – 7:00 p.m. .....R&D 100 AWARDS SEATING FOR DINNER
Octavious 25

7:00 p.m. – 8:00 p.m. .....R&D 100 AWARDS BANQUET
Octavious 25

8:00 p.m. – 10:30 p.m. .....R&D 100 AWARDS PRESENTATION
Octavious 25

Recognizing Excellence, Inspiring Innovation

R&D 100 Awards & Technology Conference Speaker Biographies

DARYL BELOCK

Vice President of Innovation & R&D Collaboration
Thermo Fisher Scientific

Daryl Belock is the Vice President of Innovation and R&D Collaboration for the Analytical Instruments Group at Thermo Fisher Scientific. He leads efforts to improve innovation processes at the total company level; connect business units in terms of synergies of like technologies; drive efforts focused on accelerating breakthrough innovation; and also provides leadership for the China Innovation Center.

Prior to assuming this role, he was Director of Vertical Marketing and R&D Collaboration for the Analytical Instruments Group.

Mr. Belock began his career at Panametrics in Waltham, Massachusetts, as an Applications Engineer, and went on to serve as Marketing Manager, leading marketing research, marketing communications and new product commercialization activities.

Mr. Belock joined GE as part of the GE Power Systems acquisition of Panametrics. He served as a Six Sigma Black Belt, leading process improvement for marketing and R&D. He subsequently served as Strategic Marketing Leader for GE Sensing, leading business development activities, and later as Product Line GM for the Gas & Moisture Instruments Group, a segment for GE Measurement & Control Solutions. He later transitioned to a R&D technology management role and led a team of more than 80 engineers and researchers in the U.S., China and India, overseeing the ultrasonic flow meter, as well as gas and moisture analyzer new product development.

Mr. Belock attended the University of Vermont and graduated with a Bachelor's of Science degree in Mechanical Engineering. He earned his MBA from Babson College.

VICKI A. BARBUR, PhD

Senior Vice President and Chief Technical Officer
Concurrent Technologies Corporation

Vicki A. Barbur, PhD, serves as Senior Vice President & Chief Technical Officer at Concurrent Technologies Corporation (CTC) and is a member of the Senior Executive Leadership Team. Dr. Barbur is responsible for setting the vision and strategic direction for CTC's scientific and technical capabilities.

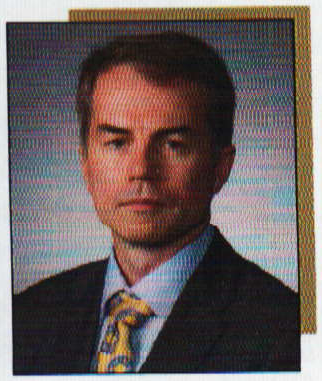
Her efforts focus on building and directing the company's technical capabilities, overseeing research and development activities and maintaining a sound plan of technical organization. Dr. Barbur also leads the execution of technology strategy for technology offerings, partnerships and external relationships, as well as providing visible leadership for CTC within the technical community.

Dr. Barbur earned a PhD in physics from Imperial College, University of London, and a MSc in applied statistics from the University of Oxford, both in the U.K.; an Executive MBA in global executive leadership from Amos Tuck Business School, Dartmouth College, Hanover, N.H., USA.; and a BSc in physics from Imperial College, University of London.

Prior to joining CTC in 2013, Dr. Barbur served as Vice President of Research and Development for the medical segment at Cardinal Health, McGaw Park, Illinois. She was responsible for the development of new products and oversaw development platforms. She had previously served as Technology Director at Kodak for research and development efforts, focused on specialty products that included nanomaterials. Dr. Barbur is widely published in peer-reviewed journals and holds three U.S. and one European patent.

DAVID S. BEM, PhD

Vice President
Research & Development, Consumer Solutions and Infrastructure Solutions
The Dow Chemical Company



David Bem, PhD, is Vice President of Research & Development for Consumer Solutions and Infrastructure Solutions at The Dow Chemical Company. He oversees innovation across a portfolio of key segments, leveraging unique chemistries and advanced technology to drive market-focused products in businesses ranging from automotive and electronic materials to medical and home care goods.

Bem joined Dow in 2007 as the R&D leader for Hydrocarbons & Energy, Alternative Feedstocks and Basic Chemicals, and moved a year later to R&D Director for Dow Automotive. He became R&D Director for Core R&D, leading early-stage exploration of disruptive technologies and development of new businesses. Prior to his current role, he served as Vice President of Research & Development for Dow's Advanced Materials business.

Bem began his career at UOP, a Honeywell Company, where his work was centered on the synthesis and applications of zeolites and microporous materials. In 2000, he became R&D Director of Torial, a subsidiary of UOP. In 2002, Bem joined Celanese Corporation as R&D Director for acetyls, oxygenates and acetone derivatives. In 2005, he became a member of the Celanese Corporate Executive Committee and R&D Director for Engineering Polymers/Ticona.

Bem holds a Bachelor's degree in chemistry from West Virginia University and a PhD in inorganic chemistry from the Massachusetts Institute of Technology. He is a member of the Board on Chemical Sciences and Technology (BCST) of the National Academy of Sciences, the Pennsylvania State University Materials Research Institute Advisory Board and Philadelphia Math and Science Coalition. He holds nine U.S. patents and has authored more than 20 publications.

TED BOSTIC, PE

Chief Technology Officer
Stanley Black & Decker

Ted Bostic, PE, is the Chief Technical Officer (CTO) for STANLEY Engineered Fastening and Advanced Industrial Systems at Stanley Black & Decker. Stanley Black & Decker is a world-leading provider of tools and storage, commercial electronic security and engineered fastening systems, with unique growth platforms and a track record of sustained profitable growth.

Mr. Bostic has provided technical leadership and contributed at all levels across a variety of industries and technologies throughout his career. He is particularly passionate about Smart Power Tools, Smart Manufacturing Systems, Industrial IoT (Internet of Things), advanced RFID systems, advanced visualization and the ultimate integration of cognitive expert systems in industrial environments. His current focus revolves around the first stages of creating interconnected, intelligent industrial systems, adaptive tooling and process control as part of the overall vision of creating a quantifiable cyber copy of the world around us.

Earlier in his career, he was a Principal Research Scientist at the Battelle Memorial Institute, allowing him to work with some of the most advanced technologies and creative people in the world. Although responsibilities as CTO are largely strategic, he remains involved in the day-to-day fundamental activities required for research, development and design. Years of experience with kinematic modeling, multiphysics modeling, advanced materials, process development and engineering application code development contribute to his effectiveness as a technology leader and strategist.

TAMARA CARLETON, PhD

CEO & Founder

Innovation Leadership Board

Tamara Carleton, PhD, is CEO and founder of Innovation Leadership Board LLC, a global leader in the design of tools and processes that enable radical innovation. Dr. Carleton has been an Innovation Fellow with the U.S. Chamber of Commerce Foundation, a Fellow with the Foundation for Enterprise Development and a Fellow for the Bay Area Science and Innovation Consortium.

She teaches organizational innovation and foresight strategy in Stanford University's School of Engineering Executive Education Program. Drawing on her business experience, her research agenda focuses on industry innovation, particularly issues related to technical visionary leadership, innovation culture, regional innovation and foresight strategy. This work builds on her pioneering study of the innovation practices of the U.S. Defense Advanced Research Projects Agency (DARPA).

A former management consultant at Deloitte Consulting LLP, Dr. Carleton specialized in emerging solutions in enterprise applications, customer experience and marketing strategy. At Deloitte, she developed two proprietary methodologies, the Customer Experience Audit and Persona Design.

A multidisciplinary scholar, Dr. Carleton holds a PhD in Mechanical Engineering from Stanford University, a Master's of Science in Public Relations from Syracuse University and a Bachelor's degree in Communications from The George Washington University.

JEFF CHAMBERLAIN, PhD

Deputy Director

Joint Center for Energy Storage Research

Argonne National Laboratory, Dept. of Energy

Jeffrey Chamberlain, PhD, is the Director of the Argonne Collaborative Center for Energy Storage Science (ACCESS) at Argonne National Laboratory. He received his PhD in Physical Chemistry from Georgia Tech, where he studied reactions at semiconductor surfaces in an ultra-high vacuum environment. From 1993 until 2006, Dr. Chamberlain worked in industry and used his knowledge of surface science to develop profitable products for mining, coatings and semiconductor manufacturing processes.

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Since 2006, he has worked at Argonne National Laboratory where, prior to starting his new role in 2012, he managed the Argonne Battery Department, as well as managed the battery intellectual property portfolio. He oversaw both the research in the lab after successfully licensing Argonne's Li-ion battery technology to GM, BASF, LG Chem and others. He went on to become the Deputy Director of Argonne's Joint Center for Energy Storage Research (JCESR), and then took on the role of JCESR External Integration Officer, as he directs ACCESS.

BRUCE CHEHROUDI, PhD

Vice President of R&D

Advanced Technology Consultants

Bruce Chehroudi, PhD, Vice President of R&D at Advanced Technology Consultants, has accumulated years of technical and leadership experiences in different capacities and organizations, which include Principal Scientist and Group Leader at the Engineering Research Consultants Inc. (appointed at Air Force Research Laboratory), Chief Scientist at Raytheon STX, Visiting Technologist at Ford's Advanced Manufacturing Technology Development Center, tenured Professor of Mechanical Engineering at Kettering University and the University of Illinois, and Senior Research Staff/Research Fellowship at Princeton University.

Dr. Chehroudi has directed numerous multi-million dollar interdisciplinary projects in areas involving chemically reacting flows, combustion and emission of pollutants, sustainable and alternative energy sources, distributed ignition, material/fuel injection, advanced pollution reduction technologies, propulsion concepts, gas turbine and liquid rocket engines, combustion instability, laser optical diagnostics, spectroscopy, supercritical fluids and applications in environmental and propulsion systems, advanced composites, MEMS, nanotechnology and microfluidics.

He has a PhD in Mechanical & Aerospace Engineering and Post-Doctoral Fellow (Princeton University), MS in Mechanical Engineering (Southern Methodist University, Summa Cum Laude), MS in Economics (Swiss Finance Institute, Magna Cum Laude), and BS in Mechanical Engineering (Sharif University). He is a senior member of the American Institute of Aeronautics and Astronautics Propellant & Combustion Committee (2008-present) and an Associate Fellow of American Institute of Aeronautics and Astronautics. Dr. Chehroudi has more than 150 publications with extensive experience in both scientific and management areas and intensive trainings in finance and financial engineering.

BARBARA FOSTER

President

The Microscopy & Imaging Place

Barbara Foster is President and Chief Strategic Consultant of the Microscopy & Imaging Place, Inc. For three decades, Foster has catalyzed business development and new technology commercialization for microscopy and imaging companies. In addition to providing expertise in business structure, strategy and rapid go-to-market plans, she is especially well known for creating action-driven programs built on concrete data derived from early-stage, user-based market research.

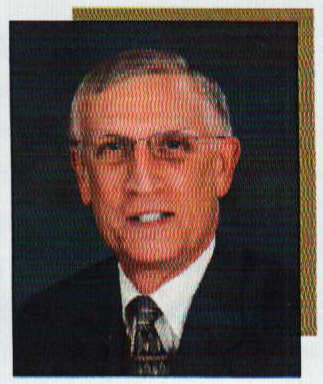
Early in her career, she served as technical marketing manager or director with a number of major manufacturers including Unitron (a spin-off from Nikon), Zeiss, Cambridge Instruments/Reichert-Jung (now part of Leica), and confocal pioneer, Sarastro (acquired by Molecular Dynamics, now part of Amersham). Since 1991, she has headed her own strategic consulting firm and recently co-founded MicroSpec On-site, a consortium that provides customized on-site educational programs in microscopy and spectroscopy.

Her work encompasses a far-reaching constellation of disciplines and industries, from confocal microscopy to gene chip readers, telepathology and revolutionary fluorescence illuminators, to surface structure texture analysis, semiconductor metrology and 3D imaging. Recent activities focus on micro- and nanotechnology, particularly hybrid technologies that marry the power of imaging with the strength of spectroscopy, from FT-IR/light microscopy fusions to next-generation SEM/EDS/Raman and AFM/Raman combinations. She has been a leader in the establishment of 10 companies and has been responsible for the launch of more than 100 products.

BRADFORD GOLDENSE, NPDP, CMfgE, CPIM, CCP

CEO

Goldense Group



Bradford L. Goldense, NPDP, CMfgE, CPIM, CCP, is CEO of Goldense Group, Inc. (GGI), a 29-year-old Needham, Massachusetts consulting, education and research firm that provides advanced business and technology management services to companies that create and commercialize products. Mr. Goldense has consulted with more than 200 of the Fortune 1000 in more than 500 manufacturing locations across North America, South America, Europe, Asia and the Middle East. Mr. Goldense previously held positions at Texas Instruments, Price Waterhouse, Knight & Associates, Index Group and a family engineering business.

Mr. Goldense is an internationally recognized expert in product development, innovation and R&D metrics practices and has been a guest on World Business Review and on Public Television, PBS and CNBC.

Mr. Goldense is a retired member of the graduate engineering school faculty at the Gordon Institute of Tufts University in Medford, Mass., after lecturing and teaching for 19 years. He holds a BS in Civil Engineering from Brown University and an MBA in Cost Accounting and Operations from Cornell University. He is a certified New Product Development Professional, Certified Manufacturing Engineer, Certified Computer Professional, and is certified in Production and Inventory Management. Mr. Goldense founded and is President Emeritus of the Society of Concurrent Product Development (SCPD) and a past member of the Board of the American Society for Engineering Management (ASEM).

RAKESH GOVIND, PhD

President

PRD Tech, Inc.

Rakesh Govind, PhD, obtained his MS and PhD from Carnegie-Mellon University and joined Mellon Institute as Director of the Industrial Control and Process Safety (ICAPS) Center. He worked at Polaroid Corporation as Senior Scientist in Boston before joining the faculty in the Department of Chemical Engineering at the University of Cincinnati. Dr. Govind is currently Professor of Chemical Engineering at the University of Cincinnati. He also co-founded PRD Tech, Inc., located in Cincinnati, Ohio. PRD Tech specializes in designing, building and installing full-scale biotreatment systems.

Dr. Govind's research interests include biological treatment, membrane systems and organo-metallic, high-surface-area adsorbents. He was awarded the Alfred Bodine Award by the Society of Manufacturing Engineering and received the Earth Day Award from the Cincinnati Gas and Electric Company for three consecutive years in 1995, 1996 and 1997.

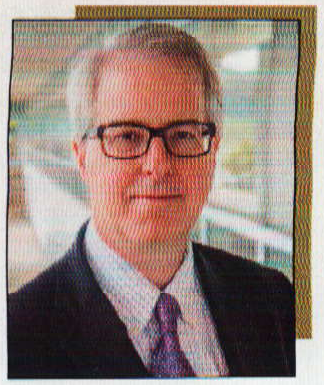
STUART HENDERSON, PhD

Project Director

Advanced Photon Source

Argonne National Laboratory, Dept. of Energy

Stuart Henderson, PhD, is an internationally recognized particle accelerator scientist. He serves as the Director of the Advanced



Photon Source Upgrade Project at Argonne National Laboratory. Prior to joining Argonne, he held leading roles at Fermi National Accelerator Laboratory and Oak Ridge National Laboratory. At Fermilab, Dr. Henderson was the Associate Laboratory Director for Accelerators and was responsible for Fermilab's accelerator research, development, construction and operations activities centered on accelerator-based particle physics.

Prior to joining Fermilab, he spent nearly a decade at Oak Ridge National Laboratory's Spallation Neutron Source (SNS), a billion-dollar U.S. Department of Energy Project to construct the world's most powerful accelerator-based neutron science user facility. He served as the Accelerator Physics Group Leader and subsequently as the Director of the Research Accelerator Division. Dr. Henderson was responsible for leading the SNS beam commissioning campaign and transition to successful user operations at megawatt beam power levels. He was also a Senior Research Associate at Cornell University working on the performance and upgrades to the NSF-funded Cornell Electron Storage Ring, and previously was a Research Associate in particle physics at Harvard University.

Dr. Henderson serves and has served on numerous advisory committees and panels for many particle accelerator facilities and projects both nationally and internationally, including accelerator facilities in the U.S., Europe and Asia. He also has served on many committees for the Dept. of Energy.

TONY HOLTZ

Technical Specialist
Proto Labs

Tony Holtz is a technical specialist at Proto Labs, a digital manufacturing company specializing in quick-turn additive manufacturing, CNC machining and injection molding. Mr. Holtz has been with Proto Labs for more than 10 years with roles ranging from CNC mill operator to mold designer to customer service engineer. While his formal education is in industrial machinery operations, he has extensive knowledge and experience in both traditional and advanced manufacturing processes and materials. Throughout his tenure at Proto Labs, Mr. Holtz has worked with countless designers, engineers and product developers to improve the manufacturability of their parts.

Mr. Holtz has more than 10 years of experience in additive manufacturing, CNC machining and injection molding processes. By utilizing complex software and automated manufacturing equipment, Minnesota-based Proto Labs is able to manufacture plastic and metal parts in less than 15 days.

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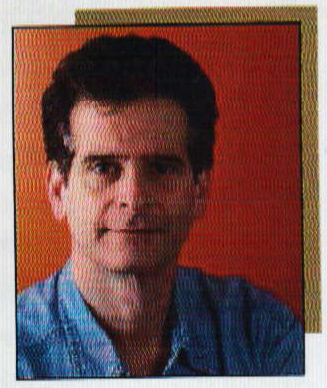
DEAN KAMEN

DEKA Research & Development Corporation, FIRST®
R&D 100 Awards and Technology Conference Keynote



Dean Kamen is an inventor, entrepreneur and advocate for science and technology and holds more than 440 U.S. and foreign patents, many of them for innovative medical devices that have expanded the frontiers of health care worldwide. While still a college undergraduate, he invented the first wearable infusion pump, which rapidly gained acceptance from such diverse medical specialties as chemotherapy, neonatology and endocrinology.

Mr. Kamen founded DEKA Research & Development Corporation to develop internally generated inventions, as well as to provide research and development for major corporate clients, including Baxter International Inc., Hologic Inc., Johnson & Johnson and C.R. Bard.

His research has led to a number of ground-breaking technology advances. Among them are a highly advanced prosthetic arm, HomeChoice™ peritoneal dialysis system, the Hydroflex™ surgical irrigation pump, the Crown™ stent, the iBOT™ mobility device and the Segway® Human Transporter.

Mr. Kamen has received many awards for his efforts. Notably, he was awarded the National Medal of Technology in 2000 in recognition for inventions that have advanced medical care worldwide, and for innovative and imaginative leadership in awakening America to the excitement of science and technology. Mr. Kamen was also awarded the Lemelson-MIT Prize in 2002, and was inducted into the National Inventors Hall of Fame in May 2005. He is a Fellow of the American Institute for Medical & Biological Engineering, and has been a member of the National Academy of Engineering since 1997.

He also founded FIRST® (For Inspiration and Recognition of Science and Technology), an organization dedicated to motivating the next generation to understand, use and enjoy science and technology, fulfilling his goal of inspiring the next generation of technological leaders.

In 2010, Mr. Kamen hosted the Planet Green television series Dean of Invention.

LESTER KEIZER

CEO

Business Continuity Technologies

As CEO/Co-owner, Lester Keizer brings to Business Continuity Technologies (BCT) over 30 years of executive responsibilities and business development skills. While Senior Vice President for Community Psychiatric Centers, he developed and managed the Residential Services Division. He grew this division by $75 million before its sale to Vencor (now Kindred Healthcare). While serving as Vice President of Development for Prime Med, he participated in the company's growth from a startup company to a $200 million leading provider of institutional pharmacy services. Mr. Keizer has also served as a Senior Vice President of Sales for one of the nation's largest home health providers and served as Vice President for Med Diversified in the development and promotion of technology, telemedicine and e-commerce on a national and international level.

Prior to his current role for BCT, Mr. Keizer was CEO for Ron Cook's Connecting Point, a 28-year-old VAR in Las Vegas. He oversaw the transformation of Connecting Point from a product centric company to a technology service centric organization. In June 2010, Business Continuity Technologies was formed and continues to build on the success of Connecting Point in Las Vegas and the surrounding areas. Mr. Keizer is also one of the co-founders and previous CEO of XiloCore, one of the first national cloud based Business Continuity Disaster Recovery companies.

Mr. Keizer grew up in Indonesia, New Guinea and Borneo (where his parents served as missionaries), went to college in England and later earned his Bachelor's degree from Southern Adventist University in Tennessee and his Master's degree in Administration from Andrews University in Michigan. He served on the Board of Directors for CompTIA, the world's largest Computing Technology Industry Association. In May 2011, he co-founded "Hands That Give," the IT industry's first member-led emergency disaster recovery response system modeled after the American Red Cross. He currently serves on the Synnex/Varnex advisory board.

SCOTT A. KUZDZAL, PhD

Life Sciences Business Leader

Shimadzu Scientific Instruments

Scott A. Kuzdzal, PhD, received his PhD in Analytical Chemistry in 1997 from the University of California at Riverside. He served as a Postdoctoral Fellow at the Johns Hopkins University School of Medicine, where he co-founded and directed the Johns Hopkins Center for Biomarker Discovery with Dr. Daniel Chan. He has extensive industrial research and clinical chemistry experience, formerly directing Toxicology and Therapeutic Drug Monitoring Labs at Johns Hopkins Medical Institutions. Dr. Kuzdzal currently serves on the editorial review board of Proteomics and hosts the USHUPO website (USHUPO.org).

Dr. Kuzdzal has published protein and peptide biomarkers for pancreatic cancer (HIPAP1), Alzheimer's disease, Duchenne's Muscular Dystrophy and ovarian cancer using a wide variety of separation and detection methods. He has lectured at continuing medical education courses at Johns Hopkins Hospital, George Mason University/INOVA Fairfax Hospital and the NIH as well as conferences worldwide. He has co-authored several proteomics book chapters and has multiple patents.

Dr. Kuzdzal currently serves as Life Sciences Business Leader for Shimadzu Scientific Instruments and has most recently helped develop and market exciting new analytical platforms including the MegaTOF Ultra High Mass MALDI, the Perfinity Workstation and cannabis testing solutions.

AMY LACHAPELLE

Founder

QBD Strategies

Amy Lachapelle has a BSc in Biochemistry and an MSc in Applied Mathematics and has always been interested in improving the efficiency of R&D efforts in the life sciences industry. Lachapelle led the protein characterization projects at GlycoSolutions where her primary focus was to develop the analytical technologies for a wide range of applications and work directly with clients to develop and streamline analytical strategies for their product characterization.

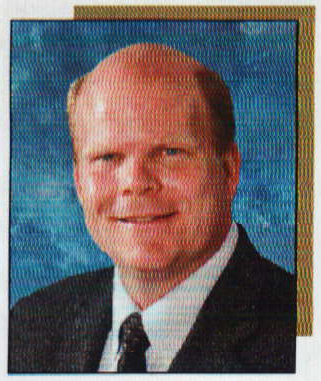
She possesses a wealth of knowledge acquired during her years at Genzyme where she assisted with the feasibility study of a protein replacement therapy for cystic fibrosis and was involved in the R&D initiative for gene therapy projects. Her duties involved the purification and characterization of a membrane protein, the monoclonal antibodies required for R&D efforts as well as the adenoviral and AAV gene therapy vectors. She is experienced not only in the analytical techniques required for protein characterization, but also a variety of cell-based and in vitro activity assays such as substrate transport and ligand-binding assays. She is the founder of QBD Strategies.

LONNIE LOVE, PhD

Group Leader

Polymer Systems Additive Manufacturing

Oak Ridge National Laboratory, Dept. of Energy



Lonnie Love, PhD, is a Corporate Fellow and Group Leader of ORNL's Manufacturing Systems Research Group. He has over 20 years of experience in the design and control of complex robotic and hydraulic systems. His primary expertise is in the areas of design, additive manufacturing, robotics and hydraulics. He is the project lead for the Big Area Additive Manufacturing (BAAM) program at ORNL that is focusing on large-scale, high-speed composite additive manufacturing now being commercialized by Cincinnati Incorporated, a 116-year-old U.S. machine tool manufacturer.

Dr. Love recently partnered with Local Motors demonstrating the technology on the development of the Strati, the world's first all-printed electric vehicle. In the fall of 2014, he was the "Printed Cobra" project lead, a six-week challenge to print an all-electric, additively manufactured Shelby Cobra.

His other recent research efforts have focused on developing new lightweight low-cost robotic and hydraulic systems through additive manufacturing. Dr. Love is also passionate about STEM, serving as a mentor for multiple FIRST Robotics teams and working with FIRST to extend their impact into inner city and rural areas, as well as initiating a new college internship program. He was ORNL's 2014 Distinguished Research Scientist, 2009 Inventor of the Year, has over 30 invention disclosures and patents and 75 peer-reviewed publications and serves on the scientific advisory board for NSF's Center for Compact and Efficient Fluid Power.

BABETTA MARRONE, PhD

Senior Scientist

Los Alamos National Laboratory, Dept. of Energy

Babetta (Babs) L. Marrone, PhD, is a Senior Scientist at Los Alamos National Laboratory (LANL) and LANL Biofuels Program Manager. She is a cell biologist and has been involved for the past 30 years in the development of flow cytometry assays and innovative instrumentation for new applications in the biosciences. She is currently the Principal Investigator (PI) on the Algae Biotechnology Partnership project sponsored by the Bioenergy

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Technologies Office (BETO), a part of DOE's Office of Energy Efficiency and Renewable Energy (EERE), and PI on a LANL-funded project on single cell analysis for bioprocess monitoring.

Dr. Marrone led the Ultrasonic Harvesting and Extraction project for the National Alliance for Advanced Biofuels and Bioproducts (NAABB), an algae consortium of over 30 organizations sponsored by BETO, from 2010 to 2013, and was also a Team Leader for the multi-lab NAABB Harvesting and Extraction research team. Dr. Marrone was the Director and PI of the NIH-sponsored National Flow Cytometry Resource from 2009 to 2014 and has led past projects sponsored by NIH, DOE-OBER, DHS, and the FBI.

THOM MASON, PhD

Director

Oak Ridge National Laboratory, Dept. of Energy

R&D 100 Awards and Technology Conference Keynote

Thom Mason, BS in Physics (Dalhousie University), PhD in Condensed Matter Sciences (McMaster University), is Director of Oak Ridge National Laboratory (ORNL). Dr. Mason joined ORNL in 1998 as Scientific Director for the Spallation Neutron Source (SNS) project. He was named Associate Laboratory Director (ALD) for SNS in 2001 and ALD for Neutron Sciences in 2006.

Before joining ORNL, Dr. Mason was a faculty member in the Department of Physics at the University of Toronto. From 1992 to 1993, he was a Senior Scientist at Risø National Laboratory. He held a Natural Sciences and Engineering Research Council of Canada (NSERC) postdoctoral fellowship at AT&T Bell Laboratories from 1990 until 1992.

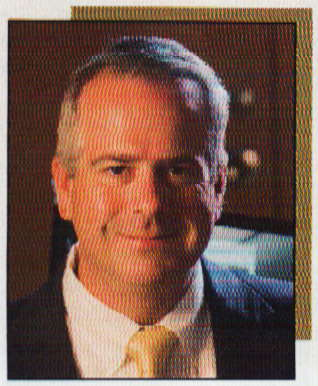
Dr. Mason's research background is in the application of neutron scattering techniques to novel magnetic materials and superconductors using a variety of facilities in North America and Europe. As Director of the U.S. Department of Energy's largest science and technology laboratory, he has an interest in advancing materials, neutron, nuclear and computational science to drive innovation and technical solutions relevant to energy and global security. He is a Fellow of the American Association for the Advancement of Science, the American Physical Society and the Neutron Scattering Society of America.

JOHN A. MCLEAN, PhD

Stevenson Professor of Chemistry

Vanderbilt Institute of Chemical Biology

John A. McLean, PhD, is Stevenson Professor of Chemistry at Vanderbilt University. Dr. McLean completed his PhD at George



Washington University in 2001, where he made significant contributions in plasma spectrochemistry in the development of new technologies for the analysis of complex and limited radionuclide and biological samples. Subsequently, he performed postdoctoral research at Forschungszentrum Jülich in Germany and then as a postdoctoral at Texas A&M University with Professor David H. Russell in biological mass spectrometry. Working with Professor Russell from 2001 to 2006, he constructed ion mobility-mass spectrometers capable of broad-scale omics analyses of complex biological samples on the basis of both molecular structure and mass.

In 2006, Dr. McLean was recruited to Vanderbilt University as Assistant Professor of Chemistry through both the Department of Chemistry and the Vanderbilt Institute of Chemical Biology. At Vanderbilt, Dr. McLean and colleagues focus on the conceptualization, design and construction of structural mass spectrometers, specifically targeting complex samples in systems, synthetic and chemical biology as well as nanotechnology. His group applies these strategies to forefront translational research areas in drug discovery, personalized medicine and "human-on-chip" synthetic biology platforms.

Dr. McLean has received a number of awards, including the Agilent Thought Leader Award, Waters Center of Innovation, Excellence in Teaching Award from the student members of the American Chemical Society, a Defense Threat Reduction Agency Research Award, an American Society for Mass Spectrometry Research Award, a Spectroscopy Society of Pittsburgh Award, an R&D 100 Award, and the Bunsen–Kirchhoff Prize from the GDCh (German Chemical Society), among others.

DAN MENNEL

CPA

Grant Thornton LLP

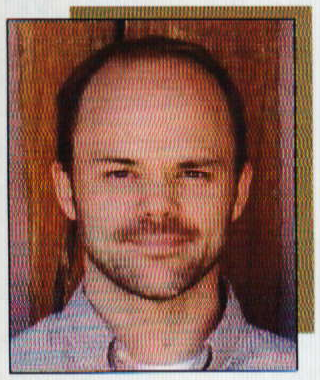
Dan Mennel, CPA, Grant Thornton LLP, is based in San Jose, and is the Market Leader for Strategic Federal Services in California. Mr. Mennel has more than 13 years of experience focused on R&D Tax Credits in a wide range of fields. He has helped implement one of the first R&D studies based on statistical sampling. He is well versed in third party time tracking systems and how these systems can best be utilized in R&D studies. Mr. Mennel has also helped develop R&D software and has significant experience with User Interface Testing. He has helped defend numerous claims before the IRS and has a track record of high sustention rates, and has helped clients create FIN 48 support.

Mr. Mennel has worked on numerous research credit engagements in diverse industries, including high technology (hardware and software), pharma-biotechnology, manufacturing as well as aerospace. He is a member of the California Society of Certified Public Accountants and the American Institute of Certified Public Accountants, and holds a Bachelor's of Science in Accounting from Indiana University.

BRIAN E. O'NEIL, PhD

Research and Development Engineer

Los Alamos National Laboratory, Dept. of Energy



Brian E. O'Neil, PhD, is a Research and Development Engineer at Los Alamos National Laboratory (LANL). Dr. O'Neil came to LANL as postdoctoral researcher investigating machine perception for automated assembly of nuclear components. He is currently responsible for robotics and automation projects in LANL's Manufacturing Science and Engineering Group. These projects include robotic inspection and contamination monitoring and advanced automation for nuclear manufacturing.

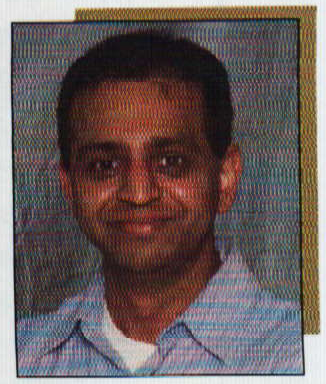
Dr. O'Neil studied Political Science and Mechanical Engineering at Arizona State University, and earned a Master of Science and PhD in Mechanical/Nuclear Engineering at the University of Texas at Austin in 2013. He currently serves on the executive committee of the American Nuclear Society Robotics and Remote Systems Division.

SANTINDERPALL PANNU, PhD

Director

Center of Bioengineering

Lawrence Livermore National Laboratory, Dept. of Energy



Satinderpall Pannu, PhD, is the Director for the Center for Bioengineering and was most recently the Section Leader for the Center for Micro- and Nano-Technology at Lawrence Livermore National Laboratory, where he managed a group of scientists and engineers dedicated to the research of bioengineering and nanotechnology. His group conducts multidisciplinary research spanning inertia sensors, electromagnetic detectors, advanced material development and biomedical devices.

As Director of the Center for Bioengineering, Dr. Pannu leads a

research team developing biomedical devices with significant interests in developing implantable neural interfaces for humans. His team, in conjunction with the Department of Energy's Artificial Retina program and Second Sight Medical Products, developed the world's first the retinal prosthesis.

Dr. Pannu and his team are pushing the boundaries of implantable neural interface technologies for chronic recording and stimulating from the central and peripheral nervous systems. These technologies include biocompatible polymers, electrode materials, hermetic packaging, dielectric coatings, and wireless electronics for neural prosthetic systems. Dr. Pannu has numerous publications and patents in the field.

ALEX PENG, PhD

Vice President & General Director

Material and Chemical Research Laboratories, ITRI

Dr. Alex Peng is Vice President & General Director at ITRI, and is responsible for the strategic direction and policy implementation for Material and Chemical Research Laboratories (MCL). He began his career at ITRI in 1988 and his fields of focus include Energy Materials, Electronic Materials, and Strategy and R&D Planning. He has accomplished many research results, published 72 papers and is the inventor of 26 patents.

Dr. Peng leads the R&D of passive components, etching, anodizing, conducting polymer solid capacitors, photovoltaics and lithium ion batteries. His persevering efforts in technology transfer helped Taiwan's industries expand in global markets. Dr. Peng also actively promotes global collaboration between academia, R&D institutes and industry.

Dr. Peng was awarded The Best Project Leader and The Best R&D Project by the Ministry of Economic Affairs, Taiwan. He is the recipient of the R&D 100 Award in 2009 for his research on the high safety STOBA lithium ion battery. Dr. Peng's leadership and expertise in material science has led him to the following professional leadership roles: currently serving as the President of Taiwan Corrosion and Protection Association and formerly President of Taiwan Battery Association. Dr. Peng studied Chemical Engineering at Taipei Institute of Technology and received a Master's in Science and a PhD in Material Science from Manchester University, UK, in 1987.

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KYLE REISSNER

1A Mobility Platform Leader

Rockwell Automation Inc.

Kyle Reissner is a connector, innovator and persuader who loves technology. In his current role as the Mobility Platform Leader at Rockwell Automation Inc., he leads a team that is pioneering disruptive software innovations in industrial mobility and information intelligence, owning the company's product focused mobility strategy. He holds a diploma in engineering and brings 15 years of diverse global leadership experience in product management, engineering, sales and marketing across various verticals within industry.

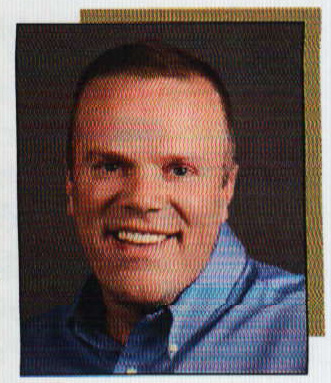
In the last 15 years, Mr. Reissner has held product leadership positions at Rockwell Automation and General Electric and engineering level positions at Activplant and Brock Solutions. He transitioned into Rockwell Automation to craft, own and lead the company's product focused mobility strategy which includes adoption of learning focused Lean Startup principles with agile execution, transforming an existing set of established industrial software products to be mobile first and to create new app focused offerings that deliver innovative and intelligent features focused on delivering industrial worker value.

Connecting his expertise to community involvement, Mr. Reissner serves as a volunteer advisory business and IT advisor with The Flood Sisters Kidney Foundation of America in New York City, a 501c3 company. The foundation's goal is to spread awareness of living organ donation by connecting those in need to altruistic donors. He is passionate about advanced technology tools that aim to address current market gaps and creating new tools that spark blue oceans of innovation. He believes that challenging the status quo with a great network of people not only breeds new ideas, but also drives existing established processes and methods forward.

GENE TETREAULT

Senior Director, Products and Marketing

Unified Laboratory Management Portfolio, BIOVIA



Gene Tetreault is Senior Director, Products and Marketing for the Unified Laboratory Management Portfolio at BIOVIA, and has over 20 years of experience in the life science industry developing and delivering laboratory informatics solutions for the research, development and quality control labs.

At BIOVIA, he is providing the vision,

strategy and management of the laboratory informatics product portfolio that includes the Electronic Laboratory Notebook, Laboratory Information Management System and the Laboratory Execution System.

JEKAN THANGA, PhD

School of Earth and Space Exploration
Arizona State University

Jekan Thanga, PhD, is Assistant Professor in the School of Earth and Space Exploration at Arizona State University. His research covers the investigation of theoretical concepts with simulation using computational tools culminating in field trials and missions. Dr. Jekan heads the Space and Terrestrial Robotics Laboratory at Arizona State University and is focused on space and extreme environment exploration using networks of robots, interplanetary CubeSats and smart sensors. His research focuses on developing enabling technologies that spans systems design, propulsion, networking and power.

Dr. Thanga was a Software Systems Engineer, R&D Department, MacDonald Dettwiler Space and Advanced Robotics (formerly SPAR).

His research and development achievements include the Artificial Neural Tissue (ANT) for autonomous control of robots including multi-robot teams, which he co-developed with a 1.2 million grant from the Canadian Space Agency and NASA; co-developed a high-density, long-life, fuel cell power supply for small robots and sensor networks for extreme environments including space; and designed and developed four different advanced robotic platforms for space and terrestrial research.

Dr. Thanga holds a PhD and a Master's of Science in Robotics from the University of Toronto, and a Bachelor's of Science in Engineering Science, also from the University of Toronto.

BILL TUMAS, PhD

Associate Laboratory Director for Materials/Chemical Science and Technology
National Renewable Energy Laboratory, Dept. of Energy

William Tumas, PhD, is the Associate Laboratory Director for Materials and Chemical Science and Technology at the National Renewable Energy Laboratory (NREL), which carries out fundamental and applied R&D for renewable energy and energy efficiency, including solar energy conversion for electricity and fuels, materials discovery and development for renewable energy technologies, energy storage, hydrogen production and storage

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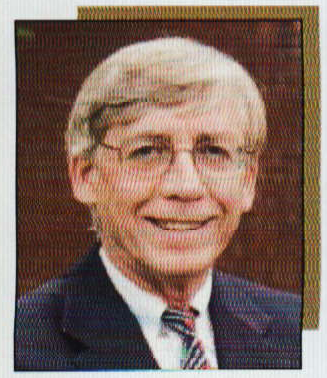
and fuel cells. Dr. Tumas is also the Director of the Center for Next Generation Materials by Design Energy Frontier Research Center. Prior to joining NREL in 2009, he held a number of leadership positions at Los Alamos National Laboratory over 17 years, including group leader of inorganic chemistry and Program Director for Applied Energy Programs. He started his career at Dupont Central Research after postdoctoral research at Caltech.

Dr. Tumas received a PhD in Organic Chemistry from Stanford University and a Bachelor's degree in Chemistry from Ithaca College. He has over 50 publications and 12 patents and his research activities have included materials by design, solar energy conversion, chemical hydrogen storage, catalysis, supercritical fluids and green chemistry.

WILLIAM B. WHITE

CEO
Offenberger & White



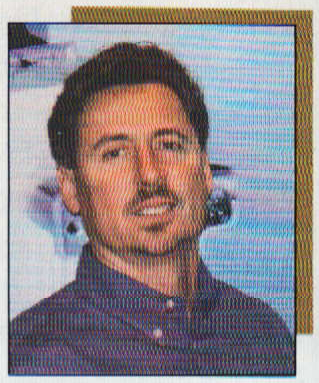
William B. White is the founder and CEO of Offenberger & White Inc., an Ohio marketing firm established in 1985. Previously, White was a co-founder and director of marketing of Queue Systems, Inc. from 1980 to 1985, and director of marketing for Forma Scientific Inc., (now Thermo Fisher) from 1976 to 1980. He is an active member in BioOhio.

Now in its 31st year, OffWhite has completed nearly 11,000 technical marketing projects for more than 300 U.S. and international companies serving life science, biotech, pharmaceutical and industrial laboratory industries in key markets throughout the world. OffWhite specializes in integrated marketing and branding programs for emerging growth companies, including startup technology firms that benefit from an experienced marketing team at a critical phase in company evolution when these skills are most needed but not generally available from industry outsiders or an in-house staff.

LARRY WILLIAMS, PhD

Director of Product Management
ANSYS

Lawrence Williams, PhD, is Director of Product Management at ANSYS Inc., Electronics Business Unit. He is responsible for the strategic direction of the company's electrical and electronics products, including the High Frequency Structure Simulator (HFSS) finite element simulator. Dr. Williams is an expert in the



application of electromagnetic field simulation to the design of antennas, microwave components and high-speed electronics. He has over 20 years of experience in the fields of electromagnetics and communications engineering and has published numerous technical papers on the subject.

Dr. Williams held various senior engineering positions in the Engineering Division of Hughes Aircraft Company, Radar Systems Group, where he was responsible for hardware design and development of advanced active phased array radar antennas, array element and aperture design, associated microwave subsystems, and antenna metrology.

He received his Master's, Engineers, and PhD degrees from UCLA in 1989, 1993 and 1995, respectively.

LIZA ZBARSKAYA

Senior Manager
Grant Thornton LLP

Liza Zbarskaya is a Senior Manager in Grant Thornton's Corporate SFTS practice and serves as the SFTS leader for the PNW market. In her role, she conducts R&D Tax Credit studies and Domestic Production Activities Deduction studies across numerous industries, including but not limited to Pharmaceutical, Biotechnology, Computer Science, Aerospace and Defense, Food Science, Telecommunications and Manufacturing. Ms. Zbarskaya holds a dual degree in Mathematics and Finance from the University of Maryland, and a MBA from Seattle University.

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NARlabs had combined ten national laboratories funded by Ministry of Science and Technology (MOST) of Taiwan into an independent non-profit institute.

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ANALYTICAL/TEST

2B Technologies Inc.
Model UV-106-W Aqueous Ozone Monitor

4D Technology Corp.
FlexCam Metrology Module

908 Devices
M908

Agilent Technologies
Poroshell HPH-C18 and HPH-C8

Agilent Technologies
Agilent A-Line Quick Connect Fitting

Agilent Technologies
Agilent 5100 ICP-OES

Anton Paar GmbH
Humidity Option CTD 180

Biotools Inc.
Mobile μ-Raman
Co-/Supporting Developer:
- Boston Univ.
- SnowyRange Instruments

Block Engineering LLC
LaserTune

Boston Scientific Corp.
SpyGlass DS Direct Visualization System

Bruker
BRAVO

CAMECA Instruments Inc.
Local Electrode Atom Probe Microscope - LEAP 5000 Product Line

Carl Zeiss Microscopy
Airyscan

ChemImage Sensor Systems
VeroVision

DANI Instruments
DANI PeakBlade 77

Data Sciences International (DSI)
PhysioTel HD-XG
Co-/Supporting Developer:
- Nova Biomedical

Data Translation Inc.
DT7837

Daylight Solutions Inc.
Spero Infrared Microscope

Delong Instruments
LVEM25 Benchtop TEM
Co-/Supporting Developer:
- Delong America

DynamicSignals LLC
Gage Eon Express

EMD Millipore Corp.
Simplicon RNA Reprogramming Technology

Ethicon
EVARREST Fibrin Sealant Patch

FEI Co.
Teneo VS

Goodwill Instrument Co. Ltd.
GDS-200/300

Hach Company
SL1000 Portable Parallel Analyzer

Houston Methodist Research Institute
Single-cell pipette (SCP)

Hummingbird Scientific
Operando Transmission Electron Microscope Gas-Catalyst Characterization System (Model Series: 1300-H)

JFE Techno-Research Corporation
FiDiCa

Keithley Instruments, a Tektronix Company
DMM7510 Graphical Sampling Multimeter

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Keyence Corporation
BZ-X700 Series All-in-one Fluorescence Microscope

Kromek/eV Products
eValuator-3500
Co-/Supporting Developer:
- Brookhaven National Laboratory

Lawrence Berkeley National Laboratory
OpenMSI

Lawrence Berkeley National Laboratory
Axial and Arbitrary Plane Optical Microscope (APOM)

Lawrence Berkeley National Laboratory
Continuous Active-Source Seismic Monitoring (CASSM)

Lawrence Livermore National Laboratory
MEMS-based Adaptive-Optics Confocal Microscope
Co-/Supporting Developer:
- Boston Micromachines Corp.
- Univ. of California, Santa Cruz

Leica Microsystems GmbH
Leica DMi8

Los Alamos National Laboratory
PipeLIBS: A Self-Contained Elemental Analysis Tool for the Oil Industry

Los Alamos National Laboratory
LARS: Lab-scale Asynchronous Radiographic System
Co-/Supporting Developer:
- CoRELabs

Lufft Mess- & Regeltechnik GmbH
WS700-UMB

Malvern Instruments
MicroCal PEAQ-ITC

Markes International
Select-eV
Co-/Supporting Developer:
- five technologies GmbH

Mentor Graphics, Mechanical Analysis Div.
MicReD Industrial Power Tester 1500A

MIT Lincoln Laboratory
Vocal and Facial Biomarkers of Depression

MIT Lincoln Laboratory
Laser Ultrasound for Medical Imaging (LUMI)

MIT Lincoln Laboratory
Dynamic Photoacoustic Spectroscopy (DPAS)
Co-/Supporting Developer:
- U.S. Army Edgewood Chemical Biological Center (ECBC)

Molecular Sensing Inc.
TruBind BSI System 100
Co-/Supporting Developer:
- Accel Biotech Inc.

Nanolive SA
3D Cell Explorer

Nanomechanics Inc.
iNano

NASA Armstrong Flight Research Center
Compact Fiber Optic Sensing System (brand name: RTS125)
Co-/Supporting Developer:
- Sensuron LLC

NASA Glenn Research Center
Supercooled Liquid Water Content (SLWC) Sensor for Radiosondes

National Security Technologies LLC
Argus Fisheye Velocimetry Probe

Neoteryx
Mitra Microsampling Device

Oak Ridge National Laboratory
Infrared Nondestructive Weld Examination System

Omega Engineering
PLATINUM Series Digital Panel Meters

Omega Engineering
UWBT

Ophir-Spiricon
BeamWatch

Oscium
WiPry-Pro

Pacific Northwest National Laboratory
Pressurized magic angle spinning (PMAS) technology for nuclear magnetic resonance (NMR) spectroscopy

Pacific Northwest National Laboratory
SPIN (Subambient pressure ionization with nanoelectrospray) Source
Co-/Supporting Developer:
- Andra Technologies LP

Packaging Technologies and Inspection
Seal-Sensor, Seal-Scan

PANalytical
Zetium

Phenomenex
Kinetex EVO C18 Core-Shell LC Columns

Phenomenex
Novum Simplified Liquid Extraction (SLE)

Protochips Inc.
Atmosphere 200 Environmental Gas Cell
Co-/Supporting Developer:
- Oak Ridge National Laboratory

Rigaku Raman Technologies
Progeny ResQ

Rigol Technologies USA Inc.
DG1000Z Arbitrary Waveform Generator with SiFi Technology

Shimadzu
IMLayer

Shimadzu
Nexera UC

Sierra Instruments
SmartTrak 100HP Ultra-High Pressure Mass Flow Meter and Controller

Siglent Technologies
Siglent SDG5000 & Easy Pulse Technology

Southwest Research Institute
FOCAS HGTR

Southwest Research Institute
Dynamic Crevice Sampling System (DCSS)

Spheryx Inc.
Spheryx Total Holographic Characterization

Tech4Imaging LLC
4Inspection

Tektronix
DPO70000SX 70 GHz Performance Oscilloscope

Teledyne LeCroy
LabMaster 10-100 Zi 100 GHz Oscilloscope

Thermo Fisher Scientific
Thermo Scientific Vanquish UHPLC System

Thermo Fisher Scientific
Thermo Scientific Q Exactive Focus Mass Spectrometer

Thermo Fisher Scientific
Thermo Scientific Gemini Analyzer

Thermo Fisher Scientific
Thermo Scientific RadEye SPRD

Thermo Fisher Scientific
Thermo Scientific DXRxi Raman Imaging Microscope

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U2D Inc.
Antero/Shavano Neutron Spectrometer
Co-/Supporting Developer:
- Defense Threat Reduction Agency
- Office of Naval Research
- Semiconductor Materials and Radiological Technologies (SMART) Laboratory
- Univ. of Missouri, Columbia
- Univ. of Missouri, Kansas City

VUV Analytics
VGA-100
Co-/Supporting Developer:
- The Market Element

IT/ELECTRICAL

A*STAR's Institute of Microelectronics
Ultra-low loss coupling technology for photonics circuits packaging

Adelphi Technology Inc.
Model DD110M Hybrid Neutron Generator

American Science and Engineering Inc.
MINI Z Handheld Z Backscatter Screening System

Argonne National Laboratory
Binary Pseudo-Random Calibration Tool
Co-/Supporting Developer:
- ABeam Technologies Inc.
- Brookhaven National Laboratory
- Lawrence Berkeley National Laboratory

Ascent Solar Technologies Inc.
MilPak

Battelle Memorial Institute
ID350 PPLN Photon Pair Source

Brookhaven National Laboratory
CZT-ElectrodePlus
Co-/Supporting Developer:
- Norfolk State Univ.

Brookhaven National Laboratory
aFCL

IBM
TrueNorth: IBM Neurosynaptic System

Industrial Technology Research Institute
Higher Sensitivity Tactile-film System for Wearable Orthosis (HSTS)

Industrial Technology Research Institute
LIM-3D

Industrial Technology Research Institute
PCOLED (Plasmon-coupled Organic Light-Emitting Diode)

Waters Corp.
ionKey/MS System

Waters Corp.
ACQUITY UPC2 Torus Columns

Wavelength Electronics Inc.
QCL Laboratory Series QCL Driver

WITec GmbH
RISE Microscopy
Co-/Supporting Developer:
- TESCAN ORSAY HOLDING

Y-12 National Security Complex
LISe Thermal Neutron Imager

Insight Photonic Solutions Inc.
Swept Distributed Sensing System

Lawrence Livermore National Laboratory
High-Power Intelligent Laser Diode-System (HILADS)
Co-/Supporting Developer:
- LaserTel Inc.

Los Alamos National Laboratory
MDHIM: Multidimensional Hashed Indexed Middleware
Co-/Supporting Developer:
- EMC

MIT Lincoln Laboratory
Simultaneous Transmit and Receive on-the-Move (STAR-OTM) system

MIT Lincoln Laboratory
Lincoln Adaptable Real-time Information Assurance Test-bed (LARIAT)

MIT Lincoln Laboratory
Instantaneous Direction-Finding Vector Sensor (IDFVS)

Mitsubishi Electric Corp.
MELSEC iQ-R

Mitsubishi Electric Corp.
Highly-reliable, superior economic switch for HVDC system

Mitsubishi Electric Corp. Advanced Technology R&D Center
UHD LCD TV

NASA Glenn Research Center
Polyimide Aerogel-Based Antenna

National Applied Research Laboratories (NARLabs)
Truly Radiation-Hardened Fiber Light Sources

Oak Ridge National Laboratory
iCRAWL: A user-oriented intelligent web crawler

Oak Ridge National Laboratory
CORE-Direct (Collectives Offload Resource Engine)
Co-/Supporting Developer:
- Mellanox Technologies

Q'Straint/Sure Lock
Q'Straint Securement System

Qualcomm Technologies Inc.
Qualcomm WiPower

Ryft
Ryft ONE

Sandia National Laboratories
LED Pulser

Sandia National Laboratories
IC ID

Sandia National Laboratories
Lightweight Distributed Metric Service (LDMS) v2.2

Sandia National Laboratories
PRISM

Southwest Research Institute
RANGER: Localization System Using a Ground-Facing Camera

SpeechVive Inc.
SpeechVive

TE Connectivity
TE 25G Active Optics Featuring Coolbit Optical Engines

TE Connectivity
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Tech4Imaging LLC
4Inspection

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The MITRE Corp.
Smart Phone Ad-Hoc Networking (SPAN)

The Univ. of Tennessee, Knoxville
Universal Grid Monitoring and Analyzing System (UGMAS)
Co-/Supporting Developer:
- Oak Ridge National Laboratory

UES Inc.
IBIS Photoconductive Semiconductor Switch

Uneo Inc.
Uneo Stylus Sensor

United Silicon Carbide Inc.
6.5kV Enhancement-Mode Silicon Carbide JFET Switch
Co-/Supporting Developer:
- Sandia National Laboratories
- U.S. Dept. of Energy, Office of Electricity Delivery and Energy Reliability, Energy Storage Program

Y-12 National Security Complex
ChIMES

Y-12 National Security Complex
LISe Thermal Neutron Imager

MECHANICAL DEVICES/MATERIALS

Argonne National Laboratory
Argonne's Fluorinated Electrolyte Technology for High-Voltage Lithium-Ion Batteries

Argonne National Laboratory
Argonne's Versatile Hard Carbon Microspheres Made from Plastic Waste
Co-/Supporting Developer:
- Purdue Univ.

Cambridge Nanotherm Ltd.
Nanotherm DM

Deep Springs Technology
I SAM-R
Co-/Supporting Developer:
- New York Univ.

Dow Automotive Systems
VORAFORCE 5300 composite matrix material

Dow Chemical
HYPERTHERM 2399 Resin

Dow Coating Materials
ACRYSOL Rheology Modifiers

Dow Corning Corp.
Thermal Radical Cure Adhesive
Co-/Supporting Developer:
- Delphi Automotive PLC

Dow Electronic Materials
MICROFILL THF-100 Electrolytic Copper

Dow Electronic Materials
SOLDERON BP TS 6000 Tin-Silver Chemistry

Dow Electronic Materials
IKONIC 2000 Polishing Pads for Chemical Mechanical Planarization (CMP)

Dow Performance Plastics
DOW ENDURANCE HFDC 4202

Dow Performance Plastics
Novel Polyethylene Stand-Up Pouch

Dow Performance Plastics
INTUNE Olefin Block Copolymers

Dow Performance Plastics
PacXpert Packaging Technology
Co-/Supporting Developer:
- Smart Bottle Inc.

Dow Pharma & Food Solutions
METHOCEL DC2
Co-/Supporting Developer:
- Colorcon

Energy Harvesting Technology LLC
Railway Energy Harvester
Co-/Supporting Developer:
- Stony Brook Univ.
- Virginia Tech

Ethicon
HARMONIC ACE +7 Shears with Advanced Hemostasis

Fiber Materials Inc.
3-D Polymer Matrix Composite

Greyrock Energy
Greyrock 300 dGTL

Honeywell International
Solstice N40 Refrigerant
Co-/Supporting Developer:
- Oak Ridge National Laboratory

Idaho National Laboratory
CellSage

Industrial Technology Research Institute
PolyE membrane technology

Industrial Technology Research Institute
Fluid-Driven Emergency Lighting

JFE Steel Corp.
Mighty Seam

JFE Steel Corp.
JFE-UHP-17CR-110

Lawrence Berkeley National Laboratory
Sensor Integrated with Recombinant and Engineered Nanophage (SIREN) platform

Lawrence Berkeley National Laboratory
Extended Pressure Inductive Coupled Plasma-synthesized Boron Nitride Nanotubes (EPIC BNNTs)

Lawrence Berkeley National Laboratory
High-capacity anode for rechargeable batteries
Co-/Supporting Developer:
- Zeptor Corp.

Lawrence Berkeley National Laboratory
Berkeley-Argonne Lab Nanoframe Catalysts
Co-/Supporting Developer:
- Argonne National Laboratory

Massachusetts Institute of Technology
RoboClam

Maxim Integrated
Maxim Integrated Solar Cell Optimizer
Co-/Supporting Developer:
- National Renewable Energy Laboratory

Maxwell Technologies
Maxwell Technologies K2 2.85V/3400F ultracapacitor cell

Mechano Transformer Corp.
Piezo Assist Precision Stage (MTPA1000XY)

MER Corp.
Lightweight free of particle generation metal composite automotive brakes

Milliken & Company
Milliguard AOX-1

Milliken & Company
MilliCap Reinforcement Tape

Milliken & Company
Hyperform HPN 210M

MIT Lincoln Laboratory
Rare-Earth Microbarcodes (REMcodes)
Co-/Supporting Developer:
- MIT Dept. of Chemical Engineering

Mitsubishi Electric Corp.
SMART V2H

NanoMech Inc.
GUARDx

NanoScience & Technology Center, Lintec of America
HeliAct Muscles
Co-/Supporting Developer:
- Alan G. MacDiarmid NanoTech Institute,The Univ. of Texas at Dallas

National Renewable Energy Laboratory
Cyanobacterial bioethylene

National Renewable Energy Laboratory
SunStop
Co-/Supporting Developer:
- e-Chromic Technologies Inc.

Oak Ridge National Laboratory
Porous Graphene Desalination Membrane

Oak Ridge National Laboratory
Multifunctional Superhydrophobic Transparent Glass Coating
Co /Supporting Developer:
- United Protective Technologies

Oak Ridge National Laboratory
Hillphoenix Advansor Transcritical CO2 Booster System
Co-/Supporting Developer:
- Hill Phoenix

Pacific Northwest National Laboratory
InjectaTag, an injectable acoustic microtransmitter

Piper Plastics Inc.
KyronMAX

Sandia National Laboratories
CO2 Memzyme
Co-/Supporting Developer:
- Univ. of New Mexico

Milliken & Company SiVance
XLED LED Encapsulant

SmartKem
tru-FLEX

Southern Company
KM-CDR Process
Co-/Supporting Developer:
- Mitsubishi Heavy Industries

SwissLitho AG
NanoFrazor

TapeSolar Inc.
Single-Crystal-Like, Low-Cost, Flexible, Large-Area, CdTe Substrates

Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences
DREAM Ink- Personal Liquid Metal Printer
Co-/Supporting Developer:
- Beijing DreamInk Technology Co. Ltd.

Terves Inc.
TervAlloy
Co-/Supporting Developer:
- Powdermet Inc.

The Dow Chemical Company
VORASTAR 7000 Polyurethane Spray Elastomer System based on VORAPEL Hydrophobic Polyol

The Dow Chemical Company
MAINCOTE AEH, Acrylic Epoxy Hybrid Waterborne Latex Polymer and Technology

The Dow Chemical Company
LIQUIDARMOR Flashing and Sealant

The Dow Chemical Company
Dow HYPERLAST Subsea Field Joint Systems

The Dow Chemical Company
NORKOOL Desitherm HS

The Dow Chemical Company
Ford F150 aluminum intensive vehicle and BETAMATE 6160 structural adhesive joining technology
Co-/Supporting Developer:
- Ford Motor Company

Toyota Motor Corp.
Toyota Fuel Cell System

Uneo Inc.
Uneo Stylus Sensor

Univ. of Central Florida
Energy transmitting and storing cables

Univ. of Waterloo
Advanced Si electrode nano-architecture for next generation high-energy lithium- ion batteries
Co-/Supporting Developer:
- General Motors

Wire Technology Co. Ltd.
Silver-alloy bonding wire and stud bump

XALT Energy LLC
XALT 60Ah High Power Lithium-Ion LTO Cell

PROCESS/PROTOTYPING

California Eastern Laboratories
MeshWorks

Carbtex Technology Inc.
Smarter Cotton which includes Green Cotton, DuraGard, NuGard and DiamondGard

Cincinnati Incorporated
BAAM-CI (Big Area Additive Manufacturing – Cincinnati Incorporated)
Co-/Supporting Developer:
- Oak Ridge National Laboratory

DeltaTrak Inc.
ThermoTrace TTI Time-Temperature Indicator Label

DOW ITALIA S.R.L.
PASCAL TECHNOLOGY

EMD Millipore Corp.
AFS 40E/80E/120E and 150E Water Purification Systems

EMD Millipore Corp.
pDADMAC and Clarisolve

Industrial Technology Research Institute
Epitaxy Optimum Coupling system, EOCS

Industrial Technology Research Institute
Optical Engine for Material Grain Microstructure-Controllable Additive Manufacturing Technology

Industrial Technology Research Institute
gLaserTrim

Industrial Technology Research Institute
SuperSizer

Lawrence Livermore National Laboratory
Large-Area Projection Micro-Stereolithography (LAPμSL)

Lawrence Livermore National Laboratory
Smart Real-Time Inventory System Based on Long-Range, Battery-Free, Radio Frequency Harsh Environment Tag (HET) System
Co-/Supporting Developer:
- Dirac Solutions Inc.

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NSF Center for High-rate Nanomanufacturing at Northeastern Univ.
NanoOPS: Nanoscale Offset Printing System

Pacific Northwest National Laboratory
Hydrothermal Processing (HTP) to Convert Wet Biomass into Biofuels
Co-/Supporting Developer:
- Genifuel Corporation

Singapore Institute of Manufacturing Technology
S-Droplet SDG 2000

Singapore Institute of Manufacturing Technology
Elegant Laser Scalpel (ELS)

Southern Company
KM-CDR Process

SwissLitho AG
NanoFrazor

SOFTWARE/SERVICES

Alpha STAR Corp.
GENOA 3D printing Software
Co-/Supporting Developer:
- Oak Ridge National Laboratory

Applied Brain Research Inc.
Nengo 2.0

Bio-Rad Laboratories Inc.
KnowItAll ID Expert

BIOVIA Dassault Systèmes (previously Accelrys)
BIOVIA Biotherapeutics Workbench

BIOVIA Dassault Systèmes (previously Accelrys)
BIOVIA Capture

California Eastern Laboratories
MeshWorks

Certara
Muse Invent

Far Eastern Electronic Toll Collection Co. Ltd.
Taiwan ETC

Hewlett-Packard
HP OneView 1.2

Image Insight Inc.
GammaPix Sim App

Institute for Information Industry
Bus on Demand (BOD)

Institute for Information Industry
2TVNow

Institute of Nuclear Energy Research
INER Energy Management System (iEMS)

Label Independent Inc.
Visual Assay

Lawrence Berkeley National Laboratory
OpenMSI

Lawrence Berkeley National Laboratory
V2G-Sim (Vehicle-to-Grid Simulator)

Lawrence Livermore National Laboratory
Zero-RK

Lawrence Livermore National Laboratory
Smart Real-Time Inventory System Based on Long-Range, Battery-Free, Radio Frequency Harsh Environment Tag (HET) System
Co-/Supporting Developer:
- Dirac Solutions Inc.

Los Alamos National Laboratory
SHMTools: Structural Health Monitoring Software for Aerospace, Civil, and Mechanical Infrastructure

MIT Lincoln Laboratory
Composable Analytics
Co-/Supporting Developer:
- Composable Analytics Inc.

MIT Lincoln Laboratory
Platform for Architecture-Neutral Dynamic Analysis (PANDA)
Co-/Supporting Developer:
- Georgia Institute of Technology
- Northeastern Univ.
- Columbia Univ.

MIT Lincoln Laboratory
Self-Defense Distributed Engagement Coordinator (SDDEC)

MIT Lincoln Laboratory
Video Content Summarization Tool (VCST)

MSC Software
MSC Apex (Engineering Simulation Software)

National Energy Technology Laboratory
EYESIM v2.3 Immersive Real-Time Virtual Reality Software for Improving Energy Plant Operations and Safety
Co-/Supporting Developer:
- Schneider Electric
- West Virginia Univ.

Oak Ridge National Laboratory
Hyperion: Automated Behavior Computation for Compiled Software

Oak Ridge National Laboratory
CoNNECT 2.0: Activity-Based Recommender System for Energy Services

Pacific Northwest National Laboratory
Power Model Integrator: A system for more accurate energy forecasts

Pacific Northwest National Laboratory
CHAMPION: Columnar Hierarchical Auto-associative Memory Processing in Ontological Networks
Co-/Supporting Developer:
- Champion Technology Company Inc.

Proportional Technologies Inc.
Boron Coated Straw Neutron Detector
Co-/Supporting Developer:
- Defense Threat Reduction Agency

Sandia National Laboratories
Lightweight Distributed Metric Service (LDMS) v2.2

Siemens Corp., Corporate Technology
eSie Valves
Co-/Supporting Developer:
- Siemens Corp., Healthcare Clinical Products, Ultrasound

Southwest Research Institute
CAPCOM

Southwest Research Institute
STRONGARM

The Mitre Corp.
Turbo-Fraud: Counter-Deception Support for Forensic Auditing

tranSMART Foundation
tranSMART Foundation Platform

Universities Space Research Association
Space Propulsion Optimization Code (SPOC)

Valtronic
Compendium

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NOTES

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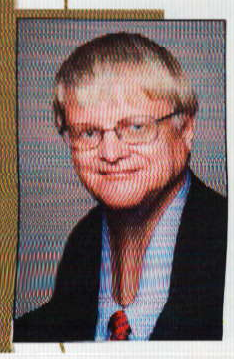
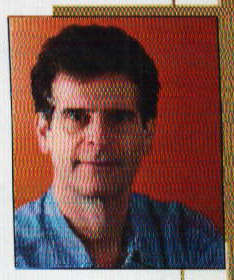
Friday, November 13, 2015
3:00 p.m. – 4:00 p.m.
Innovation Hall Theater

Panelists include:





Keynote Speaker: Dean Kamen, Founder, FIRST® (For Inspiration and Recognition of Science and Technology)

Keynote Speaker: Thom Mason, PhD, Director, Oak Ridge National Laboratory, Dept. of Energy

Daryl Belock, Vice President of Innovation & R&D Collaboration, Thermo Fisher Scientific

John McLean, PhD, Stevenson Professor of Chemistry, Vanderbilt Institute of Chemical Biology

Alex Peng, PhD, Vice President & General Director, Material and Chemical Research Laboratories, ITRI

Moderator: Tim Studt, Program Director, R&D 100 Awards & Technology Conference

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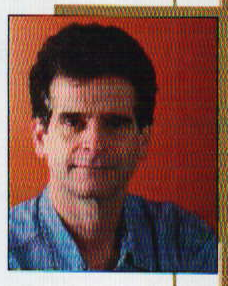

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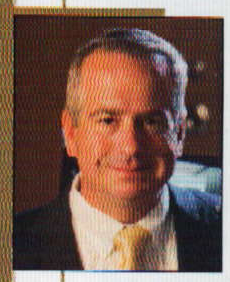

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Lawrence Livermore National Laboratory
Milliken
NSPO
NARLabs 國家實驗研究院
國家太空中心 National Space Organization
OAK RIDGE National Laboratory
Sandia National Laboratories

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