



Summer Member Meeting

June 10 - 11, 2013

The Ritz-Carlton
Washington, D.C.

AGENDA

MONDAY, JUNE 10, 2013

THE RITZ-CARLTON, WASHINGTON, D.C.

- ▷ 1:00 P.M. **Attendee Registration**
- ▷ 1:30 P.M.- 5:30 P.M. **Opening Program**
Meeting the President's STEM Call to Action: A Joint Implementation Response to PCAST's *Engage to Excel* Report
Salon II, Ballroom Level
- 1:30 P.M. **Welcome from the Business-Higher Education Forum (BHEF)**
Wes Bush, Chairman, CEO, and President, Northrop Grumman Corporation
- 1:35 P.M. **Welcome from the U.S. Navy**
The Honorable Ray Mabus, Secretary of the Navy
Introduced by RADM Matthew L. Klunder, Chief of Naval Research
- 2:05 P.M. **The Administration's Vision for the Future of Undergraduate STEM Education**
Thomas Kalil, Deputy Director for Policy, White House Office of Science and Technology Policy
- 2:20 P.M. **Federal Agencies Respond to the President's Challenge for 1M STEM Graduates**
- **Reginald Brothers**, Deputy Assistant Secretary of Defense for Research, Department of Defense
 - **Susan Singer**, Director, Division of Undergraduate Education, National Science Foundation
- 2:40 P.M. **U.S. STEM Undergraduate Model**
- Rollout**
- **Brian K. Fitzgerald**, CEO, BHEF
 - **William H. Swanson**, Chairman and CEO, Raytheon Company
- Discussion**
Moderator: CDR Joseph Cohn, Deputy Director of Research – STEM, Office of Naval Research
- **Jo Handelsman**, Frederick Phineas Rose Professor, Molecular, Cellular and Developmental Biology, Yale University; Co-chair of PCAST STEM Undergraduate Education Working Group
 - **Freeman A. Hrabowski III**, President, UMBC

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MONDAY, JUNE 10, 2013

THE RITZ-CARLTON, WASHINGTON, D.C.

- 4:00 P.M. **Unpacking the 1M Goal and a Vision for a Successful Path Forward**
- **S. James Gates Jr.**, Regents Professor, John S. Toll Professor of Physics, University of Maryland; Co-chair of PCAST STEM Undergraduate Education Working Group
 - Interviewed by: **Roger W. Ferguson, Jr.**, President and CEO, TIAA-CREF
- 4:30 P.M. **Achieving the President's STEM Higher Education Goals: Actions and Commitments**
Moderator: Barbara R. Snyder, President, Case Western Reserve University
- **David J. Asai**, Director, Precollege and Undergraduate Science Education, Howard Hughes Medical Institute
 - **John R. Ettinger**, CEO, The Leona M. and Harry B. Charitable Trust
 - **James P. Clements**, President, West Virginia University, Chair of the Council of Presidents, Association of Public and Land-Grant Universities
 - **Hunter R. Rawlings III**, President, Association of American Universities
 - **Eric A. Spiegel**, President and CEO, Siemens Corporation
- ▷ 5:30 P.M. **Closing**
Brian K. Fitzgerald, CEO, BHEF
- ▷ 6:00 P.M. **Opening Reception**
West View, Lobby Level
- ▷ 7:00 P.M. **Opening Dinner**
Plaza Ballroom, Ballroom Level

AGENDA

TUESDAY, JUNE 11, 2013

THE RITZ-CARLTON, WASHINGTON, D.C.

- ▷ 7:30 A.M. **Breakfast**
Salon II, Ballroom Level
- ▷ 8:30 A.M. **Opening Remarks**
Salon III, Ballroom Level
- ▷ 8:45 A.M. **Keynote Address**
Richard H. Ledgett, Jr., Director, NSA/CSS Threat Operations Center
Salon III, Ballroom level
- ▷ 9:15 A.M. **Plenary Session I**
Connecting BHEF's Work with National Policy: Cyber Intelligence Sharing and Protection Act (CISPA)
Salon III, Ballroom Level
- The Cyber Intelligence Sharing and Protection Act (CISPA) and the Future of Cyber Legislation**
Moderator: Wes Bush, Chairman, CEO, and President, Northrop Grumman Corporation
- Marion C. Blakey, President and CEO, Aerospace Industries Association
 - Richard H. Ledgett, Jr., Director, NSA/CSS Threat Operations Center
 - Congressman C. A. ("Dutch") Ruppberger, (D-Maryland)
 - Larry Zimbleman, Chairman, President, and CEO, Principal Financial Group
- ▷ 10:30 A.M. **Break**
- ▷ 10:45 A.M. **Plenary Session I (cont.)**
- Roundtable on Building the Cyber Workforce: Enabling Policy and Innovative Solutions**
Moderator: William E. ("Brit") Kirwan II, Chancellor, University System of Maryland
- ▷ 12:00 P.M. **Lunch**
Salon II, Ballroom Level

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TUESDAY, JUNE 11, 2013

THE RITZ-CARLTON, WASHINGTON, D.C.

▶ 1:30 P.M.

Plenary Session II (Learning Session)

What Can BHEF Regional Projects Learn from Successful State Innovation Incubators?

Salon III, Ballroom Level

- **Richard A. Bendis**, President and CEO, BioHealth Innovation
- **W. Mark Crowell**, Executive Director, U.Va Innovation, Associate Vice President, University of Virginia
- **Christopher C. Valentino**, Director, Contract Research & Development, Cyber Solutions Division, Cyberintelligence Division, Northrop Grumman Information Systems

▶ 3:00 P.M.

Closing Discussion/Business Meeting

Salon III, Ballroom Level

OVERVIEW



Welcome to the Business-Higher Education Forum's (BHEF) Summer 2013 Member Meeting on June 10 and 11. This event, hosted in our nation's capital, will engage BHEF members and guests on pressing policy issues confronting education and the workforce. Over two days, conversations with speakers and panelists will connect BHEF's regional projects, that constitute the National Higher Education and Workforce Initiative with federal policy and policymakers in an effort to better align higher education with workforce needs, particularly for women and other minorities.

Over the last year, BHEF has developed a model for strategic engagement between business and higher education that moves away from transactional partnerships to deep collaborations that drive sustainable change in higher education and workforce outcomes. BHEF implemented this model in the first cohort of a dozen regional higher education-workforce projects launched in 2012 and a second cohort of its regional industry-higher education projects in June 2013.

These projects represent a unique model of business and higher education collaboration to bolster student persistence toward degree completion and align undergraduate education with workforce needs in high-demand sectors, including information technology, financial services, energy, health and agriculture, and emerging fields such as water sciences, large-scale data analytics, and cybersecurity. Cohort I projects, now in the implementation phase, integrate assessments of regional workforce needs with an understanding of the migration patterns of students in key academic fields to shape new undergraduate experiences during the first two undergraduate years. Cohort II projects, now in the planning and launch phase—which includes specific metrics for sustaining the partnerships—will also provide further opportunities for BHEF to build networks of effective practice around sectors and fields, both nationally and regionally, and drive project scaling and adaptation through university systems, national partnerships, and other mechanisms.

This meeting, focusing on the intersection of federal policy and the regional work of the National Higher Education and Workforce Initiative, is structured around three sessions. The opening program on June 10 is a public summit on meeting President Obama's educational goal of adding one million STEM graduates by 2020. In collaboration with the White House Office of Science and Technology Policy, the National Science Foundation, and the Office of Naval Research (ONR), this summit represents a direct response to the report by the President's Council of Advisors on Science and Technology (PCAST) and will feature keynote remarks by the Honorable Ray Mabus, Secretary of the Navy, as well as the official launch of BHEF's U.S. STEM Undergraduate Model, funded by ONR. Following the opening summit, the first plenary features

a conversation on the Cyber Intelligence Sharing and Protection Act (CISPA) with Congressman C.A. Dutch Ruppersberger (D-MD), ranking member of the House Permanent Select Committee on Intelligence, and several other panelists. The second plenary will be structured to inform BHEF members currently leading or considering leading a regional higher education and workforce project about the challenges and benefits of building successful innovation and commercialization networks.

Opening Program

Summit on Meeting the President's STEM Undergraduate Goals: A Joint Implementation Response to PCAST's *Engage to Excel* Report

In 2012, the President's Council of Advisors on Science and Technology (PCAST) issued a report, *Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics*, recommending the nation graduate one million STEM students by 2020 in order to meet economic forecasts. On Monday, June 10, BHEF will draw upon this call to action and offer a response during the *Summit on Meeting the President's STEM Undergraduate Goals*. This summit will bring together senior leadership from federal agencies, businesses, and universities, as well as internationally renowned scientists and other stakeholders, elaborating on the vision for STEM education and demonstrating the collective action in place to meet the administration's goal of one million additional STEM graduates.

This summit will also feature BHEF's U.S. STEM Undergraduate Model, an innovative tool that applies system dynamics modeling techniques to assist policymakers when identifying high-leverage strategies and understanding the impacts of scaling practices. Funded by the Office of Naval Research in an effort to inform the Navy's strategy to grow a robust civilian workforce, this BHEF meeting will feature the Honorable Ray Mabus, Secretary of the Navy, and mark the public release of the model with a discussion of its important policy implications for meeting PCAST's recommendation.

Plenary Session I

The Cyber Intelligence Sharing Protection Act and Potential National Cybersecurity Workforce Policy

As the nation grapples with fundamental issues of national security and privacy, cyber threats continue to grow as does the need to increase public awareness of cybersecurity. More so, employers increasingly must build the kind of capable, agile workforce equipped to address these cyber threats. Several of BHEF's member companies are major employers of "cyber warriors," while others are in the business of building the nation's infrastructure or supplying its energy, food, or financial service needs, all of which require "cyber enabled" professionals who possess an understanding of cybersecurity as it pertains to their fields.

In the context of these cyber challenges and the national investment initiatives in the development of the cybersecurity workforce, this session will explore key issues that have emerged in the advancement of the Cyber Intelligence Sharing and Protection Act (CISPA), an amendment to the

National Security Act of 1947. This will include a panel discussion on the national debate over CISPA among Congress, the administration, the private sector, advocacy groups, and other stakeholders. The conversation will reflect the significant challenge of balancing national security and privacy with the development of cybersecurity public policy and the implications for the workforce needed to support the cybersecurity enterprise.

Plenary Session II

What BHEF Regional Projects Can Learn from Successful Innovation and Commercialization Networks

The relentless drive by global companies to innovate is the hallmark of the 21st century. Companies and regions have exploited the virtuous cycle of innovation, beginning with basic and applied research funded by government and corporations, leading to new products, services, and jobs. Regions that possess a critical mass of research universities, national labs and research facilities, and key industry sectors have demonstrated how these ecosystems of scientific and technological, financial and human capital and commercial resources can be harnessed in service of innovation and economic growth. These “innovation clusters” have excelled at refining the interaction points among government, universities and companies to advance science, technology and innovation in areas of regional comparative advantage.

This learning session will explore lessons that can be taken from the records of successful state and regional networks. Richard Bendis, president and CEO of BioHealth Innovation, Inc., Maryland’s commercialization collaborative, and Mark Crowell, executive director of U.Va. Innovation, will discuss critical network ingredients and their successes in spurring innovation and economic growth.

OPENING PROGRAM



Summit on Meeting the President's STEM Call to Action: A Joint Implementation Response to PCAST's *Engage to Excel* Report (Featuring the Launch of the U.S. STEM Undergraduate Model)

On Monday, June 10, 2013, BHEF will host the *Summit on Meeting the President's STEM Undergraduate Goals: A Joint Implementation Response to PCAST's Engage to Excel Report*. This event will demonstrate the momentum and highlight the progress toward the president's call to action for the nation to graduate one million additional STEM students by 2020.

The first convening of its kind, the summit will bring together national thought leaders, including senior White House and federal agency officials, CEOs, university presidents, internationally renowned scientists (including two of the PCAST co-chairs), distinguished practitioners, and association and foundation executives, all showcasing their individual contributions towards a collective, overarching goal. This summit elevates the visibility of the progress underway in STEM undergraduate education by demonstrating how a joint implementation response can yield significant progress in a short period and change the culture of STEM teaching and STEM learning nationwide. The event will be preceded by a series of workshops engaging leaders in STEM undergraduate education and providing a forum to discuss and disseminate evidence-based practices that improve persistence of STEM undergraduates and spotlight collaborations that deploy these practices.

Although a steep climb remains to reach the president's goal by 2020, BHEF and the National Undergraduate STEM Partnership are developing the infrastructure necessary to change undergraduate STEM education through sustained transformational reforms. This begins with the development of cutting-edge tools, successful pilots, and research to deploy evidence-based practices nationwide. A key example of such a resource is BHEF's U.S. STEM Undergraduate Model (the "Model"). Funded by the Office of Naval Research (ONR), the Model which will officially be released to the public at the summit, is a tool that assists policymakers to identify highest-leverage education strategies and understand their impacts at scale.

Summit Speakers

BHEF, in collaboration with the White House Office of Science and Technology Policy, the National Science Foundation, and the Departments of Defense and of the Navy, will discuss the president's vision for one million new STEM graduates by 2020 and the responses from various sectors contributing to attaining that goal. BHEF Chair Wes Bush will welcome the audience, anticipated to include over 250 leaders from federal agencies, industry, higher education,

foundations, associations, and non-profits, and describe the catalytic role BHEF is playing in forging a national response to a common goal set forth by the president, highlighting that none of the organizations in the room can address this challenge alone. If these groups shift their focus from solely the one million number; align their perspectives and view the challenge as an increase in undergraduate retention by 10 percent; and deploy thoughtful and strategic reforms across undergraduate STEM education to influence the quality of a student's experience, the goal becomes attainable.

The White House, represented by Tom Kalil, deputy director for technology and innovation at the Office of Science and Technology Policy, will frame the blueprint for the future of STEM undergraduate education and describe the programs and policies in place to set this vision into action. Susan Singer, director, Division of Undergraduate Education, National Science Foundation (NSF), and Reginald Brothers, Deputy Assistant Secretary of Defense for Research, will illuminate how the federal agencies are responding to the president's call to action. Both will provide leading examples, such as the NSF's Graduate 10K+ program, where innovative partnerships with private companies (such as GE and Intel) provide NSF the funds to support institutions developing STEM retention programs in engineering and computer science.

James (Jim) Gates, Jr., who co-chairs the PCAST STEM Undergraduate Education Working Group and is a recent recipient of the National Medal of Science as well as University System of Maryland Regents Professor, John S. Toll Professor of Physics, and director of the Center for String & Particle Theory, will be interviewed by Roger Ferguson, Jr., president and CEO, TIAA-CREF, and member, President Obama's Council on Jobs and Competitiveness. As part of his work on the President's Jobs Council, Roger was tasked with developing a plan for how industry can get more engaged with STEM education. As co-chair on the PCAST *Engage to Excel* Report, Jim is poised to discuss the group's thinking in developing the goals and its vision for how the stake-holder group can respond to such a report.

A panel discussion, *Achieving the President's STEM Higher Education Goals: Actions and Commitments*, moderated by Barbara R. Snyder, president of Case Western Reserve University, will highlight some of the key responses to the president's goal. Barbara will discuss the National Higher Education and Workforce Initiative, update the group on progress that has been made in implementing the Cohort I projects, and announce the Cohort II projects. Panelists include David Asai, director of precollege and undergraduate science education, Howard Hughes Medical Institute; John Ettinger, CEO, The Leona M. and Harry B. Helmsley Charitable Trust; Jim Clements, president, West Virginia University and chair of the Council of Presidents, The Association of Public and Land-Grant Universities; Hunter Rawlings, president, The Association of American Universities; and Eric Spiegel, president and CEO, Siemens Corporation.

Acknowledging that many more evidence-based practice programs are underway than those highlighted, BHEF CEO Brian Fitzgerald will close with a brief report from the workshops and detail the next steps for building a community of practice that aligns each organization's contributions for the benefit of a broader goal.

Unveiling the New U.S. STEM Undergraduate Model

The Honorable Ray Mabus, Secretary of the Navy, will provide keynote remarks on the Navy's civilian STEM workforce needs, the need for increased STEM skills in the workforce, and the strategy the Navy and its Office of Naval Research are using to address these needs. Launched in 2010, the Navy's response, the STEM2Stern Initiative, is its vehicle for investments in STEM education. ONR has funded BHEF to develop the U.S. STEM Undergraduate Model to help the Navy shape its undergraduate investments in STEM, providing insights into the highest-leverage strategies that maximize impact at scale.

During this session, BHEF will unveil its U.S. STEM Undergraduate Model. Bill Swanson, chairman and CEO, Raytheon, will provide framing remarks, describing the history of BHEF's modeling work and Raytheon's lead role in developing this groundbreaking resource that guides policymakers in making smarter investments in STEM education. Brian Fitzgerald will then demo the Model and discuss key findings and policy implications that have emerged from its use.

The Model is informed by an extensive BHEF literature review on high-impact interventions that have proven highly effective on STEM undergraduate retention. Following the model launch, Commander Joseph Cohn, ONR's deputy director of research for STEM, will lead a discussion with intervention experts, unpacking the core elements of highly successful programs. Jo Handelsman, co-chair of the PCAST STEM Undergraduate Education Working Group and Frederick Phineas Rose Professor of Molecular, Cellular and Developmental Biology, Yale University, will focus on course redesign to induce active engagement. Freeman Hrabowski III, president of the University of Maryland, Baltimore County, will discuss the Meyerhoff Scholars Program, a multidimensional initiative that integrates numerous interventions.

**The U.S. STEM Undergraduate Model:
Applying System Dynamics to Help Meet President Obama's Goal for One Million STEM
Graduates and Navy Needs for Robust STEM Skills in the Civilian Workforce**

The United States Navy maintains its technological edge through a dynamic portfolio of scientific research and technology development, a culture of innovation, and the capacity to draw upon diverse ideas and approaches. To sustain this advantage, the Navy must be able to recruit and retain a civilian workforce that is highly skilled in science, technology, engineering, and mathematics (STEM).

BHEF has applied system dynamics modeling techniques as a means to better understand the U.S. STEM challenge. BHEF found, for example, that STEM undergraduate education represents the highest leverage strategy for increasing the number of STEM graduates. Given the Navy's interest in maximizing the impact of its investments in undergraduate STEM education, the Office of Naval Research (ONR) awarded BHEF a grant in 2012 to develop a next-generation U.S. STEM Undergraduate Model that applies system dynamics modeling to show how ONR's investments in high-impact, cutting-edge STEM student retention strategies can have the strongest influence on the Navy's future workforce needs.

BHEF's original U.S. STEM Education Model[®] was developed by systems engineers at the Raytheon Company in collaboration with BHEF staff. Donated to BHEF in 2009, it simulates the impact of various policies and programs on the number of graduates in the STEM disciplines who go on to pursue STEM industry careers. The key insights from this model were two-fold: 1) the highest leverage point for investment in STEM education is at the undergraduate level, and 2) evidence-based intervention strategies, applied at the undergraduate level, can have a significant effect on the graduation rates and trajectory of the STEM workforce.

As part of its 2012 award, BHEF developed the U.S. STEM Undergraduate Model, which focuses on the undergraduate portion of the pipeline and directly ties the model to undergraduate STEM retention and graduation, in alignment with the ONR STEM2Stern priorities and the PCAST goal of one million STEM graduates by 2020. The U.S. STEM Undergraduate Model retains components of the original but adds significant depth in its abilities to: 1) simulate interventions that can improve STEM college graduation outcomes, and 2) enables users to run simulations of various investments and how they might affect students as they move through STEM undergraduate programs.

The newly released report shows how insights gained from system dynamics modeling can help inform the Navy's strategy to grow a robust civilian workforce that is strongly invested with Navy-relevant STEM skills and ready to contribute to the next generation of Naval innovation. This work positions the Navy to serve a strong national leadership role in advancing President Obama's goals in STEM education precisely while it enhances Naval STEM capacity. That powerful synergy is doing much to advance important improvements in the shaping and execution of the STEM undergraduate education pathway.

Connecting BHEF's Work with National Policy: The Cyber Intelligence Sharing and Protection Act (CISPA)

This session will explore key issues that have emerged in the advancement of the Cyber Intelligence Sharing and Protection Act (CISPA), the first legislation introduced in Congress to address issues surrounding cyber threats and national cybersecurity. Panelists will discuss the national debate over CISPA among Congress, the administration, the private sector, advocacy groups, and other stakeholders, reflecting the significant challenge of balancing national security and privacy in the development of cybersecurity public policy. Given the bipartisan support for CISPA in the House, panelists will examine the future of the bill and the potential for cybersecurity legislation that extends beyond CISPA, including national investment in the development of the cybersecurity workforce.

An amendment to the National Security Act of 1947, which lacks any provisions related to cyber threats and security, CISPA expands the coverage of the act to include cybercrime, defines the nature of cyber threat intelligence, and includes provisions for the sharing of information regarding computer security threats between government agencies and technology and manufacturing companies. According to the Library of Congress's public legislation tracking system: "CISPA requires the Director of National Intelligence (DNI) to: (1) establish procedures to allow intelligence community elements to share cyber threat intelligence with private-sector entities and utilities, and (2) encourage the sharing of such intelligence."

Further: "(CISPA) allows the federal government to use shared cyber threat information: (1) for cybersecurity purposes to ensure the integrity, confidentiality, availability, or safeguarding of a system or network; (2) for the investigation of cybersecurity crimes; (3) for the protection of individuals from the danger of death or serious bodily harm and the prosecution of crimes involving such dangers (including the protection of minors from child pornography, sexual exploitation, kidnapping, and trafficking); or (4) to protect U.S. national security. (The bill) prohibits the federal government from affirmatively searching such information for any other purpose."

Versions of the bill have been presented to Congress since 2011, when it was introduced by Congressman Mike Rogers (R-MI), Chair of the House Permanent Select Committee on Intelligence, and 111 co-sponsors. After the Senate failed to pass the bill, it was reintroduced to the House in 2013 under the co-sponsorship of Congressman Rogers and Congressman Dutch Ruppersberger (D-MD) and was passed in April 2013 with significant bipartisan support. CISPA has undergone several amendments, mostly intended to address criticism of the bill as having the

potential to compromise individual privacy in the sharing of information between companies and government agencies. The bill is now with the Senate, where members have expressed doubt about its future passage, particularly in light of unease within the administration regarding the privacy provisions. (A legislative history of CISPA is included below.)

Proponents of the bill point to the need for laws and national policy to address the rapidly escalating cyber threats posed to all sectors of American society. They cite the numerous cyber attacks against the private and public sectors, and the growing danger of state-sponsored cyber crime and terrorism. CISPA's critics have expressed concern that the bill is too expansive in its reach and brings with it potential compromises to privacy in the sharing of information between companies and government agencies without adequate civilian oversight.

Regardless of outcome, the bill's development in the House has reflected bipartisan support for effective cyber legislation. As the nation grapples with fundamental issues of national security and privacy, cyber threats continue to grow as does the need to increase public awareness of cybersecurity and to build the kind of capable, agile workforce equipped to address cyber threats. Several of BHEF's member companies are major employers of "cyber warriors," while others are in the business of building the nation's infrastructure or supplying its energy, food, or financial services needs, all of which require "cyber enabled" professionals who possess an understanding of cybersecurity as it pertains to their fields.

BHEF's members, well aware of the emerging workforce needs in cybersecurity, are developing academic programs to build the human capital needed for the cyber workforce of the future. A group of BHEF business and higher education members is now engaged in planning or launching unique new projects aimed at aligning emerging workforce needs in cybersecurity with the knowledge, skills, and competencies imparted to undergraduates. BHEF has brought these projects together in regional and national networks to share learning, better understand industry and government demands, and engage federal agencies and additional stakeholders. These networks provide test laboratories for addressing key cyber workforce policy issues—such as accelerating the clearance process for students to enable them to take on cyber internships early in their academic careers—and could serve as proof points to be adopted nationally.

Cybersecurity Intelligence Sharing and Protection Act Legislative History

November 30, 2011: Introduced in the House as H.R. 3523 by Congressman Mike Rogers (R-MI), Chair of the House Select Committee on Intelligence, and 111 co-sponsors.

April 26, 2012: Passed in the House but failed in Senate in the same session.

February 12, 2013: Reintroduced in the House as H.R. 624 by Congressman Rogers and Congressman Dutch Ruppersberger (D-MD).

April 18, 2013: Bill passed in the House of Representatives.

Present: Bill under review by the Senate.

PLENARY II LEARNING SESSION



What BHEF Regional Projects Can Learn from Successful Innovation and Commercialization Networks

The relentless drive by global companies to innovate is the hallmark of the 21st century. Companies and regions have exploited the virtuous cycle of innovation, beginning with basic and applied research funded by government and corporations, leading to new products, services, and jobs. Regions that possess a critical mass of research universities, national labs and research facilities, and key industry sectors have demonstrated how these ecosystems of scientific, technological, financial, and human capital and commercial resources can be harnessed in the service of innovation and economic growth. These regions include the Boston/Rte. 128 corridor, the Research Triangle, and Silicon Valley, to name a few. These “innovation clusters” have excelled at refining the interaction points among government, universities, and companies to advance science, technology, innovation, and commercialization in areas of regional comparative advantage.

While many states and regions have succeeded in creating sectoral clusters, particularly in technology, biotech, and advanced manufacturing, many have failed as a result of a common set of challenges, including:

- Inability to produce or attract technical and entrepreneurial talent;
- Failure to effectively use a region’s assets, including government, corporate, and university labs;
- Inadequate early-stage funding for commercializing discoveries; and
- Lack of complementary activities that companies can call upon to support innovation.

Several recent studies document the inadequacy of the talent supply chain. For example, a McKinsey report, *Big Data: The Next Frontier for Innovation*, indicates that U.S. demand for employees with data science and analytics training will soon outstrip supply by nearly 200,000 data scientists and 1.5 million “analytics-enabled” managers, in turn jeopardizing innovation in U.S. companies. Similar challenges exist across these emerging fields that are critical to the next wave of innovation.

The BHEF Higher Education Workforce Initiative promotes strategic engagement by BHEF’s business and academic leaders to develop unique workforce solutions that address each region’s highest-demand workforce needs. BHEF launched 12 regional projects in June 2012, and subsequent cohorts of projects are planned for launch in 2013 and beyond. Building the talent pipeline in a region’s economic area of comparative advantage is the goal of each project. Many of the projects focus on emerging fields for which neither the innovation ecosystems nor the talent pipelines

exist, particularly at the undergraduate level; this represents a significant opportunity for regional economic growth.

For example, The University System of Maryland-led project focuses on building new undergraduate programs in cybersecurity, reflecting the state's comparative advantage of government, business, and academic cyber resources. Other projects focus on water sciences, engineering, and policy, demonstrating the prominence of water issues in regions such as Wisconsin, where a project is led by the University of Wisconsin, and a three-state region in the Southwest, where a project is jointly led by Colorado State University and the University of Texas at El Paso. Projects in New York City, Ohio, and Kentucky focus on data analytics, with Ohio and Kentucky focusing on health analytics, reflecting the strength of that industry in those states.

These regions' comparative advantages in a variety of emerging fields also present opportunities for developing commercialization networks that can accelerate innovation and economic growth. The learning session will explore lessons that can be taken from the records of successful state and regional networks. Richard Bendis, president and CEO of BioHealth Innovation, Inc., Maryland's commercialization collaborative, and W. Mark Crowell, executive director of U.Va. Innovation, will discuss critical network ingredients and their successes in spurring innovation and commercialization.

BioHealth Innovation

BioHealth Innovation, Inc. (BHI), based in central Maryland, is a regional innovation intermediary that accelerates and facilitates technology transfer and commercialization of market-relevant research in federal labs, universities, and biohealth companies. It is a private-public partnership in the form of a 501(c)(3) nonprofit that connects the region's innovation assets to provide integrated technical knowledge, financial means, and entrepreneurial/managerial expertise to turn promise into prosperity for the region while advancing human health.

BHI will accomplish its mission by building an entrepreneurial ecosystem, working directly with federal and academic technology transfer offices, making various types of risk capital readily available to promising biohealth startups, strengthening and connecting the local supply of industry talent, developing a regional brand and reputation, and advocating for improved business and regulatory conditions in the industry.

NEW MEMBER BIOGRAPHIES



JORGE L. BENITEZ

CHIEF EXECUTIVE UNITED STATES AND SENIOR MANAGING DIRECTOR
NORTH AMERICA ACCENTURE

Jorge L. Benitez is Accenture's chief executive of the United States and senior managing director of North America. He has primary responsibility for Accenture's business and operations in North America, including developing and executing the company's business strategy and driving its growth in the region.

Most recently, Mr. Benitez served as the chief operating officer for Products, the largest of Accenture's five operating groups. In that role, which he held for five years, he led Accenture's global business across a wide set of consumer-relevant industry groups, including: Automotive; Air, Freight & Travel Services; Consumer Goods & Services; Industrial Equipment; Infrastructure & Transportation Services; Life Sciences; and Retail. He has also served as the relationship lead for one of Accenture's largest Products clients.

Mr. Benitez's success in business and his contributions to the broader community have been recognized on a number of occasions. Hispanic Business Magazine recently named him to its "2011 Top 25 Corporate Elite" list and, in 2004, selected him as one of the 100 most influential Hispanics in the United States. He was also selected to the PODER Top 100 Influential Hispanics in 2011.

Mr. Benitez is a member of Business Roundtable, on the Board of the United States Chamber of Commerce, and is a member of Chief Executive 50. He is on the National Board of the Leukemia and Lymphoma Society, a cause about which he feels personally passionate. Mr. Benitez is a member of the Accenture Diversity Council, has led Accenture's Minority Mentoring Program, served as Accenture's Global People Advocate, and was a member of the Accenture Foundation Board. Jorge is deeply involved in supporting STEM education and training through his service on the Education and Workforce Committee on the Business Roundtable, and as a board member of Change the Equation. Additionally, he is a Board member of The Business-Higher Education Forum.

Mr. Benitez graduated from the University of Florida with a degree in accounting. He and his wife, an accomplished engineer, live in Miami with their three children.

SONDRA L. BARBOUR

EXECUTIVE VICE PRESIDENT, INFORMATION SYSTEMS & GLOBAL SOLUTIONS
LOCKHEED MARTIN CORPORATION

Sondra Barbour is Executive Vice President of Lockheed Martin's Information Systems & Global Solutions (IS&GS) business area and an officer of the Lockheed Martin Corporation. Under her leadership, IS&GS employs 28,000 experienced professionals, who provide integrated information technology solutions, systems and services to support civil, defense, intelligence and other government customers globally. One of five business areas within Lockheed Martin, IS&GS is headquartered in Gaithersburg, Maryland, and operates in all 50 U.S. states and 20 countries around the world. It generated \$8.8 billion in sales in 2012.

Most recently, Ms. Barbour was the Senior Vice President of the Enterprise Business Services organization and the corporation's Chief Information Officer. In this role, she was responsible for all internal information technology operations, including protecting the company's infrastructure and information from cyber threats. In previous roles, she led the company's Shared Services and Internal Audit organizations that provided knowledge and oversight of supply chain activities, internal controls, risk management and more.

Ms. Barbour spent more than 20 years working at a predecessor of IS&GS, including serving as Chief Information Officer and Vice President of Operations for Lockheed Martin Integrated Systems & Solutions. In this role, she was responsible for the Information Technology, Facilities, Supply Chain, Technical Publications, and Environment, Health & Safety operations. Her career includes extensive leadership and technology experience, notably in the design and development of large-scale information systems.

Ms. Barbour holds a bachelor's degree from Temple University in Computer Science and Accounting.

STEVEN KNAPP, PH.D.

PRESIDENT

GEORGE WASHINGTON UNIVERSITY

Steven Knapp became the sixteenth president of the George Washington University in August 2007. His priorities include enhancing the university's partnerships with neighboring institutions, expanding the scope of its research, strengthening its worldwide community of alumni, enlarging its students' opportunities for public service, and leading its transformation into a model of urban sustainability.

Dr. Knapp serves on the boards of directors of the Economic Club of Washington; the Greater Washington Urban League; the World Affairs Council - Washington, D.C.; and the National Symphony Orchestra and the boards of trustees of the Washington National Cathedral Foundation and Al Akhawayan University in Ifrane, Morocco. He also serves on the senior advisory board of the Northern Virginia Technology Council, the executive committee of the Council on Competitiveness, and the education committee of the Federal City Council.

A specialist in Romanticism, literary theory, and the relation of literature to philosophy and religion, Dr. Knapp taught English literature at the University of California, Berkeley before serving as dean of arts and sciences and then provost of the Johns Hopkins University. He is a fellow of the American Academy of Arts and Sciences, a member of the Council on Foreign Relations, and a member of the Modern Language Association. He earned his doctorate and master's degrees from Cornell University and his Bachelor of Arts degree from Yale University.

MICHAEL V. MARTIN, PH.D.

CHANCELLOR
COLORADO STATE UNIVERSITY SYSTEM

Michael V. Martin was named chancellor of the Colorado State University System in May 2012. Based in Denver, the chancellor is the chief executive officer of the CSU System, responsible for working with the Board of Governors to lead the system's operations, set legislative strategy, serve as the primary spokesperson, increase engagement among alumni, donors and the business community.

Prior to joining the CSU System, Dr. Martin served four years as campus chancellor of Louisiana State University and A&M College. Before serving at LSU, he was president of New Mexico State University.

Before arriving at NMSU in 2004, Dr. Martin served for six years as vice president for agriculture and natural resources at the University of Florida, leading the university's Institute of Food and Agricultural Sciences with more than 3,000 employees statewide. He was elevated to senior vice president of the University of Florida shortly before being selected as NMSU's president. Previously, he was vice president for agricultural policy and the dean of the College of Agricultural, Food and Environmental Sciences at the University of Minnesota. He began his academic career at Oregon State University as a faculty member in the Department of Agricultural and Resource Economics.

An academic leader dedicated to the land-grant mission of teaching, research, and extension service, Dr. Martin is recognized as a strong voice for education and the agriculture industry. In 2007, he received the Justin Smith Morrill Memorial Award, named after the author of the bill creating land-grant universities, which honors outstanding service on behalf of the land-grant mission. Only six individuals have been designated to receive this award since it was first given in 1980. For his leadership in improving the quality of life for New Mexico citizens and future generations, he was awarded the 2008 Distinguished Leadership Award by Leadership New Mexico.

Other recent awards include his recognition as a powerbroker by The New Mexico Business Weekly in 2006, being named Outstanding Alumnus of Minnesota State University Mankato in 2006, and receiving the NMSU Social Justice Award in 2005.

Dr. Martin's professional and community service organizations include the Farm Foundation's Bennett Agricultural Round Table, the National Agricultural Biotechnology Council, and the Florida Agricultural Resource Mobilization Foundation. He is a member of the American Economic Association, the American Agricultural Economics Association, the International Association of Agricultural Economics, the International Agricultural Trade Research Consortium, Sigma XI Scientific Research Society, and the Economic History Association.

An active scholar, Dr. Martin has authored numerous book chapters and articles for academic journals, trade publications, and the popular press and recently published pieces for The Chronicle of Higher Education and University Business.

Some of his philosophy is summed up in the following quote: "It is the tradition of land-grant universities to be non-traditional," written as part of a 2001 article titled "The Land-Grant University in the 21st Century," published in the Journal of Agricultural and Applied Economics. He traced the history of the land-grant movement from the

mid-1800s and concluded that “the fundamental land-grant principles of accessibility, practical as well as classical education, research and discovery in the public interest, and connectedness to all the people remain powerful and profound.”

A native of Crosby, Minn., Dr. Martin earned a bachelor’s degree in business and economics and a master’s degree in economics at Mankato State College (Minnesota State University) in Minnesota. He received his Ph.D. in applied economics from the University of Minnesota in 1977. His areas of specialization are prices, international trade, public policy, transportation and business logistics.

Dr. Martin and his wife, Jan, have two children, both adopted from South Korea. Amanda, a graduate of the University of Wisconsin-Eau Claire, is a graphic artist in Saint Paul, Minn. Sam, who holds a bachelor’s degree from the University of Minnesota and a master’s from Sarah Lawrence College, is a genetics counselor at Beth Israel Hospital in New York City.

CHARLES STEGER, PH.D.

PRESIDENT
VIRGINIA TECH

Now in his fourteenth year as President of Virginia Tech, Dr. Charles Steger is pursuing the course he laid out to establish Virginia Tech among the nation's premier research institutions. Steger has provided visionary leadership in the creation and implementation of a bold vision and strategic plan, with a demand for quality across all aspects of the academic enterprise. Among the highlights of his presidency to date are the university's adoption of A Plan for a New Horizon: Envisioning Virginia Tech 2012-2018; the Principles of Community (2005); and the Virginia Tech Climate Action Commitment (2009); and the fulfillment of Virginia Tech's 50-year-old dream to join the Atlantic Coast Conference (2003).

One of the most exciting new initiatives to become reality was the completion of the new 144,000-square-foot Virginia Tech Research Center-Arlington (VTRC-A) in 2011 to enhance the university's presence in the National Capital Region and ability to compete for major research grants and contracts. In addition, the Virginia Tech Carilion Research Institute is fully operational in a new 152,000-square-foot building in Roanoke. VTCRI is now the hub for the world-wide interactive functional brain imaging network.

Another initiative on the horizon is the new Center for the Arts that will open in the fall of 2013. This 130,000-square-foot facility will feature a 1,300-seat performance hall, visual art galleries, and innovative creative technology lab spaces. At the intersection of North Main Street and Alumni Mall, its location symbolizes the university's commitment to the arts and its importance to the university and the broader community.

Since Steger became president, the university has added over 2.4 million square feet of space, mostly in new construction. This surpasses all growth that occurred over the entire period between 1872 and 1960.

During his tenure, the university's annual research expenditures have increased more than 300 percent, now topping \$450 million. According to the National Science Foundation (NSF), Virginia Tech is the only Virginia university to rank in the top 50 out of 679 universities in the nation in sponsored research. Shortly after Steger took office, the university launched the Virginia Bioinformatics Institute, which has already secured well over \$100 million in external research funding. Virginia Tech has also partnered with a number of other universities to further leverage its research strengths and resources, including Johns Hopkins University, Wake Forest University, the University of Virginia, the University of Maryland, and Georgetown University. Concurrent with the expanding research agenda, the university has expanded its outreach efforts like never before. For example, Virginia Tech has partnered in numerous initiatives in Southside Virginia, including the renowned Institute for Advanced Learning and Research (IALR), which are advancing both educational and economic development opportunities.

A hallmark of Steger's administration is his commitment to the students. With his leadership, the university has reaffirmed its core mission of undergraduate education. The university is dedicated to fostering a research-intensive environment that offers students an opportunity to learn the scientific process while enhancing

their critical-thinking skills. Recognizing that graduates will be entering a global economy, Virginia Tech initiated a comprehensive International Strategic Plan and has doubled the number of students participating in international education opportunities.

In 2010, Steger was selected as a recipient of the Michael P. Malone International Leadership Award, sponsored by the Association of Public and Land-grant Universities. During his presidency, five international centers have been established around the globe, and another is being developed in India.

Another of the most notable contributions of Steger's administration is the role he played in the Higher Education Restructuring Act, which took effect in July 2006. Steger was one of the leaders among university presidents to help define a ground-breaking new relationship between the commonwealth of Virginia and its colleges and universities, which enables greater institutional flexibility and potential for growth. This legislation was intended to enable Virginia Tech to perform long-range planning, ensure a stable and predictable revenue stream, and ultimately ensure a quality education for its students.

In 2011, the university successfully completed an aggressive fundraising campaign to "Invent the Future," surpassing the \$1 billion goal by more than \$100 million. These funds provide the university with a margin of excellence for its academic agenda.

Steger was elected as a Fellow in the American Institute of Architects (AIA) in 1990 and holds the William C. Noland Award (2001) and the Distinguished Achievement Award (1996) from the Virginia Society AIA. The New Century Technology Council awarded him its 2004 Compass Award for visionary thinking and leadership in the field of information technology, and the National Conference for Community and Justice awarded him the 2002 NCCJ Humanitarian Award.

Credited with calm leadership during a very difficult period, President Steger led the university through an extended recovery in the aftermath of the April 2007 tragedy. In 2009, President Steger received the Chief Executive Leadership Award from the Council for the Advancement and Support of Education (CASE) District I II for outstanding leadership and service in support of education.

Steger received his Bachelor of Architecture degree, Master of Architecture degree, and Ph.D. in Environmental Science and Engineering from Virginia Tech. His passion for teaching led him to leave a career in the private sector as a professional architect and planner to return to Virginia Tech to teach in the College of Architecture and Urban Studies (CAUS), where he won two teaching excellence awards and authored a portion of a textbook that has been adopted by 230 universities and is now in its 7th edition. When he became Dean in 1981 at the age of 33, he was the youngest architecture dean in the nation. After 12 years in that role, he was appointed Vice President for Development and University Relations (1993-2000) before being named President in 2000.

PETER WEINBERG

PARTNER

PERELLA WEINBERG PARTNERS

Mr. Weinberg started his career at Morgan Stanley after completing his MBA at Harvard Business School and spent the bulk of his career at Goldman Sachs. At Goldman, he became a partner in 1992 and co-headed the Global Investment Banking Division before becoming the Chief Executive Officer of Goldman Sachs International, residing in London. He was on the firm's Management Committee, headed the European Management Committee and co-headed the Partnership Committee. In 2006, he and Joe Perella started Perella Weinberg Partners, a boutique advisory and asset management firm that now has a well-established M&A brand, over 400 people and \$9 billion of assets under management.

Mr. Weinberg founded a co-ed boarding school in the Middle East called Kings Academy. He and his wife Debby have recently started the Weinberg Cerebral Palsy Center at Columbia University. He also serves on the board of overseers of the Columbia Medical School, the Memorial Sloan Kettering Cancer Center and several other charities.

TIMOTHY P. WHITE

CHANCELLOR
THE CALIFORNIA STATE UNIVERSITY

The Chancellor of the California State University is the chief executive officer of the country's largest senior system of public higher education. He provides leadership to 44,000 faculty and staff and 427,000 students on 23 campuses and seven off-campus centers. The CSU, which spans the entire state of California, has an annual budget of more than \$5 billion.

The California State University currently offers approximately 1,233 bachelor's degree programs, 783 master's programs, and 29 joint doctoral programs in 319 areas. CSU prepares the majority of the state's new public school teachers and 10 percent of the nation's K-12 instructors. Each year, nearly as many people graduate with bachelor's degrees from the CSU as from all other universities and colleges in the state combined.

Timothy P. White, the seventh chancellor of the California State University system, formerly served as the chancellor of UC Riverside and saw the campus grow to more than 21,000 students for the first time in its history. He was also Professor of Biology and of Biomedical Sciences. Soon after his appointment at UCR, he formed a committee of several hundred faculty, staff and community members to forge an innovative strategic plan, UCR 2020. This plan guided UCR's next stage of development as a major player among first-rate research institutions. He also implemented the foundation of a UCR School of Medicine by hiring the school's first dean and obtaining start-up resources.

White came to UC Riverside in 2008 after serving as the University of Idaho's president from 2004-2008. Through his leadership, the University of Idaho established a vision and strategic direction to further the University's role as the state's land-grant and flagship research university.

White served Oregon State University from 1996-2004 as a dean, the provost and executive vice president, and with an interim appointment as president. He previously held positions as professor and chair of the Department of Human Biodynamics at the University of California, Berkeley (1991-96), and as professor and chair of the Department of Movement Science and research scientist in the Institute of Gerontology at the University of Michigan.

White is a product of California's Master Plan, having pursued his higher education from Diablo Valley Community College, Fresno State, California State University East Bay (nee Hayward), and his Ph.D. from the University of California, Berkeley. He spent two years as a post-doctoral scholar in physiology at the University of Michigan before starting his academic career at Ann Arbor in 1978. He is internationally recognized for his research in muscle plasticity, injury and aging.

White was born in Argentina. He and his parents immigrated to Canada and then to California when he was young. White is a first-generation college graduate. He is married to Karen White and has four sons.