Europe and the U.S. have higher wages than in many other economies in the world. If they are to compete in manufacturing in the global market, then they need to be more innovative and efficient—by remaking manufacturing—something especially important to SME’s. Leading MIT researchers will present their insights on the most critical problems, and the potential of new movements like Big Data, Collaborative Innovation Networks, Printed Machines, and Robotic Assistants that are remaking manufacturing.

Day 1

8:00 AM Registration

9:00 AM Welcome and Introduction
Randall Wright
Karl F. Koster
Walter Koren
Karlheinz Töchterle

9:30 AM Global Innovation and Entrepreneurship: The New Austrian Competitiveness Challenge
Scott Stern
To sustain its prosperity, Austria must upgrade its capacity for global innovation and entrepreneurship. While many Austrian companies have prospered through integration with Europe and leveraging opportunities in Eastern Europe, a fundamental challenge for Austrian companies going forward is to develop the ability to develop and commercialize innovations at the global frontier. Building on an assessment of the main challenges for Austrian competitiveness, this interactive lecture will identify the investments and choices that Austrian companies must embrace in order to compete through innovation on a global basis. To ensure long-term sustainability and prosperity, global innovation and entrepreneurship must be at the heart of the Austrian competitiveness agenda.

10:15 AM Production in the Innovation Economy
Suzanne Berger
Do countries that are strong in innovation need manufacturing in order to gain the returns on their innovative capabilities? Twenty MIT faculty in the Production in the Innovation Economy Commission have carried out research on this question over the past two years. Their analysis in Making in America: From Innovation to Market (MIT Press, Fall, 2013) traces how innovations are commercialized in high tech startups, Main Street small and medium-sized manufacturers, and in a sample of German and Chinese firms. The research has identified advanced manufacturing
technologies that have potential for accelerating the passage of innovation into the market and considered ways of getting those new technologies into use in the economy.

11:00 AM  Break

11:30 AM  Misunderstanding Human Capital: Rethinking Innovation Strategy  
*Michael Schrage*

Do we fundamentally misunderstand and/or undervalue the role of human capital in innovation and innovation in human capital? Perhaps innovation's real impact comes less from adding new value to products and services than making customers and clients more valuable. What happens to traditional business and marketing models when we see innovation as an investment in the human capital, and competences of our customers and clients? Digital innovation transforms the economics of these investments.

Based on his Harvard Business School ebook 'Who Do You Want Your Customers To Become?,' MIT Center for Digital Business Fellow Michael Schrage will argue that innovators, economists and entrepreneurs to fundamentally rethink 'innovation' as a medium for value creation and growth. Successful innovators don't just 'meet customer needs' and/or 'solve client problems;' they transform customer capabilities.

12:15 PM  Future Manufacturing Paradigms: Printed Electronics and Synthetic Biology  
*Joseph Jacobson*

From biological machines that may one day be used to perform computation, assemble computer components, or become part of computer hardware or circuitry—to radio-controlled biology that may hook tiny antennae into living systems to turn genes on and off—to hydrothermal synthesis to produce complete electronic devices without expensive semiconductor manufacturing processes and facilities, Joseph Jacobson, head of the Media Lab's Molecular Machines research group, is working to reinvent microelectronics with processes to directly and continuously print communication, computation, and displays onto almost any substrate.

1:00 PM  Lunch and Startup Exhibit

- Infinite Corridor Technology (ICT)
- GAMED Gesellschaft für Angewandte Mathematik und EDV mbH
- Compacfoam GmbH
- ecoduna produktions-GmbH
- FerRobotics Compliant Robot Technology GmbH
- EEN (Enterprise Europe Network)
- FFG (The Austrian Research Promotion Agency)
- AWS (Austria Wirtschafts Service GmbH)

2:30 PM  Instrumentation Manufacturing  
*Ian Hunter*
Recent advances in the miniaturization of instrumentation such as mass spectrometers, gas liquid chromatographs, Raman spectrometers, nonlinear dynamic mechanical analyzers, electrical impedance analyzers, and quantum coherence spectrometers will lead to changes in the way that manufacturing processes are implemented. Prior to this level of miniaturization, it has been common to take samples from a manufacturing process to a test and measurement laboratory for analysis. With the advent of miniaturized instrumentation, it will be possible to take the instrument to the specimen instead of the specimen to the instrument. In this talk I will present the work we have been doing to miniaturize all the above mentioned instruments and furthermore overview the manufacturing techniques used to create these instruments which had led to dramatic reductions in their manufacturing costs.

3:15 PM Manufacturing in Austria - Actual Movements within Adritz AG
Markus Maier
The ANDRITZ GROUP is an international technology corporation and globally a leading supplier of plants, equipment and services for hydropower stations, the pulp and paper industry, the steel industry and solid/liquid separation in municipal and industrial sectors.
Manufacturing within the Andritz Group – especially in Austria – has been affected by market forces and internal factors e.g. development and structure of manufacturing locations through worldwide acquisitions.
There is one common result gained from both of these issues when competing on the global market out of high wage countries:
It’s not enough to keep an eye on operative issues (Quality – Time - Costs) but it necessitates the development of know-how and innovation.

4:00 PM Break

4:30 PM Robotic Assistants to Humans in the Factory
Julie Shah
Recent advances in computation, sensing, and hardware enable robotics to perform an increasing percentage of traditionally manual tasks. Yet, often the assembly mechanic cannot be removed entirely from the process. This provides new economic motivation to explore opportunities where assembly mechanics and industrial robots may work in close physical collaboration. To harness the relative strengths of humans and robots, we must develop robots that seamlessly integrate with human group dynamics. Although there are numerous studies on human teamwork and coordination in high-intensity domains, very little prior work exists on applying these models to human-robot interaction. In this talk, I describe ongoing work aimed at translating qualitative insights from human factors engineering into quantitative, predictive models that improve human-robot teamwork. I discuss two key challenges: learning team fluency through experience and practice of repetitive tasks, and pre-planning for team coordination in novel tasks.

5:15 PM TRUMPF - Winner Innovation Award Austria 2012
Armin Rau
TRUMPF Machines Austria is the technology leader in sheetmetal machine tools and automation systems for bending. The machine tools and systems where built in Austria on flowlines with state of the art manufacturing principles – Company of the Year 2011 in Austria. TRUMPF Machines Austria was also the winner of the Austrian Innovation Award 2012 with a high productive robotized Bending Cell which can even handle small lots. Innovation and world class manufacturing are the keys to success.

6:30 PM  Networking Reception and Dinner @Hofburg Imperial Palace  
Hans Jörg Schelling
Staying Power: Six Enduring Principles for Managing Strategy & Innovation in an Uncertain World

Michael Cusumano

This is an overview of Professor Cusumano’s latest book, Staying Power (paperback 2012, Oxford University Press). It was named one of the top books of 2011 by Strategy + Business magazine and has been translated into Japanese, Italian, Korean, and Chinese.

The focus of the book is on basic principles important to address the challenge of simultaneous innovation and commoditization in many industries. The underlying ideas come from Professor Cusumano’s research over the past 30 years on the automobile, software, internet services, and consumer electronics industries, and have been studied extensively by management researchers. The six principles, and their counterparts, are: (1) platforms, not just products; (2) services, not just products (or platforms); (3) capabilities, not just strategy; (4) pull, don’t just push; (5) scope, not just scale; and (6) flexibility, not just efficiency. The first two principles are a new way of looking at strategy, innovation, and business models for the product firm. The last four principles deal with firm “agility” or the ability to anticipate and react quickly and flexibility to change. Professor Cusumano positions principle idea against other concepts frequently associated with “best practices” and competitive advantage but which he believes are less valuable than they seem.
competitors worldwide—all are working to create the next great feature or design. As a result, business is constantly evolving and rapidly moving. He argues the transition of systems to complex and dynamic characterizes most industries today, and it requires major changes in management. Unless executives have a methodical system of design, operation, and improvement, complexity will overwhelm any advantage gained through new technology. But, with an effective system, enormous competitive advantage can be garnered.

10:45 AM Break

11:15 AM Collaborative Innovation Networks
Peter Gloor
Every disruptive innovation is not the result of a lone inventor, but of a small group of likeminded individuals, working together in close collaboration to get their cool idea off the ground. This talk introduces the concept of swarm creativity, where a small team of innovators – the Collaborative Innovation Network (COIN) - empowered by the collaborative technologies of the Internet and social media, turns their creative labor of love into a product that changes the way how we think, work, or spend our day. The talk also introduces the concept of coolhunting, finding new trends by finding the trendsetters, and coolfarming, helping the trendsetters getting their idea over the tipping point. The ideas of swarm creativity borrow heavily from the bees, where self-organizing individuals work together for the good of the hive.

12:00 PM Lessons from MEDRC
Brian Anthony
The vision of MEDRC (Medical Electronic Device Realization Center) is to transform the medical electronic device industries: to revolutionize medical diagnostics and treatments, bringing health care directly to the individual; and to create enabling technology for the future information-driven healthcare system. Specific areas that show promise are wearable or minimally invasive monitoring devices, medical imaging, laboratory instrumentation, and the data communication from these devices and instruments to healthcare providers and caregivers. MEDRC establishes partnerships among the microelectronics industry, the medical devices industry, medical professionals, and MIT to collaboratively achieve improvements in the cost and performance of medical electronic devices similar to those that have occurred in personal computers, communication devices and consumer electronics. The successful realization of such a vision also demands innovations in the usability and productivity of medical devices, and new technologies and approaches to manufacture devices. We will explore examples in ultrasound imaging and ambulatory physiological monitoring.

12:45 PM Wrap Up & Adjournment
Christian Kesberg

NOTE: All schedule and speakers are subject to change without notice.