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News Clips: New and Notable

- "Research and development is increasingly going global, according to a new report by [Duke's Offshoring Research Network](#) (ORN). More than half of U.S. companies now have corporatewide initiatives to outsource innovation activities, up from 22% in 2005, according to the ORN, which has been tracking the growth of outsourcing since 2004. And of those companies already offshoring development, 60% intend to do so more aggressively."

-Vivek Wadhwa, "The Global Innovation Migration," *Business Week* online, 11/09/09.

Full article: http://www.businessweek.com/technology/content/nov2009/tc2009119_331698.htm

- Economics blogger Mike Mandel looked into the role that higher education degrees play in the U.S. economy and found that 35 percent of college graduates have a degree beyond the B.A., up from 32.7 percent in 1999. "That seems pretty good, doesn't it?" he wrote. "More and more of our college grads are getting advanced degrees, which is exactly what we would want to help foster innovation." The growth, he realized was at the masters (and professional) level, however: the proportion of workers with Ph.D's is on a slight downward curve, dipping under 4.5 percent in 2007 and still dropping. Christopher Shea from the Boston Globe further commented on Mandel's findings:

"That doesn't represent an exodus, but perhaps people *should* flee the Ph.D. path, given another figure Mandel uncovered. While the inflation-adjusted earnings of workers with bachelor's or masters degrees have increased very slightly since 1999--a rise of one percent or less--the story was quite different for the doctorate. Employees with Ph.D.'s can expect to earn 10 percent less, in real dollars, than they would have a decade ago. 'Yowza,' Mandel writes."

-Christopher Shea, "The Ph.D. and Wages," Boston Globe Brainiac Blog, 1/12/10.

Full post: http://www.boston.com/bostonglobe/ideas/brainiac/2010/01/the_phd_and_wag.html

Science News: A Year in Review

Top science news stories from selected sources:

Boston Museum of Science: Museum Education Associate Susan Heilman has compiled her list of the year's ten best science stories, based on the relevance of the story to the intersection of science and society. This year also marks an anniversary of one of the most important scientific breakthroughs of all time: the 150th anniversary of Charles Darwin's *The Origin of Species*. Read on to see if any of these stories might stand the test of time and be honored in 150 years.

1. **A Flu for All Seasons** – the H1N1 crisis.
2. **Walk Like A Man** - the discovery of our newest, oldest human ancestor, *Ardipithecus ramidus*. "Ardi."
3. **One More Small Step** - In June, NASA sent lunar "scouts" in the form of the Lunar Reconnaissance Orbiter (LRO) and the Lunar CRater Observation and Sensing Satellite (LCROSS, which confirmed the presence of large amounts of ice water in a crater.
4. **UN Climate Summit** - More than 85 world leaders gathered with the simple goal of saving the world from an environmental Armageddon.
5. **Diagnosing Disease** - Dr. George Whitesides's goal to make diagnostic testing easy and accessible has quickly been recognized for its potential to aid medical monitoring in under-developed countries by enabling clinics in remote areas to use a cell phone camera to send an image to a doctor for more immediate medical diagnosis.
6. **Oldest Object in the Universe** – In April, a massive star called GRB 090423 exploded in the constellation Leo. Based on the wavelengths of radiation detected, the star exploded 13 billion years ago, approximately 630 million years after the Big Bang. Not only is it now the oldest object ever observed, but this explosion also tells us more about the beginnings of the universe.
7. **A Good Start to a Tough Vaccine** – In September, a breakthrough was finally reported for an HIV vaccine. Researchers in Thailand conducted a large-scale vaccine trial with over 16,000 volunteers. Although the vaccine was only about 30% effective in reducing HIV infection, this is a significant and useful starting point to adapt and optimize for a more successful vaccine in the future.
8. **A Very Old Primate** – Ida, at 47 million years old, she is one of the oldest primates ever found. She is also the most complete primate fossil ever found before the advent of human burial
9. **Are We Alone?** The Kepler telescope, launched in March, is seeking to find other Earth-like planets which are solid rather than gaseous, similar in size to Earth, and a certain distance from the star they orbit.
10. **Giant Snake** - The discovery of *Titanoboa cerrejonensis*, which approximately 58 - 60 million years ago, walked through the rainforests of present-day Colombia.

Source: http://www.mos.org/visitor_info/museum_news&d=4125

Science News: A Year in Review

An LANL-centric gaze at scientific progress in 2009 from Nanowerk News

Los Alamos National Laboratory (LANL) has identified the Top 10 Laboratory science stories of 2009 based on global viewership of online media content and LANL's role in achieving these breakthroughs

The Top 10 LANL Science Stories for 2009 are:

- 1) **Roadrunner**: The Roadrunner supercomputer at Los Alamos is the first computing system in the world to reach a petaflop, computer jargon for 1 million billion calculations per second, a record that stood for a year and a half.
- 2) **Ardi**: A Los Alamos National Laboratory geologist is part of an international research team responsible for discovering the oldest nearly intact skeleton of *Ardipithecus ramidus*, who lived 4.4 million years ago.
- 3) **Climate modeling & monitoring**: LANL innovations in high-resolution climate modeling and monitoring led to new insights into the impacts of climate change at global and regional scales.
- 4) **MagViz**: LANL's MagViz team pioneered the use of modified magnetic resonance imagery (MRI) technology to distinguish and alert airport security staff to potentially dangerous liquids and gels in airport carry-on baggage.
- 5) **First dual-axis hydrodynamic test**: LANL scientists and engineers fired the first-ever double-viewpoint, multiframe hydrodynamic test at DARHT, the Laboratory's Dual Axis Radiographic Hydrodynamic Test facility – leading to future experiments at LANL and across the nation's nuclear security enterprise, supporting the stockpile stewardship and weapons assurance mission.
- 6) **Hurricane prediction**: A system of sensors developed by Los Alamos National Laboratory for the National Nuclear Security Administration's nonproliferation mission has also begun to give meteorologists their most detailed view of the relationship between hurricanes and lightning.
- 7) **Fuel from plants**: Los Alamos National Laboratory has teamed with Solix Biofuels, Inc. to use an award-winning LANL sound-wave technology to optimize production of algae-based fuel in a cost-effective, scalable, and environmentally benign fashion.
- 8) **IBEX**: The invisible structures of space are becoming less so, as scientists look out to the far edges of the solar wind bubble that separates our solar system from the interstellar cloud through which it flies. Using the High Energy Neutral Atom Imager, led by LANL, the NASA Interstellar Boundary Explorer (IBEX) mission (http://www.nasa.gov/mission_pages/ibex/index.html) has sent back data that indicates a "noodle soup" of solar material has accumulated at the outer fringes of the heliosphere bubble.
- 9) **Laser-particle acceleration for cancer therapy**: Laser-particle acceleration is an emerging area of physics expected to enable significant future advances in cancer radiotherapy. An international team of physicists led by LANL has accelerated protons to world-record high energies that otherwise only achievable with large accelerator facilities.
- 10) **Nanotechnology for Energy Frontiers**: Two LANL teams were awarded lead roles as DOE Energy Frontier Research Centers to develop new materials for energy.

Full Article: <http://www.nanowerk.com/news/newsid=14277.php>

Featured Academic Papers

For pdf copies of papers refer to:

<http://www.hbs.edu/units/tom/seminars/2009/science/>

"WARF's Stem Cell Patents: Issues of Access and Investment in Biomedical Technology" [John Golden](#), Ph.D.
(Assistant Professor, University of Texas School of Law)

Abstract: Golden discusses patents on stem cell technology owned by the Wisconsin Alumni Research Foundation (WARF), a nonprofit institution associated with the University of Wisconsin. These patents have been a focal point for controversy about the granting and enforcement of rights in biomedical technology. As in the case of WARF's stem cell patents, worries that patent rights in such technology can delay or limit follow-on research are exacerbated when the technology is difficult to replicate and access to the technology therefore commonly requires a material transfer agreement (MTA) with a rights holder. Further complications can result from use restrictions in agreements with the donors of tissue or embryos from which transferred material was derived. The controversy over WARF's stem cell patents highlights these concerns and provides lessons about institutions and practices that might smooth the path for future follow-on research

"Gaining it by Giving it Away - How Firms Capture Value from Open Source Software by Waiving Intellectual Property Rights" [Markus Reitzig](#) (Assistant Professor for Strategic Management, London Business School)

Abstract: We advance theory in strategic management by suggesting two arguments for why and when firms may increase their performance by waiving their property rights on rare and valuable assets. We propose that firms may benefit from reducing their formal resource control if doing so either (1) increases upstream supply productivity by third parties and/or (2) helps firms capture value from a resource jointly with others when no single firm can appropriate the resource using its individual property rights alone. Drawing on a variety of original data pertaining to open source software (OSS) programming activity, firm products, and firms' patent acquisitions, we empirically test whether corporate patent non-assertion claims against OSS users can be explained through our theoretical lenses *ex post*. Our findings indicate that firms' patent pledges are a subtle means to capture value from a (partially) public resource.

[Benjamin Jones](#), (Kellogg School of Management)

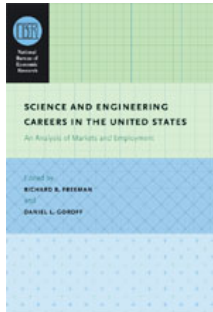
"The Knowledge Trap: Human Capital and Development Reconsidered"

Abstract: This paper presents a model where human capital differences, rather than residual productivity differences, can explain several central phenomena in the world economy. In the model, workers choose both the duration and content of their training. A "knowledge trap" occurs where skilled workers avoid narrow, deep training and thus fail, collectively, to embody frontier knowledge. Standard human capital accounting is shown to underestimate the resulting skill differences between rich and poor nations. The theory may explain price, wage and income differences across countries, and suggests novel interpretations of immigrant outcomes, poverty traps, and the brain drain, among other applications.

Featured Books

Science and Engineering Careers in the United States An Analysis of Markets and Employment

Edited by Richard B. Freeman and Daniel L. Goroff



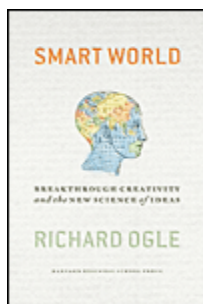
Series: [National Bureau of Economic Research Conference Report\(2009\)](#)

Beginning in the early 2000s, there was an upsurge of national concern over the state of the science and engineering job market that sparked a plethora of studies, commission reports, and a presidential initiative, all stressing the importance of maintaining American competitiveness in these fields. *Science and Engineering Careers in the United States* is the first major academic study to probe the issues that underlie these concerns.

This volume provides new information on the economics of the postgraduate science and engineering job market, addressing such topics as the factors that determine the supply of PhDs, the career paths they follow after graduation, and the creation and use of knowledge as it is reflected by the amount of papers and patents produced. A distinguished team of contributors also explores the tensions between industry and academe in recruiting graduates, the influx of foreign-born doctorates, and the success of female doctorates. *Science and Engineering Careers in the United States* will raise new questions about stimulating innovation and growth in the American economy.

Featured Books

Smart World: Breakthrough Creativity and the New Science of Ideas



By [Richard Ogle](#)

"Since ancient times, people have believed that breakthrough ideas come from the brains of geniuses with awesome rational powers. In recent years, however, the paradigm has begun to shift toward the notion that the source of creativity lies "out there," in the network of connections between people and ideas. In this provocative book, Richard Ogle crystallizes the nature of this shift, and boldly outlines "a new science of ideas." The key resides in what he calls "idea-spaces," a set of nodes in a network of people (and their ideas) that cohere and take on a distinctive set of characteristics leading to the generation of breakthrough ideas. These spaces are governed by nine laws--illuminated in individual chapters with fascinating stories of dramatic breakthroughs in science, business, and art. "Smart World" will change forever the way we think about creativity and innovation."

www.hbr.org

Featured Publications

Study: U.S. Scientist and Engineer Supply as Strong as Ever But New Data Show Top Students Choose Careers in other Fields

A new study, conducted with funding from the Alfred P. Sloan Foundation, finds U.S. colleges and universities are graduating as many scientists and engineers as ever before. Contrary to fears expressed by educators and employers, American students have not wavered in their interest in science and math studies over the past 30 years.

The new report entitled, “**Steady as She Goes? Three Generations of Students through the Science and Engineering Pipeline**,” is one of the most comprehensive analyses of a major longitudinal dataset to examine the transition of American students in science, technology, engineering and mathematics (STEM) from high school into the labor force. While the data show no decline in students pursuing science and math, they do indicate that many of the highest performing students are choosing careers in other fields after graduation.

Among the findings of the “*Steady As She Goes*” report:

- American student interest in science and math has NOT wavered in the past 30 years.
- The STEM student retention rate in the transition from high school to college has been relatively unchanged since the 1970's.
- The STEM retention rate from college to 1st job actually increased between 1977 and 2000.
- The retention rate as STEM students moved from college to mid-career jobs also increased 1977-2003.
- The **percentage of all college undergraduates** who earn a degree in STEM fields has also stayed steady at around 20% for 1972-2005.
- The real challenge facing employers in the STEM fields is the loss of the top STEM students to other industry sectors. For example, the retention rate of the top 20% of STEM students moving from high school to college fell steeply 2000-2005.

“Over the past decade, U.S. colleges and universities graduated roughly two to three times more scientists and engineers than were employed in the growing science and engineering workforce,” said the study’s co-author Lindsay Lowell, Director of Policy Studies at Georgetown University. “There is no evidence of a long-term decline in the proportion of American students with the relevant training and qualifications to pursue STEM jobs.”

“Despite decades of complaints that the United States does not have enough scientists and engineers, the data show our high schools and colleges are providing an ample supply of graduates. It is now up to science and technology firms to attract the best and the brightest graduates to come work for them,” said co-author of the study, Hal Salzman, Professor of Public Policy at Rutgers, The State University of New Jersey. “Our problem is not a failure to educate enough science and math students, but an inability to induce our most talented young people to pursue careers within our high-technology companies.”

Copies of the “**Steady as She Goes?**” report are available at www.heldrich.rutgers.edu.

Hal Salzman

Hal Salzman is a Professor of Public Policy at the Edward J. Bloustein School of Planning and Public Policy and Senior Faculty Fellow at the John J. Heldrich Center for Workforce Development. His research focuses on labor markets, workplace restructuring, skill requirements, and globalization of innovation, engineering and technology design. Recently he has been writing on the science and technology policy implications of his research. His work is funded by Sloan Foundation, National Science Foundation, and Kauffman Foundation.

B. Lindsay Lowell

Dr. Lowell is Director of Policy Studies for the Institute for the Study of International Migration at Georgetown University. He was previously Director of Research at the Congressionally- appointed Commission on Immigration Reform where he was also served as Assistant Director for the Mexico/US BiNational Study on Migration. He has been Research Director at the Pew Hispanic Center of the University of Southern California, a Labor Analyst at the US Department of Labor; and taught at Princeton University and the University of Texas at Austin.

Dr. Lowell co-edited *Sending Money Home: Hispanic Remittances and Community Development*, and he has published over 150 articles and reports on his research interests in immigration policy, labor force, economic development, and the global mobility of the highly skilled. He received his PhD in Sociology as a Demographer from Brown University.

Featured Publications

Innovation Policy and the Economy



Innovation Policy and the Economy provides a forum for research on the interactions among public policy, the innovation process, and the economy. The distinguished contributors cover all types of policy that affect the ability of an economy to achieve scientific and technological progress or that affect the impact of science and technology on economic growth.

Volume 9 considers such topics as the rationale for doubling Congressional R&D spending on the physical sciences, intellectual property as a bargaining environment, using the Google Book Search litigation as a lens to study copyright as innovation policy, what has been learned about market design by looking at common patterns of market failures and how they have been fixed, and how market design plays a central role in innovation.

Among the issues covered in Volume 8 are policy challenges at the university-industry interface, the role of innovation and experimentation in the net neutrality debate, and the trade-offs in establishing the scope of patent rights or limitations on patent pools.

Josh Lerner is the Jacob H. Schiff Professor of Investment Banking at Harvard Business School, with a joint appointment in the finance and entrepreneurial management units, and a research associate of the NBER.

Scott Stern is associate professor of management and strategy at the Kellogg School of Management, Northwestern University, and a research associate of the NBER.]

To Order:

<http://www.journals.uchicago.edu/page/ipe/brief.html>

Featured Publications

Report on the Conference: How does Silicon Valley Evaluate Foreign Education and Experience?

The conference was inaugurated by Professor Philip Martin of University of California, Davis, and Dr. Michael Teitelbaum, Sloan Foundation, who laid out the broad themes of the West Coast Initiative of the Science and Engineering Workforce Project, of the National Bureau of Economic Research.

The Sloan West Coast Program on Science and Engineering Workers is a statewide network of researchers interested in the science and engineering labor force. It sponsors campus seminars, publishes analytic articles that summarize key research findings, and organizes field visits to examine S&E issues in the workplace.

IT firms in Silicon Valley access talent globally, recruiting from colleges abroad and recruiting firms, and personnel transfers from overseas affiliates. Another strategy is to open offshore operations – although this restricts access to a few locations, in countries with large labor pools this may spur innovation, while providing access to domestic markets.

The conference, the fourth in S-APARC's annual Globalization of Services series, explored SV IT firms' assessment of foreign education and experience, the career paths of foreign engineers, and the impact on firms' capacity for scale and innovation. The intent was to understand whether selecting from a global labor force enables US employers to select just the "best" worker or is motivated by other considerations.

This conference was held on Friday, March 13, 2009, organized by the Shorenstein Asia-Pacific Research Center (S-APARC), Stanford University. The conference was supported by the Sloan Foundation, ETLA Finland and the University of Colorado, Denver.

Full Report: <http://migration.ucdavis.edu/wcpsew/files/seminar-report-march-13-2009>

Featured Publications

Gender Differences at Critical Transitions in the Careers of Science, Engineering, and Mathematics Faculty (2010)

Committee on Gender Differences in the Careers of Science, Engineering, and Mathematics Faculty; Committee on Women in Science, Engineering, and Medicine; National Research Council



Gender Differences at Critical Transitions in the Careers of Science, Engineering, and Mathematics Faculty presents new and surprising findings about career differences between female and male full-time, tenure-track, and tenured faculty in science, engineering, and mathematics at the nation's top research universities. Much of this congressionally mandated book is based on two unique surveys of faculty and departments at major U.S. research universities in six fields: biology, chemistry, civil engineering, electrical engineering, mathematics, and physics. A departmental survey collected information on departmental policies, recent tenure and promotion cases, and recent hires in almost 500 departments. A faculty survey gathered information from a stratified, random sample of about 1,800 faculty on demographic characteristics, employment experiences, the allocation of institutional resources such as laboratory space, professional activities, and scholarly productivity.

This book paints a timely picture of the status of female faculty at top universities, clarifies whether male and female faculty have similar opportunities to advance and succeed in academia, challenges some commonly held views, and poses several questions still in need of answers. This book will be of special interest to university administrators and faculty, graduate students, policy makers, professional and academic societies, federal funding agencies, and others concerned with the vitality of the U.S. research base and economy.

Featured Publications

Protecting and Accessing Data from the Survey of Earned Doctorates: A Workshop Summary



Committee on National Statistics (CNSTAT)
Behavioral and Social Sciences and Education (DBASSE)

Thomas J. Plewes, Rapporteur; National Research Council

The Survey of Earned Doctorates (SED) collects data on the number and characteristics of individuals receiving research doctoral degrees from all accredited U.S. institutions. The results of this annual survey are used to assess characteristics and trends in doctorate education and degrees. This information is vital for education and labor force planners and researchers in the federal government and in academia.

To protect the confidentiality of data, new and more stringent procedures were implemented for the 2006 SED data released in 2007. These procedures suppressed many previously published data elements. The organizations and institutions that had previously relied on these data to assess progress in measure of achievement and equality suddenly found themselves without a yardstick with which to measure progress.

Several initiatives were taken to address these concerns, including the workshop summarized in this volume. The goal of the workshop was to address the appropriateness of the decisions that SRS made and to help the agency and data users consider future actions that might permit release of useful data while protecting the confidentiality of the survey responses.

To download: http://books.nap.edu/catalog.php?record_id=12797#description

Upcoming Events

Climate Change and Emerging Infectious Diseases Tuesday, March 2, 2010 | 9:00 AM - 5:00 PM
The New York Academy of Sciences

Organizers: Dickson Despommier (Columbia University), Stephen Morse (Columbia University), Jennifer Henry (The New York Academy of Sciences), Madeleine Thomson (Columbia University) and Gavin Schmidt (NASA)

Climate change has led to higher rates of emerging infectious diseases worldwide, reemergence of diseases previously under control, and redistribution of diseases across the planet. This symposium examines these complex relationships.

Innovation in Arts and Culture, February 24th, 2010
5:30pm to 6:00pm- Reception, 6:00pm to 7:30pm- Discussion
The LEVIN Institute
116 East 55th Street (between Lexington and Park Avenues)

Innovate New York is a series of discussions that explores New York's role as a global leader in innovation. Examining the role of innovation across fields from finance to arts and culture, this series convenes leaders in science, technology, finance, and business with the public to discuss New York's strengths, opportunities and challenges.

New York is one of the world's cultural leaders. What is needed to sustain and strengthen this leadership, and exploit global opportunities?

Reynold Levy
President
Lincoln Center for the Performing Arts

Kate D. Levin
Commissioner
New York City
Department of Cultural Affairs

Tom Finkelpearl
Executive Director
Queens Museum of Art

Moderated by
Garrick Utley President, The LEVIN Institute

RSVP by February 22nd to
artsinnovation@levininstitute.org



S | E | W | P

Science & Engineering Workforce Project
at the National Bureau of Economic Research (NBER)

About SEWP

Among all workers, scientists, mathematicians, and engineers are believed to have a disproportionately strong impact on the growth and prosperity of an economy. How society provides training, incentives, and jobs to such individuals therefore merits special attention.

The Science and Engineering Workforce Project (SEWP) based at the National Bureau of Economic Research (NBER) is a network of labor economists and other researchers studying the professional development, deployment, and productivity of scientists, engineers, and highly skilled technical workers. Set up in 2001 with funding from the Sloan Foundation, the Project is directed by Professor Richard Freeman at Harvard University.

Current research foci for SEWP include: wage levels and stipend policy, education and recruitment, graduate student unionization, career choices and trajectories, scientific competition and collaboration, funding mechanisms and incentives, as well as international development and immigration reform.

SEWP seeks to provide government, business, and labor with objective and timely analyses of scientific workforce issues. Network members meet each semester to connect their work with the concerns of policymakers, hi-tech employers, and academic institutions.

In addition to economists, we welcome the participation of social scientists, statisticians, government officials, hi-tech employers, educational leaders, reformers, and researchers, as well as current or future scientists, mathematicians, and engineers.

Administered jointly by

The [Labor & Worklife Program at Harvard Law School](#) and the [\[National Bureau of Economic Research\]](#) (NBER)

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