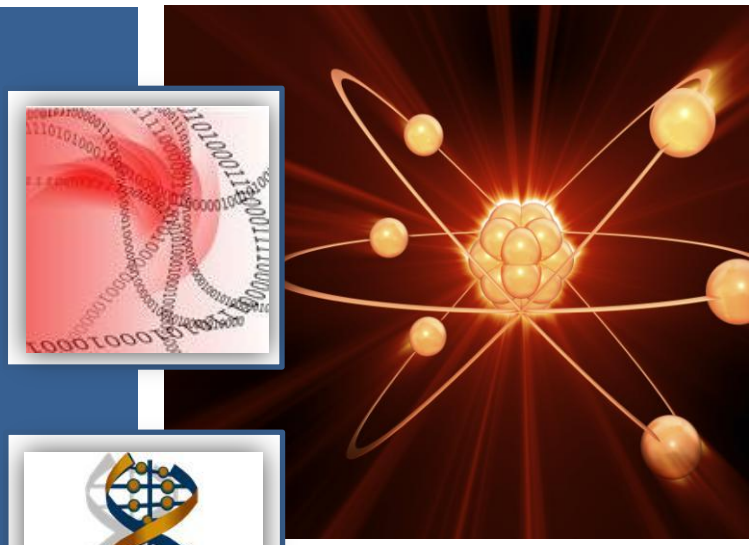
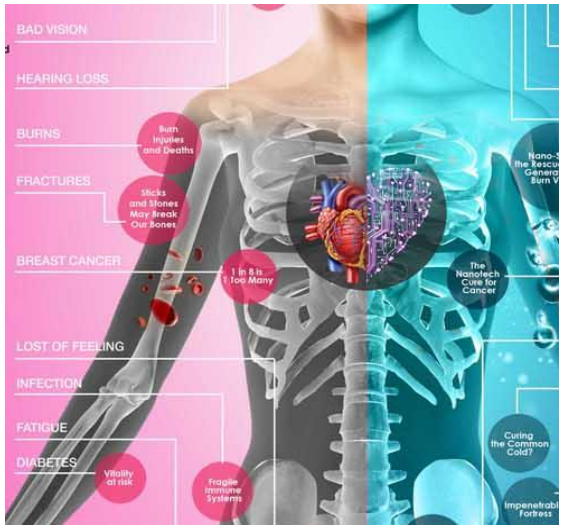
Manufacturing 2.0





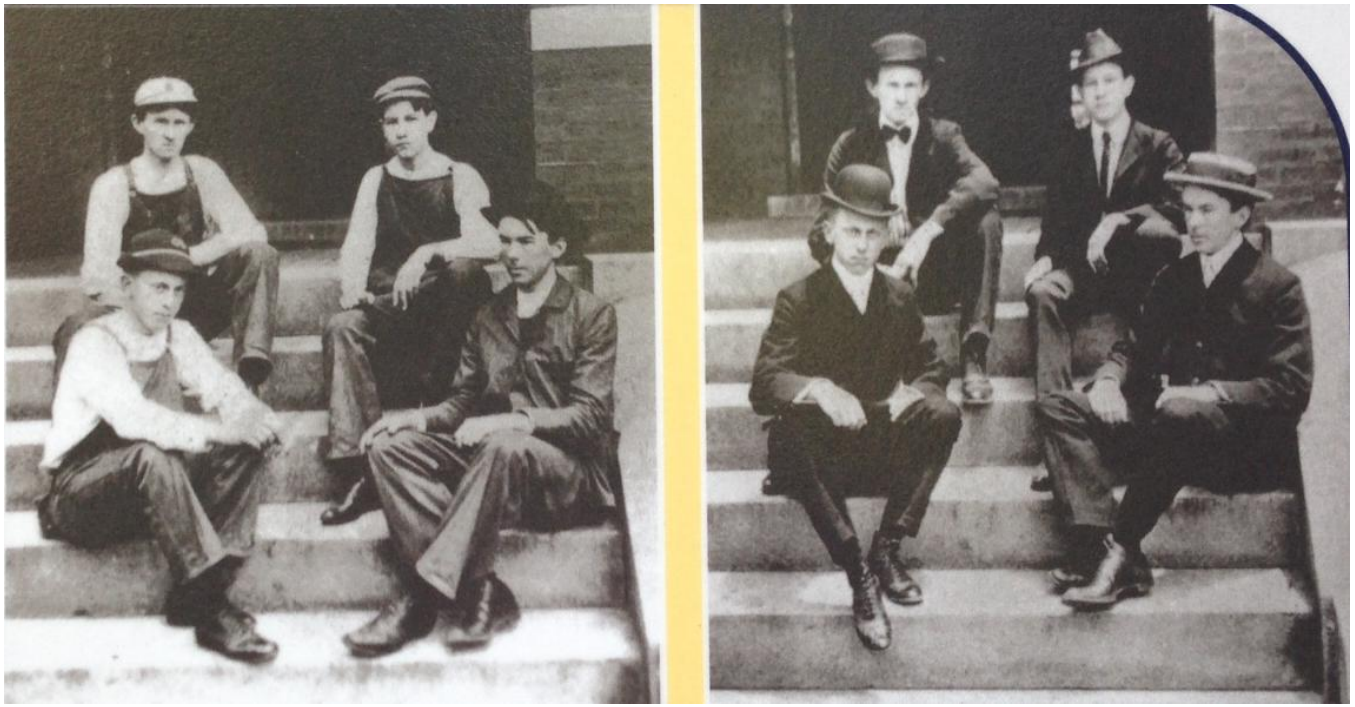
Ben Wang

Outline

- GT & GTMI
- Why Mfg Matters
- Advanced Mfg Partnership
- Opportunities for IE&M
- Working with Industry

Georgia Tech Manufacturing Institute catalyzes and accelerates transition of advanced technology from research lab to market

Manufacturing is in GT's DNA



Georgia Tech's Vision

Georgia Tech will define the technological research university of the 21st century.

As a result, we will be leaders in influencing major technological, social, and policy decisions that address critical global challenges.

A Time for Positive Momentum

over the past 5 years:

- **70% increase** in applicants
- Enrollment has increased by **11%**
- **40% increase** in research awards
- Net increase - **70** tenured/tenure-track faculty
- Global, national, and regional impact
- Increasing partnerships
- Expanding the campus infrastructure
- Increasing national visibility

National Leadership

Georgia Tech had the best 30-year return on investment as reported by the *Wall Street Journal* in March.

Clough Commons

Clough Commons

200 events

- Dr. Ellen Ochoa, the first Latina astronaut and deputy director of the Johnson Space Center
- Young Guru, Grammy-Winning Recording Artist
- Bill Gates, Talks@Tech
- "The Internship"
- Clough Art Crawl

Leadership in Research

Discovery-based research is the fuel for our research engine

Interdisciplinary, collaborative

Partner with business, industry, and government

$655M in sponsored expenditures in 2013

Innovation Zone

Evernote lynda.gatech.edu SugarSync My GaTech Workamajig Image Portal 5.0 Dictionary.com Google DIGIT.PUB. WEB PRESENT.

Forbes

New Posts
+10 posts this hour

Most Popular
NFL's Richest Teams

Lists
Top Innovative Companies

Video

Share
Tweet
Share
Submit
+1
0
reddit

12 Business Incubators Changing The World

The Advanced Technology Development Center at Georgia Institute of Technology

Atlanta, GASince 1980 the center has launched more than 120 tech companies that have collectively raised more than $1 billion in outside financing. The center is backed by a fund that will invest $1 in a company for every $3 of private capital, up to $1 million. The companies here are heavy with Georgia Tech alumni, but that's not a requirement.

Ads by Google
Advanced Technology Inst - Train
New Skills
ASE and NATEF Certified
www.auto.edu/
Learn More About ATI
CDL Programs
Military & Vets
HVAC Program

ATDC is one of 12 business incubators changing the world

— *Forbes* magazine

Innovation Zone

ATDC has launched

140 companies,

attracting **$2 billion**

in investment

VentureLab ranked No 2 globally

by University Business Incubator

Campaign Georgia Tech

National Rankings

U.S. News & World Report, *America's Best Engineering Graduate Schools 2012*

1. Massachusetts Institute of Technology
2. Stanford University
3. University of California — Berkeley
4. Georgia Institute of Technology
5. California Institute of Technology (CalTech)
6. University of Illinois — Urbana-Champaign
7. Carnegie Mellon University
8. University of Michigan — Ann Arbor
9. University of Texas — Austin
10. Cornell University

U.S.News & WORLD REPORT

Eighth Year!

http://grad-schools.usnews.rankingsandreviews.com/grad/eng/search

National Rankings

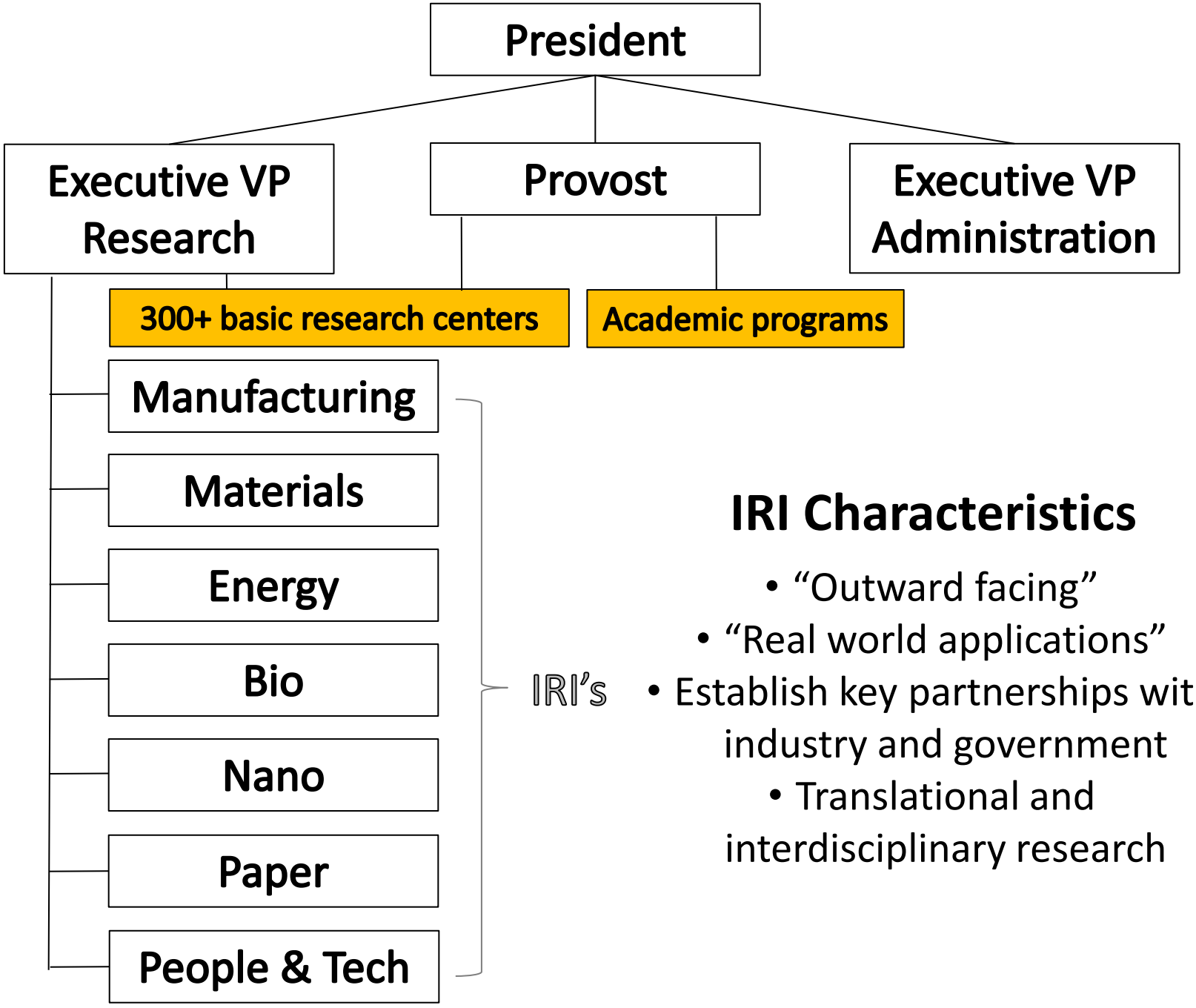
U.S. News & World Report, *America's Best Engineering Graduate Schools 2012*

Strength across the board!

U.S.News & WORLD REPORT

Aerospace	#4		
Biomedical	#2		
Chemical	#10	Industrial	#1
Civil	#3	Materials	#7
Computer	#6	Mechanical	#6
Electrical	#5	Nuclear	#5
Environmental	#6	*Agricultural*	*N/A*

22nd Year!



IRI Characteristics

- "Outward facing"
- "Real world applications"
- Establish key partnerships with industry and government
- Translational and interdisciplinary research

Industrial Design

Precision Machining

Clean Energy Manufacturing

Model-Based Systems Engineering

Factory Information Systems

Public Policy

Robotics

Additive Manufacturing

Sustainable Design & Manufacturing

Supply Chain & Logistics

Nano-Composite Processing

Regenerative Medicine & Stem Cells

Georgia Tech Manufacturing Institute catalyzes and accelerates transition of advanced technology from research lab to market

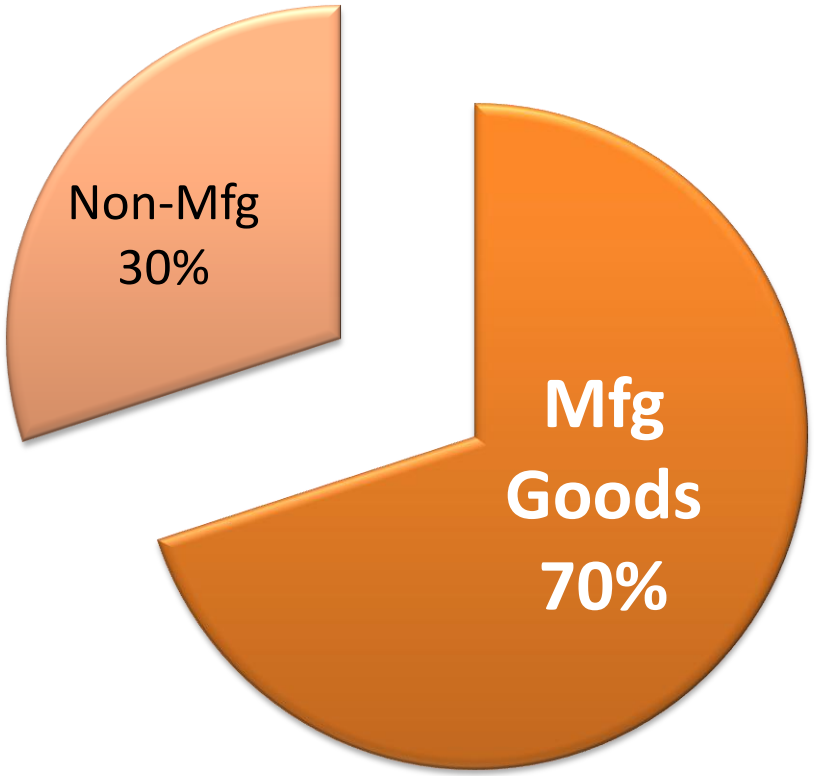
Academia
Georgia Institute
of Technology
Supplier
of the
Year

Why Manufacturing

America as a case study

Wealth Creation

U.S. Exports

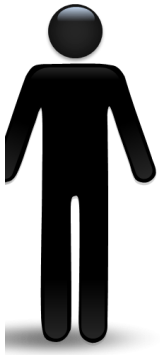


Economic Multiplier Effect

$1 investment In manufacturing

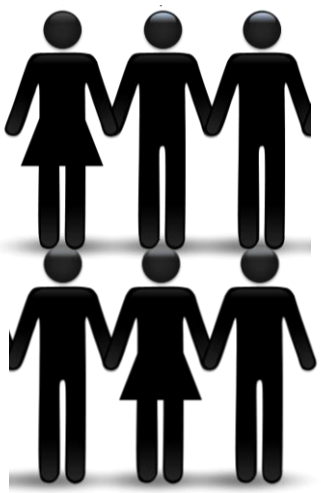
$2.48 economic activity

Job Multiplier Effect



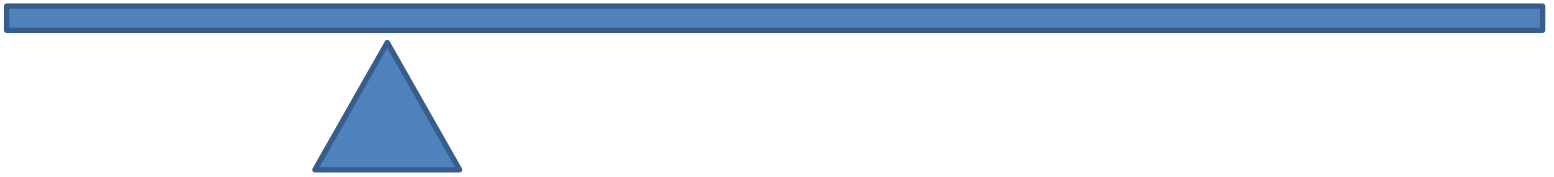
One

mfg assembly job

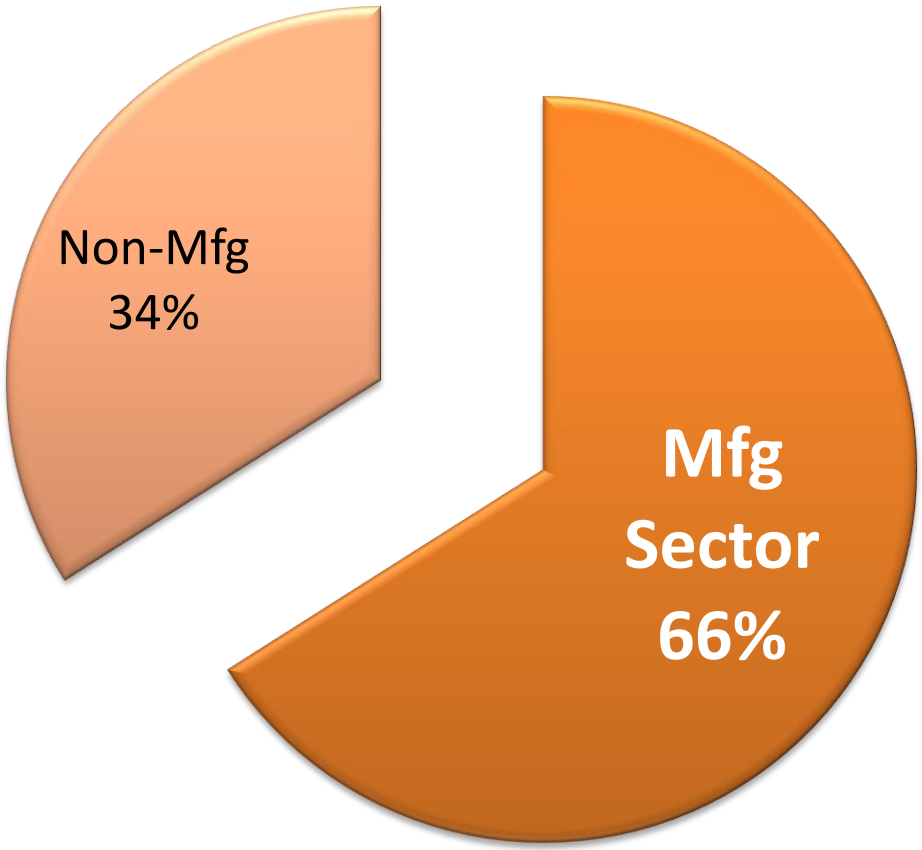


up to Six

jobs in economy

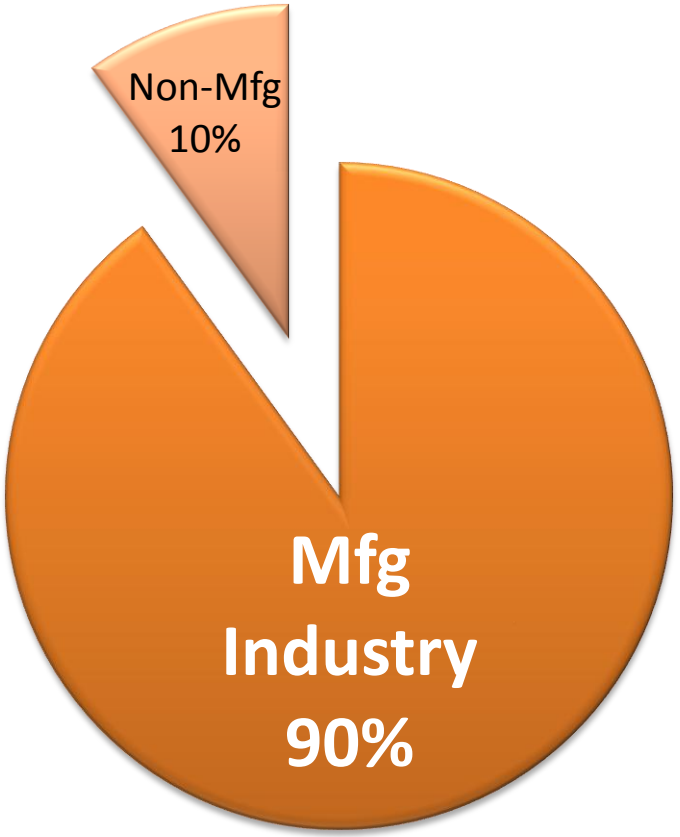


2/3 U.S. scientists and engineers are employed in manufacturing



Manufacturing Drives Innovation

U.S. Patents



CMU,
Georgia Tech,
Michigan,
MIT,
Stanford,
UC Berkeley

Allegheny Technologies,
Caterpillar,
Corning,
Dow,
Ford,
Honeywell,
Johnson & Johnson,
Intel,
Northrop Grumman,
P&G, Stryker, UTC

Background Information

- President Obama announced the Advanced Manufacturing Partnership (AMP) initiative on June 24, 2011
- Reinvigorating the U.S. manufacturing competitiveness
- Creating high-quality jobs
- Public-private partnership (PPP)

White House AMP 2.0

"Our first priority is making America a magnet for new jobs and manufacturing."

President Barack Obama February 12, 2013

AMP 2.0

- FOCUS: implementation with recommendations (specific, targeted, actionable), building on the 2012 AMP report
- WORKSTREAM: 5
  - Launching additional multi-agency initiatives to advance transformative early-stage technologies
  - Scaling best-in-class demand-driven workforce solutions to develop technical skills
  - Building a lasting National network for Manufacturing Innovation
  - Addressing core advanced manufacturing policy questions
  - Driving excitement and engagement from the science and engineering community

REPORT TO THE PRESIDENT ON CAPTURING DOMESTIC COMPETITIVE ADVANTAGE IN ADVANCED MANUFACTURING

Executive Office of the President

President's Council of Advisors on Science and Technology

JULY 2012

THE MANUFACTURING RESURGENCE:
WHAT IT COULD MEAN FOR THE U.S. ECONOMY
A Forecast for 2025

By Thomas J. Duesterberg
Executive Director, Manufacturing and Society in the 21st Century, The Aspen Institute

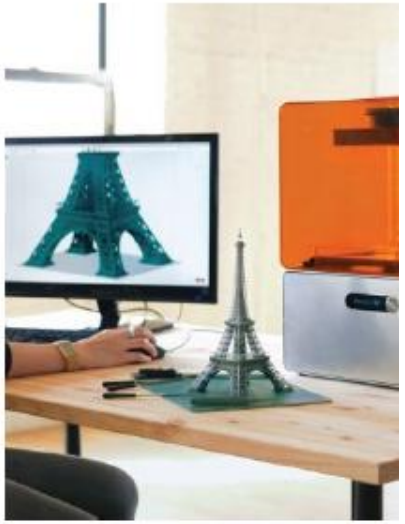
March 2013

Foreword by Stephen Gold
President and Chief Executive Officer,
Manufacturers Alliance for Productivity
and Innovation (MAPI)

MAPI

THE ASPEN INSTITUTE
MANUFACTURING AND SOCIETY IN THE 21ST CENTURY

McKinsey Global Institute



May 2013

Disruptive technologies: Advances that will transform life, business, and the global economy

May 2013

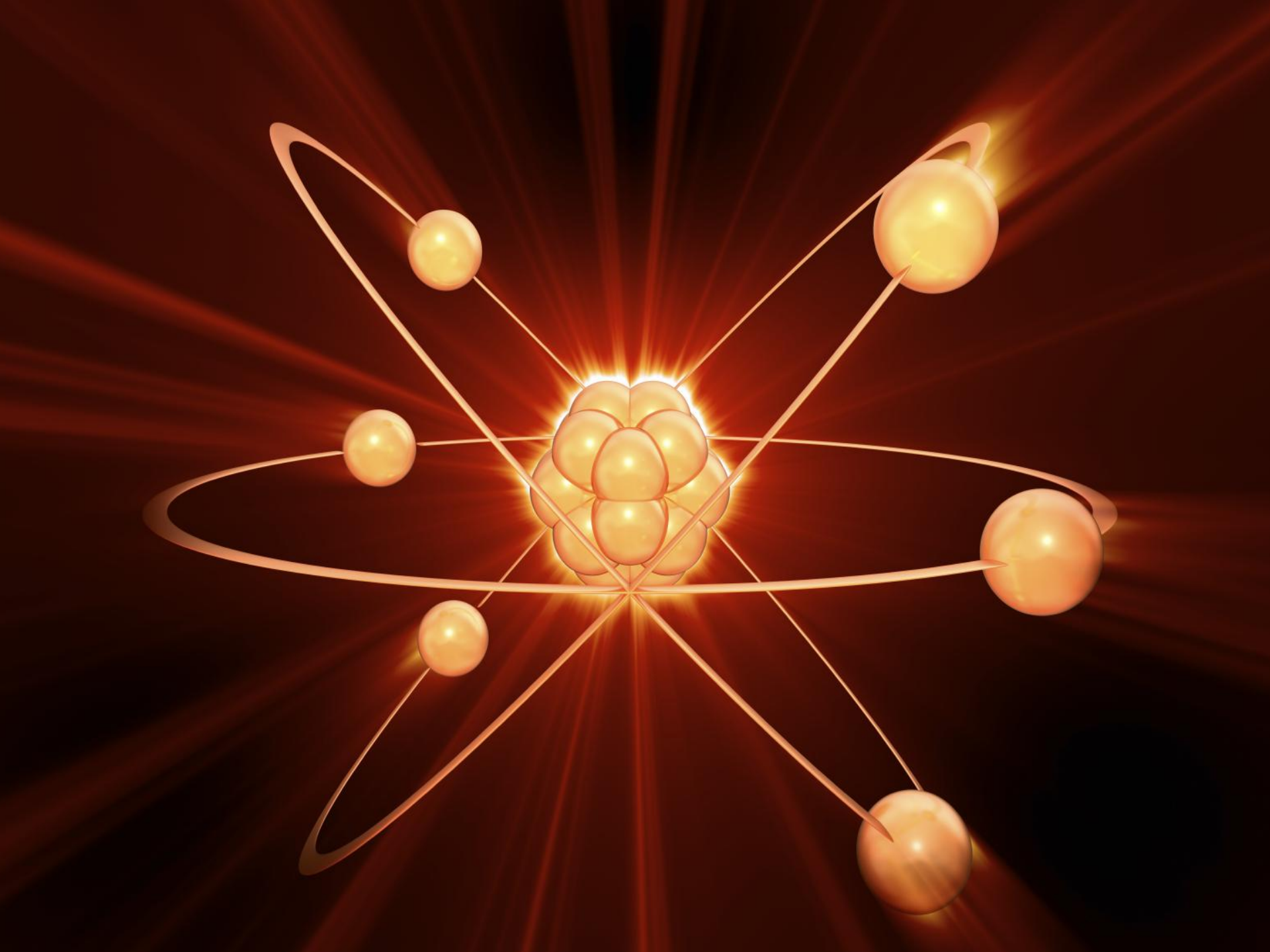
Ten IT-enabled business trends for the decade ahead

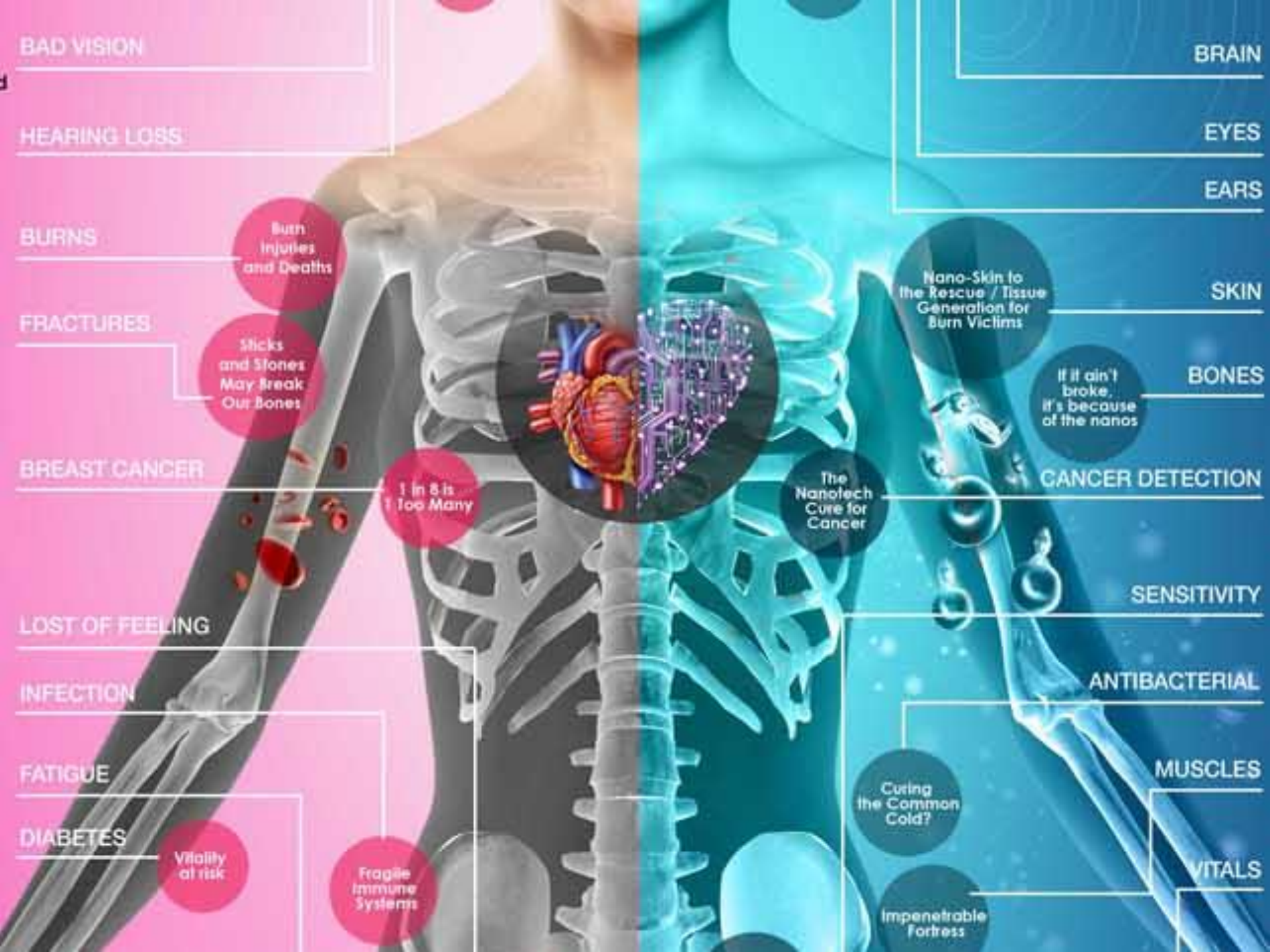
Updated research

Deloitte.

Compete.
Council on Competitiveness

2013 Global Manufacturing Competitiveness Index




BAD VISION
HEARING LOSS
BURNS
Burn Injuries and Deaths
FRACTURES
Sticks and Stones May Break Our Bones
BREAST CANCER
1 in 8 is 1 Too Many
LOST OF FEELING
INFECTION
FATIGUE
DIABETES
Vitality at risk
Fragile Immune Systems
BRAIN
EYES
EARS
SKIN
Nano-Skin to the Rescue / Tissue Generation for Burn Victims
BONES
If it ain't broke, it's because of the nanos
CANCER DETECTION
The Nanotech Cure for Cancer
SENSITIVITY
ANTIBACTERIAL
Curing the Common Cold?
MUSCLES
VITALS
Impenetrable Fortress

IE&M should be leading the charge for a manufacturing renaissance

Leadership in Research

Discovery-based research is the fuel for our research engine

Interdisciplinary, collaborative

Partner with business, industry, and government

$655M in sponsored expenditures in 2013

$55M

1. Purdue
2. MIT
3. Penn State
4. UC – Berkeley
5. North Carolina State
6. Univ. of Washington
7. Univ. of Texas – Austin
8. Carnegie Mellon
9. Stanford Univ.
10. **Georgia Tech**
11. Univ. of Florida
12. Texas A&M
13. UCLA
14. VA Polytechnic
15. Univ. of Minnesota
16. Univ. of Michigan
17. Cornell
18. Univ. of Illinois
19. Cal Tech
20. Northwestern Univ.
21. Johns Hopkins

Leadership in Research

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$655M in sponsored expenditures in 2013

2X in 5Y

Barriers

- Administrative obstacles
- Incentive policy
- Faculty's lack of knowledge and training
- Historical reasons for focusing on academic research